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## THE REFLECTIONS OF NEW ECONOMY ON MONETARY POLICIES AND CENTRAL BANKING

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### Abstract

*Developments in the information and communication technologies have been causing significant changes on the working mechanisms of the economy both at the national and international areas. Some of the developments can be indicated as follows: the dramatic increasing of capital movements amongst nations; the speeding of global economic integration; the effects of world's financial markets; the creation of new payment mechanisms; the decreasing of transaction and knowledge costs; getting the information in a permanent and fast way; the fluctuations in financial markets; increasing potential growth and productivity rates. It is possible to summarize the mentioned developments with the concept of "new economy". In this paper, the reflections of new economy on monetary policies and central banking are examined. According to the results of this study, the views about monetary policies and central banks will no longer exist in the future is not realistic. As far as we are concerned, central banks will continue to guarantee the stability of financial system all over the world as was the case in the past.*

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## **1. Introduction**

The globalization and developments in the information and communication technologies in the last quarter of the 20th century have given birth to important changes in the commercial, educational, health, economic, social, political and cultural lives of the societies. Likewise, some researches suggest that the developments in the information and communication technologies boost productivity, offer new employment scope, increase potential growth ratio without raising inflation, affect living standards positively, change traditional commerce and payment types, promote democracy, facilitate state-citizen relations, increase health service quality and convert goods, labor and money markets into more competitive forms. In spite of these positive developments, there are some negativity such as digital division and instability.

Various concepts such as “e-economy”, “new economy”, “e-commerce”, “e-financing”, “e-money”, “e-banking”, “e-education”, “e-health”, “e-government”, “e-democracy” and “e-citizenship” are seen to have used to describe the developments to which the information and communication sectors lead. The multitude and diversity of the concepts can be taken as a sign how much the innovation in the information and communication technologies affects many aspects of everyday life.

In this paper, the macroeconomic reflections of the new economy on monetary policies and central banking are examined. In fact, it is hard to say that the works carried out in the economics literature have a long history. However, it should also be indicated that a consensus at which direction the new economy will affect monetary policies and central banking as well the other subjects of economics has not been created. The economists in this case can be divided into two main groups: The first one is the group of economists who support the idea that the new economy does not constitute any changes relating to monetary policies and central banking. The

second one is those who argue that the new economy can cause vital changes on monetary policies and central banking.

This study has been organized as follows: we have examined the conceptual issues concerning new economy in the second section, the advent of the new economy and its basic features in the third section, and the macroeconomic reflections of new economy on monetary policies and central banking in the fourth and fifth sections.

## **2. The Definition of New Economy and Conceptual Issues**

In the literature, it is apparent that there is no consensus on how to express the impacts of the developments in the information and communication technologies on economy and the extent of their impacts. And this is accompanied with some problems. The first problem is connected with the *concepts* used to express the impacts of information and communication technologies on economy. However, when the literature is scrutinized, the multitude of the frequently referred words such as “digital economy”, “digital era”, “digital sector”, “information economy”, “e-commercial”, “e-economy”, “e-conomy”, “electronic commerce”, “knowledge-based economy”, “knowledge economy”, “weightless economy”, “virtual economy”, “internet economy”, “new global economy”, “network economy”, “frictionless commerce”, “innovation economy”, “connected economy”, “goldilocks economy”, “next economy”, “new new economy”, “renewed economy”, and “new old economy” summarize what is meant by the problem.

The second problem is related to the *definition* of the concepts to have been used for analyzing the changes emerged in economy. This problem results from the various perspectives that have been formed on the issue of the *dimension* or *depth* of the change. It is meant by the dimension of the impact what are the elements that have caused the changes in economy, whether the impacts of the technological changes on economy are observed in a certain sector or in all sectors, whether or not they are observed in certain countries or throughout the world and

whether structural changes have been experienced in economy. Definitions are given in narrow or broad sense according to the dimension of the specified impacts.

These two problems are also encountered in the context of the concept “new economy”, which is the subject of this study. Likewise, even though a quite large literature of new economy exists, it is pretty hard to respond correctly to the query what the *new economy is* at this stage. Consequently, it is rather a difficult task to try to define new economy.

The usage of the concepts and definitions covering lots of different meanings, paves the way to misinterpretation and misguidance. Thus, when selecting and defining concepts, it must be cautious about the fact that they hold different and similar contents. In the reduction of these specified problems, it will be helpful to express clearly the contents of the concepts and definitions to be used in the studies. For example, Cohen, Delong and Zysman (2000) stated that they preferred to apply a new term named “E-conomy”. In their opinion, the term “network economy” is of very narrow meaning; on the other hand, “new economy” very broad. Kling and Lamb (2000) suggest that using the term “digital economy” to include the goods and services whose development, production, sale, or provision is critically dependent upon digital technologies, and the term “information economy” to include all informational goods and services like publishing, entertainment, research, insurance services, and teaching in all of its forms.

The proposals below should be taken into consideration in analyzing the impacts of the changes in the information and communication technologies on economy:

- If the internet is considered to be a stimulating power of new economy, such concepts as “digital economy”, “network economy”, “e-economy” or “internet economy”, can be applied in the same sense. These definitions are in narrow sense.

- If new economy is not considered to be restricted with the digital or internet economy, in this case the new economy can be defined in a sense that will cover digital economy, globalization, innovation and sustainable development (<http://www.crie.ro/nouaeconomie/se1-presentation-VD.html>). The definitions given in this scope are considered to be broad meaning.

