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Open Review of Management, Banking and Finance

«They say things are happening at the border, but nobody knows which border» (Mark Strand)

Slowing down the progress of bad debt

by **Patrizio Messina**

Abstract: *Careful analysis of this report is the Greek NPL legislation (Law No. 4354), recently subject to major legislative and regulatory reforms, aimed at facilitating the reduction of the large stock of NPLs held. The objective of the legislation is to create a secondary market for Greek impaired loans. The issue of NPLs in Greece was already addressed in detail in the context of the financial assistance programme entered into with the ESM in August 2015.*

Summary: *1. Introduction. – 2. Legislative measures. – 3. Purchase and management of NPLs under the law. NPL Servicers and NPL purchasers. – 4. Recent developments.*

1. On February 6 2017, the executive board of the IMF completed the article IV consultation with Greece. The IMF stated in its staff report that Greece has reached important goals in settling political and economic imbalances during the past years. However, progress is still too slow and investment risks remain high. While the new European stability mechanism (ESM) supported programme has helped stabilise the economic situation, the underlying issues hindering the recovery have not yet been fully addressed.

In particular, the IMF called for decisive action in repairing bank and private sector balance sheets, returning to sustainable credit growth, and expressed concern that without reducing non-performing loans (NPLs)[1] rapidly, banks would not be able to provide new lending to viable firms, hence slowing down the recovery.

2. As part of the deliverables under the ESM programme, the Greek Parliament introduced Law 4354 which entered into force on December 16 2015 (as subsequently amended, the NPL law), which set forth new rules for the sale and management of NPLs[2].

Subsequent amendments to the NPL law introduced in 2016 broadened its scope, extending its application to various types of loans (law 4393/2016), and introducing provisions for the tax treatment of the management and sale of the loans (law 4389/2016).

Furthermore, the Bank of Greece (BoG) issued implementing provisions to the NPL law with the executive committee Act (ECA 82/2016, as further amended, the BoG act), which specifies the licensing and regulatory regime for non-bank servicers and companies that are acquiring NPLs[3].

The NPL law framework aims to create a secondary market for NPLs in Greece. In particular, the NPL law sets forth requirements for the establishment and operation of companies purchasing NPLs and servicing companies managing the loans. The BoG supervises and regulates the activities, as the competent licensing authority under the NPL law[4].

3. NPLs are usually managed internally by the banks through dedicated units. This strategy has been ineffective in increasing the recovery of the NPLs. Therefore, the transfer of NPL portfolios to special purpose entities and external management of these NPLs has become a pillar of the NPL law. Two types of companies are deemed to be eligible to undertake the activity of, respectively, acquiring and servicing NPLs, which was previously limited to banks and financial institutions: an asset acquisition companies (AAC or purchaser), and an asset management company (AMC or servicer).

Companies that intend to act as servicers of NPLs under the NPL law must satisfy the main following requirements:

be established either in Greece (under the legal form of *société anonyme*), with the sole purpose of servicing loans, or in another European economic area (EEA) member state and operating in Greece through a branch that has as its purpose the servicing of loans; have registered shares, and a minimum share capital of €100,000 (\$106,521); and be listed in the general commercial registry.

Furthermore, servicers need to acquire a special operating license granted by the BoG. The specific provisions and requirements for the licensing procedure are set forth in the NPL law and in the BoG executive committee act of 95/2016 (which replaced BoG act 82/2016), which sets forth the supporting documents that the prospective servicer must submit to the BoG. These include *inter alia*, extensive disclosure of information regarding the company, its beneficial owners and the company's directors and managers; the company's organisational structure; and a business plan presenting the company's strategy. Approval is granted by the BoG upon satisfactory evidence of the company's capability and suitability to carry out the strategy.

The NPL law does not include particular licencing requirements for companies intending to purchase NPLs. An AAC must satisfy the following basic requirements: a company must be established either in Greece as a Greek company under the form of a *société anonyme*, or as a company established in another EEA member state, operating through a subsidiary, having as business purpose the acquisition of loans[5]; and such a company must have signed a loan servicing agreement with a servicer legally licenced and supervised by the BoG.

Furthermore, the offer of sale for NPLs (with certain exceptions) is conditional upon the delivery of a notice to the relevant debtor and any guarantor to settle their debts at least 12 months prior to the sale. The sale of the claims must also be registered in a public registry and is effective upon registration, and notified to the relevant debtors. The position of the debtor should not be worsened due to the servicing or transfer of the loan.

