ETLA

Keskusteluaiheita - Discussion papers

No. 683

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THE ECONOMIC CRISIS

OF THE 1990s IN FINLAND***

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ABSTRACT: We develop an interpretation of the severe economic crisis in Finland in the 1990s, when real GDP dropped about 14 percent from the peak in 1990 to the through in 1993 and the unemployment rate rose from 3 percent in 1990 to almost 20 percent at the beginning of 1994. Finland´s case is an example of the classical financial crisis, which have been experienced in countries so different from each other as Chile in the early 1980s, Mexico in mid 1990s and some of the Asian countries quite recently. The background for the Finnish crisis lies in poor design of financial deregulation and this appears to be a common feature in several countries. Our specific contribution is to provide econometric evidence, which has been seldom presented in the discussion of financial crises. We evaluate the role of financial factors in the real economy as factors explaining fluctuations in private investments and consumption behavior. The period of recovery in Finland has also been puzzling. Despite of high economic growth unemployment has fallen very slowly. We argue that indebtedness of the private sector has increased the structural unemployment, which provides an explanation of the puzzle.

1. Introduction

The economic experiences of Finland in the second half of 1980's and through 1990's have been dramatic. In this period the Finnish economy first experienced a strong upswing and an overheating of the economy and then a major fall in GDP and a rapid rise in unemployment. Real GDP dropped in real terms about 14 percent from the peak in 1990 to the through in 1993 while the rate of unemployment rose from 3 percent in 1990 to almost 20 percent in the beginning of 1994. Since 1994 the economy has been recovering, but in spite of rapid GDP growth the decrease in unemployment has been slow and even at present it remains at a high level exceeding 10 percent.

These macroeconomic figures show just the tip of the iceberg. The Finnish depression of the 1990's has been the most serious economic crisis in its peacetime history. It is more severe than the depression of the 1930's in terms of many indicators, and in fact it is the perhaps most severe crisis of any OECD economies. The 1990s crisis has been characterized by many features which do not appear as part of a regular business cycle of a market economy. These are the huge expansion of bank lending as a consequence of financial market deregulation and major inflows of foreign capital during the boom, periods of speculative attacks on the currency, and the emergence of a major banking crisis as part of the depression, just to mention a few.

This paper develops an interpretation of the Finnish economic crisis of the 1990s. More specifically, we argue that the depression was no ordinary recession. Even though the Finnish economy experienced several exogenous shocks both during the boom and the bust periods that contributed to the business cycle up and down, shocks are only a part of the story. The case of Finland is a very good example of the classical financial crises, which have been experienced in countries so different from each other as Chile in the early 1980s, Mexico in mid 1990s, some of the Asian countries quite recently, and (we believe) Sweden in early 1990s.

While macroeconomic developments and institutions in these countries vary from country to country, these countries have several common features which seem to have dominated their economic developments.[1] The beginning of the story is a poorly designed deregulation of financial markets. Deregulation usually means two things. First, domestic interest rate regulation

is lifted and, second, the private sector is allowed to borrow freely from abroad while authorities indicate their desire to stick to the fixed exchange rate. Since financial market deregulation is not usually connected with other measures like the reform in the tax system to tighten the deductibility of interest expenses and the more stringent bank supervision, and since investors perceive little likelihood of a loss from exchange rate movements under these circumstances, financial market deregulation leads to a lending boom both domestically and from abroad often in foreign currency terms. As a result the private sector becomes highly indebted both in domestic and foreign currency terms and is thereby very vulnerable to changes in the domestic interest rates and in the exchange rate.

When the economy has developed a huge lending boom often showing features of a bubble, sooner or later the turnaround starts to happen and this often shows up as a tendency for outflow of financial capital. This is the stage, where authorities have only bad alternatives available. If they want to defend the value of the currency, they have to tighten monetary policy. As a result domestic interest rates increase and this hurts the highly domestically indebted private sector. But if the authorities desire to improve the weakened competitiveness of the export sector, they should either devaluate or let the currency float. These measures in turn hurt that part of the private sector which has borrowed from abroad. They become subject to a kind of capital levy.

The final stage of the crisis starts from deteriorating economic developments due either to tighter monetary policy and/or depreciation of the value of currency. As a consequence bankruptcies and thereby unemployment start to increase. Banks face difficulties, because their customers are in trouble. A banking crisis emerges and a rise in unemployment takes place. For both reasons public sector finances becomes worse-off. In fiscal policy there is a need to increase taxes and cut expenditures, i.e. to exercise procyclical fiscal policy. High real interest rates and indebtedness, as well as higher tax rates, increase structural unemployment. Hence, as the recovery ultimately starts to develop, it tends to alleviate unemployment very slowly if all for the reason that unemployment has turned structural to a significant extent during the depression. As a mirror image public sector budget deficit turns out to be hard to close despite the revival of economic growth.

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[1] See e.g. Edison et al (1998) and Corsetti et. al (1998) and Stiglitz (1998).

This is in outline the story of a financial crisis we tell about Finland and compare the Finnish developments with those of the other countries. Our paper also contributes to this topic by providing econometric evidence from Finland.

We start the paper by telling in section 2 the story of both the events and a general view about the reasons behind these developments in Finland. After this descriptive part we provide a diagnosis of the Finnish economic depression as a classical financial crisis in section 3. We make some comparisons of the developments with other countries like in Chile, Mexico, some East Asian Countries and Sweden. We also carry out some econometric studies to evaluate the role of financial factors in the real economy as factors explaining fluctuations in private investment and consumption behaviour.

Section 4 evaluates the role of economic policies – monetary and exchange rate policy as well as fiscal policy – both before, during and after the crisis. Section 5 deals with the recovery period and a puzzling phenomenon associated with it in Finland. Even though economic growth has been relatively high, unemployment rate has fallen very slowly and therefore public sector finances have been in relatively bad shape until quite recently. This leads us to analyze what has happened to structural unemployment in Finland. We argue that, as a result of several features in depression, structural unemployment has increased and has made it harder to return into 'normal' levels of unemployment. In particular, we evaluate econometrically potential role of indebtedness in wage and price setting to check the view that financial factors matter not only for investment and consumption behaviour, but also price and wage setting and thereby for structural unemployment.

Finally, section 6 provides our views on what can be learned from the Finnish experience.

Before proceeding we want to stress that this paper is best seen as a 'country case study'. While we often discuss the Finnish experiences in relation to some other countries, the comparisons are not based on as detailed analyses as for the case of Finland. There are various reasons behind this. For the analysis of the influence of financial factors data limitations did not allow a detailed comparison, while for certain other aspects we can occasionally cite relevant country studies using closely related methodologies.

2. The Road from Boom to Bust[2]

This section is designed to present an overview of the Finnish crisis in three stages: overheating, depression and a recovery. The experiences of the Swedish economy are in many respects similar, though there are some notable differences. We will make comparisons between these two countries in the course of our discussion. For convenience Box 2.1 provides the basic macroeconomic indicators for Finland and Sweden during the overheating (1985-90), the depression (1991-93) and the recovery (1994-97).

Box 1: Macroeconomic indicators for Finland and Sweden

Starting with the period preceding the crisis, we note that in the first half of the 1980's the performance of the Finnish economy, measured in terms of economic growth, was relatively smooth, with an average growth rate slightly above the OECD-European rate. Looking at GDP growth, it can be seen that, relative to Sweden, the Finnish growth rate was higher as a result of catching-up features on the one hand and the relatively sluggish growth performance of the Swedish economy on the other.[3] Figure 2.1 shows GDP growth for Finland, Sweden and EU-countries since 1980.

Figure 2.1: GDP in Finland, Sweden and EU-Countries

In contrast to most other European countries, Finland and Sweden did not experience any major rise in unemployment in the aftermath of the oil crises of the 1970's. The first half of 1980's can be characterized as a gradual disinflation process for Finland, there were no major indebtedness problems in the external dimension or in the public sector, and unemployment remained low, as it

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[2] See Honkapohja, Koskela and Paunio (1993) for a detailed description of the overheating and the onset of the crisis. There exist several other studies as well, see Honkapohja, Koskela and Paunio (1996) and Jonung, Söderström and Stymne (1996), and also the other papers in the Special Issue of Finnish Economic Papers (1996) for some English-language contributions.

[3] The slow growth in Sweden since mid 1970's has been subject to a lot of controversy. See e.g. Gylfason et al (1997) and Lindbeck (1997) and the references therein for detailed discussions of the fading Swedish miracle.

did in Sweden. Overall, the macroeconomic performance in this period can generally be viewed as favorable.

2.1. The Overheating

The smooth developments changed around 1986-87. As shown in Figure 2.1, growth accelerated significantly and the economy entered a period of overheating. Several factors were behind this change. Without trying to quantify their relative significance these can be classified into the following categories:

(i) Financial market deregulation, which included both the abolition of regulation of domestic bank lending rates and the lifting of restrictions on private borrowing from abroad, led to an explosion of bank credit and large capital inflows. We discuss these developments in the next section.

(ii) A sharp increase in the terms of trade as a result of the fall in energy prices and the rise in world market prices of forest products. The data on terms of trade is shown in Figure 2.2.

Figure 2.2: Terms of trade

(iii) Economic policies which were not sufficiently restrictive.

Figure 2.3 shows the development of the components of GDP, together with their contribution to GDP growth. The panel showing the contributions illustrates that private consumption and investments had the biggest positive impacts. Fiscal policy did not appear to counteract the fast growth. On the contrary, public consumption and investment contributed positively to it. We consider economic policies further in Section 4.

Figure 2.3: Components of aggregate demand and their contribution to growth

In the process of overheating the rate of inflation rose from about 2-3 percent in 1986 to about 7 percent in 1989-90, see Figure 2.4. From the same figure it is seen that the rate of unemployment

declined from the approx. 4 percent level of the first half of the decade to about 2.5-3 percent at the end of 1989. In comparison to Sweden it may be noted that Swedish unemployment showed a very gradual decline for most of 1980's, which suggests that Sweden experienced less pronounced overheating in the second half of the decade. The GDP growth performance of Sweden supports this view, compare Figure 2.1 and Box 1.

Figure 2.4: Inflation and unemployment

The Finnish boom led to weakened price competitiveness and serious current account problems. These are shown in Figures 2.5 and 2.6, respectively. For 1985-90 the average current account deficit to GDP ratio was 2.9 percent for Finland, while the same figure for Sweden was only 1.1 percent, again suggesting that in Sweden the overheating was less pronounced (compare Box 1).

Figures 2.5-2.6: Relative unit labor costs, Current account

In the boom years competition among banks intensified in line with the financial deregulation. The new possibilities for competition between banks led to increased risk-taking, probably as a result of moral hazard and myopic behavior.[4] As a result indebtedness of the private sector went up. Moreover, capital inflows increased hugely, partly as a result of the interest rate difference between the domestic and foreign interest rates and partly because investors perceived little likelihood of a loss from exchange rate movements. All this lead to the soaring of the real estate and other asset prices. (The data on asset price developments will be discussed in Section 3.)

2.2. The Onset of Depression

The end of the boom came in 1990, when a rapid process towards bust started. Economic activity as measured by the growth rate of real GDP declined extremely rapidly from +5.4 % in 1989 to -6.5 % in 1991. As shown in Figure 2.3, domestic private investment, private consumption and net exports of goods and services all fell sharply. Thereafter, the decline

continued, though at a slower pace through 1992 and most of 1993. The decline in GDP stopped and a turnaround took place in the Fall of 1993.

As Figure 2.3 shows, while all domestic components of aggregate demand contributed to the decline in economic activity, a particularly important feature was the major decline in investment activity. Quite expectedly, price inflation slowed down significantly and came close to a standstill (cf. Figure 2.3). This and the depreciation of the Markka since November 1991 led to a major improvement in the price competitiveness of the Finnish economy (cf. Figure 2.5). Moreover, the current account deficit gradually disappeared and turned into a surplus (cf. Figure 2.6).

The emergence of a major banking crisis was a notable feature of the bust process. The rapidly falling asset prices and bankcruptcies of firms led to credit losses and the government had to provide public support for banks. (Section 3 discusses the details). The banking crisis was an episode of major financial restraint and it, as well as the overheating, allow us to consider empirically the view that the financial factors accentuated both the rise and the fall in the different components of aggregate demand. We test for the effects of interest rates and other financial factors on investment and consumption in section 3.

Both international and domestic factors contributed to the onset of the crisis. These factors can be classified into shocks and economic policy effects as follows:

(i) The Finnish exports to the market economies declined as a result of slow international growth, loss in the price competitiveness of the Finnish industry and the fall in the terms of trade. With the collapse of the Soviet Union, the Finnish exports and imports to Russia dropped in 1991 by 70 percent almost overnight. This fall contributed to the decline in Finnish GDP in the crisis years, but - as we will argue - it was not the main factor in the onset of the depression.

(ii) The German unification raised the interest rates in Europe as a result of loose fiscal and tight monetary policies in Germany.

(iii) Monetary policy turned very restrictive in early 1989 after the revaluation of the Finnish Markka. The defence of the Markka against speculative attacks kept nominal and real interest rates high and made the short rates volatile (see Figure 2.8). Real interest rates rose from the beginning of 1990 to the end of 1992. This fixed exhange rate/hard-currency policy ran into

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[4] Savings Banks were the most aggressive competitors in the banking sector. Vihriälä (1997) has found evidence that moral hazard contributed to the expansive lending behavior of Savings Banks.

problems of credibility, and it was eventually abandoned with the depreciation of the Markka in November 1991 and September 1992. (Figure 2.7 shows the behavior of the exchange rate, together with its bands up to 1992 and the ECU central rate since 1996.) Moreover, public consumption and investment declined in 1991 and 1992 as part of the depression. We discuss economic policies further in section 4.

Figure 2.7: The exchange rate

Figure 2.8: Interest rate differential between Finland and Germany

While it is evident that these three elements contributed to the onset of the Finnish depression as external or domestic impulses with consequent propagation mechanisms, it is not straigthforward to assess their relative significance. In our opinion the external shocks are not the whole story. For example, consider the collapse of Soviet trade. In 1991 it was around 15 percent of total exports, and the export share in GDP was then 23 percent. After allowing for even a large multiplier it is evident that a 70 percent decline in this trade can account for roughly two percentage points of the total nearly seven percent decline in DGP in 1991. Similarly, the Western recession and the rise in German interest rates contributed to the depression, but were not the main story.

The influence of financial factors as a further propagation mechanism in the depression process has been suggested as a key element of the crisis. In our view the financial factors have played a central role amplifying the effects of some shocks, especially those coming from the exchange and interest rates. Several financial market considerations can be identified.

First, the exchange and interest rate shocks from first the defence of the hard-currency and then from the major depreciation of the currency must have influenced both consumption and investment behavior, given the high levels of indebtedness of both firms and households and the fact that significant part of their borrowing was from abroad. Second, the collapse of asset prices led to difficulties in the banking system and the emergence of a banking crisis. This crisis may have in turn led to financial constraints in the financing of firms and households. We examine these issues in a more systematic way in Section 3.

2.3. Recovery

The economy turned around in late 1993, but this recovery was mostly concentrated in the capital-intensive export industries and domestic sector remained remained relatively depressed until 1995-96.

These features are reflected in unemployment which continued to rise well into 1994 reaching the level close to one fifth of the labor force. After that it started to decrease very slowly and it is still at a high level (11 percent in 1999) despite the revival of economic growth. The fall in open unemployment became more rapid only in 1997, as part of the fast and general recovery of the economy.[5]

Thus in the most recent years the Finnish economy has been experiencing a strong and general recovery, where also domestic sectors of the economy and not only export-related activities are growing (see Figure 2.3.). These last developments are beginning to bring open unemployment down somewhat more rapidly. Inflation has remained low and external competitiveness strong (cf. Figures 2.4 and 2.5), so that the current account has continued to be in surplus. The recovery period may be characterized as a policy of 'getting the fundamentals right'. We also remark that Finland joined the EU in the beginning of 1995 and is one of the eleven countries that joined the European Monetary Union at its inception in 1999.

Concluding the overview it may be said that, at the moment, the general picture about the economy is rather favorable. The remaining major macroeconomic problem at present is high unemployment. While one might think that fast growth will, at least partly, take care of this problem, this view may well be too optimistic. We will argue in Section 5 that a significant part of the unemployment appears to be structural, and growth by itself cannot cure structural unemployment. Moreover, the emerging slowdown in the Western economies will make the problem harder to solve.

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[5] The preliminary figures for GDP growth is 5,5 percent for 1997 and 4,7 percent for 1998, while the 1999 forecasts are around 3.5 percent.

3. The Main Diagnosis: A Financial Crisis

We have already stated our view that the role of financial factors was the key element in the Finnish crisis. The roots of the crisis can be traced back to the deregulation period of the financial system in the 1980's. The fact that financial deregulation precedes a crisis has now been documented for many countries, including Chile in early 1980's, Mexico in mid-1990's and, most recently, several Asian countries in the second half of 1990's.[6] In this section we first take a detailed look at the financial developments. After that we argue that Finland, like the countries mentioned above, faced problems in international indebtedness and liquidity. Finally, we analyze the role of financial factors further and provide some econometric evidence of their importance for consumption and investment behavior.

3.1. The Financial Developments

The process of financial deregulation was started in the early 1980's, but the greater part of the deregulation was carried out in the second half of the decade. Figure 3.1.1, adapted from Vihriälä (1997), shows the timing of the deregulation steps during 1980-1991 in both domestic and international dimensions.[7]

Figure 3.1.1: Deregulation of financial markets in Finland

The deregulation process was problematic in several respects. First, its timing in the 2nd half of the 80's unfortunately coincided with the upswing of the business cycles in the Western market economies. Second, rules and practices in prudential regulation and bank supervision were left unchanged. They were tightened later on in 1991, when the depression had already started. Third, the tax system, which had favored debt financing of investments, was not reformed. Fourth, in the deregulation lending rates were liberated earlier than deposit rates, which also helped to make banks' position relatively loose. Finally, when monetary policy under the fixed exchange rate with a narrow band tried to maintain some tightness in the wake of the boom, it in fact increased the interest rate differential between Finland and Germany and thereby gave further impetus to

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[6] See e.g. Sachs, Tornell and Velasco (1995), Corsetti, Pesenti and Roubini (1998), and Radelet and Sachs (1998).

the foreign capital inflow, which was growing in any case as a result of freeing of the capital movements.

The inflow of foreign capital was mediated to large extent by Finnish banks and led to foreign-currency denominated borrowing by firms. The Central Bank held the exchange rate in a narrow band, but there was pressure for Markka to strengthen. This was resisted at first, but in 1988 the band was first widened from ± 2,25 to ± 3 percent and then Markka was revalued by 4 percent in early 1989 (see Figure 2.7).

These factors contributed to an exceptionally rapid growth in bank lending (see Figure 3.1.2). Much of the borrowing was directed at investments in real estate and other assets. For example, the share of deposit banks' credit to business and financial services out of total corporate lending rose from 9.3 percent in 1985 to 22 percent in 1991.

The rapid growth in lending in turn led to a doubling of real asset prices in the boom. Subsequently, the asset prices halved during the depression (see Figure 3.1.3). Bank lending decreased from 400 to less than 300 Billion FIM in 1992-95. It is remarkable that, despite the strong upturn in the economy, it barely increased for the two years 1996-97 after the low point reached in 1995 (cf. Figure 3.1.2). Only since 1998 there has been a significant increase in bank lending.

