

Financial Innovations, Monetary Policy and Financial Stability

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I. Introduction

Since the mid-seventies the financial environment in the leading industrial world has changed enormously through the rapid developments in the process of financial innovations, the deregulation of financial markets and the structural changes in the whole financial industry. The international integration of the major financial centres has led to the creation of a 24-hour global market, in which information is available in real time throughout the world.

The financial innovations defined in *Schumpeter's* sense either as a new product or as a new process refer to the introduction of new financial instruments and practices on financial markets. The importance of this phenomenon was clearly emphasized in July 1985 by the president of the American Finance Association in his opening address of the annual conference when he pointed out, "One of the bedrocks of our financial system is financial innovation, the lifeblood of efficient and responsive capital markets".¹ In comparison with the sixties financial markets have become more extensive and integrated internationally and especially more dynamic. This implies that these markets have become extremely sensitive to all kinds of real and monetary disturbances in the economy.

Although in comparison with the U.S. and the U.K., the Dutch financial system can be characterized as a relative free and unregulated system, the Minister of Finance and the Central Bank have decided to a further liberalisation of the Dutch capital market dating from January 1st 1986. The main reason was to avoid the settlement of guilderttransactions through foreign financial markets. In this context Dr. *Duisenberg*, the President of The Netherlands Bank, remarks "The essential feature of the international

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¹ J. van Horne, Of Financial Innovations and Excesses, *The Journal of Finance*, July 1985, p. 621.

developments regard's to the increasing interweavement of the different financial markets. The Netherlands, already characterized by a great freedom of capital movements, cannot withdraw from these tendencies".²

This paper reviews the main trends in the broad fields of financial innovations, as these came about in the last decade. First of all attention will be given to the characteristics and activities of financial intermediaries on financial markets. Subsequently the causes and consequences of financial innovations will be analyzed, focusing in particular on the phenomena of disintermediation, securitisation and off-balance-sheet activities. Finally an outline will be given of the implications of all these new financial developments for the authorities operation of monetary policy and also with regard to their task to safeguard and to strengthen the stability of the whole financial system.

II. Financial Intermediaries and the Saving-Investment Process

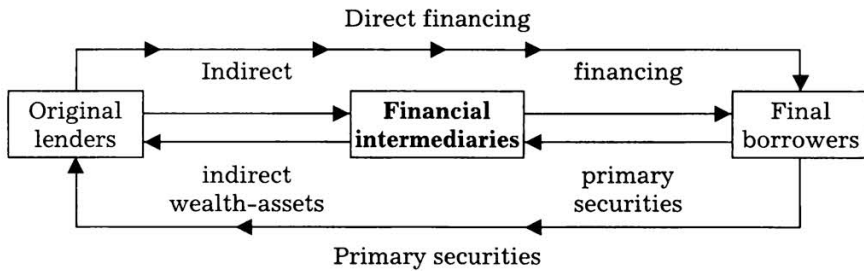
In the financially well-developed western countries traditionally financial intermediaries played an important role on financial markets in canalizing savings to investments. In the economy consumers make a trade-off between current and future consumption and transfer the accumulation of wealth, especially through financial institutions, to the producers, the ultimate borrowers.

In this way there are many different financial intermediaries, some with a money-creating character, between the ultimate wealth-owners and the ultimate borrowers or between surplus and deficit agents in the economy. In supplying their own wealth-assets, with a different liquidity-feature, risk and yield, the financial intermediaries are raising funds from the less-informed agents on the financial markets.

Subsequently, based on their specific know-how and information, these funds will be transferred through credit-activities and investments (buying primary securities such as government bonds, mortgages etc.) to the ultimate borrowers.

The figure below illustrates this intermediation process, the flow of funds from original lenders, directly through financial markets and indirectly through financial intermediaries to the final borrowers.

² W. Duisenberg, Financiële innovatie en monetair beleid: Deregulering van de Nederlandse kapitaalmarkt, Kwartaalbericht De Nederlandsche Bank N.V. nr. 3, December 1985, p. 32.



In the early sixties *Gurley and Shaw*, starting from the liquidity-concept of the British *Radcliffe-Committee* (1959) criticized the traditional distinction between monetary and non-monetary financial institutions.³

They emphasized the rapid growth of the phenomenon of indirect financing through non-monetary financial institutions after the second world war, weakening the effectiveness of monetary policy. In the sixties financial institutions could roughly be divided in three groups. Primarily the monetary institutions, part of their liabilities is used as money (demand deposits), which determine the amount of the money supply through their credit-activities and therefore will be controlled by the central bank. Subsequently the so-called para-monetary institutions (savings-banks) which only have an intermediation function in the saving-investment process, but part of their liabilities has the character of an interest-bearing money-substitute. These liabilities can be compared with the savings- and time-deposits of the monetary institutions and have a close substitution relation with the traditional money concept. (*Gurley and Shaw's* substitution-hypothesis). Finally the "other financial intermediaries" (insurance companies, pension-funds etc.), which only have a "broker-age-function" in the saving-investment process.⁴

Whereas monetary institutions had previously been discussed only in the context of money, with the other two types of institutions being treated separately and individually, over the past twenty-five years the increasing tendency has been to place both banks and non-bank financial intermediaries within a general field of financial intermediation as far as the working of financial markets is concerned.

Summarizing it can be put forward that the assets of the financial intermediaries constitute the primary securities (bonds, mortgages etc.) of the final borrowers and that the indirect securities of the financial inter-

³ *J. Gurley and E. Shaw*, *Money in a Theory of Finance*, 1960.

⁴ *J. Sijben*, *Near-Banking and Monetary Policy*, Amsterdam-Rotterdam Bank, Quarterly Review, December 1972.

mediaries (such as savings- and time-deposits etc.) constitute the financial wealth-assets of the ultimate lenders.

