Simin Hojat, PhD.

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The New Economy: Cyclical or Structural?

Abstract

One of the most astonishing occurrence of the last decade of the 20th century in the USA, is the technological revolution in information technology and the changes it has brought about in economics and social arena, specifically in the USA. In the realm of economy these changes are formed into a new paradigm, called *new economy*. In this essay, the main features of the new economy are discussed and their empirical credibility are verified. In particular, emphasis is made on the controversial argument, whether the socio-economic changes that have occurred in the U.S. as a result of the advent of information and communication technology since mid -1990s are structural and permanent or were cyclical and temporary?

The purpose of this essay is to study the most astonishing occurrence of the last decade of the 20th century in the USA, technological revolution in information technology, and analyze the changes it has brought about in economic and social arena both in the USA and around the world. In the realm of economy these changes are formed into a new paradigm, called *new economy*. In this essay, the main features that are attributed to the new economy and its empirical verification in the U.S. economy since 1990s are analyzed. In particular, emphasis is made on this controversial argument, whether the socio-economic changes that have occurred in the U.S. as a result of the advent of information and communication technology since mid -1990s are structural, permanent or cyclical? Although there is no consensus among economists on this matter, empirical evidence verifies that the US economy since mid-1990s experienced

moderately high productivity and economic growth coexisted with low inflation and low unemployment which has been historically unprecedented.

The word new economy was first appeared in the book by Peter Drucker (1969) "The Age of Discontinuity"; it took 30 years for the name to be recognized again (Drucker, as cited in GiJu, et.al, 2010, P. 28). The term, 'new economy' is used to advocate the changes that expansion and globalization of information technology brought about to the way that world economy operates since late 1990's. The concept of new economy has been rapidly apprehended as a new revolution in the USA and gradually has been adapted by most of the world globally. Daniel Bell (1973) was first to see that the US society was in the process of transition into a new structure and he came up with the term post-industrialism to describe the growing trend in the economy from manufacturing to services and the social consequences that ensue (Bell, 1973). Advocates of post industrialism believed that growth and adoption of new technologies change our social relationships, bring about more equality in wealth and power, as well as flourish our values of equality, democracy, and affection for each other.

However, the concept of new economy is different from that of post-industrialism. New economy that started from focusing on some specific types of new technologies, has covered most of the production process and has changed many aspects of life both nationally and globally. However, there is no consensus among economists on pros and cons for new economy in the literature and despite the over optimism of some advocates, there are some economists who believe that Information technology has not changed the economic structure and the way the economy works (Lee, Peek & Rensel, 2008). They doubted whether there is a new economy? "*Is this 'new' economy evolutionary or revolutionary" (P.104).*

Nevertheless all economists seems to be in consensus that the main pillar and the instigator of the new economy is the Information and Communication Technology (ICT). Innovation of computer chips in the USA was the foundation for microcomputer revolution of 1970s and it lead to the internet boom of last half of 1990s (Carpenter, Lazonick, & O'Sullivan, 2009). ICT existed before the 1990s, but it was flourished since mid-1990s by producing almost daily innovations in computer processing power, software technology, multimedia technology, wireless communications, and above all in the internet technology. ICT innovations started being implemented in the ICT producer sector, then moving to the other sectors of the economy, from the car manufacturing to grocery stores and from the steel mills to department stores, to the drug stores, and so on.

The main foci of this article is to evaluate structural changes that happened on the interconnections amongst macro phenomena in the economy such as employment, productivity, inflation, and economic growth, as well as international and financial markets. Special emphasis is made on intellectual capital and intangible assets with a reference to the financial crisis of 2007-2009. The other important issues in the research are analyzing the effects of ICT on growth and structural change in capital market, composition of labor force, education, business, and commerce.

So far, there have been three different phases of technological revolution in the last 110 years in the United States: "the rise of manufacturing in the 1890s, mass-production and national corporatism in the 1940s and 1950s, and high-tech entrepreneurialism and services in the global economy of the 1990s" (Atkinson, as cited in Lee, Peek, & Rensel, 2008, p.104)." Every new era has been replaced by the old one and changed the structural architecture of the economy and society. It has changed the pace of growth, the welfare and wellbeing of people, the education

and the judicial system, the public policies that govern over private enterprises, and "traditional conceptions of family and morality"(Lee, Peek, & Rensel, 2008, P.104).