Comparing these developments to Sweden, we see that the two countries behaved similarly in many respects. Both the rapid growth in bank lending and the huge rise in asset prices also took place in Sweden after the deregulation. There is, however, one notable difference: as documented in Box 1, the current account deficits were much smaller in Sweden than in Finland.

Figure 3.1.2: Bank lending and industrial production

Figure 3.1.3: Real Asset Prices

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7 The last step was the liberalization of foreign ownership of Finnish shares in 1993, which is not in the figure.

A banking crisis emerged as part of the depression. It became visible in 1991 and it deepened in 1992.[8] The banking crisis required major policy interventions by the government and the Parliament. It also led to major restructuring in the Finnish banking system. Box 2 describes the main policy actions and the restructurings that took place.

Box 2: Policy Measures in the Banking Crisis and Restructuring of the Banking Sector in Finland

Policy actions in the banking crisis began in September 1991 when the Bank of Finland took control of Skopbank, the "central bank" of the Savings bank system. In early 1992 the government injected public funds in the form of preferred capital certificates to the banking system and set up a Government Guarantee Fund (GGF). GGF could use various instruments to support the banking system. With the continuation of the crisis first the government and then the Parliament made public declarations that the stability of the Finnish banking system will be guaranteed under all circumstances. In early 1993 the GGF was strengthened and it was given additional capital. Public support to the banking industry continued through 1994. Total fiscal cost of bank support is estimated to be around 7.5 percent of the 1992 GDP.[9] (see Nyberg and Vihriälä (1994) for more details).

Major restructurings of the banking sector occurred during the crisis. First, most of the 250 Savings Banks were grouped into a Savings Bank of Finland,[10] but subsequently this bank was splitted and the pieces were merged to Commercial, Cooperative and the Post-Office Banks. A small commercial bank STS-Bank was also merged into KOP. Then the two big commercial banks (KOP and SYP) also merged, and the structural changes continued with the recent merger of the remaining Finnish commercial bank (Merita Bank) with Nordbanken of Sweden. Another restructuring occured in 1998 between the government-owned Post-Office Bank and Vientiluotto (Export Credit Institution).

A modest improvement in the banking sector took place in 1993, and this tendency continued in 1994 and 1995. The loss making by banks more or less stopped during 1996, and since 1997 the banks have showed significant positive profits (see Figure 3.1.4). The crisis is most clearly shown

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[8] See Honkapohja, Koskela and Paunio (1993, section 4) or Nyberg and Vihriälä (1994) for a more precise description.

[9] For comparison we note that the corresponding figures for Sweden and Norway are 5.2 and 3 percent, respectively, see Edey and Hviding (1995). The figures for total fiscal support continue to be adjusted as the assets acquired by the state are being resold. The relative ranking by these costs illustrating the severity of the crisis in these countries is not likely to change though.

[10] Only a handful of small Saving Banks retained their independence.

by the negative net (accounting) profits and the relatively higher credit and guarantee losses during 1991-1995. They are particularly high during the same period. (This can be contrasted with the income side, where there are fluctuations but they are not visibly abnormal.)

Figure 3.1.4: Indicators of the banking crisis

The banking crisis was the result of several factors: The boom of the real economy, the speculative rise in asset prices and the rapid expansion of credit led to problems in the banking sector when the economy entered a downswing and asset prices started to fall. Very high real interest rates and the dramatic decline in asset prices contributed to liquidity and collateral problems and increased bankruptcies of businesses which in turn led to credit losses of the banks as shown in Figure 3.1.4. The indebtedness problems of the sheltered sector were aggravated by the depreciation of the Markka, since during the boom this sector had accumulated large amounts of foreign currency loans following the deregulation process.[11]

We do not make a detailed comparison of the banking crisis in different countries, but it may be remarked that in Nordic countries, with the exception of Denmark, the banking industries have all experienced similar crises.[12] This is remarkable, since in many respects Denmark experienced similar macroeconomic developments. Edey and Hviding (1995) provide a review of the financial reform processes in OECD countries. They argue that the important difference between Denmark and the other Nordic countries lies in the prudential supervision and disclosure rules and in the stricter capital adequacy standards in Denmark, where these were tightened concurrently with the reform.[13]

3.2. Problems in International Indebtedness and Illiquidity

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[11] The share of foreign-currency loans in total lending was 13-15 percent in mid 1980's and it rose to over 27 percent by 1991. The share is currently about 6 percent.

[12] The table in Box 1 shows that the ratios of credit losses to bank lending were of similar magnitudes in Finland and Sweden.

[13] Drees and Pazarbaşioğlu (1998) provide a detailed comparative discussion of the Nordic banking crises. A recent empirical study of 53 countries during 1980-95 finds that (a poorly designed) financial liberalization increases the probability of a banking crisis, see Demirgüç-Kunt and Detragiache (1998).

Recent analyses of financial crises in different countries have stressed that problems of international illiquidity, real exchange rate appreciation and lending boom are central characteristics of such crises largely resulting from a preceding process of financial deregulation, see e.g. Sachs, Tornell and Velasco (1995) and Velasco and Chang (1998). We demonstrated in Section 2 that Finland was facing real exchange appreciation (measured as relative unit labor costs in Figure 2.5) and a lending boom both at home and from abroad with a consequent worsening of international indebtedness.

A country may put up with a relatively high level of international indebtedness, provided its economic growth is relatively fast and the economy is internally relatively well in balance. Nevertheless, a high debt position means increasing risks, should a country run into other economic difficulties. For Finland these risks were realized with the slowdown of the economy at the start of the 1990's. Table 3.1. shows the external debt to GDP ratio for Finland and Sweden for the period 1982-96. For comparison, the table also shows the figures for Chile, for Mexico for period 1984-95 and for Korea, Malaysia and Thailand for the period 1990-96.

Table 3.1: International Indebtedness

The build-up of debt for Finland is much more pronounced in 1988-91 than for Sweden.[14] This suggests that the external situation for Finland was relatively risky, so that the pressures mounted rapidly once the general outlook became gloomy in 1990-91. International indebtedness for Mexico has been very high in the 1980s and for Chile even higher in mid 1980s. Also Korea, Malaysia and Thailand increased their foreign indebtedness quite rapidly in 1995-96.

International indebtedness of a country includes both long- and short-run external liabilities. In contrast to debt, liquidity is exclusively a short-term issue, and problems of international illiquidity provide indications of a financial crisis. The financial system of a country is internationally illiquid if its potential short-run obligations exceed the amount of foreign currency it can have access to on short notice. When governments are committed to act as lenders of last resort for the banking sector, deposits can be regarded as liabilities (see Velasco and Chang 1998

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[14] The numbers for the post-depreciation years are naturally even higher since debt is measured in terms of the domestic currency.

for more details). For this reason the ratio of M2 money to foreign exchange reserves is a commonly used indicator for international illiquidity. We now look at this indicator for Finland and compare it to other countries that have experienced financial crises.

Table 3.2: International Illiquidity

Table 3.2 shows that this indicator of international illiquidity for Finland not only exceeded one but fluctuated in the second half of 1980's with some build-up of illiquidity at the onset of the crisis in 1990-92. The behavior of the same indicator for Sweden is a bit different, but its behaviour in the second half of 1980's points to potential international illiquidity problems as well. Table 3.2 also provides values of this indicator for some other countries. It is seen that the M2-foreign reserves ratio exceeded one for all countries in the Table 3.2 and increased in the buildup of the crisis.

The conclusion we draw is that Finland appears to have experienced problems of international indebtedness and illiquidity. These contributed to the pressures on the Finnish Markka and led to subsequent depreciations and banking sector problems. The same argument appears to apply not only to Sweden, but also to Chile, Mexico, Korea, Malaysia and Thailand, though to slightly varying extent.

3.3. Financial Factors, Investment and Consumption

In the light of the dramatic developments in the financial system it is natural to consider whether the banking crisis may have led to a credit crunch which, in addition to the effects of high interest rates, may have directly affected investment and consumption in the aggregate economy in 1990-92. The view that financial factors have a direct influence on business fluctuations in the real economy is usually based on capital market imperfections and agency costs in financial intermediation, especially in debt and bank lending. This "credit-channel view" has been subject to extensive research in recent years.[15]

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[15] Recent overviews are given in Cecchetti (1995), Hubbard (1995), and Bernanke, Gertler and Gilchrist (1998).

Empirical evidence and tests of the credit channel of monetary policy have been sought recently. Some studies of the Finnish bank loan markets have also been done with the 1990's data. The evidence about the credit crunch provided by Vihriälä (1997) and Pazarbaşioğlu (1997) is mixed. They see the decline of bank lending to be, at least to an extent, a result of weakness in loan demand. However, the results of Pazarbaşioğlu (1997) suggest that banks' willingness to supply credit deteriorated during the banking crisis as a result of reduction in asset quality, low profitability and tightened capital requirements. Saarenheimo (1995) has provided evidence of the importance of credit crunch for investment in a VAR framework.

Focusing attention exclusively on bank credit may be too narrow a viewpoint. It has been suggested as an alternative that there is in fact a broad credit channel, so that attention should be directed at the supply of funds in general.[16] This channel should manifest itself in the differential responses of external and internal finance as well as of small and large firms. The impact of financial factors on investment has been studied with microeconomic data in a number of countries, and Hubbard (1998) provides a review of the methodology and evidence. For studies focusing on consumption and financial factors, see e.g. Bacchetta and Gerlach (1997), Bayomi (1993), Wilcox (1989), and Zeldes (1989). In this subsection we look at Finnish evidence about the influence of financial variables on firms and investment as well as on consumption-savings behavior.

3.3.1 Cash Flow, User Cost and Investment Responses of Firms[17]

To analyze the investment behavior of firms we utilize a panel data set on 500 largest Finnish firms to see whether evidence of the direct effects of financial factors on investment can be found in Finland for the period of 1986-96. (See appendix A for a description of the data set.) The fact that the data consists of 500 largest firms prevented us from considering the importance of size

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[16] The empirical evidence of financial factors has been developed on microeconomic data from the US, see e.g. Bernanke, Gertler and Gilchrist (1996) and Oliner and Rudebusch (1996). These papers look at several different types of evidence about the broad credit channel of financial factors and monetary policy.

[17] The extensive empirical work in this section has been done by Mr. Jyrki Ali-Yrkkö. For further results see his Licentiate thesis, Ali-Yrkkö (1998).

differences which have been one way of testing the agency cost theory.[18] Nevertheless, it is possible to examine econometrically whether cash flow and other financial factors had an effect on investment by Finnish firms during the depression.

Box 3: Financial Factors and Investment

The basis for research on financial factors and investment is in models of asymmetric information and incentive problems which imply that information costs and internal funds of firms affect the (shadow) price of external finance for investment. A standard empirical framework was used to consider econometric evidence on the role of cash flow and other financial factors for investment behavior of Finnish firms. It is based on an Euler equation for financially constrained firms, see e.g. Bond and Meghir (1994) or the review discussion by Hubbard (1998). The econometric model is postulated as

$$\left(\frac{I}{K}\right)_{i,t} = \beta_1\left(\frac{I}{K}\right)_{i,t-1} + \beta_2\left(\frac{I}{K}\right)_{i,t-1}^2 + \beta_3\left(\frac{\pi}{K}\right)_{i,t-1} + \beta_4\left(\frac{Y}{K}\right)_{i,t-1} + \beta_5\left(\frac{B}{K}\right)_{i,t-1} + \beta_6 uc_{i,t-1}$$
$$+ d_i + \alpha_t + v_{it}$$

Here the investment (I) of each firm i in each year t depends on its lag and lag squared, its profits (π), sales/turnover (Y) and total debt (B). All these variables have been scaled by value of total capital, and the other variables $uc_{i,t-1}$, d_i and α_t consist of the firm-specific user cost of capital, firm specific factors and time-specific factors. In the equation the term $\left(\pi / K\right)$ controls for the role of cash flow, the output term (Y/K) for imperfect competition and the debt term (B/K) for non-separability between investment and borrowing decisions. Apriori one would guess β_3 and β_4 to turn out positive and that β_5 and β_6 negative.

Box 3 describes the main features of the setup. We estimated this standard model of investment and finance constraints from a panel constructed from the previously mentioned financial-reporting data set on Finnish firms. A GMM estimation method was used.

The results reported in Appendix A.1 accord rather well with the theoretical model (see Appendix A.1, Table A.1.4). While these results were suggestive about the influence of financial factors, a proper analysis requires the estimation of different decision rules for financially unconstrained and constrained firms. This is done in Table A.1.5. which reports the estimation results about the differences between financially constrained and unconstrained firms using some alternative criteria to define financial unconstrainedness (as explained in the appendix).

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[18] Bernanke, Gertler and Gilchrist (1996, section 4) examine the differential response of small and large firms in

In the estimations the coefficient on the user cost of capital was found to be negative. The positive coefficient on debt suggests that investments are partly financed by debt. The coefficients on explanatory variables were usually statistically significantly different between unconstrained and constrained firms. The coefficient on profits is much larger for constrained firms in comparison to the estimate for unconstrained firms. This accords with the notion that profits are more important as a source of finance for firms which are financially constrained. The economic significance of this difference is illustrated by computing the long-run elasticities of the investment-capital ratio with respect to the profits variable for unconstrained and constrained firms. They are 0.0648 and 0.2690, respectively, using the classification whereby a firm was defined to be financially unconstrained in year t if it managed to cover interest in debt from its profit during period t or t-1, and the respectively average values over the whole period.

In order to see the relative importance of various financial factors contributing to fluctuations in private investments we calculated the relative contributions of user cost, debt, sales and profit variables. This calculation is presented in Figure 3.3.1 for all firms in the sample (using annual averages of the data). It suggests that a decline in the sales has contributed to the decline in investments for most of the period. Moreover, a rise in the user cost of capital caused the fall in investments over the period 1988-1992 and the other way round in 1993-1996 after Markka had started to float. The cash flow variable was relatively the most important in 1990-91.[19]

Figure 3.3.1.Contributions of financial factors on investment fluctuations

All in all these results accord in general quite well with the view that financial factors matter. The profit (cash flow) and sales variables have a positive significant effect on investment, and the profit variable is larger for financially constrained firms than unconstrained ones. Simple cross-section estimates (details not reported here) showed also that the significance of cash flow appears to have strengthened during the depression years, so that the role of internal finance for investment took on added significance.[20]

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sales, inventories and short-term debt using financial reporting data from the US.

[19] One should notice that figure 3.3.1 describes the relative contributions of user cost, debt, sales and profits. This calculation accounts neither for firm dummies, time dummies, nor lagged values.

[20] The interpretation of the cash flow variable as reflecting finance constraint is not, however, uncontroversial. One can argue that if cash flow is correlated with future profitability, a link between cash flow and investment could

3.3.2. Consumption, Net Wealth and Financial Factors

In section 2 we argued that besides private investment also private consumption contributed both to the boom of the late 1980s and to the decline of economic activity in the early 1990s. In what follows we look empirically at the determinants of the fluctuations in private consumption. In particular, we are interested in evaluating the effects of changes in net wealth and financial factors like interest rates and credit constraints have had on consumption behaviour. Box 4 summarizes the setup.

Box 4: Net Wealth, Financial Factors and Consumption

The starting point is the following consumption function which can be regarded as an approximation to a much richer theoretical structure[21]

$$\Delta \ln C = \alpha_0 + \underset{(+)}{\beta(\ln Y - \ln C_{-1})} + \underset{(+)}{(1-\beta)\lambda\Delta\ln Y} + \underset{(+)}{(1-\lambda)\beta\gamma W_{-1}/Y} + \underset{(?)}{(1-\lambda)\beta\eta r} + other$$

Here C denotes private consumption, Y disposable income, W net wealth, r the real interest rate. The equation has an error correction term, and β reflects the adjustment due either to habit formation or adjustment costs in consumption. A fraction of λ of aggregate disposable income accrues to households that are subject to binding liquidity constraints, while a fraction $(1-\lambda)$ accrues to households that obey the permanent income hypothesis.[22] In the basic version for the first group of households the rate of growth of consumption depends solely on the rate of growth in disposable income, while for the second group the real interest rate and the net wealth/income ratio play a role. As for the first group, private consumption may be affected by credit constraints via other channels as well. To the extent that lenders follow a practice of restricting borrowing so as to keep current payment-to-current income ratios below some ceiling level, *nominal* interest rate i affects the growth rate of aggregate consumption, see e.g. Wilcox (1989). Moreover, other credit market variables like credit growth and/or the wedge between borrowing and lending rate - which has been used in the literature as a measure of the tightness of credit conditions – may affect consumption growth.[23]

   As for the "other variables" category one could argue that for Ricardian-type reasons increasing

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reflect the link between expected profitability and investments according to the usual neoclassical investment theory with perfect capital markets. Also a cross-sectional link between cash flow and investment could be similarly suspect: firms with high cash flow have had successful investment and face incentives to expand production. While this question cannot be fixed here, we would like to point out that in our specification current investments are strongly related to cash flow even after controlling to output fluctuations, leverage and year dummies. Moreover, the significance of cash flow increases with our definition of financial constrainedness.

[21] See e.g. Muellbauer and Murphy (1993) for further details, and Agell and Berg and Edin (1995) for an application to Swedish data.

[22] See e.g. Campbell and Mankiw (1991).

[23] For international empirical evidence that aggregate consumption may be 'excessively sensitive' to credit conditions as well as to income, see Bacchetta and Gerlach (1997).

government deficit tends to increase private saving and thus decrease consumption. Similarly, the rapid rise in unemployment might have a negative effect on consumption to the extent that households perceive an increasing income risk as unemployment increases. Permanent income might increase if a fall in deficits signals a future decreases in tax burden, which would increase consumption. These non-Keynesian effects of fiscal policy have been analyzed in the context of consumption behaviour by Giavazzi and Pagano (1996) who have emphasized that sharp and persistent fiscal actions might have non-standard effects on private consumption. In estimations unemployment and government deficits turned out to be insignificant.[24]

A set of instrumental variable estimation results is reported in appendix A.2 using Finnish annual data over the period 1970-1996.[25] There are several relatively robust observations which can be drawn.

First, the net wealth income ratio as well as the change in disposable income have a positive effect on consumption, while the real rate of interest variables were consistently insignificant. This lies in conformity with the view that real interest rate has effects on consumption via changes in asset values by stimulating it in the boom and depressing it in the recession. The short run net wealth elasticity of the consumption change is about 0.03-0.05.

Second, the nominal interest rates affects consumption significantly negatively.[26]A natural way to interpret this is to say that it reflects liquidity constraints. Also the change in credit growth has a significantly positive effect on consumption. In fact, credit growth appears to be roughly as important a determinant of consumption as disposable income growth. The short-run elasticities with respect to disposable income and credit growth changes are in the neighborhood of 0.30.[27]

Our estimates of private consumption in Finland support the view that both the changes in new wealth and the changes in financial variables like the nominal interest rate and credit growth as

[24] We also included a variable intended to capture the effects of transitory changes in net wealth on consumption. Private consumption in Finland has been rather highly correlated with changes in real housing prices and one could conjecture that windfall gains in the housing market stimulate consumption and depress saving. A house price innovation measure was computed as the forecasting error from an AR(2)-model for real housing prices. This temporary windfall gains variable had a positive, but not very significant effect on private consumption. Therefore, we do not report the results, but these are available upon request.