In many studies, it is seen that new economy concept covers the basic features of internet economy and information economy. In this context, the term “new economy” describes an economy where both final output and intermediate goods predominantly consist of information and where the digital information and communication technologies provide world-wide access to almost any available information (Piazolo, 2000, p.3).

In the light of conceptual discussions which are tried to be summarized above, it is beneficial to mention some descriptions related to new economy.

While Stiroh (2002) defines new economy as *productivity gains, unemployment declines, and inflation moderation in the late 1990s that resulted from technology globalization, and increased competitive pressures*, Bullard and Schaling (2000) label the new economy as a condition in which productivity and growth increase are experienced on the one hand and inflation follows a stagnant line on the other. It is accepted that the basic factor lying under the growth without enhancing inflation is the higher performance provided in productivity.

According to Nordhaus (2000), *the new economy involves acquisition, processing and transformation, and distribution of information. The three major components are the hardware (computers) that processes the information, the communications systems that acquire and distribute the information, and the software which with human help manage the entire process.*

Nakaramura (2000) expresses the new economy as *high-tech innovation* and he thinks that *the globalization of world markets have changed our economy enough that we need to think about it and operate within it differently.*

To Atkinson and Court (1998), *the term new economy, refers to a set of qualitative and quantitative changes that, in the last 15 years, have transformed the structure, functioning, and rules<sup>3</sup> of the economy.*

Gordon (2000) defines the new economy as *mid-1990s acceleration in the rate of price decline in computer hardware, software, and telephone services, the corollary of an acceleration of the exponential growth rate of computer power and telecommunication capability, and the wildfire speed of development of the internet.*

Some of the definitions limited with a few examples related to the new economy have been made in a narrow sense and the others in a broad sense. While Atkinson and Court (1998), Stiroh (2002) and Nakamura (2000) prefer to make a broad definition, Nordhaus (2000) and Gordon (2000) are interested in narrow one.

Two final points to be made here are that there are another division concerning the definitions of new economy as “moderate and extreme views” and that there are views in the literature against the new economy concept. For example, Meyer (2001) argues that *new economy depends on how you define it and where you live.* It is beyond the scope of this paper to discuss these views.

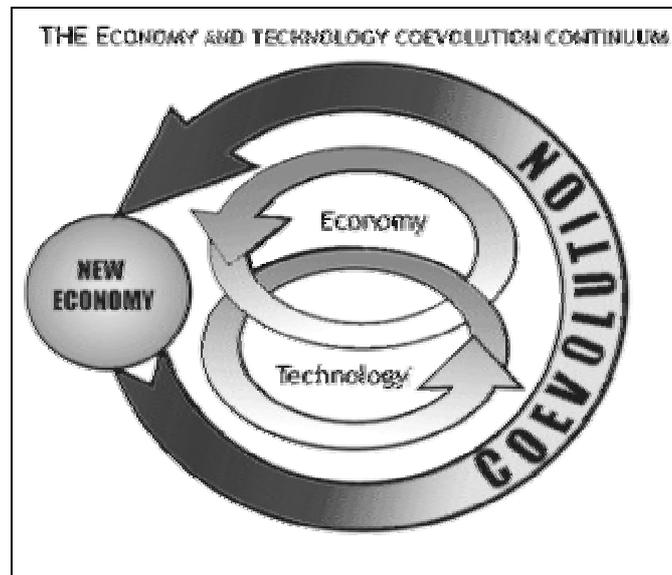
### **3. Advent and Basic Features of New Economy**

The developments in the information and communication technologies, globalization and rising global competition have been the fundamental factors in the advent of new economy. The economy and technology coexist and co-evolve to produce so-called *new economy*. Thus new economy can be formulized briefly as that  $technology + economy = new\ economy$  (Figure 1).

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<sup>3</sup> According to Kelly (1999) there are ten new rules for the new economy: 1) Embrace the swarm, 2) Increasing returns, 3) Plentitude, not scarcity, 4) Follow the free, 5) Feed the web first, 6) Let go at the top, 7) From places to spaces, 8) No harmony, all flux, 9) Relationship technology, 10) Opportunities before efficiencies (Kelly, 1999, p.161-162).

Similarly there is a close correspondence between new economy and globalization. The motto “new economy is globalization’s daughter” by Furia (2000) sums up this correspondence very briefly and clearly.



**Figure 1: Creation of New Economy through Co-evolution.**

Source: Tanjuakio, 2002, p.3

The close correspondence between technological developments, globalization and competition that are the dynamics of new economy can be worded variously. For instance, by reducing the cost of communication<sup>4</sup>, information and communication technologies have helped to globalize product and capital markets. In turn, globalization spurs competition and therefore innovation, and speeds up the diffusion of new technologies through trade and investment (Berk, 2002, p.4). As a consequence of this close correspondence, the unseen successes have been achieved in the macroeconomic performance of economy. Likewise, in the 1995-2000 period of the USA economic performance far exceeded even optimistic forecasts with 4.1 % in real GDP

<sup>4</sup> E.g. whereas the cost of a three-minute telephone call between New York and London was \$ 244.65 in 1930, this cost fell to \$3.32 in 1990 (IMF, World Economic Outlook, May, 1997, p.46).

growth, 3.2 % in real GDP per capita growth, 4.6 % in average unemployment and 1.7 % in average core inflation (Baily, 2001, p.203).

