

Relationship between E-money and Monetary Policy in Egypt

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Abstract

The increased use of E-money has led to various studies about the impact this new form of money could have on central banks' ability to control the money supply. Many economists believe that E-money could completely replace currency while others feel that its impact will be less drastic. The ability to control the money supply depends on the definition of money, M1. M1 currently includes currency, traveler's checks and demand deposits. If the use of these variables were to decrease due to an increased reliance on E-money, M1 would not serve as an accurate measure of money in the economy.

On a national level, studies have proven that the more connected a country's banks, national assets, financial sector and citizens are to each other and the rest of the world, the more economic prosperity that country enjoys.

This research examines how a widespread use of digital money would affect monetary policy. Widespread use of digital money could affect central banks in such areas as monetary policy, banking supervision of the payment system, and the stability of the financial system.

This research also gives information about the history of money and its evolution is included in the research. Also, it involves a display of the main types of E-money Visa, Master Cards and ATM, along with their advantages, disadvantages and problems, in addition to knowing how E-money is applicable in Egypt. Moreover, the paper gives a general overview of the key features and the main policy issues that arise for central banks as a result of the development of E-money.

The future of E-money is dependent on its growth, its regulation and the increased technological advancements that would increase the security of this new instrument. It will directly impact the central bank's control of monetary policy unless the central bank includes it in its measurements of monetary aggregates and regulates its growth and usage.

Key words :

- **E – money** : E-money.
- **Seignorage income**: the interest saving the government earn by issuing non- interest bearing debt in the form of currency.
- **Credit Card (CC)** : such as the visa or a master card , has a present spending limit based on the user's credit limit.
- **Debit Card (DC)** : Removes the amount of the charge from the cardholders account and transfer it to the seller's bank.
- **Automated Clearing House (ACH)**: Computer based clearing and settlement facility for interchange of electronic debits and credits among financial institutions.

Introduction:-

Through the years, money has changed as technology developed. "in 5000 years there have been only four times that we have changed the way we pay : there was barter to coinage; coins to paper; paper to cheques; and then cards.¹

The changes have been brought about by the development of the internet and the resulted explosion of e-commerce².

Money can take several physical forms. Economists define the money supply to include a set of assets that are either used to make payments or that can cheaply and easily be converted into something that can be used for payments. This includes currency and coins, as well as bank deposits such as checking accounts that can be used for transactions.

The widespread use of electronic currency didn't begin until the Automated Clearinghouse³, so electronic currency has been widely used throughout the world on an institutional level for so many years.

The following three requirements are necessary for a digital currency system to attain widespread recognition and use: instant clearing of funds, elimination of payment risk and secure transactions using strong encryption. But, none of the electronic currencies in use today fulfill all the three of these requirements.

The increasing popularity of the Internet and e-commerce meant that it was necessary to find new ways of purchasing goods and services. Currently, there are three major electronic payment schemes available:

- Using credit card numbers (*either encrypted or verified off-network*)
- Electronic checks (*sent over the network and cleared offline*)
- E-money (*sent and cleared over the network during transaction*).

Electronic monetary assets can be handled properly with the standard monetary theory; even new private electronic currencies can be interpreted with the free banking theory, going back to the British Monetary Controversy of the first half of the nineteenth century, and even back to Adam Smith⁴.

Digital money can be designed to share all characteristics of central bank currency, and it could, therefore, be a very close substitute for banknotes and coins⁵.

The number of cards has been doubled three times in one single decade. In the beginning of the 90s, the number of cards used around the world was about one billion, the half of which are Visa Cards, and about 30% Master Cards. However, the number of cards used nowadays is about 2.8 billion, the majority of which are bank-cards (Visa and Master cards)⁶.

To take the American E-money market as an example, Visa Cards dominate 50% of the market, while Master Cards dominate 25%.

¹ David Evans, economist and co-author of paying with plastic says that Visa : Joining the Cashless Society, Report of Visa International Corporation , 2006.

² Friedman, Benjamin M. (1999): The future of Monetary Policy : The central Bank as an Army with only a single Corps? International Finance , 2 (3), 321-38.

³ AC was set up by the US Federal Reserve in 1972 to provide the US Treasury and commercial banks with an electronic alternative to check processing. Similar systems emerged in Europe around the same time

⁴ (www.ecb.int/emi/pub/ar97/en ar97).

⁵ The main differences are that digital money is not legal tender, which would reduce its acceptance initially, and that, unlike currency and all other media of exchange Today, digital money does not require the physical presence of payer and payee for payment finality because digital money balances can be transferred across telecommunication networks in real time.

⁶ Dr. Abdel Baset Mohammad Wafa "E-money Market (opportunities, threats and horizons)", Contemporary Egypt Journal, issue 471/472, The Egyptian Association for Political Economy, Statistics and Legislation-October 2003, Cairo (in Arabic).

Recent statistics show that around half of the adult urban population in Egypt is still completely unbanked, that only 17% own a payment card and that 97% of Egyptian employees receive their salaries in cash⁷.

Though there are different kinds of E- money, which will be dealt with in section II, this research will focus on Visa, Master , and ATM.

The research includes four sections. Section I poses the question “What is E-money”, Section II explores the Kinds of E-money, Section III is entitled the Monetary policy in Egypt , Section IV discusses the impact of E-money on central bank monetary policy , Section V handle the effect of E-money on the Monetary Policy and finally the examination of E-money and the monetary variables in Section VI .

⁷ Visa : Joining the Cashless Society, Report of Visa International Corporation , 2006.

Section I : What is E-money ?

The History of E-money

The year 1914 witnessed the birth of the first consumer credit card issued by Western Union. Also, its roots go back to 1918 when Federal Reserve Banks first moved accounts (i.e., manipulated book-entries to clear payment balances among themselves) via telegraph⁸.

In 1950, Diners Club issued the first credit card that was accepted many and different merchants. The plastic money first used in 1950 diners club and American express launched their charge card in the USA. One year after, nearly another 100 banks began to issue their cards.

The credit cards were first issued in the UK in 1966.

The widespread use of electronic currency didn't begin until the Automated Clearinghouse (ACH) was set up by the US Federal Reserve in 1972 to provide the US Treasury and commercial banks with an electronic alternative to check processing. Similar systems emerged in Europe around the same time, so electronic currency has been widely used throughout the world on an institutional level for more than two decades.

Payments made today in nearly all of the deposit currencies in the world's banking systems are handled electronically through a series of inter-bank computer networks.

What is E-money?

Before we start, we need to fully understand what E-money is, and how it has been defined? Money can take several physical forms and there is still no unified definition of E-money.