[25] We have used annual data here and later on in section 5 in the evaluation of structural unemployment. This is mainly because the seasonally unadjusted quarterly aggregate time series data covers relatively short time span.

[26] In estimations the borrowing-lending rate wedge turned out to be positive and sometimes statistically significant depending on the precise specification, but the overall performance of the equations was slightly worse than those with the nominal interest rate. In general the results were qualitatively quite similar.

[27] We also used government deficits and unemployment as alternative explanatory variables. While both affected consumption negatively the coefficient estimates were not statistically very significant. Finally, we tried to evaluate the role of non-Keynesian behaviour. This was done by first constructing the indicator for the fiscal stance (we used the Blanchard fiscal impulse indicator) and then using the idea that if the discretionary fiscal deficit is high and

well as changes in disposable income can explain variations in private consumption behaviour. During the boom asset values, liquidity variables and credit expansion went up and boosted private consumption, while the reverse happened when the recession came in.[28]

Figure 3.3.2: Contributions of explanatory variables for consumption

In order to see the relative importance of various factors contributing to fluctuations in private consumption we calculated the contributions of the explanatory variables. This calculation is presented in Figure 3.3.2. It suggests that changes in new wealth and in nominal interest rates have been the most important factors in the fluctuations of consumption. The change in disposable income was important during the boom years and not surprisingly, nominal interest rates took added significance during the depression years.

4. Policies Before, During and After the Crisis

4.1. Monetary and Exchange Rate Policy

Maintenance of a regime of fixed exchange rates has been the long-term basis for monetary and exchange rate policy in Finland in the post-war period. However, through much of this period the Finnish economy was prone to periodic inflationary pressures which in turn led to corresponding deteriorations of price competitiveness and balance of payments problems. The latter were corrected by major devaluations of the Markka from time to time, for example in 1957, 1967, and 1977. Thus this earlier policy can be characterized as fixed but adjustable exchange rate. The devaluations, which were in the 30 percent range, often contained the seeds of a further inflationary process and led to pressure for another devaluation in the future. However, due to the financial regulations - including Central Bank control of interest rates in bank lending and control

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persistent, it may have a smaller effect on consumption. This hypothesis did not get support from the estimations, however.

[28] Agell and Berg (1996) have argued that Swedish boom of the late 1980s can be explained along other lines than financial deregulation. The idea here has, however, been that liberalization of the financial system comes through the

of international capital movements – expectations of future devaluations did not affect domestic interest rates.

In the aftermath of the oil crises a new regime for monetary and exchange rate policy, starting in early 1980's, was established in an attempt to eliminate the inflation-devaluation cycle. This was executed by means of a fixed exchange rate policy, where the exchange rate was used as an anchor that would keep inflation under control. This policy was relatively succesful for some years, though in the Summer of 1986 there was significant speculation against the Markka. This pressure was succesfully resisted and the exchange rate remained fixed six and half years within a band of 4.5 percent from October 1982 to November 1988 and within a band of 6 percent from November 1988 to March 1989. See Figure 2.7 for the nominal exchange rate and its bands (as well as the ECU central rate since 1996).

The strong Markka regime came under gradually increasing pressure during the financial deregulation in the second half of 1980's. With the liberalization of international capital flows a major inflow of capital to Finland occured and created pressures for the Markka to appreciate. It is notable that this appreciation pressure existed though since 1987 the current account had already been in deficit and price competitiveness had been deteriorating. This was due to the huge capital inflow which exceeded the current account deficit. In addition, exports to Soviet Union were gradually falling which added to the overvaluation of the Markka. In March 1989 the Markka was revalued as response to appreciation pressures thereby weakening the competitiveness problem further.

When the domestic boom ended, the Markka started to become subject to speculative attacks from 1990 onwards. The policy response was to remain in the strong Markka regime. Defence of the fixed exchange rate led to high domestic real interest rates. The fixed exchange rate/hard currency policy was eventually abandoned; first a forced devaluation of approximately 12 percent took place in November 1991 and in September 1992 the Markka was floated.[29]

In the floating regime the Bank of Finland introduced a domestic inflation target. This rule gradually gained credibility. As an indication of increased credibility the interest rate differential between Finland and Germany narrowed significantly (see Figure 2.8). Some of the differential

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associated changes in availability and cost of debt, revised expectations of income growth and increases in net wealth. All this leads to a consumption boom and to a fall in the savings rate.

for long rates remained, and actually widened temporarily in 1994 but was brought under control by the fiscal policy package of the new government which had taken office in Spring 1995. The period of floating ended in October 1996, when Finland joined the ERM (with wide bands), and now Finland is a member of the European Monetary Union.

Figure 4.1.1: Monetary conditions index

Figure 4.1.1 provides an index for monetary policy stance. Looking at monetary and exchange rate policy, it is evident that the strong Markka policy was clearly misguided on two occasions. First, during the financial deregulation period domestic monetary policy could not counteract the boom. Since the exchange rate was fixed, the attempt to tighten monetary policy in 1988 led to a higher interest rate differential between domestic and foreign rates and this further increased the inflow of foreign capital. Moreover, at the end of the boom this policy showed a direct failure in credibility with the revaluation of the Markka in 1989. This revaluation was forced by the strong capital inflows and it came far too late. An early revaluation of the currency in the boom and/or a move to floating (or active exchange rate management) would have limited the capital inflows. However, while we see capital inflows as contributing to the boom-bust process, there is a caveat. Causality tests (available upon request) show that in Finnish data there is a causality from inflows of foreign capital into the appreciation of the Markka, but it is not statistically significant.[30] We think that this is partly due to the target zone system, which prevented free movement of the nominal exchange rate, though Markka had a tendency to appreciate. However, as discussed in Section 3, there is some evidence that Finland was running into a position of international illiquidity (see Table 3.2.).

The second failure of monetary and exchange rate policy occured in the wake of the depression. The fixed exchange rate was maintained in spite of all indicators pointing towards a serious downturn. The very high interest rates from the defence of the currency contributed to the

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[29] See Dornbush et al (1995) for a critical discussion of this episode.

[30] In the literature it is suggested that liberalization of capital movements and the resulting inflows of capital have been a primary source of overheating and slump. See e.g. Edwards (1998) and Bacchetta and van Wincoop (1998) for this argument and evidence in the context of Latin America and emerging market economies. Estimation of equilibrium real exchange rates for Finland lends support to the view that the Finnish real exchange rate was overvalued in late 1980's and became undervalued during the crisis, see Feyzioğlu (1997).

collapse of aggregate demand, which started in early 1990. The late move to floating exchange rates initially worsened the situation, given the high largely unhedged foreign debts that had been accumulated during the boom. However, it subsequently permitted the easing of monetary policy and contributed to the turnaround of the economy.

The short-term nominal interest rate differential between Finland and Germany fell from seven percentage point in late 1992 to close to zero in mid 1993. This contributed to a fall in the long-term nominal interest rate differential as well (see Figure 2.6).[31]

These two failures of exchange rate and monetary policy provide a clear lesson. When the financial deregulation starts, there is a tendency for the external value of the home currency to appreciate due to the huge capital inflow and fiscal policy which does not offset the demand – augmenting effect of the capital inflow. One should float the currency to mitigate overheating coming from financial deregulation and liberalization of capital movements. Exchange rate flexibility can provide some help in curbing the capital inflows. In our view the Finnish boom-bust cycle would have been less extreme with a floating exchange rate regime, though the extent of mitigation can be debated. But we want to emphasize that financial deregulation, jointly with the incomplete policy package, led to the lending boom both in domestic and foreign currency terms. As a result of these developments only bad alternatives remained in the exchange rate policy.

4.2. Fiscal Policy

In discussing fiscal policy during the period 1985-98 it should be recalled as a background that the size of the public sector in Finland, as measured by total public expenditure relative to GDP, has traditionally been below the OECD average. Since 1990 the GDP share of the public sector has increased dramatically. From Figure 2.3 it is seen that public consumption and investment have declined in real terms in 1991-93. However, total expenditure has (even without banking

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[31] Since the Finnish markka started to float in September 1992, the long-term nominal interest rate differential between Finland and Germany has decreased with the exception in the spring of 1995, when the Bank of Finland temporarily tightened monetary policy. According to our estimates this can be explained by the lower Finnish inflation, the smaller short-term interest rate differential, and the decreased volatility of the Finnish financial markets. These factors was counteraffected by the higher Finnish government budget deficits (results available upon request).

support) increased mainly as a result of increased transfers, especially on unemployment compensations.

These developments, together with a fall in tax revenues, have resulted in serious indebtedness problems, see Figures 4.2.1 for the development of the central government debt. The deficits responsible for the buildup of the debt were large relative to GDP, reaching the 10-15 percent range in 1992-93. With falling GDP, the debt-GDP ratio shot up very rapidly, so that Finland shifted from the group of low public-debt countries to the group of medium debt countries in just a few years. These developments also meant that throughout the crisis the rise in central government debt became a major concern in fiscal policies carried out.

Figure 4.2.1: Central government debt /GDP ratio

For the purpose of measuring the stance of fiscal policy we define the fiscal impulse as the discretionary change in the budgetary position of the government excluding financial transactions. If the focus is on the discretionary changes in fiscal policy, the benchmark for any year can be assumed to be the previous year. Blanchard has suggested an attractive way of measuring discretionary fiscal policy.[32] The interpretation of the change in fiscal stance is then the following: fiscal policy is 'loose' ('tight') if the difference is positive (negative). Figure 4.2.2 describes the Blanchard fiscal impulse measures as a share of GDP together with a change in unemployment rate.

Figure 4.2.2: Indicator of fiscal policy and change in unemployment

Looking first at the period of overheating it is seen that by the Blanchard measure fiscal policy was expansionary in 1987 but slightly restrictive for two years 1988-89. Qualitatively, the growth contribution of public consumption and investment tells a similar story with some fiscal tightening in these two years. In the 1991 discretionary fiscal policy was countercyclical, while in

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[32] The idea is to estimate what government outlays and revenues would be in a given year if the unemployment rate had remained the same as in the previous year. The Blanchard fiscal impulse measure is then constructed as the difference between the unemployment-adjusted measure of the primary deficit and the previous year's primary deficit. For a general discussion of measures of fiscal stance see Alesina and Perotti (1995).

1992 it tightened a bit despite the increase in unemployment. Unemployment continued to increase in 1993-94 but discretionary fiscal policy remained tight particularly in 1993. While bank support and automatic stabilizers have acted as expansionary fiscal components, cuts in government expenditures and increases in tax rates particularly during 1993 have had a contractionary effect on the economy. This interpretation is reinforced by the strongly negative growth contribution of public consumption and investment in 1993, as shown in Figure 2.3. This leads to our conclusion that fiscal policy decision making during the depression was not consistently designed as counter-cyclical smoothing policy.

In Spring 1995 a new government was formed and from the start it formulated a programme of fiscal consolidation. This has gradually led to smaller deficits, so that with the current GDP growth the central government indebtedness has started to decline. Over the period 1995-98 the discretionary fiscal policy has sometimes been procyclical, sometimes countercyclical with no consistent patter. The impulses have been small which is natural since fiscal consolidation, and not active stabilization policy, was the primary objective of the government. This programme has been succesful (see Figure 4.2.1), though we expect that government budget situation will probably pose problems again when growth starts to slow down.

As a general conclusion for fiscal policy it is evident that the Finnish picture is not very clear-cut (see Figure 4.2.2). In the boom it was only weakly counter-cyclical, and in the depression its directions seem to have been fluctuating in a somewhat inconsistent manner. The big deficits and the shoot-up of the public sector indebtedness during the crisis were quite remarkable as a result of the huge rise in unemployment and bank support. In such a crisis the policy-makers face the difficult problem of identifying the permanence of the shocks to the economy. In the case of Finland the shock coming from the collapse of trade with former Soviet Union seemed at least semi-permanent, but the other shocks appeared as basically cyclical.

Another lesson for fiscal policy emerges from the most recent times, namely the difficulties in restoring budgetary balances after the crisis. Despite the strong growth since 1994 the central government has run sizeable deficits.[33] This is partly due to the fact that that - as we argue later

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[33] The seriousness of the issue is better seen after noting that the EMU-defined deficit of 2-3 percent of GDP includes a surplus of the pension system which is around 4 percent.

on in section 5 - structural unemployment increased during the crisis years, and this apparently made economic growth less effective in alleviating budget deficits.

4.3. A Brief Comparison to Swedish Policies

It is of interest to briefly compare macroeconomic policies in Finland and Sweden. The policy approaches showed some interesting differences even though the two countries experienced similar crises.

Starting with monetary and exchange rate policy, it is evident that its general features in Sweden have been similar to the Finnish ones in the post-war period. Sweden also experienced periodic inflationary pressures and devaluations in 1950's –70's, and in the 1980's it attempted to resolve this "devaluation cycle". Though the financial deregulation led to somewhat less pronounced overheating and did not create as big external imbalances as in Finland (cf. Section 3.2), the Swedish krona also had to be floated in 1992 after which it depreciated significantly. A floating regime for Sweden has continued to the present, as Sweden decided to stay out of the EMU and also the ERM-2.

As for fiscal policy may be noted that, as shown in Box 1, public deficits as percentage to GDP were bigger in Sweden during the acute crisis in 1991-93. Also during the recovery the Swedish deficits have been somewhat higher than the Finnish ones. Thus, while we have not calculated measures of the stance of discretionary fiscal policy for Sweden, looking at the deficits in the 1990's crisis Swedish fiscal policy would seem to have been more consistently countercyclical than the Finnish one.

5. Unemployment: the Remaining Challenge

Eventhough since the beginning of 1994 economic growth in Finland revived, this led to only a relatively small decrease in unemployment rate (see Figures 2.1 and 2.3). This development is puzzling, and it is important to understand the nature of unemployment in order to develop appropriate remedial policies. Understandably, part of the increase in unemployment during the

depression has been cyclical i.e. it will be cured by the resumption of economic growth. However, to the extent that unemployment results from some structural malfunctions, attempts to reduce unemployment by growth-enhancing fiscal and monetary policies are bound to fail, possibly resulting only in higher inflation and/or increased foreign indebtedness.[34] In this section we study the nature of unemployment in Finland and argue that its structural component increased significantly during the crisis.

To this end we adopt a standard open economy model of the labor market and the current account to evaluate how the equilibrium unemployment has developed in the 1990s. The 'benchmark model' is extended to allow for financial considerations and thereby a bridge is built between the analysis of structural unemployment and the financial crisis.

Our approach to the estimation of equilibrium unemployment is more 'structural' than the most commonly used single-equation Phillips-curve type models.[35] The view that higher unemployment in Finland in the 1990s reflects a rise in equilibrium unemployment does not lie in contradiction with these simple Phillips curves. However, the single-equation Philips curve estimates can be criticized for a number of reasons: They do not account for open economy aspects, they completely abstract from financial considerations which might be important when evaluating the nature of unemployment, and they are 'black-box' in nature. In particular, with simple Phillips curve models it is not possible to trace the changes in equilibrium unemployment to underlying factors. These limitations led us to attempt a structural approach.

5.1. Structural Unemployment and Financial Factors

Our framework utilizes the ideas presented in e.g. Layard, Nickell and Jackman (1991), where both labour and product markets are assumed to be characterized by imperfect competition. If the real wage desired by wage-setters is the same as that desired by price-setters, then inflation will be stable at the intersection of wage- and price-setting schedules. The variable bringing about this consistency is the level of unemployment, which affects the wage mark-up and (indirectly) the

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[34] See e.g. Wyplosz (1994) for a good discussion about the nature of unemployment.

[35] Elmeskov (1994) gives a detailed account of how the Phillips curve approach works and present estimates of the equilibrium unemployment for OECD countries. His data does not, however, cover the 1990s.

price mark-up. In a closed-economy framework inflation will be stable when unemployment is at the appropriate equilibrium level.

Earlier we emphasized the role of financial factors both in the boom and bust of the Finnish business cycle. To evaluate their role in the development of structural unemployment we incorporate them as potential factors affecting wage and price setting.

To deal with equilibrium unemployment in open economies one has to introduce the current account equation, see e.g. Layard, Nickell and Jackman (1991). The latter is particularly important since it gives a second condition for the equilibrium unemployment, in addition to the non-changing inflation (or wage inflation) rate. Next we give a more detailed description of the equations of the adopted framework.[36] Box 5 describes some formal details.

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[36] The price and wage setting equations presented below do not allow for possible hysteresis in unemployment. Econometric experiments (not reported but available on request) did not support this notion for Finland.

Box 5: Elements of equilibrium unemployment

For the wage-setting schedule we adopted the following equation for the (log) of the real wage rate.

$$w - q = \alpha_0 + \alpha_1 \, lp + \alpha_2 \, t + \alpha_3 \, u + \alpha_4 \, \Delta^2 q + \alpha_5 \, b + \alpha_6 \, tp + \alpha_7 \, indebt \quad (1)$$
$$\underset{(+)}{} \quad \underset{(+)}{} \quad \underset{(-)}{} \quad \underset{(-)}{} \quad \underset{(+)}{} \quad \underset{(-)}{} \quad \underset{(-)}{}$$

where w = the nominal wage, q = the price of industrial production, lp = labour productivity, t = the total tax wedge, u = unemployment rate and $\Delta^2 q$ is the change in the inflation rate (the inflation 'surprise')[37], b = benefit-replacement ratio, tp = progression of income taxation and indebt = household indebtedness. The signs below the equation indicate the priori anticipations about the directions of the effects. It is to be expected that an increase in the the labour productivity, the tax wedge and the benefit-replacement ratio lead to higher real product wages, while unemployment and inflation surprises have a dampening effect on them. A rise in tax progression is expected to work like a higher tax on wage increases (see e.g. Lockwood and Manning (1993) and Koskela and Vilmunen (1996)). Finally and importantly, we have introduced a potential financial factor. The higher is the indebtedness of the households (members of the trade unions) the higher is the utility loss associated with becoming unemployed. It can be shown that this leads to wage moderation and tends to decrease structural unemployment.[38]

As for the price-setting schedule the following specification was adopted

$$q - w = \beta_0 + \beta_1 \, (q - w)_{-1} + \beta_2 (y - y_0) + \beta_3 \, s + \beta_4 \, \Delta^2 q + \beta_5 \, lp + \beta_6 \, c + \beta_7 \, r$$
$$\underset{(+)}{} \quad \underset{(?)}{} \quad \underset{(+)}{} \quad \underset{(+)}{} \quad \underset{(-)}{} \quad \underset{(?)}{} \quad \underset{(+)}{}$$
$$+ \beta_8 \, debt \quad (2)$$
$$\underset{(+)}{}$$

where $y - y_0$ = deviation of domestic demand (and output) from a "normal" level, s = the sales tax rate, c = the real exchange rate (competitiveness using consumer prices), r = the real interest rate and debt = the indebtedness ratio of the firms. The signs below the price equation indicate hypotheses that, together with the sluggish price adjustment, sales tax and inflation surprises have a positive effect. The effects of domestic demand and the real exchange rate on the price-wage mark-up are a priori ambiguous, while quite likely positive. Labour productivity tends to dampen the price-wage mark-up. Following Phelps (1994) the price-wage mark-up is assumed to increase with the real rate of interest since higher real interest rates leads to higher emphasis on short-run considerations in pricing.[39] Finally, it can be argued that when firms become more financially constrained, they care less about future and cut their investment in market share so that mark-ups and structural unemployment increase. We use indebtedness as a proxy to financial constraints.[40]

To build up a connection between the deviation of output from a "normal" level and the unemployment rate we also estimated the usual Okun type equation, in which $y - y_0$ was regressed against unemployment and its lagged value:

$$y - y_0 = \gamma_0 + \gamma_1 u + \gamma_2 u_{-1} \text{ where } \sum \gamma_i < 0. \quad (3)$$

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[37] We could not reject the hypothesis that the Δq variable is I(1), which justifies the use of $\Delta^2 q$ as a surprise variable under rational expectations.