The newest phase of technology revolution happened in the second half of 1990s primarily in the USA. In this era, technological innovations in the information and communication technology (ICT) industry resulted in some macroeconomic consequences for the US economy unprecedented by historical standards. Although there is no consensus among economists, but proponents of the new economy believed that the fast growth of technology in ICT investments in the USA since 1950 has boosted the efficiency in the economy, has created higher economic growth. Also, it has provided a more stable economy with little cyclical movements, less or no inflation, and less unemployment. Therefore, they foresaw that the existence and spread of new economy could provide better employment prospects, improve work conditions and higher standards of living, as well as could lead to less income inequality and a new life style for the individual American citizens. In other words, they made similarity between this change of technology and the changes that the industrial revolution of the 1800s brought for the developed countries. These arguments suggested that with the emergence of the 'new economy' the rules and principles that governed the US economy have changed in three ways. (a) The stronger productivity growth permits the US to maintain a higher long run economic growth without inflation. (b) The coexistence of low inflation and low unemployment changes the nature of the business cycle. (c) The very nature of ICT innovations increases the economic returns and positive spillovers that would alter how the economy grows (Houben & Kakes, 2002).

However, the economic realities did not meet the expectations of the metaphor on new economy in most of the cases. Stock market experienced a technological bubble a few times

since 2000 and real estate bubble and financial crisis together with high unemployment occurred in 2007-2009, carpenter referres to these bubbles as "new economy bubble" (Carpenter, Lazonick, & O'Sullivan, 2009). Business cycles have not been removed from the economy and we have seen quite a few economic cycles since 1950s, and the last one was the great recession of 2007-8. It seems that the problems of old economy reappeared in the new economy (Lee, Peek & Rensel (2008).

New global economy of the 21st century is composed of a "trilogy of interactive forces that includes globalization, trade liberalization, and the information technology and communications" (Passaris, 2011, P.1). The new economy has increased globalization at an unprecedented rate and in the new economy geography and distance have became irrelevant. In other words, the use of internet and other communication instruments in commerce has dissipated the distance barrier from commercial transactions (Cuzovic, Mladenovic, & Cuzovic, 2012). The new phenomenon ecommerce is invented and countries around the world have adapted the modernization, as well as transitional and transformational change of ICT. Along with the growth of ecommerce, the flow of foreign direct investment (FDI) has been enhanced. Furthermore, international business integration, outsourcing, and international movement of labor market have increased. The catalyst for the growth of globalization were newly developed multinational enterprises and old multinational corporations that benefited from new technology. Nevertheless, the growth of competition from emerging economies has made export of the products and services very competitive and that has encouraged trade protection policies by some countries.

Trade liberalization and availability of information for consumers in the internet has made pressure on firms to be more productive, more competitive, and to increase the business

integration, both vertically and horizontally. Moreover advancement and spread of technology among firms and small enterprises, has increased labor productivity, has reduced costs and prices, and has added to the human capital versus physical capital in the firms. This is a very important property of new economy and will be discussed later in this article under "'intangible assets".

Another aspect of new economy has been constant increase in technological improvements in a way that the quality of products have improved constantly. New phone, new lap tops, and new software come to the market almost every six months. This is due to the fact that information asymmetry and imperfect market, if not vanished completely, was alleviated in new economy. This fact has increased the awareness of consumers concerning the quality of the products and has increased the competitiveness among producers. In order for enterprises to get ahead of the competition, they have no choice but to improve their technology, to increase their skilled and innovative labor, as well as constantly produce something new with better quality and lower prices.

One of the important factors that advanced disproportionately in the new economy is the increase in the service sector, specifically in the financial sector. In an analytical survey by Nissan, Galindo, and Mendez, (2011) they concluded that in the new knowledge based economy the role of services, in particular financial services increased more compared with the manufacturing era. The growth of financial services has been due to the expansive use of financial instruments and ever increasing financial liquidity that was needed for the growth and investment in the ICT sector. The most innovative form of these financial instruments is a new concept known as "virtual money" or "currency". This money that is generated when companies acquire another company with the help of their own shares, or even better when a manager

would accept payment in stock options instead of salary. Also, ICT technology has been mainly financed by private equity funds, such as Venture Capital. Venture capitalism is one of the important steps towards the creation of knowledge economy.

Another aspect of new economy that has been noticeable during last two decades is the development of knowledge in the production function. Francis Bacon was the first to call "knowledge is power" in the sixteenth century (as cited in GINGHINĂ, SĂCU & SALA, 2012). Today the rules of business and the system of accounting are changing to pronounce knowledge as an asset that adds value to the economy. The value added to the production through skilled labor, good structural management, and trained labor is called "intangible assets". It is suggested that Knowledge has become the main source of power and the basis for classification and separation of people (GINGHINĂ, SĂCU & SALA, 2012). They believed that the economic power and competitiveness of companies are in intangible assets. Schumpeter (1942) stated that innovation is a fundamental source for enterprises and Innovation can be achieved by investment in intangible assets (Schumpeter as cited in SĂCUI1, & SALA, 2012).

