

## What lessons from the 1930s?

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### Abstract

This paper explores three areas in which the experience of the Great Depression might be relevant today: monetary policy, fiscal policy and the systemic stability of the banking system.

We confirm the consensus on monetary policy: deflation must be avoided.

With regard to fiscal policy, the picture is less clear. We cannot confirm a widespread opinion according to which fiscal policy did not work because it was not tried. We find that fiscal policy went to the limit of what was possible within the confines of sustainability, as they existed then.

Our investigation of the US banking system shows a surprising resilience of the sector: commercial banking operations (deposit-taking and lending) remained profitable even during the worst years. This suggests one policy conclusion: At present the authorities in both the US and Europe have little choice but to make up for the losses on 'legacy' assets and wait for banks to earn back their capital. But to prevent future crises of this type, one should make sure that losses from the investment banking arms cannot impair commercial banking operations. At least a partial separation of commercial and investment banking thus seems justified by the greater stability of commercial banking operations.

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# WHAT LESSONS FROM THE 1930s?

## CEPS WORKING DOCUMENT NO. 312/APRIL 2009

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The overarching concern of policy-makers dealing with the financial crisis on both sides of the Atlantic is to avoid a repeat of the policy errors that contributed to the severity of the downturn in the 1930s. The lessons from the Great Depression for monetary policy and for the banking sector seem clear.<sup>1</sup> However, the same cannot be said for fiscal policy. It seems that fiscal policy played only a minor role even after the New Deal was announced by Roosevelt both in terms of government deficits and government employment.

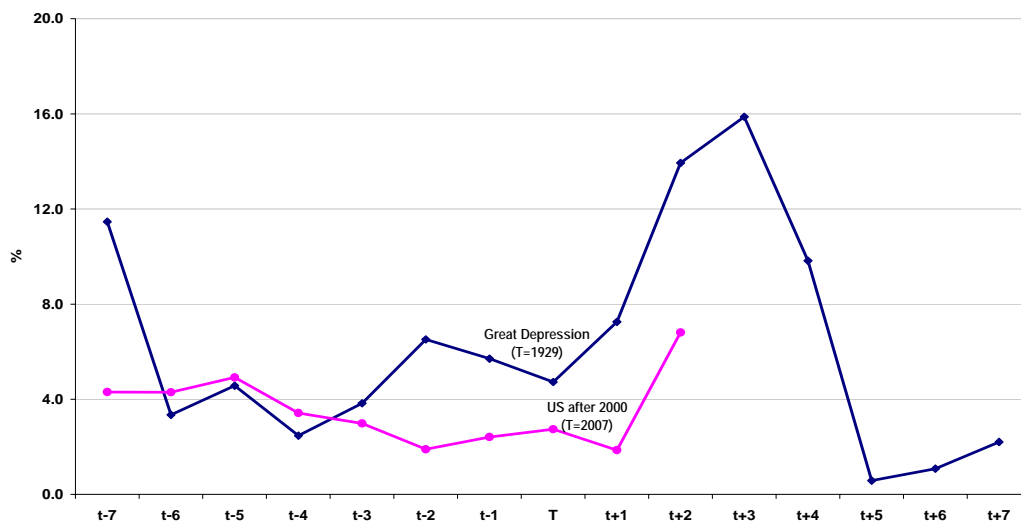
A closer inspection of some key economic variables shows that the situation today is quite different from that of the 1930s. This is the case for the savings/investment balance (during the Great Depression, savings actually declined, whereas today they are increasing).

The performance of the US banking system during the Great Depression shows a surprising resilience of the sector. US (commercial) banks surprisingly continued to make profits throughout the 1930s, whereas the profits of the non-financial sector experienced wide swings and in aggregate actually made losses in 1933.

### 1. Monetary policy

There is a general consensus among economists that sustained deflation has to be avoided at all costs. This was not the case after the crash of 1929. Between 1929 and 1933, prices fell in the US by a cumulative total of over 25%.

Figure 1. US real interest rate on AAA corporate bonds



Data source: FRED II. Real rate own computation based on CPI (all items) inflation.

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<sup>1</sup> See for instance Bernanke (2004) IMF (2009a).

With nominal interest rates during this period registering not even close to zero (they hovered above 4% even for AAA rated issues), this implies, as shown Figure 1, an impossibly high real interest rate during this period. Double-digit real interest rates must be the main explanation of the near collapse of investment until 1933 (massive bank failures of course also contributed to this).<sup>2</sup>

Another indication of the extraordinary level of interest rates is given by the concept of the ‘natural’ rate,<sup>3</sup> which should be close to the growth rate of nominal GDP. As real GDP also fell by about 25% over this period the difference between the nominal growth rate of GDP (about minus 20%) and the nominal interest rate (3-4% even for good credit risks) was extraordinary. It is no wonder that borrowers massively default when the market (nominal GDP) contracts at such a rate.

There seems to be little danger that sustained deflation will occur in either the US or Europe today. Wages are still increasing and the money supply is growing rapidly (almost everywhere). The conclusion for monetary policy is clear: the errors of the 1930s will not be repeated (policy interest rates have been lowered decisively and quantitative easing is being actively considered even by the ECB).

## 2. Fiscal policy

There is less consensus on fiscal policy.<sup>4</sup> Did fiscal policy play a central role in stopping the recession in the 1930s? In particular, did Roosevelt’s New Deal mark a clear turning point? A cursory look at Figure 2 below suggests that in terms of fiscal policy Roosevelt did not mark a radical change. Even before his election, the deficit had been allowed to increase to 5% of GDP and it fluctuated within a rather narrow corridor, between 4% and 5% of GDP, until 1936 without any clear break after Roosevelt’s election (1932). Growth, however, was highly variable over these years, ranging from -12% (1932) to plus 10% (1934). During that period, federal fiscal expenditure amounted to only 2.3% of GDP<sup>5</sup> (about the same as all public sector infrastructure investment spending is today). Roosevelt increased it to 5% in 1934. It is hard to

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<sup>2</sup> Romer (2009), among others, argues that monetary policy played an important role in the recovery phase of the Great Depression. At that time, monetary policy action was mainly conducted by the US Treasury and took the form of quantitative easing. Yet, the monetary expansion did not significantly lower nominal interest rates. If one compares the volatility of nominal and real interest rates, the latter is far larger than the former (e.g. over the period 1928-37, the proportion is 1 to 7).