[38] In the presence of transactions costs the utility loss associated with becoming unemployed is positively related to the budget share of durables. This higher cost of losing the job induces wage moderation. We use household indebtedness, measured as household debt divided by disposable income, as a measure of budget share of illiquid durables. For a more detailed argument and some cross-country empirical evidence, see Ellingsen and Holden (1997).

[39] This reflects the view that an increase in the real rate of interest decreases the planning horizon of firms and makes them more aggressive in pricing.

[40] For a detailed argument and some empirical evidence see e.g. Chevalier and Scharfstein (1997).

Finally, we developed an equation for the trade account surplus (relative to nominal GDP) as a second condition for the equilibrium unemployment rate. We adopted the following specification:

$$tb = \delta_0 + \delta_1 c_{-1} + \delta_2(y - y_0) + \delta_3(y^* - y_0^*) + \delta_4(x - x_0), \qquad (4)$$
$$ (+) \phantom{c_{-1}} (-) (+) (+)$$

where tb = the trade account surplus (relative to nominal GDP), c = the real exhange rate, $y - y_0$ = deviation of domestic demand (and output) form a "normal" level, $y^* - y_0^*$ = deviation of foreign demand (and output) from a "normal" level, $x - x_0$ = deviation of Finnish exports for former Soviet Union from a "normal" level. According to (4) the trade account surplus/GDP ratio depends positively on competitiveness and foreign and former Soviet Union demand deviations from "normal" levels, negatively on domestic demand deviations from "normal" level. The foreign demand deviation variable turned out to be insignificant perhaps because of the lack of the appropriate proxy, so it was left out from the reported specification.

The system of equations in Box 5 was estimated by using the annual data from Finland over the period 1970-1994. The estimation results are presented in appendix A.3. The general performance of the equations is good, as are generally specification tests and diagnostics[41]. Coefficient estimates are usually significant, and in line with a priori conjectures. *The wage mark-up* depends negatively on unemployment, inflation surprise and the change in household indebtedness. The last finding is in line with the hypothesis that a rise in indebtedness increases the relative cost of becoming unemployed and thus moderates wages and tends to decrease structural unemployment. Labour productivity, tax wedge, the benefit-replacement ratio and the tax progression variable increase the wage-price mark-up and thereby structural unemployment.[42]

As for *the price mark-up* labour productivity dampens the price mark-up. On the other hand, inflation surprise, sales tax, domestic demand deviation from its "normal" level, competitiveness, the real rate of interest and the corporate indebtedness have a positive effect on price-wage mark-up. The positive real interest rate effect on the price-wage mark-up lies in conformity with the hypothesis by Phelps (1994) according to which higher real interest rates make short-run considerations more prevailing in pricing behaviour. Finally and importantly, the statistically significant positive coefficient estimate for the corporate indebtedness variable supports the

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[41] We studied the stability of the estimating equations in several ways. First, we looked at the recursive time paths of the coefficient and +/-2 standard errors, the time paths of the standard errors of the equations and well as several recursive Chow tests. Not surprisingly, there were some, though not very dramatic, signs of instability. A full set of results is available upon request.

[42] We have used the so-called Musgrave-Thin residual progression $tp = (1 - m(y))/(1 - a(y))$ as the measure of progression, where $m(y)$ and $a(y)$ are the marginal and average tax rates from the tax base y, respectively. This is the elasticity of post-tax income to pre-tax income, and it is less than one under a progressive system. A reduction in tp must thus be interpreted as an increase in progressivity.

notion that indebtedness of firms increases structural unemployment by raising the price-wage mark-up.

According to the so-called Okun relation there is a negative relationship between the domestic demand deviation from its "normal" level and unemployment rate (see Appendix A.3). In terms of *trade account surplus* the potential explanatory variables with the exception of the foreign demand variable were of expected sign and highly significant. Not surprisingly, the competitiveness as well as the variable describing export to the former Soviet Union and current Russia has a positive and the domestic demand variable a negative effect on the trade account surplus.

The equilibrium unemployment rate (NU) was derived from this structural model via the following procedure.[43] First, following usual practice we equated the real product wage from the wage and price equations. The Okun relation was then to substituted into this relation and a constant rate of inflation was imposed.[44] Second, the definition of external balance must be formulated. Since the foreign indebtedness of the Finnish economy during the period of interest was quite high we introduced the notion of constant foreign debt to GDP ratio in place of the usual requirement of balance of trade. (In principle one could even contemplate allowance for some GDP smoothing which would result in a time-varying external debt ratio, but such refined notions are difficult to operationalize.) Appendix A.3 describes further details of this concept of external balance. This system can be then be used to compute NU as a function of exogenous variables and their lagged values. Since the lags were not eliminated, the concept of NU refers to short-run equilibrium unemployment.

On the basis of estimated equations we computed the equilibrium unemployment rate at (exogenously) specified time intervals. In the computation the exogenous variables were set at the average value for each interval. In Table 5.1 the first column describes the actual (open) unemployment rate and the second column our estimates of NU.

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[43] We use the term equilibrium unemployment and the short-hand NU rather than NAIRU in view of the open-economy complications. Also the terms equilibrium unemployment and structural unemployment are used interchangeably.

[44] See e.g. the Symposium in the Journal of Economic Perspectives (1997) for discussions of the difficulties in estimating NU.

Table 5.1: Estimates of NU (%)

	Actual U	NU
1975-79	5.0	4.6
1980-85	5.1	5.3
1986-89	4.6	6.8
1990-93	10.5	6.1
1994-96	17.3	11.9

An interesting picture emerges from Table 5.1. It suggests that in the 1980s the labor force in Finland was "over-employed" in the sense that actual unemployment rate was clearly below the equilibrium unemployment rate. The reason for over-employment relative to equilibrium was in part due to current account deficit in that period which made it possible to keep unemployment temporarily below the equilibrium level. In the early 1990s the gap was reversed and actual unemployment has since exceeded its equilibrium rate by a clear margin.

Of much interest is the evolution of the equilibrium rate of unemployment. We experimented with various slightly different empirical specifications, and Appendix C reports the estimated contributions of changes in the exogenous variables for a reported specification. The actual figures and the estimated level of equilibrium unemployment are somewhat sensitive to the specification, in particular to the treatment of dummies in the equations. However, alternative specifications suggest robustly that taxes and financial factors have raised the equilibrium unemployment during the depression years. The exchange rate also acts in the same direction. This effect stems from the influence of the depreciation on the price mark-up, which is not fully offset by its effect on the trade balance.

6. What Can Be Learned from the Finnish Experience?

It has often been argued that a financial crisis, as experienced by Finland and several other countries, leads to significant financial restraint in which both bank lending and other sources of finance are curtailed and this feeds into the real economy by weakening aggregate demand. Our

econometric work with Finnish data supports this notion. Our microeconometric study on investment behavior with panel data suggests that financial factors like the profit (cash flow) are significant in firms' investment behavior and their significance tends to have strengthened with the depression years, so that the role of internal finance took added significance. In addition, the high interest rates in Finland from 1989 to the Spring of 1993 also had a clear impact on investment demand through the conventional cost-of-capital channel.

The household consumption-saving behavior was also affected by the deregulation process. In the boom the saving rate went down to almost zero, and in the depression it reached very high levels by conventional standards in Finland. The huge variations in asset prices due to changes in real interest rates in the boom-to-bust cycle were reflected in the net wealth of households, which has a strong influence on consumption according to our estimations with Finnish annual time series data. In addition to wealth effects, our study points to the influence of liquidity variables in consumption behavior, so that direct financial restraints have had a role in the fall of aggregate consumption.

Financial factors are not only important on the demand side as has been commonly argued. It has also been pointed out that the real interest rate might matter on the supply side by affecting the demand for labour and/or the pricing behaviour by firms. Our analysis provides some, though not very strong, support for this view. But more importantly, we have identified a new channel for financial factors on the supply side, namely the effects of indebtedness on wage and price setting. Higher indebtedness leads to wage moderation since the loss of becoming unemployed increases, while firms tends to increases their mark-ups. The former effect tends to lessen, while the latter effect to raise structural unemployment. We argued in Section 5 that this channel has been important in Finland in raising the level of 'structural unemployment' in the 1990's. As a result of the rise in structural unemployment the recovery of the Finnish economy has alleviated unemployment surprisingly slowly and thereby government budget has been in deficit all the time until now.

Our analysis and interpretation of the reasons behind the Finnish depression of the 1990's can be aptly described by the summary "bad luck and bad policies".

We begin with the external shocks, exogenous to the economy and in this sense unavoidable. The collapse of trade with former Soviet Union in March-April 1991 is the most obvious shock,

but two other important international developments can also be identified. First, in the second half of 1980's the Western economies experienced a strong business-cycle upswing, which showed up as a considerable increase in the terms of trade. Second, the recession in the Western market economies in the beginning of 1990's and the high interest rates due to the policy mix between monetary and fiscal policy associated with German unification were additional negative external shocks.

Clearly, the external shocks played a significant role in the Finnish boom-to-bust process - this is the "bad luck" part of the short summary. However, in our view they are far from being the whole story, though our analysis has not systematically attempted to quantify the relative significance of the shocks. If there had been no additional factors, Finland would have experienced a recession but not a depression.

We have argued that Finland (and to some extent Sweden) experienced a classical financial crisis, which was similar to crises in a number of countries so different from Finland and Sweden as Mexico, Chile, Korea, Malaysia and Thailand. Problems originated from a badly designed deregulation of the financial system. Lifting domestic interest rate controls, allowing the private sector to borrow freely from abroad and sticking to the fixed exchange rate lead to a lending boom at home and from abroad in foreign currency terms.[45] In the case of Finland this lending boom was made worse by an unreformed tax system favouring debt finance and unchanged bank regulation. For all these reasons the private sector became financially very vulnerable to changes in interest rates as well as in the exchange rate.

A situation of financial vulnerability has the implication that when the turnaround happens and/or currency starts to become subject to speculative attacks, only bad alternatives are available to policy-makers. Defence of the value of the currency leads to tightening of monetary policy which, via increases in domestic interest rates, hurts the domestically highly indebted private sector. In contrast, devaluation of the currency as an instrument to alleviate weakened competetiveness of the export sector, is effectively a capital levy to that part of the private sector which had borrowed in foreign currency terms. Both of these policy choices at the downturn are

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[45] The reports by the three foreign experts of the Bank of Finland also emphasize this a great deal and point out that there was no clear overall strategy for financial deregulation, see Bordes et al (1993).

grim for a country entering the crisis, and Finland was no exception to this in the beginning of 1990's.

Failure to reform regulatory schemes of the financial markets and the decision to leave tax system unchanged in the process of financial deregulation were clear policy mistakes in Finland. Evidently, one lesson is that financial market deregulation should not be carried out is isolation, but it must be tackled with the reform of the tax system and tightened bank supervision. These measures would mitigate the domestic and foreign lending boom which stem from deregulation.

Next we discuss macroeconomic policies, which in Finland contributed to fluctuations in the financial system and thereby affected both cyclical and structural unemployment, i.e. consumption, investment, and wage and price setting.

Looking first at monetary and exchange rate policy, we argued in Section 4.1 that the strong Markka policy was miguided at least twice. The failures of exchange rate and monetary policy suggest another lesson. When the financial deregulation starts, there is a tendency for the external value of the home currency to appreciate due to the huge capital inflow and to the fact that usually – as e.g. in Finland - fiscal policy does not offset the demand-augmenting effect of the capital inflow. To mitigate overheating coming from financial deregulation and liberalization of capital movements one should let the currency float (and most likely appreciate at least initially). When the turnaround starts to happen the financial system would then be less fragile and thereby the authorities would have better alternatives to deal with evolving problems.

An early floating of the currency appears to be an appropriate complement to policies for financial deregulation. If the currency is not floated as part of the deregulation phase, then the exchange rate cum monetary policy alternatives seem all bad. The monetary policy becomes ineffective; in fact an attempt to fight boom leads to higher capital inflow thus making the financial system even more fragile if and when investors think wishfully that the likelihood of exchange rate movements is very small. Moreover, currency depreciation via floating seems necessary after the boom is over and the competitiveness has deteriorated. After the floating credibility of monetary policy can be improved by setting a clear domestic target, such as an inflation target. If it is not set very tightly, monetary policy should contribute to the recovery as inflation will normally not be a problem in depression.

As for fiscal policy we argued in section 4.2. that the Finnish picture is not clear-cut. While the discretionary part of fiscal policy was weakly countercyclical during the boom it become very tight in 1993. More generally, it is difficult to find a clear pattern in its discretionary component. As was pointed out, Sweden appears to have been more systematic in this respect.

For fiscal policy the general lessons from the Finnish experience are in principle straightforward. First, restrictiveness should complement any financial liberalization phase to mitigate the boom. Second, if a crisis and depression nevertheless emerges, big deficits and a rapid shoot-up of the public sector indebtedness are to some extent inevitable.This development makes it imperative to pursue a program of fiscal consolidation at some stage of a major crisis. This increases credibility and thereby lowers domestic interest rates and paves the way for recovery. Its timing is the major difficulty. The timing of policies hinges on the nature of the impulse shocks. If they are basically cyclical in nature, a policy of fiscal smoothing appears natural. Then the economy must live with fairly sizeable public deficits and some build/up of public debt. However, if shocks are deemed permanent or semi-permanent, the fiscal adjustment should not be delayed too long.

Finally, the Finnish experience with rising unemployment poses a major challenge for policy during the recovery phase. Our analysis suggests that a financial crisis and the depression can significantly increase the level of structural unemployment via tax increases, high indebtedness of firms and the exchange rate depreciation. If our view is at all correct, then measures to alleviate structural unemployment are an important part of the economic policies during the recovery from a major financial crisis and macroeconomic depression.

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Appendix A: Econometric Details

Appendix A.1: Investment Study

Data Description in Investment Study

The data base has provided by Etlatieto Ltd and Talouselämä-magazine. Aalto (1993, in Finnish) reports the details of the data set. It contains the complete annual reports and balance sheets of the 500 largest Finnish firms each year in the period 1986-96. For our study the data base was first trimmed by excluding observations in which some crucial variables was missing. Some clear errors were also corrected. Finally, only those firms which were in the data base for at least five years were included. This left 205 firms in the panel.

Variables:

1) Investment was obtained from the balance sheet; deflated to 1985 prices using producer price index.
2) Production: measured by turnover, deflated as above.
3) Profit: computed as net proceeds; deflated as above.
4) Capital stock: measured by working capital of the balance sheet; deflated to year 1985 using producer price index for investment goods.
5) User cost: measured by the formula

$$uc = \frac{p_i(r - \frac{dp_i^e}{dt} + \delta)(1 - \tau\frac{\alpha}{r+\alpha})}{p_0(1 - \tau)}, \text{ where}$$

p_i is price index of investment goods,

r is average nominal rate of interest on firm's debts,

$\frac{dp_i^e}{dt}$ is the expected price change of investment goods, measured as a five-year moving average from preceding price changes,

δ is the rate of depreciation of capital. It is measured by computing it as an industry average of reported depreciations and averaged over the sample period.

τ is the corporate tax rate,

α is the maximal depreciation rate permitted in corporate taxation; nowadays 30 %,

p_0 is the product price of the firm; obtained from national account for each industry.

For distinguishing financially constrained firms in the data we initially experimented with three different definitions. A firm was defined to be financially unconstrained in year t if either

(i) it has paid dividends in years t-1 and t but did not make a share issue in period t, or

(ii) if it paid dividends in period t but did not issue new shares in t, or

(iii) if it managed to cover interest in debt from its profit during period t or t-1.

In other words, in (iii) a firm was viewed as constrained if it did not manage to cover its interest expences from profits in both years t-1 and t. Here the concept of profit was the average between net proceeds and accounting profit. With this concept the firm can cover half of the capital depreciation and use the rest in covering financial costs.

The precentage of financially constrained firms in each year according to above three criteria is shown in the table A.1.1 below.

Table A.1.1: Classification of companies by financial statement

Year	Number of companies	Financially constrained firms, % (Classification 1)	Financially constrained firms, % (Classification 2)	Financially constrained firms, % (Classification 3)
1986	125	68	55.2	28.8
1987	155	73.5	60.7	19.4
1988	172	78.5	67.4	24.4
1989	185	71.4	57.8	35.7
1990	193	65.8	51.3	58.5
1991	205	63.9	54.2	61.5
1992	185	67	52.4	54.6
1993	177	69.5	58.2	37.3
1994	160	61.9	57.5	17.5
1995	144	61.1	56.3	14.6
1996	132	53.8	54.9	12.8
Total	1834	67 %	57 %	35 %

Of these classification (iii) seems most natural, and in the above table the percentage of financially constrained firms behaves in the way as expected *apriori*. The other criteria seem somewhat less plausible, and for them the behavior of the percentages behave counterintuitively in the table. For brevity, the subsequent analysis was based on the criterion (iii). We note that the empirical results were qualitatively similar to what we report below when either (i) or (ii) was used.

The average data values of the variables used in the econometric analysis are shown in the next table. The values are given separately for financially unconstrained and constrained firms using the different criteria (i)-(iii).

Table A.1.2: Descriptive data, averages

	Non-constrained	Constrained
Investment/fixed capital	0.27	0.23
Net sales/fixed capital	4.76	5.07
Operating margin/fixed capital	0.46	0.16
Long-term liabilities/fixed capital	1.30	3.31
User cost	0.27	0.29

Some Estimation Results

We first estimated the basic investment model of Section 3. The results are presented in the next two tables. Table A.1.3 reports the basic model. In Table A.1.4 dividends and share issues were included as additional variables to get first indications of the possible explanatory power of firms' financial policy.