For business enterprises to become successful and competitive globally, it is essential that they increase their investments in information and communication technologies, to increase the computers and related equipment in their production system, to increase research and development (R&D) investment, and to spend more on training the labor force on computer software and technical expertise. For many organizations investment in such intangibles now equal or exceeded their investment in tangible assets such as buildings, office equipment, hardware, machines, and vehicles (Blaug & Lekhi, as cited in GiJu, et al., 2010). Intellectual capital is the value driver of the enterprise and its most valuable asset.

In other words, the new economy can be referred as information economy, because what distinguishes the new economy from the old economy is the unique properties of information technology. In a general term, Information Communication Technologies (ICT) can be defined as all technologies that consist of communications and computer technology and are used for collection of information, processing, storage, and transfer of information. It is in fact the increasing the importance of information on production process that has brought changes in the structure and sub-structures of national and international economies. ICT for the new economy is as important as mechanization for the industrial economy. What makes a big change in information technological based economy is the specific property of ICT which is the capacity to grow continuously, to increase productivity of labor, to reduce production costs, and lower the price of the products in the market (Hava, & Azer, 2011).

Another distinct feature of new economy is that production is subject to increasing rate of return. In the new economy as supply increases, the cost of production per unit falls, price per unit decreases, and demand for the product increases. In other words, there is no diminishing return or upward supply curve in the new economy; the supply curve in ICT industry is downward and with the increase in production the marginal cost of production could approach to zero. The fact that development of technology increases the depth of capital, improves the organizational management of the industry, and improves the productivity of labor, is the evidence that development and expansion of ICT in the production system adds value to the production (Hava, & Azer, 2011).

Hava and Azer provided data for the USA which was the leading country in ICT and indicated that between the years of 1960 and 1980, the share of information processing equipment and software investment increased continuously in total investment in equipment

and software in the USA. Later in the 1980s, the increase in ICT investment occurred at higher rates, and in fact for the "year 2008 it was above the rate of fifty percent" (Hava, & Azer, 2011, P.58). Moreover, the research presented data that the improvement of labor productivity in the USA in the second half of 1990s was due to ICT growth and investment. Also they provided data that technological innovations which resulted in reduction of prices in computer equipment, and the decline in price of computer software caused an increase in investment in the computer by the whole economy. Thus an" annual 48% increase occurred in investment of computerization in these years" (P.58). The advance in ICT that has resulted in strong economic growth together with high labor productivity and low inflation rate is the birth of new economy that has spread through the US economy and has transformed the structure of the economy in the whole world.

Another aspect of new economy that in particular attracted the research by non-US economists is the idea that all countries globally want to get most out of this new era of technology. The study performed by Popescu, Popescu , & Popescu (2009) illustrated that degree of benefit from development of information and communication technology in different countries vary with their state of development. The authors concluded that in order to benefit from global advantages of ICT technology, countries should concentrate on their development first. Further research performed by Kuznetsov (2012) indicated that Countries with rigid and non- democratic culture have a harder time to adapt to the new era of technology (Kuznetsov, 2012).

Ramona, (2009) put forwarded the idea that new economy is all about ideas, individualism, creativity, and information. Entrepreneur is the one who materializes information into knowledge and into production of goods and services and make the profit. The author stated that corporations that are incorporated into the new economy are doing better than the ones that

are still operated with the old management structure. His analysis is based on the fact that when corporations operate in the new economy which is based on knowledge and intangible assets, they perform more efficient, they have higher short term profit, and their portfolio show higher "long-term value (Ramona, 2009).

Financial crisis of 2008

It was claimed that the center of 2008 financial crisis was the sub-prime mortgage crisis that was unfolded in 2007. The core of the problem was considered to be bundling of mortgage backed securities which was collateralized by sub-prime mortgages, and selling it as AAA assets to the investors around the world. Therefore, it was easy for mass media and even a few economists to put the blame of the entire crisis on the collapse of US housing market. Housing market that enjoyed unprecedented growth between the years of 1950 up to 2006 started with the idea that all individuals should own a house and this goal was achieved through easy credit regulations. In September 2007, after the first shock in the mortgage market, two coherent happenings changed the real estate market completely: (a) Housing prices ceased to rise, and (b) mortgage interest rates began to increase. These two combinations was the start of the defaults on mortgage payments and also reduction in the volume of mortgages. Finally it all ended in the collapse of the security market and big investment firms and their bankruptcy.

Another factor was deregulation that took place during the two decades prior to financial crisis and deregulation of derivative markets that started in 1998. In 2004, the US Securities and Exchange Commission relaxed the regulations on net capital and gave the investment banks and other non-bank financial institutions the opportunity to increase their level of debt. Therefore investment banks by way of maximizing this financial opportunity shifted a major portion of their assets and liabilities off the balance sheet and increased their level of leverage ratio.