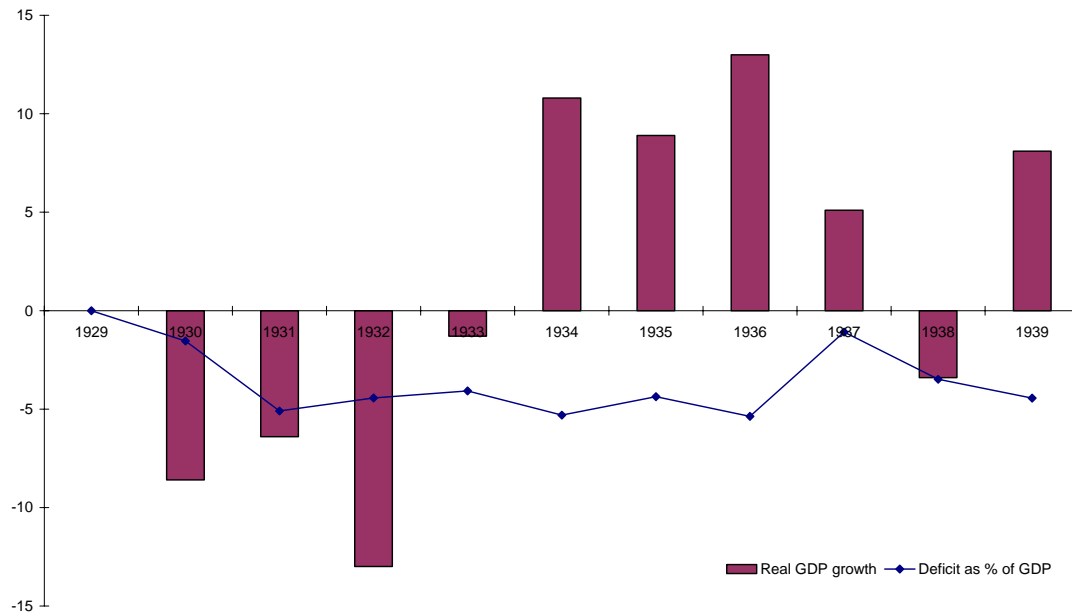
<sup>3</sup> The notion of a *natural* rate of interest was introduced by the Swedish economist Knut Wicksell at the end of the 19<sup>th</sup> century. Conceptually different from the money interest rate, it is defined as the real interest rate consistent with output equalling its potential and stable inflation. In a context of standard growth model, the natural rate of interest varies over time and depends upon preferences and technology, i.e. the main determinants of the trend growth rate of output.

<sup>4</sup> A quite large literature, among others Cole & Ohanian (2004), argues that the New Deal was contractionary. Yet, the opposite conclusion is drawn recently by Eggertsson (2009), who goes beyond the conventional ‘macro’ view of the New Deal as consisting primarily of the Banking Act and federal spending. Using a dynamic general equilibrium model that incorporates inflation expectation, the paper shows that the New Deal had an expansionary effect. The author emphasises that by increasing monopoly power and facilitating union militancy, the New Deal generated inflationary expectations, which lowered real interest rates and resulted in stimulating private spending.

<sup>5</sup> This is the average between 1929 and 1932 of the values derived from the national accounting according to which federal spending includes only current consumption expenditure and gross investment. If one also includes transfers and interest payments, the average of the total federal expenditure over the same period amounts to 4.4% of GDP and increases to 9.7% in 1934. However, a large part of these transfers went to the states and is thus accounted for in the government deficit shown in Figure 2.

believe that an increase in such a small item could have led to the huge turnaround in growth between 1932 and 1934.

Figure 2. Government fiscal deficits and growth in the US during the 1930s



Note: Government deficits include federal, state and local government deficits.

Source: Bureau of Economic Analysis (BEA), US Department of Commerce, Washington, D.C.

It is sometimes alleged that Hoover, Roosevelt’s predecessor, could have been more active. However, if rather than measuring expenditure in terms of GDP, one looks at the ratio with respect to tax revenue, already in 1932, federal expenditure was two times larger than revenue and the ratio fell to 1.8 in 1934. These values are larger than President Obama’s fiscal package as documented in Table 2. In its projections, the Congressional Budget Office estimates the ratio at 1.6 for 2009 and at 1.5 for the following period. Hence one cannot really argue that fiscal policy was not used during the 1930s. During that time the size of the government’s budget in the economy was so small that it would have been impossible to have a deficit (as a proportion of GDP) comparable to today’s values. Annex I elaborates on this point.

Table 1. Government expenditure/revenue ratio

	1932	1933	1934	1935	2008(Q3)	2009	2010
<b>Fed expenditure/revenue</b>	2	1.5	1.8	1.7	1.3	1.6	1.5
<b>Total government expenditure/revenue</b>	1.3	1.3	1.4	1.3	1.3	1.29*	1.3*

