Kerstin Hessius: The new economy seen from a central bank perspective

Speech by Ms Kerstin Hessius, Deputy Governor of the Sveriges Riksbank, at a seminar on the IT revolution and the new economy, organised by Skandinaviska Enskilda Banken Institutionell Förvaltning, at Moderna Museet Stockholm, on 12 October 2000.

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I would like to begin by thanking the organisers for choosing such a stimulating and appropriate environment for this seminar as Moderna Museet. If there is one place where you can see the effect of structural change, it is in art.

A country's economy is constantly subjected to changes, which lead to new structures. However, this is nothing new. Every time an economy has undergone significant structural changes, it has been regarded as a new economy. In many ways today's "new economy" can be seen as one of many such major structural changes. Nor is there any accepted definition of the "new economy" concept; what I am referring to is primarily an increase in the growth potential of the economy.

"Multiplied intellectual capacity"

The new information technology and the internet have revolutionised the methods in which we work, shop and communicate today. As someone once said, it is as though IT multiplies intellectual capacity in the same way that the industrial revolution multiplied physical capacity. In addition, the costs of using the new intellectual capacity have fallen drastically over a short period of time, which facilitates a rapid dissemination.

However, from a historical point of view, it is only when technological advances have made a general impact on the production process that productivity gains will arise. The steam engine moved production from household to factory, the railway enabled wider markets to develop and electricity brought the conveyer belt. Computers and the internet enable a more effective flow of information at almost all stages; financing, projection, follow-up, stock management, procurement, negotiation, auction, verification, invoicing, auditing, requisitioning and distribution. Furthermore, the improved access to information contributes to a reduction in the risks when outsourcing parts of the company's operations.

More efficient markets - the "naked economy"

Increased access to information means that the markets - the matching processes between buyers and sellers - also become more efficient. Some people therefore call the new economy the "naked economy". We can use the internet to search for products and compare prices, which brings down transaction costs and new companies find it easier to get into the market.

A good example of this is how the matching process on the labour market is facilitated by information technology. In the USA around 80% of personnel managers are said to use the internet and one of the largest employment agencies on the internet advertises more than one million jobs.[1] Four hundred of the world's 500 largest companies use web sites in their recruitment process. These internet employment agencies probably reduce the search costs and facilitate the matching process - reducing what is known as friction unemployment.

[1] Economic Report to the President 2000, Council of Economic Advisers.

This has a particularly strong impact when it occurs in conjunction with lower trade barriers and an increased exchange of trade. A popular example of the new international business to business is the joint electronic marketplace planned by the world's leading car manufacturers. This is estimated to achieve a turnover of USD 250 billion and to cover 60,000 sub-contractors. Electronic trading in components in the motor vehicle industry is estimated to be able to reduce the cost of producing a car by almost 15%.[2]

The new internet markets will naturally lead to stiffer competition. Sub-contractors will experience fewer barriers to entering markets and the price picture will become more transparent. This means that strong suppliers will be able to push out weaker ones more quickly and sub-contractors' margins will in general be put under pressure - the producer surplus will decline for the benefit of the consumers and prices will fall. Suppliers will be forced to rationalise and to improve in order to maintain their margins. The stiffer competition among those who remain will be the driving force behind continued growth in productivity.

How IT will boost growth

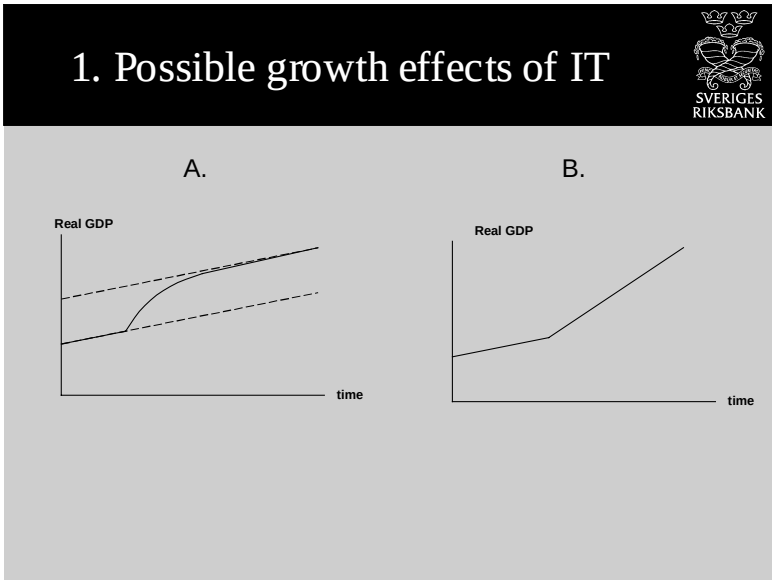
The more efficient production process and markets are both examples of boosts to productivity that will temporarily increase growth. A simple way of describing this is to imagine the new technologies and more efficient markets causing the path of the long-term potential GDP to shift outwards. This is done by growth strongly accelerating (see slide 1A). However, when the technological revolution has subsided, the boost in growth will also subside.