**Table 1: Keys Features of Old Economy and New Economy**

ISSUE	OLD ECONOMY	NEW ECONOMY
<b>Markets</b>		
<b>Economic Development</b>	Steady and linear, quite predictable	Volatile and chaotic
<b>Market changes</b>	Slow and linear	Fast and unpredictable
<b>Lifecycle of Products and Tech.</b>	Long	Short
<b>Key Economy Drivers</b>	Large industrial firms	Innovative entrepreneurial knowledge-based firms
<b>Scope of Competition</b>	Local	Global hyper competition
<b>Market Structures</b>	Stable	Dynamic
<b>Competition: Name of the Game</b>	Size: The big eats the small	Speed: The fast eats the slow
<b>Marketing: Name of the Game</b>	Mass marketing	Differentiation
<b>Enterprise</b>		
<b>Organization of Production</b>	Mass production	Flexible and lean production
<b>Key Drivers of Growth</b>	Capital / Labor	Innovation / Knowledge
<b>Importance of Research/Innovation</b>	Low – Moderate	High
<b>Key Technology Drivers</b>	Automation and mechanization	Digitization
<b>Main Sources of Competitive Advantage</b>	Lowering cost through economies of scale	Innovation, Quality, Time-to-Market, and Cost
<b>Pace of business</b>	Slow	Appreciably faster with ever-rising customer expectations
<b>Emphasis on</b>	Stability	Change management
<b>Business Development Approach</b>	Strategy pyramid: vision, mission, goals, action plans	Opportunity-driven, dynamic strategy
<b>Success Measure</b>	Profit	Market capitalization
<b>Scarce Resource</b>	Financial capital	Human capital
<b>Decision Making</b>	Vertical	Distributed
<b>Innovation Processes</b>	Periodic, linear	Continuous, systemic
<b>Production Focus</b>	Internal processes	Entire value chain
<b>Strategic Alliances with Other Firms</b>	Rare, "go alone" mindset	Teaming up to add complementary resources
<b>Organizational Structures</b>	Hierarchical, Bureaucratic	Networked
<b>Work Force</b>		
<b>Leadership</b>	Vertical	Shared: employee empowerment & self-leadership
<b>Policy Goal</b>	Full Employment	Higher real wages and incomes
<b>Work force characteristics</b>	Mainly male, high proportion of semi-skilled or unskilled	No gender bias; high proportion of graduates
<b>Skills</b>	Mono-skilled, standardized	Multi-skilled, flexible
<b>Education Requirements</b>	A skill or a degree	Continuous learning
<b>Management-Employee Relations</b>	Confrontation	Cooperation, Teamwork
<b>Employment</b>	Stable	Affected by market opportunity, and risk
<b>Employees Seen as</b>	Expense	Investment
<b>Government</b>		
<b>Business – Government Relations</b>	Impose Requirements	Encourage growth opportunities
<b>Regulation</b>	Command and Control	Market tools, Flexibility

Source: Atkinson and Court, 1998, p.7, and Kotelnikov, Vadim, [http://www.e-coach.narod.ru/business\\_guide/crosscuttings/new\\_economy\\_transition.html](http://www.e-coach.narod.ru/business_guide/crosscuttings/new_economy_transition.html)

Table 1 has been arranged to display the key features of new economy. As can be seen from the table, new economy, on the contrary to old economy, is open to rivalry, man-centered, information-based, flexible, swift, changeable and digitalized.

At this stage, the query “Does it mean that new economy changes the basic rules of economy?” is still beyond the scope of our paper.

#### **4. Reflections of the New Economy on the Monetary Policy and Central Banking**

The use of information and communication technologies in monetary sector commonly has emerged new payment instruments such as e-cash, network money and access products. Generally, becoming widespread of electronic payment instruments called electronic money (e-money)<sup>5</sup> has brought into the agenda the discussions among the economists related to whether there will be a “cashless world” or “cashless society”. These discussions have revealed a wide literature studying the effects of electronic money on central banking and monetary policies.

Spread of new payment instruments which have become an indispensable unit of the new economy is of fairly important impacts on the future of central banks and monetary policies. The direction and the level of these impacts will depend on three factors: the changes in demand for central bank’s reserves, money multiplier and the functioning of monetary transmission mechanism, which are briefly discussed below.

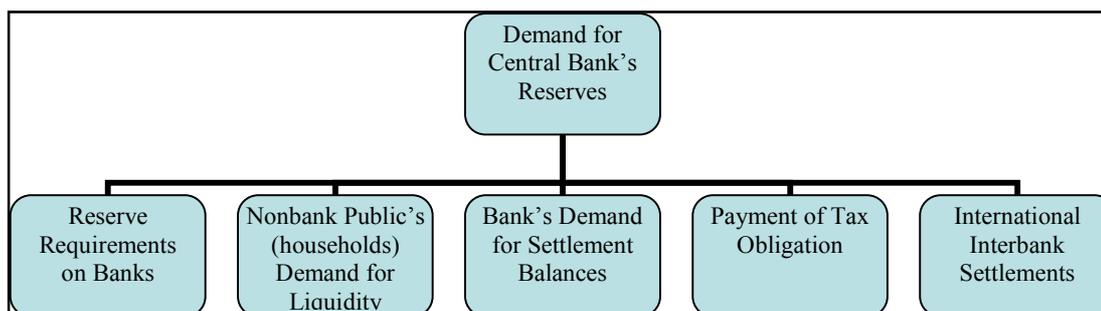
##### ***Electronic Payment Technology and the Demand for Central Bank Reserves (Liabilities)***

Along with the spread of electronic money, some arguments regarding the considerable decrease of central bank reserves have been put forward. Those arguments maintain that if the central bank reserves decrease, power of central bank to influence economic activities will increasingly weaken. Thus, the efficiency of monetary policy will diminish in parallel fashion.