What is Money ?

First we have to define the term "money". The common definition of money is that money is a generally accepted means of payment⁹.

A number of innovations are taking place in the area of retail electronic payments known as E-money (E-money).

"E-money products are defined as stored value or prepaid products in which a record of the funds or value available to the consumer is stored on a device in the consumers possession. This definition includes both prepaid cards (sometimes called electronic purses) and prepaid software products that use computer networks such as the internet (sometimes called digital cash)¹⁰.

Some economists described and categorized E-money products in different ways as follows: -

The European Commission defined E-money in its Draft Directive as¹¹:

- Stored electronically on an electronic device such as a chip card or a computer memory.
- Accepted as means of payment by undertakings other than the issuing institution.
- Generated in order to be put at the disposal of users to serve as an electronic surrogate for coins and bank notes.

⁸ For more information see David s; Glyn (1996), " A history of money from ancient times to the present day ", University of Wales Press,U.K, P.P. 1-50

⁹ The words "generally accepted "do not mean that everyone is willing to accept it, but rather that it is accepted by a large share of economic agents"

The transaction media is any tool used to make a payment. Some transaction media are monetary assets at the same time (e.g. coins, bank notes, or traveler's checks), some of them are not (e.g. credit cards). Some of them are uniquely linked to some currency, other ones not.

¹⁰ Bank for international Settlement (BIS) (1996): "Implication for central bank of the development of E-money", Basle, P. 13.

¹¹ European Commission (1998) : " Proposal for European parliament and council Directives on the taking up, the pursuit and the Prudential supervision of the business of E-money institution" Brussels, Com (98) 727, p.p.w.

- Generated for the purpose of effecting electronic transfers of limited value payments.

The Consumer Advisory Board of the Federal Reserve Board of the USA :

Described that E-money is money that moves electronically. It can be carried on the persons in the form of a smart card or stored-value cards or electronic wallets. It can be used at the point of sale or it can be used person-to-person directly without the intervention of any outside entity. It can be moved around or spent through telephone lines to banks or other providers or issuers. It can also be moved around or spent through links with interactive cable television and personal computers¹².

E-money is money that is transmitted via the Internet, and is outside the established network of banks, checks and paper currency governed by the federal reserve.

This new form of money is expected to grow in the future to become a viable alternative to traditional money.¹³

Based on these definitions and the real money nature, one can describe E-money characteristics as follows:

E-money should be characterized as a substitute for currency. E-money is a replacement for currency as are other payment mechanisms such as checks, credit cards, traveler's checks, and debit cards. Yet, E-money is potentially a perfect medium of exchange¹⁴. By effecting and settling commercial transactions almost instantaneously, E-money will simplify the complex payment system process that characterizes commerce today.

A Comparison between Cash and E-money:-

The following table presents synthetic comparison between cash and e-money.

Table (1): Comparison between cash and E- money

Comparison	Legitimized	Anonymity	Component of monetary aggregates	Dematerialized	Small value transaction	Under central bank control
e- Money	-	+/-	-	+	+	-
Cash	+	+	+	-	+	+

Source : <http://www.ws19webtask.p1.com>

Here in table (1) we noted that when making a comparison between E-money and cash we will see that E-money is included in component of monetary aggregates but in contrast cash is not included in it . Also we found that cash is legitimized but E-money do not have the legitimacy, E-money can be positive dematerialized but cash is not, also we can find that both of them E-money and cash have small value transaction. Cash can be under central bank control but in contrast the E-money is not, and the last thing we found in this comparison that E-money can be either positive or negative anonymity but cash would have positive anonymity.

What is the difference between a credit card and a debit card?

¹² The Consumer Advisory Board of the Federal Reserve Board of the USA (1996) : " Federal Reserve Board Consumer Advisory Council Meeting" , Nov. 2, P. 5.

¹³ Stephen M.Miller, (2000): Monetary policy Delegation, Contract Costs, and Contract Targets, Working per, 2000-01, Janury, University of Cinnecticut. <http://www.econ.uconn.edu>

¹⁴ See : White, LH. (1996): The technology Revolution and Monetary Evolution" in The future of Money in the information Age, Cato Institute's 14th annual monetary conference, May 23, Washington, D. C. P. 16.

Credit card is a card that lets a consumer access funds in a credit line set aside for that user. When the purchase is made, and settlement occurs, funds are drawn from the credit line and deposited to the merchant's account.

On the other hand, a debit card is a payment card whose funds are withdrawn directly from the cardholder's checking account. With an on-line debit card, the customer must enter a PIN to authorize payment at the time of sale (and the funds are settled through a debit network). In the case of off-line debit cards (generally with Visa or Master Card logos) the customer signs a receipt, as would be the case in a credit card transaction. In this case, the funds are transferred after batch settlement.

Functions of Credit cards:

Credit cards serve two main functions they are¹⁵: -

1- A convenient means of "paying for" goods and services and at the same time they are a convenient way for consumers to obtain unsecured credit. Credit cards are convenient for consumers to use in transactions because they are compact and safe to carry. Merchants often prefer them to checks because the bank issuing the card guarantees payment as long as the merchant follows established authorization procedures.

2- Credit cards also offer consumers a line of credit on which they can draw at any time, without providing any collateral. Because unsecured loans are considered riskier than those are for which collateral is required, credit card borrowers usually pay higher interest rates than other borrowers.

Types of risks involved in E-money Schemes

1-Quantifiable risks:

a-Credit risk is the risk that a counterpart will fail to perform on an obligation to the institution. It is the most common risk relating to banking activity.

b- Liquidity risk is the risk that the institution is temporarily unable to meet its payment obligations as they fall due without incurring losses.

c- Interest rate risk is the risk that movements in interest rates might adversely affect an institution's financial conditions.

d- Foreign exchange risk is the risk that fluctuations of foreign exchange rates might adversely influence the financial conditions of the institution. It arises when the issuing institution is ready to accept foreign currencies in payment for E-money or when the structure of the E-money scheme allows the acceptance of multiple currencies.

2- Non-quantifiable risks:

a-Strategic risk is the risk that the strategic objectives of an institution, the business strategies developed and the resources devoted to achieving these objectives as well as the quality of its implementation might not be consistent.

b-Operational risk is the risk that deficiencies in internal controls and information systems might result in unexpected losses for the institution. This risk is normally associated with inadequate procedures and controls, information system failures and human error. Inadequate operational procedures and internal controls expose the institution to potential fraud,

¹⁵ www.pbs.org/opb/electronicmoney

counterfeiting and costly disruptions in operations. Operational risk is incurred in different forms by all the institutions involved in E-money schemes.