Speaking about the micro-economic foundations of financial intermediaries it can be stated that in circumstances of a perfect capital market, characterized by a costless gathering and interpretation of information, homogeneous expectations etc. financial intermediation would not exist. This means that the existence of financial intermediaries is based on imperfections on the capital market.

The development of intermediaries reflects the diversity of financial balances and the advantages which they offer for their customers as compared with the direct contact between surplus and deficit sectors in the economy. The advantages ultimately arise from the saving in transaction and information costs, stemming from uncertainty, which financial intermediation achieves as compared with direct external financing (search costs of “financial barter”). The other advantages and gains from intermediation may be described more immediately in terms of the creation of liquid assets or the provision of a wider range of financial instruments to which intermediation leads, increasing the possibilities of portfolio-diversification.

III. Causes of Financial Innovations

Based on the broad definition of financial innovations as mentioned in the introduction, the innovations always refer to a change in the characteristics, the amount and the composition of monetary and financial aggregates on the one side and to the structural changes in the working of financial markets on the other side. In this way the phenomenon of indirect financing according to the *Gurley* and *Shaw*-analysis has increased rapidly, extending the amount and variety of financial wealth-assets in the economy substantially. Moreover since the early eighties, also direct financing through financial markets, known in the literature as securitisation and disintermediation, showed a strong dynamic development.

Analysing the causes and driving forces of the process of financial innovations the following issues can be put forward. The innovations will always occur when agents on financial markets try to find out ways to enlarge their profitabilities on the one side and to reduce the financial risks on the other side. Mapping out the causes of financial innovations we can mention subsequently:

- deregulation of financial markets
- financial and monetary uncertainties

- the changed international environment
- internationalisation of financial markets
- information-technology.

Since the mid-seventies the innovations in the saving-investment process were set going through the existence of many regulations in financial markets (especially in the U.S. and the U.K.), in an economic environment characterized by a high, variable, and unpredictable rate of inflation and interest rate. Later on the concomitant monetary and financial uncertainties were strengthened by the volatility of exchange rate movements, after the collapse of the Bretton-Woods system. It appeared that the regulated environment disturbed the smooth working of financial markets. Therefore the innovations aimed at circumventing these stifling regulations, like the maximum rate of interest on time deposits with American commercial banks (Regulation Q, which was abolished not until 1986). The need for deregulation of financial markets subscribed well to the recent development in macro economic theory (new-classical macro economics) in the seventies, emphasizing the operation of the market mechanism in economics. In this context I refer to the “Depository Institutions Deregulation and Monetary Control Act” (1980) in the U.S. and to the deregulation of financial markets in the U.K. in October 1986 (“Big-Bang”) to strengthen the position of London as an international money centre.⁵ It is interesting to ascertain that the recent process of deregulation and the concomitant increasing competition in the financial system have speeded up the process of financial innovation. This process of interaction between regulation and deregulation, the so-called dialectic of financial regulations, which drives the innovations, is described by *Kane* as follows: “When structural changes in regulated markets kick-off the game, the sequence becomes one of innovation, re-regulation and avoidance. In the regulatory dialectic, political processes of regulation and economic forces of avoidance adapt continually to each other like riders on a seesaw”.⁶

As was mentioned before, the high and variable rate of inflation and inflationary expectations, together with the erratic fluctuations of interest rates had also a strong influence on the pace of financial innovations. Especially since the change in monetary policy behaviour in the U.S. in 1979 (controlling monetary aggregates) with its simultaneous upward trend in

⁵ *D. Llewellyn*, *The Regulation and Supervision of Financial Institutions*, Gilbert Lectures on Banking, 1986, The Institute of Bankers, London, 1986. See also *J. Germany* and *J. Morton*, *Financial Innovations and Deregulation in Foreign Industrial Countries*, Federal Reserve Bulletin, Washington D. C., October 1985.

⁶ *E. Kane*, *Policy Implications of Structural Changes in Financial Markets*, *The American Economic Review*, May 1983, p. 97.

world-interest rates, monetary uncertainty and the opportunity costs of holding non-interest bearing transaction balances increased substantially. It is evident that private households and non-financial-corporations as well as financial institutions were stimulated to implement new cash-management and liability-management techniques and practices respectively to cope with the new risky environment. This changed portfolio-behaviour in the private sector (demand-side) was made possible through the introduction of financial liquid-assets (supply-side), bearing a market-related rate of interest. Moreover this tendency to a more efficient cash-management behaviour, according to *Baumol's* analysis of the early fifties, was technically strengthened by the application of electronics in the financial system.

Especially in the early eighties this development resulted in the U.S. in a great extension and a deepening of financial markets and in a growth of the available supply of high-yielding liquid financial assets fitting well in private portfolios (NOW-Accounts, Money Market Mutual Funds, Money Market Mutual Deposits, ATS-Accounts). These liquid assets and other financial services are offered even by traditional non-financial firms (*Sears-Roebuck*, *Merrill Lynch's* Cash Management Account).⁷ The availability of these wealth-assets with a liquidity and an investment character simultaneously has further intensified the optimum cash-management practices of households and business-firms. In this way the holding of non-interest bearing transaction balances has been reduced while the share of interest-bearing liquid assets in the (broad) money concept has been extended⁸ (see section V).

The deregulation of financial markets and the increased competition between financial intermediaries has strongly enlarged the interest sensitivity of their liabilities (liability-management). This resulted in an interest rate-risk, which can be described as the probability that the net-interest returns of a bank can be affected unfavourably by the volatile fluctuations in interest rates. This risk will be greater the higher the mismatch of the maturities of its assets and liabilities and the higher the amount of these assets and liabilities. The banks reacted upon the increased volatility of interest rates with the introduction of new credit-instruments with variable or adjustable lending rates and also with a shortening of the maturities of their assets

⁷ In this context the pronouncement of *Sametz* is appropriate, as he remarked at the First International Meeting "Financial Innovations", organized by New Fin, Bocconi University in Milan, 1986, "You can buy your stocks where you can buy your socks". See also, *The Pandemic of Deregulation*, *International Currency Review*, no. 1, 1986, p. 18 - 31.