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<sup>5</sup> *Electronic money* is broadly defined as an electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transaction, but acting as a prepaid bearer instrument (European Central Bank, 1998, p.7).

There are five basic sources for the demand for the central bank reserves (Figure 2): 1) Reserve requirements on banks, 2) non bank public's demand for liquidity, 3) bank's demand for settlement<sup>6</sup>balances, 4) payment of tax obligations, 5) international interbank settlements (Palley, 2002, p.219; Arnone and Bandiera, 2004, p.13).



**Figure 2: Demand for Central Bank's Reserves**

Reserve requirements and households' demand for liquidity have constituted the most important sources of the demand for central bank's reserves<sup>7</sup> (Palley, 2002, p.220; Woodford, 2001, p.23). Therefore, the replacement of e-money for the government money will lead to a remarkable decrease in the central bank reserves. Both the influencing power of the overnight interest rates and the seigniorage revenue may be influenced negatively in parallel fashion. Seigniorage revenue here refers to the interest savings the government earns by issuing non-interest-bearing debt in the form of currency (Ely, 1996 p.3).

Banknotes in circulation represent the liabilities of central bank which do not provide interest profit (non-interest-bearing). As expressed in the previous part, with the spread of electronic money seigniorage revenue of central banks will gradually begin to decrease (Rahn, 2000, p.3). For instance, to Ely (1996), if private sector issues \$10 billion electronic money to the

<sup>6</sup> *Settlement* is an act that discharges obligations in respect of funds or securities transfers between two or more parties (European Central Bank, 1998, p.41).

<sup>7</sup> For example, the percentage of currency in central bank's liabilities in the USA, Canada and Japan is over 84 % (Bank for International Settlements, 1996 p.5).

market, seigniorage revenue of the government will approximately diminish \$ 600 billion annually. The decrease of seigniorage revenues may cause that central banks can not cover their operation costs. As seigniorage revenues are one of the most significant income sources of national treasury at the same time, it can be also stated that there will be a decrease in the income of treasury. So, according to the Bank for International Settlements, among the G-10 countries, seigniorage as a percent of GDP ranged from low of 0.28 percent in United Kingdom and France to a high of 0.65 percent in Italy in 1996 (BIS, 1996, p.7).

The decrease in seigniorage revenues will also increase the possibility that central banks will be dependent on other income sources. This means that central banks may lose their financial independence and they may be exposed to much more political pressure.

#### ***Electronic Payment Technology and the Money Multiplier***

The power of central banks and the efficiency of monetary policy stem from monopolistic powers on base money (monetary base). Base money consists of the sum of the bank's reserves at the central bank and the currency. Base money is also known as high-powered money. Its reason is that central banks can create changes in money supply as several times as money base thanks to the mechanism of central bank's money multiplier.

Money multiplier mechanism can be formulated as follows (Bank of Japan, 2000, p. 52-53; Selgin, 1996, p.1-2):

Money supply (M) is the sum of currency (C) and the bank deposit balance (D) and shown as following:

$$M=C+D \quad (1)$$

Base money (H) is the sum of the bank's reserves at the central bank (R) and the currency (C) as following.

$$H=R+C \quad (2)$$

Therefore, the money multiplier (M/H) is written as

$$\frac{M}{H} = \frac{C+D}{R+C} = \frac{\frac{C}{D}+1}{\frac{R}{D}+\frac{C}{D}} \quad (3)$$

Note that C/D is public's desired currency-to-deposit ratio (c) and that R/D is the bank's desired reserve-to deposit ratio (r). The formula for the money multiplier becomes

$$m = (1+c) / (r+c) \quad (4)$$

where the total money stock is

$$M = mH \quad (5)$$

When electronic money appears, the money supply and money multiplier will be changed adding the electronic money balance E to equation (1) so that

$$M = C' + D' + E \quad (6)$$

Finally, the formula for the new money multiplier is that

$$\frac{M}{H} = \frac{C' + D' + E}{R' + C'} = \frac{\frac{C'}{D'} + \frac{E}{D'} + 1}{\frac{R'}{D'} + \frac{C'}{D'}} \quad (7)$$

Comparing equations (7) with (3), along with the spread of electronic money it is easily understood that money multiplier will increase because with the use of electronic money instead of government money, both  $C/D > C'/D'$  and  $R/D > R'/D'$  will appear. In other words, currency-to-deposit ratio (c) and reserve-to deposit ratio (r) will decrease. In view of these explanations, it may be concluded that base money (H), money multiplier (m) and money supply (M) become unstable. In this case, the monetary policy strategy depending on monetary targeting will lose its efficiency. Nowadays it is accepted that this is one of the reasons why central banks give up monetary targeting and prefer inflation targeting strategies (Mishkin, 2004, p.501).

