

Svante Öberg: Monetary policy and productivity

Speech by Mr Svante Öberg, Deputy Governor of the Sveriges Riksbank, at a meeting arranged by Danske Bank, Stockholm, 29 January 2008.

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Productivity is an important part of the equation when analysing the economy. In the long run, productivity determines most of a country's GDP growth and welfare. In the short term it is an important factor for how inflation develops. It is therefore important for the Riksbank to assess how productivity will develop in future. To create a better picture of productivity and its driving forces the Bank regularly works on further developing and deepening our analysis. For instance, we arranged two conferences on the theme of productivity last year, where the most recent analysis and research in the field was discussed. I intend to take up some of the insights from the conferences in my speech today.

Productivity has gone from surprisingly strong to surprisingly weak

Over the past 10-15 years inflation has been lower and more stable than before. This is a pattern that can be seen around the world and probably has several explanations. One explanation is that monetary policy has gained greater credibility. Inflation expectations have thus stabilised at a low level, which in turn has contributed to keeping down inflation. Another explanation is that globalisation, that is, increased trade and economic integration, has subdued inflation.

In Sweden, strong productivity growth and an increased share of imports from low-cost countries in recent years have contributed to low inflation (see Figure 1). This made it possible for the Riksbank to cut its interest rate and hold it down in a situation where the economy was expanding rapidly.

Now these factors are pushing in the other direction. Rising global demand is pushing up prices on energy, commodities and grain. This has forced up world market prices. The strong economic activity in recent years has meant that resource utilisation in the Swedish economy is now at a high level and that cost pressures have therefore risen. Judging by the wage statistics, wages so far have increased at a moderate rate, but the earlier strong productivity growth has ground to a halt and productivity even declined last year.

In the same way as the strength in the rate of productivity surprised the Riksbank and many other forecasters earlier, last year we were surprised by the strength of the downturn. An important task for forecasters will be to estimate to what extent the most recent decline is temporary or to what extent it involves more of a trend decline in growth.

Let me clarify a little before I continue. When I talk about productivity today I mean productivity measured as production per hour worked, that is, labour productivity.

Upswing in productivity growth since the beginning of the 1990s

How has productivity developed in recent decades? There was a sharp break in the trend in the mid-1970s (see Figure 2). From a rate of increase for the business sector of around 6 per cent a year during the 1960s, the trend increase fell to around 2 per cent a year during the second half of the 1970s and in the 1980s.

After the economic crisis at the beginning of the 1990s, productivity growth increased again. Growth rose to around 3 per cent a year during the period 1995-2007 and was at its highest during the years 2002-2006, when it increased on average by 4.4 per cent a year. It was a broad upturn, covering almost all sectors.

But in 2007 productivity slowed down considerably. It fell by 0.5 per cent during the first three quarters, compared with the previous year. I will return to the decline later on.

Productivity is affected by economic activity

What explains the fact that productivity has shown an increase trend? At the beginning of the 1990s part of the increasing productivity growth was probably linked to the rapid exclusion of companies and labour with low productivity during the crisis years. When the crisis was over, companies had plenty of spare capacity and could therefore increase production. In addition, the substantial weakening of the krona in autumn 1992 contributed to a rapid increase in exports. When production and resource utilisation rose, this led to an upswing in productivity.

A commonly recurring cyclical pattern is that productivity increases more quickly at the beginning of an economic upswing. Companies then normally have the capacity to increase their production with the existing resources. The need for resources then gradually increases and the companies begin to recruit new staff. Productivity growth usually falls then. When the economic cycle enters a downturn phase, productivity develops even more slowly. Another way of describing this cyclical pattern is to assume that the economy is exposed to technological shocks. This is how productivity is modelled in so-called real business cycle models. This is the case in Ramses, for instance, which is the general equilibrium model used by the Riksbank.

But also by factors such as globalisation and new technology

However, productivity growth did not fall back, but remained high in the latter half of the 1990s. There was only a marked reduction in connection with the bursting of the IT bubble in 2000 and in the following year productivity did not increase at all.

Since then productivity has increased rapidly during the 2000s up to last year (see Figure 3). During the economic upturn in recent years it took longer before employment accelerated. Most indications are therefore that the strong productivity growth in recent years was not solely a cyclical phenomenon – it was also due to structural factors such as globalisation, use of information technology (IT), deregulation of product markets and innovations.