This wave of deregulation that started in the 1980s by the proponents of free market mechanism and laissez fair pushed for deregulation and less presence of government in economic affairs. The tendency was towards privatization of public sector and the extension of contractual arrangements for public sector activities in a way that public sector became more entrepreneurial in its operation. It means a change of the role for government from an influential and controller into a catalyst and facilitator. In other words government ‘s role for private sector was supportive and complementary and it was restricted in the areas of legislature, property rights, intellectual property, enforcement of contracts, and investing in infrastructure to facilitate the growth of economy by private sector (Passaris, 2011).

As Chinese say, “Crisis is an opportunity riding the dangerous wind” (Passaris, 2011, P.3), therefore the global financial crisis of 2008, was an awakening sign for the faults and deficiency in the economy. The 2008 financial crisis showed that there were faults in the economic structure and redesigning and realigning of economic structure became a necessity. The first economist that developed a model for post depressions of 1930s was the British economist, John Maynard Keynes. His model gave power to the government with a supportive role in economic decision making. In fact, his model represents a kind of mixed economy that encompasses both government and the private sector in such a manner that these two collectively and collaboratively accomplish the basic macroeconomic objectives of price stability, employment creation, and a high rate of economic growth. In this case the role of government is to stabilize the economy through the means of fiscal and monetary policy and to alleviate the business fluctuations in the economy. According to Passaris, the problem with Keynesian model is that governments are elected for a short time with a political mandate, while achieving the ideal macroeconomic objectives takes longer time. Thus, in Keynsian model, “the short term

political cycles prevailed at the expense of the longer term economic time frame". (Passaris, C., E., as cited in Passaris, 2011, P.3).

In the aftermath of financial crisis, the legitimacy of government, especially in financial sector was increased. In the USA, the government and the Federal Reserve went into action immediately to save the economy of the world from a great disaster. Their action can be summarized as: Massive fiscal stimulus, expansionary monetary policy, and extensive bailouts of big corporations. The financial tsunami and economic crisis that surrounded the whole international community of nations as a result of this great recession, was an adequate evidence that the economic structure and the regulatory framework that were designed for the old economy was not suitable for the" newly emerged global economy of the 21st century" (Passaris, 2011, P.9).

Another view was that the main reason for the financial crisis of 2007-2009 was overinvestment in technology, mainly by over leverage of the technological industry. The notion of self – financing or financialization of monetary economy during 1990s facilitated the overleverage, in particular in technological *(*Fumagelli, & Lucarelli, 2011). J.M. Keynes was one of the first economists who initiated monetary theory of production and the rejected the idea that money is neutral Monetary. By accepting this theory, money creation and expansion of money found its significance in economic growth.

New economy is referred as fiancé-led- growth economy (Fumagelli, &, Lucarelli, 2011). Financial structure has changed and money is created by the interaction between the banking and the enterprise sector, as well as self-securitization. The banking system provides credit to the enterprises and the decision by banks to whom they give credit and by how much credit is a decisive factor in pattern of growth in the economy. Also, enterprises can finance themselves by

securitizing their stock and issuing new securities in the financial market. In new financing the three sectors of Finance, Insurance, and Real estate (FIRE) create credit. This is because, in the FIRE sector wealth grows exponentially and interest payments become the base for more loans. The more interest payment result in more bank loans and more demand for real estate and more loan. This process of credit creation or "rentier economy" was suggested to be one of the causal effect for the financial crisis of 2009 (Hudson, as cited in Fumagalli, & Lucarelli, 2011).

Empirical Validity of the New Economy

To verify the validity of the effect of new economy from empirical standpoint, I compared the basic macro performance of the economy since the second half of the 1990s which was the heydays of the new economy with the decade before that up to the present as far as data was available. In this attempt, I addressed three issues: The changes that occurred in the US economy after 1950s were temporary, cyclical, or permanent and structural? How much of the change was due to ICT investment? (c) Were the effects of the new economy strong, persistent, and extensive enough to be carried over into the future for good and would bring about the societal, managerial and organizational changes that would expect from it.

Labor productivity

Labor productivity is defined as the value of output produced per hour of labor input and productivity growth refers to annual or quarterly growth of productivity. The general belief by some economists is that new economy and growth of increase in ICT has resulted in the growth in productivity of labor more than what could have been explained by improvement of technology and capital deepening in the economy. Due to this fact, high labor productivity has been compensated for higher wages and the inflationary pressure that traditionally would have followed by growth in output had been eased, inflation has been lower during these years. This

analysis verifies that growth in productivity decreases cost of production per unit of product and reduces the price of the product and make it possible to have economic growth with less inflation.