### ***Electronic Payment Technology and the Monetary Transmission Mechanism***

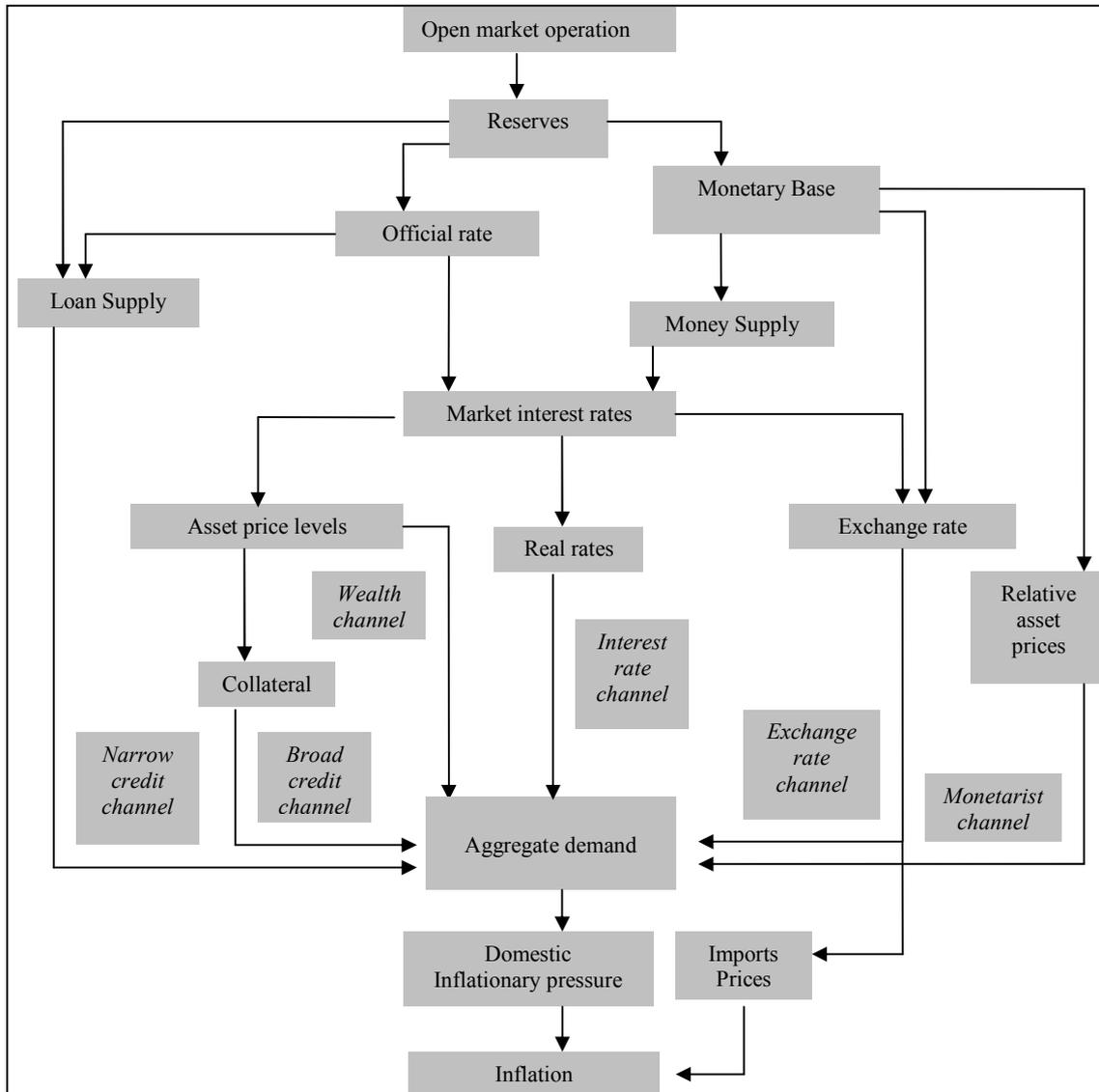
Monetary transmission mechanism being a complicated process describes how policy-induced changes in the nominal money stock or the short-term nominal interest rate impact on real variables such as aggregate output and employment (Ireland, 2005, p.1).

Central banks in transmission mechanism try to influence the households and firms' pricing behaviors through interest rate, exchange rate, asset price, credit, expectations and monetarist channels. But the process described below generally is quite complicated since many factors influence the process of monetary transmission mechanism.

The interest rate channel is a primary interaction channel both in macroeconomics models and monetary policy applications. That is why interest rate channel plays a crucial role in monetary transmission mechanism. Central banks try to attain inflation target through interest rate influencing expectations, asset prices and exchange rate (Figure 3).

Operation of this process effectively depends on the central banks' capability of controlling interest rates. This situation requires positive demand on government money because central banks can influence real economy through interest rates, which stems from its monopolistic power on money supply (Friedman, 1999, p.321; Woodford, 2001, p.50).

In this phase, the question arises whether central banks can control interest rates or not. There are various viewpoints on this subject. In general, it is asserted that the government money demand may decrease as a consequence of the spread of electronic money. Therefore, central banks may not control interest rate.