Globalisation sharpens competition and pushes up productivity growth through a higher degree of specialisation and use of comparative advantages. Sweden's membership of the EU from 1995, the EU's enlargement and the gradual intensifying of the EU's common market have been significant factors here. New, large markets, such as China, India and the earlier planned economies in eastern Europe are being rapidly integrated into the world economy. Trade barriers and customs duties between countries have declined. Technological developments make it easier for companies to build up global trade and production networks. This has resulted in a strong increase in world trade. In Sweden, this is reflected in the fact that exports have increased from around 30 per cent of GDP in 1990 to around 50 per cent in 2006.

Another tendency that is related to globalisation is that integration of companies over national borders has increased. Studies by the OECD indicate that a country's productivity increases if companies in the country have a large degree of foreign ownership.¹ Quite simply, a multinational company must be better than the local competitors in order to outweigh the handicap of operating in a foreign country. Compared with other European countries, Sweden has a high percentage of foreign-owned companies. This percentage has increased substantially since the mid-1990s. In the manufacturing industry around 40 per cent of the

¹ Criscuolo (2005).

employed are now working in foreign-owned companies. The corresponding figure in the services sector is 55 per cent.²

IT is another factor that has probably contributed to the rapid rate of increase in productivity over the past 10-15 years. The significance of IT is visible in two ways; in production and use. If we look at the production of IT, we can observe that the telecom industry's share of total industry is relatively large in Sweden compared with many other countries. This means that the rapid development in productivity that has occurred in the telecom sector has contributed to pushing up productivity growth in the business sector as a whole.

If we instead look at use of IT, Sweden has a relatively large share of IT capital in the total capital stock, compared with other countries. Sweden is in this respect more like the United States than continental Europe. The use of IT means that one can simplify and automate the work so that those who work can carry out more tasks in a shorter time, that is, productivity increases. The financial sector is very skilled at making use of IT to increase productivity. Its customers currently carry out many simple tasks from home in front of their computers instead of going to a bank office.

During the second half of the 1990s, major investments were made in IT capital. These investments accounted for approximately half of the growth in productivity during the period 1996-2000 (see Figure 4). The investment upturn was broken in connection with the IT bubble bursting at the beginning of the 2000s. After that the contribution from IT capital to productivity growth has declined substantially. Instead it is technological and organisational advances, together with innovations, that have largely been the driving forces behind productivity.

During the 1990s a number of markets in Sweden were opened up to competition. This included the markets for electricity, telecommunications, post and a large part of the transport sector. At the same time, there was a general reinforcement of the competition policy through the establishment of the Swedish Competition Authority and the introduction in Sweden of a new, stricter law on competition. When competition stiffens, companies are forced to become more efficient and cost-conscious, which leads to an increase in productivity. Studies by the OECD indicate a clear relationship between deregulation of product markets and productivity growth.³ This factor has probably been significant for the relatively rapid increase in productivity during the past 10-15 years.

One important aspect in today's globalised knowledge-based society is that competition promotes innovation and thereby productivity.⁴ To avoid being driven out of the market companies are forced to constantly improve existing products and processes and also to develop new ones. Sweden is at the forefront in Europe and pointed out as an innovation leader alongside Denmark and Finland, for instance.⁵

Another explanation for the growth in productivity in Sweden, as in many other countries, has been that the percentage of highly educated persons in the labour force has shown an increase trend, partly as a result of technological developments. A study of Swedish data shows that such changes have raised productivity growth by 0.2 percentage points a year during the second half of the 1990s.⁶

² ITPS (2007).

³ Conway, Nicoletti, de Rosa and Steiner (2006).

⁴ See, for instance, Crépon, Duguet and Mairesse (1998).

⁵ Esser, Villalba and Tarantola (2007).

⁶ Forsling & Lindström (2004).

Organisation important for productivity growth

IT is available all around the world at roughly the same price, but the differences are substantial with regard to how different countries and sectors use this technology to make their production more efficient (see Figure 5). The United States and Europe have experienced a similar productivity growth in the IT-producing sectors, but the Americans have had stronger growth in sectors with intensive use of IT. This includes, for instance, the wholesale and retail trade sectors and financial services.

