

Gold Standard, Deflation and Depression: The Swiss Economy during the Great Depression

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The Great Depression of the 1930s was the most serious economic crisis of the 20th century. The USA and Germany were the two epicentres, but no country integrated into the global economy was spared. In Switzerland, industrial production fell by 20% between 1929 and 1932 and, other than in 1937 and 1939, remained below the 1929 level until the end of the decade (and, indeed, the end of World War II). It is not surprising, therefore, that people have worried ever since about the possibility of the Great Depression being repeated.

The international economy of the interwar period was shaped by developments in the USA, Germany, the UK and France. Hence, most of the literature on the Great Depression focuses on these four countries – first and foremost the USA, where the discussion on the role of monetary policy triggered by Friedman and Schwartz in 1963 dominated the field for years (cf. Brunner, 1981; Temin, 1978). In the last two decades, however, researchers have shown growing interest in comparative studies of large sets of countries. Bernanke (1995) sees two particular advantages in this approach. First, the Great Depression was a global event that should be dealt with in an international context; and second, comparative empirical treatment of 20 or 30 countries improves the likelihood of more accurately identifying causes and effects.

Although the Great Depression was a defining event for Switzerland too, the number of macroeconomic studies using Swiss data remains small. This holds both for traditional country studies, of which there are few on Switzerland (Kneschaurek, 1952; Rutz, 1970; Weber, 1983; Faber, 1997), and for the comparative studies performed in recent years, which often disregard Switzerland. The main reason in both cases is the lack of data, which severely limits the possibility of empirical analyses. For instance, figures for Swiss national product in the 1930s do not allow us to break down expenditure clearly according to components of demand or according to quantity and price indices.

The available data are, however, entirely adequate for tracing the development of the Swiss economy. This is the starting point of the present study, which is consciously data-oriented, making substantial use of charts and tables. Moreover, an effort is made to place Switzerland in an international context. Historical details of Swiss economic policy on the other hand are discussed only in passing; for a comprehensive treatment of this topic, see Rutz (1970). The contemporary debate on economic policy in political and business circles is largely ignored as well; it has been dealt with by Müller (2000).

Today, it is generally agreed that there was no single cause for the Great Depression. The stock market crash, bank failures, and growing trade protectionism all played a role. However, monetary factors – most notably the role of the international gold standard – were of particular importance. The fixed exchange rates of the gold standard transmitted deflation around the world. And by sticking to the gold standard, central banks allowed a relatively normal recession to turn into a full-scale depression. Although Cassel (1936) and Hawtrey (1939) had expressed similar views in the 1930s, this international monetary view of the Great Depression has found general acceptance only in the last two decades. This can be attributed to the comparative studies by Choudhri and Kochin (1980), Eichengreen and Sachs (1985) and Bernanke and James (1991) and the syntheses by Temin (1989), Eichengreen (1992, 2002) and Bernanke (1995).

The international monetary view of the Great Depression is the approach we adopt in the present paper. The first part deals with the international background and the interplay between the gold standard, deflation and depression. The second part examines the development of the Swiss economy between 1929 and 1937. Besides some indicators of economic activity and prices, we explore interest rates and exchange rates, money aggregates and their determinants, and the difficulties of the banking sector. The paper concludes with a brief summary and an outline of the main lessons central banks have learnt from the Great Depression.

1 The international crisis

The first part of this paper deals with the international backdrop to developments in the Swiss economy. With the help of some major indicators, we illustrate the phenomena of international deflation and depression and the relationship between the two. This is followed by a description of the international gold standard and its deflationary effect on the world economy. Finally, we look at the gradual collapse of the gold standard, which provided the basis for global economic recovery.

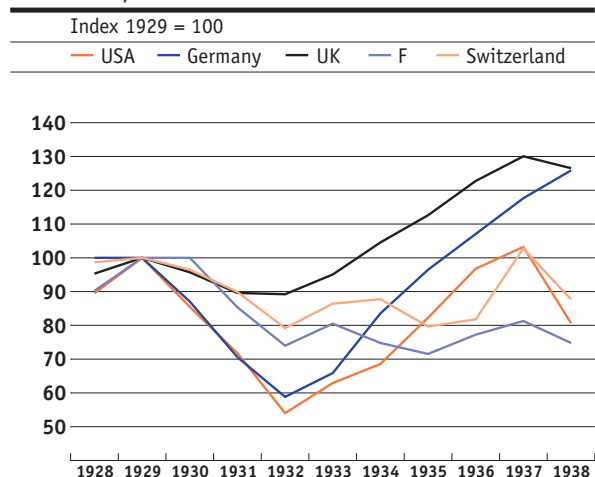
This presentation of the international context focuses on just a few points. Many aspects that contribute to a deeper understanding of the Great Depression are omitted, in particular the historical background to the Great Depression, which includes World War I and various key events of the 1920s such as hyperinflation in Germany and other countries, the international crisis in agriculture, and the dispute about German reparations and intra-allied war debts. For an excellent survey that integrates the Great Depression into the economic history of the interwar period, see Eichengreen (1992) or Feinstein, Temin and Toniolo (1997).

1.1 Deflation and depression

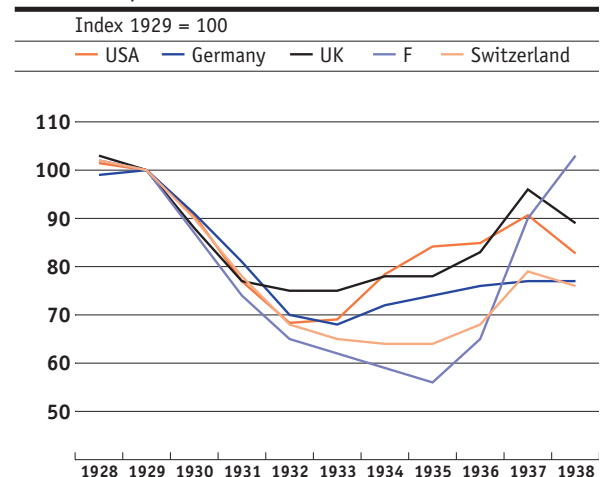
Chart 1 shows the development of industrial production in the four largest economies (the USA, Germany, the UK and France) and Switzerland from 1928 to 1938.¹ The data show that output peaked in the USA, Germany, the UK and Switzerland in 1929. In France, industrial production in 1930 remained steady at the 1929 level, before falling there as well. The USA, Germany and the UK all bottomed out in 1932 and started to recover in the following year. Switzerland, like France, experienced only a brief revival, before dropping back again in 1935 and 1936.

These annual figures indicate that the collapse was most severe in the USA (1929–32: -46%) and Germany (1929–32: -41%) and least severe in the UK (1929–32: -11%). France (1930–35: -28%) and Switzerland (1929–32: -21%) were in between. The chart also indicates that by 1937 global production returned to the level of 1929, before falling back into recession in 1938. This defines the timeframe of the Great Depression used in this paper: 1929–1937.²

Industrial production Chart 1



Wholesale prices Chart 2



1 The sources used for the charts and tables are listed in the Annex.

2 The literature does not agree on a single date for the end of the Great Depression. The main reason is differences in the start and

scale of the recovery in the various countries. Apart from this, some authors use trend-adjusted data or some indicator for economic activity other than industrial production.

One of the best-known features of the Great Depression is the enormous drop in prices recorded in the initial years. Chart 2 shows the development in wholesale prices for the same five countries as in Chart 1. Although prices were already falling in 1929, the rate of decline accelerated substantially by 1930. Prices fell at much the same pace in all countries through 1931, which can be explained by the fixed exchange rates of the gold standard. After that, developments fanned out. Whereas prices stabilised in the UK, and subsequently in the USA and Germany, and then soon began to recover, in France and Switzerland they continued to fall for another three years. According to the annual data in Chart 2, the largest falls in prices ranged from 25% (UK, 1929–32) to 44% (France, 1929–35). The figure for Switzerland was 36% (1929–35).

Although there are instances in economic history in which moderate deflation is accompanied by economic growth, deflation as extreme as in the 1930s is virtually always linked to falling output and employment. The literature suggests various mechanisms through which deflation may affect production and employment. Three in particular appear to have played a role in the Great Depression (see Bernanke and James, 1991; Bernanke, 1995):

The first mechanism is based on the stickiness of wages. If nominal wages do not decrease in line with falling prices, real wages are rising. Real wage increases in excess of productivity gains reduce the demand for labour and raise production costs. The data show that during the Great Depression real wages rose in all major countries except Germany. Furthermore, there is a strong inverse relationship between real wages and industrial production, both over time and in an international comparison (cf. Eichengreen and Sachs, 1985; Bernanke and Carey, 1996).

The second mechanism works through the real rate of interest, which is defined as the nominal rate of interest less the corresponding expected rate of inflation. Inflationary expectations are not direct observations, only estimates. In his study with US data, Hamilton (1992) concludes that although deflation initially took the markets by surprise, after about a year a substantial portion of the deflation yet to come was anticipated. As real interest rates exceed nominal interest rates by the extent of deflationary expectations, this suggests that real interest rates were high in the early 1930s.

A third mechanism by which deflation can reduce production is through the balance sheet of net debtors. An unexpected fall in the level of prices raises the real value of all nominal debts, thereby increasing the risk that loans may not be repaid. Borrowers will react by reducing the amount of credit they are willing to grant, which in turn leads to cut-backs in plans for investment and consumption. This mechanism was first described by Irving Fisher (1933). Owing to the popularity of microeconomic models of imperfect credit market, it has enjoyed a renaissance in recent years.³

In the model by Bernanke, Gertler and Gilchrist (1996) the credit market is imperfect because lenders are not in a position to inform themselves about the borrowers' activities and characteristics at zero cost (i.e. it involves an agency cost). For this reason, self-financing or external financing against collateral costs less than external financing without collateral. The premium varies with the borrower's net worth. If deflation reduces the borrowers' net worth, financing costs rise. As a result, some projects that would otherwise have been implemented are no longer realised, and production and employment will fall.⁴

3 Calomiris (1993) discusses various empirical applications of this approach to the Great Depression.

4 Besides the credit mechanism described here, which is based on the effects of deflation on the balance sheets of firms and households, there is a second credit mechanism that analyses the effects of deflation on the

balance sheets of banks. When banks' balance sheets deteriorate, these banks will charge more for loans or restrict their lending activity. As bank loans are the only source of external financing for many firms and households, this second credit mechanism may supplement and strengthen the first.

1.2 The deflationary effect of the gold standard

What, then, are the causes of deflation? One of the usual suspects is the supply of money. A decrease in money supply – everything else remaining equal – causes prices to fall. Indeed, statistical evidence indicates that the global supply of money did fall in the first years of the Great Depression (Bernanke and Mihov, 2000). This raises the question of the monetary regime in effect at the time: the international gold standard.

The international gold standard collapsed at the outbreak of World War I in 1914 and was reinstated between 1922 and 1927. As the standard had functioned reasonably well in the 40 years up to 1914, its reconstruction was founded on hopes that it would help stabilise the international economy after the chaos of the early postwar years. Of the major countries, only the USA had never left the gold standard. Germany, Britain and France effectively retied their currencies to gold in 1923, 1925 and 1926 respectively. Switzerland took the step *de facto* in 1924 and *de jure* in 1930. Only a few countries (Denmark, the UK, the Netherlands, Norway, Sweden and Switzerland) restored the prewar parities; rampant inflation since 1914 effectively forced the other countries to return to the gold standard with devalued currencies.

The basic idea of an international gold standard is that every country undertakes to buy and sell gold in its own currency at a fixed price. This keeps the gold price stable, and, indirectly, the exchange rates with other currencies too. Imbalances between two countries are stabilised by inflows and outflows of gold. For example, if a country is growing at a faster rate than its long-term potential and prices are rising, the country's balance of payments starts to deteriorate and gold flows abroad. As a result, the money supply also falls, which causes interest rates to rise, putting pressure on production and prices. Thus, the gold mechanism automatically ensures that stability is restored.⁵

In reality, the gold standard did not function quite as simply and elegantly as described. One major difference is that movements in gold were not always reflected in corresponding movements in the money supply. Hence, it was possible for the global supply of money to grow at a slower rate than the gold holdings of the central banks. Three factors were crucial to this development:

First, the international reserves of most countries did not only consist of gold but also included foreign exchange.⁶ These funds – for the most part US dollars, pounds sterling and French francs – could be exchanged for gold at the central banks of the respective issuing countries at any time. As long as there was confidence in the gold parities, this solution was beneficial to all involved. The central bank that held foreign exchange could earn interest on it and the international gold standard was able to function with comparatively small gold reserves in the vaults of the centre countries. But as confidence in the gold parities began to weaken, central banks turned in their foreign exchange holdings for gold. As a consequence, the proportion of foreign exchange in international reserves declined substantially. According to data from 24 countries, it fell from 42% at the end of 1928 to 35% at the end of 1930 to 8% at the end of 1932 (Nurske, 1944, p. 235). International reserves thus grew at a slower rate than gold reserves.

