Panel Discussion on the New Economy

Robert J. Gordon

Northwestern University and NBER

For Presentation at
Annual Meetings of the American Economic Association,
New Orleans, Louisiana,
January 6, 2001
Definitions

Definitions of the New Economy in papers on productivity growth have become circular. The New Economy is whatever began in 1995, the clear turning point of productivity growth. Two complementary candidates to define the New Economy that occurred then are (1) the invention of the World Wide Web and (2) an acceleration in the rate of price decline of computer hardware from -15 percent in the decade before 1995 to -31 percent from 1995-99. The pace of technological advance accelerated, and the leading edge of the productivity growth revival was faster growth of MFP in the production of computer hardware.

Excluded from these definitions of the new economy are the computer chip and IT more broadly conceived, since they go back long before the productivity revival. Computers came in the 50s, chips in the 60s, ubiquitous dumb terminals on office desks in the 70s, and PCs in the 80s, not to mention such other IT marvels as bar coding, laser scanners, and ATM machines. Thus when we read such new economy hype as "the computer chip is going to change almost everything about the economy," we can disregard it as irrelevant — the chip and IT are much too broad a definition of what has been happening since 1995 and leave open why productivity didn't revive 20 years earlier and in fact why the 1972-95 growth slowdown happened in the first place. A corollary is that much research on the productivity of IT at the micro level, especially that based on pre-1995 micro data, is not helpful in understanding the past 5 years — what matters is understanding the acceleration of IT investment, not IT investment itself.

The Computer-Productivity Nexus

What happened after 1995 was straight substitution — the prices of computer hardware doubled their rate of price decline, firms and households boosted their purchases with an elasticity greater than unity, but with less than the elasticity that had obtained before 1987. This price response came out in the national accounts as a boom in the purchases of real, constant dollar hardware and in the software needed to use the hardware. The excitement over Windows 95, soon replaced by Windows 98, brought a flurry of hardware purchases required to use ever-more complex software, validating the famous motto, "What Intel Giveth, Microsoft Taketh Away."

In addition to Microsoft's operating software improvements, the hardware investment boom was fueled by another software innovation, the web, which diffused into homes and offices with unprecedented speed. The resulting fever of investment in communications infrastructure by its nature was partly temporary and would subside after a transition from initial construction to subsequent maintenance.

Empirical studies like mine, and those of Oliner-Sichel and Jorgenson-Stiroh, finessed the problem of defining the New Economy by measuring at the margin — the New Economy was not everything achieved by computers, but just the post-1995 acceleration of MFP growth in computer production and in the capital-deepening effect created by the investment boom in computers. The central question became, how much
had MFP growth accelerated in the rest of the economy, beyond the production and use of computers — that is still under debate — the answer ranges from "substantially" to "not at all", depending on which industrial sectors of the economy you cover and whether you allow for any cyclical effect of temporarily rapid productivity growth in response to output growth, especially between mid-1999 and mid-2000, when real GDP grew much faster than anyone’s definition of potential output growth.

However you slice and dice the productivity growth revival, whether it was partly temporary and largely due to the production and use of computers, it was real and substantial and brought a virtuous circle in his wake. The productivity growth revival and the faster fall in computer prices both contributed to holding down inflation, aided by extraneous factors, including a temporary cessation of medical care inflation, and the role of the Asian crisis and other factors in boosting the dollar and causing an absolute decline in import prices and in energy prices through early 1999. Some economists add to the list a separate set of extraneous factors pushing down the NAIRU — demographics, temporary help agencies, internet job search, and putting some of America’s younger unemployed males into prison.

The resulting combination of low inflation and low unemployment could be interpreted as the result of a large beneficial supply shock, explaining why the late 1990s turned out to be the exact macroeconomic opposite of the 1970s and early 1980s. Everything was the mirror image of the 1970s. Stock market valuations surged, the government went from deficit to surplus, the saving rate went to zero, consumption grew faster than income. It wasn’t all due to the computer-productivity nexus, since those extraneous factors helped quite a bit, and some of those (like prisons) will still be with us even if the computer investment boom fades away.

The Over-Hyped New Economy

However it is defined, a significant ingredient of the New Economy was hype. The internet was the Third Industrial Revolution. E-commerce would wipe out bricks and mortar, prices for consumers would plummet, inflation and the Phillips curve were dead, the business cycle was obsolete, and the Dow was headed for 36,000. Some economists raised faint voices of skepticism, led by Robert Shiller’s gloomy assessment of the stock market boom. My role as skeptic involved two parts of the virtuous circle. My interpretation of inflation in the Goldilocks economy denied that the Phillips curve was dead and argued instead that low inflation could be explained by a list of beneficial supply shocks; in retrospect I omitted an independent role of the productivity growth revival as a member of that list. In my view, the outlook for inflation depended in part on how long the beneficial shocks lasted, although part of the standard econometric Phillips curve is a powerful role for inertia; this has caused the good shocks of 97-98 to
hold down inflation in 1999 and 2000 and has prolonged the boom.