Studies indicate that one of the explanations for the United States' relative productivity advantage over Europe is that the US companies have been quicker and better at adapting their organisations to the new technology.⁷ One factor that might contribute to this difference is that the stricter regulations in the labour market in Europe mean that it takes longer time and costs more money to reorganise. Sweden is an exception in this context. We have seen a strong growth in productivity in the sectors using IT at the same time as we have a relatively regulated labour market.

Given this, the Riksbank has initiated a research project to obtain more information on how investment and use of IT as well as reorganisation affects productivity growth in Sweden. The project is in two parts. The first sub-project is a micro study which examines whether companies that have reorganised and invested in IT will have higher productivity growth. The second part of the project is based on an own survey study in collaboration with Statistics Sweden, which covers the years 1997-2005.

The first, preliminary results of this study were presented at a conference organised by the Riksbank at the end of last year on the theme of productivity.⁸ They indicate that the companies that made organisational changes at the same time as investing more in IT than the average company experienced a substantial increase in productivity growth.⁹ The study also shows that it was not possible to find any significant effects on productivity growth from IT investments in the companies that had not reorganised. It is therefore important to take into account investments in "organisational capital" when analysing productivity growth. Other investments in knowledge capital such as staff training and R&D should also be important to productivity. This is also confirmed by studies using US data.¹⁰

This type of measure is not reported as an investment in the official statistics. This is despite the fact that they can be regarded as intangible investments. Instead they are calculated as a cost to companies. On the one hand it is difficult to measure these intangible assets, but on the other hand one disregards a large part of the companies' investments if one does not take them into account. US and European studies show that investment in intangible assets comprises around 10 per cent of GDP.¹¹

The most recent productivity growth and forecasts

Let me now comment on the development of productivity last year and during the period to come.

⁷ Bloom, Sadun and Van Reenen (2007).

⁸ Håkanson (2007).

⁹ By productivity is meant total factor productivity, TFP. In the study the comparison has been made with the median company.

¹⁰ Brynjolfsson and Hitt (2003).

¹¹ See, for instance, Corrado, Hulten and Sichel (2005), (2006), Hao, Manole and van Ark (2007), Haskel and Marrano (2007).

Productivity growth in the business sector has been 4.4 per cent a year during the period 2002-2006. In the increasingly mature phase of the economic cycle where the economy is now, it is normal for productivity growth to slow down in connection with an increase in employment. This is also something the Riksbank has been expecting.

However, the downturn in the rate of increase in productivity last year was stronger than motivated by the prevailing economic situation and the Riksbank, like many other analysts, was surprised by the strength of the downturn. The National Accounts show that productivity on average fell by 0.5 per cent in the first three quarters, compared with the same period in the previous year. The downturn was broad and covered almost all sectors. The Riksbank was therefore forced during the course of last year to revise down its short-term productivity forecast.

One important explanation for the slowdown in the productivity increase is linked to cyclical developments. When the economic cycle has peaked, productivity usually slows down. The Riksbank assumed in the third and the year's final Inflation Report in October 2006 that GDP would increase by 3.1 per cent in 2007 and that employment would increase by 1.1 per cent in 2007. In the most recent Monetary Policy Update published in December 2007 the GDP increase was calculated at 2.6 per cent and the increase in employment was calculated at 2.5 per cent for the whole year 2007 (see Figure 6). Employment has thus continued to increase more quickly than we had estimated, while GDP growth has slowed down. The fact that employment is increasing can thus be regarded as natural in this phase of the economic cycle, but the increase has been unexpectedly rapid, which is possibly a reaction to the weak growth in employment during the first years of the 2000s.

There are also other factors that may have contributed to the severe slowdown. The number of hours worked per employed person has increased in 2007, which further subdues productivity, on condition that the increased hours are not fully counterbalanced by increased production. A reduction in absence due to sickness could be one explanation for this, but sick leave has declined steadily ever since 2003. Our own company survey indicates that one reason for the downturn could be that newly-engaged staff initially have a lower productivity level than their more experienced colleagues. In addition, administration and other auxiliary services increase in connection with companies expanding, which temporarily brings down the growth rate for productivity.¹²

Another explanation is the composition of production, that is, that sectors with a low level of productivity are growing more quickly than those with a high level. For example, the manufacturing industry has gone from previously accounting for 1/3 of productivity growth in industry during the period 2000-2006 to instead providing a negative contribution of 0.5 percentage points during the first three quarters of 2007 (see Figure 7).