⁸ *M. Akhtar*, *Financial Innovations and Their Implications for Monetary Policy: An International Perspective*, *BIS. Economic Papers*, nr. 9, December 1983.

(asset-management). In this way they were trying to seek protection from the risk arising from the unpredictable and fluctuating interest rates, shifting these risks to the ultimate borrowers. In this way financial institutions were able to mitigate or eliminate the so-called mismatch and its associated deterioration of the profit-margin.⁹

Not only the financial intermediaries but also business-firms were confronted with these interest rate risks in the last decade. They were also trying to shift this risk by introducing new market instruments like interest-rate swaps. This hedging instrument refers to a financial transaction in which two parties agree to change each others future interest payments according to a predetermined rule, aiming at an achievement of lower costs of financing and hedging the interest-rate risk.¹⁰

Next to the deregulation of financial markets and the increased volatility of inflation and interest rates the pace of financial innovations was also driven by the changed international environment (a.o. the international debt-crisis in 1982). In this respect mention must be made of the arise and further development of the Eurobanking system, of the introduction of flexible exchange rates and of the liberalisation of capital flows. Especially the Euro-currency market and the liberalisation of capital movements have enlarged the amount as well as the marketability and so the liquidity of the different financial wealth-assets. At the same time the interweavement of financial markets in the world as a consequence of an increased economic integration has resulted in a substantial extension of the possibilities to hold foreign wealth-assets and to borrow internationally. This means that the process of saving and investment got a more international feature and took place through the national financial markets to a lesser extent. In this context I refer to the strong growth of the international bond market and the rapid development of the Euronote market (Euro-Commercial Paper) which occurred since the early eighties. *Llewellyn* talks of a globalisation of financial markets whereby the national financial markets can be considered as a sub-set of a world financial market. In his opinion this integration and interweavement of financial markets arose through the deregulation trend

⁹ In this context of asset-liability management, I refer to the "duration-analysis" as a new technique in the management of interest rate risk, including both the effects of the interest rate exposure on profitability and on the market value of the assets and liabilities of the institution. Duration is a measure of the average maturity of a security. See, *G. O. Bierwag*, Immunisation, Duration and the Term Structure of Interest Rates, *Journal of Financial and Quantitative Analysis*, December 1977, p. 725 - 742.

¹⁰ For other techniques of risk-management I refer to "Interest rate options" and "Forward-rate-agreements". See the *Cross-Report* of the B.I.S., Recent Innovations in International Banking, B.I.S., Basle, 1986.

and the introduction of telecommunication-technologies in the financial system.¹¹

The erratic and unpredictable course of exchange rates in the last decade has increased portfolio diversification. In this way currency substitution by international firms with regard to the composition of their transaction-balances and also the substitution of financial assets, denominated in foreign exchange, have assumed large proportions.¹² For a diversification of portfolios and an efficient foreign exchange management behaviour can reduce or eliminate the exchange rate risk. Also in this field of hedging exchange risks new financial techniques and instruments were developed, enlarging the amount of international financial transactions enormously. In this context the so-called "Financial futures contracts" with regard to exchange rates, currency swaps and the foreign currency options can be mentioned as new hedging-instruments.¹³

Finally the introduction of electronics and communication-technology with regard to the gathering and interpretation of financial information has strongly reduced the costs of financial transfers. The swiftness, the amount and especially the complexity of financial transactions have increased substantially as a consequence of the application of computer-techniques on financial markets. Simultaneously these technological developments have speed up and strengthened the whole financial intermediation process, enabling households and firms to improve their cash-management policies.

After these considerations about the causes of financial innovations the question comes about as to how far these processes will be temporarily.

One might be wondered if in an economic environment with liberalized capital markets and characterized by a greater stability with regard to inflation, interest rates and exchange rates (and the concomitant expectations) the pace of the innovation processes will be mitigated or perhaps may come to an end. With respect to this question *Sametz* made some interesting remarks. In a discussion-paper focusing on the analysis of the driving forces of the innovation processes on financial markets in the last 25 years, he dis-

¹¹ *D. Llewellyn*, Financial Intermediation and Systems; Global Integration, Paper presented at the SUERF-Colloquium, International monetary and financial integration – the European dimension, Luxemburg, October 1986.

¹² Owing to the volatile developments on the international foreign exchange markets in recent years, the exchange rate-risk has become a predominant uncertainty, which the multinational firms have to take into account.

¹³ For a more technical elaboration of these hedging-instruments, see *S. Cooper* and *D. Fraser*, *The Financial Market Place*, Addison-Wesley Publishing Company, 1986, p. 575 - 595 and also the *Cross-Report*, mentioned in footnote 10.

tinguished two stages. On the one hand the seventies, characterized by a deregulation trend and a high degree of uncertainty concerning inflation, interest rates and exchange rates; on the other hand the eighties, in which decade the technical revolution on financial markets will be continued and will become the impetus of the innovation process. In this context he points out "This will equip us to judge the usefulness of most of the available theories of innovation which are largely based on exogenous factors; in the end we will see that financial innovation itself in time becomes the principal cause of future innovations.¹⁴ This means that the process of financial innovations will be developed further on and will become endogenous. He states that just the reaction on the erratic course of inflation, interest rates and exchange rates through new hedging-instruments and through the technological developments in the financial system has increased the amount as well as the variety of financial risks. Then he remarks, "... the development of futures markets is an 'internal' innovation, an innovation that grow out of the needs of the new, competitive, deregulated automated financial system, rather than as a response to unexpected shocks. In this sense the innovative financial system is a continuously innovating system. Today, the over-the-counter sector and overseas trading are challenging the exchange's dominance and once again (like in 1975) technology (e.g. computerized execution of trades) seems to be the driving force".¹⁵ This view is also expressed by *Gleske* as he puts forward, „Es gibt jedoch längerfristig wirkende Kräfte, die selbst in einem stabilerem Umfeld die Innovationsbewegung vorantreiben werden. Dazu gehört vor allem der technologische Fortschritt in der Datenverarbeitung und der Nachrichtenübermittlung“.¹⁶

¹⁴ A. *Sametz*, Stages of Financial Innovations of the Last 25 Years, Paper presented at the First International Meeting "Financial Innovations", organized by New Fin, Bocconi University, Milan, September 1986, p. 1. The proceedings of this conference are published in First International Meeting Financial Innovation, Milan, July 1987.