The data on trend of labor productivity in the US from 1947, after the Second World War, up to 2012 is analyzed

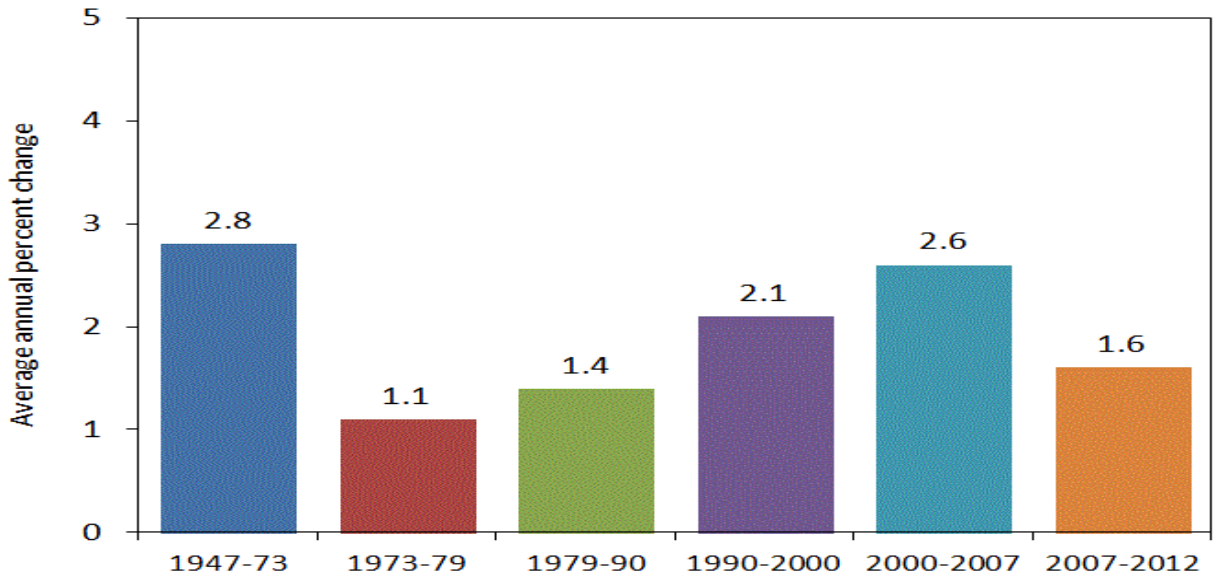

Figure 1. Annual rate of labor productivity growth in the US nonfarm private business: 1947-2012 (Source US Bureau of Labor Statistics).

As the above figure indicates, as a result of mass production and application of new technologies after the Second World War, from 1948 to 1973 the US labor productivity grew faster than average. During this period, labor productivity rose on an average of 3.2% per year with the 1950 experiencing the highest rise of 6.6%. After 1973 due to higher oil prices and higher inflation labor productivity slowed down and from 1973 to 1995 its annual average was reduced to 1.4% per year indicating that the productivity rates for 1947-1972 especially for 1950s and 1960s were exceptional compared with the ordinary trend of labor productivity in the

USA. However, between 1995 and 2000 along with the exponential rise in the ICT investments, labor productivity in the US started to rise again, growing at an annual rate of 2.9% per year. In the period between 2000 and 2007, annual percentage change in labor productivity was 2.6%, almost equal to the percentage change in 1947-1973. Since 2007, due to financial crisis and recession of 2007-2009, the rate dropped to 1.6%.

Figure 2 shows the change in the labor productivity growth for the manufacturing sector. As figure 2 below indicates, the change in labor productivity in the manufacturing sector has been more significant. Annual average percentage change in labor productivity in the manufacturing sector soared to 4.1% from 1990 to 2000. The rate of growth was continued from 2000 to 2007 to 3.9% and was dropped to 1.8% in the period of 2007 to 2012. As Figures 1 and 2 illustrated, despite the slowdown in economic activities since the year 2000, labor productivity soared to levels even higher than the 1995-2000 periods, but was reduced between 2000 and 2007.