It is important to remember in this context that productivity statistics are often revised afterwards. A study of the revisions made in the National Accounts showed that the first preliminary outcomes on average underestimate GDP growth by around 0.3 percentage points, and thereby also underestimate productivity growth.¹³ The underestimation of productivity growth appears to be particularly great during economic booms (see Figure 8). Given past events, my feeling is, although I have no firm facts to base it on, that the low productivity outcome for 2007 will be revised upwards somewhat as the statistical base improves. But this will not alter the picture of 2007 as a year of very weak productivity growth. We will not know the definite outcome for a couple of years yet.

In the Monetary Policy Update published in December last year we could observe that productivity growth had been weaker than we estimated in our October Report (see Figure

¹² Sveriges Riksbank (2007).

¹³ Öller (2007).

3). We therefore revised down our forecast slightly in the short term. In 2008 we envisaged a gradual recover in productivity. After that, our assessment was that productivity growth would develop roughly in line with the trend rate of increase.

Several factors indicate that the long-term rate of increase in productivity will remain relatively high, although it will not be as high as during the years at the beginning of the 2000s.

Globalisation is one such factor, and will probably continue to be a driving force behind productivity for a long time to come. Integration within the EU is deepening. The countries in eastern and central Europe who have moved away from planned economies have many years of rapid development ahead of them before they catch up with western Europe. The international competition in the product and labour markets and the financial integration process will thus continue to increase during the foreseeable future.

The deregulation implemented in Sweden in the 1990s in the communication and transport sector has probably already had its main impact on productivity. There is of course still scope for reforms to increase competition further and thereby also productivity.¹⁴ But without such new initiatives the deregulation will probably not contribute as much to future growth.

Investments in IT will probably fuel productivity for a long time. Earlier experiences show that major development phases, such as electricity and the combustion engine, affected productivity growth over several decades.¹⁵ As yet we know very little about the delayed effects on productivity from earlier IT investments and reorganisations. Hopefully, the productivity project I mentioned earlier will increase this knowledge.

All in all, the indications are that long-term productivity growth will be slightly lower than in the past 10-15 years. The Riksbank's assessment is that the long-term rate of increase in productivity in the economy as a whole has fallen slightly to 2.25 per cent a year. This is lower than during the period 1995-2006, when productivity growth was on average 2.6 per cent a year, but slightly higher than the level of around 2 per cent a year that applies if the 1980s are included. The Riksbank's assessment is well in line with what, for instance, the National Institute of Economic Research has assumed regarding long-term productivity growth in the economy.¹⁶

In conclusion, let me briefly summarise my main message today. The rapid increase in productivity growth is an important explanation for the earlier low inflation. Over the past year there has been a decline in productivity growth. This is assessed to be temporary. A recovery is foreseen in the coming years, but at a slightly slower rate of increase than before.

References

Bloom, N., Sadun, R. and van Reenen, J. (2007), "Americans Do I.T. Better: US Multinationals and the Productivity Miracle", CEP Discussion Paper, no 788.

Brynjolfsson, E. and Hitt, L. (2003), "Computing Productivity: Firm-Level Evidence", MIT Sloan Working Paper, no 4210-01.

Conway, P., de Rosa, D., Nicoletti, G. and Steiner, F. (2006), "Regulation, Competition and Productivity Convergence", OECD Working paper, no 509.

Crisuolo, C. (2005), "The Contribution of Foreign Affiliates to Productivity Growth: Evidence from OECD Countries", Yearbook on Productivity 2005, Statistics Sweden.