My second role as skeptic was on a broader topic, whether the internet and the web deserved the rubric of Third Industrial Revolution, at least compared to the Great Inventions of the Second Industrial Revolution, which included electricity and all its spinoffs, the internal combustion engine, chemicals, plastics, pharmaceuticals, communication, entertainment, and indoor plumbing. For me, the fabled networking of the web was just another step in the evolution of electronics and communication going back to the telephone and telegraph, and consumer e-commerce was just a new form of mail-order catalogue shopping — eliminating the initial human phone contact with a computer screen and providing more choice, but still requiring stocking the warehouse, finding the goods in the warehouse, and such dreary old-economy activities as packing and shipping.

The falling prices of computers and the invention of the internet obviously created consumer surplus, albeit a small fraction of that created by the Great Inventions. The inexorable decline in computer prices brought elementary economics into play: exponential growth in computer capability combined with one human brain and ten fingers brought diminishing returns operating at a speed without precedent to reduce the average and marginal product of capital, measured as in the national accounts by computer speed, memory and storage capacity. Elementary economics came into play in another dimension: consumer surplus was not enough to sustain e-commerce, but profits were needed as well. When they were not forthcoming, the NASDAQ responded with a vengeance.

The Virtuous Circle Unwinds

The virtuous circle would inevitably come to an end, and perhaps be followed by a vicious circle. The question was, how and when. Goldilocks was supported by such unholy twins as an exploding current account deficit and rising dollar; both could not continue forever. Unemployment couldn’t continue to fall through zero. The jolt to the economy of stable unemployment meant by definition that actual output growth would decelerate to potential growth, and that soft landing would be a tough trick to carry out.

Everybody is talking about the NASDAQ bust and how fast Alan Greenspan can ride to the rescue, but they’re missing much of the point. The economy is in trouble for old-economy reasons engraved in macro textbooks for decades.

Go back to Goldilocks and the list of beneficial supply shocks. Energy prices turned back in 1999. Economic analysts breathed a sigh of relief last summer when gasoline prices headed back down without without apparent macroeconomic damage.
But they haven’t seen anything yet — heating bills in Chicago tripled over last year in December and will quadruple in January, and this is a supply shock with a wallop. At last year’s low level of energy prices, I spent three times as much on natural gas as on gasoline at the pump. This year it will be 10 times as much. The dollar is hanging by a thread, perhaps at the top of a cliff. The seeds of faster inflation are being sown, in gasoline prices, natural gas prices (Bob Hall can tell us what will happen to California electricity prices), the effect of a possible dollar decline on import prices, in medical care premiums, and even in computer prices, which slowed their rate of decline back to -13 percent over the past year. How far will Greenspan’s benign neglect of accelerating inflation extend?

Perhaps the most neglected of the old-economy models dates back to 1940, the multiplier-accelerator. It is operating powerfully today. The virtuous circle pumped up income growth, which in turn boosted investment growth by an inherently temporary mechanism. With some of the props of the virtuous circle knocked away, income growth is slowing dramatically and the accelerator will move into reverse. Not only will the desired capital stock cease its double-digit advance in some industries; it may fall, and net investment could turn negative in some places. The multiplier effects have hardly begun to play out. For each lost job at a dot com or auto company, lost income and spending will deprive two or three other people of jobs.

Can monetary policy come to the rescue? All this unwinding has been happening despite 10-year interest rates lower than at any point in the past 15 years, with the brief exception of a few months during the Asian crisis of 1998. Lags in the effects of monetary policy are a year at least, and much can happen in that year.

The New Economy Unwinds

As the new economy investment boom unwinds, I have come to realize that the debate on computers and productivity growth has been framed incorrectly. For 18 months I’ve been decomposing the productivity growth revival into a cyclical component and a large remaining structural component, which I’ve been treating as a permanent acceleration in trend. But as Oliner, Sichel, Jorgenson, and Stiroh have shown us, much of this acceleration in trend is the direct result of capital deepening, all of it in the form of computer investment. Everyone agrees that non-computer capital has contributed nothing to the capital-deepening effect. Much slower growth, or even shrinkage, of investment in computers and software will cause some or all of the capital deepening effect of computers to evaporate, and what we all agreed on six months ago, the permanent part of the productivity revival based on computer investment, may turn out not to be so permanent after all.