Roger W Ferguson, Jr: Conversation with leaders of the "New Economy"

Speech by Mr Roger W Ferguson, Jr, Vice-Chairman of the Board of Governors of the US Federal Reserve System, at the New Economy Forum, held at Haas School of Business, University of California, Berkeley, on 9 May 2000.

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Thank you for inviting me here today to discuss with you the "new" economy and its implications. As always, the views I will be expressing are my own and are not necessarily shared by other members of the Board of Governors or the FOMC.

With my normal disclaimer out of the way, I'd like to turn to a brief review of the extraordinary performance of the US economy over the past five years. Since 1995, real gross domestic product has grown, on average, more than 4¼% per year. This is significantly above the pace in the previous five years, and you have to go back to the decade of the 1960s to find even closely comparable periods of consistently robust economic expansion. In this environment, the unemployment rate has fallen to 4%, and the underlying rate of price inflation has slowed, on net, despite very high rates of resource utilization. Even the most optimistic of forecasters could not have anticipated such a favorable confluence of economic events.

Productivity growth and cost reductions

So, what happened? As a policymaker, I'd like to think that well-executed monetary and fiscal policies played some role in creating an economic environment that was conducive to non-inflationary economic growth. Our economy has also benefited from past actions by the government to deregulate industries. The removal of unnecessary government regulation started more than twenty years ago, during the administration of President Ford, and gathered momentum during the Carter years. It has altered the business landscape. Deregulation allowed, indeed forced, businesses to focus more clearly on a marketplace that has become more competitive, with fewer constraints and increased flexibility.

But the dominant force of late appears to have been a significant upshift in the rate of productivity growth. After increasing 1.6% per year from 1990 to 1995, output per hour in the non-farm business sector - a conventional measure of productivity - has increased at an annual pace of about 2.6% since 1995. Cyclical forces - such as the inability of businesses to add to their payrolls as rapidly as they would have liked in response to the rise in demand - have probably played some role in these efficiency gains. But I suspect that longer-term, structural changes, reflecting the boom in capital spending and the revolution in information technology, probably have been more important. I will return to the evidence of this point shortly.

Why are the growth rate of productivity and the sources of that growth so important to policymakers? Very simply, economic theory indicates that, over the long run, faster growth of labor productivity allows faster growth of real wages - that is, wages adjusted for inflation. Without faster growth in productivity, businesses faced with a nominal wage bill that is increasing faster than productivity would be tempted to pass those increased labor costs to consumers in the form of higher prices for goods and services in order to protect profit margins. Adding the growth rate of labor productivity, or output per hour, to the growth rate of the number of labor hours gives an approximation of the rate of increase in the economy's ability to create goods and services. Since labor hours tend to be determined in the long run by increases in the working-age population, growth in productivity is the focal point. Why then are the sources of productivity growth important? If that growth in productivity is due to a change that outlasts the business cycle, then economists and policymakers can have confidence that the productive potential of the economy has changed. Economists speak of that as "trend" productivity and the resulting growth rate as the "trend" growth rate.

The structural changes that I mentioned above have had effects beyond increasing the rate of productivity growth. They have also enhanced the ability of businesses to reduce their operating expenses. In many industries, investments in information technologies have helped firms to cut back on the volume of inventories that they hold as a precaution against glitches in their supply chain or as a hedge against unexpected increases in aggregate demand. In fact, we have seen that the ratio of inventory to sales and inventory to shipments have both trended down since 1995. Product development costs have probably also been reduced through the use of better computer hardware and software, and new communications technologies have increased the speed with which firms can share information - both internally and with their customers and suppliers. This intense focus on cost reduction has been an important element in helping to head off the development of inflationary pressures in this expansion. Moreover, given intense competition and the resultant lack of pricing "leverage", ongoing programs to reduce costs have become a key part of corporate strategies to maintain or improve profit margins.

Technology change and productivity growth

Bob Solow - the MIT economist who won the Nobel Prize in economics for his work on the theory of economic growth - once quipped that you can see computers everywhere except in the productivity statistics! That situation has recently begun to change, and we now have strong evidence that the productivity growth that our economy has experienced is in fact due in part to newer technologies.

Research by two economists on the Board staff - Steve Oliner and Dan Sichel - sheds some light on the sources of this faster productivity growth. About one-half of the 1 percentage point increase in productivity growth over the 1995-1999 period can be attributed to so-called "capital deepening". As everyone here is well aware, providing your workers with more equipment improves his or her efficiency. Likewise, at the aggregate level, the high (and rising) levels of business investment raised the amount of capital per worker and thereby boosted productivity. It is also interesting to note that most of the capital deepening reflected greater spending by businesses on high-tech equipment: computers, software, and communications equipment. Another 1/2 percentage point of the pickup in productivity growth reflected technological innovations in the actual production of computer hardware and semiconductors as well as better management - perhaps assisted by these high-tech investments - of the nation's capital and labor resources. Oliner and Sichel estimate that, if one consolidates all the influences of high-tech investments, they account for about two-thirds of the acceleration in productivity since 1995. This research supports the view that fundamental changes are under way in our economy.