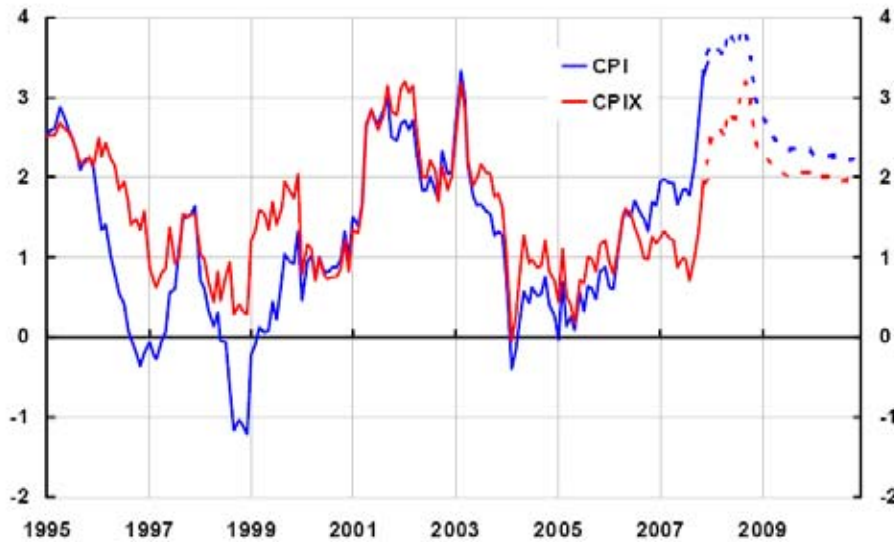
¹⁴ Lundgren, Edquist and Wallgren (2007).

¹⁵ David (1990).

¹⁶ National Institute of Economic Research (2005, 2007).

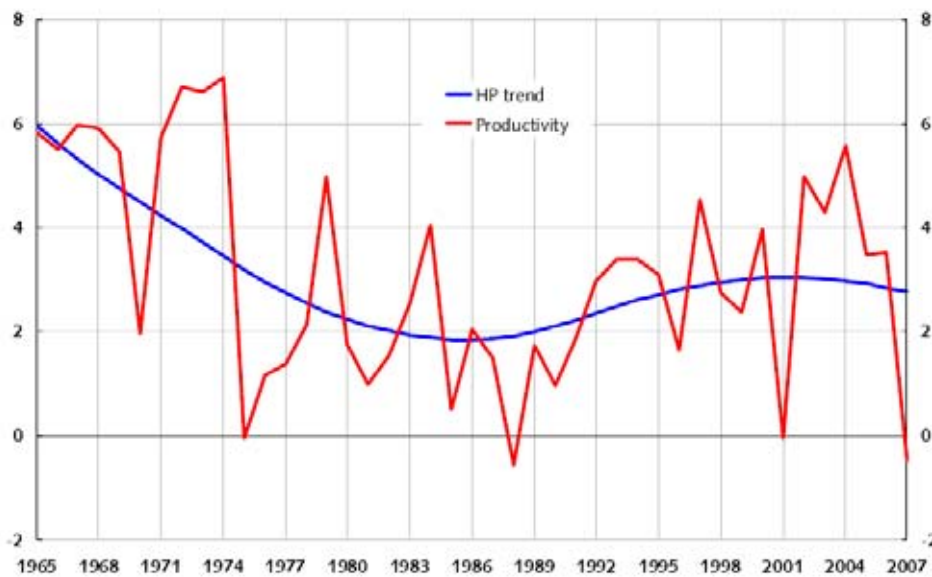
- Corrado, C., Hulten, C. and Sichel, D. (2005), "Measuring Capital and Technology: An Expanded Framework", i Corrado, C., Haltiwanger, J. and Sichel, D. (red.), *Measuring Capital in the New Economy*, Studies in Income and Wealth, vol. 65., Chicago, University of Chicago Press.
- Corrado, C., Hulten, C. and Sichel, D. (2006), "Intangible Capital and Economic Growth"; National Bureau of Economic Research Working Paper, 11948, Cambridge, MA.
- Crépon, B., Duguet, E. and Mairesse, J. (1998), *Research, Innovation and Productivity: An Econometric Analysis at the Firm Level*, National Bureau of Economic Research Working Paper, 6696, Cambridge, MA.
- David, P., (1990), "The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox", *American Economic Review Papers and Proceedings*, 80, 355-361.
- Esser, F., Villalba, E. and Tarantola, S. (2007), "The Lisbon Strategy and Development of Metrics to Measure Innovation in Europe", *Yearbook on Productivity 2007*, Statistics Sweden.
- Forsling, G. och Lindström, T. (2004), "Labour Quality and Productivity: Does Talent Make Capital Dance?", *Background Facts on Economic Statistics, 2004:07*, Economic Statistics Department, Statistics Sweden.
- Hao, J., Manole, V. and van Ark, B., (2007), "Intangible Capital and Growth – An International Comparison of France, Germany, Netherlands, United Kingdom and the United States, The Conference Board, to be published.
- Haskel, J. and Marrano, M G. ,(2007), "How Much Does the UK Invest in Intangible Assets?", *CEPR Discussion Papers, DP6287*.
- Håkanson, C. (2007), "Effects of Organizational Change on Firm Productivity", essay presented at Sveriges Riksbank's conference on "Understanding and Predicting Productivity Growth", Stockholm, 30 November - 1 December, 2007.
- ITPS, (2007), "Foreign companies 2006", Report series S2007:005.
- National Institute of Economic Research, (2005), "Productivity and wages up to 2015", Special Study no 6, May 2005.
- National Institute of Economic Research, (2007), *Wage formation report 2007*.
- Lundberg, L. and Karpaty, P. (2004), "Foreign direct investment and productivity in the Swedish manufacturing industry 1990-2000", in "The internationalisation of the business sector – effects on employment, productivity and R&D", ITPS report series A2004:014.
- Lundgren, S. (ed.), Edquist, H. and Wallgren, A. (2007), *Tillväxt i otakt (Growth out of time)*, SNS Förlag.
- Sveriges Riksbank, (2007), Box: "The Riksbank's company survey", *Monetary Policy Report 2007:3*.
- Öller, L-E., (2007), "Revisions of Production Data in the Swedish National Accounts", *Background Facts on Economic Statistics, 2007:2*, Economic Statistics Department, Statistics Sweden.