However, it is not self-evident that there is some form of "natural" growth rate to return to. Over a long-term perspective the growth rate has both varied and accelerated. I therefore intend to take up the other possible angle of approach sometimes mentioned, that IT could raise growth permanently. This could only be achieved by the technological innovations also creating the right conditions for a more rapid development in technology in the future (see slide 1B). One example of this type of development is what is known as Moore's Law. It is now 25 years ago that Gordon Moore, the founder of Intel, predicted that the capacity of a microprocessor would double every 18 months. So far he has been proved right and many believe that Moore's forecast may hold true far into the 2010s. However, despite the fact that certain technological indicators, such as the number of patents granted, indicate an increasingly rapid development in the USA and Sweden, it is difficult to believe in a perpetual technological acceleration.

From a central bank perspective, we can probably keep our distance to this debate by reminding everyone that our monetary policy goal horizon is one to two years. It suffices to imagine that the adaptation periods between the first and second dotted-line curve (in slide 1A) will take perhaps five to 10 years. From this perspective the question of whether IT developments will lead to a temporary or permanent increase in the growth rate is of mainly academic interest.

[2] The Economist, 23 September 2000

The models can manage the "new economy"



In this context, it may be appropriate to dismiss some prejudices about macro-models. Many believe that these models will become unusable and outdated in a "new economy", but that is not the case.

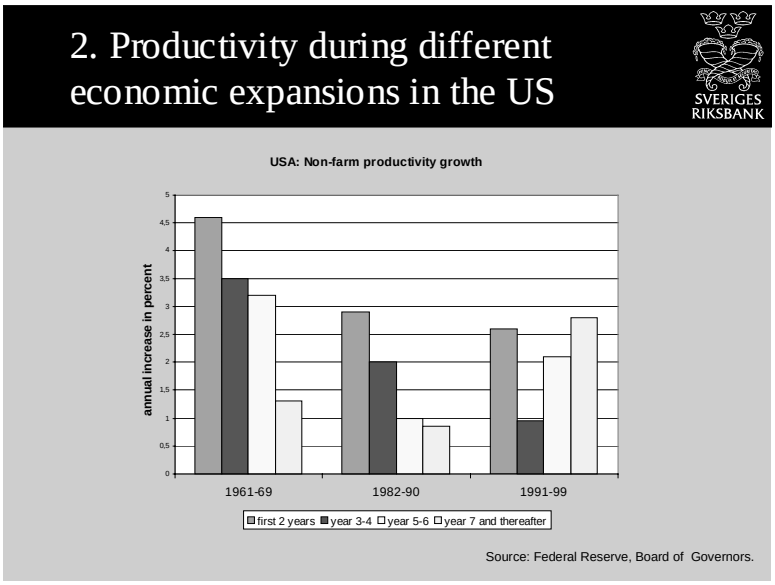
When structural changes take place, forecasts based on historical estimates naturally become more uncertain. It is therefore reasonable to attach greater importance on these occasions to recent information and indicators. But the models *need not* be assessed on historical data. In actual fact the models' parameters can be "calibrated" in such a way that their properties closely agree with the conception of the way the economy functions. This conception can, of course, be based on historical connections, but can *equally well be based on information not contained in historical data*. The models are in actual fact an important tool in testing whether historically assessed connections still apply and play an important role in signalling significant structural changes.