Second, in addition to international reserves, central banks held domestic securities. This enabled them to sterilise the effects of gold flows on the monetary base by adjusting their portfolio of domestic credit. However, a country's options varied greatly depending on whether it was running a current account surplus or a deficit. A country in deficit whose gold reserves were running out would sooner or later be forced to reduce the money supply, whereas a country running a surplus, and experiencing an inflow of gold, was not under pressure to increase the supply of money. This asymmetry is the main argument for the common view that a gold standard tends to be deflationary. In our context, the behaviour of the French and US monetary authorities is of particular interest. Both countries experienced heavy inflows of gold in the crucial years and both sterilised these inflows' effects on the monetary base by reducing their domestic credit (cf. Hamilton 1987). The reasons differed, however. France was afraid of inflation and wanted to take preventive action. The US authorities, on the other hand, wanted to counter the bull market in equities, which they viewed as a speculative excess. Regardless of how we view these domestic economic concerns, the actions contradicted the rules of the gold standard. The result was that the monetary base increased at a slower rate than the international reserves.

⁵ See Niehans (1978) for an analytical model of the gold standard and Eichengreen (1992) or Hawtrey (1939) for institutional and practical details.

⁶ For this reason, the gold standard in the interwar period is also referred to as a gold-exchange standard. Although the central banks also held foreign exchange before World War I, the proportion was lower.

Third, in addition to the behaviour of the central banks, there is the behaviour of the general public and the banking sector. This was shaped by the growing uncertainty in the early years of the Great Depression. The response of the public was to cut back on bank deposits in favour of cash. The banks in turn had to defend themselves against any runs on deposits by holding sufficient reserves. As a consequence, the money supply increased less than the monetary base.

Together, the behaviour of the central banks (exchanging foreign exchange for gold and sterilising gold inflows), the banks (higher reserve ratios) and the public (higher currency ratios) was responsible for the money supply of the global economy growing more slowly than gold holdings (see Bernanke and Mihov, 2000). Eichengreen (1992) argues that the deflationary pressure of the gold standard could have been corrected if all countries had devalued their currencies in concert, i.e. simultaneously cut the value of their currencies as expressed in units of gold. The opportunity was lost because governments and central banks had different views on the situation and could not agree on joint action.⁷ In these circumstances, every country had to seek its own solution. Between 1931 and 1936 every country either devalued its currency against gold or introduced foreign exchange controls. Both contradicted the basic thinking behind the gold standard. Though many countries continued to tie their currencies to gold in some way or other, the international gold standard as a device to harmonise monetary policy had collapsed.

1.3 Abandoning the gold standard and surmounting the crisis

The international gold standard disintegrated in a number of steps. It began in 1931 with the banking crisis in Germany and Austria. In May 1931, the largest Austrian bank, the Creditanstalt in Vienna, failed. The impact of this event was felt particularly in Germany, where banks had large short-term foreign liabilities and the Brüning government strained the confidence of foreign investors by demanding an end to reparations and a customs union with Austria.⁸ The most prominent victim was the Darmstädter und Nationalbank (DANAT), the fifth largest bank in the country, which closed its doors in July of the same year. After the gold reserves of the German Reichsbank had been severely depleted and efforts to obtain an international loan were unsuccessful, the German government was faced with the choice of abandoning the gold standard or introducing exchange controls to curb the outflow of capital; it chose the latter. In mid-August it issued a foreign exchange decree and an emergency decree to prevent capital flight and tax evasion. At the same time, it opened negotiations with foreign banks that resulted in a moratorium on foreign deposits at the end of August ("standstill" agreement). In the following years capital controls were successively extended.

In summer 1931 the pound sterling came under pressure. The overvalued pound, along with high unemployment and strained public finances, was the Achilles' heel of the British economy. Hence, it was generally expected that the Labour government would not defend the gold parity regardless of cost. When private investors and foreign central banks began to exchange their sterling holdings for gold, the Bank of England moderately raised the Bank Rate to 4.5%. This failed to restore the confidence of the markets, and on 20 September 1931 the British government suspended the obligation of the Bank of England to sell gold at a fixed rate. Sterling immediately depreciated sharply against all other major currencies. The countries of the British Empire and the Scandinavian states followed London's example, while many Central and Eastern European countries took the German course of adopting capital controls.

7 See Cassel (1936) and Eichengreen (1992, pp. 258–286).

8 See Ferguson and Temin (2002). For a brief introduction to the modern debate about Brüning's economic policies, also see Feinstein, Temin and Toniolo (1997, pp. 120–124).

In September 1931, the currency crisis crossed the Atlantic. Investors' doubts about the dollar's gold parity triggered demand for gold. The US Federal Reserve reacted by raising the discount rate. This calmed currency markets for a while, but worsened the ongoing banking crisis. The turning point in the USA came in 1933, after Franklin D. Roosevelt was elected President. The new Administration implemented policies to increase production and prices, and was not going to be distracted by the gold standard. In March 1933, an embargo was placed on gold exports and the dollar was allowed to float. It immediately fell, and on 31 January 1934 was provisionally fixed at 59% of its former gold value.

After the USA left the gold standard, the remaining countries – Belgium, France, Italy, the Netherlands, Poland and Switzerland – formed the “gold bloc” (8 July 1933). Owing to other countries' currency devaluations, the gold bloc countries suffered a huge fall in the competitiveness of their economies. The logic of the gold standard left them no other choice but to cut costs and prices. These policies were strongly resisted by trade unions and other interest groups. In the following years, the gold bloc currencies were repeatedly the object of speculators. In March 1935, Belgium devalued its currency after a banking crisis. In the same year Italy and Poland introduced capital controls. The end came in 1936. After the Popular Front led by Léon Blum won the national elections in France in May 1936 and started to implement a programme of social reforms, the French franc came under heavy pressure. On 25 September 1936, a Friday, France left the gold standard and devalued its currency. Switzerland and the Netherlands followed that weekend. The Swiss franc was devalued by 30%.

Switzerland had stuck to the gold standard to the very last. Through the years, the Swiss government and the Swiss National Bank (SNB) had used two arguments to resist devaluing the Swiss franc. First, devaluation would not help matters but would only generate inflation. Second, devaluation would be a breach of trust and faith.⁹ Even after the devaluation of the French franc, the SNB first argued against devaluation and for the existing policy. In the discussions with the Swiss government, it could point out that the gold backing of the currency far exceeded the statutory minimum and that the economic situation had improved slightly since the beginning of the year. Yet the Swiss cabinet (Federal Council) voted five to two to devalue. It justified the decision with economic arguments and the hope that the

Tripartite Agreement between the USA, Great Britain and France held out the prospect of a new currency system.¹⁰

Most contemporaries took a negative view of the devaluation cycle of the 1930s. A typical example is the study that the League of Nations commissioned from Nurske (1944). Eichengreen and Sachs (1985, 1986), on the other hand, argue that the unilateral devaluations did more than simply neutralise one another. Together they led to looser monetary conditions for the world economy, thereby hastening economic recovery. As a coordinated devaluation had proved impossible, this was the second best solution.

As can be seen in Chart 1, economic recovery occurred first in those countries that freed themselves from the straitjacket of the gold parity. While not all countries were equally quick to grasp the potential, the pattern is unequivocal: the later the break with the gold standard, the later the economic recovery. This is supported by several empirical investigations using various data sets (Choudhri and Kochin, 1980; Eichengreen and Sachs, 1985; and Bernanke and James, 1991). On the whole, the results of these studies are a strong argument that it was a mistake to stick to the gold standard, as this worsened and prolonged the Great Depression. They also support the view that monetary factors make an important contribution to explaining the causes of the Great Depression.¹¹

9 For a revealing presentation of the “gold standard mentalité”, i. e. of the economic ideas and beliefs that shaped the actions of the elite at the time, see Eichengreen and Temin (2000).

10 For a history of the Swiss devaluation debate, see Müller (2000).

11 For an account of the recovery phase, see Temin (1989, pp. 89–137) for the global economy and Romer (1992) for the USA.

2 The Swiss economy in the Great Depression

The first part of this paper looked at the relationship between the gold standard, deflation and depression. The second part will deal with developments in the Swiss economy. First we shall analyse two crucial indicators of economic activity: national product and unemployment. As will be seen, the available data for the period in question are not completely satisfactory. Therefore, we shall also look at various indicators of demand components. The subsequent sections deal with prices and wages, interest rates, exchange rates, monetary aggregates and their determinants and developments in the banking sector.

2.1 National product and unemployment

Switzerland has had national accounts only since 1948. However, they were in preparation for some time before then. At the beginning of the 1940s the Federal Statistical Office presented estimates of nominal net national income for 1938 and subsequently used the same methods to calculate figures for the years from 1929 to 1937. Net national income differs from the better known concept of gross

national product (GNP) in that indirect business taxes and the decline in the value of existing capital are subtracted. We have figures for indirect taxes, but not for depreciation. Hence, in addition to net national income we can calculate net national product (NNP), but not GNP.

To obtain income series at constant prices, the Federal Statistical Office deflated nominal net national income with the national consumer price index (CPI). Later authors worked in the same way with NNP (see *Historische Statistik der Schweiz*, 1996). Andrist, Anderson and Williams (2000), who estimated real gross domestic product for the years 1914 to 1938, also base their figures for the period from 1929 to 1938 on CPI-deflated official estimates of nominal NNP.¹²

Table 1 shows the development in nominal net national income, nominal NNP and real NNP (where the latter is CPI-deflated nominal NNP). For our purposes, the most interesting series is the development in real NNP. In 1930, this measure still shows a marginal increase, before falling by about 5% in total over the following two years. In contrast to Swiss industrial production, real NNP is affected later and less severely by the global economic crisis. After a temporary recovery in 1933–34, real NNP declined again in 1935–36. Strong recovery did not ensue until the Swiss franc was devalued.

Net national income and net national product

Table 1

Year	Net national income	Indirect taxes	Net national product (NNP)	CPI, 1929=100	CPI-deflated NNP (1929=100)
1929	9469	284	9753	100.0	100.0
1930	9344	290	9634	98.3	100.5
1931	8609	296	8905	93.2	98.0
1932	7685	302	7987	85.9	95.3
1933	7698	308	8006	81.5	100.7
1934	7599	314	7913	80.3	101.0
1935	7429	320	7749	79.5	99.9
1936	7457	326	7783	80.9	98.6
1937	8160	332	8492	84.8	102.7
1938	8202	340	8542	85.0	103.1

12 I was unable to reconstruct the index series that Mitchell (1992) used for real NNP. Apart from differences in rounding, the nominal values correspond with the official estimates. However, the implicit deflator deviates from both the consumer price index and the wholesale price index.

The problem with this estimate of real NNP is the use of the CPI as deflator. It is a stopgap, because the Federal Statistical Office does not provide a deflator geared to national product before 1948. The CPI differs from a conventional national product deflator since the CPI measures the price level of goods purchased by consumers while a national product deflator would measure the prices of output produced from Swiss-owned inputs. The differences are twofold:

On the one hand, the prices of imported goods show up in the CPI, but not the national product deflator. Since all the available data indicate that prices of imported goods fell considerably more than the prices of domestically produced goods, the CPI, everything else being equal, exaggerates the decline in the national product deflator.

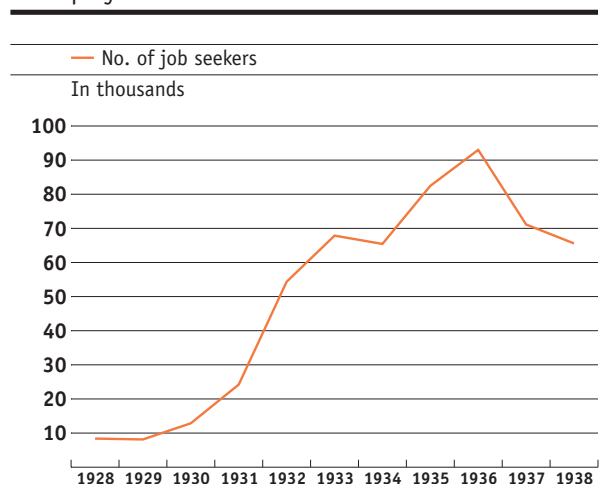
On the other hand, the CPI is based on a fixed basket of goods (Laspeyres Index), whereas a national product deflator measures the prices of goods produced in the period in question (Paasche Index).¹³ Hence, the CPI ignores the possibility that consumers react to changes in relative prices and substitute products whose prices have fallen for goods whose prices have risen. This suggests that, all else being equal, the CPI registers a lower rate of deflation than a national product deflator would.

As the two conceptual differences do not work in the same direction, we cannot draw any clear conclusions. However, if we do not make implausibly high assumptions about the elasticity of substitution, the second difference – the difference between the Paasche and Laspeyres Indices – should have a noticeably weaker effect than the first. In that case it is probable that the CPI fell more than a conventional national product deflator would have. Hence, the real Swiss NNP calculated using the CPI may well not reflect the full decline in aggregate output during the Great Depression.

The unemployment figures raise different problems. We know the number of unemployed registered with the labour bureaux, as shown in Chart 3. According to these figures, there were about 8,000 unemployed on average in 1929. In the following years, with the exception of 1934, this figure rose from year to year, finally peaking at 93,000 in 1936. The highest monthly figure was 124,000 registered unemployed in January 1936. If these figures are set in proportion to the labour force (1930: 1,943,000 people), we obtain a rise in the unemployment rate from 0.4% in 1929 to 4.8% in 1936, peaking in January 1936 at 6.4% (not seasonally adjusted). However,

many of those without a job will have seen little point in registering as unemployed, since there was no general, compulsory unemployment insurance, and there was little chance of getting a job through the labour bureaux. Hence, actual unemployment was probably higher than the official figures.