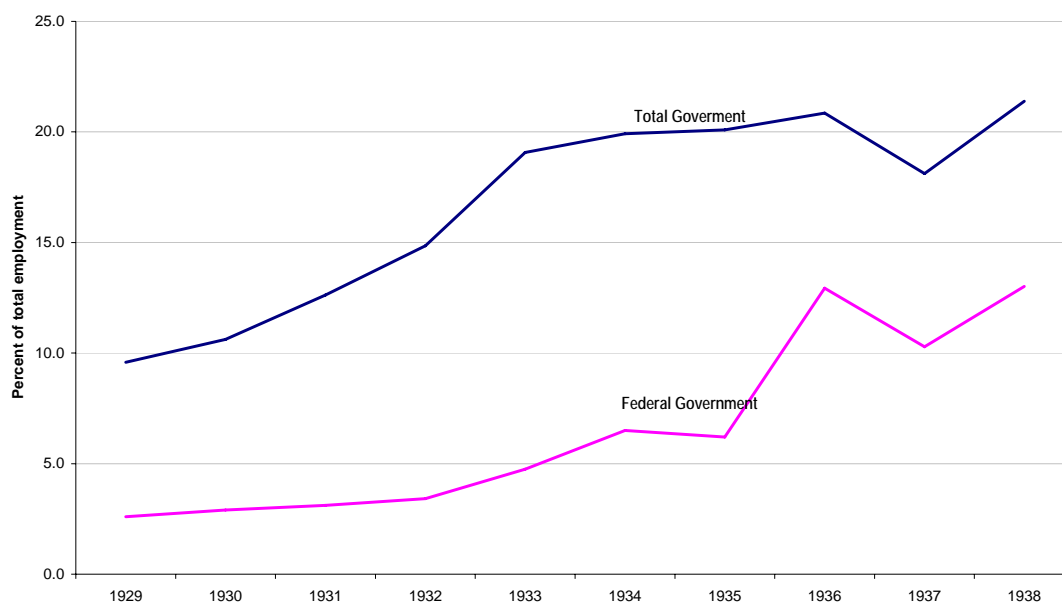
Note: TARP is excluded from the outlays for 2009.

\*Authors’ own computations.

In addition, the US government, at both the federal and state levels, made strong efforts to directly improve the labour market. Figure 3 shows the share of government employment (and the federal part of it) in total employment. In 1929, 10% of all employed were working for the government, but in 1933 (before Roosevelt could have had a strong impact) this percentage had already doubled to close to 20%. This shows that the public sector (mostly at the state level,

initially) did undertake substantial efforts to improve the labour market. However, Figure 3 shows a clear policy switch in 1934 and a slowdown in the employment increase.

Figure 3. Government employment during the 1930s



Source: Bureau of Economic Analysis (BEA), US Department of Commerce, Washington, D.C.

### **Infrastructure as the focal point of fiscal policy**

The invocation of John Maynard Keynes as providing the intellectual justification of fiscal policy expansion during the 1930s seems also not quite justified. It might be useful to carefully (re-)read Keynes in 1942:

Organized public works, at home and abroad, may be the right cure for a chronic tendency to a deficiency of effective demand. But they are not capable of sufficiently rapid organization (and above all cannot be reversed or undone at a later date), to be the most serviceable instrument for the prevention of the trade cycle (John Maynard Keynes, *Collected Writings*, Vol. XXVII, 1942, p. 122).

Keynes' mature policy ideas of the late 1930s and 1940s seem to differ from his simple advice of the early 1930s. The reason is quite simple: infrastructure expenditure always takes a long time to implement. Moreover, public sector infrastructure investment accounts only for 2-3% of GDP in both the US and the EU. It would have to increase by a large percentage (+40%) in order to have an appreciable impact on demand. In Japan, public sector infrastructure was always much higher and reached 7% of GDP at one point. However, this does not seem to have had a strong impact on either demand or supply, as the trend growth did not increase in Japan. On the contrary, as shown in Annex II, it has contributed to capital overhang.

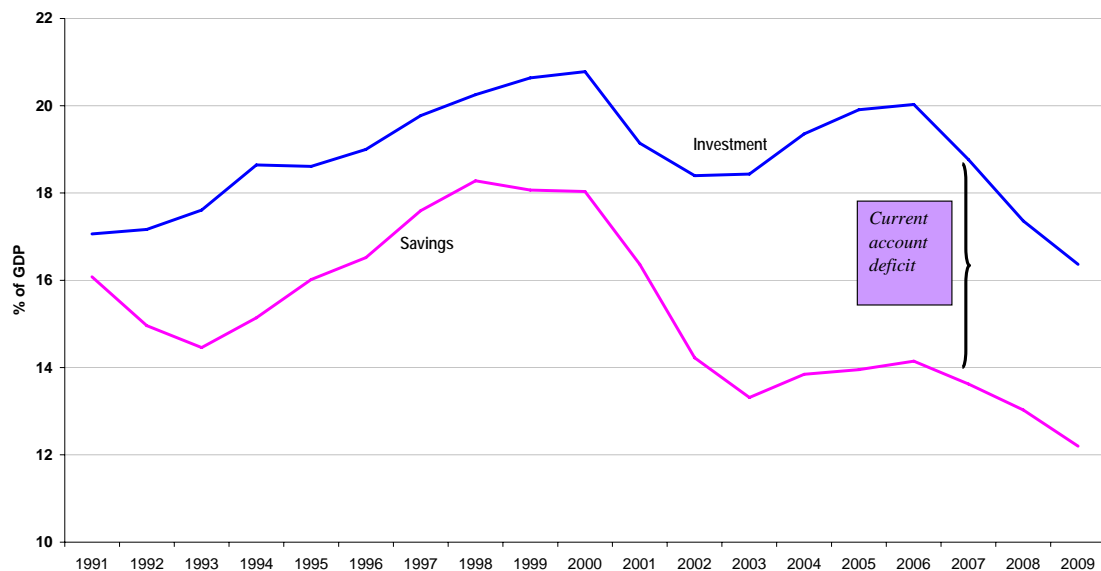
### **Long-term changes in the savings/investment balance?**

The key question for fiscal policy today is thus whether today's problem is cyclical or structural in nature. An emphasis on infrastructure investments as part of a fiscal stimulus package is justified mainly if the problem is one of "chronic tendency to a deficiency of effective demand"

to use Keynes' words. Is this likely to be the problem today in Europe or the US? The answer should be yes if there are reasons to believe that investment will remain weak for a long time and/or savings rates increase permanently. For the US both might be the case, but not necessarily for Europe.

In the case of the US, one can argue that the credit and housing bubble has led to a capital overhang (at least in housing, as shown by Gros, 2007) and that there are many indications that household savings should increase as asset prices have collapsed and credit availability has fallen (Mayer, 2009). The key question now is whether government (and enterprise) dissavings can make up for this turnaround by households. The trend-wise increase in the US current account deficit from the 1990s until 2006 suggests by itself a chronic savings/investment imbalance in the US. However, Figure 4 below shows that the *national* (as opposed to the personal) savings rate in the US actually slightly increased between 2003 and 2006 (although the household savings rate fell).