But technological waves ebb and flow, and it is natural to ask whether we can count on such rapid productivity growth in the future. On this score, I am cautiously optimistic. But, as an economist, I need to see hard evidence of actual ongoing productivity gains or cost reductions in the economic statistics to truly believe that the world is continuing to change in a fundamental way. I am confident that the efficiency gains that have already been achieved are permanent: the investments have been made, the technologies are in place and are being disseminated, and production is proceeding apace. But I think that it is wise to get support for the assertions that all of the new technologies and business practices now coming to the fore will prove to be as revolutionary as some of their marketing materials suggest. Clearly, there is great potential to improve efficiency using Internet-based e-commerce strategies such as electronic marketplaces and business-to-business supply chain management. But no one really knows how big those productivity gains will be, how long they will take to be realized, and who will be the ultimate beneficiaries. Have not other technologies emerged over the past fifty years - such as the television, the jet engine, or even air conditioning - that were equally revolutionary? Indeed the transatlantic cable and telephone probably revolutionized communications as much as any other technology. The Internet has attracted the most media and public attention as a symbol of the new economy. It clearly improves communication, collapsing time and space, but are we overstating the potential benefits of this one, admittedly stunning, innovation? Does the Internet have the potential to *continuously* improve business processes, as some enthusiasts argue, and if it does, what conditions are required to achieve that? I hope that, given the expertise of

the participants at this symposium, we can return to these and related questions in the discussion period.

The macroeconomic implications of faster productivity growth

A step-up in the growth rate of technological change certainly would have important implications for economic activity and inflation. As I indicated above, the main reason policymakers and economists are interested in the growth rate of productivity is that understanding that rate gives a clear understanding of the economy's potential to supply goods and services. Where would we look for corroborating evidence of this improved growth rate in technological change? The most immediate effects would be on capital investment. A more rapid pace of technological change raises the real rate of return on new investments - perhaps significantly. Put another way, a more rapid pace of technological change makes investments in capital goods embodying the new technology more profitable. When businesses recognize the new technological possibilities, capital spending accelerates to take advantage of the new profit opportunities. Businesses can better produce more output with the same labor input. While supply-side effects are clear, a new higher level of productivity growth would also affect the demand side of the economy. The employment and income generated by business spending on capital goods boosts consumer spending and sets off another round of investment spending. Typically referred to by economists as "multiplier-accelerator" effects, such processes would continue as long as the real rate of return on a new capital project exceeded the real cost for capital for that project. This is the process through which an innovation on the supply side of the economy generates a comparable increase in aggregate demand.

Theory also teaches that the increase in the rate of return on capital - even if generated by a rise in the growth rate of technical change - ultimately requires an increase in real market interest rates. Market interest rates must rise in order to maintain equilibrium between the demand for investment funds, which increases, and the supply of investment funds. And, indeed, we have seen that market interest rates, particularly for corporate issuers, have risen steadily for the last year or so.

This somewhat abstract description of the effects of a step-up in the growth rate of technical change bears a striking resemblance to the developments in labor markets, prices of goods and services, capital investments, and fixed-income markets of recent years. But there's still an element missing. How does the performance of the stock market in recent years fit into this picture? A higher rate of technical change that raises the productivity and hence the profitability of capital should elevate the valuation of equities. But how much should stock values rise under those circumstances? Are stocks today overvalued, correctly valued, or undervalued? I certainly do not know, and I am not aware of anyone who does. As a result, I believe that it would be unwise - and indeed impossible - for the Federal Reserve to target specific levels of valuations in equity markets.

However, equity markets obviously do have spillover effects on the real economy and, thus, need to be considered in assessing the aggregate balance of supply and demand. Given the efficiency and forward-looking nature of financial markets, even future technical innovations will have an immediate effect on equity valuations. Equity valuations in turn can influence consumer behavior. As you know, economists often speak of the "wealth effect", and econometric modeling indicates that consumers tend to raise the level of their spending between 2 and 5 cents for every incremental dollar of wealth over a period of two to three years. As a consequence, equity valuations can have a noticeable effect on consumption and on macroeconomic performance. Additionally, equity markets are a source of investment capital, and valuations in the stock market are one determinant of the cost of capital for businesses. To put a rough number on these influences, simulations by the Board staff using our econometric model of the economy suggest that wealth generated in the equity markets over the last four years added about 1 percentage point to the growth rate of real GDP.

Some particularly enthusiastic observers of the "new" economy argue that inflationary pressures are no longer a risk. I firmly believe that we should recognize that, even in a high-productivity economy, stresses and imbalances might emerge. In the present context, the most obvious indication of an imbalance is the current account deficit, which is both large and growing. This means that we are financing investment with savings from overseas. The other indicator of an imbalance between

demand and supply growth is the gradual decline in the unemployment rate over the last few years. It may be that this imbalance has served only to bring the unemployment rate to a new and lower sustainable rate, but it is also true that the wedge between demand and supply growth cannot continue indefinitely because, once pressures on limited resources rise sufficiently, inflation will start to pick up.