Unemployment Chart 3



13 This difference refers to the CPI in use at the time (1921 = 100). The current CPI (May 2000 = 100) is a chain index in which the weighting of the components is adjusted once a year.

Another method of determining the unemployment rate tries to take these reservations into account. Its approach uses the ratio between the number of unemployed insured with public and private unemployment relief funds and the total membership of these funds.¹⁴ As expected, the unemployment rate calculated in this way is considerably higher than the conventional figure: it averaged 14.6% in 1936 and peaked in January 1936 at 20.9% (not seasonally adjusted).¹⁵ That said, the development pattern of the two figures over time is similar. The second method also has its weaknesses. In particular, the attraction in joining an unemployment benefits fund was probably greater for people in occupations with a high unemployment risk than for others. Accordingly, an unemployment rate calculated on the basis of fund membership may be too high.

The flaws in the data for real NNP and unemployment indicate that comparisons with today or with other countries yield only a approximate picture of reality. This qualification should not be exaggerated, however. In the USA, real GDP dropped by 30% between 1929 and 1933, and in 1933 25% of the labour force on average was registered as unemployed (see Mitchell, 1992). In Germany, the other epicentre of the crisis, real NNP fell by 23% from 1928 to 1932, and in 1932, 30% of the labour force was registered as unemployed (see Mitchell, 1993). In the light of such figures, there can be no doubt that in Switzerland the effects of the Great Depression were comparatively mild.

2.2 Industrial production, building investment, foreign trade and government spending

There are a number of other economic indicators that supplement our picture of the course of the Great Depression in Switzerland. First and foremost is industrial production, which we have already seen in an international comparison in Chart 1. The data for industrial production are estimates by David (1996), who aggregated various sector indices. According to these estimates, industrial production fell with increasing speed from 100 in 1929 to 79 in 1932. It then recovered a little (1934: 88), before dropping back towards the trough of 1932 in 1935 (80) and 1936 (82). The devaluation of 1932 in 1935 (80) and 1936 (82). The devaluation of the Swiss franc was the turning point: in 1937 industrial production rebounded to about the level of 1929 (103).

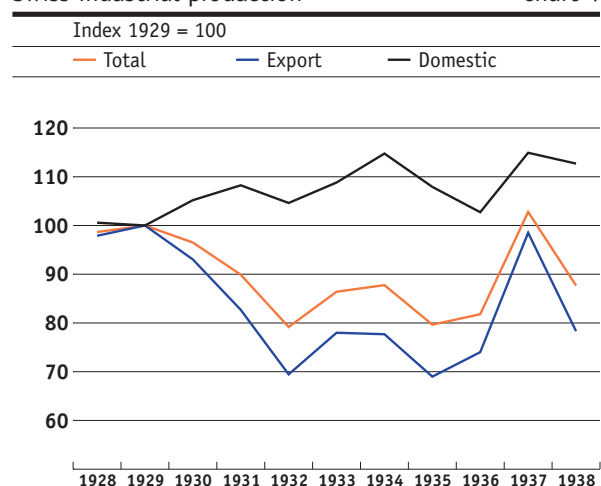
14 The calculation uses the data of 15 public unemployment benefits funds in German-speaking Switzerland and 15 private unemployment benefits funds (see Historische Statistik der Schweiz, 1996).

15 The increase in full-time unemployment lagged that in part-time unemployment. It already peaked in 1932 (average of 11.6% of unemployment relief fund members). In 1935, it was 4.9%.

The breakdown by sector highlights the forces that act on Swiss industrial production. Hit earliest and hardest was watchmaking, a typical export industry. Other export industries, such as machinery, textiles and chemicals, also suffered heavy losses early on. Of all these sectors, only the chemical industry recovered relatively well from 1933 onwards; in all other sectors, production only picked up noticeably in 1937. The picture presented by industries producing mainly for the domestic market is very different. Cement production rose steadily until 1931, and results in the food processing industry were also better in 1931 than in 1929. Although cement production then fell continuously until 1936, food processing continued to fill its order books.

Chart 4 shows the development in the sub-indices for export and domestic-market-oriented industries.¹⁶ As can be seen, production in the export industries fell by about 30% between 1929 and 1932, and more or less reached the 1929 level only in 1937. By contrast, industrial production of domestic-market-oriented industries continued to rise from 1929 to 1931 and from 1932 to 1934. A slump followed in 1935 and 1936, but the index still remained slightly above the 1929 level.

Swiss industrial production Chart 4



16 David (1996) calculates sub-indices for individual sectors; he counts the chemical, footwear, machinery and metal, textile, and watchmaking industries as export industries, and the cement, food processing, and paper sectors as domestic industries.

The opposite developments in the export and domestic-market-oriented industry provide an explanation for the discrepancy between the development of real NNP and industrial production at the beginning of the Great Depression. Whereas industrial production fell from 1929 onwards, real NNP continued to rise in 1930. This rise reflects the robust domestic economy, which is better expressed in real NNP than in industrial production, in which the export industry plays a greater role.

In the early years of the Great Depression, the domestic economy held up thanks primarily to construction investment. As mentioned above, production in the cement industry rose solidly until 1931. This is confirmed by the development in construction expenditure. As Chart 5 shows, expenditure on construction in real terms rose by 17% from 1929 to 1931. It then fell back to the 1929 level in 1934 and posted further steep declines in 1935 and 1936. Spending on construction in real terms did not return to the level reached in the first half of the 1930s until after the war.¹⁷

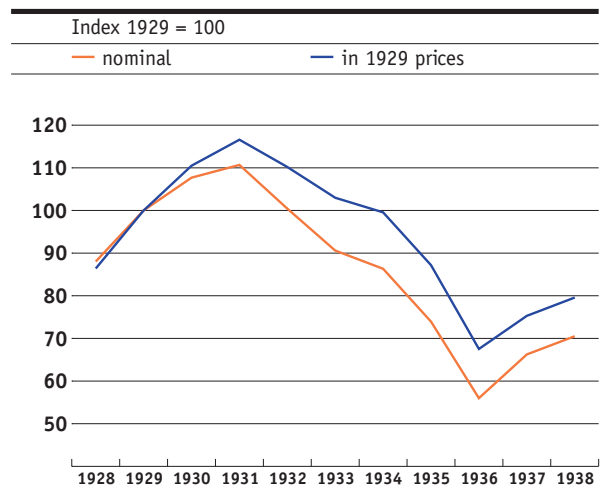
The influence of foreign demand is best examined using foreign trade statistics. These show that the value of merchandise exports fell by about two thirds from 1929 to 1932 (Chart 6). Part of this reflects the global drop in prices. But even measured in tonnes, exports declined in these three years by more than 50% (Chart 7). The development of nominal merchandise trade as a proportion of NNP points in the same direction. Its share fell from 22% in 1929 to 10% in 1932, at which level it more or less stagnated until 1936. The devaluation of 1936 brought some relief, but the situation of the export industry remained difficult. In 1937 and 1938 the share of nominal exports in NNP was barely that of 1931 (15%).

Whereas in the first two years of the depression, developments in exports can be explained almost entirely by economic activity abroad, from 1931 onwards there are two other major factors to consider: the first devaluations among leading trading partners and growing trade protection. At the end of 1931, Switzerland reacted by moving from a multilateral to a bilateral trade policy on the principle of “placing imports in the service of exports”. The instrument of this policy was quotas. Switzerland also introduced bilateral exchange clearing for trade with countries that had introduced exchange controls.¹⁸ Between 1931 and 1937, Switzerland signed exchange clearing agreements with 12 countries, the most important of which was that with Germany

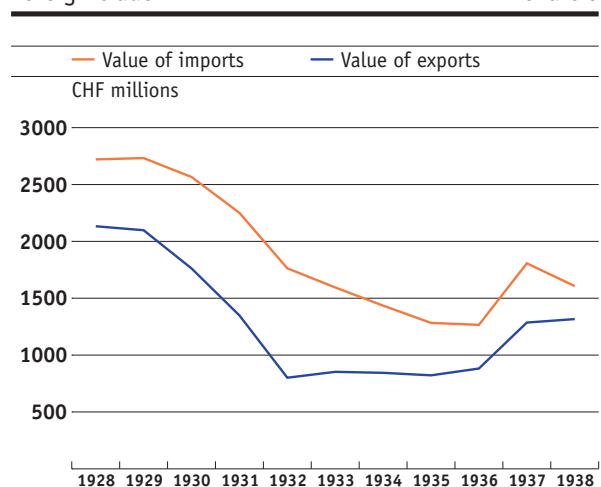
17 For the construction sector we have data on nominal construction expenditures. To obtain figures for construction expenditure in real terms, we have deflated the nominal figures using the Zurich construction cost index.

18 After Switzerland signed the first clearing agreements with Austria and Hungary in 1931, the SNB explained the working of the exchange clearing system as follows: “The method used to settle payment transactions functions as follows: Swiss buyers of Austrian goods pay the purchase price in Swiss francs into a pooled account that is held with the

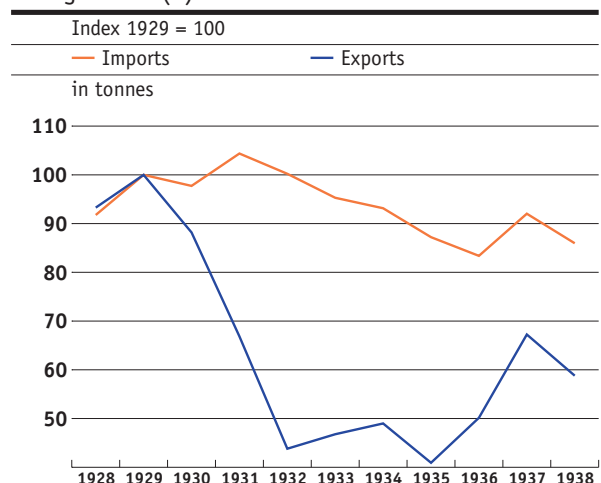
Construction investment Chart 5



Foreign trade Chart 6



Foreign trade (2) Chart 7



Swiss National Bank in the name of the Austrian National Bank. Similarly, Austrian buyers of Swiss goods settle their debts with Swiss sellers by paying the purchase price in Austrian schillings to the Austrian National Bank for account of the Swiss National Bank. The central banks keep each informed about payments into their respective accounts and

then pay out these amounts to the sellers as and when the amounts as defined in the agreement are available” (SNB Geschäftsbericht 1931, pp. 9–10). For a comprehensive treatment of the clearing with Germany and Italy, see Frech (2001).

(1934). Because of this policy of bilateral trade agreements, the trade deficit remained relatively small, despite currency devaluations abroad. As can be seen in Chart 6, it rose sharply in 1931 and 1932 but then fell again. As a proportion of nominal NNP, the trade deficit rose from 7% in 1929 to 12% in 1932, before declining steadily to 5% in 1936 and 3% in 1938. Between 1935 and 1938 it was always lower than at the beginning of the crisis in 1929.

Finally, let us glance at government spending and fiscal policy. Table 2 shows figures for government budgets at different levels of government: federal, cantonal and large municipalities (all as a proportion of nominal NNP).¹⁹ Public spending as a proportion of NNP rose moderately during the Great Depression. Between 1930 and 1936, the share of spending by the federal government increased from 5.0% to 6.7% and by the cantonal governments from 6.1% to 8.6%. As government revenues as a proportion on NNP were also increasing, deficits at

all levels of government remained modest. The federal government ran a small deficit only in 1933 and 1934. Although the cantons and municipalities constantly ran deficits from 1931 onwards, the shortfalls were modest. The total budget deficits of the federal, cantonal and large municipal governments never exceeded 1.2% (1933) of NNP.

The development in government budgets shows just how little stimulus was provided by fiscal policy. The clear aim of fiscal policy was to balance the budget. Memories of the early 1920s, when budget deficits and inflation went hand in hand in many countries, were still fresh. Moreover, people were aware that a loose fiscal policy could undermine the markets' confidence in the currency. So if it was considered necessary to raise spending in order to alleviate the effects of the crisis (job creation programmes, unemployment benefits, etc.), attempts were made to offset this with savings in other areas or with selective tax increases.

Government budget (administrative accounts)

Table 2

Year	Expenditures, in % of NNP			Revenues, in % of NNP			Surplus, in % of NNP		
	Federal government	Cantons	Large municipalities	Federal government	Cantons	Large municipalities	Federal government	Cantons	Large municipalities
1929	3.9		2.8	5.3		2.9	1.4		0.1
1930	5.0	6.1	2.9	6.6	6.4	3.0	1.6	0.4	0.1
1931	4.5	7.1	3.4	5.5	7.1	3.4	1.0	-0.1	-0.0
1932	5.4	8.3	3.9	5.9	7.8	3.7	0.5	-0.5	-0.2
1933	5.6	8.6	4.0	5.5	7.7	3.8	-0.1	-0.9	-0.2
1934	6.3	8.6	4.0	6.1	7.9	3.9	-0.1	-0.7	-0.1
1935	6.5	8.6	4.2	6.8	8.1	4.0	0.3	-0.5	-0.1
1936	6.7	8.6	4.1	7.0	8.1	4.0	0.3	-0.5	-0.2
1937	6.3	8.1	3.8	6.6	8.0	3.7	0.3	-0.1	-0.0
1938	7.1	8.5	3.8	6.7	8.2	3.8	-0.4	-0.3	0.0

¹⁹ The municipalities are the members of the Swiss Association of Towns and Cities (*Städteverband*), the number of which varied from 59 to 64. To avoid double counting, the gross figures for the federal, cantonal and municipal budgets cannot simply be added together.