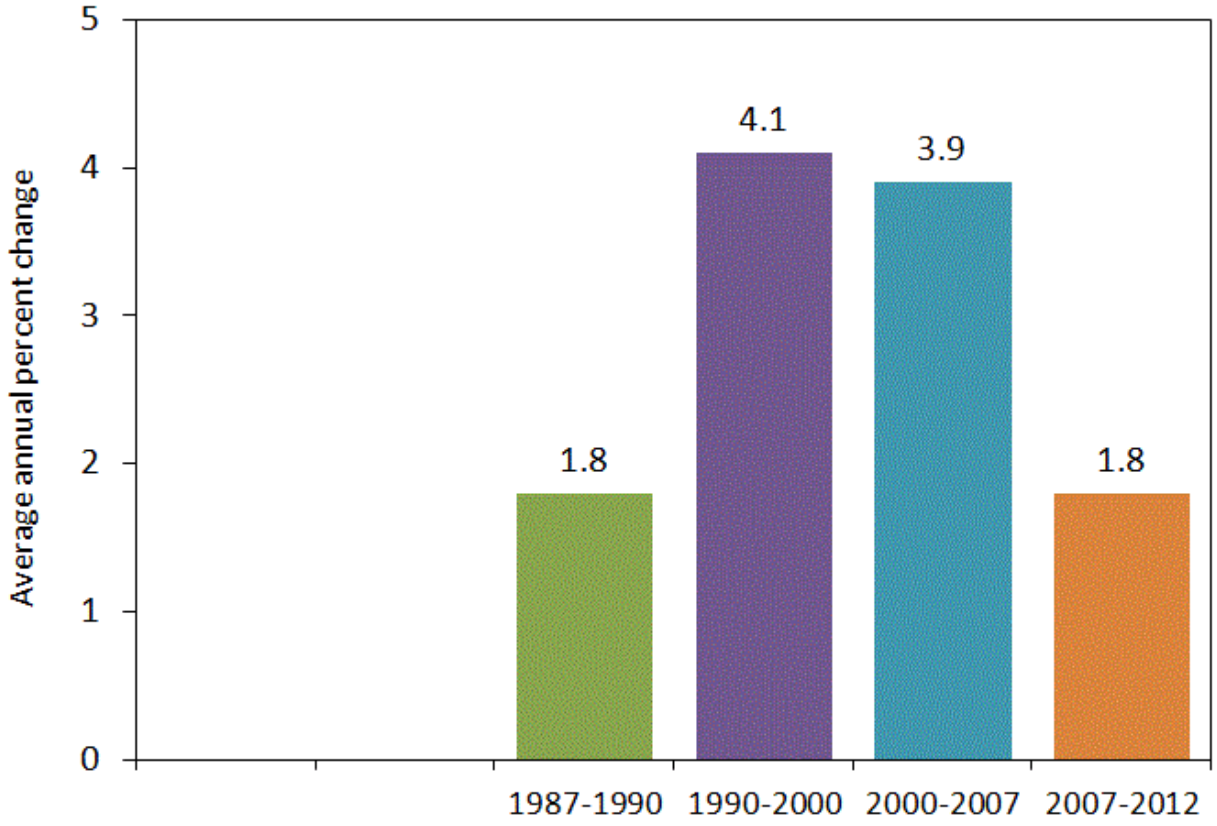

Figure 2: Annual rate of labor productivity growth in the US Manufacturing Sector, 1987-2012 (Source US Bureau of Labor Statistics).

In recent years, a new measure of productivity has been used that measures the growth of output in relation with all the inputs and it has become more popular in assessing the effect of technology on factor efficiency. US Bureau of Labor Statistics provides estimates of this measure under the name **multiple factor productivity index**. This index measures the effect of knowledge on the way that all factors of production are utilized. This newly built index can be a more reliable source of information on whether the effect of ICT revolution on economy has been something substantial and structural, or something temporary that will not continue in the future. For example, the rate of growth of multi factor productivity changed from .03 between

the years of 1987-1990 to 1.2 in the years 1990-1995 and 1.8, and 2 percent in the years of 1995-2000, and 2000-2007. This indicates great improvement that took place in labor productivity after the increase in the use of ICT technology products in enterprises. However, after 2007, it dropped to .06 and .08, for the periods of 2007-2011 and 2010-2011(Us Bureau of Labor Statistics, Multifactor productivity Measures).

Due to the fact that financial crisis of 2007 reduced labor productivity, it is difficult to conclude by how much and how big ICT technologies has affected the growth of labor productivity. Consequently, economists have not been able to reach consensus whether changes in productivity growth that occurred after 1950s has been structural and long lasting or cyclical and temporary. As for the future, if the faster economic growth in the second half of the 1990s has brought about structural change in the US economy with far reaching social consequences, the productivity growth to be sustained for many decades in the future.

Nonetheless, the empirical evidence of growth in labor productivity supports the idea that the innovation of ICT technologies and internet impacted differently on various sectors of the economy. The use of internet has increased profoundly in the growth of sectors such as: Services, finance, banking, trade, and ecommerce and it has increased productivity and has reduced the cost of production and prices in these sectors.