C _ Compliance risk is the risk associated with non-compliance with laws, rules, regulations, prescribed practices or ethical standards. Given the particular nature of E-money schemes, compliance with regulations on information disclosure assumes special relevance.

d _ Reputation risk is the risk that the reputation of an institution might deteriorate following specific events. In the context of E-money schemes, the emergence of malfunctioning or security breaches in the system, the inability to solve problems with customers and adverse media coverage are all elements which might negatively affect the reputation of an institution.

e-legal risk is the risk that an institution might be adversely affected by uncertainties surrounding the legal framework governing its operation. This could occur, for instance, in the event that commercial laws are not sufficiently explicit to settle disputes between the issuer and the customer.

Legal discussion on issuing and using E- money:-

1. Security:

Security issues are a major source of concern for everyone both inside and outside the banking industry. E-money increases security risks, potentially exposing these isolated systems to open and risky environments.

2. Privacy

Consumers may fear that their financial, credit and spending information derived from E-money transactions or products could be used without their knowledge or permission.

To achieve widespread confidence, all participants in the system such as banks , other issuers, consumers and merchants, must have certain basic information about the rules governing the use of E-money products. The consumer must be guaranteed that any information exchanged will be transmitted only to properly authenticated parties and only to the extent to which they are authorized to receive the information.

3. Legal risk:

Legal risk arises from violation of laws, regulations or prescribed practices, such as money laundering, customer disclosures, privacy protection, etc. Legal risk may also arise when the legal rights and obligations of parties are not well established.

A major concern is whether the rights and obligations of all the parties involved are certain and transparent. For example, issues could arise regarding liability in the event of fraud, counterfeiting, accident or the default of one or more of the participants.

Problems which electronic money makes for monetary targeting :

E-money raises several potential problems for monetary targeting:

First, even if a central bank were to define its monetary target appropriately, there would be reason to assume that a rapid development of E-money or electronic access products could affect, for a transitory period, the stability of money demand, and that a stable relationship with prices and spending could only be re-established after the market for E-money had reached a more mature stage.

Second, as witnessed with previous forms of financial innovation, the development of E-money may add to the difficulties of distinguishing monetary

assets from non-monetary assets, thus blurring the borderline for the definition of monetary aggregates.

Third, the controllability of the targeted monetary aggregate would be rendered more difficult by the potential increase in the weight of interest-bearing assets in the aggregate.

It should be emphasized that the mentioned effects do not only concern a strategy of intermediate monetary targeting. They would also affect, for example, a strategy of direct inflation targeting, to the extent that such a strategy would pay need to monetary aggregates as indicator variables, and insofar as a change in the interest rate elasticity of money demand would affect the transmission.

Section II: Kinds of E- Money

E- money can be divided into two parts wholesale services and retail services:-

The Wholesale payment system services¹⁶ (or corporate payments) include Fed wire Funds Service funds transfer and book-entry securities; CHIPS; SWIFT; payment messaging systems; net settlement, clearing and settlement systems; internally developed and off-the-shelf funds transfer systems; and web-based payment systems.

The Retail payment system services¹⁷ include checks and share draft item processing, bankcards, payment cards, automated clearinghouse (ACH), EFT/POS networks, and electronic bill payment and person-to-person payment systems.

The following table lists some of the common retail and wholesale e-banking services offered by financial institutions

Table (2): Common E-Banking Services

Retail Services	Wholesale Services
Account Management	Account Management
Bill payment and presentment	Cash management
New account opening	Small business loan applications, approvals, or advances
Consumer wire transfers	Commercial wire transfers
Investment/brokerage services	Business to business payments.
Loan application and approval account aggregation	Employee benefits/pension administrate

Source : Federal Financial Institutions Examination Council, E- Banking, August 2003.

Divisions of E-money market¹⁸:

1. Bank-Cards¹⁹ : There are four kinds of bank cards:

- a. Withdrawal cards.
- b. National cards.
- c. International cards.
- d. International Prestige cards.

2. Non-banking Financial institutions cards:

- a. Diners Club and
- b. American Express.

¹⁶ FFIEC IT Examination Handbook

¹⁸ Dr. Abdel Baset Mohammad Wafa "E-money Market (opportunities, threats and horizons)", *Contemporary Egypt Journal*, issue 471/472, The Egyptian Association for Political Economy, Statistics and Legislation-October 2003, Cairo (in Arabic).

¹⁹ Bank-cards occupy an important position among other methods of payment. In the mid-nineties, it reached about 45% of the methods of payment in the USA, 23% in Luxemburg and France (against 4% in 1982), and 14% in Britain and Denmark.

3. Non-Financial cards:

- a. Private Commercial cards.
- b. Prepaid cards²⁰.
- c. Professional cards.
- d. Customer's cards.

Types of E-money :-

There are two types of E-money: identified E-money and anonymous E-money (digital cash)

Identified E-money operates similar to bank like products because the identity of the user and the way of spending is well known to financial institutions and the latter can easily track the circulation of E-money in the economy.

Identified E-money contains information revealing the identity of the individual who originally withdrew the E-money from the bank.

Anonymous E-money is untraceable to create anonymous E-money blind signature is needed.

In the case of anonymous E-money, once the E-money is withdrawn from the bank, the identity of the person who uses the money will remain unknown and the bank cannot track the movement of the E-money through the e-market.

There are two varieties of each type of E-money: online E-money and offline E-money.

On-line: means you need to interact with a bank (via modem or network) to conduct a transaction with a third party. On-line E-money systems prevent double spending²¹ by requiring merchants to contact the bank's computer with every sale²².

Off-line: Offline means you can conduct a transaction without having to directly involve a bank.

An *offline E-money system* can be used with both *identified and anonymous E-money*. An *identified offline E-money system* can discover the path E-money through the e-market. The bank can check its database to see if a customer's E-money has been double spent. If it has, the bank can use the transaction

²⁰ Thygesen , Christian and Kruse , Mogense (1998) : E-money , Danamarks National Bank Monetary Review ,4th Quarter , P-3.

²¹ **HOW WE CAN OVERCOME THE DOUBLE SPENDING PROBLEM?**

-Online electronic system it prevents the double Spending by requiring merchants to contact the Bank's computer with every sale. the bank Computer maintains database of all spent Piece of E-money still spendable If the bank computer says the E-money is already spent, the merchant refuses the sale. This is similar to way Merchants currently verify credit card at point of sale .

-Offline E-money it detects double spending in two different ways.