Figure 4. Gross national savings and investment rates in the US

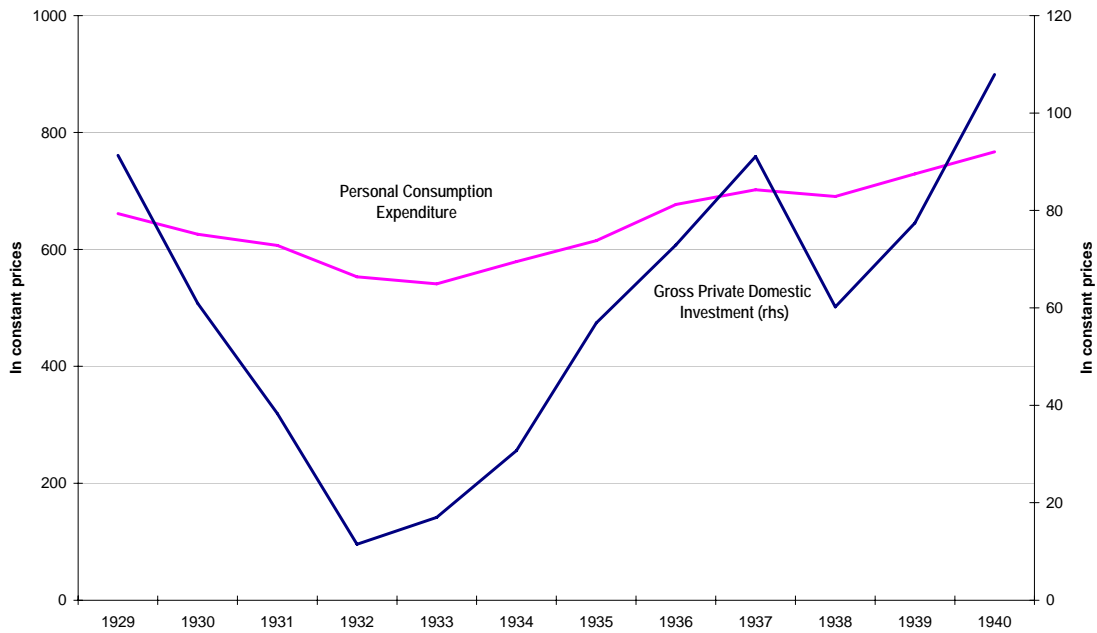


Source: *World Economic Outlook* (WEO), International Monetary Fund, Washington, D.C.

If one looks at personal (household) savings in the US, she will find that it actually *declined* during the Great Depression: the personal savings rate was 4.5% in 1929; it fell to -1.5% in 1933 – and increased with the recovery to over 6% in 1937! The current crisis started with the household savings rate essentially at zero and now it is sharply increasing. The starting point for the two crises is thus definitely different. The key driver of the Great Depression was the extraordinary investment cycle during that period – not a deficiency of household savings.

Figure 5 shows that investment collapsed between 1929 and 1932 – (going from about \$100 in 1929 to less than \$20 (real \$2000) in 1932 – but subsequently rebounded quickly. The huge variations in growth during the 1930s were thus essentially driven by extraordinarily large swings in investment, whereas consumption remained relatively constant.

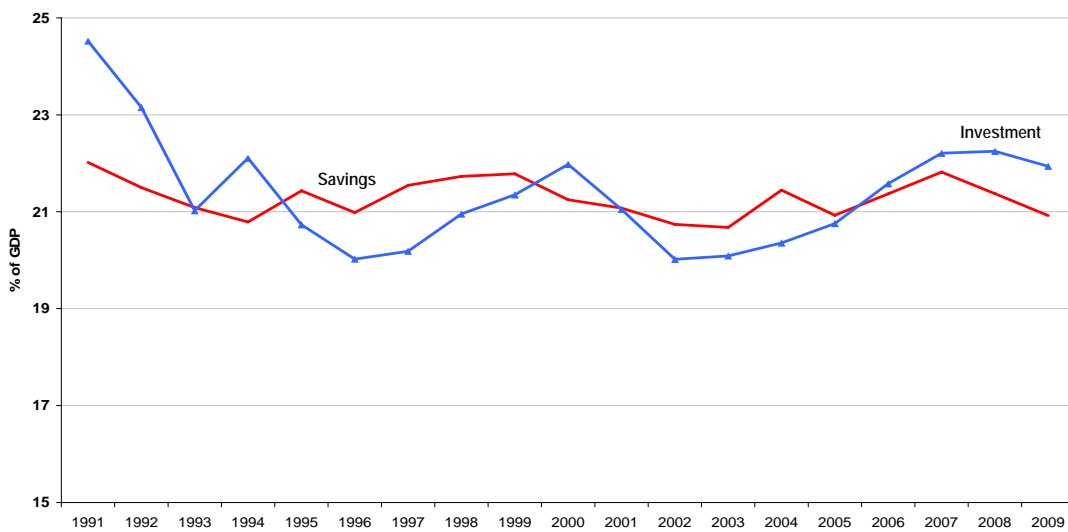
Figure 5. Consumption and investment during the Great Depression



Source: Bureau of Economic Analysis (BEA), US Department of Commerce, Washington, D.C.

In contrast to the situation in the US today, savings (and investment) rates have been roughly constant over the last decade in most of the euro area (the exceptions are mainly Spain and Ireland); and the current account of the eurozone has remained in rough balance over the last decade. A priori there is thus little reason to expect a lasting change in either savings or investment on aggregate for the eurozone.

Figure 6. Gross national savings and investment rates in the eurozone



Source: World Economic Outlook (WEO), International Monetary Fund, Washington, D.C.



Figure 6 shows that investment in the eurozone has fluctuated quite regularly between 20-22% of GDP over the last decades. The years 2007-08 represented a cyclical peak so that one could have expected in any event a fall in investment (albeit not that rapidly) on a purely cyclical basis.