It is notable that, some of the effects of ICT on productivity has not been captured in the standard national data, unless the accounting standard adjusts to the new features of new economy. For example, in the new economy there is substantial contribution to the growth due to intangible assets and the ICT revolution has increased substantially the share of intangibles in Gross Domestic Product Nakamura (1999). The effect of these new knowledge-based assets on the productivity through legally recognized as trademarks, patents, and other titles, are not

accurately counted in the national output statistics. Besides, Research and Development (R&D) outlays, which are a significant part of the intangibles, are treated as expense in the national accounts and not as assets. Nakamura recalculated US national accounts of the 1990s by adjusting them for R&D outlays and reported that if R&D were treated as investments in the national accounts, it would have raised the GDP of the USA by about 1.5% and national savings as a percentage of GDP Would have risen from 15.9% to 17.1% (Nakamura, L. 1999).

The inclusion of intangible assets in the accounting system of enterprises and government has attracted a lot of attention in economic literature. There is considerable amount of official and unofficial proposals as to how data can be measured to give a more accurate and realistic data in the new economy. In 2002 the International Association for Official Statistics (IAOS) held a Conference in London in which a representative from the US Bureau of Economic Analysis was also present. At this conference special attention was paid to the importance of growing changes that were brought about by ICT in economic and social life of people and several proposals were made on improvement of data measurements in the new economy. In this Conference new economy was described as 'the Knowledge Based Economy' and 'Information Society' which was characterized by: (1) Intensive use of ICT technologies with major effects on other technology developments such as biotechnology and material science. (2) Intensive adoption of knowledge by companies and markets leading to faster economic growth on a global scale. (3) Rapid increase in the products and services available to consumers and businesses. (4) Changes in the way consumers and businesses behave and interact.

With this perspective, the IAOS Conference recommended that National Statistics Institutes (NSIs) and statisticians to incorporate the following major aspects of the 'new economy' in their measurements. Some of the propositions of the conference were as follows: (a)

To develop criteria for measuring ICT related capital formation, such as accounting for software and more generally for the intangible assets such as R&D which clearly fell within the definition of 'Knowledge Based Economy. (b) To update statistical data in such a way to reflect the economy's changing structure, especially in the growing service sector. (c) To develop a new National Accounts Statistics that incorporates the new features of new economy. (d) To identify and assess new assets that serve as inputs in the production process, in particular the importance of human capital as an asset and its measurement and recognition in calculation of labor productivity was emphasized.

Inflation and unemployment

Another highlight of ICT evolution for the economy has been its effect on inflation. The point of the matter is that inflation does not rise along with higher growth and lower unemployment, if it is accompanied by a rise in productivity of labor. The conventional view of the relationship between inflation and unemployment is explained in a model known as the Philips curve. According to the Philips curve, as economy grows, unemployment rate falls and after reaching a rate below a certain rate which is known as "natural rate", inflation rate increases faster than expected. It is calculated that the natural rate of unemployment for the USA economy is around 5.6 percent of the labor force. Traditionally, this was accepted by economists that there is a negative relationship between unemployment and inflation rate. Lower unemployment give rise to higher wages and consequently higher prices and this lowers the growth in the economy and possible future recession.

However, the historical data indicates that ICT revolution has changed this chain of causation and nations can experience growing prosperity without fear of unemployment or

inflation. Table 1 and *Figure 3* below showed the trend of inflation and unemployment in the US for the 1980s, 1990s, and for the years 2000 to 2012.

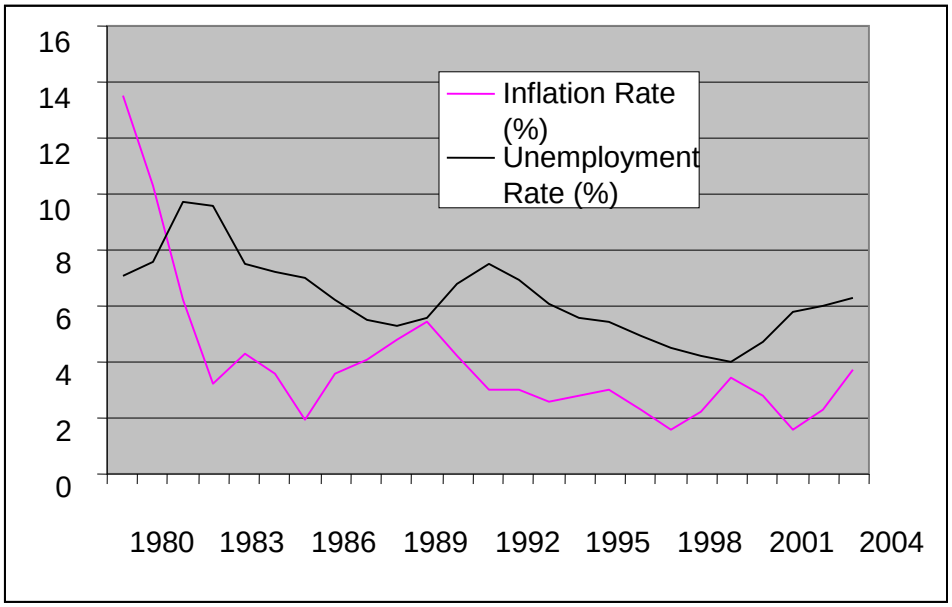

Figure 3. Annual rate (percentage point) of unemployment and inflation in the US: 1980-2004 (Source US Bureau of Labor Statistics).