¹⁵ A. *Sametz*, Bocconi University, Milan, 1986, op. cit. p. 3 and p. 6. A similar view was expressed by *Lamfalussy* when he remarked, "... won't one of the motives for innovation vanish? An additional factor that comes to my mind is this. What would be the feed-back of generalised hedging on interest and exchange rate movements? Will the use of hedging-techniques accentuate or will it on the contrary attenuate volatility? See A. *Lamfalussy*, Worldwide Competition in Financial Markets: Issues for Banking Supervisors, Paper presented on the Conference of Banking Supervisors, 23 October, 1986, Amsterdam.

¹⁶ *H. Gleske*, Finanzinnovation aus Sicht der Notenbanken und der Bankaufsichtsbehörden, Die Bank, Juni 1986, p. 284.

IV. Marketisation of Banking and Finance

Based on the preceding considerations it can be pointed out, that the deregulation of domestic financial markets and the further liberalisation of capital movements have led on the one hand to an increase of competition in attracting funds between financial intermediaries and to a deterioration of profit-margins and its concomitant solvency of the financial institutions on the other hand. Banks therefore have sought out other areas for profitable expansion and additional income-sources. In this context very recently some interrelated developments occurred, which are very important for the safety and the stability of the financial system. First the process of intermediation and securitisation; subsequently the off-balance activities and finally the increasing internationalisation of financial markets.

The phenomenon of securitisation or disintermediation refers to the situation in which the ultimate borrowers (business firms and governments) tap financial markets directly rather than borrow traditionally from the banks. This means that more and more bank loans will be replaced by negotiable securities, avoiding the banking system and other financial intermediaries as the traditional channels in the saving-investment process (see figure in section II). It refers to a financial intermediation process in which the credit activities occur directly through the market and an anonymous price mechanism by the introduction of tradable credit instruments (Eurobonds, Euronotes etc.). Shortly, it concerns "less banks and more markets". Consequently the dominant position of syndicated bank-lending has declined both in total amount and as a share of total international lending. In international markets, securitized lending now accounts for over 80 percent of gross new credit arranged, compared with about 25 percent in the mid seventies.

The table below illustrates the rapid change in the development of credit activities on international financial markets in recent years.¹⁷

In this securitisation process the risk will be borne by the ultimate lender or wealth-holder and the liquidity of the asset is determined by the maturity and the existence of a secondary market. The phenomenon of securitisation has resulted in a substantial increase of the share of negotiable financial assets in the total wealth of the industrialized countries. In this way a strong financial deepening of the western economies has occurred. This implies a more efficient mobilisation and allocation of private savings on the one hand

¹⁷ See, *Global Financial Change*, in: *World Financial Markets*, Morgan Guarantee Trust Company of New York, 1986.

Gross International Borrowing
(billions of dollars at annual rates)

	1983	1984	1985	January – September 1986
<i>Securitized financing</i>	87	151	215	258
Bond issues	77	112	168	232
NIF's and similar backups	10	29	47	26
<i>Syndicated bank loans</i>	67	57	42	40
other backups	3	11	11	7
Total borrowing	157	219	268	305
Securitized financing as percent of total	55	65	80	84

and a fundamental change in the relation between money, credit, prices and economic activity on the other hand.

Now the questions comes about what are the causes of the recent marketisation of finance? In this respect mention must be made of the important geographic shifts in financial flows (disequilibrium in the balance of payments), the deregulation of world financial markets and the international debt-crisis, with its associated credit-worthiness of the banking system. In this context *Gleske* points out, „Während in den siebziger Jahren achtzig Prozent der internationalen Finanzierungsmittel in der Form von Bankkrediten bereitgestellt wurden, haben heute verbriefte Finanzierungen einen Anteil von vier fünfteln“, and further on, „Da die amerikanischen Banken an der Kreditfinanzierung Lateinamerikas sehr stark beteiligt waren, wurden sie vom Ausbruch dieser Verschuldungskrise besonders stark betroffen. Bei verschiedenen bedeutenden amerikanischen Banken wurden auch noch größere Teile der Inlandskredite notleidend. Als Folge davon nahm die Kreditwürdigkeit der amerikanischen Großbanken ab, so daß mehr und mehr Anlieger sich von Bankeinlagen ab- und dem Wertpapier zuwandten.“¹⁸ Especially the large and highly credit-worthy borrowers can directly and relatively cheaper tap the international financial markets.

It is evident that this disintermediation process as a consequence of direct financing through the markets will have an influence on the balance-sheet of

¹⁸ *H. Gleske*, *Die Bank*, Juni 1986, op. cit. p. 280. See also: *Neue Entwicklungen am internationalen Kapitalmarkt*, Deutsche Bank A. G., Frankfurt am Main, 1986.

the banks. Primarily on the liability-side. For it implies a reduction of savings flowing to the banks and other financial intermediaries, narrowing their basis for further credit-expansion. Next to this shortening of the balance-sheet and the reduction of total bank-activities, securitisation has also an important impact on the asset-side. For in future the banks will be more committed to the less credit-worthy borrowers, increasing the average risk of their loans or worsening the average quality of their assets.