### 3. Banking system under stress

There is today a general consensus that everything possible must be done to avoid large-scale bank failures and that this was not done during the 1930s. However, the impact of the wide scale failures that took place then was much more limited than is generally assumed.

The number of bank failures rose from an annual average of about 600 during the 1920s, to 1,350 in 1930 and then peaked in 1933 when 4,000 banks were suspended. According to the World Economic Outlook (WEO), April 2009, over the entire period 1930-33, one-third of all US banks failed. However, deposit losses remained limited even during this turbulent period at a cumulative 4% (with an annual peak of 2.15% in 1933) of total deposits (of all commercial banks). How can one reconcile these relatively modest losses with the large number of bank failures?

*Table 2. Commercial bank suspensions during the Great Depression*

Year	Number of suspensions	Deposits (\$ millions)	Losses borne by depositors (\$ millions)	Losses (%)	Losses of deposits of all commercial banks (%)
<b>Average 1921-28</b>	631	174	61	35	0.15
<b>1929</b>	659	231	77	33	0.18
<b>1930</b>	1,350	837	237	28	0.57
<b>1931</b>	2,293	1690	390	23	1.01
<b>1932</b>	1,453	706	168	24	0.57
<b>1933</b>	4,000	3597	540	15	2.15
<b>Cumulative 1930-33</b>	9096	6830	1337	20	4.3

*Source:* Federal Deposit Insurance Corporation (FDIC).

A first reason why losses to depositors were, in the end, quite limited is that depositors got back, on average, about 80 cents on the dollar (the rate of loss was only about 20%).<sup>6</sup>

Another key reason was that back then the degree of concentration in the banking industry back then was much lower than it is today. In the mid-1930s, the top three banks had about 11% of the total assets of the industry, whereas in 2008, that share was about 40%. Although about one-third of all banks failed between 1930 and 1933, they had only about 20% of all deposits.

The downside of this fragmentation of the banking sector was that few institutions were regarded as systemic. The failure of any one of the numerous 'mini' banks thus did not arouse

<sup>6</sup> According to the US Federal Deposit Insurance Corporation (FDIC), between 1908 and 1917, eight states established deposits insurance funds, but by end of the 1920s they had all failed.

particular concerns. Hence little was done to prevent the very numerous bank failures that did occur. However, the continuing latent, even if actuarially relatively small, risk of a bank undermined confidence. Given the absence of a federal deposit insurance system, this undermined the functioning of the banking system, as banks had to be extremely cautious given the potential for withdrawal of deposits (runs). The negative feedback loop, which is manifested by weakness of demand leading to more firms failing and hence bank losses, was thus amplified by the lack of an effective deposit insurance system and a generally higher willingness to allow banks to fail.

The creation of the federal deposit insurance system in the US was one of the key lessons learnt, and its creation as part of the New Deal certainly contributed to the recovery. The lesson that confidence of depositors in the banking system is crucial has been amply applied in Europe during the crisis management in 2008, when EU governments extended the existing deposit insurance systems to cover the missing spots that the Northern Rock episode had exposed.

The US authorities had to relearn this lesson after the Lehman Brothers debacle. Given the large impact of the modest deposit losses during the 1930s, it should not have come as a surprise that a failure of this size should have extreme consequences. As an investment bank, Lehman did not have any deposits from the general public, but its assets of about \$660 billion were equivalent to about 5% of the entire US banking system. Moreover, Lehman constituted by itself an important part of the bank bond market as it had issued about \$600 billion of short- and long-term bonds, out of a total of about \$1,200 billion emitted by all commercial banks together.

### Can banks survive a depression?

The Great Depression certainly led to a collapse in corporate profits. The corporate sector went from profits amounting to over \$10 billion (about 10% of GDP) in 1929 to a collective loss of about \$1.5 billion (about 2.5% of GDP) in 1932 (see table below).

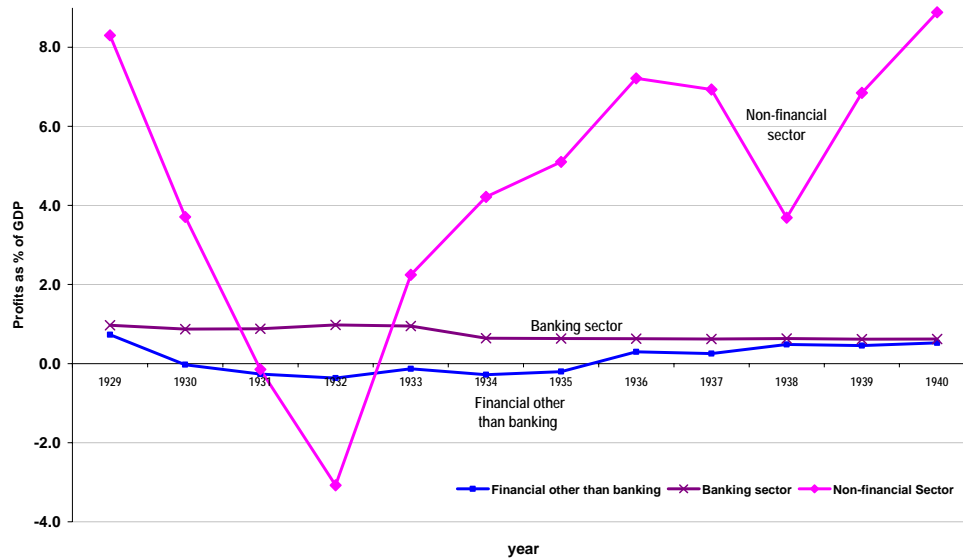
Table 3. Corporate profits before tax (millions of \$)

	1929	1930	1931	1932	1933	1934	1935	1936	1937
<b>Total corporate (domestic &amp; foreign)</b>	10595	4291	357	1480	1728	3079	4216	6931	7450
<b>Domestic non-financial sector</b>	8603	3383	-112	1807	1267	2783	3739	6048	6374
<b>Domestic financial sector (finance, insurance &amp; real estate)</b>	1760	771	473	361	463	236	318	779	804
<b>Banking</b>	1003	796	675	576	536	422	466	529	570

Source: Bureau of Economic Analysis (BEA), US Department of Commerce, Washington, D.C.