Table 1

Annual Rate (Percentage Point) of Unemployment and Inflation in the US: 1980-2012 (Source US Bureau of Labor Statistics).

Year	Inflation Rate	Unemployment Rate	Year	Inflation Rate	Unemployment Rate	Year	Inflation Rate	Unemployment Rate
1980	13.5	7.1	1990	5.4	5.6	2000	3.4	4
1981	10.3	7.6	1991	4.2	6.8	2001	2.8	4.7
1982	6.2	9.7	1992	3	7.5	2002	1.6	5.8
1983	3.2	9.6	1993	3	6.9	2003	2.3	6
1984	4.3	7.5	1994	2.6	6.1	2004	3.7	6.3
1985	3.6	7.2	1995	2.8	5.6	2005	3.4	5.1
1986	1.9	7	1996	3	5.4	2006	2.5	4.6
1987	3.6	6.2	1997	2.3	4.9	2007	.036	4.6
1988	4.1	5.5	1998	1.6	4.5	2008	.228	5.8
1989	4.8	5.3	1999	2.2	4.2	2009	.949	9.3
2010	.179	9.6						
2011	.672	8.1						
2012	.601	8.9						

As the data indicates during 1980s unemployment rate was always above 5.5% and periods of low inflation was accompanied by higher unemployment rate; therefore, almost Philips curve was confirmed in the 1980s. However, in the 1990s, both unemployment and

inflation continued to decline, specifically from 1995 to 2000 unemployment declined from 5.6% of the labor force in 1995 to 4.5 percent in 1998 accompanied by low inflation rate of around 3% in 1996 to 1.6 % in 1998. This was one of the strong reasons that new economy advocates suggested that economic growth has impacted unemployment and inflation rate differently this time and they cast doubt on the applicability of the Philips curve to the economic conditions of the ICT era. In the era of post-2000, in some years unemployment and inflation data move in the same direction and in other years they move more in line with Philips curve model. It seems that up to 2005 unemployment was rising, so was inflation rate; in the second half of 2000s up to 2007 both were falling and after 2007 that was the start of great recession, unemployment soared, but inflation fell below 1%. Thus, while statistics did not support the analysis of Philips curve, similarly, it did not support the proposition that put forward by new economy advocates.

As data illustrates what determines the relationship between unemployment and inflation rate depends on the status of economy. In the downturn, specifically in a deep recession such as great recession of 2007-2009 inflation is low and even there is the possibility of deflation, but unemployment is high. On the contrary, when economy is in the expansionary mode, higher growth results in lower unemployment and higher inflation. However, in the condition of ICT the productivity of labor increases constantly due to the vast use of internet and other communication facilities, then, economic growth is accompanied with lower inflation and lower unemployment as it is indicated by data of unemployment and inflation since 2009.

Nevertheless, the question of whether the effects of ICT technology on economy is cyclical or structural has yet to be unanswered. Differentiating between temporary short term factors and long term structural changes in unemployment versus inflation has been what divided the critiques and the proponents of the ‘new economy’ metaphor. It is only by empirical

verification of longer time series of data and by observing unemployment and inflation rate under a wide range of economic conditions that it becomes possible to conclude if any structural change has occurred in the US economy as a result of ICT technology.

Conclusion

Despite lack of consensus among economists on the viability of new economy, evolution of technology in the ICT industry has been a great occurrence in human history and has penetrated in all and every aspects of human life both nationally and internationally. Although cyclical problems still exist in the market economy, but economies are growing rapidly and underdeveloped countries have become prosperous and developed constantly. In the USA that has been the pioneer in new technology, the manufacturing sector has been transformed swiftly to the new economy. The fear of losing the competitiveness has forced the firms that were running with traditional old equipment to adapt to new technology. The entrance of new and young innovators in the internet has increased the innovative capability in the economy. New innovations cut the cost of production, lowers the price, create more demand and creates a new cycle of growth that can continue forever as long as the increase in monetary wage exceeds the pace of inflation. Globally, cost of international transactions has been reduced, internet has brought closeness to people, and the geographical distance has been dissipated. Geographical and cultural differences does not matter anymore, the world had become united, and the internet has changed the way people and corporations live and do business.

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