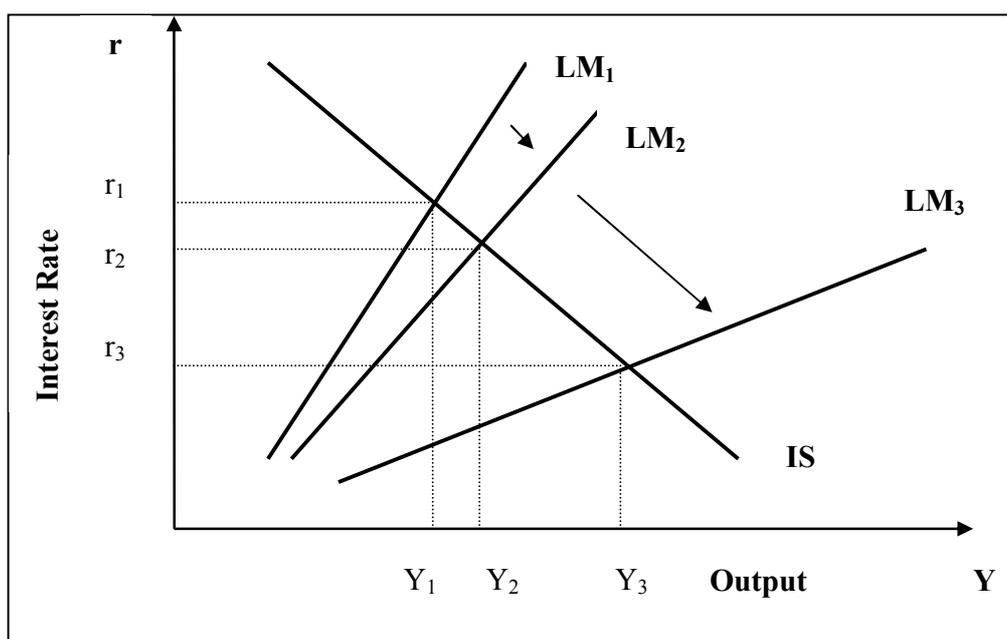


**Figure 3: Monetary Transmission Mechanism**

Source: Kuttner and Mosser (2002, p.16; Bank of England, p.3)

According to Fullenkamp and Nsouli (2004), as a result of the spread of e-banking services, interest sensitivity of money demand will enhance due to the decreasing operation costs. The macroeconomic effects of these changes are shown using a simple IS-LM model and are illustrated in Figure 4. Theoretically, the shifts in LM curve depend upon the interest sensitivity of money demand, and money supply. The spread of electronic banking increases the interest

sensitivity of money demand, and money supply through banking service, which therefore make the LM curve flatter. As seen in figure 4,  $LM_1$  curve will shift rightward into  $LM_2$  due to the increase of interest sensitivity of money demand, and into  $LM_3$  due to the increase in the sum of money supply through banking services. This means that the efficiency power of monetary policy in influencing macroeconomic variables will increasingly weaken.



**Figure 4: Combined Effect of E-Banking and Private E-Money**

Source: Fullenkamp and Nsouli, 2004, p.11).

Some economists heavily criticized the conclusion that central banks will have difficulty in controlling interest rates along the spread of electronic money (Cecchetti, 2002, p.19-20; Fullenkamp and Nsouli, 2004, p.23; Arnone and Bandiera, 2004, p.13; Palley, 2002, p.220; Delong, 2000, p.7; Bank of Japan, 2000, p.37; Berk, 2002, p.21; Freedman, 2000, p.21-22).

According to them, the demand for government money may continue *ad infinitum* and central banks are still capable of controlling interest rates because of the settlement operation of central banks, non-full substitution of government money with electronic money, reserve

requirements for all payment instruments, interest-bearing central bank bills and central banks' position as lender of last resort operations.

## **5. Debate over Reflections of the New Economy on the Monetary Policy and Central Banking**

It is possible to say that there exists a consensus among economists on the fact that the developments in the information and communication technologies will have impact on the monetary policy and central banking. Disagreement among them may stem from the degree of the impacts under consideration.

*It is possible to divide into two groups the discussions on this issue.*

In the first group are the economists advocating that there will not be radical changes in the monetary policy and central banking. This group does not disregard such probabilities that the activity of the monetary policy may diminish and central banks lose their financial independent. They, on the other hand, voice that these impacts should not be exaggerated. In this group are some economists such as Mesonnier (2001), Johnson (2001), Freedman (2000), Berk (2001), Goodhart (2000), Delong (2000), Cecchetti (2002), Arnone and Bandiera (2004), McCallum (2000), Woodford (2000, 2001), Plosser (2000), Palley (2001), Meyer (2001), Green (2001), and Ely (1996) and their views can be summarized as follows:

- Monetary policy is currently conducted in an environment very different from that of just 10 to 15 years ago. Acquisition of information is getting cheaper, easier and faster thanks to progressing technologies. Consequently, transaction costs are falling. Particularly, the fall in the transaction costs of banking services raises the securitization. These developments in the banking sector naturally affect the monetary transmission mechanism as well. Yet, the basic principles of the monetary policy and the role, objectives and targets of central banks will not change largely.

- As the demand for the government money sustains, the impact of central banks on interest rates does not cease completely. Besides, there is no historical evidence that none of the new means of payment instruments completely removes the government money. On the other hand, the fact that the electronic money holds much risk compared to the government money raises suspicions of whether this money can be used successively or not.

- The possibility that the seigniorage revenues of central banks will fall due to the prevalence of the electronic money is not very realistic. Because central banks can stabilize the fall in the seigniorage revenues through reserve requirements to e-money, central bank bill, interest payments of central banks on reserve balances, government deposits at the central bank, and being the lender of last resort operations.

- Being public institutions, central banks are not of any risk, do not face bankruptcy and can determine higher interest rates to preserve the demand for the government money. What is more, central banks are lender of last resort. Due to these reasons, the demand for the government money will never come to an end. Central banks, therefore, will sustain their functions in the following centuries, too. If someday there were a bad end of central banks, this would be not because of technological causes, but the outcome of their own incapability.