4. In December 2016, in order to provide further impetus for the implementation of the NPL law, the Greek parliament introduced extensive amendments to the bankruptcy code, in order to facilitate, *inter alia*, pre-bankruptcy arrangements with creditors[6].

According to the IMF staff report, 'without reducing NPLs rapidly, banks will not be able to provide new lending to vibrant firms, putting the recovery in jeopardy'. Therefore, the IMF has called for the BoG, together with the single supervisory mechanism, to set ambitious NPL targets and monitor banks'

strategies and performance against these targets. On the other hand, as with other countries where the NPL stock is significant, an effective reform process of the enforcement system is an important incentive for the purchase and recovery of NPLs. Therefore, in order to be able to develop an effective secondary NPL market, the reform process should continue in Greece, introducing other measures, such as out-of-court debt restructuring and the full implementation of the insolvency and debt enforcement framework.

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«They say things are happening at the border, but nobody knows which border» (Mark Strand)

Economic Growth, Financial Stability, and Monetary Policy

by **Galina Gospodarchuk - Sergey Gospodarchuk**

Abstract: *The article specifies the role of monetary policy in ensuring the financial stability of the economy. It also proposes the financial stability indicator and the algorithm for its calculation. The author provides grounds for the transition from inflation-targeting to real interest rate targeting. A rule has been formulated to plan the target of a key rate based on the level of financial stability, the level of risk in economy, and the level of inflation. The strategic objectives of Russia's monetary policy for 2017-2019 were defined using the proposed methodology for targeting financial stability.*

Summary: *1. Relevance. – 2. Overview. – 3. Study. – 4. Calculations and Results. – 5. Conclusions. – 6. References.*

1. In today's world, a new perception of the role of central banks in the economy has emerged, according to which central banks are charged with a new function – stimulating economic growth. According to this function, along with the support of price stability, the monetary policy of the central bank should be aimed at the development of the economy. This transformation of monetary policy objectives is manifested in modern currency management models, based on the so-called “monetary rule”, which describes the dependence of the key rate on inflation and on the rate of growth of real gross domestic product (GDP). Raising the key rate means tightening monetary policy, while its reduction is a sign of its easing. In theory, easing the monetary policy is seen as an instrument for stimulating economic growth in the context of an anticipated recession, as it leads to cheaper credit for individuals and businesses. The tightening of monetary policy, on the contrary, is followed by an increase in interest rates and is applied in the context of expected economic recovery to reduce the risk of its “overheating”. In this interpretation, monetary policy essentially becomes countercyclical and begins to contribute to sustainable economic growth.

However, the analysis of the application of the monetary policies in practice has revealed a number of problems related to their performance:

1. Increasing or decreasing the key rate, unless accompanied by a similar change in the supply of money, has no significant impact on financial markets and economic growth.
2. Consistent policies to reduce the key rate backed by quantitative easing result in negative interest rates on deposits and reduced profitability of investment in the economy. At the same time, the return of the buy-and-hold strategy is increasing, especially for commodities. As a result, “smart” investments are being replaced by “unintelligent” ones, aimed at buying assets rather than at the development of technology and production.

These problems lead to the necessity of finding highly effective models for the management of money and credit, consistent with the current perception of the role of monetary policy in achieving target economic performance.

2. Today, there are three main approaches in the scientific community to assessment of the role of monetary policy in stimulating economic growth.

Proponents of the first approach [1, 2] see a source of economic growth in the easing of monetary policy by increasing the supply of money and reducing interest rates. The idea of this approach is to stimulate final demand, which, according to its proponents, should stimulate production and economic growth. However, the effect of lower rates is limited in time, which is a very important drawback of this approach. In order to provide a long-term stimulation of the economy, the rates should be reduced regularly. As the rates go down, investment demand is growing along with the growth of final demand. Over time, the investment demand transforms into the supply: investors are trying to sell the goods bought earlier if they need money. This reduces the demand for new products and, with it, the effect of monetary policy.

The effect of demand growth is largely achieved by reducing the cost per unit of a product, which reduces final prices, or at least does not increase them. However, that does not occur with all the prices. Resource prices do not have a significant impact on the scale of production. Therefore, the prices of resources are growing when demand increases. After some time, the rate of growth of resource prices reaches the level of interest rates, which triggers investment demand for resources and accelerates the price growth. The increase in the price of resources has a significant impact on the level of prices in the economy as a whole and can nullify the positive effects of the stimulation of final demand. Thus, the stimulation of the economy with a soft monetary and credit policy is only effective for a limited time, and only with the application of additional tools to limit investment demand, especially to resources.