Subsequently the banks reacted on this disintermediation process to recoup their loss of the market-share in the intermediation process and to restore or maintain their profitability by getting involved with more risky and higher yielding activities. On the one hand with activities which traditionally belonged to investment-banks and on the other hand with underwriting facilities or off-balance-sheet activities, avoiding the capital adequacy requirements of the regulatory authorities. These off-balance-sheet activities can be considered as a by-product of the securitisation process. They may be characterized as a recent development which deserves serious attention of regulators with regard to their task to safeguard the soundness and stability of the whole financial system (see section VI).

The off-balance-activities refer to medium-term fee-based commitments to purchase short-term paper that otherwise fails to sell within specified terms. So this means that the bank gives a credit-guarantee with regard to a predetermined amount and for a specified time-period to the potential borrower, to purchase the short-term securities if these cannot be placed in the financial market. It is also possible that a bank enters in an obligation to commit to a letter of credit.

The underwriting facilities (like NIF's, RUF's etc.) refer to the insurance function of bearing the risks of adverse price fluctuations during the period in which a new issue of securities is being distributed. In practice the underwriting facilities are often combined with the distribution of the securities concerned. They imply an additional source of income for the banks, without leading to any balance-sheet expansion. The main forms of these new off-balance-sheet techniques, including swaps, dealing in options and futures, forward-rate-agreements etc. are described and analysed in the *Cross-Report of the Bank for International Settlements*.¹⁹ In recent years (1983 - 1984) the off-balance activities of ten large American banks

¹⁹ In this context *Heintzeler* points out, „Nach den Erfahrungen in Süd-Amerika ist es das Ziel der im internationalen Bereich tätigen Banken, Transaktionen ohne Belastung ihrer Bilanz zu arrangieren; ihre Priorität lautet nicht mehr Margen auf Kredite, sondern „fee-business“, in: *Strukturwandel am internationalen Kapitalmarkt*, Deutsche Bank A. G., 1986, p. 4.

developed very rapidly. In this respect *Saunders* remarks, "As can be seen, even if Continental Illinois is excluded, commitments and contingencies (C.C.) is 1,7 times the size of the average on balance-sheet assets. Given leverage ratio's of approximately 20 this implies that these potentially risky CC-activities are commonly more than 34 times the size of bank-capital".²⁰ It is quite obvious that these off-balance activities may increase the potential credit risks and the potential future funding-risks and may deteriorate the solvency of the banks in a rapid and substantial way.

V. Implications for Monetary Policy

It is self-evident that the pace of financial innovations and the associated changes in the working of financial markets will have consequences for the design and the implementation of monetary policy.

Primarily the question about the operational meaning of the traditional narrow money-definition (currency in circulation and demand deposits). For in a financial environment with an extending amount of interest-bearing liquid financial assets, sometimes adopting the function of medium of exchange of the traditional money-concept, it becomes more difficult to make a clear distinction between a narrow and a broad money-definition. Especially in the US the introduction of new financial assets with a money and an investment character simultaneously (see section III) has confronted monetary policy-makers with many problems. Since 1980, the Fed has modified its definitions of money several times. However these issues are not confined to the US financial system. At the time in the seventies other central banks changed their monetary policy behaviour to monetary targeting aiming at the central goal of abandoning inflation, they were also confronted with the phenomenon of shifting frontiers between monetary and non-monetary financial institutions (see section II) and so with the blurring of money and other liquid financial assets. Moreover, just the policy of announcing and sticking to the monetary targets has strongly increased the arise and use of new financial assets for transaction purposes. This is linked-up with the fact that the rise and erratic movements of interest rates, induced by the change in monetary policy behaviour, have driven the process of financial innovations.

In the Netherlands already in the sixties the President of the central bank made a clear distinction between savings-accounts with a money character

²⁰ A. *Saunders*, *Financial Institutions: Innovations in Risk-Management by Banks and their Regulations in the U.S.*, Paper presented on the First International Meeting "Financial Innovations", Bocconi University, Milan, September 1986, p. 2.

and those with a genuine savings or wealth-character. For these savings deposits the turnover rate was used as a yardstick to determine the extent to which they may be considered to be held as liquid savings (included in M2) to be controlled by the central bank or as genuine savings to be held as a wealth asset in portfolios of economic agents.

Second the current wave of innovations has also an influence on the money-supply process. This influence is enacted particularly through a change in the money-multiplier (the relation between the monetary-base and the money supply) in the medium term as a result of the frequent and unpredictable changes in portfolio-behaviour of the non-monetary sectors in the economy. *Ceteris paribus*, it can be put forward that the innovations will increase the medium-term money-multiplier. In its most simple version this coefficient depends on the ratio between currency in circulation and the traditional money-supply (M1) on the one side and on the reserve requirements of the money creating institutions on the other side. As was mentioned before the intensive use of cash-management practices has resulted in a reduction of the ratio of currency in circulation to the interest bearing liquid deposits with financial institutions. Moreover the impact of the reserve requirement is weakened as the public shifts from demand deposits (M1) with a higher reserve requirement ratio to the higher yielding deposits with a lower or no reserve requirement. Both factors, the reduction in currency in circulation and in the effective reserve ratio's *ceteris paribus*, enlarge the numerical value of the money multiplier and so the money supply, weakening the authorities' control of the money supply process. In this way the money supply has become interest sensitive indirectly through the interest-induced changes in the liability-structure of the balance-sheet of money creating institutions and in the portfolio-behaviour of the public.