Table A.1.3: Basic model, GMM estimation

Wald test of joint significance: 7969.230187   df = 6
Wald test - jt sig of time dums: 979.867767   df = 9
            Sargan test: 146.585731   df = 119

Variable	Coefficient	Std. Error	T-Stat	P-Value
Constant	0.050394	0.009127	5.521700	0.000000
Investment(-1)	0.349706	0.014911	23.452802	0.000000
Investment(-1)^2	-0.190891	0.010131	-18.842523	0.000000
Sales(-1)	0.013055	0.000758	17.224189	0.000000
Profit(-1)	0.071419	0.004847	14.733737	0.000000
Debt (-1)	0.000261	0.000120	2.167892	0.030167
User cost (-1)	-0.126641	0.034120	-3.711644	0.000206
D89	-0.077577	0.014863	-5.219421	0.000000
D90	-0.079151	0.010312	-7.675357	0.000000
D91	-0.164150	0.011095	-14.794879	0.000000
D92	-0.012009	0.010240	-1.172757	0.240893
D93	-0.096775	0.009973	-9.703655	0.000000
D94	-0.046520	0.009929	-4.685217	0.000003
D95	-0.038651	0.009686	-3.990473	0.000066
D96	-0.050698	0.009225	-5.495870	0.000000

Robust test for first-order serial correlation: -6.559 [205]
Robust test for second-order serial correlation: 0.715 [205]

Table A.1.4: GMM-estimation for the financial factors

Wald test of joint significance: 743.050886   df = 10
  Wald test - jt sig of time dums: 356.012049   df = 9

Wald test selected by user: 56.684554   df = 4
Testing: Dividends(0) Dividends (-1) Issue of shares(0) Issue of shares(-1)

Sargan test: 96.219392   df = 88

Variable	Coef	Std. Error	T-Stat	P-Value
Constant	0.053392	0.012048	4.431773	0.000009
Investment(-1)	0.318877	0.039083	8.158892	0.000000
Investment(-1)^2	-0.155282	0.035193	-4.412355	0.000010
Sales(-1)	0.014607	0.002437	5.992948	0.000000
Profit(-1)	0.056194	0.015157	3.707437	0.000209
Debt (-1)	0.000244	0.001313	0.185617	0.852745
User cost (-1)	-0.154224	0.067234	-2.293851	0.021799
Dividends (0)	0.033130	0.051308	0.645715	0.518464
Dividends(-1)	0.072509	0.049023	1.479071	0.139121
Issue of shares (0)	0.229824	0.032912	6.982976	0.000000
Issue of shares(-1)	-0.016803	0.019242	-0.873248	0.382528

D89	-0.074758	0.019510	-3.831825	0.000127
D90	-0.079764	0.017329	-4.602968	0.000004
D91	-0.155906	0.015195	-10.260180	0.000000
D92	-0.021195	0.014640	-1.447748	0.147688
D93	-0.092172	0.013271	-6.945276	0.000000
D94	-0.053930	0.013301	-4.054689	0.000050
D95	-0.043003	0.013489	-3.187925	0.001433
D96	-0.046622	0.013131	-3.550613	0.000384

Robust test for first-order serial correlation: -6.732 [205]
Robust test for second-order serial correlation: 0.465 [205]

The results Table A.1.3 accord rather well with the postulated model. The coefficients on investment and its square are positive and negative, respectively. The estimated coefficient on turnover is positive statistically highly significant suggesting the presence of imperfect competition in the product market. The coefficient of the user cost is negative. The positive coefficient on profits could reflect financial constraints but other explanations can also be conceived of. The coefficient on the debt term is positive and significant in the basic model, but its significance is much lower than those of the other variables. Morever, it becomes statistically insignificant in the second column, where dividend and share issue variables are added. The time dummies are usually significant with the exception of year 1992. In Table A.1.4 dividend and share issues and their lags were included. The contemporaneous share issue variable was statistically highly significant, but the other variables were not so.

We next provide estimation results for the case of different decision rules between unconstrained and constrained firms. The first seven rows report the parameter estimates for financially unconstrained firms, while the next six rows report the differences between the coefficients for constrained firms from the corresponding estimates for unconstrained firms (in the first seven rows). These variables are distinguished by letter D. The test statistics report the significance for testing differences of behavior between unconstrained and constrained firms.

Table A.1.5: Differences between financially unconstrained and constrained firms, GMM-estimation, sub-samples

Classification 3

Variable	Coefficient (Std. Error)
Constant	0.053436*** (0.004578)
Investment(-1)	0.348422*** (0.015540)
Investment(-1)^2	-0.168813*** (0.013016)
Sales(-1)	0.013719*** (0.000440)
Profit(-1)	0.063400*** (0.004470)
Debt (-1)	0.002447*** (0.000298)
User cost (-1)	-0.136505*** (0.017764)
Dinvestment(-1)	-0.038263** (0.016274)
Dinvestment(-1)^2	-0.015617 (0.014716)
Dsales(-1)	0.000801*

	(0.000464)
Dprofit(-1)	0.053567***
	(0.006847)
Ddebt (-1)	-0.001735 ***
	(0.000336)
Duser cost (-1)	-0.031455**
	(0.013808)
D89	-0.069744***
	(0.006846)
D90	-0.088067***
	(0.005733)
D91	-0.161443***
	(0.004719)
D92	-0.007112
	(0.005596)
D93	-0.100614***
	(0.004024)
D94	-0.057421***
	(0.004306)
D95	-0.046309***
	(0.004760)
D96	-0.053998***
	(0.004702)
first-order serial correlation	-6.491 [205]
second-order serial correlation	0.673 [205]
Wald test of joint significance:	15163.7 df = 12
Wald test - joint sig. of time dums	11041 df = 9
Sargan test	181.09 df = 172

The stars ***,** and * refer to 1 %, 5 % and 10 % significance levels, respectively.

Sargan test is a test for the validity of instruments. It is χ^2 distributed.

Table A.1.5 reveals several interesting things. First, the coefficients on lagged investment, profits, sales and debt are positive and coefficients on lagged investment squared and user cost of capital are negative for unconstrained firms. The positive coefficient on debt suggests that investments are partly financed by debt.[46] Second, the coefficients on explanatory variables are usually statistically significantly different between unconstrained and constrained firms. The coefficient on profits is much larger for constrained firms in comparison to the estimate for unconstrained firms, which accords with the notion that profits are more important as a source of finance for firms which are financially constrained.

[46] A small positive coefficient also for financially constrained firms is not fully consistent with the notion that a constrained firm cannot obtain much external funding. The value of the coefficient is quite small, however, and is in fact negative for classification 2.

Appendix A.2: IV Estimates of the Consumption Function: Annual Data 1970-1996.

List of variables

All variables except the rate of unemployment and the interest rate are in logarithms. Variables taking also negative values have been rescaled prior to taking logarithms.

LC	private consumption
LYD	disposable income
ECM	LYD – LC_1
RLBN	average rate of interest on new loans from depository institutions
WEALTH	household assets in relation to households' disposable income
DLYD	change in disposable income
DRHDEBT	change in real aggregate household debt
RDIFF	difference between banks' borrowing and lending rates
D77	impulse dummy for year 1977

The models were estimated by using the IV method.

Table A.2.1: The dependent variable is the difference of LC

Variable	Coefficient	Std.Error	t-value	t-prob
RLBN	-0.012174	0.0017824	-6.830	0.0000
DLYD	0.30912	0.066490	4.649	0.0002
DRHDEBT	0.34606	0.040034	8.644	0.0000
LC_1	-0.0091350	0.0046483	-1.965	0.0634
WEALTH	0.046270	0.013254	3.491	0.0023
D77	-0.053709	0.012163	-4.416	0.0003

Additional Instruments used:
RLBN_1 RDIFF_1

RSS = 0.002485013014 for 6 variabless and 26 observations
2 endogenous and 5 exogenous variables with 7 instruments

Specification $\chi^2(1) = 0.67134\ [0.4126]$

Goodness of fit: $\chi^2(6) = 143.64\ [0.0000]$ **
AR 1- 2 F(2, 18) = 1.4858 [0.2528]
ARCH 1 F(1, 18) = 0.092547 [0.7645]

Normality $\chi^2(2) = 2.7734\ [0.2499]$

Table A.2.2: The dependent variable is the difference of LC

Variable	Coefficient	Std.Error	t-value	t-prob
RLBN	-0.013747	0.0026607	-5.167	0.0000
DLYD	0.34034	0.089606	3.798	0.0011
DRHDEBT	0.28995	0.055101	5.262	0.0000
ECM	0.015217	0.0093455	1.628	0.1184

| WEALTH | 0.026455 | 0.0054235 | 4.878 | 0.0001 |

Additional Instruments used:
 RDIFF_1 RLBN_1

RSS = 0.005782696639 for 5 variabless and 26 observations
 2 endogenous and 4 exogenous variables with 6 instruments

Specification χ^2 (1) = 0.81562 [0.3665]

Goodness of fit: χ^2 (5) = 58.393 [0.0000] **
AR 1- 2 F(2, 19) = 0.42033 [0.6628]
ARCH 1 F(1, 19) = 0.064287 [0.8026]

Normality χ^2 (2)= 5.0941 [0.0783]

The data set consists of annual observations covering the period 1971-1996. The regressor RLBN (average rate of interest on new loans from depository institutions) was suspected to be endogenous, and its first lag (RLBN_1) and the lagged difference between banks' borrowing and lending rates (RDIFF_1) were used as additional instruments. Following Staiger and Stock's (1997) suggestion the F statistics of the first stage regression (testing the hypothesis that the instruments do not enter the first stage regression) were computed to examine the weakness of the instruments. Their values were 519.53 and 350.63 for the two models, respectively, lending strong support for the validity of the instruments.

Diagnostic tests: AR 1-2 is the LM-test for first and second-order autocorrelation, ARCH 1 is the LM test for first-order conditional heteroscedasticity, the residuals are tested for normality using the Jarque-Bera test, and the specification test is an LM test for the validity of the instruments. The figures in square brackets are significance levels.

Appendix A.3: Equilibrium Unemployment: Estimations and Computations

The details of the estimation of the model in Section 5.2. were done as follows.

List of variables

All variables except the rate of unemployment and interest rates are in logarithms. Variables taking also negative values have been rescaled prior to taking logarithms.

w	nominal wage index (industrial workers), 1985=100
q	price index for industrial production, 1985=100
u	rate of unemployment
lp	labour productivity
b	benefit-replacement ratio
c	competitiveness (computed using consumer prices)
lvv	sales tax rate
RRB	real interest rate on government bonds
tb	trade balance
iv/kv	share of exports to Eastern Europe of total exports
t	tax wedge = average income tax rate + employers' social security contributions/total wages
Dhdebt	change in household debt divided by income
idebt	debt divided by the value of production of the industrial firms
MTprog	measure of progressivity of taxation
i1975&89	impulse dummy for years 1975 and 1989

i1992-94   impulse dummy for years 1992-1994
yhp10   domestic industrial production minus its trend component computed
using Hodrick-Prescott filter with smoothing parameter $\lambda=10$

The models were estimated using two-stage least squares, The data set consists of annual observations covering the period 1970-1994.1

Table A.3.1: Price setting equation

The dependent variable is q-w.

Variable	Coefficient	Std.Error	t-value	t-prob
Constant	0.27000	0.33995	0.794	0.4395
yhp10	0.57060	0.21418	2.664	0.0177
q-w_1	0.54008	0.094641	5.707	0.0000
D2q	0.42495	0.088917	4.779	0.0002
lp	-0.39471	0.088194	-4.476	0.0004
RRB_1	0.38042	0.31495	1.208	0.2458
lvv	1.8860	1.0027	1.881	0.0795
c	0.13409	0.066393	2.020	0.0617
idebt_1	0.11130	0.038966	2.856	0.0120

RSS = 0.004188781823 for 9 variables and 24 observations

Specification $\chi^2(5) = 10.044\ [0.0740]$

Goodness of fit: $\chi^2(8) = 3730\ [0.0000]$ **
AR 1 - 2 F(2, 13) = 0.38774 [0.6862]
ARCH 1 F(1, 13) = 1.0147 [0.3322]

Normality $\chi^2(2) = 1.5295\ [0.4654]$

Table A.3.2: Wage setting equation

The dependent variable is w-q.

Variable	Coefficient	Std.Error	t-value	t-prob
Constant	-2.1366	0.34470	-6.198	0.0000
D2q	-0.41871	0.059282	-7.063	0.0000
lp	0.40838	0.036890	11.070	0.0000
b	0.15042	0.031897	4.716	0.0002
Dhdebt	-0.22975	0.10198	-2.253	0.0387
u_1	-0.80303	0.18473	-4.347	0.0005
Mtprog	0.71537	0.32716	2.187	0.0440
t	.20580	0.083241	2.472	0.0250

RSS = 0.006492324659 for 8 variables and 24 observations

AR 1- 2 F(2, 14) = 0.16322 [0.8510]
ARCH 1 F(1, 14) = 0.15353 [0.7011]

Normality $\chi^2(2) = 2.4277\ [0.2970]$
RESET F(1, 15) = 4.637 [0.0480] *

Table A.3.3: Trade balance equation

The dependent variable is tb.

Variable	Coefficient	Std.Error	t-value	t-prob
Constant	-56.563	6.2526	-9.046	0.0000
yhp10	-1.0871	3.0908	-0.352	0.7289
c	11.220	1.3076	8.581	0.0000
iv/kv	7.8198	1.8320	4.268	0.0004
i1975	-0.97068	0.35052	-2.769	0.0122

RSS = 3.645983735 for 5 variabless and 24 observations

Specification $\chi^2(8)$ = 13.959 [0.0828]

Goodness of fit: $\chi^2(4)$ = 112.33 [0.0000] **
AR 1 - 2 F(2, 17) = 1.1077 [0.3530]
ARCH 1 F(1, 17) = 0.13117 [0.7217]

Normality $\chi^2(2)$= 0.52247 [0.7701]

Table A.3.4: Okun relationship

The dependent variable is yhp10.

Variable	Coefficient	Std.Error	t-value	t-prob
Constant	0.028668	0.012050	2.379	0.0274
u	-2.7184	0.40953	-6.638	0.0000
u_1	2.2674	0.32428	6.992	0.0000
i1992-94	0.11850	0.034126	3.472	0.0024

RSS = 0.008021031357 for 4 variabless and 24 observations

Specification $\chi^2(10)$ = 20.702 [0.0233] *

Goodness of fit: $\chi^2(3)$ = 52.86 [0.0000] **
AR 1- 2 F(2, 18) = 0.29861 [0.7455]
ARCH 1 F(1, 18) = 0.68264 [0.4195]

Normality $\chi^2(2)$= 2.87 [0.2381]

Diagnostic tests: AR 1-2 is the LM-test for first and second-order autocorrelation, ARCH 1 is the LM test for first-order conditional heteroscedasticity, the residuals are tested for normality using the Jarque-Bera test, the RESET test is used to test for functional form misspecification, and the Specification test is an LM test for the validity of the instruments. Goodness of fit is an F-test for the significance of the variables. The figures in square brackets are significance levels. For price setting equation RESET is not computed, due to low degrees of freedom. For wage setting equation specification test and goodness of fit have not been reported, since IV and OLS estimates are the same.

Computation of NU

In the computation of the NU for open economy it is important to take into account the requirement of external balance. A conventional view on this is to impose trade balance, see Layard, Nickell and Jackman (1991). While this requirement is natural for a country without significant foreign debts, it seems inappropriate for Finland in this period as the country had severe foreign indebtedness problems. An alternative definition is the requirement that the foreign debt GDP ratio remains constant.

To implement this formally we note that in the standard models of open-economy NU nominal trade balance is usually measured relative to nominal GDP. To derive the alternative criterion we note that the current account equals the change in foreign indebtedness we get $\Delta(eF) = tb + r^*(eF)$, where eF, tb and r^* are foreign debt, trade balance and interest rate on foreign debt, respectively. The requirement that the debt-GDP ratio $f = \dfrac{eF}{PY}$ remains constant can be written in the form

$$\frac{tb + r^*(eF)}{PY} = f\frac{\Delta(PY)}{PY},$$

where PY denotes the nominal GDP. From this it is seen that this concept requires a surplus in the current account if a country has significant foreign debt (assuming positive growth in nominal GDP). In the computation of the NU this requirement is used as a constraint once the trade balance equation has been estimated.

In computing the changes in NU we simply took average values of the results from the model. This means that the concept of NU is a short-run equilibrium, since the effects of the lags have not been eliminated. The next table shows the contributions of changes in the different exogenous variables to changes in NU computed as averages for specified intervals. Only the economically most important contributions are shown. The component "other" includes lags and dummies from the trade balance and Okun relationship equations.

Table A.3.5: Contributions to changes in equilibrium rate of unemployment

	80-85	86-89	90-93	94-96
taxes	2.35	1.43	4.52	0.86
debt factors	0.58	0.09	2.49	-1.08
exchange rate	-0.20	-0.55	0.57	1.19
other	-2.02	0.51	-8.24	4.87

Notes: The category "other" includes the effects of all other variables. In the calculation dummies have been zeroed out. Including them would raise equilibrium unemployment by 1.5-2.5 percentage points for 90-93 and 94-96.

Box 1: Macroeconomic indicators for Finland and Sweden
(annual average growth unless indicated otherwise)

	Finland			Sweden		
	1985-90	1991-93	1994-97	1985-90	1991-93	1994-97
Real GDP	3,4	-11,4	4,8	2,2	-1,6	2,6
PCP (private consumption deflator)	4,7	4,7	1,2	6,8	6,1	2,3
Private consumption	3,6	-3,8	3,4	2,5	-1,2	1,5
Private Fixed Investment	5,0	-20,7	9,0	6,1	-14,7	4,6
Exports	1,9	6,7	9,6	2,8	2,6	11,4
Imports	6,3	-3,3	8,6	5,4	-2,1	9,7
Stock market	17,2	4,1	29,1	17,1	2,8	26,6
Total lending	17,7	-4,8	-0,5	20,5	0,0	1,5
Commercial property prices	11,9	-13,2	6,3	18,2	-26,5	
Fixed investment / GDP, %	25,9	19,8	17,0	19,3	17,2	15,5
Unemployment, %	4,4	11,1	14,8	2,1	5,5	7,9
Total employment	0,6	-6,1	1,2	0,9	-4,0	-0,3
Total employment / population (15-64 years),%	73,2	65,5	61,9	80,1	75,5	69,9
Current account / GDP, %	-2,9	-3,8	3,7	-0,9	-2,6	1,9
Household saving/disposable income, %	1,3	5,8	1,9	-1,6	6,4	4,9
Money Stock	12,4	1,8	2,4	6,8	3,7	4,0
Bussiness bankruptcies, no	2709	6792	4527	6698	19109	
Credit losses, % of bank lending	0,3	4,1	2,5	0,4	4,3	
Public saving/ GDP , %	3,8	-5,0	-4,1	2,0	-7,1	-5,3
Unit Labour Cost	6,2	1,6	-0,3	7,8	2,3	1,5
Hourly Earnings in Manufacturing	8,0	3,3	4,4	8,1	4,4	5,1
Capital Income Share in the Business Sector	28,6	26,5	33,7	30,6	31,0	34,6