Oddly enough in the banking sector, which is thought to have been the most affected by the crisis, profits stayed positive throughout this period as shown in the last row of Table 3. Banks' profits declined by 'only' a little more than 40%, which is more or less in line with nominal GDP. Figure 7 shows that indeed banks' profits were relatively stable as a proportion of GDP (just below 1% of GDP).

Figure 7. Profits (before tax) in the US during the 1930s (% of GDP).



Source: Bureau of Economic Analysis (BEA), US Department of Commerce, Washington, D.C.

However, the financial sector outside of banking also experienced losses. Banks thus appear to have been an island of relative stability. The run-up and aftermath of the current crisis show similar features with corporate profits buoyant before the crisis but collapsing with the onset of the bust. This boom-bust pattern is also pronounced in the financial sector outside of banking.

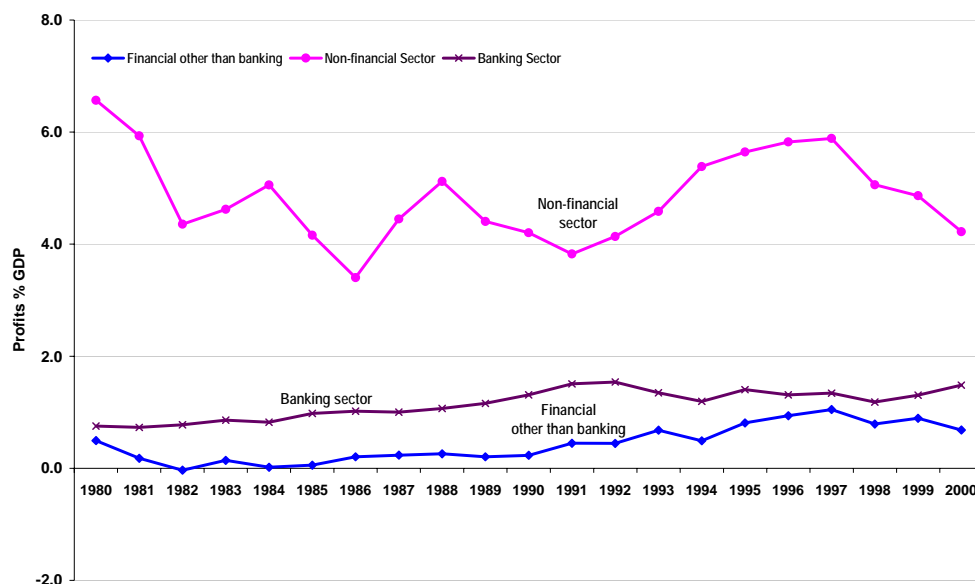
The data for the period 1980-2000 plotted in Figure 8 show that in general banking profits display little correlation with GDP growth. This property is not evident in any other sector of the financial industry, nor the corporate sector as whole.

As most observers tend to lump banks and the larger financial sector together, it is widely assumed that banks' profits also increased during the last boom. However, this is not the case. The profits of (commercial) banks as measured by national accounts have not noticeably increased up to 2007. The data from the Great Depression suggest that they might also be more resilient than that of the wider financial sector.

Another reason for the widespread impression of large profits in banking might be the confusion between the national income accounting concept and the numbers reported in financial statements. The national income accounts do not 'mark to market'. Financial transactions and capital gains and losses related to transactions of financial securities are thus not included in the national accounts. During the boom phase national income accounting profits tended thus to be lower than those reported to financial markets (and vice versa during the bust). Profits as measured by the national accounts should thus give a better picture of underlying, operating profitability of the sector.

The recent batch of relatively reassuring profits reported by many US banks can thus be understood also in the light of the switch away from mark to market. That most banks can report positive profits resembles the experience of the Great Depression.

Figure 8. Profits (before tax) as a share of GDP in the US after 1980



Source: Bureau of Economic Analysis (BEA), US Department of Commerce, Washington, D.C.

How can one explain the relative stability of bank profits in general and in particular during the Great Depression? Simply put, it seems that banks are on average able to charge enough of a risk premium to cover the increase in non-performing loans during downturns. The present crisis confirms this tendency. Much has been made of the headline estimate of over \$4 trillion, published recently by the IMF of the aggregate losses to the financial sector expected from the present crisis. However, this figure is an estimate of the total over four years (2007-10) and banks account for only about 60% of the overall amount. Moreover, about one-half of the losses expected by banks (\$2.4 trillion) derive from the markdown of securities (which would not be included in national income accounts).<sup>7</sup>

The global average overall loss rate on loans for banks is estimated to be around 5.1%. Given that this is assumed to be the cumulated loss rate over four years, banks should be able to absorb it with a commensurate increase in their spreads. If the losses accrue mostly towards the end of this period, an increase in the spread applied by banks of less than 2%, on average on all loans, should be sufficient to protect banks (on average at least) from making large losses. This should be the case at present as well. For example, the European Central Bank reports that the rates charged by euro area banks to corporate customers are now around 4.8%, about 2.5-3 percentage points higher than marginal funding costs as measured by Euribor rates or the rates paid on savings deposits. In the US, the 'prime rate' (the rate charged by banks to their best customers) is, at 3.25%, about 3 percentage points above marginal funding costs embodied in federal funds or commercial paper rates. This should be sufficient to deal with the losses that can be expected even under the current economic conditions.

<sup>7</sup> For details, see Table 1.3 of the IMF (2009), Global Financial Stability Report, April.

Despite its much greater severity, the Great Depression did not actually lead to much higher loss rates. According to the IMF, commercial bank loan charge-off rates peaked for only one year at a bit above 5%,<sup>8</sup> but the average for the early 1930s remained between 2 and 3%.