With regard to the impact of financial innovations on the demand for money the following brief remarks can be made. In recent years in many countries it can be observed that due to the extended cash-management practices etc. the velocity of money (M1) has risen. These erratic movements of the velocity of money, induced by shifting portfolio-behaviour of the public in the short run, are unpredictable and increase the instability of the demand for money (M1). Moreover in a higher financially integrated world, currency substitution with regard to transaction balances of multinational firms, also influences the stability of money demand functions. Although strong short-run fluctuations of the velocity of money have come about, it appears from empirical studies that the demand function of money in the long run is rather stable and that this stability is not dependent on the chosen money definition.²¹

Subsequently, from a macro economic perspective the effects of financial changes on the transmission mechanism of monetary policy are of particular interest. Broadly three types of influences stemming from financial deregulation and innovation are important as transmission channels in this respect.²² First, with deregulation of financial markets, more competition and other financial changes, monetary impulses are now increasingly being transmitted to the ultimate objectives of economic policy through interest rate fluctuations. In principle wider recourse to variable rate financing and the new techniques of risk-management make the financial system more responsive to interest rate fluctuations. The view that interest elasticities of various aggregate demand components would rise over time implies a flattening of the IS-schedule in the standard IS-LM model making economic activity more responsive to monetary policy. According to *Poole's* analysis, this would imply that controlling the rate of interest in the short run should be preferred to monetary targeting to mitigate fluctuations in national income.²³

Second, financial changes are increasing the share of monetary aggregates that is subject to market related interest rates, eventually reducing the interest elasticity of the demand for money (in a broad sense). In theoretical and more technical terms this implies a steepening of the LM-schedule in the standard IS-LM model, improving the effectiveness of monetary policy.²⁴

Finally, it can be pointed out that as a result of financial innovations, deregulation and a globalisation of financial markets, international capital has become more mobile and sensitive to interest rate differentials and to expectations regarding exchange rates. As a consequence in the recent past the exchange rate has taken on greater importance in the transmission processes of monetary policy impulses, especially in small open economies. For shifts in relative monetary conditions in major financial markets lead

²¹ *M. Fase*, The Demand For Financial Assets, *European Economic Review*, 1979, no. 4, p. 381 - 394 and *J. Judd* and *J. Scadding*, The Search for a Stable Money Demand Function, *Journal of Economic Literature*, September 1982, p. 993 - 1023.

²² *M. Akhtar* and *G. Dennis*, Financial Innovations and the Interest Elasticity of Private Expenditures, Research Paper, no. 8422, Federal Reserve Bank of New York, October 1984, p. 1 - 4. Their empirical results for a sample of seven countries seem to lend some support to the hypothesis that the interest elasticities of private demand have drifted upward owing to financial innovations and deregulation.

²³ *W. Poole*, Optimal Choice of Monetary Policy Instruments in a Simple Stochastic Macro Model, *Quarterly Journal of Economics*, May 1970, p. 197 - 216.

²⁴ See *M. Akhtar*, BIS-Economic Papers, no. 9, December 1983, op. cit. p. 38 - 44 and the appendix, Interest Rates and Economic Activity, p. 52 - 57.

rapidly to exchange rate changes, thus influencing actual and expected inflation, relative prices and the level and composition of output.

In this context the development of interest rates in the Dutch money market corresponds with interest rate developments in the German money market. This is caused by the so called “narrow-monetary policy” of The Netherlands Bank, aiming at a control of the money market rate of interest by influencing the liquidity of the banking system in such a way that the exchange rate to the D-Mark will be stabilized. This policy behaviour is an outcome of the higher integration of domestic and international financial markets, that can be observed since the mid-seventies. At that time a policy trade-off came about between the objective of the “narrow-monetary policy” (exchange rate stabilization) and the goals of the broad-monetary policy (stabilization of economic activity, without inflation).

With regard to the meaning of the current wave of financial innovations for monetary policy implementation I want to make the following remarks. Although the short-run demand function for money has become less stable owing to interest induced volatile portfolio shifts and the frontiers between money and interest bearing liquid assets, both domestic and foreign, have shifted in a strong way, it is by no means justified to abandon monetary policy targeting.²⁵ If this would occur and monetary policy behaviour would aim again at stabilizing interest rates, an erratic and unpredictable course of the money supply would be the result. As was learned by the lessons of the seventies, the induced monetary uncertainty may give rise to an impairment of the credibility of monetary authorities and to an increase of inflation and exchange rate risks in the economy. Undoubtedly this increased monetary uncertainty will be reflected in higher long-term interest rates (risk-premium), weakening the investment-activity. Therefore in my opinion it will be a challenging task for monetary authorities to guide deregulation and financial innovations in the desirable direction to conduct monetary policy in order to achieve macro economic objectives.²⁶ In this context monetary policy might aim at controlling a monetary indicator like the money market situation or base – money to replace one or another broad monetary aggregate.

²⁵ J. Sijben, *Money and Finance: A Blurring of Disciplines*, May, 1986, Tilburg University Press. p. 29 - 38.

²⁶ See also N. Thijgesen, *What Monetary Targets in an Evolving Financial System? An introductory address*, in: *Shifting Frontiers in Financial Markets*, SUERF-publication, Martinus Nijhoff Publishers, 1986, p. 19 - 30 and J. Pierce, *Did Financial Innovations Hurt the Great Monetarist Experiment?*, *The American Economic Review*, May 1984, p. 392 - 396.

In this way a policy of announcing and sticking to a monetary target will be less sensitive to the influence of financial innovations because this monetary indicator is more safeguarded against these innovations. However in a world of changing financial arrangements the fixing of the target should be supplemented by information about several monetary variables to represent the real thrust of monetary conditions.²⁷

VI. Implications for Financial Stability

Based on the preceding analysis it is quite obvious that central banks, supervisors, will monitor the processes of financial innovations very closely, owing to their task of safeguarding the stability of the whole financial system. For through the off-balance-sheet activities the capital adequacy requirements of the regulators can be avoided, resulting in a misleading information of the solvency of the banks concerned. (See *Saunders*, footnote 20). Recently *Corrigan*, the President of the Federal Reserve Bank of New York emphasized his anxiety with regard to this development as he stated, “When we pull together these various elements one message emerges rather powerfully: namely that events have undercut the effectiveness of many elements of the supervisory and regulatory apparatus historically surrounding banking and finance. If it can’t be done on-shore it’s done off-shore; if it can’t be done on the balance-sheet it’s done off-the-balance-sheet; and if it can’t be done with a traditional instrument, it’s done with a new instrument”.²⁸

The Netherlands Bank concluded from these developments to a new guideline for the treatment of banks’ off-balance-sheet activities (included swaps, options and futures). At the end of November 1985 the Bank confirmed that solvency rules are applicable to all the new forms of off-balance-sheet financing. Pending the result of the international consultations on this subject, among other developments, such facilities and “invisible” banking operations will be subject to half the solvency requirement for comparable lending or on-balance-sheet activities. Meanwhile three countries – the UK, Ireland and the U.S. – have also extended – their supervision to include the off-balance-sheet risks.