Figure 2.1: GDP in Finland, Sweden and EU-countries

Index, 1985 =100.
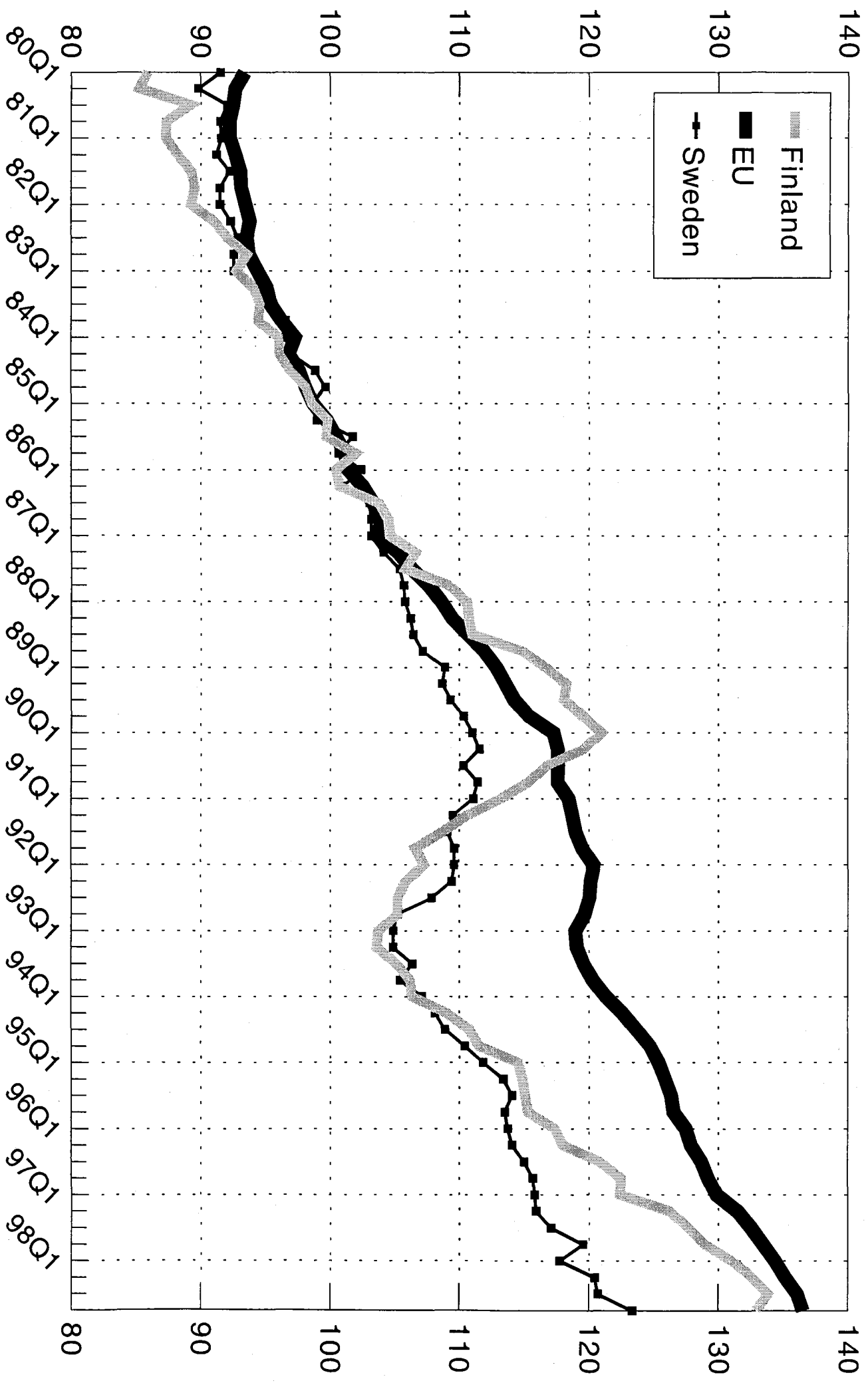
Figure 2.2: Terms of Trade

1990=100
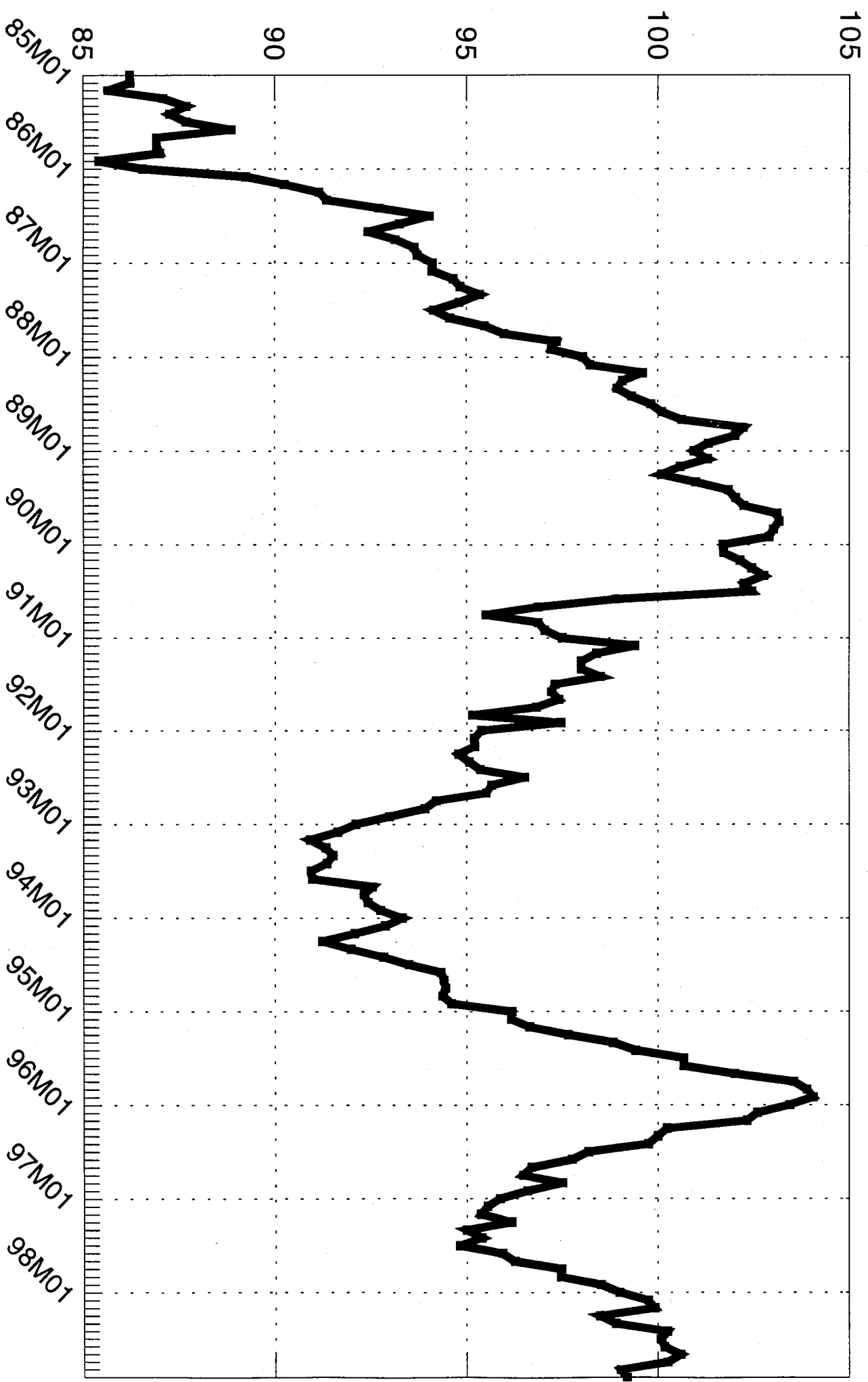
Figure 2.3: Components of aggregate demand and their contributions to growth

Gross Domestic Product

150 · 140 · 130 · 120 · 110 · 100

84Q4 85Q4 86Q4 87Q4 88Q4 89Q4 90Q4 91Q4 92Q4 93Q4 94Q4 95Q4 96Q4 97Q4 98Q4

Net Exports

15 · 10 · 5 · 0 · -5

84Q4 85Q4 86Q4 87Q4 88Q4 89Q4 90Q4 91Q4 92Q4 93Q4 94Q4 95Q4 96Q4 97Q4 98Q4

Private Consumption

74 · 69 · 64 · 59 · 54

84Q4 85Q4 86Q4 87Q4 88Q4 89Q4 90Q4 91Q4 92Q4 93Q4 94Q4 95Q4 96Q4 97Q4 98Q4

Private Investment

35 · 30 · 25 · 20 · 15 · 10

84Q4 85Q4 86Q4 87Q4 88Q4 89Q4 90Q4 91Q4 92Q4 93Q4 94Q4 95Q4 96Q4 97Q4 98Q4

Public Consumption and Investment

33 · 32 · 31 · 30 · 29 · 28 · 27 · 26

84Q4 85Q4 86Q4 87Q4 88Q4 89Q4 90Q4 91Q4 92Q4 93Q4 94Q4 95Q4 96Q4 97Q4 98Q4

Growth Components of GDP

8 · 6 · 4 · 2 · 0 · -2 · -4 · -6 · -8 · -10

■ GDP
■ Net Exports
■ Private Consumption
■ Private Investment
□ Public Cons. and Inv.
■ Inventories and errors

85 86 87 88 89 90 91 92 93 94 95 96 97 98

Figure 2.4: Inflation and Unemployment

1. Consumer Prices (left sc.)
2. Unemploymnet Rate (right sc.)

Figure 2.5: RelativeUnit Labour Costs inManufacturing
14 Competitor Countries / Finland, 1987=100
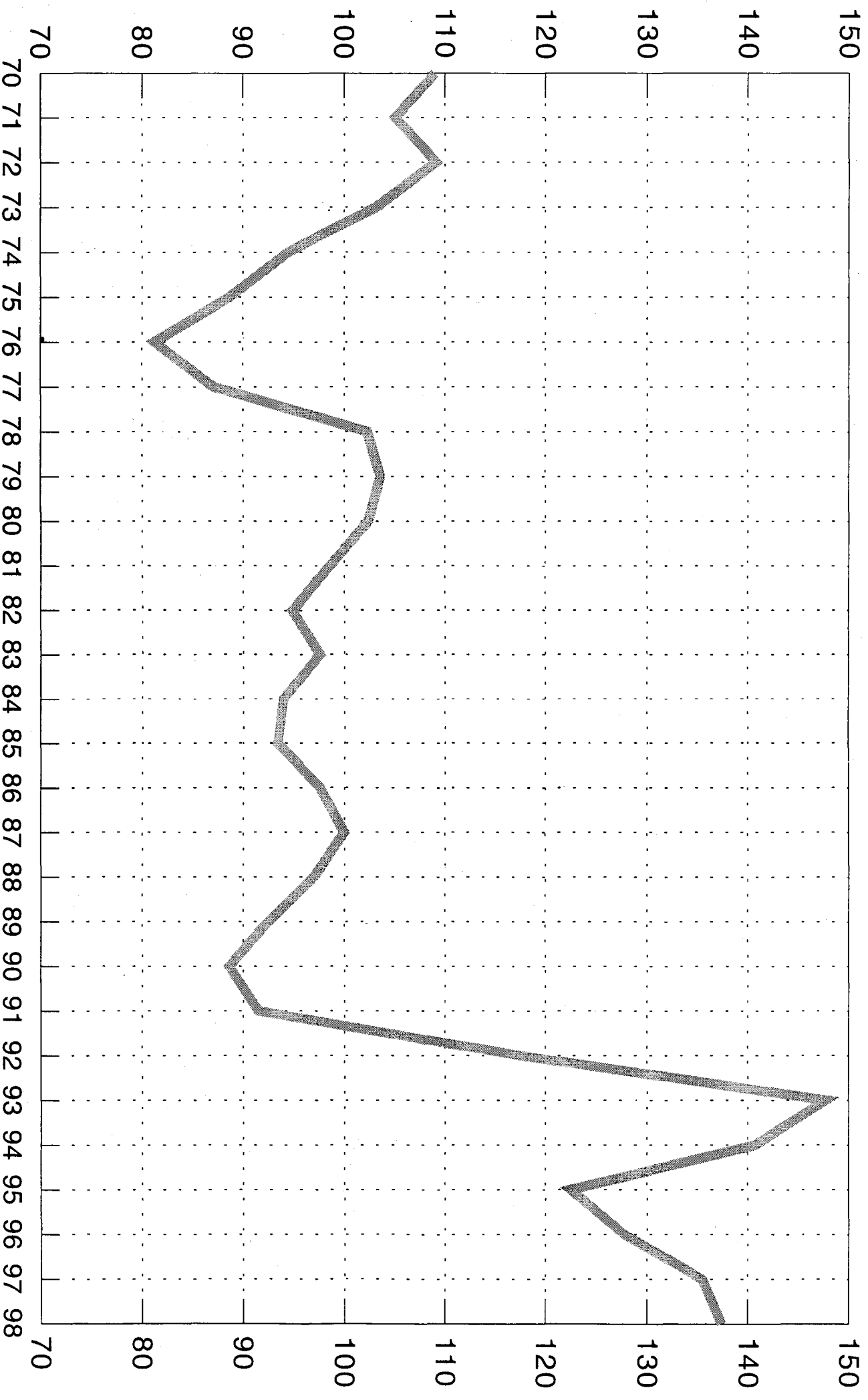
Figure 2.6: Current Account
12-month moving total

Legend:
- Bill.FIM (left sc.)
- % of GDP (right sc.)
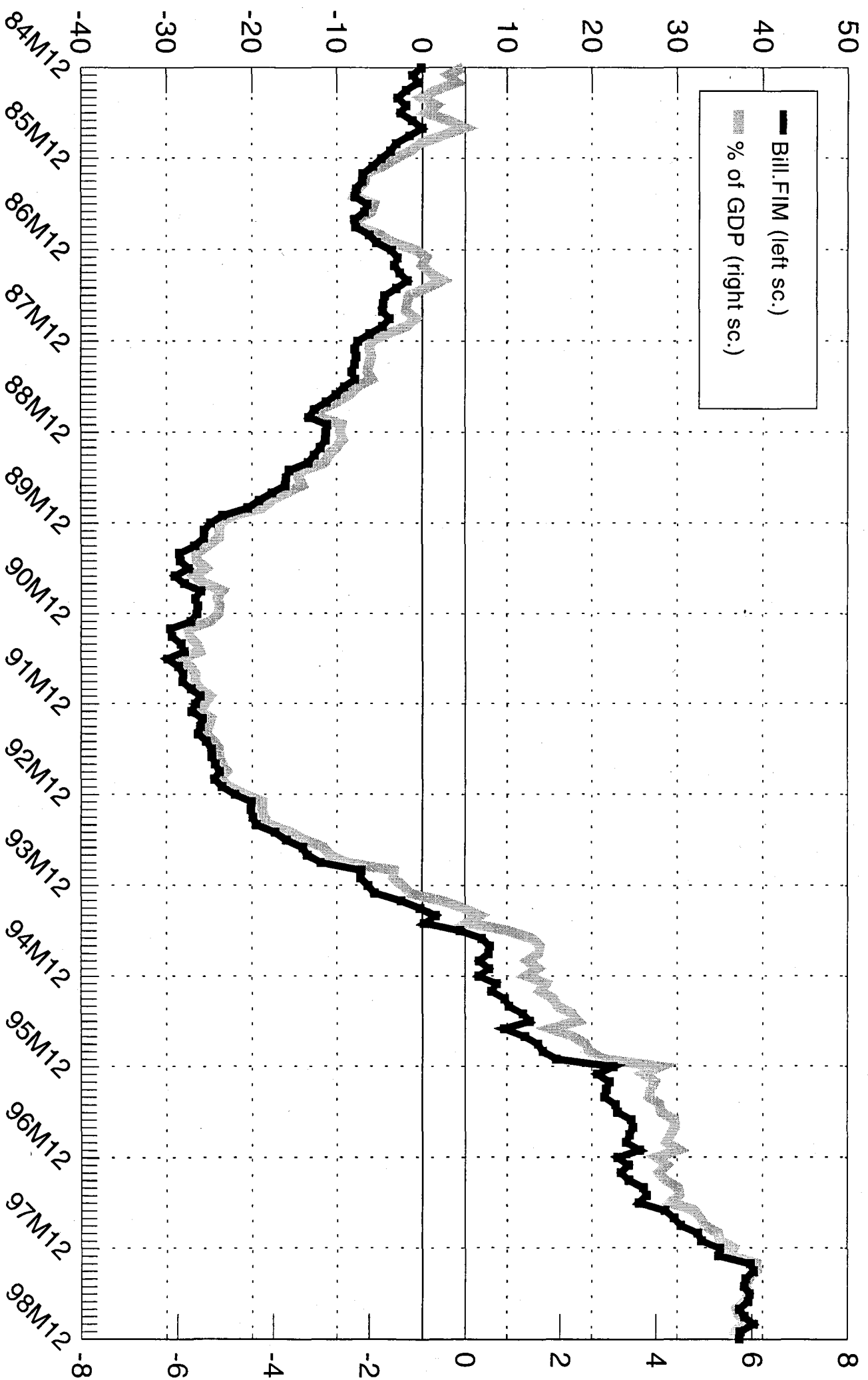
Figure 2.7: Bank of Finland currency index

Rising curve indicates Fim depreciation

1982=100

Trade-weighted currency index
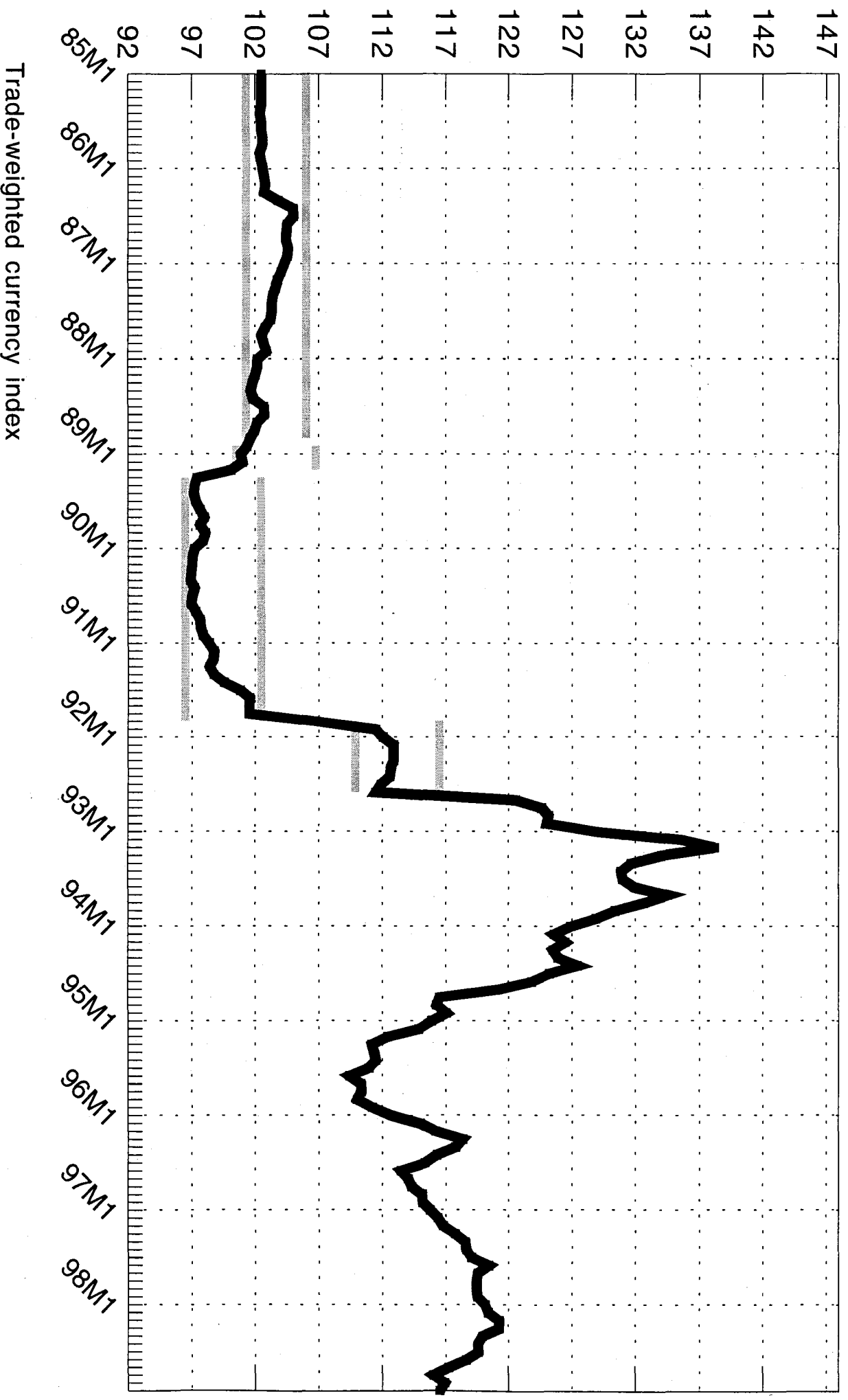
Figure 2.8: Interest Rate Differential Between Finland and Germany