2.3 Prices and wages

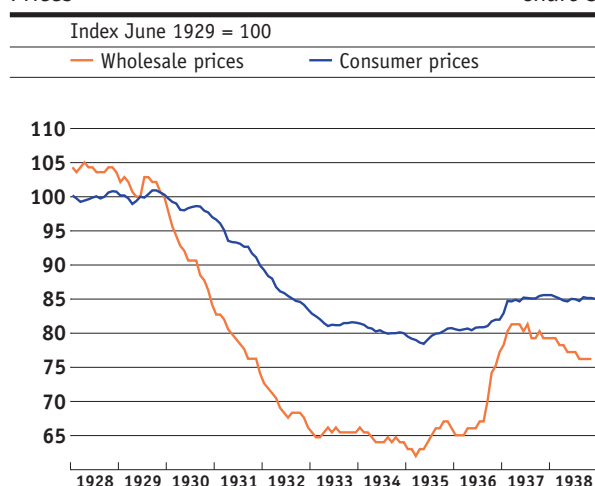
A striking feature of the Great Depression was the massive drop in prices. As shown above, wholesale prices fell at about the same rate in Switzerland and abroad from 1929 to 1931, i.e. before countries started to devalue. After that, developments fanned out, depending on individual monetary policies (Chart 2). Chart 8 shows the development of Swiss wholesale prices based on monthly data, which makes it possible to pinpoint turning points. According to these figures, wholesale prices started to fall in August 1929 and declined virtually without a break until March 1933. The low point was reached in March 1935 (July 1929–March 1935: -39.6%). After the Swiss franc was devalued in September 1936, wholesale prices jumped, but remained well below the level of 1929 through to the end of the observation period in December 1938.

As a rule, consumer prices are less volatile than wholesale prices, because many components of the CPI face less international competition. As can be seen in Chart 8, between mid-1929 and the first half of 1935 the drop in consumer prices was only about half that of wholesale prices. Consumer prices started to fall in November 1929, i.e. a little later than wholesale prices, and also bottomed a little later than wholesale prices, i.e. in May 1935 (October 1929–May 1935: -22.0%).²⁰

Unlike the prices of goods, nominal wages fell only modestly during the Great Depression. As Chart 9 shows, they actually continued to rise into 1931, before declining steadily until 1936.²¹ But even then, they had fallen less than 10% from their 1929 level. The sharp contrast between developments in prices and wages means that real wages posted a noticeable increase during the Great Depression, most of it in the early years. CPI-deflated nominal wages rose by 17% between 1929 and 1933. After that, they declined until 1937, at which point they were still a good 7% above the 1929 level.

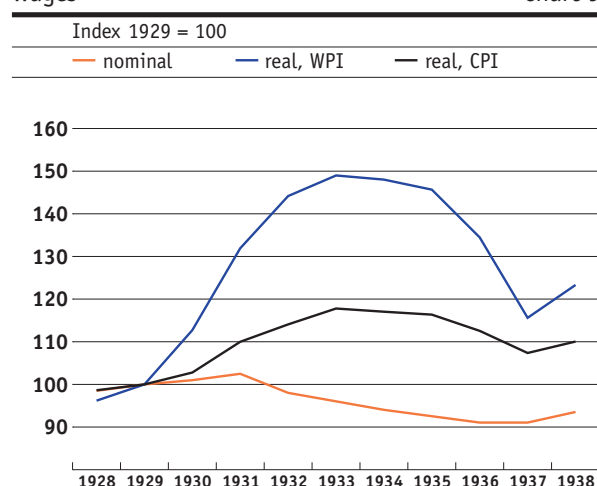
From the producer's point of view, nominal wages must be deflated by producer prices. Given the available data, we have to use wholesale prices as an approximation. Real wages calculated in this way rose considerably more than those deflated with consumer prices. Even after steep corrections in 1936 and 1937, they were still substantially above the wage level at the start of the Great Depression. Despite the uneven quality or the data, the general impression is one of a hefty increase in real wages.

Prices Chart 8



²⁰ The two price indices exceeded the average 1929 level from 1940 (wholesale price index) and 1941 (consumer price index) onwards.

Wages Chart 9



²¹ These data refer to nominal hourly earnings of workers who had had an accident at work. The corresponding data for weekly earnings yield almost identical results.

The authorities were aware that high real wages were an obstacle to re-establishing international competitiveness and contributed to high unemployment. However, they had no means of directly influencing wages in the private sector and therefore had to settle for an attempt to reduce wages in the public sector. The unpopularity of this move became clear when the government and parliament passed a law to temporarily cut nominal salaries and wages of federal employees by 7.5% in 1933 and 1934. The law was subject to a mandatory referendum. The referendum was duly launched, and on 28 May 1933 the government's proposal was rejected in a national vote by a majority of 55%.²²

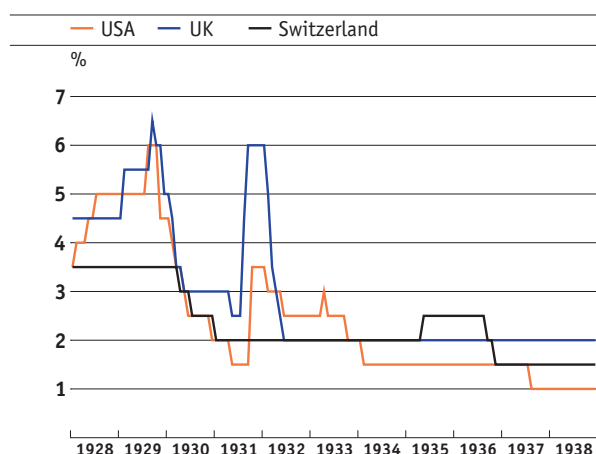
By comparison with countries that left the gold standard at an earlier date, Switzerland experienced a very strong rise in real wages during the Great Depression. In this it shared the fate of all gold bloc countries. Eichengreen and Sachs (1985) and Bernanke and Carey (1996) show that from 1932 onwards real wages in the gold bloc countries were systematically higher than in other countries. The lack of wage flexibility was one reason why the depression lasted so long in the gold bloc countries.

2.4 Interest rates

The next two sections deal with the monetary conditions under which the Swiss economy operated during the Great Depression. As in any system of fixed exchange rates, which the gold standard was, the feasibility of influencing interest rates was limited. This holds all the more for a small country like Switzerland. Although the SNB fixed the official rates (discount rate, Lombard rate), in doing so it had to take account of the exchange rate and the metal backing of notes in circulation. The Coinage Law of 3 June 1931 fixed the gold content of the Swiss franc at 290.322 mg, and the National Bank Law prescribed a metal backing of notes in circulation of 40%.

Between April 1930 and January 1931, the SNB reduced the discount rate in three steps (3 April 1930, 10 July 1930 and 22 January 1931) of half a percentage point each from 3.5% to 2%. More than four years later, in response to heavy pressure on the Swiss franc, the SNB raised the discount rate from 2 to 2.5% (3 May 1935). But shortly before the devaluation of the Swiss franc in 1936, the Bank reduced it to 2% again (9 September 1936), a sign of how secure the SNB felt at that time. After the devaluation, the SNB cut the discount rate to 1.5% (26 November 1936), the lowest level since the SNB was established in 1907. The Lombard rate was always held above the discount rate. The difference between the two amounted to half a percentage point between 8 February 1933 and 3 May 1935, and to one percentage point before and after this period.

Official discount rates in selected countries Chart 10



²² However, the government later got its way (albeit with slight modifications) by a decree. See Rutz (1970, p. 185).

Bond yields in selected countries Chart 11

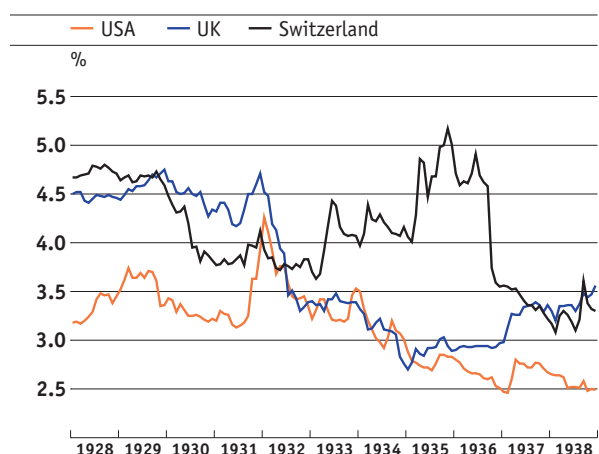


Chart 10 shows developments in the Swiss discount rate as well as the US and the British discount rate. It shows the tightening of monetary policy in the USA in 1928-29, which in Hamilton's (1987) view triggered the recession that eventually grew into the Great Depression. Britain was forced to follow suit. Switzerland, by contrast, left its discount rate unchanged for the time being. This pattern was repeated in 1931, when Germany, Britain and the USA temporarily hiked up their discount rates to 10%, 6% and 3.5%, respectively, while the SNB again left its rate unchanged. These events demonstrate the confidence the markets had in the Swiss franc in the early years of the Great Depression.

The situation was reversed after the UK and the USA left the gold standard and geared their monetary policy towards domestic goals. Now it was the gold bloc countries that tried to defend the gold parity by raising their discount rates, while the UK left the discount rate (Bank rate) at 2% and the USA cut its discount rate to 1.5%. By comparison with other gold bloc countries, the SNB still found itself in a relatively comfortable position. While it raised the discount rate on 3 May 1935 to 2.5% for a period, France had to push its rate up to 6% at times.

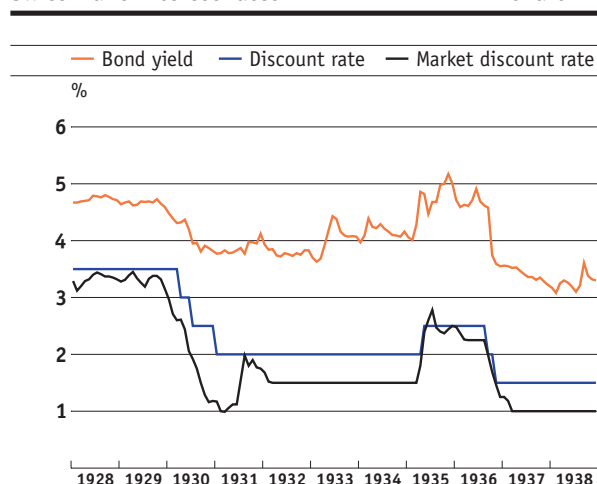
The general reasons for the loss of confidence in Switzerland's ability to maintain the gold standard in early 1935 lay in the weakness of overall demand and the rise in unemployment. Another factor was the initiative launched by the trade unions and the

Young Farmers' Movement to tackle the crisis (the so-called Crisis Initiative), which was put to the public vote in June 1935. The Initiative was an attempt to force the state to take the lead in resolving the economic crisis. Opponents of the Initiative argued that if it passed devaluation was unavoidable. On 2 June 1935, the Swiss electorate rejected the Crisis Initiative by a vote of 563,000 to 423,000 and 18 to 4 cantons.²³

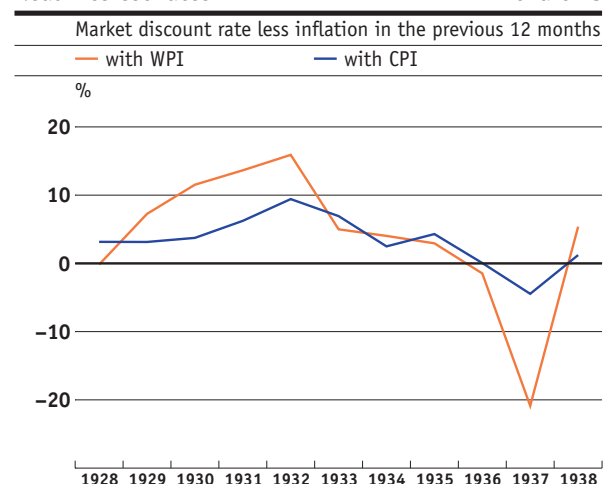
The pattern of bond yields is similar to that of discount rates (Chart 11). The average yield on Swiss government bonds fell by a little more than one percentage point between the end of 1929 and the beginning of 1933, before rising again. For most of 1935 and 1936 it fluctuated between 4.5 and 5%. After the devaluation in September 1936, average bond yields fell overnight to the level of British bond yields, reminiscent of the pattern in 1928 and 1929. Movements in bond yields thus confirm that countries which left the gold standard enjoyed lower interest rates.