The economists in the second group advocate that, in the new economy, there will be important changes in the monetary policy and central banking. Among them are some economists defending that central banking can go bankrupt and even more vanish. Some of the economists in this group are King (1999), Dowd (1998), Rahn (2000), Friedman (1999, 2000), White (2001), and Cronin and Dowd (2001) and their views are as follows:

- Parallel to the progress in information technologies and financial markets, it is needless to discuss over whether or not central banks will function efficiently because historical evidence shows that central banks have never functioned effectively by far.

- Since the demand for government money will decrease, depending on the technologic breakthroughs in the long run, monetary policy may become ineffective and even disappear completely. Furthermore, when the demand for government money decreases, money supply should also decrease not to cause inflation. For this reason, central banks will have to withdraw their money. In this case, central banks will notably be deprived of seigniorage revenue. Consequently, even the bankruptcy of central banks may come to the agenda.

- In comparison with government money, electronic money has some advantages since it is easy to carry, reliable and hygienic. At the same time, electronic money operation costs will be reduced. So, the demand for electronic money will gradually increase and there are some concrete evidence on this point. Consequently, there may well be fewer central banks in the future.

- There is no reason, in principle, why final settlements could not be carried out by the private sector without the need for clearing through the central bank via the technologic innovations. Without such a role in settlements, central banks in their present form would no longer exist.

- The main issue is that technological innovations will impair the central bank's ability to carry out operations that reliably affect economic activity in the usual sense of real output and inflation.

## **6. Conclusion**

Rapid developments in information and communication technologies have paved the way to significant changes in all sectors of economy as well as other fields. The dimension and content of the changes are briefly expressed via "the new economy" concept. There are differences in the content of this concept among the economists. While some economists assert that the new economy entails new rules (extreme view), the others defend that this change is usual (moderate view).

Taking into consideration that the changes in economy seem to continue depending on the various reasons, we think that it is better to use “*renewed economy*” instead of “new economy” because the economy is *ad infinitum* renewing itself.

The field that the developments in information and communication technologies influence most is monetary economy. Through the spread of e-money and e-banking services, the future of monetary policy and central banking is under question. As a result of the continuing debates, there have existed two different arguments. The first is that there will not be any change in the future of central banking and monetary policy. The second, including extreme views, is that monetary policy and central banking will no longer exist.

Having about three hundred year-past, central banking has managed to keep up with the changes in economy by renewing itself. Also, they have become the forerunners and regulators of these changes. Thus, that the central banks have pioneered in the studies on electronic payment instruments is the evidence of this change. Relying on the reasons investigated through the paper, the views that monetary policy and central banks will no longer exist in the future, is unrealistic. As far as we are concerned, central banks will continue to guarantee the stability of financial system all over the world as was the case in the past.

## References

- Arnone, Marco and Bandiera, Luca (2004), “Monetary Policy, Monetary Areas, and Financial Development with Electronic Money”, IMF Working Paper, WP/04/122.
- Atkinson, Robert D.;  
Court, Rondonph H. (1998),  
Progressive Policy Institute, The New Economy Index, (PPI: Washington, DC.  
“Macroeconomic Implications of the New Economy”, Institute for International  
Economics Working Paper Series, WP01-9.
- Baily, Martin N. (2001),  
Berk, Jan Marc (2001),  
“New Economy, Old Central Banks? An overview of monetary transmission in a  
new economic environment”, Monetary and Economic Policy Department Series,  
2001-5.
- Berk, Jan Marc (2002),  
“New Economy, Old Central Banks?,” Tinbergen Institute Discussion Paper, 02-  
087/2.
- Bullard, J. and Schaling , E. (2001),  
“New Economy-New Policy Rules?”, Working Papers No: 2000-019A, Federal  
Reserve Bank of St Louis Review, 83(5), pp.57-66.
- Cecchetti, Stephen G. (2002),  
“The New Economy and The Challenges for Macroeconomic Policy”, NBER  
Working Paper Series, 8935
- Cohen, Stephen S, DeLong, J. Bradford and  
Zysman, John (2000),  
“Tools for Thought: What is New and Important About the “E-economy””, BRIE  
Working Paper # 138.

International Conference on Human and Economic Resources May 24-25, 2006 Izmir University of Economics