## Concluding Remarks

The analysis of monetary policy and the banking system in the 1930s has led to two important lessons from the Great Depression: deflation as well as massive bank failure must be avoided. The lesson for fiscal policy is less unambiguous. There is widespread consensus that the fiscal expansion during the 1930s was too limited to yield a significant impact on economic growth. This seems to be the case. Yet, some considerations about government debt sustainability seem to suggest that fiscal policy failed to generate recovery because the government could not do more than it did.<sup>9</sup>

However, this analysis has also pointed out differences in terms of the starting point and possible adjusting mechanisms. In this regard, as shown above, during the Great Depression, output was largely driven by a strong cycle in investment and until 1937, the savings rate did not increase. Thus the current crisis starts with a completely different pattern, namely insufficient household savings in the US.

Another potential difference lies in the size of private-sector balance sheets. As shown in Table 4, the debt burden of the financial and non-financial sector (excluding government) increased by almost 70% of GDP between 2001 and 2007. Moreover, this increase in debt has been accompanied by huge balance-sheet leverage that is largely based, as shown in Figure 9, on a bubble in housing prices.

Table 4. Debt burden as a proportion of GDP in the US (1 = 100 %)

		2001	2007	Change 2007-2001
<b>Non-financial sector</b>		1.91	2.29	0.39
<b>Households total</b>		0.76	1.00	0.24
Of which:	<b>Mortgages</b>	0.53	0.76	0.23
	<b>Consumer credit</b>	0.19	0.19	0.00
<b>Business</b>		0.69	0.77	0.08
<b>Government</b>	<b>Local &amp; state</b>	0.13	0.16	0.03
	<b>Local &amp; state + federal</b>	0.46	0.52	0.06
<b>Financial sector (domestic)</b>		0.90	1.17	0.27

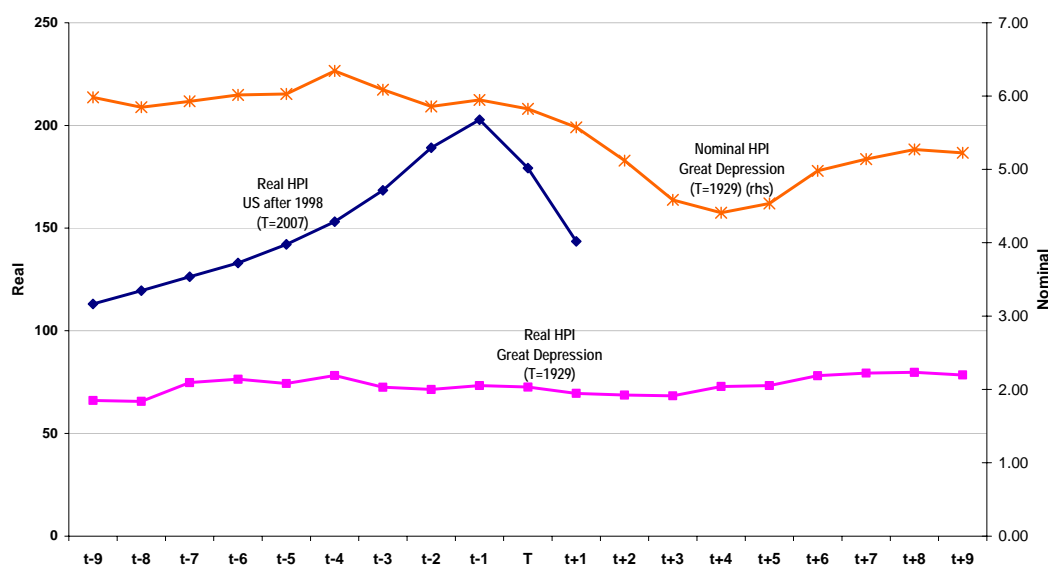
Source: Federal Reserve, flow of funds (Z1).

<sup>8</sup> Ibid.

<sup>9</sup> In line with this thesis, W. Buiter talks of US *de facto* default during the 1930s: “In the case of the US, the sovereign default took the form of the abrogation of the gold clause when the US went off the gold standard (except for foreign exchange) in 1933. In 1933, Congress passed a joint resolution canceling all gold clauses in public and private contracts (including existing contracts). The Gold Reserve Act of 1934 abrogated the gold clause in government and private contracts and changed the value of the dollar in gold from \$20.67 to \$35 per ounce. These actions were upheld (by a 5 to 4 majority) by the Supreme Court in 1935.”

By contrast, housing prices do not seem to have played a crucial role in the development of the crisis in the 1930s, at least not as much as today.<sup>10</sup> Although housing prices started to fall at the end of the 1920s, there is no evidence of a bubble in the pre-Depression period.

Figure 9. US home price index



Source: Shiller (2005) and author's update.

The fall in housing prices in 2007 acted as an important factor triggering the financial crisis and in making this recession a 'balance-sheet' recession.

Surprisingly, the good news comes from the banking sector. The resilience of 'normal' banking operations to a recession or even a depression strengthens the argument for a separation of commercial and investment banking activities.

The classic banking operations of deposit-taking and lending tend to remain profitable even under conditions of stress. But this classic function of banking would not be such a cause of concern today if the investment banking arm of banks had not gotten into trouble by investing in 'toxic' assets. At present the authorities in both the US and Europe have little choice but to make up for the losses on 'legacy' assets and wait for banks to earn back their capital. But to prevent future crises of this type, one should make sure that losses from investment banking arms cannot impair commercial banking operations.

<sup>10</sup> We can assume that during the 1930s, stock prices played a similar role to the one being played by house prices today. The difference is that the current housing bubble has emerged from the ashes of a previous stock bubble busted in 2001.

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## Annex I. Debt sustainability

Given that in the 1930s, unlike today, federal spending was much smaller than state and local government spending, to get a complete overview of the fiscal situation, Table 1 in the main body of the text above also shows data also for the aggregate. Combining US Census Bureau and US Government Accountability Office data and forecast, we guesstimate that the ratio between total expenditure and revenue is about 1.3 for both 2009 and 2010. Hence one cannot really argue that federal fiscal policy had been too timid at the start of the Great Depression.<sup>11</sup>

Another aspect to take into account in assessing whether the authorities tried fiscal policy during the 1930s is debt sustainability.