²⁷ *D. Hester*, On the Adequacy of Policy Instruments and Information when the Meaning of Money Is Changing, *The American Economic Review*, May 1982, p. 40 - 44.

²⁸ The Globalisation of Financial Markets; central banks warn of grave unnecessary risks, *International Currency Review*, May 1986, p. 6. See also *J. Clements*, Caught off Balance, *Euromoney*, June 1986, p. 137.

Traditionally in the western industrialized countries the financial regulations were aimed at a sufficient competition in the financial system and the insurance of the users of the financial services on the one side and at an efficient implementation of monetary policy and safeguarding the soundness and the stability of the whole financial system, on the other side. However the recent financial innovations had a strong impact on the structure and working of the financial system, resulting in conflicts between these target-aims. As was analyzed in the preceding sections the deregulation trends sharpened the competition between the financial intermediaries (squeezing profit margins) and were blurring the barriers between banks and other financial institutions, sometimes eliminating them. Simultaneously the direct financing or direct intermediation through financial markets and the off-balance-sheet activities have increased the total risks of the saving-investment process, deteriorating the stability of the financial industry. Finally the interweavement of financial markets in the world induced by the introduction of telecommunication-technology has enlarged the vulnerability of the domestic financial system.

Some years ago the Bank for International Settlements took the initiative to stimulate central banks to consult and cooperate internationally aiming at a sharpening of the control of financial institutions to safeguard the stability of the financial system. Within the Committee on Banking Regulations and Supervisory Practices the consultations will be continued about the assignments given by the central bank governors in March 1984 to design internationally comparable capital-adequacy ratios and draft a recommendation about the way in which, in due course, a certain minimum standard for banks' capital-adequacy could be achieved internationally.²⁹ In this context I refer to the 4th International Conference of Banking Supervisors held in Amsterdam in November 1986, with its central issue of coordination and harmonization of banking supervision in the world. In this way supervisors try to achieve an adaption of regulation through international consultations, aiming at a restoration of the balance between the conflicting objective targets of financial regulation mentioned before. This means that central banks, regulators, are confronted with a difficult and essential trade-off between giving sufficient scope for free enterprise in banking on the one hand and to reduce the financial risks to give monetary stability and strength to the international banking system on the other hand.

At this moment a growing fraction of financial transactions has moved into the unregulated off-balance activities or sectors of the market. As

²⁹ De Nederlandse Bank, N. V., Annual Report 1985, p. 140.

domestic financial markets have become even more integrated in the world, activities important to the domestic economy have passed beyond the control of domestic regulatory authorities. Since the forces underlying the internationalisation of financial markets will continue to act and if its undesirable consequences are to be avoided, the necessary changes in legislative and administrative systems will have to be internationally coordinated. The convergence of regulatory provisions and the mutual recognition of financial regulations and techniques will have to be pursued through suitable policies.³⁰

Finally in my view international supervision should not be restricted to a strengthening of the solvency of the banks. The supervision with regard to liquidity is also important to guarantee financial stability. For to focus exclusively on the improvement of the capital adequacy might give the banks an incentive to cope with its squeezing margins by increasing the “mismatch” or to reduce the amount of their lower-yielding liquid assets. Moreover there exists another liquidity-risk which is associated with the underwriting facilities. This refers to the potential risk that the bank is unable to a sufficient amount or at the appropriate price to attract funds in the future when the borrower has to make use of the promised credit-facility.

VII. Some Concluding Remarks

This paper highlights some important causes and consequences of the rapid pace of financial innovations in recent years. The new financial trends produced major changes in financial instruments, practices and services, altering the structure of intermediation and creating new forms of competition. First, high market interest rates, exchange rates, and inflationary expectations, fluctuating erratically, with its concomitant monetary uncertainties have provided increased incentives for the market to create and use new kinds of liquid financial assets and to introduce financial instruments and practices of shifting the interest and exchange rate risks. Second the rapid development of electronics and communication technology has contributed to the innovation processes and to a globalisation of financial markets. Third the trend towards deregulation has generated greater competition in the financial system, thereby also promoting more rapid innovations and an efficiency improvement of financial markets.

³⁰ L. Dini, *Towards a European Integrated Financial Market*, Banco Nazionale del Lavoro, Quarterly Review, December 1986, p. 387.

As was pointed out all these developments implied the introduction of new financial instruments on the money and capital markets (securitisation and off-balance activities) and led to a change of the set of monetary aggregates and interest rates, inducing rapid shifts in the portfolios of economic agents.

It is evident that these financial developments have a strong impact on the implementation and effectiveness of monetary policy. As was described in section IV the innovations influence the money-definition, the money-multiplier, the stability of the money demand function and the transmission processes of monetary impulses. The increased vulnerability of the financial system due to the shifted frontiers in the various financial markets and to more risky activities of the banks has also consequences for the stability of the system. Monetary authorities in the world hold the view that deregulation of financial markets has proceeded too far and that there is a need for re-regulation and solvency-control of the banking system.³¹ Therefore it will be a challenging task for monetary and supervisory authorities in the world to coordinate and harmonize financial regulations to strengthen the stability but especially the solidity and credibility of the whole financial system.