First is to create a special smart card containing a temper proof chip called observer. The observer chip keeps a minidatabase of all pieces of E-money spent by smart Card. If the owner of smart card attempts to copy some E-money and spend it twice, imbedded Observer chip would detect the attempt and wouldn't allow the transaction.

Second is to structure the E-money and cryptographic protocols to reveal The identify of doble spender by the timepiece of E-money make it back to the bank. If users of offline E-money know they will be caught, the incidence will be minimized. The advantage of this type is that they do not require special tamper proof chip. The entire system can be written in Software and run on ordinary personal computer or cheap smart card.

²² file:///J:\she\E-money%20mini-FAQ%20E-money%20mini-FAQ,%²⁰Questions%²⁰and...

path to find the identity of the double spender. This type of money system works on ordinary PCs or less expensive smart cards²³.

With identified E-money, both offline or online, the bank can always reconstruct the path the E-money took through the economy. The bank will know what everyone bought, where they bought it, when they bought it, and how much they paid. And what the bank knows, the IRS (Internal Revenue Service - the US tax agency) knows.

Though there are different kinds of e- money mentioned before, we will deal with the Visa, Master, and ATM in details since these will be the focus of this research.

²³ [http// www.ex.ac.uk/Rdavies/arian/emoney.html](http://www.ex.ac.uk/Rdavies/arian/emoney.html).

1- Visa

The visa cash is "a new way to pay forever day necessities without having to carry around a pocket full of change"²⁴.

The reach and popularity of Visa-branded cards is almost universal, there are more than one billion cards, with unsurpassed acceptance in more than 150 countries. In 2002, \$2.4 trillion in goods and services were purchased using Visa products.

Visa International is a partnership of 21,000 member banks. These banks have issued over a billion Visa cards worldwide on which US\$ 4 trillion per year is spent across over 150 countries.

The MENA region's total Visa card expenditure value reached US\$ 89 billion by the end of 2005. Leading the results are the three Gulf States of Saudi Arabia, Kuwait and UAE.

Egypt is ranked among the fastest growing Visa markets in the Middle East and North Africa (MENA) region as it takes confident leaps toward a cashless society.

Egypt's growth in card numbers far exceeds the 30% average regional increase for MENA, which reached a total of 17.2 million cards by the end of 2005.

The results indicate an increase in the number of Visa acceptance locations in Egypt by 6% to reach a total of 27,663 locations, including 23,910 merchant outlets (up 4% year-on-year) and 1,912 ATMs (up 46% year-on-year).²⁵

There are two main types of visa cards, the disposable and the reloadable:

1- Disposable cards are loaded with a pre-determined value. These cards come in denominations of local currency such as us\$10 when the value of the card is used, the card is discarded and a new card may be purchased.

2- Reloadable cards come without predefined value. Cash value is reloaded into the card at specified terminals and automated teller machines(ATMs).

The Core Benefits of Visa Distribution are:

a. Increased productivity and efficiency: With the Visa distribution card program the distributor has a much quicker and a simple process in place to collect payments for delivered merchandise. The traditional invoicing and payment processes are eliminated, and the distributor is able to concentrate on its core business, selling and delivering merchandise.

b. Increased security: By eliminating the need to carry cash and checks received when collecting payments, the distributor company employee enjoys increased security and avoids unnecessary risks.

c. Cost reduction: The distributors operating costs could be reduced to 1% to 3% of sales. In addition, incremental sales might go up between 1% and 9%.

²⁴ <http://www.nbn.org.il/Klita/dollars%20shekels%20banks%20credittransfer.htm>. There are many types of visa which are :- Visa classic, visa platinum, visa secured, visa signature, visa gold, smart visa card and reward cards. See : http://usa.visa.com/personal/cards/debit/index.html?ci=personal/index%2Ehtml/check%20Cards#anchor_2

²⁵ Quarter 1st,2006. Report

2-ATM (Automatic Teller Machine)

History of ATMs

Automated Teller Machines (ATM) allow customers to perform banking transactions anywhere and at anytime. By using a debit or ATM card at an ATM, individuals can withdraw cash from checking or savings accounts, make a deposit, or transfer money from one account to another. You can also get cash advances using a credit card at an ATM.

When ATMs were introduced in the 1970s, they were set up only inside or immediately outside their banks' branch offices. They were seen by banks largely as a way of saving money, by reducing the need for tellers. Even with the relatively expensive computer technology of the late '70s and early 80s, the cost of processing deposits and withdrawals via ATMs proved to be less than the cost of training and employing tellers to do the same work.

ATM Definition : automated teller machines fact : an ATM is an unattended electronic machine in public place, connected to a data system and related equipment and activated by a bank customer to obtain cash with draws and other banking service²⁶.

- An automatic teller or ATM allows a bank customer to conduct their banking transactions from almost every other ATM machine in the world.
- The first working ATM was installed in a New York based chemical bank.
- They are friendly boxes that allow you to withdraw cash from your bank or credit account while charging you a rediculos surcharge for the service.
- They are unmanned electronic device that performs basic teller functions.

3-Master card

History

MasterCard was founded in 1966 as the Interbank Card Association (ICA) in the United States. In 1969, "Master Charge" was purchased by the California Bank Association and in 1979, the MasterCard brand was introduced. Issuers began offering MasterCard in Canada 1973. MasterCard opened their Canadian office 1993²⁷.

A master card is named after the small plastic card issued to make electronic purchases. A credit card is different from the debit card for the credit card issuer lends the consumer money rather than having the money removed from an account most credit cards have the same shape and size, as specified by the international standardized organization (ISO). It's incorporated institution that issues its card. Master is also the company's brand of credit card.

MasterCard's roles are to:

- 1- Establish standards and procedures for the acceptance and settlement of member transactions on a global basis.
- 2- Provide a global communications network for interchange the electronic transfer of information and funds among its members.
- 3- Develop marketing programs that build even greater awareness for the brand, thereby increasing business for its members; and

²⁶ [http://www. Business_ranks.com/automated-teller-Machineshtm](http://www.Business_ranks.com/automated-teller-Machineshtm).

²⁷ Corporate Profile, http://www.mastercard.com/canada/general/press/corp_history.html

4- Enhance and support the marketing activities and operational functions of its members in connection with MasterCard programs and services.

MasterCard does not issue cards; set annual fees on cards; determine annual percentage rates; solicit merchants to accept cards or set their discount rates. MasterCard member financial institutions manage the relationships with consumers and merchants.

There is no significant practical differences between a master card and a visa credit card. Master card and visa are the names of the global companies who manage credit cards coordinating payments systems and keeping track of transaction.