Figure 3.1.1: Deregulation of financial markets in Finland

	1980	1983	1985	1986	1987	1988	1989	1990	1991

D Relaxation of lending rate regulation
Entry of foreign banks into the call money market

o Call money deposit rate separated from credit rate

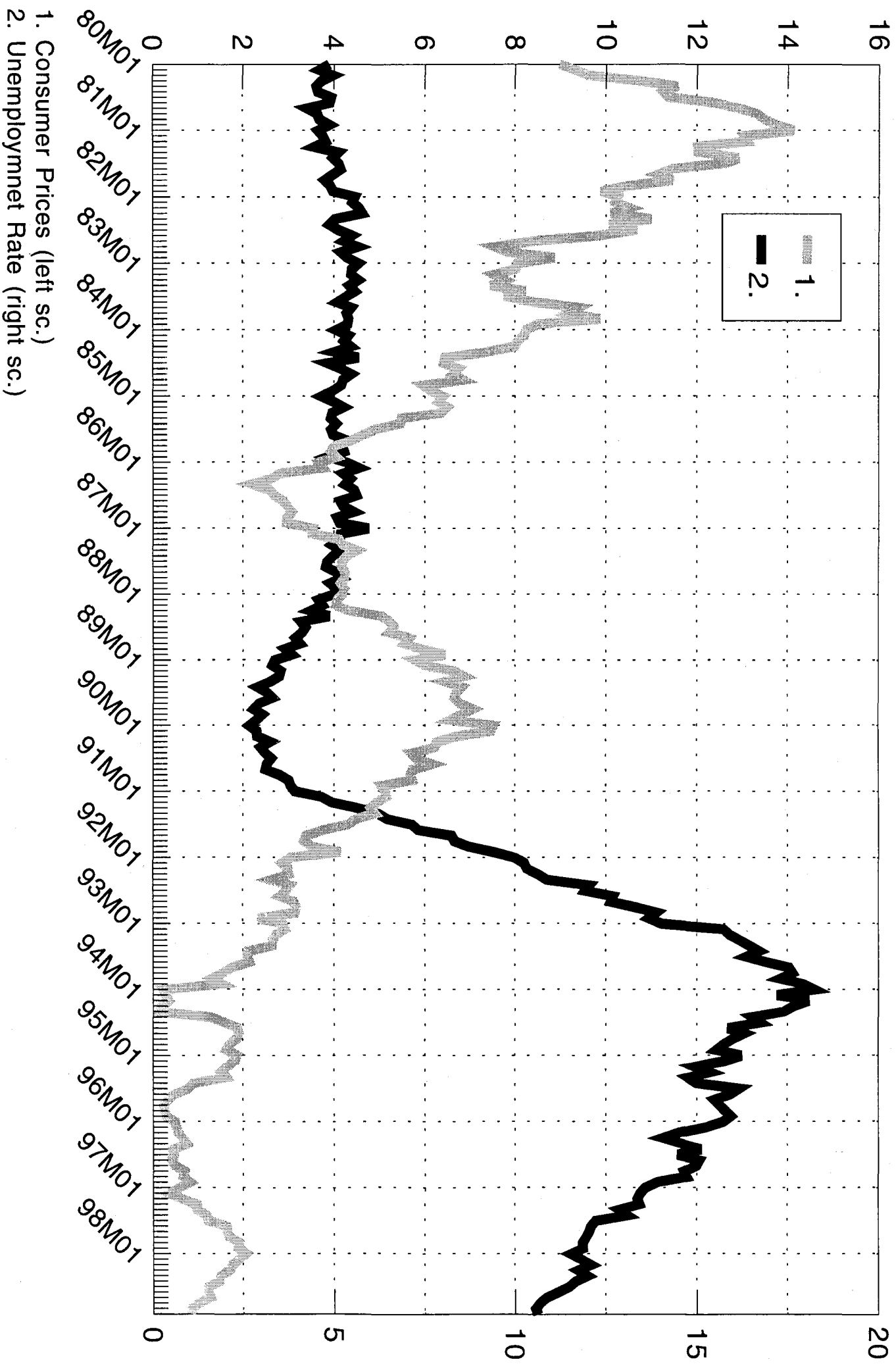**m** Abolition of regulation of lending rates
Floating rates allowed on some loans

e CDs exempt from reserve requirement
Open market operations start

s Heilbor rates introduced

t Credit guidelines introduced
Floating rates allowed on all loans

i Floating rates discontinued

c Prime rates allowed as reference rates

F Free forex borrowing for households

o Free short-term capital movements

r Free household foreign investment

e Forex regulations relaxed except for households
and short-term capital movements

i Free direct investment abroad for nonfinancial companies

g Free long-term foreign borrowing for all companies

n Free long-term foreign borrowing for manufacturing and shipping companies

Limited currency options allowed for authorized banks

Banks free to cover commercial forward positions

Source: Vihriälä (1997)

Figure 3.1.2: Bank Lending and Industrial Production

Bill.Fim   1995=100

Legend:
1.
2.

1. Total bank lending to the public (left sc.)
2. Volume of industrial production (right sc.)
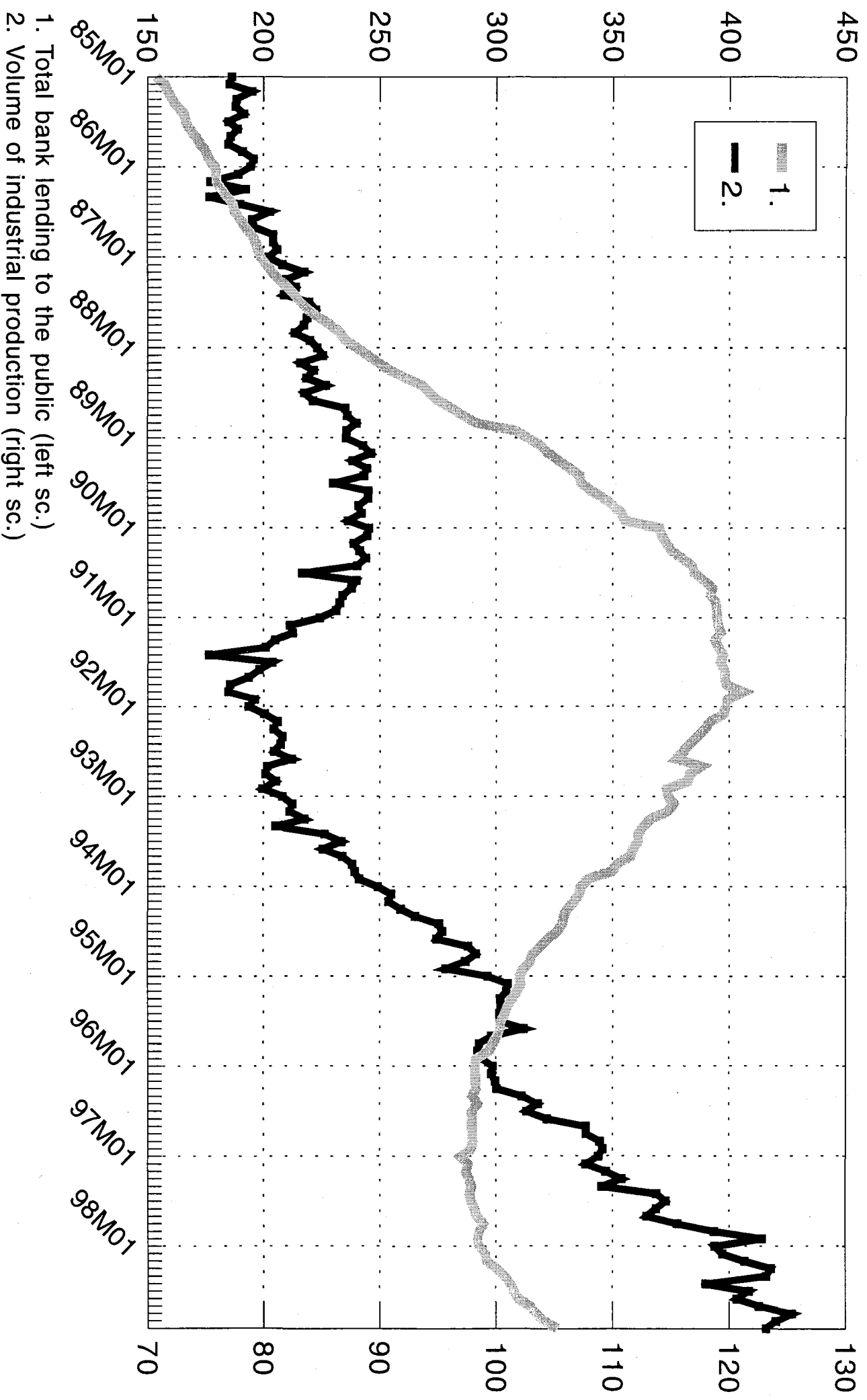
Figure 3.1.3: Real Asset Prices
Defl. by 12-month change in consumer prices

1980=100

1980=100

Legend:
1.
2.

1. Old two-romeed flats in Helsinki (left sc.)
2. Share Prices (right sc.)
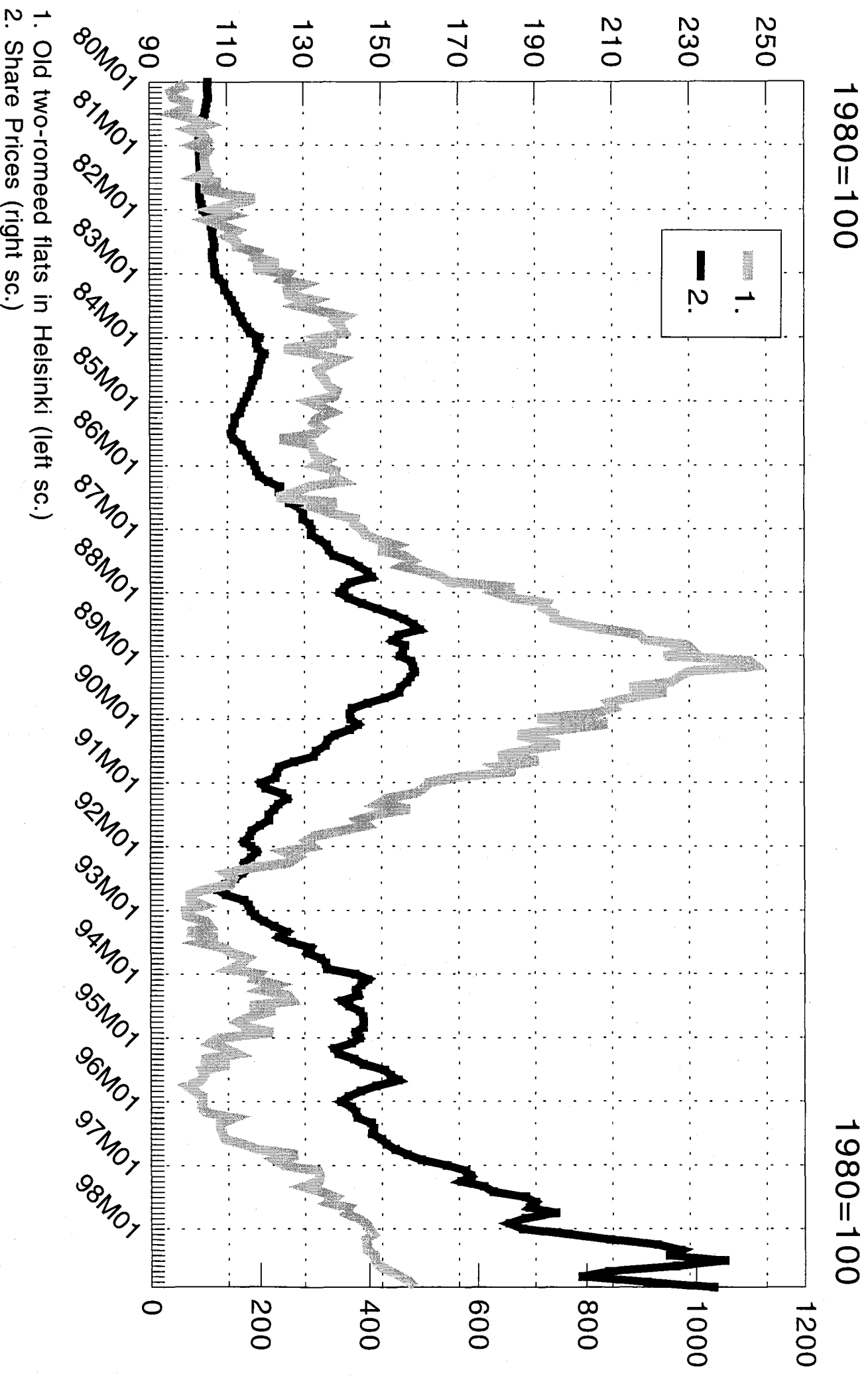
Figure 3.1.4: Profitability of Finnish deposit banks

FIM billion

Legend:
- Credit and guarantee losses (1)
- Expenses (2)
- Other income (4)
- Income from financial operations (3)
- Net profit (5)
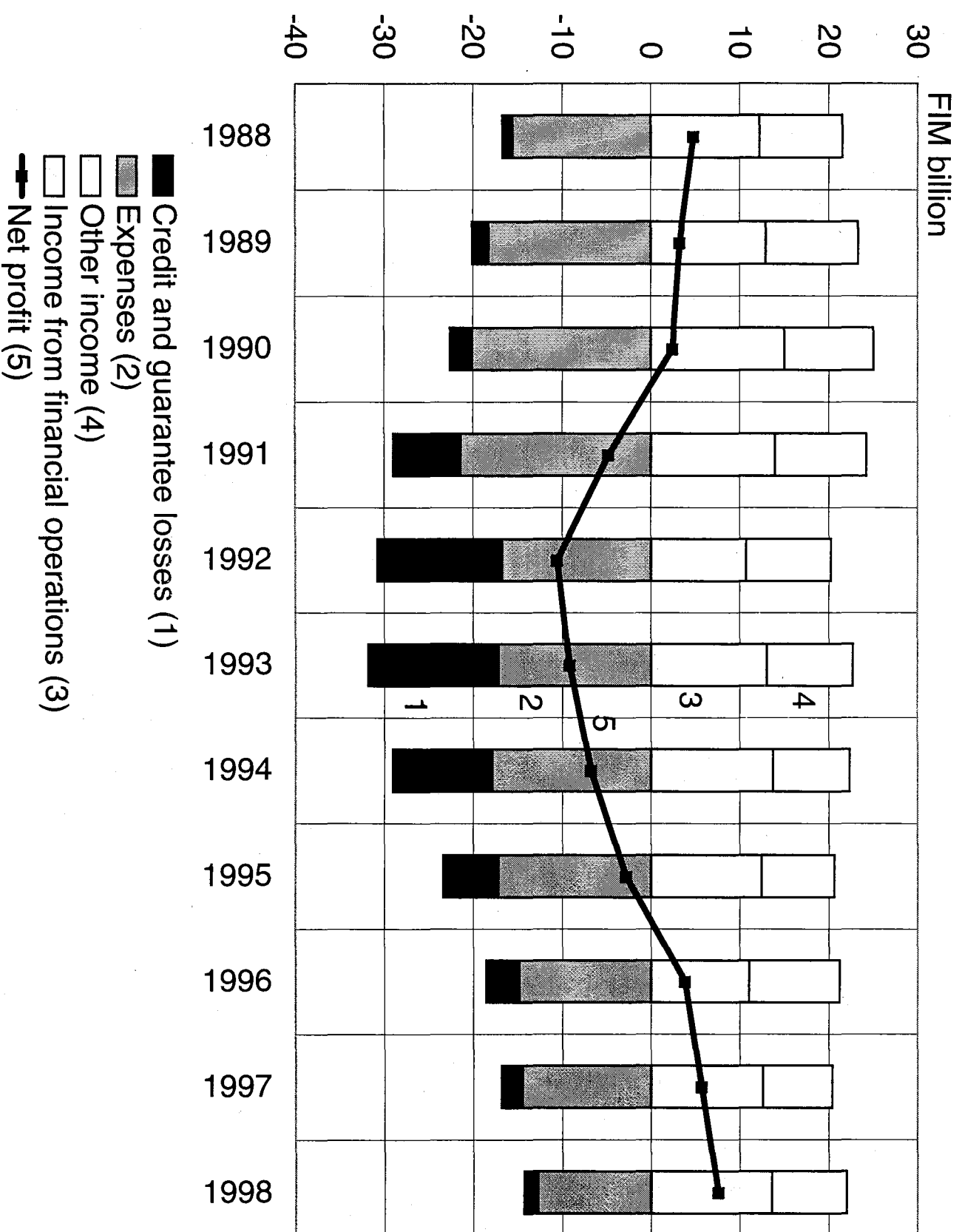
Table 3.1: International indebtedness   (net foreign debt, % of GDP)

	Finland	Sweden	Mexico	Chile	Korea	Malaysia	Thailand
1982	17	19	30	21			
1983	20	22	45	33			
1984	19	20	48	73			
1985	19	21	46	88			
1986	17	19	58	85			
1987	20	17	53	74			
1988	19	19	41	50			
1989	23	21	31	33			
1990	29	27	30	17	14	36	33
1991	35	28	26	17	14	36	38
1992	41	24	22	14	14	35	38
1993	53	43	20	16	14	41	34
1994	57	48	19	18	14	40	33
1995	42	42	33	11	24	39	34
1996	42	41	28	7	28	40	50

Table 3.2.Indicator of International illiquidity

Money to foreign reserves ratio

	Finland	Sweden	Mexico	Chile	Korea	Malaysia	Thailand
1980	11	21	19	2			
1981	14	19	19	3			
1982	14	17	65	5			
1983	16	13	11	4			
1984	8	14	7	3			
1985	7	9	9	3			
1986	18	10	6	3			
1987	7	10	3	4			
1988	9	10	3	4			
1989	11	9	6	4			
1990	7	6	6	3	6	3	4
1991	9	6	4	3	8	3	4
1992	12	5	5	3	7	3	4
1993	9	5	4	3	7	2	4
1994	5	4	19	3	6	2	4
1995	7	4	5	3	6	3	4
1996	9	6	5	4	7	4	4
1997	7	10	4	4	11	5	5