What does the data in the USA say?

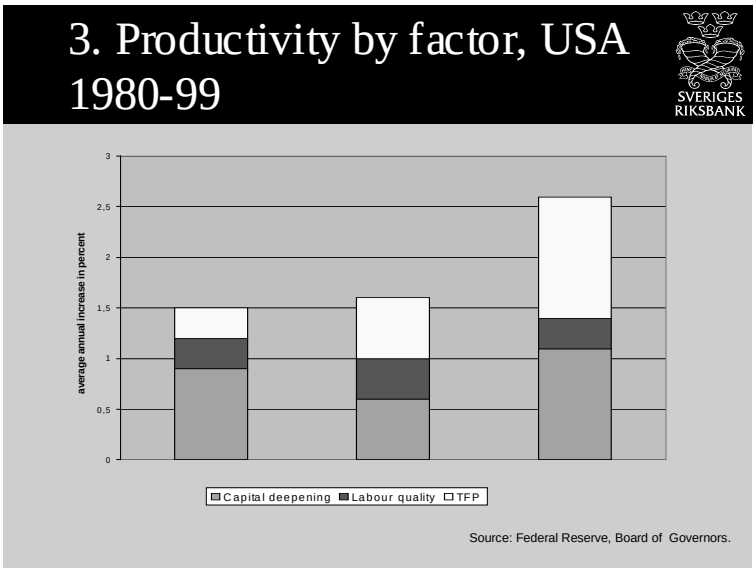
What information does factual data actually give us? Without doubt there is a clear break in the GDP growth trend in the USA, which has been much higher during the second half of the 1990s than during the 1970s and 1980s. The fact that this has occurred without any corresponding increase in inflationary pressure indicates that there has been an increase in the economy's long-term production capacity. But should this really be regarded as a "new" economy? In actual fact, the growth rate in recent years does not appear unusually high when seen in a perspective of 40-50 years. On the contrary, it is the growth rate during the 1970s and 1980s which appears to be unusually low.

What really makes the 1990s in the USA unique is the course of the economic upswing, its long duration and especially the developments in productivity. Growth in productivity has largely increased over time, instead of decreasing, as has been the case in previous periods of economic upswing (slide 2).

There has been an intense debate among leading US economists over the past year as to whether this increase in productivity merely reflects greater productivity in the manufacture of computers and other IT equipment, or whether this IT capital also has a spread effect to other parts of the economy. No one questions the fact that productivity in the actual manufacture of computers and IT equipment has increased. There has been an increase of almost 25% a year in this field during the 1990s. The dissension concerns the spread effects.



The background to this scepticism regarding the effects of IT on the rest of the economy lies in the "Solow paradox". Nobel prizewinner Robert Solow stated in 1987 that "we see computers everywhere but not in the productivity statistics". This was true until the mid-1990s.



Now, however, the effects of computers are beginning to show in the statistics and this paradox could be dismissed. Stephen Oliner and Daniel Sichel at the Federal Reserve in Washington[3] have made an in-depth analysis. This is based on the fact that the productivity trend has increased by just over 1 percentage point during the latter part of the 1990s and they conclude that IT actually accounts for most of the growth in productivity. Just under half of the total increase results from investments in IT. The remainder is the result of a more rapid increase in total factor productivity (TFP), that is to say, the part considered to be due to factors such as technology and organisation (slide 3). Half of this part

[3] The Resurgence of Growth in the Late 1990s: Is Information Technology the Story? May 2000.