For the real economy, the crucial rates are not nominal but real interest rates. How high were real interest rates during the Great Depression? The first difficulty is that inflationary and deflationary expectations can be determined only indirectly. To simplify this problem, we assume that the markets project past price developments into the future. In other words, the change in the price level expected over the coming 12 months is the same as that realised

Swiss franc interest rates Chart 12



Real interest rates Chart 13



23 For the debate on the Crisis Initiative, see Müller (2000).

over the past 12 months.²⁴ The second difficulty is the lack of short-term, fixed-maturity Swiss franc interest rates. Hence, as an approximation of nominal 12-month money market rates we take the market discount, which was widely held as a good indicator of money market developments at the time.²⁵

Under these assumptions, the short-term interest rate in real terms equals the nominal market discount rate less the actual price level change over the previous 12 months. The graphs in Chart 13 are plotted on the basis of the figures for June of each year. The results indicate that short-term real interest rates were very high from 1930 to 1932. This is particularly true if the wholesale price index is used for the calculation. Real interest rates only fell sharply after the devaluation of the Swiss franc in September 1936, when the combination of falling nominal interest rates and rising prices produced negative real interest rates for a short period.

2.5 Exchange rates

A second important monetary variable besides interest rates is the exchange rate. As most countries on the gold standard devalued before Switzerland did, the Swiss economy suffered from a substantial appreciation in the exchange rate of the Swiss franc from 1931 to 1936. The appreciation lowered the Swiss franc prices of internationally traded goods. Above all, this exacerbated the crisis in the export and tourism sectors.

Charts 14a-d show the development in the exchange rate of the Swiss franc against the leading currencies (US dollar, British pound, French franc and German reichsmark) from 1928 to 1938. A fall in the benchmark exchange rate (June 1929 = 100) is tantamount to an appreciation of the Swiss franc. In addition to the nominal exchange rates, the charts include two real exchange rates. The difference between the two real rates relates to the price deflator; one uses the consumer price index and the other the wholesale price index of Switzerland and the respective foreign country.

The charts show that in both nominal and real terms the Swiss franc appreciated in particular against sterling and the dollar. As US and UK consumer prices were falling faster than Swiss prices before these countries abandoned the gold standard, the Swiss franc was already appreciating in real terms in the initial years of the Great Depression. Then, the situation worsened dramatically after first Great

Britain (1931) and then the USA (1933) let their currencies float. The nominal exchange rate of the dollar when it was stabilised at the beginning of 1934 was about 40% below that of June 1929. The CPI-deflated real exchange rate declined practically at the same rate, whereas the real rate calculated with wholesale prices dropped by about 30%. Only after the devaluation of the Swiss franc in September 1936 did the wholesale-price-deflated exchange rate return to about its 1931 level.²⁶

The nominal exchange rate of the Swiss franc was virtually constant against the French franc for almost the entire observation period. In September 1936, France and Switzerland devalued by the same amount, which had no effect on the bilateral exchange rate. However, owing to the gradual emergence of inflation in France since mid-1935, the French franc came under pressure again shortly after its devaluation. A few months later the French government gave in and let the currency float.

The exchange rate between the Swiss franc and the reichsmark is of little interest in the context of this study. Germany reacted to the bank and currency crisis of 1931 by introducing foreign exchange controls and blocking foreign bank deposits. Chart 14d shows the foreign exchange rate, which continued to track the official gold parity of the reichsmark even after 1931, and does not give a true picture. German banknotes were traded abroad at a considerable discount. The same applies to the different kinds of marks resulting from the 1931 "standstill" agreement and the 1933 moratorium on currency transfers. Table 3 shows the development in the exchange rates of three of these kinds of mark: the Registermark, the Effektenspermark and the Reisemark. All three traded at a large discount, which widened over time.

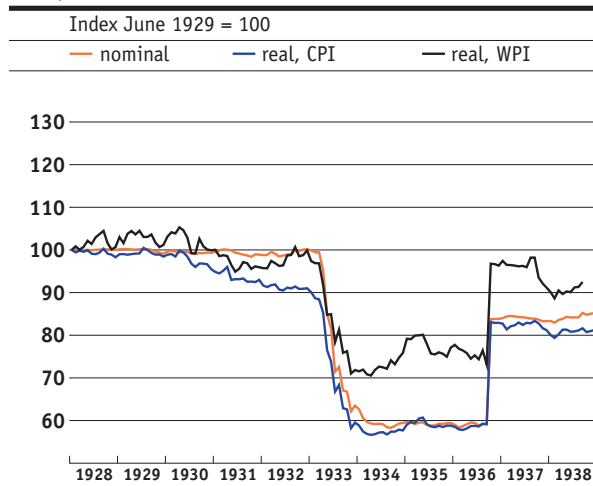
24 An alternative would be to assume perfect foresight, i. e. that the inflation expected over the next 12 months coincides exactly with the actual inflation over this period. This alternative was not chosen because in the first year of the Depression deflation probably took most of the

markets by surprise (see Hamilton, 1992). This was also the case with devaluation in 1936, as we shall see in the next section.

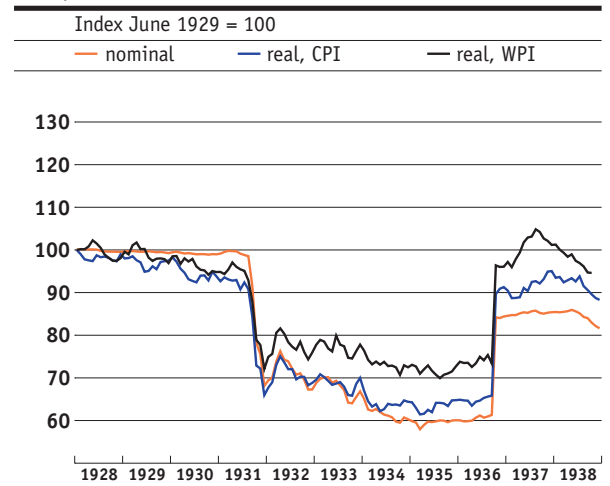
25 However, by agreement between the banks, the market discount was fixed for part of the period covered.

26 The 30% devaluation of the Swiss franc (measured in gold units per Swiss franc) corresponds to an appreciation in the exchange rate of 43% (measured in Swiss francs per gold unit or foreign currency unit).

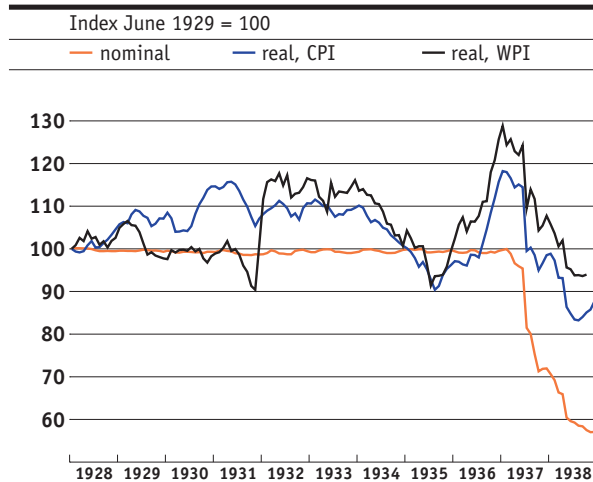
CHF per USD Chart 14a



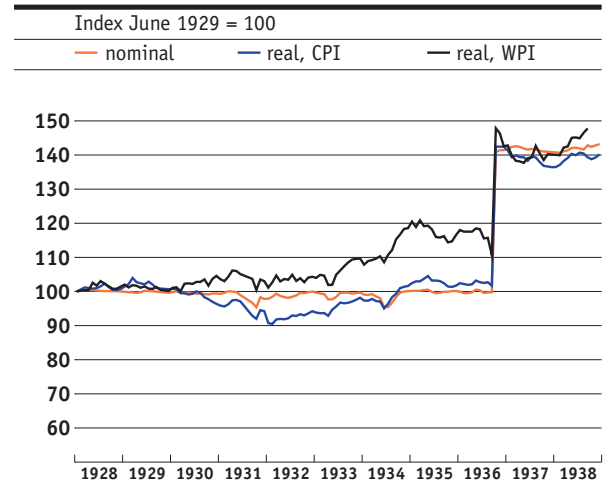
CHF per GBP Chart 14b



CHF per FRF Chart 14c



CHF per RM Chart 14d



Taken together the charts make it clear that the Swiss economy did not regain its competitiveness with much of the world until the devaluation of the Swiss franc in September 1936. The effects of the nominal devaluation of the leading currencies were only partly offset by higher deflation (or lower inflation) than abroad. In his study of Swiss economic policy, Rutz (1970) argues that efforts to regain competitiveness were undermined by numerous government measures that tended to support prices.²⁷ The SNB saw the situation similarly and, in addition, pointed to the role of the mortgage debt. In its 1936 Annual Report it noted: “Until 26 September 1936 the economic policy of the Federal Council sought to adjust

the level of prices in Switzerland to that abroad by lowering prices and wages (...). However, measures to protect ailing industries counteracted the practical implementation of this guideline. One major obstacle to this adjustment was the mortgage debt of the private sector” (SNB Geschäftsbericht 1936, p. 11).

This background of failed adjustment raises the question of whether the devaluation of 27 September 1936 was anticipated or not. One indicator of market expectations of exchange-rate movements is the forward exchange rate. Chart 15 shows the movement of the three-month premium of the Swiss franc versus the pound sterling from the beginning of 1935 to the end of 1936. For comparison, the

27 Among the measures that reduced supply were the cartelisation of the watchmaking industry, the ban on hotel construction, the prohibition on opening or extending department stores and similar measures to support

the needlework industry, the footwear industry and the shoemakers’ trade. Measures to raise demand included purchase guarantees for agricultural products and milk price supports.

Year	Foreign exchange	Clearing	Banknotes	Registermark	Effekten- sperrmark	Reisemark
	Average December	Year end	Year end	Year end	Year end	Year end
1934	123.82	123.50	113.50	75.50	49.50	85.00
1935	123.86	123.60	–	64.75	27.75	77.00
1936	174.90	174.50	–	80.50	36.25	95.00
1937	174.16	174.00	88.00	92.50	29.00	109.00
1938	177.05	176.85	53.50	76.00	18.75	105.00

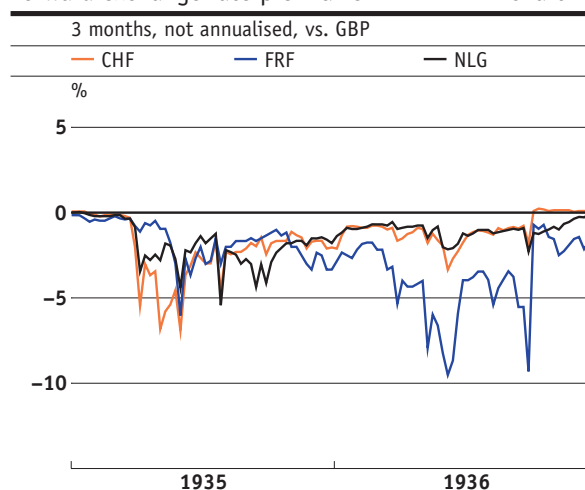
chart also shows the corresponding premiums for the French franc and the Dutch guilder, the other currencies in the gold bloc.²⁸

The chart shows that all three currencies traded at a discount to the British pound. In quiet markets the Swiss franc traded at a discount of a good 1% (three-month premium, not annualised). Large speculative attacks occurred in April 1935, after Belgium devalued its currency, and June 1936, after the election of the Popular Front government in France. In these two phases the Swiss franc traded at a discount of about 6% and 2.5% respectively.

In the weeks before the devaluation of 27 September 1936, the discount was generally below 1% while the discount on the French franc soared. On 26 September 1936 the discount on the Swiss franc was 1.8%, implying an expectation that the Swiss franc's exchange rate in sterling terms would fall by 1.8% in the next three months. In other words, the market thought there was a probability of about 6% that the Swiss franc would devalue by 30%. Thus, developments in the forward exchange market support the supposition that the devaluation of the Swiss franc took just about everybody by surprise.

²⁸ Weekly data (Saturday). A discount (-) implies that the forward rate of the gold bloc currency (expressed in pounds sterling) was below the spot exchange rate. Note that in chart 15 the exchange rate is

defined as pounds sterling per Swiss franc, whereas in chart 14 all exchange rates of foreign currencies are expressed in terms of Swiss francs.