Figure 3.3.1: Contributions of financial factors on investment fluctuations
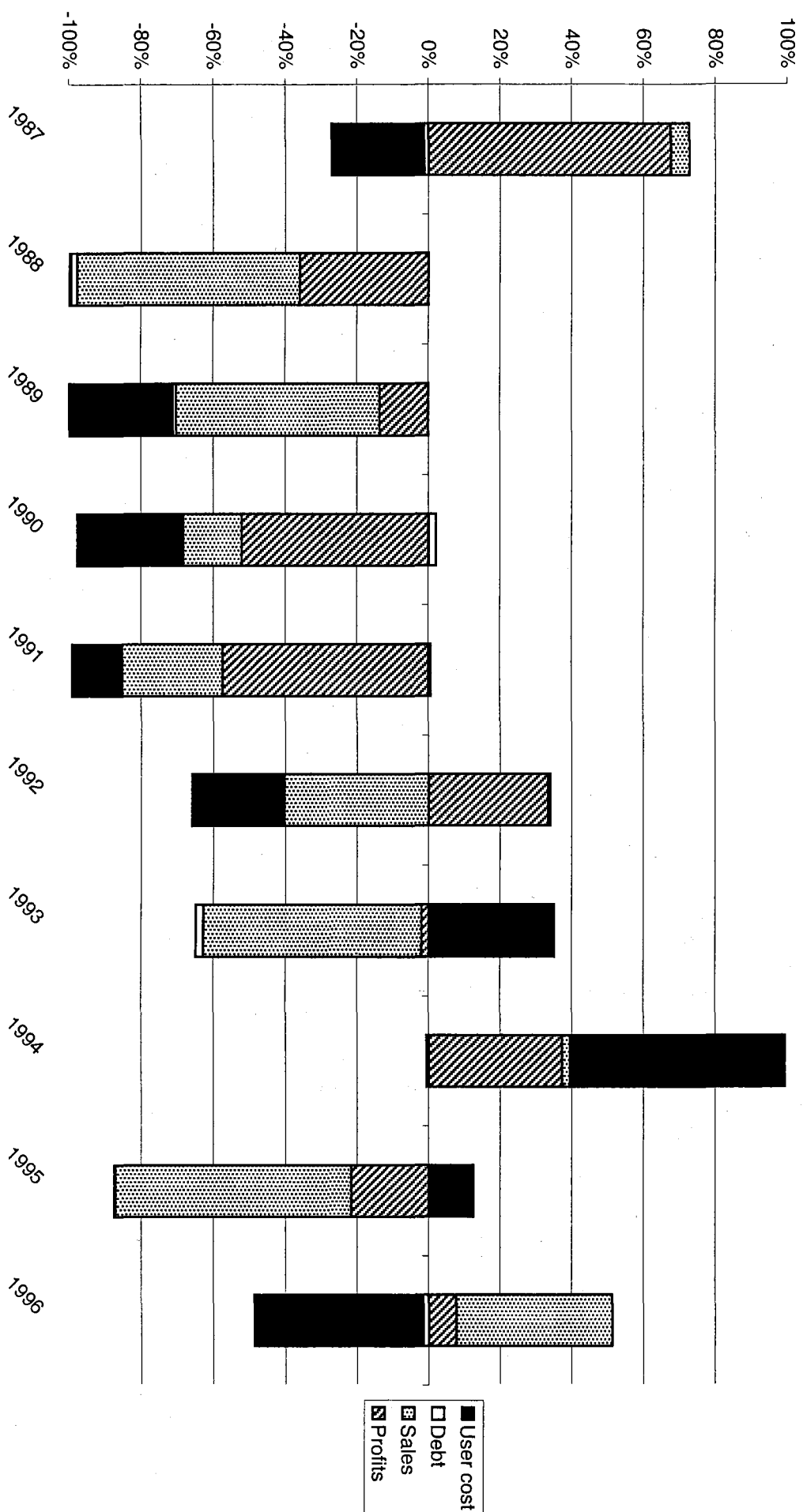
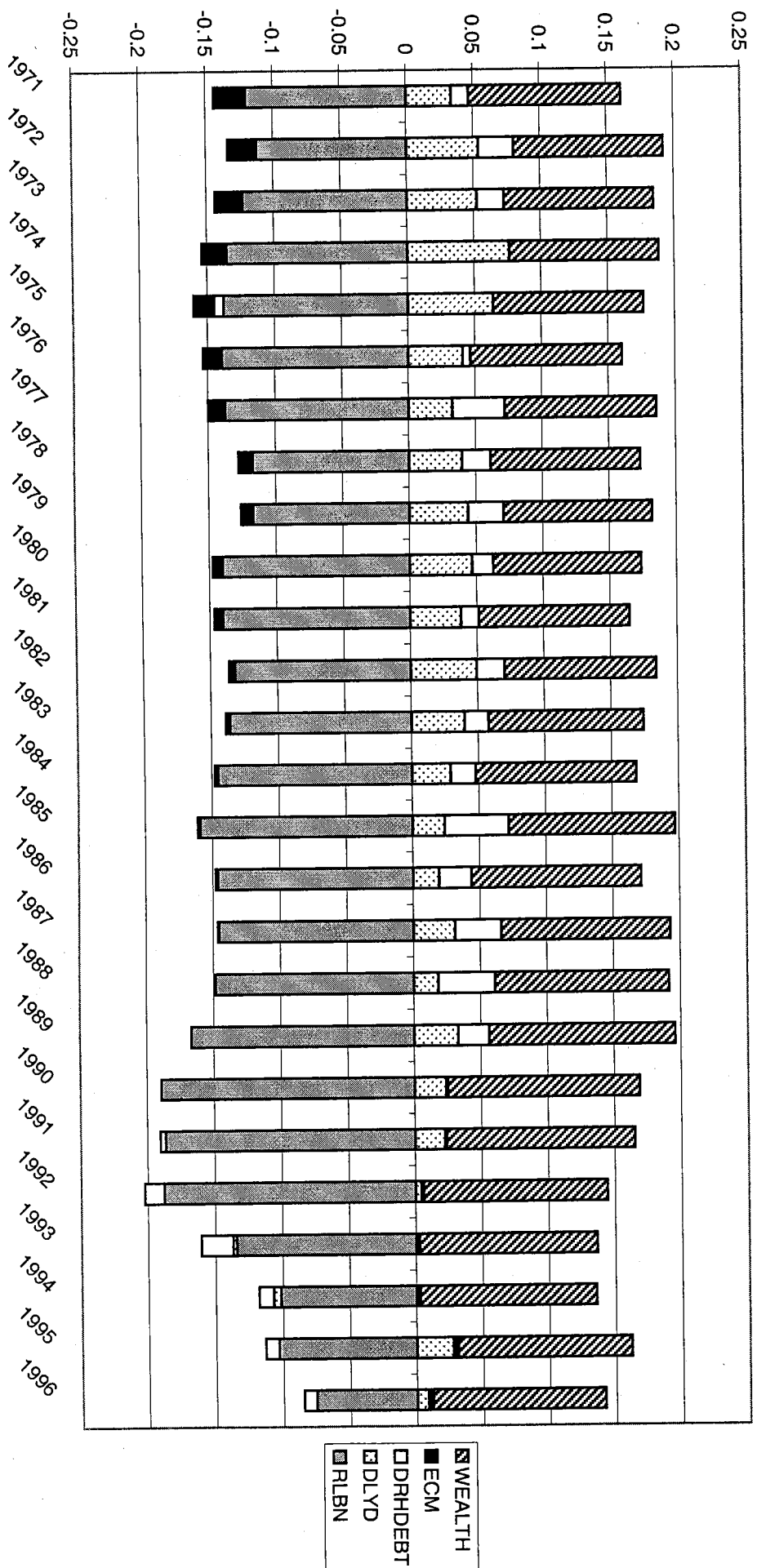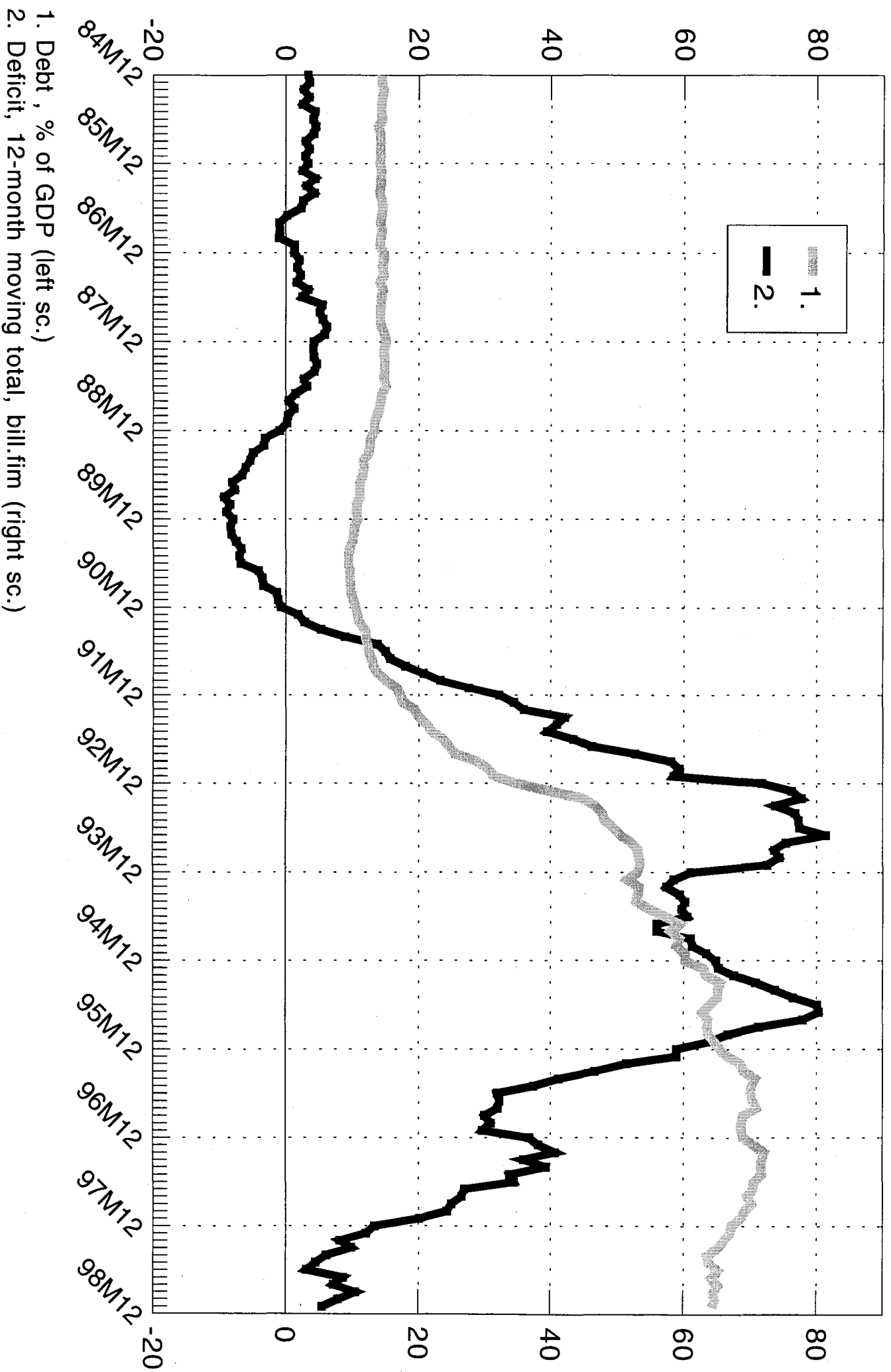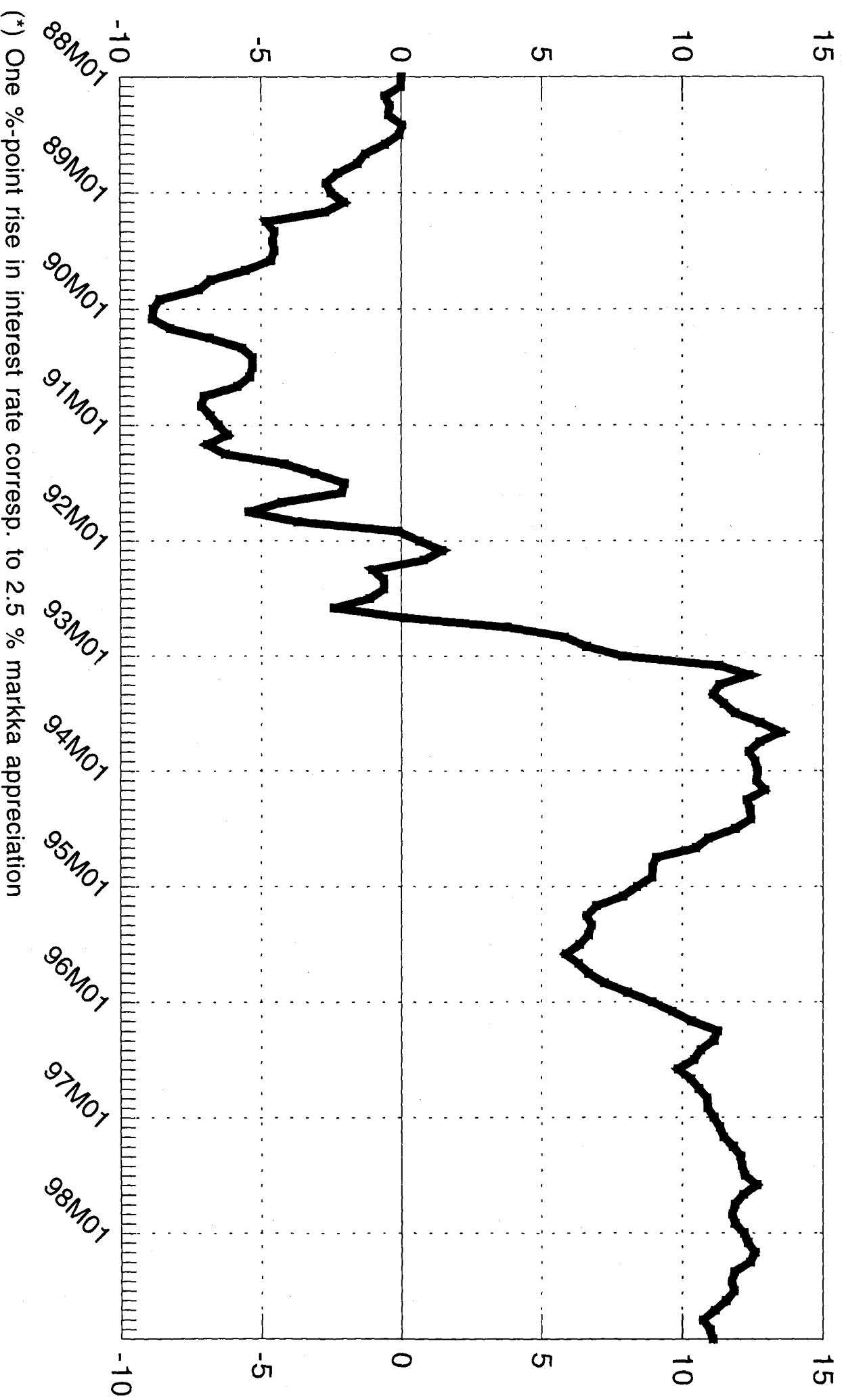**Figure 3.3.2: Contributions of explanatory variables on consumption fluctuations**

Figure 4.2.1: Central Government Budget Debt and Deficit

1. Debt , % of GDP (left sc.)
2. Deficit, 12-month moving total, bill.fim (right sc.)

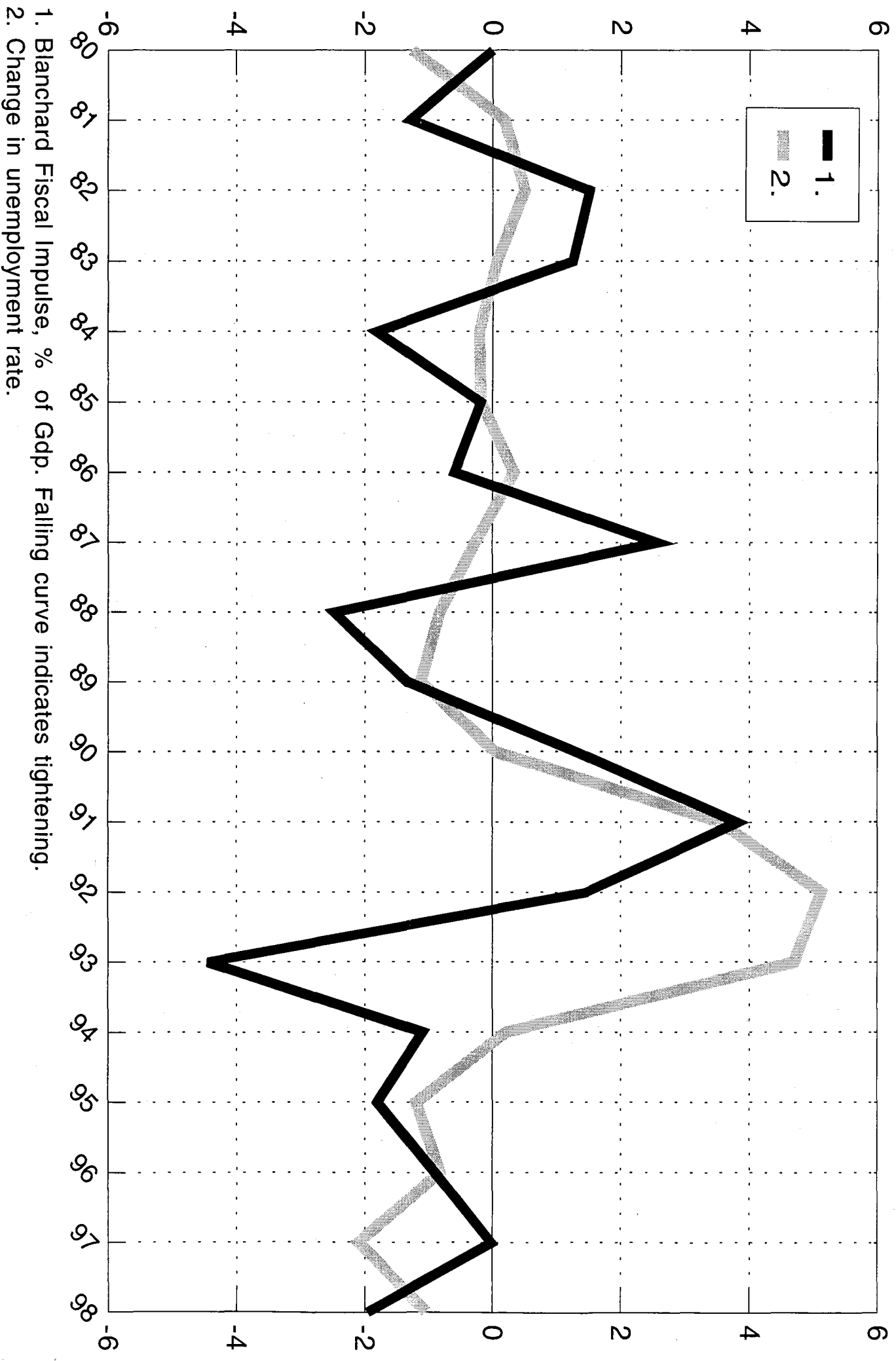## Figure 4.1.1: Monetary conditions index
Falling curve indicates tightening (*)

1988m1=0

(*) One %-point rise in interest rate corresp. to 2.5 % markka appreciation

Figure 4.2.2: Indicator of Fiscal Policy and Change in Unemployment

1. Blanchard Fiscal Impulse, % of Gdp. Falling curve indicates tightening.
2. Change in unemployment rate.

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