The second approach is to control price stability (i.e., level of inflation), while policies aimed to promote economic growth lose the importance [3-7]. The idea of this approach is that inflation is the main factor, which reduces real incomes of the population and, therefore, the final demand. This approach takes into account the problems of the previous one, as they are essentially the result of excessive price increases due to moderate monetary and credit policy. However, inflation control implies tight monetary policy, so it cannot give any additional incentives to the economy. It primarily aims to achieve a long-term stability.

The third approach is to combine the first two approaches. This combination comes down to the situation where monetary policy is relaxed until the rate of inflation reaches the specified limit. If it exceeds the specified limit, the monetary policy is tightened. It is this approach that forms the basis of modern monetary policy models that define the rules for targeting interest rates [8].

Why is the key rate given so much attention in monetary policy lately? A clear answer to this question is the reduction of the rate of credit due to a reduction of the key rate. In modern realities, credits are very common, and the reduction of interest rates can be beneficial to many.

However, we believe that there is a different underlying reason for this phenomenon. The reduction of the key rate is essentially very close to the increase of the supply of money. However, the increase of the supply of money is an inconvenient tool, because it is a well-known fact that it leads to inflation. It can be quite hard to lobby for a direct increase of the supply of money. In order to facilitate the task, one can rely on the substitution of notions. The emphasis shifts towards the discussion of the key rate, in particular, of the decisions to reduce it. With that in mind, it is understood that a reduction in the key rate would entail an increase in the supply of money, since it could not be achieved in any other way.

This approach does not take into account the fact that in real life the change of rate does not necessarily have to be followed by the change in the supply of money. The rates are calculated as the average of different borrowers. If banks stop granting expensive loans, but continue to grant the cheap ones, the average interest rates will go down. The interest rate largely depends on the level of risk, i.e. on the reliability of borrowers. The share of the cost of risk is much higher than the share of a risk-free component. For instance, if the risk of the borrower going bankrupt within a year is 10%, the risk premium cannot be less than these same 10%, while a risk-free premium in Europe and USA is around 1%.

Thus, by cutting the high-risk borrowers from the credit, you can efficiently reduce the rates. This is exactly the way it happens in real life – instead of an implied increase of the supply of money, it is reduced or maintained at the same level. It is clear that the results of such monetary and credit policy will no longer be consistent with the concepts discussed above. Therefore, when discussing the issue with rates, one should always clarify, what should happen to a monetary mass.

The rate itself does not have a significant influence on the economic growth. This is illustrated by the graphs (fig. 1), which reflect the dynamics of the key rate, monetary mass M2, consumer price index (CPI) and rate of growth of real GDP (TQ) in the Russian Federation. They show that the growth of the key rate at the end of 2014 was roughly the same as that of the inflation. M2 was changing in the direction opposite to the key rate, but was lagging behind by 1-2 months. This means that the M2 money mass was not used as a tool for changing the rate and was reduced and increased due to other factors. The decline in M2 in January 2015 was greatly facilitated by the depreciation of the rouble and the seasonal factor. As a result, the impact of the key rate on real GDP was very weak and was related to the economic crisis and the depreciation of the rouble, and not to the key rate. The graph also shows that the real GDP growth is better correlated with the CPI rather than with the key rate. This can be clearly demonstrated by two episodes: At the end of 2014 and early 2016. At these moments, the sharp growth and decline of the CPI caused a reverse change in real GDP.