Advantages & Disadvantages of E-money

For every new technology it has an advantage and also has its dark side

Some Advantages of E-money

- Instant Access: Credit cards and ATMs give the customer instant access to cash at millions of merchant locations worldwide globally available any time of day or night.
- Fast & Flexible : Credit cards and ATMs provide customers with consolidated access to multiple accounts through a single relationship device.
- Easy to Use: With one simple swipe of the credit card, a transaction can be completed and you no longer have to deal with the hassle of travelling with bulky sums of financial instruments.
- Purchase assurance: Cardholders can benefit from the security and safety offered through Purchase Assurance. If something you bought with your card is damaged or stolen within 90 days of purchase, chances are you're protected
- Internet Purchases: Credit cards are a convenient way to pay for very small purchases over the internet. They allow you to conveniently buy and sell tiny but valuable bits of information.
- Merchants Satisfaction: Merchants around the world are now processing more sales transactions with greater speed and precision thanks to credit cards.

Some of the disadvantages of E-money

- Identity Theft (fraud): like cash, credit card are liable to theft.
- Credit cards' Hackers: Credit cards have a great drawback in electronic commerce. Consumers fear that sending their credit card numbers over the Internet makes them too vulnerable to hackers or electronic thieves.
- Small purchases: Merchants don't want to accept credit cards for small purchases, since the merchant typically would have to hand over six percent of the value of sales under \$10 to the credit card company in fees.
- Over-the-limit fees: Credit card companies set a time limit for how much u can charge you card. If you got over that limit they charge you an over-the-limit fee.
- Cash advance fees: Aside from paying a high rate on the cash you take out, you're going to pay a fee, usually 2 percent to 4 percent of the amount advanced. And your payments will be applied to the lower-interest balance before they are applied to your cash advance.
- ATM locations: You have to depend on an ATM machine being open and working when you need it. ATM machines cannot be found everywhere.

- Daily limits: Credit card companies set a certain limit as a credit line for you to withdraw from your account per day or month.

- Cash only: Credit cards are not yet accepted by all product and service providers, some places still accept cash only.

- Overspending: It is extremely easy to overspend as people tend to get carried away when they use credit cards.

Although the credit card is a convenient financial tool, if you should use your credit card with responsibility .

To Overcome This:

- **Know your limit**: obey your limit , exceeding your limit may be deemed a violation of your account agreement and may result in additional fees.

- **Pay On Time**: whether you choose to make the minimum payment or to pay the total outstanding balance . Your payment must reach the financial institution by the payment due date.

- **Stay in Good Grace**: many payment cards offer a grace period within which you can pay off the total balance of your account and avoid any finance charges .

- **Get To Know Your APR** : because different institution often use different system for computing finance charges, your APR (annual percentage rate) is a valuable number to know.

- **Keep in Touch**: If you change your name, address, or job notifies your lending institution immediately. Your payment could turn into a late payment in the time it takes for a statement to be forwarded to your new address by the postal service.

Section III : Monetary Policy in Egypt

A- E-money and Monetary policy

To appreciate the implications of the spread of E-money for monetary policy, it will be helpful to understand the concept of the monetary base (B). The monetary base consists of currency held outside the banking system (C) and the bank reserves (R). In the United States the depository institution hold reserves either in the form of currency, so called vault cash or balance at Federal Reserve Banks. Banks are required to hold reserves against their transactions deposits, and they voluntarily hold a small amount of excess reserves.

The implications of the spread of E-money for monetary policy would arise from the substitution of E-money for both currency and deposits shrinking the size of the monetary base. Taken by itself the decline in the demand for currency would have no direct implications for the conduct of monetary policy because what matters for monetary policy is the supply of and demand for reserves

B- Risks on the Monetary System Stability

E-money has dangerous effects on the payment system on the one hand, and the monetary policy targets on the other.

1- The impact of E-money on the Payment System and the Financial Markets Stability:

E-money has a direct effect on the good performance of the payment system and the stability of the financial markets. This goes back to the fact that exempting E-money from reasonable supervision by the monetary public authorities may harm the good performance of the payment system on the long run, which, in its turn, harms the financial markets.

2- The impact of E-money on the Monetary Policy Targets:

Banks offer their clients various electronic cards to be used in several functions. Moreover, many giant projects tend to issue their own E-money that bears their logos.

These cards influence the monetary policy since they are crystallized either as monetary substitution or creation of money.

The effect of monetary substitution

E-money is crystallized as a monetary form substituting one another. Thus, the **Council of the European Monetary Institute** decided in a recent report on "pre-paid money" that E-money should be included in the country's monetary statistics, since it substitutes liquid cash (coins or paper). In the same way, e-currency will affect the velocity of money because the purchasing power in this case is considered as bank deposits. There is no doubt that the effect of E-money on the monetary policy is attributed to the fact that decreasing the amount of liquid cash will contribute to decreasing the importance of the plans of the central banks and their ability to control money markets.

The effect of creation of money

E-money does not create money as long as it is used as a tool for exchange, just like the cheques used by the depositor within his account. But once E-money is

used as a kind of credit²⁸, it becomes very close to real money, and thus we can call it “creation of money”. The difference between the two cases goes back to the current account cover for E-money. In the first case, the cards have an ordinary account cover, but in the second, E-money that has no account cover will turn into lawful money as soon as it is demanded.

Two vital questions are raised in this respect²⁹:

- Did the appearance of E-money lead to reducing the tools used by the central bank to maintain price stability and encourage growth?
- If this is the case, what should the country do, to spread its authority over E-money as a part of its role in influencing the macro-economic?

In answering these questions, economists were divided among two parties:

The first has an optimistic view, and belittles the effect of E-money. One of the main supporters of this party is the Canadian writer Eric Helleiner (1998) who stated that there is no need to worry about the future of the monetary policy because E-money cannot threaten the authority of a sovereign state in a noticeable way. This point of view is supported by many other economists such as Charles Freedman (2000), Charles Goodhart (2000) and Michael Woodford (2000). The latter clarifies that concerns about the role of the central banks are excessive and unjustified. He adds that even if there may be vast changes in E-money one day, these changes cannot perceptibly influence the monetary policy.

Supporters of this optimistic party support their views by three claims that can be easily refuted.

The first claim: Lawful money will continue to exist and have authority in the future because of the compulsory power granted to it by the country.

However, this claim ignores the fact that although the compulsory power granted to lawful money can give it a competitive advantage, it cannot prevent the occurrence of new forms of money. It is widely recognized that the public’s trust in money is not only based on the authority of the country.