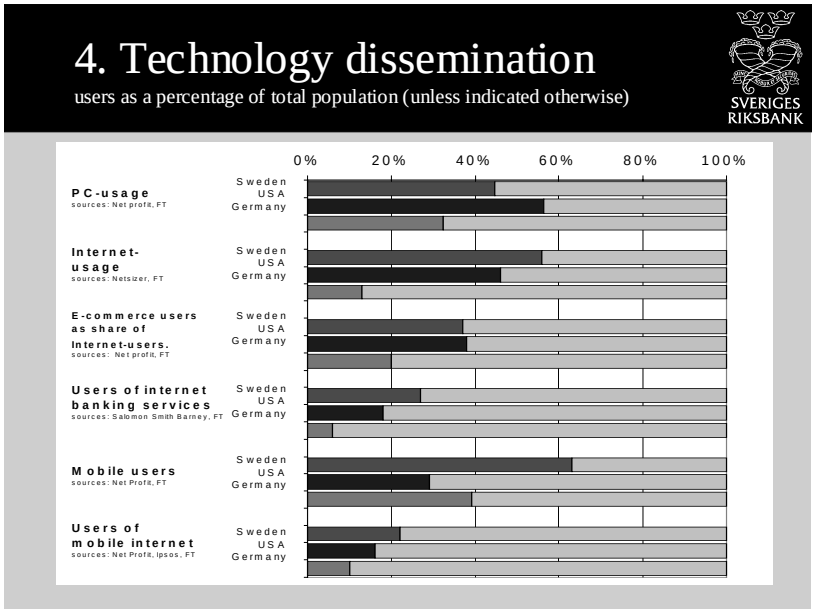
can be attributed to the production of IT products, but the remainder - corresponding to one third of a percentage point of the total increase - is attributable to a generally higher level of efficiency in the economy as a whole. Other studies have produced similar results. However, the question of how strong a relation this has to IT is still open. There are probably a number of factors working together in this process, such as deregulation, increased competition, a higher average level of education, etc.

The new economy in Sweden

While many people are wondering whether what has happened in the USA can really reach Europe, it cannot be denied that Sweden is showing many similarities. The good growth rate in recent years and low prices provide food for thought.

Firstly, a few words on the conditions in Sweden compared with the USA. Here I am not merely talking about the most fundamental factor, ie a broad base of well-educated labour. Price stability and healthy public finances are also important conditions for providing a "new economy" with growing power. In addition, strategically important markets, such as telecommunications and broadcasting media have been opened up to competition.

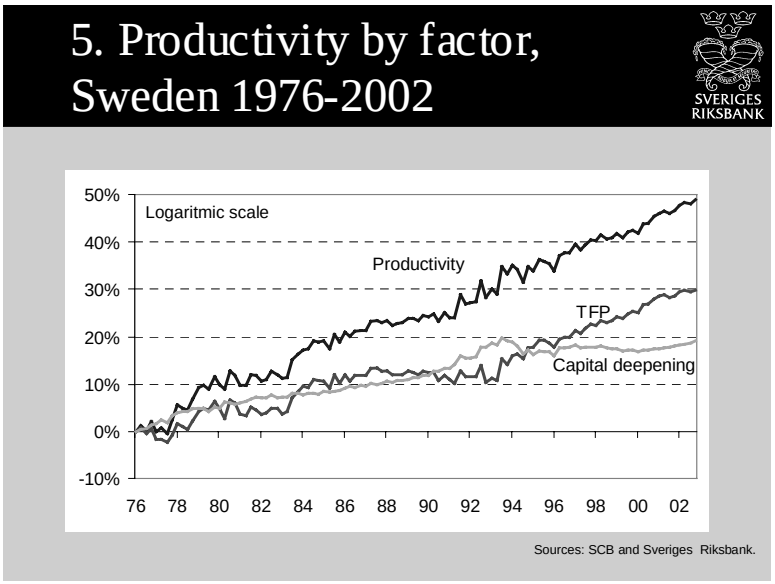
It is especially important that Sweden had a broad base of users of various technical systems at an early stage. A broad base is essential for users and producers to gain a real exchange from working in the networks comprised by the new technology. Ericsson's successful broadening of its operations from fixed to mobile telephony and Sweden's rapid licensing of first NMT and then GSM gave Sweden one of the world's broadest bases of mobile phone users. The subsidised provision of personal computers to employees also broadened the user base and gave Sweden the highest PC density in Europe. This of course facilitated the use of the internet and thus the general e-mail revolution in Swedish companies and homes. The combination of internet usage and the high density of mobile phones means that mobile internet, despite its slow start, has already come further here than in the USA. Slide 4 shows a summary of Sweden's position in various technological, network-based systems. As the internet is still in a phase of development, these figures can primarily serve as indicators of future growth.