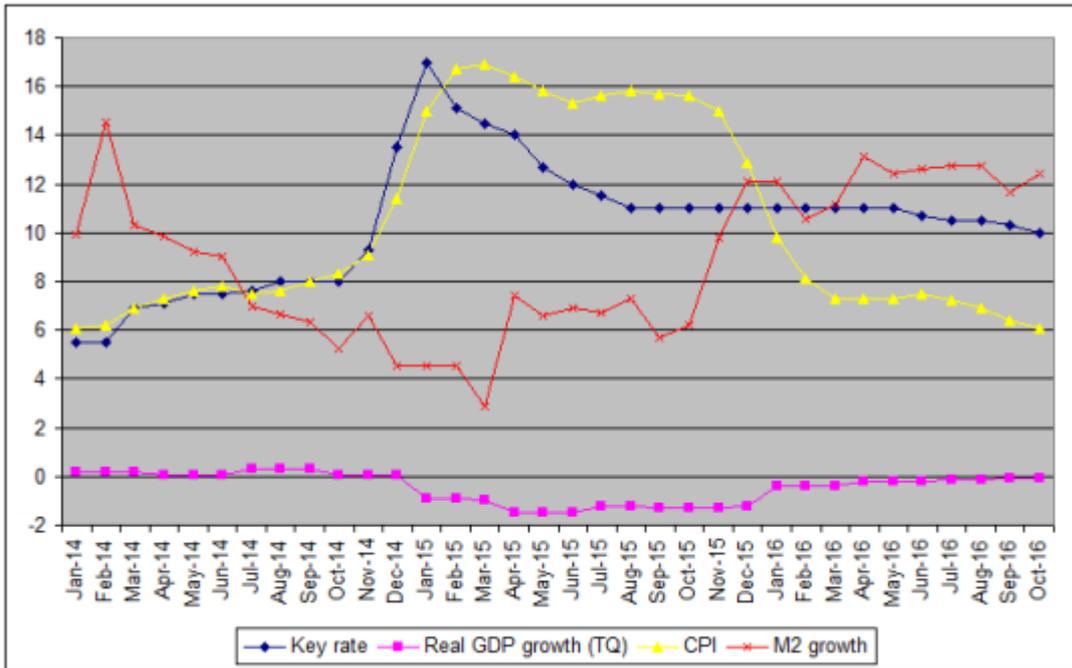


Figure 1. Dynamics of the CPI, key rate, monetary mass M2 and the growth of real GDP (TQ) of Russia during 2014-2016.

Note: M2 growth is marked by a clear seasonal fluctuation in December-January. It was smoothed in the following way: the data for M2 growth for December and January has been averaged, and the resulting average value is used instead of the original values.

The above shows that using the key rate as a tool for stimulating economic growth is a bad idea. This tool does not work. Therefore, in the formulation of monetary policy, a key rate policy cannot be tied to the economic growth plan. A detailed calculation of its impact on economic growth will show that there is no influence.

In this regard, the policy of the key rate should be based not on economic growth but on another indicator that is actually affected by the key rate. This indicator, in our view, is the level of financial stability.

It is clear that the rates affect the level of financial stability of both organizations and the economy as a whole. In addition, it turns out that there are multiple mechanisms of influence:

1. Low rates reduce the interest margin and interest revenue of banks, forcing them to increase lending, and increase the share of speculative transactions and other non-traditional sources of income;
2. Low credit rates do not cover credit risks. However, the banks are forced to keep the rates low because of increased competition from other banks;
3. Lower rates result in financial pyramids in different markets.

Thus, the correlation of the rates with financial sustainability is very strong.

In recent years, owing to the increasing volatility of financial markets, the problems of managing financial sustainability have been the focus of attention of both international financial organizations and central banks in different countries. This has been manifested in the expansion of the regulatory functions of central banks and in the improvement of the regulatory framework, with account for the need to maintain the sustainability of financial institutions and banking systems at an acceptable level.

At the same time, the methodology for determining the strategic objective for financial stability and the algorithm for embedding it into monetary policies have not yet been developed.

The ambiguity of the dependence between economic growth, inflation, and the key rate, on which central banks are relying in modern monetary policy and the necessity of financial stability being included in the monetary policy system in the absence of a methodology requires more detailed study in the following format: “Economic growth – financial stability – price stability – monetary policy”.

3. These studies are complicated by the fact that, as of today, there has been no simple method for measuring financial stability at the macroeconomic level, even though approaches to measuring the financial sustainability of individual economic agents have been developed a long time ago.

Therefore, we have used real interest rates calculated on different source data as indicators of financial stability.

The grounds for the approach used are as follows:

1. The stability of the economy as a whole can be assessed through the assessment of the sustainability of all core organizations with the subsequent aggregation of results. This approach is hardly possible in real life because it is important not only to provide stability of the organizations themselves, but also the correlation between their risks. It is very difficult to obtain such information, and it is not featured in financial statements.

2. The stability of the economy as a whole can be assessed directly, without the analysis of specific organizations. To this end, it is necessary to investigate the weakest places and the probability of typical crisis scenarios. The history of past economic crises shows that the following accumulated imbalances tend to be the most typical scenarios of crisis development: (1) imbalances between the supply and demand of goods, which are expressed in excess of some goods along with the shortage of others; (2) imbalances between the rate of growth in the prices of individual groups of goods, which usually surpass the increase in the price of resources compared to final products.