Forward exchange rate premiums Chart 15

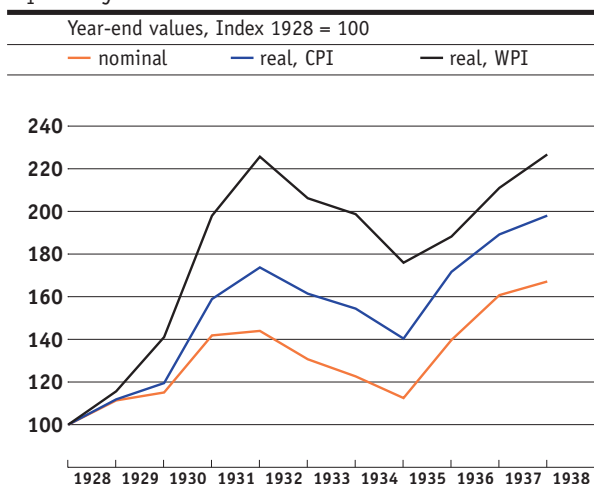
2.6 Monetary aggregates and gold movements: levels

Besides interest rates and exchange rates, monetary aggregates and their components also offer a perspective on monetary developments. Since Friedman and Schwartz (1963), they play a major role in the literature on the Great Depression. Friedman and Schwartz argue that the decline in the US stock of money was the main reason for the decline in overall demand, and that the US Federal Reserve should have prevented this: "Prevention or moderation of the decline in the stock of money, let alone the substitution of monetary expansion, would have reduced the contraction's severity and almost as certainly its duration" (Friedman and Schwartz, 1963, p. 301). The question is whether the gold standard allowed the Federal Reserve this scope. It probably did, as the USA held about 40% of the world's gold reserves at the time (see Bordo and Schwartz, 2001). But for small countries the possibilities were rather limited.²⁹

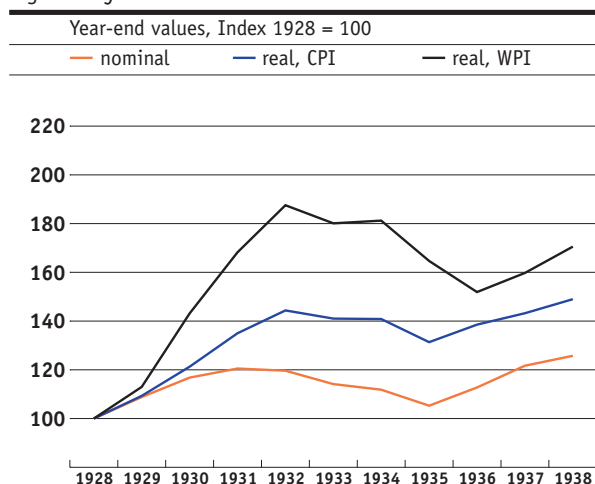
Nonetheless, it is revealing to trace the development of the Swiss monetary aggregates. Charts 16 and 17 show the nominal and real development of the M_1 and M_3 aggregates. M_1 includes notes and coins in circulation plus demand deposits held by the public with banks and the post office. M_3 comprises M_1 plus all time deposits and saving deposits that the public hold with banks. All data are year-end values.

The charts show that, despite sizeable fluctuations at times, the stock of money in nominal terms tends to rise. From 1929 to 1938 it was always above the level at the end of 1928. The M_1 aggregate soared in 1931 in particular, the year in which Britain left the gold standard and Germany introduced currency controls. In 1931 and 1932, M_1 was more than 40% higher than at the end of 1928. In the following three years, this aggregate gave up most of its advance and at the end of 1935 it was back where it had been at the end of 1929. In 1936, M_1 rose sharply, and was soon higher than at the end of 1932. The more broadly defined M_3 aggregate did not fluctuate as much as M_1 , but the pattern of development is similar.

M_1 money stock Chart 16



M_3 money stock Chart 17



29 Meltzer (2003) argues that US monetary policy failed primarily because the Federal Reserve allowed the "real bills doctrine" to influence its monetary operations. The publications and minutes of meetings of the SNB reveal that the "real bills doc-

trine" also had proponents at the SNB. However, one must agree with Weber's (1983) observation that the effects in the case of Switzerland were small, because in practice all SNB actions were determined by the requirements of the gold standard.

The turning points can be determined more accurately with the aid of quarterly figures, which are available from the end of the fourth quarter of 1931. According to these data, the two nominal monetary aggregates peak in the first quarter of 1932 and hit their respective troughs in the second quarter (M_1) and third quarter (M_3) of 1935.

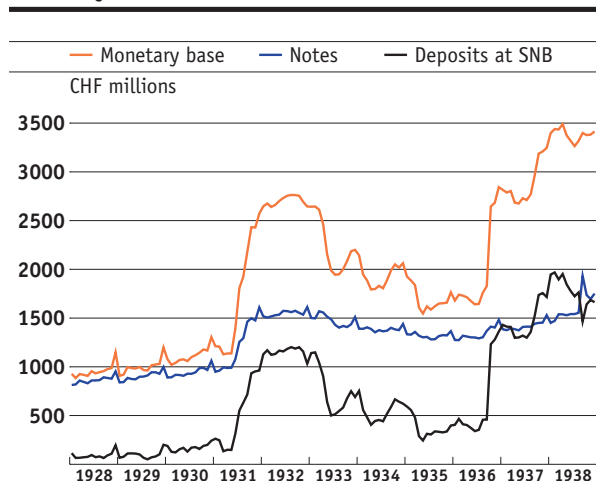
The development of the nominal M_1 and M_3 aggregates demonstrate that prices in Switzerland were falling even though the nominal stocks of money were rising. This means that the real stocks of money rose significantly. Charts 16 and 17, which show both the nominal aggregates as well as two calculations of real aggregates adjusted by two different price indices, illustrate this. The high level of real money balances can be explained by the low interest rates and deflation. Both make it relatively attractive to hold cash and thus increase the real demand for money. Real NNP growth reduced the real demand for money from 1931 onwards, but obviously was unable to compensate for the countervailing forces.

A more narrowly defined monetary aggregate than M_1 is the monetary base, for which monthly figures are available. This is made up of notes in circulation plus demand deposits with the SNB. It reflects the amount of money created by the SNB, but does not take deposits created by the banks into account.³⁰ Chart 18 shows the development of this aggregate

from 1928 to 1938. It reveals that the monetary base doubled in the course of a few months in 1931. About two thirds of this increase in the monetary base is accounted for by demand deposits with the SNB and one third by notes in circulation. Among the notes, the increase in demand was mainly for large denominations (1000 and 500 Swiss franc notes). The situation then remained quiet until the first quarter of 1933. After the US suspended the gold convertibility of the US dollar, the Swiss franc was the target of a series of speculative attacks, with the result that the monetary base gradually decreased until the devaluation of 1936. After the devaluation, the monetary base increased again and soon exceeded the 1932 peak.

We can distinguish three waves of speculation against the Swiss franc in the period 1933–1935, each of them associated with a substantial reduction in the monetary base. The first wave lasted from March to July 1933, and was connected with speculation that Switzerland could be forced to abandon the gold parity now that the USA had done so. Confidence in the Swiss franc was restored only after the formation of the gold bloc (8 July 1933). The second wave of speculation lasted from February to April 1934. It was triggered by the move to stabilise the dollar at 59% of its former gold value (31 January 1934). This strengthened confidence in the dollar and renewed

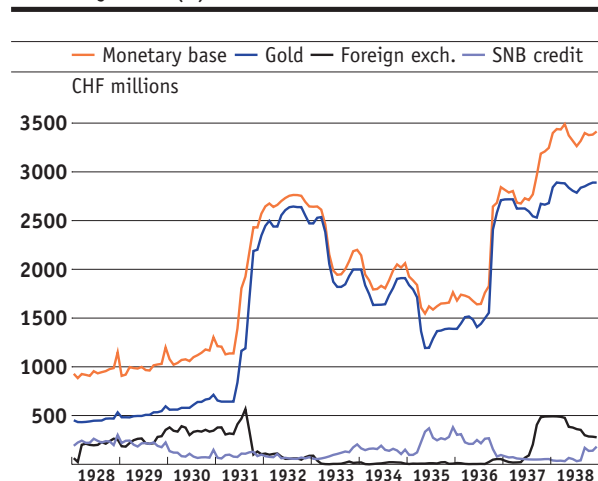
Monetary base Chart 18



30 The demand deposits with the SNB include the giro accounts of the federal government. These were published separately only once a year. In principle, the accounts of the federal administration should be excluded from

the monetary base. See Gruebler (1958) and Weber (1983) for monetary base figures calculated on the basis of annual figures.

Monetary base (2) Chart 19



doubts about the gold parity of the Swiss franc and the other gold bloc currencies. The third wave of speculation started in January 1935 and continued until June. Initially, it was fuelled by the banking crisis in Belgium and the subsequent devaluation of the Belgian franc (31 March 1935). Immediately after this the fierce referendum campaign on the Crisis Initiative of the trade unions and the Young Farmers' Movement generated further uncertainty. The situation only calmed down after the voters rejected the Initiative on 2 June 1935.

The SNB has a number of instruments that it can use to change the monetary base. Under the National Bank Law in force at the time, it could buy gold, foreign exchange and bonds as well as grant discount and Lombard advances.³¹ Chart 19 shows the development of SNB assets as published in the SNB's return (balance sheet). It reveals that up to 1931, gold was by far the largest single item among the SNB's assets. At the beginning of the period under review, foreign exchange reserves and domestic credit together were about as large as the Bank's gold holdings. The domestic credit was sharply reduced in the course of 1930. The Bank took the same action with its foreign exchange within two months in 1931. Domestic credit rose temporarily in 1935 and 1936, but the SNB did not start buying foreign exchange again until 1937.

The profit of CHF 539 million on the revaluation of the SNB's gold holdings were credited to an Exchange Stabilisation Fund. This Fund was designed to serve the SNB in the conduct of monetary policy and as a reserve for possible currency losses.³² Unfortunately, the Fund makes the interpretation of the SNB's return more difficult at times. What we know is that the SNB bought gold amounting to CHF 539 million on behalf of the Exchange Stabilisation Fund in the 2–3 weeks after the devaluation. By mid-October 1936, the demand deposits – temporarily distorted by the Fund's giro account – can thus again be regarded as a good indicator of the market's liquidity. When interpreting the SNB's international reserves, however, one must stay on the cautious side until the liquidation of the Fund in 1940. In the first three months after the devaluation, the investments of the Exchange Stabilisation Fund were not included in the SNB's return, and were subsequently presented only as a total separate from the "regular" gold and foreign exchange holdings. Therefore, the figures in Chart 19 – which are based on the SNB's return – do not reflect the entire gold and foreign exchange holdings of the SNB.

31 In practice, open market operations with domestic bonds were seldom used. The National Bank Law allowed the SNB to "buy liquid, interest-bearing debenture bonds issued by the Federal government, the Cantons and foreign states, but only for the purpose of temporarily investing funds" (Art. 14 para 7 National Bank Law).

32 The currency situation evolved such that the SNB made little use of the Exchange Stabilisation Fund. In May 1940, the Fund was liquidated and the proceeds (CHF 533 m) shared between the federal government (CHF 325 m), the cantons (CHF 150 m) and the SNB (CHF 58 m).

2.7 Money supply aggregates and gold movements: Bernanke Ratios

It is often useful and interesting to describe and interpret the development of money aggregates in terms of simple ratios. Friedman and Schwartz (1963) did this with the money multiplier and its breakdown into the currency-deposit ratio and the reserve-deposit ratio. Weber (1983) adopted the same approach in his analysis of the Swiss money aggregates. Bernanke (1995) introduced an alternative breakdown of the money supply, which Faber (1997) applied to Switzerland. This breakdown is particularly apposite for the gold standard. It is defined as follows:

$$M \equiv \frac{M}{BASE} \cdot \frac{BASE}{RES} \cdot \frac{RES}{GOLD} \cdot QGOLD \cdot PGOLD,$$

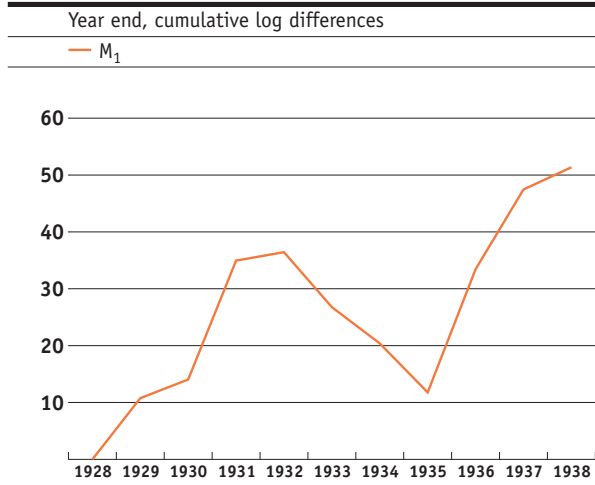
where M is the stock of money M_1 , $BASE$ the monetary base, RES the international reserves in Swiss francs (sum of gold and foreign exchange), $GOLD$ gold holdings valued in Swiss francs, $QGOLD$ the quantity of gold and $PGOLD$ the gold price (purchase price of the SNB). RES and $GOLD$ differ from the data displayed in Chart 19 in that the investments of the Exchange Stabilisation Fund are included and that the gold holdings are valued at the SNB's purchase price.³³

With this breakdown of M it is possible to illustrate the origin of movements in the money supply. Bernanke and Mihov (2000) did this for eight different countries (the USA, Germany, France, Great Britain, Canada, Japan, Poland and Sweden). Our results for Switzerland are displayed in Charts 20a–f. To facilitate a comparison with Bernanke and Mihov's results, the results are presented as cumulative changes in logarithmic monthly series from June 1928 onwards (except for $M/BASE$, which is based on year-end values).

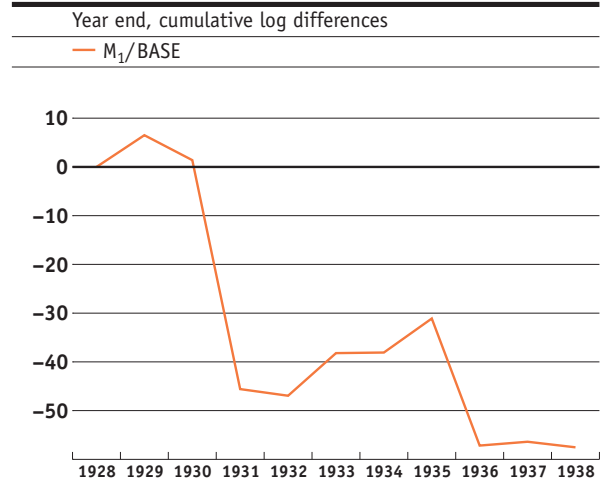
33 The data on the investments of the Exchange Stabilisation Fund are taken from Jaquemot (1974, Annex 3). These are monthly figures starting at the end of December 1936. Jaquemot (1974, p. 88) notes that on 15 October the SNB had new gold that could not be transferred to the Fund. We therefore assume

that the Fund was already fully invested in gold at end-October and end-November 1936.