Monetary policy and the "new" economy

As I have said many times before, uncertainty about productivity trends is a major challenge in the design and implementation of monetary policy. As you can imagine, it is very difficult to infer the true structure of the economy through the interpretation of the twists and turns of incoming economic data. How do we know, for example, if unexpected developments are just temporary movements away from stable longer-run relationships or are manifestations of changes in the underlying economic structure? In many cases, this judgment is difficult to make with much confidence even considerably after the fact. In the meantime, we must bear in mind that the statistical relationships we work with, embodied in our econometric models, are only loose approximations of the underlying reality. The considerable uncertainty regarding statistical constructs such as the "natural" rate of unemployment or the "sustainable" rate of growth of the economy suggest, in my judgment, the need to downplay forecasts of inflation based solely on those variables. Some fog always obstructs our vision, but when the structure of the economy is changing, the fog is considerably denser than at other times.

What should be done when such uncertainties seem particularly acute? When we suspect that our understanding of the macroeconomic environment has deteriorated, as evidenced by strings of surprises difficult to reconcile with our earlier beliefs, I think that the appropriate response is to rely less upon the future predicted by the increasingly unreliable old models and more upon inferences from the more recent past. That means we should weight incoming data more heavily than data from decades past in trying to make judgments about the new economy and, of course, act appropriately when trends become clear.

But, even for those of us who take this more pragmatic approach, there are many serious challenges. Economic data are notoriously volatile, are easily affected by a variety of special factors, and are subject to revision as more reliable or more complete sources become available. For example, there are several estimates of the growth in real GDP in any particular quarter. The so-called "advance" estimate contains numerous assumptions about missing source data. One month later, the "preliminary" estimate is produced with a more complete information set. And, one month after that, the "final" estimate is generated. But that's not the end of the story. Once a year the GDP data are revised again to incorporate the results of source data that are only available annually. Thus, over this revision window, the picture painted by the GDP data can change significantly, and policymakers obviously need to be aware of this to avoid attaching too much significance to any one piece of data.

Moreover, it is at uncertain times such as these that the wisdom underlying the institutional structure of the FOMC becomes most apparent. A committee with broad representation can bring a variety of perspectives and analyses to bear on difficult economic problems. In addition, the anecdotal reports that the presidents of the Federal Reserve Banks bring from their Districts are especially valuable in the decision-making process because they afford a "real-time" sense of what is going on in the economy. Such diversity of information sources becomes particularly useful when our earlier assessment of the economy's structure has been drawn into question by surprises, even pleasant ones.

Even in a period of some uncertainty, monetary policy authorities have an important responsibility to remain vigilant with regard to inflationary pressures. Since in the long run there is no tradeoff between unemployment and inflation, we know that keeping inflation low and stable and maintaining an obvious stance of vigilance vis-à-vis inflation, so that inflation expectations are also relatively low, is the main value that a central bank can add to this equation.

Besides the issue of how monetary policy should respond to a productivity shock, questions have recently resurfaced about the effectiveness of any actions that the Federal Reserve might take. Some analysts note that economic growth has not slowed even though the FOMC has raised the federal

funds rate five times over the past year, and they draw the conclusion that the central bank has lost its effectiveness. I do not share that view. There have always been lags between the initiation of a monetary policy action and its effect on the economy. And, as Milton Friedman pointed out many years ago, these lags are “long and variable”.

Unanswered questions

As I promised, I will now pose several questions about the new economy to this gathering. I can assure you that this will not be a multiple-choice test, and it will ultimately be up to your shareholders and the American people to grade all of our answers.

First, what has been so special about the technological developments since 1995? How quickly have the innovations to computing and communications technology diffused throughout the economy? How much diffusion of the current technologies remains to be accomplished?

Second, what makes the Internet unique in its potential to improve productivity, and is the potential greater than that of other recent technological developments? What are the potential benefits - and costs - of the adoption of the commercial and communication strategies required to fully use the Internet? Does the Internet have the potential to *continuously* improve business processes, as some enthusiasts argue, and if it does, what conditions are required to achieve that?

Third, how have you used information technology or the Internet to improve productivity or reduce costs in your own businesses? How far along are you in this process? How important is spending on research and development to the long-run competitive position of your own business and the pace of innovation in your industry? Are new technologies emerging from R&D that have the realistic potential to increase productivity growth in the economy even further?

Fourth, do the methods used to value the so-called dot-coms differ from those used to value “old economy” companies, and should they differ? How should gross margins be considered in valuing dot-coms? Do tools used to value direct-mail companies apply to dot-coms? Given recent volatility in equity prices and the IPO market, are venture capital funds less forthcoming? Will new ventures still emerge at the same pace in a period of equity market volatility?

Concluding remarks

In conclusion, let me remind you that, while these are challenging times for monetary policymakers and financial market participants, the US economy is enjoying a period of unprecedented prosperity. Technological developments associated with the information revolution are truly transforming the way we work and play. Our job at the Federal Reserve is to do our utmost to produce a stable economic environment without inflation so that these trends can continue. I look forward to discussing these issues with you.