- Cronin, David and Dowd, Kevin (2001), "Does Monetary Policy Have A Future?", *Cato Journal*, 21(2), pp.227-244.
- DeLong, Bradford J. (2000), "Macroeconomic Implications of the "New Economy"", [http://www.j-bradford-delong.net/OpEd/virtual/ne\\_macro.html](http://www.j-bradford-delong.net/OpEd/virtual/ne_macro.html)
- Dowd, Kevin (1998), "Monetary Policy in the 21st Century: An Impossible Task?", *Cato Journal*, 17(3), pp.327-331.
- Ely, Bert (1996), "Electronic Money And Monetary Policy: Separating Fact From Fiction", *Cato Institute's Conference on The Future of Money in the Information Age*, May 23, 1996, <http://www.cato.org/moneyconf/14mc-2.html>
- Freedman, Charles (2000), "Monetary Policy Implementation: Past, Present and Future- Will the Advent of Electronic Money Lead to the Demise of Central Banking?", <http://www.worldbank.org/research/interest/confs/upcoming/papersjuly11/fredman.pdf>, s. 1-32.
- Friedman, Benjamin M. (1999), "The Future of Monetary Policy: The Central Bank as an Army with Only a Signal Crops?", *International Finance*, 2(3), pp.321-338.
- Friedman, Benjamin M. (2000), "The Threat to Monetary Policy from the Electronic Revolution in Banking", <http://www.cato.org/events/money/papers/friedman.pdf>, s.1-7.
- Fullenkamp, Connel and Nsouli, Saleh M. (2004), "Six Puzzles in Electronic Money and Banking", *IMF Working Paper*, WP/04/19.
- Furia, Enrico (2000), "Globalization and New Economy" <http://www.worldbusinesslaw.net/swbl/journal/plist/g&ne.htm>
- Goodhart, Charles A. E. (2000), "Can Central Banking Survive the IT Revolution?", <http://www.worldbank.org/research/interest/confs/upcoming/papersjuly11/goodhart>.
- Gordon, Robert J. (2000) "Does the 'New Economy' Measure Up to the Great Inventions of the Past?" *NBER Working Paper Series*, 7833.
- Green, Edward J. (2001), "Central Banking and the Economics of Information", *Economic Perspectives*, Federal Reserve Bank of Chicago, 2Q, pp. 28-37.
- Greenspan, Alan (1998), "Is There a New Economy?" *Remarks at the Haas Annual Business Faculty Research Dialogue*, UC Berkeley, September 4.
- Ireland, Peter N. (2005), "The Monetary Transmission Mechanism", *Federal Reserve Bank of Boston Working Papers*, No.06-1
- Johnson, Manuel H. (2000), "The New Economy: Implications for Monetary Policy", *Cato Journal*, 21(2), pp.177-182.
- Kelly, Kevin (1999) *New Rules for the New Economy: 10 Radical Strategies for a Connected World*, Penguin Books, USA.
- King, Mervyn (1999), "Challenges for Monetary Policy: New and Old", <http://www.bankofengland.co.uk/speeches/speech51.pdf>, s.1-34
- Kling, Robert and Roberta Lamb (2000), "It and Organizational Change in Digital Economies: A Sociotechnical Approach", Eds: Erik Brynjolfsson and Brain Kahin, *Understanding the Digital Economy-Data, Tools, and Research*, MIT Press, Cambridge, USA.
- Kotelnikov, Vadim, [http://www.e-coach.narod.ru/business\\_guide/crosscuttings/new\\_economy\\_transition.html](http://www.e-coach.narod.ru/business_guide/crosscuttings/new_economy_transition.html)
- Kuttner, Kenneth N. and Mosser, Patricia C. (2002), "The Monetary Transmission Mechanism: Some Answers and Further Questions", *FRBNY Economic Policy Review*, May, pp.15-26.
- McCallum, Bennett T. (2000), "The Present and Future of Monetary Policy Rules", <http://www.worldbank.org/research/interest/confs/upcoming/papersjuly11/mcccllum.pdf> s. 1-20.
- Mesonnier, Jean-Stphane (2001) "Implications for Monetary Policy of the Development of Electronic Money: A

International Conference on Human and Economic Resources May 24-25, 2006 Izmir University of Economics

- Meyer, Laurence, H. (2001), "Review of Recent Debate", Banque de France Bulletin Digest, No: 92, pp.23-34.
- Nakamura, Leonard I. (2000), "What Happened The New Economy", Remarks at Before the New York Association for Business Economics and The Downtown Economists, New York
- Nordhaus, William D. (2000), "Economics and the New Economy: The Invisible Hand Meets Creative Destruction." Business Review, Federal Reserve Bank of Philadelphia, pp. 15-30.
- Palley, Thomas I. (2002), "Policy Rules in the New Economy." Presentation for the Discussion on the New Economy sponsored by the Congressional Budget Committee and the Senate Budget Committee, June 6.
- Piazolo, Daniel (2001), "The E-money Revolution: Challenges and Implications for Monetary Policy, Journal of Post Keynesian Economics, 24(2), pp.217-233.
- Plosser, Charles I. (2000), "The New Economy and the International Regulatory Framework", Kiel Working Paper No.1030.
- Rahn, Richard W. (2000), "Does The "New" Economy Call for a "New" Monetary Policy?", Cato Journal 21(2), pp.169-175.
- Selgin, George (1996), "The Impact of Digital Money on Central Banks", <http://www.cato.org/events/money/papers/rahn.pdf>, s. 1-5.
- Stiroh, Kevin J. (2002), "E-money: Friend or Foe of Monetarism?", Cato Institute's Conference on The Future of Money in the Information Age, May 23, 1996, <http://www.cato.org/moneyconf/14mc-5.html>
- Tanjuakio, Joyce (2002), "New and Old Economics in the New Economy", Economic Policy in the 'New Economy', Horst Siebert ed., Springer-Verlag: Berlin.
- White, Lawrence H. (2001), "The Coevolution of Economy and Technology: The Birth of the "New Economy", CCT / 1101.
- Woodford, Michael (2000), "In What Respects Will the Information Age Make Central Banks Obsolete?", Cato Journal, 21(2), pp.219-224.
- Woodford, Michael (2000), "Monetary Policy in a World Without Money", <http://www.worldbank.org/research/interest/conf/upcoming/papersjuly11/woodford.pdf>, s. 1-44.
- Woodford, Michael (2001), "Monetary Policy in the Information Economy", NBER Working Paper Series, 8674
- BIS  
Bank of England  
Bank of Japan
- Implications For Central Banks of The Development of Electronic Money  
The Transmission Mechanism of Monetary Policy  
"Forum on the Development Electronic Payment Technologies and Its Implications for Monetary Policy", Discussion Paper, No.2000-E-6.  
<http://www.crie.ro/nouaeconomie/se1-presentation-VD.html>