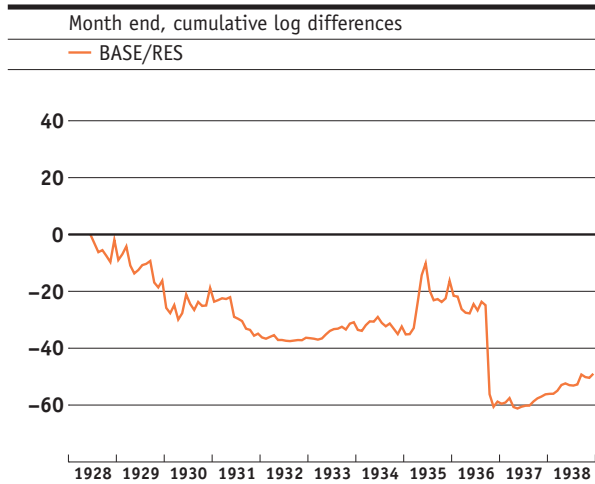
M₁ Chart 20a



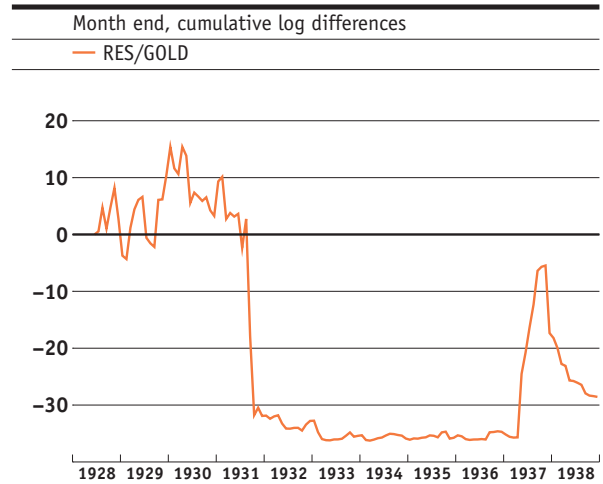
M₁/BASE Chart 20b



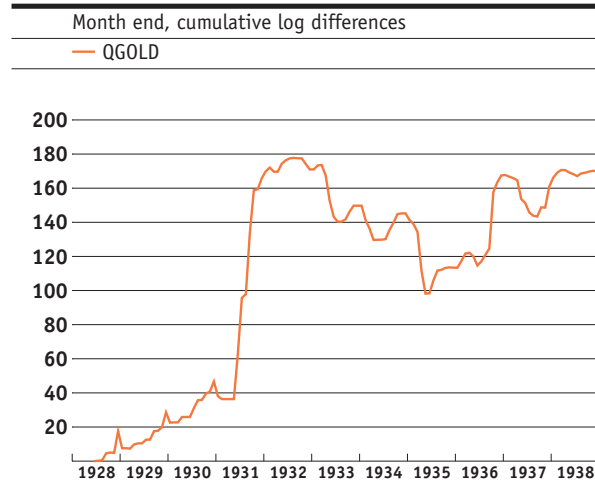
BASE/RES Chart 20c



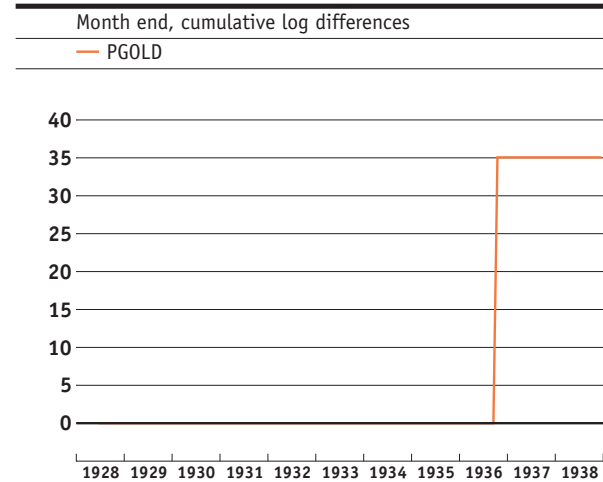
RES/GOLD Chart 20d



Gold holdings Chart 20e



Gold price Chart 20f



The first ratio on the right-hand side of the definition of M is $M/BASE$, the money multiplier. The money multiplier correlates negatively with the currency-deposit ratio and the reserve-deposit ratio. According to Bernanke (1995), in the Great Depression the money multiplier is above all an indicator of bank crises. Doubts about the soundness of banks prompted the public to increase their cash holdings at the expense of bank deposits. This in turn forced banks to increase their liquidity reserves to withstand a sudden run on the deposits. Both changes reduced the money multiplier $M/BASE$.

In Switzerland, the money multiplier had a value of 2.7 at the end of 1929. As Chart 20b shows, it plunged in 1931 and then rose gradually through 1935, before falling to new lows from 1936 through 1938. The massive decline in 1931 coincides with the international banking crisis, which originated in Germany and Austria and also affected Switzerland. Two major banks (Swiss Volksbank and Banque d'Escompte Suisse) ran into financial difficulties and had to turn to the federal government for assistance.

Apart from the banking crisis, the international currency crisis is also likely to have had a direct effect on the money multiplier. First, the Swiss franc was seen in 1931 as a relatively solid currency, so speculation against other currencies triggered a heavy inflow of funds from abroad. As the banks expected that part of these deposits would be withdrawn as soon as the situation stabilised, they raised their reserves. Second, Germany introduced currency controls in 1931. As banknotes are a suitable means of circumventing currency controls, this was probably reflected in a higher demand for Swiss franc banknotes.

The second ratio on the right-hand side of the money supply definition is $BASE/RES$, the ratio between the monetary base and the international reserves. Its inverse, $RES/BASE$, resembles the statutory cover requirements of the SNB.³⁴ Bernanke treats $BASE/RES$ as an indicator of monetary policy. It reveals whether or not the central bank sterilised the effects of international reserves on the monetary base by way of compensating changes in discount or Lombard advances, or whether it tolerated (and possibly even strengthened) them.

As Chart 20c shows, in the early years of the Great Depression, $BASE/RES$ trended downwards. In this phase, the effect of higher international reserves on the monetary base was largely neutralised by the reduction in domestic credit. However, the reduction in domestic credit was more or less completed in the

second half of 1931, when the international reserves posted their strongest growth. $BASE/RES$ shot up again only in April 1935, and then maintained an average level more or less equal to that in the period from mid-1929 to mid-1931 until the 1936 devaluation. This pattern suggests that initially the SNB virtually ignored the periodic crises of confidence that hit the Swiss franc from 1933 onwards. However, as economic conditions worsened in 1935 and 1936, the SNB took steps to isolate the Swiss economy from the effects of speculative attacks against the Swiss franc.

The plunge in $BASE/RES$ in October 1936 is not a reflection of a tighter monetary policy, but of the revaluation of the SNB's gold holdings, and therefore its currency reserves. As the profits from devaluation were not distributed but credited to an Exchange Stabilisation Fund, $BASE/RES$ falls by about 35 log points.

The third ratio on the right-hand side of the money supply definition is $RES/GOLD$, the ratio between international reserves and gold holdings. This ratio tells us how the SNB deploys its foreign exchange reserves. The principal feature of the $RES/GOLD$ curve in Chart 20d is the sharp tumble in September and October 1931. In these two months the ratio fell by 29 log points. Two factors were responsible for this development: on the one hand, the currency and banking crisis abroad led to a huge increase in Switzerland's gold holdings and, on the other, the SNB exchanged its sterling reserves for gold. In 1937, the SNB temporarily increased the share of foreign exchange in the Bank's international reserves. In doing so, it was responding to discussions about a possible reduction of the international gold price (Jaquemet, 1974, p. 89). To avoid disrupting the markets, most of this restructuring was carried out within the Exchange Stabilisation Fund.

The last two charts in this group, Charts 20e and 20f, show movements in gold holdings by weight, $QGOLD$, and the gold price, $PGOLD$. $QGOLD$ includes the complete gold stock of the SNB, i. e. the "regular" gold as well as the gold of the Exchange Stabilisation Fund. $PGOLD$ reflects the SNB's purchase price for gold. With its decision to devalue, the government directed the SNB to maintain the gold value of the Swiss franc at between 190 and 215 milligrams of fine gold (compared with 290.32 milligrams under the Coinage Law of 1931) implying a devaluation of the Swiss franc of at least 25.9% and at most 34.6%. Shortly afterwards, the Federal Council instructed the SNB to maintain the gold value of the Swiss franc at a level that corresponded to a

34 There are differences, however. According to the National Bank Law at least 40% of notes in circulation (not the monetary base) had to be covered by precious metal (not international reserves). Moreover, the notes

in circulation had to be fully covered by a further group of assets including, among others, discount and Lombard advances.

devaluation of the Swiss franc of about 30%. This is reflected in an increase in the SNB's purchase price for gold expressed in Swiss francs of about 42% (or 35 log points).

In conclusion, we note that all three ratios, $RES/GOLD$, $BASE/RES$ and $M/BASE$, fell sharply in the early years of the Great Depression. In consequence, the M_1 money supply (M) increased by just 26 log points between the end of 1929 and the end of 1932, although gold holdings ($QGOLD$) soared by 142 log points. After the devaluation of September 1936, $QGOLD$, $RES/GOLD$ and $BASE/RES$ all rose, so that M also grew strongly, although $M/BASE$ fell further.

Comparing the Swiss case with the eight countries that Bernanke and Mihov (2000) include in their article, the strongest similarities are with France. In France, $RES/GOLD$ and $M/BASE$ also fell sharply in the second half of 1931. But France's M_1 and gold holdings rose between the end of 1929 and the end of 1932 only by one and 69 log points respectively. Switzerland had a larger relative increase in gold holdings than any of the eight countries studied by Bernanke and Mihov. The inflow of gold was so heavy that despite the huge drop in all three ratios, M_1 posted a solid increase in this period. Accordingly, thanks to the inflow of gold, liquidity in the Swiss economy and the Swiss banking system was higher than would otherwise have been the case. This inflow was one of the factors that enabled Switzerland to weather the Great Depression better than other countries for a time.

2.8 The banks

There are two reasons to end our analysis with a closer look at the banking sector. First, the problems of the banking sector were a major cause of the decline in the money multiplier discussed in the last section. Second, problems in the banking sector can prompt banks to raise the cost of credit, or even refuse to grant credit to certain customer segments. As bank loans are the only source of external financing for most firms and households, this has negative implications for production and employment.³⁵

Bank balance sheets afford a broad view on developments in the banking sector. Table 4 shows that nominal balance sheet totals still rose modestly (by 5%) in 1930, but then fell continuously up to and including 1935 (1930–1935: -19%); only in 1936, the year of the devaluation, did they start to recover. On the asset side, we notice a marked shift towards safer investments. The proportion of money balances rose strongly, that of securities moderately.³⁶ Mortgage lendings also posted solid growth. On the other hand, the proportion of loans and advances declined.³⁷ This is the pattern that one would expect of a risk-conscious bank in those circumstances. Banks took steps to protect themselves against the danger of unexpected runs on deposits by increasing cash and securities at the expense of loans and bills of exchange. Moreover, they reacted to declines in the quality of borrowers by raising the proportion of secured loans.

We do not know the size of the write-offs that banks had to take on their assets during the Great Depression. But we do know that growing numbers of bank customers experienced financial difficulties under the burden of deflation and recession. Chart 21 shows the growth in bankruptcies among companies registered in Switzerland. As can be seen, bankruptcies peaked in 1936. This is in line with the picture presented by other indicators, which show that the crisis shifted increasingly from the export sector to the domestic-market-oriented sector with its large number of medium-sized and small firms.

35 See Bernanke (1983) and the survey article by Calomiris (1993).

36 Cash also includes current account and postal giro account balances. Securities also include permanent shareholdings.

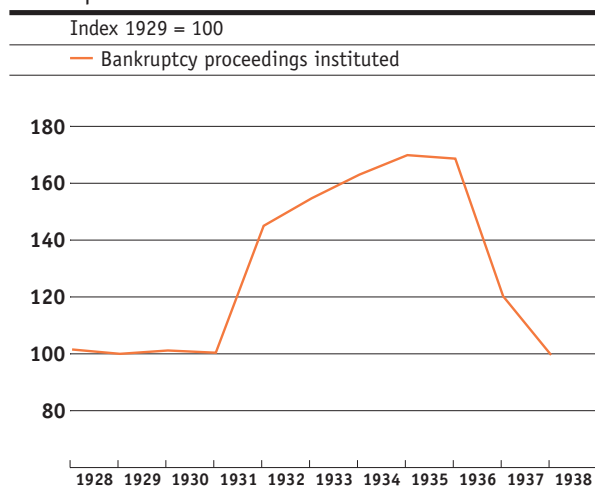
37 Sums due from customers are the total of overdrafts, fixed advances and loans. From 1930 onwards, the share of mortgage-backed fixed advances and loans is known. This share rose substantially over the years (except in 1934).