However, Sweden's relatively high growth rate and low inflation rate can at the same time be partly explained by the fact that we are still absorbing spare resources and labour laid off in connection with the crisis at the beginning of the 1990s. The gap between actual and potential growth does not appear to be completely closed, while the Riksbank and others perceive that this gap is well and truly closed in the USA.

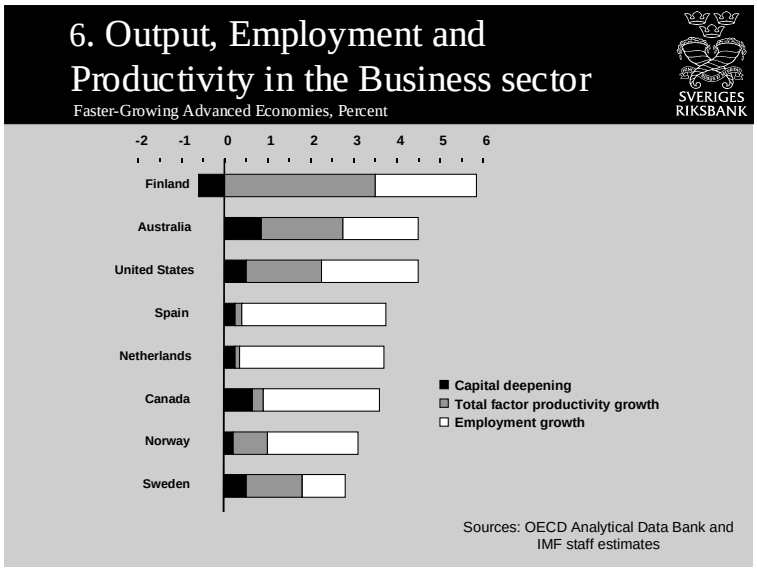
There are thus a few pieces of the puzzle remaining before we can feel convinced that Sweden is moving towards a US development: how large is the IT sector in the Swedish economy? How important is the IT sector to the rest of the Swedish economy? What does IT mean to productivity in Sweden? Unfortunately I have to say now that we know too little about this.

We know that productivity in Sweden has developed unevenly during the 1990s - a disjointed period disturbed by a bank crisis, currency crisis and problems with public finances. Investment has developed more weakly than in the USA, although it has picked up in recent years. Capital intensity does not, therefore, explain the growth in productivity. What does become more evident, on the other hand, is a break in trend in that part of productivity attributed to technology and more efficient organisation, ie total factor productivity TFP (slide 5). This showed a weak and tentative development up to the mid-1990s, but has really picked up over the last five years.

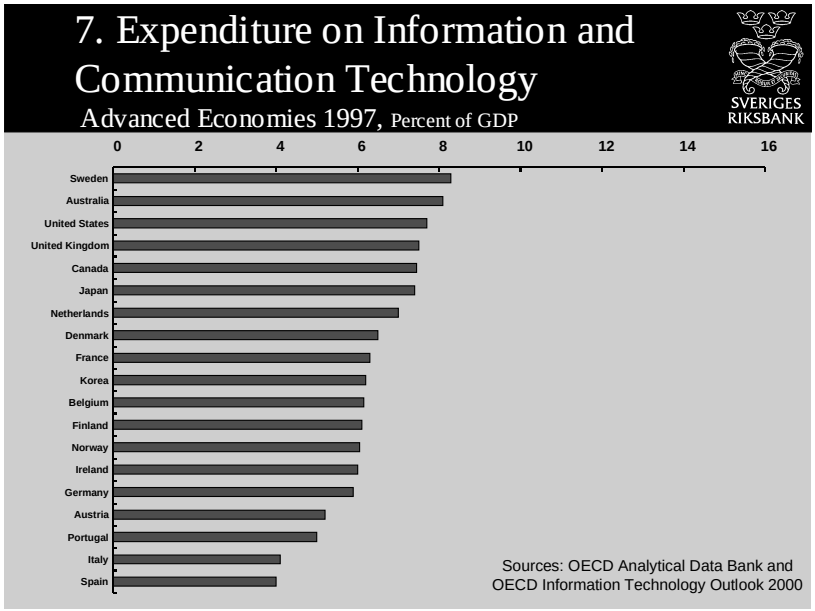


This picture is also supported by studies from the OECD *(*slide 6*)*. A comparison of the different countries shows that Sweden, along with the USA, Finland and Australia, has had the highest technology content (TFP) in growth, while other countries have grown through using more labour or capital.