An uncoordinated reaction of the authorities on the changed financial environment is undesirable. For this might give incentives to geographic shifts of financial activities and might result in unequal competition in world financial markets shifting business to less regulated and supervised markets (regulation-arbitrage). In the near future it will appear whether the supervisors will succeed in controlling the consequences of the innovation processes and technology by a coordinated design of a new framework of supervision aimed at a stronger banking industry in an era of more freedom.

Zusammenfassung

Finanzinnovationen, Geldpolitik und finanzielle Stabilität

Seit Mitte der siebziger Jahre ist in den wichtigsten Industrieländern eine Vielzahl von Finanzinnovationen entstanden. Dieser Artikel gibt einen Überblick über die Haupttrends auf diesem Gebiet. Zunächst werden die Charakteristika der Kapital-sammelstellen und ihre Aktivitäten an den Finanzmärkten betrachtet, und es wird auf die fließenden Grenzen zwischen den verschiedenen Arten von Finanzierungsinstitu-

³¹ See Re-regulation, World Welcomes Watchdogs, *Euromoney*, June 1986, In this article it is pointed out that “the era of deregulation is over. Inhabitants of the world’s financial markets must now brace themselves for something new: re-regulation” and further on, “The regulatory pendulum, which had swung without resistance toward more liberal and open markets is swinging back very fast”, p. 76.

ten eingegangen. Anschließend werden die Ursachen und treibenden Kräfte von Finanzinnovationen analysiert wie Deregulierung der Finanzmärkte, Unsicherheit über die monetäre Entwicklung, Internationalisierung der Finanzmärkte und Informationstechnologie. Der folgende Abschnitt gibt eine Übersicht über die Phänomene der Desintermediation, der Securitisation und bilanzunwirksamer Geschäfte, die mit dem zunehmenden Trend im Bank- und Finanzwesen zu einer Umwandlung von Aktiva und Passiva in marktfähige Papiere zusammenhängen. Das Tempo der Entwicklung von Finanzinnovationen und die damit verbundenen Änderungen in der Funktionsweise der Finanzmärkte wirkt sich erheblich auf den Entwurf und die Durchführung der Geldpolitik aus. In diesem Zusammenhang wird die Eignung der herkömmlichen Geldmengenabgrenzungen behandelt sowie der Einfluß der gegenwärtigen Innovationswelle auf den Geldangebotsprozeß, auf die Stabilität der Geldnachfragefunktion und auf den Transmissionsmechanismus der Geldpolitik. Während der letzten Jahre hat die Internationalisierung der Finanzmärkte zweifellos dazu geführt, daß der Wechselkurs für die Transmission geldpolitischer Impulse an Bedeutung gewonnen hat, vor allem in kleinen, offenen Volkswirtschaften. Zum Schluß werden einige Bemerkungen zu den Aufgaben der Zentralnotenbanken als Aufsichtsorgane im Hinblick auf die Erhaltung der Stabilität und der Funktionsfähigkeit des gesamten Finanzsystems gemacht. Es wird immer wichtiger, die Bankenaufsicht international zu koordinieren und zu harmonisieren.

Summary

Financial Innovations, Monetary Policy and Financial Stability

This paper reviews the main trends in the broad field of financial innovations, as these came about in the major industrial countries since the mid-seventies. First of all attention is given to the characteristics and activities of the financial intermediaries on financial markets and to the shifting frontiers between the different kinds of financial institutions. Subsequently the causes and driving forces of financial innovations are analyzed (deregulation of financial markets, monetary uncertainties, internationalisation of financial markets, information-technology etc.). In the next section an outline is given of the phenomena of disintermediation, securitisation and off-balance sheet activities, which refer to the increasing trend in the marketisation of banking and finance. The pace of financial innovations and the associated changes in the working of financial markets have important consequences for the design and the implementation of monetary policy. In this context attention is given to the operational meaning of the traditional money-definition, to the influence of the current wave of innovations on the money-supply process, on the stability of the money-demand function and on the transmission channels of monetary policy. It appears that as a result of the globalisation of financial markets in the recent past the exchange rate has taken on greater importance in the transmission processes of monetary policy impulses, especially in small open economies. Finally, some remarks are made on the task of central banks, the supervisory authorities, to safeguard the stability and soundness of the whole financial system. In this context there is a growing need for coordination and harmonization of banking supervision in the world.

Résumé

Innovations financières, politique monétaire et stabilité financière

L'auteur examine les principales tendances dans le large champ des innovations financières, qui sont apparues dans la plupart des pays industrialisés depuis le milieu des années 70. Il porte avant tout son attention sur les caractéristiques et les activités des intermédiaires financiers sur les marchés financiers, et sur les déplacements entre les différentes sortes d'institutions financières. Il analyse ensuite les causes et les forces qui guident les innovations financières («deregulation» des marchés financiers, incertitudes monétaires, internationalisation des marchés financiers, technologie de l'information, etc). Dans la section suivante, l'auteur donne un aperçu de phénomènes accompagnant la tendance croissante de la commercialisation des opérations bancaires et financières, comme par exemple la «desintermediation», la «securitisation». La tendance des innovations financières et les changements associés du fonctionnement des marchés financiers ont d'importantes conséquences pour la conception et la réalisation de la politique monétaire. Dans ce contexte, l'attention est portée sur la signification opérationnelle de la définition traditionnelle de la monnaie, sur l'influence de la vague actuelle d'innovations sur le processus d'offre monétaire, sur la stabilité de la fonction de demande monétaire et sur les canaux de transmission de la politique monétaire. On voit que le taux de change joue un rôle plus important dans les processus de transmission d'impulsions de la politique monétaire, spécialement dans des petites économies ouvertes – résultat de la récente globalisation des marchés financiers. Finalement, l'auteur fait quelques remarques sur la mission des banques centrales, les autorités de contrôle, en vue de conserver la stabilité et la solidité de tout le système financier. Il devient ici de plus en plus nécessaire de coordonner et d'harmoniser le contrôle bancaire mondial.