Year	Cash in %	Securities in %	Bills of exchange in %	Due from banks in %	Loans and advances in %	Mortgage loans in %	Balance sheet total in CHF m
1929	1.8	6.4	9.4	10.7	34.0	33.7	20,493
1930	2.2	6.5	9.4	11.2	34.8	33.2	21,530
1931	6.3	7.1	6.8	5.7	34.1	36.9	20,467
1932	6.3	7.5	5.8	4.4	32.3	40.7	19,945
1933	5.4	7.1	5.0	3.9	31.4	43.9	19,150
1934	5.0	7.0	5.0	3.5	30.6	46.0	18,646
1935	3.1	7.5	3.9	3.7	25.0	49.2	17,552
1936	7.3	7.8	3.8	4.3	21.8	47.6	18,080
1937	8.8	8.5	3.9	5.2	19.7	47.1	18,497
1938	9.3	8.8	3.5	4.5	18.9	48.2	18,297

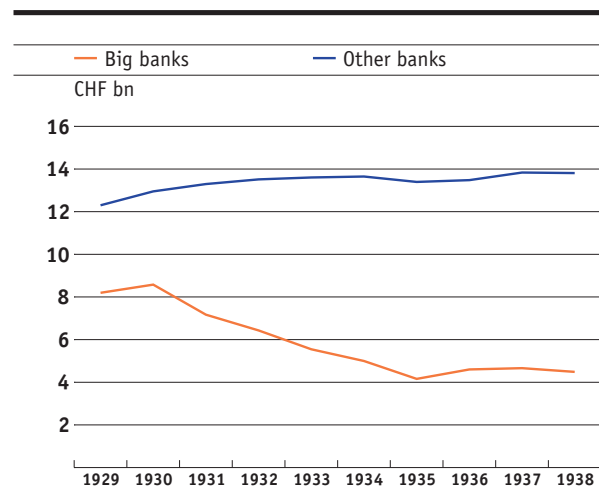
The other important reason why banks had to take write-offs against their assets was the freezing of foreign credit balances by Germany and a number of Central and Eastern European countries. In September 1931, Germany and its bank creditors signed a "standstill" agreement that was regularly renewed in the following years. Although there was a market for blocked marks subject to the "standstill" agreement, these marks (Registermark) traded at a large discount. Even more difficult was the liquidation of other investments (securities, mortgages, etc.). Thus, repatriating the blocked assets from Germany was a laborious and expensive undertaking.³⁸

Not all banking groups were affected to the same extent. Worst hit were the big banks, a term used at the time to refer to the eight largest commercial banks (Swiss Bank Corporation, Credit Suisse, Swiss Volksbank, Banque d'Escompte Suisse, Union Bank of Switzerland, Eidgenössische Bank, Basler Handelsbank and Bank Leu). At the beginning of the 1930s, all of the big banks had sizeable outstanding loans in Germany and were hard hit by the transfer restrictions and the uncertainty this caused among investors. Chart 22 illustrates this. The balance sheet totals of the eight big banks fell by about half between 1929 and 1938, while those of the other banks were practically unchanged.

Bankruptcies Chart 21



Balance sheet totals Chart 22



38 See Fior (2002) and Perrenoud et al. (2002) for the development of individual big banks' exposure in Germany.

Of the eight big banks, only two, Credit Suisse and Swiss Bank Corporation, had adequate reserves to cover their losses without having to dip into their share capital. Three banks (Basler Handelsbank, Eidgenössische Bank and the Union Bank of Switzerland) turned to their shareholders for fresh funds to cover their losses. One bank (Bank Leu) had recourse not only to its shareholders, but also to its creditors. Swiss Volksbank was able to avoid taking these steps, but after a sharp drop in its cooperative capital, the bank was forced to turn to the federal government for temporary assistance. The fate of the Banque d'Escompte Suisse was even worse: despite government assistance and several years of restructuring efforts, it had to close its doors on 30 April 1934 and go into liquidation. Table 5 lists the contributions of the shareholders and creditors of these six big banks up to the end of 1937. It is clear from the table that the Banque d'Escompte Suisse and Swiss Volksbank were the most serious and most expensive cases.³⁹

The 28 cantonal banks, the second most important group of banks after the big banks, generally weathered the crisis in good shape. They did not have any significant foreign business and probably benefited from their state guarantees. Just three banks (Banque Cantonale Neuchâteloise, 1935; Kantonalbank von Bern, 1939; Bündner Kantonalbank, 1939) needed to be restructured, mainly because the major

industries in the respective cantons were badly hit by the crisis (watchmaking industry, the hotel business).

In response to the banking crisis, the state introduced two reforms. First, it established a federal loans institution, the Eidgenössische Darlehenskasse (1932), which was obliged to accept even such bills of exchange that the SNB would not. With this step, the traditional function of a central bank defined by Bagehot (1873), to act as lender of last resort, was partially outsourced. A guarantee fund, to which the federal government contributed CHF 75 million and the banks and insurance companies CHF 25 million, was liable for the Darlehenskasse's liabilities. Second, the Swiss Banking Law was passed (1934). Besides provisions to protect the rights of creditors, it contains various regulations applicable in the event of a bank encountering financial difficulties (deferral of debt repayment, moratorium, bankruptcy). This takes account of the specific circumstances of banks which, because of the possibility of a "run", require different regulations than other firms.⁴⁰ In the period from 1935 to 1938, 12 banks requested a deferral of debt repayments, 15 banks a bank loan moratorium and 21 a general moratorium, while eight banks had to file for bankruptcy (Ehrsam, 1985, p. 84).

Restructuring of big banks (in CHF m)

Table 5

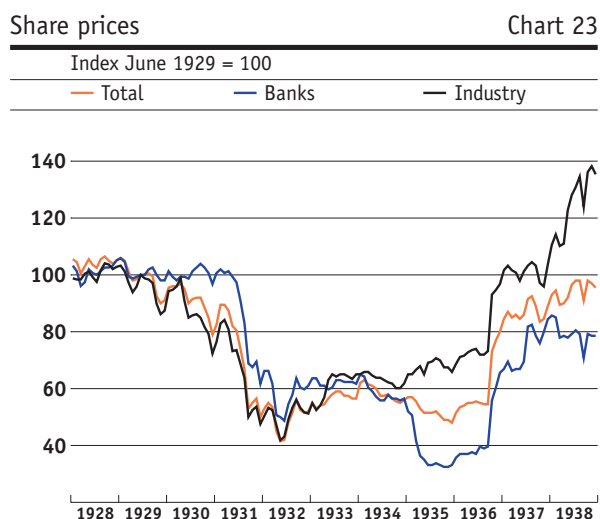
Bank	Contributions			Balance sheet total as at end-1930
	Shareholders	Creditors	Total	
Banque d'Escompte Suisse	165	85	250	677
Swiss Volksbank	195		195	1,680
Bank Leu	33	31	64	416
Basler Handelsbank	55		55	835
Union Bank of Switzerland	40		40	983
Eidgenössische Bank	33		33	854
Total	521	116	637	5,445

39 The data in Table 5 are taken from Paul Rossy, as quoted in Ehrsam (1985, p. 90). On the collapse of the Banque d'Escompte Suisse, see Scheuss (1960) and Ehrsam (1985, pp. 93–97). On the restructuring of Swiss Volksbank, see Ehrsam (1985, pp. 97–101).

40 On the events leading up to the Swiss Banking Law, see Bänziger (1986).

How serious were the difficulties of the Swiss banking sector compared to other sectors? The assessment of the financial markets is reflected in the development of share prices. Chart 23 shows the development of the overall market index of Swiss shares and the indices of the banking and industrial sectors. Up until 1934, bank shares tended to fall in line with the rest of the market. Whereas industrials showed signs of a mild recovery in 1935, bank shares plunged even further. From the chart it is clear that the market rocketed on the devaluation in September 1936, with bank shares outperforming other sectors. In the last three months of 1936, bank shares soared by no less than 65%. In the same period, industrials increased by 35%. Against this backdrop, the widely held view that it was in the interest of the banks to stick to the gold standard is not convincing. In the end, the financial markets at least saw this differently.

The repercussions of the crises in the banking sector on economic activity are hard to assess. By international standards, Swiss banks apparently coped relatively well with the situation. Major banking crises hit the USA, Germany and Belgium as well as most countries in Central and Eastern Europe. Many of these led to moratoria and to the temporary shut-down of all banks (bank holidays). In the USA, one out of three banks failed between 1929 and 1933 and many others merged, so that the number of banks was halved. In contrast, Switzerland saw restructurings but few mergers and liquidations (an exception being the Banque d'Escompte Suisse, one of the country's big banks). The number of banks, excluding private banks and finance companies, fluctuated in a narrow range between 357 (1934) and 365 (1937 and 1938).⁴¹ In addition, there were no general moratoria and no bank holidays imposed by the government.



41 See Historische Statistik der Schweiz (1996, p. 818).

3 Concluding remarks

In this paper, the Great Depression in Switzerland has been analysed using the approach of Temin (1989) and Eichengreen (1992), who ascribe a crucial role to the international gold standard in spreading and worsening the crisis.

The causes of the Great Depression lay outside Switzerland, and the first victims were the various export sectors. Fixed exchange rates under the gold standard rapidly transferred deflation to Switzerland, as a result of which real wages, real interest rates and the real burden of nominal debt rose. After a time lag, therefore, the domestic economy – which had held up well in the early years of the Great Depression – also came under pressure.

The critical year for Switzerland was 1931, when Britain let sterling float and Germany introduced controls on capital movements. From then on, Switzerland had to live with an overvalued currency and the burden of blocked assets in Germany. The currency and banking crisis abroad also triggered huge inflows of gold into Switzerland. Consequently, and in contrast to many other countries, the money supply remained above the level of 1929–30. That said, the large gold holdings were a mixed blessing, as they contributed to Switzerland's determination to maintain the old gold parity and its attempt to restore price competitiveness through deflation. This policy failed since real wages and the real exchange rate of the Swiss franc remained well above the level of 1929–30. The turning point was the devaluation of the Swiss franc in 1936, precipitated by the devaluation of the French franc.

All the evidence supports the view that the decision to stick to the gold standard worsened and prolonged the depression in Switzerland. While it is true that abandoning the gold standard at an earlier stage would not have avoided the crisis – the devaluation of the Swiss franc did not affect the course of the international economy, international trade protectionism or the blocking of foreign assets in Germany – by sticking to the old gold parity monetary authorities prevented a departure from deflationary expectations, an increase in prices or a normalisation of real exchange rates with countries such as the USA and Great Britain. Furthermore, maintaining convertibility with gold meant that economic policymakers sought refuge in measures that distorted market mechanisms. It is ironic that in the circumstances of the 1930s the defence of the gold standard, which its supporters held to be the cornerstone of a free-mar-

ket economy, ultimately led to greater intervention by the state.

The Great Depression has three main lessons for monetary policy. First, it demonstrated how dangerous an international gold standard can be. In the circumstances of the 1930s the gold standard was deflationary. In addition, like any system of fixed exchange rates, it left small countries like Switzerland no scope for an autonomous monetary policy. It took almost 30 years for this lesson to be fully grasped. The international monetary system created at Bretton Woods (1944) was a gold exchange system, and thus a fixed-exchange-rate system. Eventually this system also collapsed, though as a result of inflation rather than deflation. Switzerland reacted comparatively quickly this time and was one of the first countries to let its currency float at the beginning of 1973.

Second, the Great Depression showed that a stable banking system is essential for an economy to function smoothly. This includes central banks as lenders of last resort (Bagehot, 1873). In the Great Depression many central banks fulfilled this role only with great reluctance. This stance was due partly to the restrictions imposed by the gold standard and the concomitant fear of speculative attacks on currency reserves. Switzerland shared the other central banks' reluctance to perform their role as lenders of last resort – as propounded by Bagehot – in a forthright fashion. When it became clear that statutory restrictions on the SNB's scope of activities was at times preventing it from providing effective assistance, the reaction was not to expand this scope but to establish the Eidgenössische Darlehenskasse, which provided funds against collateral that the SNB was not allowed to advance. Today, it is generally recognised that central banks have a major role to play in ensuring the stability of the financial system, and the definition of their scope of business should not stand in the way of this function.

Third, the Great Depression illustrated the dangers of deflation. This insight is reflected in the statutory duties of many central banks. The monetary-policy goal of price stability now enshrined in the statutes of many countries expressly confers upon the central bank the task of preventing deflation as well as inflation. Moreover, definitions of goals are often defined in ways that reduce the likelihood of deflation. On the one hand, goals are often expressed in the form of annual inflation rate targets rather than in the form of price levels. This means that if the rate of inflation overshoots the target in

one year, it does not have to be offset by a corresponding undershooting the next year. On the other hand, in most countries the target is defined as a slight increase in the CPI. Both factors contribute to reducing the likelihood of deflation.

Annex: Sources

All sources cited below refer to the data used in the charts and tables. Unless otherwise stated, the data refer to Switzerland.

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