The second claim: Central banks do not consider the existence of E-money as a real threat. Helleiner (1998) quotes official studies which demonstrate that E-money has only a limited effect on the monetary policy because it is not important for the monetary policy to conform to the techniques used by E-money.

However, Mervin King refutes this claim stating that the central banks will be unable to implement an effective monetary policy if E-money evades lawful money.

The third claim: If E-money forms real threats at any time, central banks will easily solve the problem by extending its supervision to E-money, as Helleiner points out.

²⁸ (purchasing what exceeds the amount of money which belongs to the purchaser)

²⁹ Dr. Abdel Baset Mohammad Wafa “E-money Market (opportunities, threats and horizons)”, *Contemporary Egypt Journal*, issue 471/472, The Egyptian Association for Political Economy, Statistics and Legislation-October 2003, Cairo (in Arabic).

However, this claim is soundless. In fact, the central banks can never control E-money because E-money is not necessarily committed to a certain country. Thus, it can get rid of the supervision by moving to countries with more flexible laws.

The second party has a pessimistic view that over estimates the effect of money. One of its prominent supporters is the American writer Stephen Kobrin (1997) who states that the appearance of E-money made it difficult for central banks to supervise and measure monetary base. The economist Benjamin Friedman (1999)³⁰ supports this view pointing out that the monetary policy, as an indicator of the public authorities' preferences is endangered by the development of E-money.

We can thus conclude that the pessimistic point of view is more sound; since E-money has an influence on the monetary policy, by influencing the supply and demand of money.

³⁰ Friedman, Benjamin M. (1999): The future of Monetary Policy : The central Bank as an Army with only a single Corps? *International Financ* , 2 (3).

Section IV : E-money effects on Monetary Policy

After defining what's the differences between money & E-money, along with the monetary policy and identifying the institution that handles it. We now reach to the point where the understanding of how E-money has an impact on the central bank in handling the monetary policy becomes critical.

The spread of E-money affect the financial stability and the nature of money determines some important properties of the economy ; including a changes in the overall price level on the monetary policy knowing that the control of the money supply in an effort to improve economic performance.

The effects of E-money on the implementation of monetary policy will depend upon whether its primary impact is on the demand for bank reserves or on the central banks capacity to supply these reserves.

E- Money can impact such variables as monetary supply, exchange rates, the money multiplier, velocity of money and seignorage.

The increased use of E-money will³¹:

- Limit the central bank's ability to control money supply .
- Increase the velocity of money.
- Lower "seignorage" income.
- Decrease reserves.
- Decrease international monetary control.
- Change the money multiplier.

1) Limit the central banks ability to control money supply:-

So either ways where we are using traditional money or E-money still it depends on the money supply . If we use E-money, money supply will be reduced in some forms and this will have an impact on inflation and the availability of credit .

And the same when using traditional money if the central bank decides to reduce the supply of money. The question needs asking what the effect of this on the demand is.

The decreased ability to measure monetary aggregates will limit the central bank's ability to conduct open market operations and target the money supply. Therefore, the need to conduct open market operations will diminish, because the supply of money for transactions should automatically adjust to demand".³²

Moreover, "when the currency weight decreases gradually as the use of E-money increases, the scale of the central bank's assets and liabilities will be reduced, which may lead to a weakening of money management, and of the interest rate management through open market operations".³³

The idea that digital money is a commodity based may be overly optimistic. The possibility of fraud could lead the central bank to want to limit the changes to M1 and prevent the growth of E-money. The following measures could be taken³⁴:

³¹ Susan M. Sullivan E-money and Its Impact on Central Banking and Monetary Policy

³² Rahn, Dr. Richard W. " on the future of electronic payments". CATO Congressional Testimony. 19 Sep. 2000. CATO Institute, 25 Nov. 2002. [http:// www.cato.org/testimony/ct-rr091900.html](http://www.cato.org/testimony/ct-rr091900.html).

³³ Tak, Seung-H. "A study on the effects of the development of E-money on mnpetary policy in Korea" Economic Papers, Bank of Korea. 5.1(July 2002): 47-79.

³⁴ Berentsen, Aleksander " digital Money, Liquidity, and Monetary Policy" 1997, First Money, 25 Nov. 2002. [http:// www.first Monday.dk/issues/issue 27/berensten](http://www.first Monday.dk/issues/issue 27/berensten).

- Limit the proliferation of digital money products to prevent the replacement of central bank currency
- Issue digital money products, and treat digital money balances in the same way as they do central bank currency.
- Apply high reserve requirements on digital money balances.
- Absorb the excess liquidity created by appropriate monetary operations.

These would allow the central bank to maintain control of monetary aggregates though it may do more harm than good by limited technological improvements. Resistance to change may not be the best approach though any acceptance should come with hesitation as a drastic immediate change could cause turmoil in the economy.

2- increase the velocity of money: An increase in the velocity of money is considered by some economists to be gradual and requires a compensating adjustment in base money by the central bank³⁵.

It will be difficult to measure the resulting changes in velocity because income circulation velocity is calculated from the ratio of a term-end money supply and national income from that period. It is difficult for the circulation velocity resulting from this calculation to reflect effective money flows from electronic settlement properly. E-money will inevitably reduce the time and space disposal expenses of payment settlement transactions, and increases the volume of transactions by promoting transaction convenience³⁶.

It can be seen that, the velocity of money will increase if E-money is first adopted as a major form of money, and second added to the aggregates used to compute the velocity of money.

Decreased ability to control cross-country currency exchanges lowers the central bank's control of the money supply.

Some people have their concerns about reducing the balance sheet because of the decrease in the monetary base which leads to decreasing the ability of central banks to supervise monetary markets.

An increasing number of economists insist that the development of E-money as a functional substitute for paper money may lead to the collapse of demand for money issued by central banks which threatens the central banks role in monetary policy³⁷.

Since we concluded that E-money influences the demand on money, it may cause changes in the velocity of money, which decreases the benefit of using money as indicators or aims for monetary policy in countries that got used to this³⁸.

E-money could lead to shifts in the velocity of money which might temporarily reduce the usefulness of the monetary aggregates, especially narrower ones, for countries that rely on them as targets or indicators.

3- The money multiplier : When E-money is introduced, currency decreases, and deposit money increases as the private propensity to retain cash goes down. Therefore, the currency ratio is reduced, the money multiplier becomes larger, and

³⁵ Rahn, Dr. Richard W. "on the future of electronic payments". CATO Congressional Testimony. 19 Sep. 2000. CATO Institute, 25 Nov. 2002. [http:// www.cato.org/testimony/ct-rr091900.html](http://www.cato.org/testimony/ct-rr091900.html).