Figure 1: Inflation
Annual percentage change



Note. Forecast from the Monetary Policy Update in December 2007. Source: Statistics Sweden and the Riksbank.

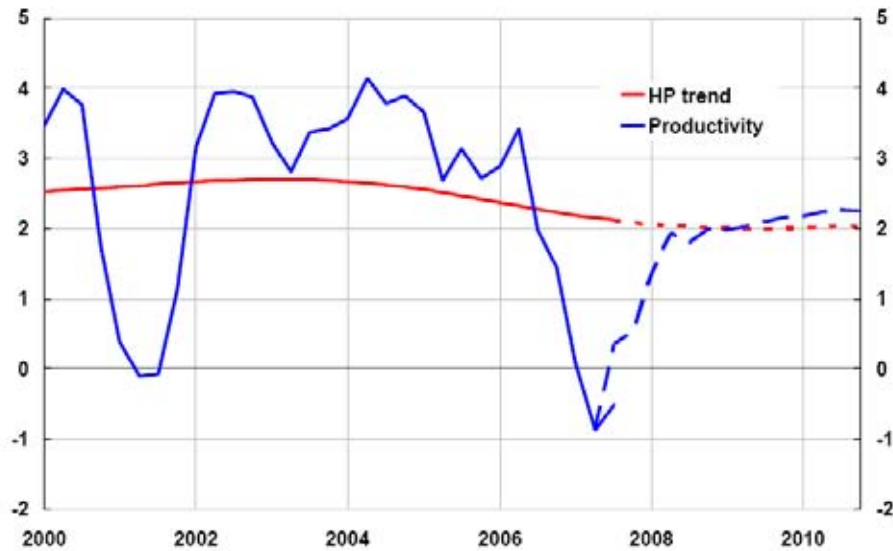
Figure 2: Productivity in the business sector
Annual percentage change



Sources: Statistics Sweden and the Riksbank.