The standard exercise for assessing debt sustainability starts from the following equation:

$$(1) \frac{PD_t}{Y_t} = \frac{D_{t-1}}{Y_t} \left( \frac{i_t - y_t}{1 + y_t} \right) + \frac{SF_t}{Y_t}$$

where Y is GDP at current prices, D is general government debt, PD is primary deficit,  $i_t$  is the implicit interest rate, y is the growth rate of nominal GDP, SF is the stock-flow adjustment and subscript t stands for time.

This equation just says that a primary deficit that keeps the debt/GDP constant is a function of the initial debt-to-GDP ratio and the so-called ‘snowball’ factor, which is  $[(i_t - y_t)/(1 + y_t)]$  (plus any stock-flow adjustment, SF, which basically captures the various factors that influence changes in the stock of debt, i.e. the assumption of debt outside the budget). This latter element is of course now a key factor as governments all over the world are guaranteeing large amounts of liabilities of banks, liabilities that are backed by assets of dubious quality.

It is customary to deflate debt by GDP; however, debt has to be serviced by taxes and in reality tax revenues might be limited to a certain proportion of GDP, dictated by the prevailing social and political forces. Equation (1) might thus be more usefully rewritten as:

$$(2) \frac{PD_t T_t}{Y_t T_t} = \tau \frac{PD_t}{T_t} = \frac{T_t D_{t-1}}{T_t Y_t} \left( \frac{i_t - y_t}{1 + y_t} \right) + \frac{SF_t}{Y_t} = \tau \left\{ \frac{D_{t-1}}{T_t} \left( \frac{i_t - y_t}{1 + y_t} \right) + \frac{SF_t}{T_t} \right\}$$

where  $\tau$  represents the (maximum) tax-to-GDP ratio, which is assumed to be fixed.

From this point of view, the large drop in nominal GDP and consequently in tax revenue had the effect of making the ratio of debt over tax revenue explosive. One could therefore argue that in the 1930s the US government did not have room to further expansionary fiscal policy.

In Table A1 below, we propose an approximate estimate<sup>12</sup> of the federal debt throughout the 1930s, so to have a sense of the situation.

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<sup>11</sup> For a different point of view, see “Lessons from the Great Depression for Economic Recovery 2009”. In his speech, C. Romer strongly reaffirms the idea that fiscal policy failed to generate recovery in the 1930s because it was not tried.

<sup>12</sup> Unfortunately data on debt are available starting only from 1938 and only for the federal component. In the table we estimate the outstanding debt in 1930 consistent with its value as measured in 1938 (FRED II database) and capitalise it over time using the long-term interest rate on government securities.



*Table A1. US government debt during the 1930s*

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
<b>Gross federal debt*</b>									48.2	50.7	57.5
<b>Estimated federal debt</b>	22.0	25.0	27.7	30.0	33.8	37.6	42.7	44.4	47.7	51.7	54.5
<b>D(t)/T(t)</b>		12.5	16.3	11.5	9.7	9.7	8.5	6.3	7.5	7.8	6.4

\*Source: FRED II database.

The ratio of the outstanding debt over total receipts in 1932 and 1933 is simply huge.<sup>13</sup> From 1934, the ratio steadily declines but it is still dramatically high. These simple calculations suggest that the federal authorities had a reason to be cautious because, given the low tax revenues on which they could count, the debt could become unsustainable (absent a strong resort to the inflation tax).

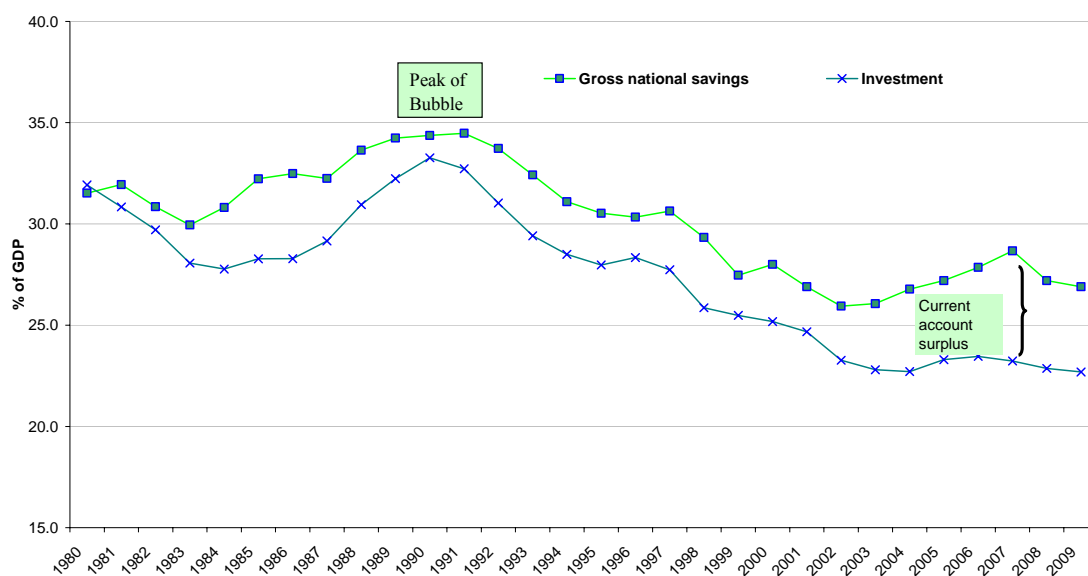
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<sup>13</sup> The same ratio has always been below 4 during the last 50 years.

## Annex II. Savings and investment balances in Japan

Japan represents a typical case of a capital overhang. The investment rate was very high during the entire 1980s and reached a peak of 34% of GDP during 1991. It then declined continuously by about 10 percentage points of GDP. The capital overhang also explains the large amounts of bad loans on the balance sheets of Japanese banks: much of the investment they had financed during the boom phase turned out to have been worthless.

Figure A2. Savings and investment rates in Japan



Source: AMECO.

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