³⁶ Tak, Seung-H. "A study on the effects of the development of E-money on monetary policy in Korea" Economic Papers, Bank of Korea. 5.1(July 2002): 47-79.

³⁷ Niskanen (W) (1997): the effects of money on monetary policy in CATO : the future of money in the information age.

³⁸ Dr. Ahmad Gamal El-Din Mussa, "E-money and its Impact on the Role of Central Banks in Monetary Policy Management", Legal and Economic Research Journal, Al Mansoura University, Faculty of Law 2001 P.85 (in Arabic)

the volume of money supply created from the supply of fixed reserve money is amplified"³⁹. This shows that E-money will directly affect the money multiplier through the currency ratio.

If E-money replaces currency (paper and coins), the efficiency of monetary policy will increase by reducing the variance of the monetary multiplier which goes back to the changes in the general demand for the currency⁴⁰.

However, W. Niskanen states that G.Selgin's opinion can only be true if two assumptions are realized: the first of which is the increase of E-money with a rate that enables it to significantly reduce the demand for currency, and the second is managing monetary policy in a better way by controlling an amount of money that the central bank is responsible for. But both the assumptions are doubted. First of all, it is not expected that E-money can effectively displace the paper and metal currency. According to Niskanen, if E-money could substitute the currency kept in the Americans' wallets, the demand for the currency will decrease only by 10%. Thus, no vital change will take place in the level or variance of money multiplier⁴¹.

4- E-money decreases reserves. If reserve requirements are placed on E-money balances, there is no change, because it is assumed that currency will decrease by the same amount that electronic balances increase. However, this assumes that reserve requirements can be set on all E-money balances. This is not the case when private institutions are liable for the smart cards and network money.

If the central bank takes corrective action, it can limit the inflationary affects of increased money. This will not be a problem as the changes will be slow and measurable, therefore allowing central banks to adjust appropriately⁴². If this assumption is overly optimistic about the central banks abilities, it can be seen that the central bank could in fact lose control, and inflation could result from increased use of privately issued E-money.

5- The loss of "seignorage" income⁴³: This money is used to run the central bank, and therefore its loss could cause central banks to suffer financially.

This money is also used to fund the budget deficit and other government programs and this loss could have a negative effect on the government. This loss could be combated by treating E-money balances similar to demand deposits and enforcing reserve requirements.

There is some concern that digital money could also affect monetary control by reducing the independence of central banks. Today, central bank independence is based on their ability to generate (more than) sufficient seignorage income to pay for their operations.

³⁹ Tak, Seung-H. "A study on the effects of the development of E-money on monetary policy in Korea" Economic Papers, Bank of Korea. 5.1(July 2002): 47-79.

⁴⁰ George Selgin Quoted in Dr. Ahmad Gamal El-Din Mussa, "E-money and its Impact on the Role of Central Banks in Monetary Policy Management", Legal and Economic Research Journal, Al Mansoura University, Faculty of Law 2001 P.85 (in Arabic).

⁴¹ Stewart (D) (1996) : the future of digital cash on the internet JIBC (the journal of internet banking and commerce),1996 from Dr. Ahmad Gamal El-Din Mussa, "E-money and its Impact on the Role of Central Banks in Monetary Policy Management", Legal and Economic Research Journal, Al Mansoura University, Faculty of Law 2001 P.85 (in Arabic)

⁴² Rahn, Dr. Richard W. " on the future of electronic payments". CATO Congressional Testimony. 19 Sep. 2000. CATO Institute, 25 Nov. 2002. [http:// www.cato.org/testimony/ct-rr091900.html](http://www.cato.org/testimony/ct-rr091900.html).

⁴³ "the interest savings the government earns by issuing non-interest bearing debt in the form of currency" . see Ely , B. (1996): " E-money and monetary policy : Separating fact from fiction, paper presented at Cato Institute's 14th Annual Money Conference", May, P.20.

Widespread substitution of central bank currency could reduce seigniorage revenue to the extent that central banks would have to turn to other income sources such as government subsidies.

The monetary policy will not be affected if E-money replaces currency. The only significant effect is that the government will lose its seigniorage income⁴⁴.

The evidence for this point of view is the following⁴⁵:

First, the market of prepaid cards will not exceed 1 billion US dollar, and the resulting income (which is equal to the government's loss) is about 600 million dollars, and this will not cover the private sector expenses of issuing, marketing and developing it. Thus, there will be no significant effect on the demand for the currency.

Second, the Federal Reserve Council does not have control over the monetary supply.

⁴⁴ B. Ely quoted in Dr. Ahmad Gamal El-Din Mussa, "E-money and its Impact on the Role of Central Banks in Monetary Policy Management", Legal and Economic Research Journal, Al Mansoura University, Faculty of Law 2001 P.85 (in Arabic)

⁴⁵ see B. Ely , (1996): " E-money and monetary policy : Separating fact from fiction, paper presented at Cato Institute's 14th Annual Money Conference", May, P.20.

Section V: E-money and Monetary Variables

We made a lot of effort to get the statistics about E-money from the beginning of using it in Egypt , but we have the possibility to get the total number of debit card (DC) and credit card (CC) from the year 1999 to 2005 .

We use these data to get the regression and the diagnostic statistics and the result is the changes in E-money on the monetary policy.

The first step in the analysis is to determine the order of integration of each variable. This is done by testing the unit roots using the Kwiatkowski, Phillips, Shin, and Schmidt (hereafter KPSS) (Kwiatkowski et al., 1992) test. This test examines the null hypothesis of stationarity against the alternatives of a unit

Results of the KPSS test without trend of each variable are reported in Table (4). These results suggest that the null of stationarity for all variables under consideration cannot be rejected at the 1 % level of significance. Thus, the results from the KPSS test indicate that all the variables are stationary in levels.

We run the following diagnostic tests to evaluate the statistical prosperities of the regressions: (1) the Breusch-Godfrey LM test (BG) which is the appropriate autocorrelation test when a lagged dependent variable is a regressor, (2) autoregressive conditional heteroskedasticity (ARCH), and (3) Ramsey's test for specification errors (RESET).

Table (5) summarizes the results of regressions and diagnostic statistics. The results are as follows: (1) the changes in E-money (CC and DC) have a positive and significant effect on money supply. This limits the central bank's ability to control money supply, (2) the increased use of E-money has a positive and significant effect on money multiplier and income velocity of money. The results of diagnostic tests suggest that the regressions are good specified. In addition, the goodness of fit (R^2) indicates that the models fit the data well.