What we still do *not* know is how large and how important the IT sector actually is in Sweden. One problem is that Statistics Sweden, which otherwise makes in-depth studies of many social phenomena, cannot discern investments in IT - much less adjust the price of these investments against the rapid qualitative development that constantly raises the performance of IT. It is necessary to obtain statistics in this field in order to calculate where productivity is coming from and how it is spread on, as Oliner and Sichel have calculated in the USA. The Riksbank therefore welcomes Statistics Sweden's announcement of a report on IT-related statistics and hopes to see concrete results.



Meanwhile, there have been passable attempts from various quarters to bridge over the gap in the statistics. The OECD has made a comparison of IT investments over one year *between* countries, which clearly places Sweden at the top of the list, together with the USA (slide 7). In addition, there are approximate calculations on expenditure on software which actually show a higher percentage in relation to GDP in Sweden than in the USA.



However, in the work on the Riksbank's Inflation Reports, there are factors that are easier to pick up. One is of course the fall in computer prices. Prices have fallen by almost 35% a year since 1996. There is even an element of "new economy" in the deregulation of the telecommunications and electricity markets. Firstly, it would not have been so easy to implement the deregulation without the aid of the new technology. Secondly, the deregulation might not have had the same impact without, for instance, the information provided on the internet, which helped consumers in making a choice.

All in all, I can allow myself to make a qualified guess on some areas, without knowing for certain:

1. Productivity, total factor productivity, has risen considerably in Sweden during the latter half of the 1990s. The emergence of information technology has probably been significant in this.
2. The effects will continue to be felt for a number of years, probably beyond the monetary policy horizon, for which reason the Riksbank will continue to monitor the IT phenomenon in future.
3. Deregulation and increased competition play a special role in Sweden, particularly as they have run parallel to IT developments.

At the same time, there is reason to point out that the "new economy" does not constitute a guarantee for a stable and positive development in asset prices, either in the USA or Sweden. On the contrary, history shows that rapid technological changes often lead to speculative bubbles. This was the case after the emergence of the railway at the end of the 19th century and the crash of 1929 followed on from the breakthrough of electricity and the internal combustion engine at the beginning of the 20th century. I do not intend to make an in-depth analysis of the causes here, but to point out that even very promising developments in the growth of productivity can live up to the profit expectations created during speculative bubbles.

Monetary policy implications

It is evident that large, IT-driven and IT-supported structural changes are underway and that these affect productivity and price levels in a way that needs to be taken into account when assessing inflationary pressure in the economy. We do not know how long the technological changes will have an effect, but I have every reason to believe that IT will affect developments in Sweden for the next few years, which basically comprises the monetary policy target horizon. On the other hand, there is in my opinion nothing to indicate that the "new economy" has invalidated any fundamental economic connections.

At the same time, rapid changes such as those we are now experiencing involve greater uncertainty. No one can say with any great precision how productivity will develop over the next few years and how large a role IT will play in its development. This uncertainty is enhanced by the difficulty in measuring the IT sector's significance as a result of shortcomings in Swedish statistics.

Uncertainty over the total effects of technological developments means that we must show greater sensitivity when formulating monetary policy. Let me call it being more "reactive" than would otherwise have been the case. By reactive, I mean that we must constantly reconsider our earlier assessments in the light of developments in the economy and the way the various parts actually react. I maintain that this has in many ways been a characteristic of our Inflation Reports over the past year. These reflect clearly how the view of potential growth and the connection between inflation and growth have changed as a result of the Riksbank's analyses and models taking account of structural changes in their assessments.

The repo rate could not have remained at its current level if price levels had not been affected by deregulation on several markets and the fact that we can see a positive development in productivity. Then there are of course a number of other important factors that must be taken into account, labour supply, wage formation, international price developments and, in particular, confidence in the monetary policy. However, developments in productivity will continue to play a central role in the assessments. The Riksbank monitors the various signs of the "new economy" and takes them very seriously.