Figure 3: Productivity, the economy as a whole

Annual percentage change, seasonally-adjusted data

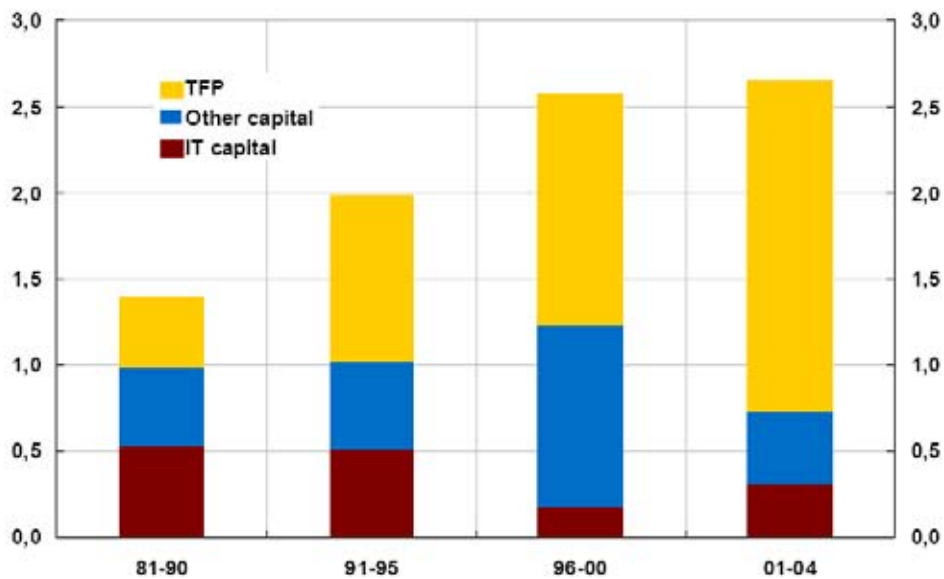


Note. Forecast from the Monetary Policy Report October 2007.

Sources: Statistics Sweden and the Riksbank.

Figure 4: Contribution from productivity, economy as a whole

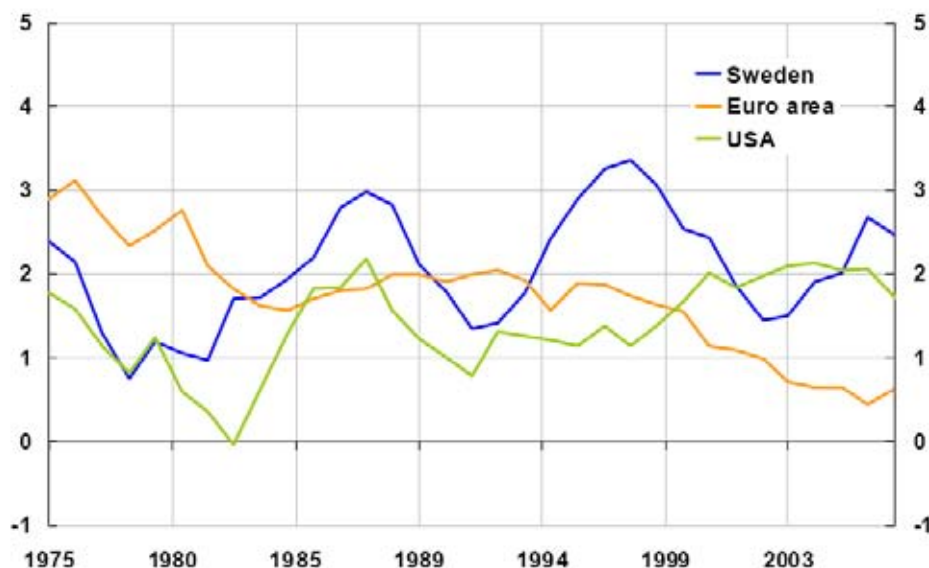
Annual percentage change



Source: Timmar, Ypma and van Ark (2003).

Figure 5: Productivity, economy as a whole

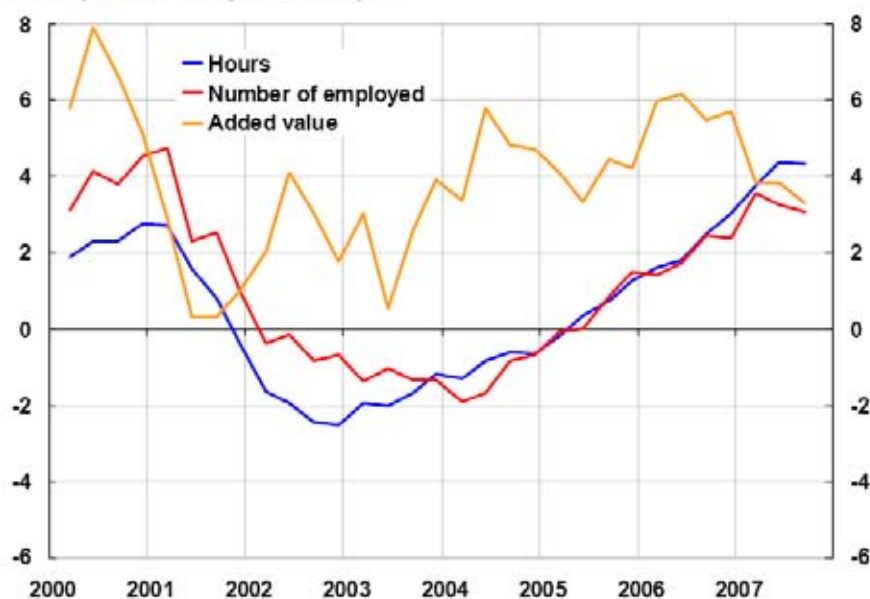
Annual percentage change, 5 year moving average



Source: OECD.