Table (3): Data used in Regression

Years	<i>CC</i>	<i>DC</i>	<i>MS</i>	<i>MB</i>	<i>GDP</i>	$m = \frac{MS}{MB}$	$v = \frac{GDP}{MS}$
1999	128421	75854	233909	73521.6	307600	3.181500	1.315041
2000	168608	80450	260999	87270.6	340100	2.990686	1.30307
2001	226421	113823	295491	102094	358700	2.894303	1.213912
2002	291593	140874	332813	111002	378900	2.998261	1.138477
2003	373054	134151	407589	155065	417500	2.628504	1.024316
2004	759765	2060098	468959	134577	485300	3.484689	1.034845
2005	966389	2870334	522857	197386	538500	2.648906	1.029918

Notes:

CC = Credit Card

DC = Debt Card

MS = Money Supply (M2)

MB = Reserve Money (Monetary Base)

GDP = Gross Domestic Product

m = Money Multiplier

v = Income Velocity of Money

Sources:

Data *CC* and *DC* are obtained from central bank of Egypt (unpublished data)
Other data are obtained from *International Financial Statistics* published by IMF (Online)

(<http://ifs.apdi.net/imf/logon.aspx>)

Sources:

1. Kwiatkowski, D., Phillips, P. C. B., Schmidt, P. and Shin, Y. (1992), "Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root: How Sure Are We That Economic Time Series Have a Unit Root?," *Journal of Econometrics*, 54, 159-178
2. Newey, W. and West, K. (1987), "A Simple, Positive Semi- Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix," *Econometrics*, 55, 703-708

Table (4): Results of KPSS (1992) Unit Root Test

Variables	Test Statistics (Levels)
<i>CC</i>	0.413 (1)
<i>DC</i>	0.516 (0)
<i>MS</i>	0.444 (1)
<i>MB</i>	0.467 (1)
<i>m</i>	0.249 (2)
<i>v</i>	0.416(1)

Notes:

- The number in the bracket denotes the lag truncation for Bartlett Kernel suggested by the method of Newey – West (Newey and West, 1987).

- The critical values at the 1 % significance level are 0.739

- The null hypothesis (H_0) is that the variable does not contain a unit root (i.e., stationary variable). Against the alternative hypothesis (H_1) where the variable contains a unit root (i.e., non – stationary variable).

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1. Kwiatkowski, D., Phillips, P. C. B., Schmidt, P. and Shin, Y. (1992), "Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root: How Sure Are We That Economic Time Series Have a Unit Root?," *Journal of Econometrics*, 54, 159-178
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Table (5): Results of the Impact of E-money on Monetary Variables

Independent Variables	Dependent Variables					
	MS_t		m_t		v_t	
m_{t-1}			-1.074 (0.019)**	-1.090 (0.019)**		
v_{t-1}					0.385 (0.226)	0.360 (0.223)
MB_{t-1}	1.611 (0.003)*	1.498 (0.006)*				
MB_t	1.289 (0.005)*	1.197 (0.004)*				
CC_t		0.054 (0.070)***		1.87E-06 (0.041)**	3.72E-07 (0.026)**	
DC_t	0.009 (0.064)***		3.21E-07 (0.039)**			6.43E-08 (0.023)**
<i>TimeTrend</i>			-0.174 (0.054)***	-0.295 (0.047)**	-0.092 (0.031)**	-0.070 (0.040)**
constant	25919.48 (0.212)	33824.60 (0.177)	6.513 (0.005)*	6.409 (0.005)*	0.824 (0.118)	0.890 (0.091)***
F	1062.249 (0.000)*	998.086 (0.000)*	19.608 (0.049)**	18.903 (0.051)***	97.324 (0.010)**	112.852 (0.008)*
R^2	0.99	0.99	0.96	0.97	0.99	0.99
Diagnostic Tests	F statistic (p-values)					
BG LM Test (1)	0.093 (0.811)	0.069 (0.837)	1.369 (0.450)	2.122 (0.383)	1.391 (0.448)	1.333 (0.454)
ARCH LM TEST (1)	2.783 (0.196)	29.768 (0.129)	0.177 (0.702)	0.234 (0.661)	0.035 (0.863)	0.037 (0.859)
RESET Test(1)	36.116 (0.105)	15.190 (0.160)	0.009 (0.941)	0.092 (0.813)	0.104 (0.801)	0.037 (0.859)

Note: *, ** and *** stand for significance level at 1%, 5% and 10%, respectively.

Sources:

1. Kwiatkowski, D., Phillips, P. C. B., Schmidt, P. and Shin, Y. (1992), "Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root: How Sure Are We That Economic Time Series Have a Unit Root?," *Journal of Econometrics*, 54, 159-178
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Conclusion

The rapid advance in information technology and the spread of E-money will weaken the Central bank's control over the supply of bank reserves. The Central bank's role as the monopoly issuer of money will be undermined by the emergence of non-bank competitors in the provision of payment services. As a result, Central banks may be reduced to signaling their policy

The future of E-money is dependent on its growth, and increased technological advancements that would increase the security of this new instrument. In fact it become widely used in the united states it will directly impact the central bank's control of monetary policy unless the central bank includes it in its measurements of monetary aggregates and regulates its growth and usage.

There is no doubt that, with the spread of electronic trade, the central bank will have to shoulder new responsibilities because of its legal responsibility to monopolize issuing money. The most prominent of these responsibilities is: standing up to the results of the universality of e-payment systems and following up the development of E-money products.

Recommendations

The effect of E-money on the monetary policy depends mainly on how fast it will spread and the extent to which it will substitute cash.

- If E-money spreads moderately, the decrease in the seignorage income and thus the decrease in the Balance Sheet of central banks will be limited. The central banks must include E-money in monetary aggregates that the spread of E-money may lead to a change in the velocity of money.

- If E-money spreads widely, central banks should consider taking steps to compensate the resulting decrease in their Balance Sheet.

- To avoid monetary policy instability, the European Central Bank (ECB) (1998) adopted a number of guarantees, the most important is that including E-money in monetary statistics in order to observe its development and make it subject to compulsory reserves system which aims at decreasing the liquidity of the banking system as a whole (which has to include E-money suppliers).

- Central bank must to impose special obligatory with the money reserve on the E-money issuer incase of any large increase in E-money creativity which affect the monetary policy in the end. The government must keep the rate of prices stable. With this condition the E-money will be equal to other forms of money which maintain by apportion percentage as a reserve ratio to the central bank

- Importance of having organizing and co-operation of international legitimacy.

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