3. The above trends, in terms of their causes, have a financial and non-financial component. The financial component is the fluctuation in the supply of money. The non-financial one is various negative factors, such as natural disasters. Given the subject matter of the article, we give our primary focus to the financial component. It affects the economy as a whole, while non-financial factors are very scattered and have a little effect at the macroeconomic level.

4. The impact of money supply on macroeconomic stability is usefully measured by the level of real interest rates. The problem is that almost all the negative effects of the increase in money supply only occur when investors get access to carry-trade, that is, investing in an asset, the rate of price growth of which exceed the borrowing rate. As long as it is possible to make such investments only in financial assets, the situation seems to be acceptable, as high returns on these investments come hand in hand with high risk. However, this risk is borne only by the investors. If the rate falls below the inflation, then such investments can be made in non-financial assets, which will result in the spread of risks across the economy.

These considerations imply that the financial stability is impaired when real rates fall below a level close to zero. It should be noted, however, that the real interest rates are not an indicator of the level of financial stability of the economy at this point in time. They are the leading indicator. Negative effects from low rates should accumulate. This takes a lot of time.

Here we can observe two types of negative effects – medium and long-term. The medium-term effect consists in the acceleration of inflation caused by an increase in the monetary mass. It starts to show up in about a year. Rising inflation leads to a decline in real income and real GDP. The long-term effect appears in about five years of low-rate policies. It consists of inflating bubbles in different markets – this usually covers securities and real estate; inflating imbalances in investment activity (funds are invested into inefficient, high-risk, or simply useless projects). The short-term effect of low real rates is likely to be positive. It is accompanied by increased demand, while there is still not enough time for negative trends to accumulate.

Therefore:

1. Low real rates are a danger only if they are supported long enough – for a time enough for negative effects to accumulate.
2. The accumulated negative effects are evident at times when the rates are beginning to go up. However, the effects structure depends on the type of effects that have accumulated. If the rates have stayed low for a short period – two to three years, their growth is accompanied by a decline in nominal indicators: salary levels, business profitability, etc. In this case, the reduction is moderate; however, it is not catastrophic. The real figures change insignificantly. If the rates were low for a long period of time, their effects are followed by the collapse of all bubbles, in particular: collapse of stock prices for equities and goods; mass bankruptcies in selected non-financial sectors of the economy; bankruptcy of financial organizations; collapse of real property prices and the associated increase in credit risks; overall growth of credit risk due to various reasons; increase in credit rates due to increased credit risk and liquidity deficit, which additionally amplify the above effects.

The real rate is a generalized concept, since it represents the difference between any nominal rate and any indicator of inflation. The study of the relationship between financial stability and the key rate requires a specification of the real rate concept. To that end, we have used the Index of Financial Stability (IFS), calculated based on official public statements.

The algorithm for calculating this index is represented in following equations (1-5):

$$IFS = RR = RN - IP, (1)$$

where:

RR is the real average weighted rate of the value of debt financial instruments (borrowings) in percent per year;

RN is the nominal average weighted rate of the value of money (borrowings) in percent per year;

IP is the economic price growth index in percent per year;

$$RN = (RNC * C + RNB * B) / (C + B), (2)$$

where:

RNC is the nominal average weighted rate on the loan market in percent per year;

C is the amount of outstanding loans in the credit market in billions of roubles;

CNB is the nominal average weighted rate on the bond market in percent per year;

B is the capitalization of the bond market in billions of roubles;

$$IP = (Ip * Q + In * N + Ia * A) / (Q + N + A), (3)$$

where:

Ip is the consumer price index in percent per year;

Q is the real GDP volume in billions of roubles;

In is the consumer price index of the real estate market in percent per annual;

N is the real estate market volume in billions of roubles;

Ia is the stock price index in percent per year;

H is the capitalization of the stock market in billions of roubles;

To calculate parameters *RNC* and *CNB* the following formulas were used:

$$RNC = (RNC1 * C1 + RNC2 * C2 + RNC3 * C3) / (C1 + C2 + C3), (4)$$

where:

RNC1 is the nominal weighted average rate on credits to organizations (excl. credit organizations) in percent per year;

C1 is the amount of outstanding loans (excl. credit organizations) in billions of roubles;

RNC2 is the average weighted rate on credits to credit organizations in percent per year;