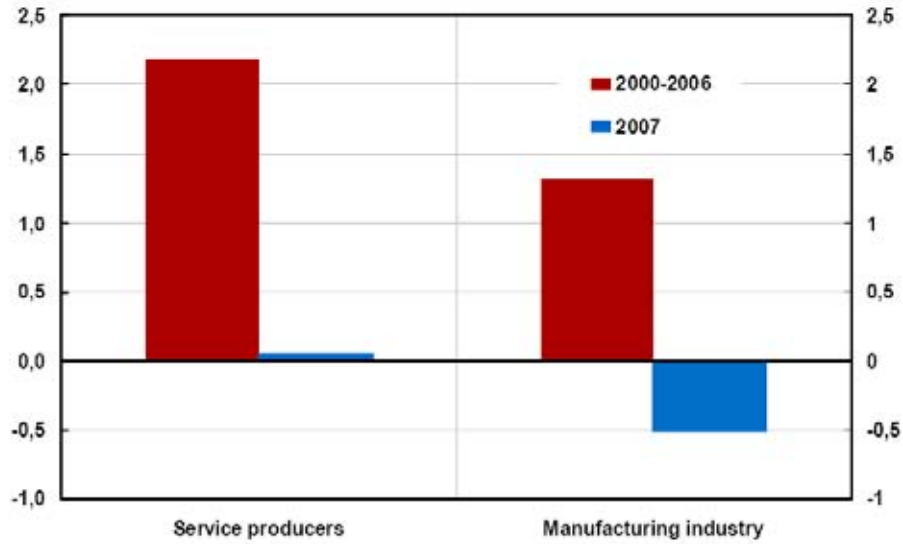
Figure 6: Production and employment in the business sector

Annual percentage change



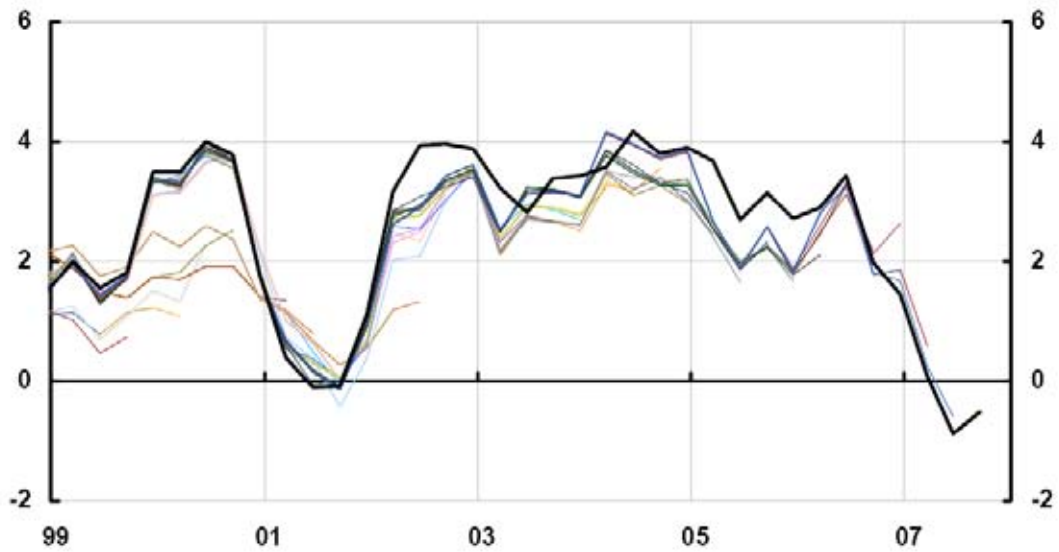
Source: Statistics Sweden.

Figure 7: Contribution to productivity growth in the business sector
Percentage points



Sources: Statistics Sweden and the Riksbank.

Figure 8: Revisions in productivity growth, NA 1999:3–2007:3
Annual percentage change



Source: Statistics Sweden.