C2 is the outstanding debt of credit organizations in billions of roubles;

RNC2 is an average weighted rate on credits to individuals in percent per year;

C3 is the amount of outstanding debt of individuals in billions of roubles;

$$RNB = (RNB1*B1 + RNB2*B2 + RNB3*B3)/(B1 + B2 + B3), \quad (5)$$

where:

RNB1 is the weighted yield of corporate bonds in percent per year;

B1 is the capitalization of the corporate bond market in billions of roubles;

RNB2 is the weighted yield of public bonds in percent per year;

B2 is the capitalization of the public bond market in billions of roubles;

RNB3 is the weighted yield of municipal bonds in percent per year;

B3 is the capitalization of the municipal bond market in billions of roubles.

As we can see from the formula (3), we have made an estimate of the inflation rate, taking into account the changes not only in consumer prices, but also in capital and real estate prices. This is because we use the price index not in a very traditional way – as a measure of the profitability of investment in assets that include goods. Using regular price indices would provide incomplete information. Regardless of the scope of each particular price index base, none of them will take into account the profitability of certain assets. Therefore, the price index was complemented by yield of the assets, which are the most likely to create bubbles.

As for the choice between the CPI and the GDP price deflator, the latter is in favor due to its broader base of calculation. However, the low rate of statistics updates is a significant drawback, which determines the choice of the CPI. In addition, numerically GDP deflator and CPI differ insignificantly.

Figure 2 illustrates the comparison of the proposed IP index with CPI in the context of the Russian economy. Figure 2 shows that the CPI curve does not coincide with the overall inflation index curve. The overall inflation index is changing more dynamically than CPI and responds faster to crises. For the majority of the period analyzed, it was below CPI. With the exception of the periods from September 2014 to February 2015 and from September 2016 to October 2016. The lower level of overall inflation can be explained by the higher decline in real estate and capital prices than in consumer goods during the crisis.

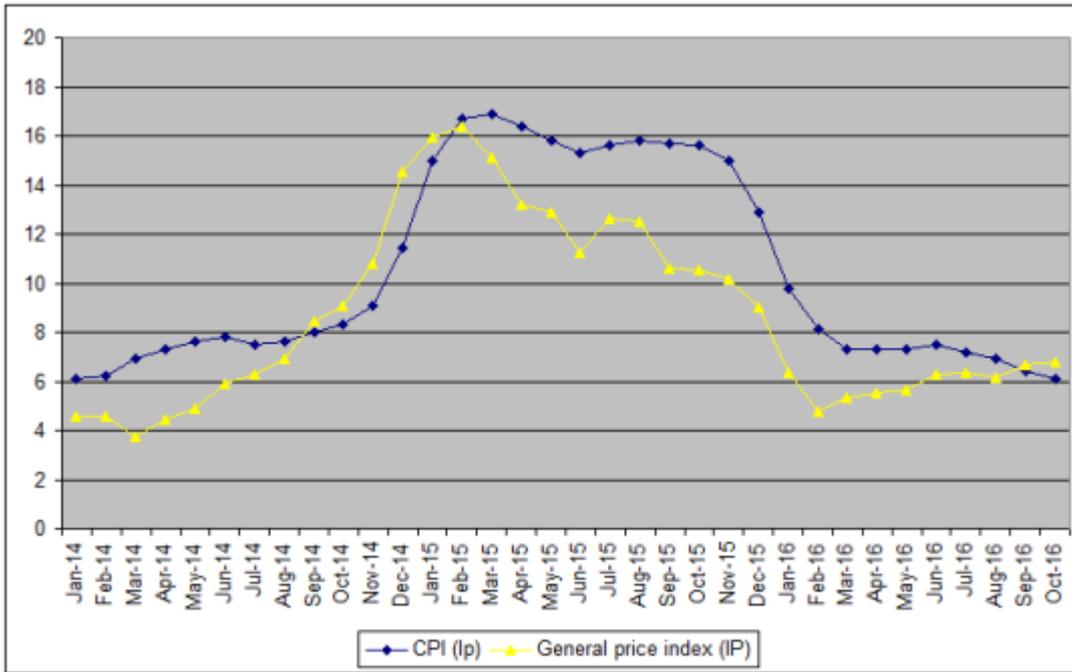


Figure. 2. Dynamics of the General Inflation Index (IP) and CPI (Ip)

The following algorithm for calculating the Index of Financial Stability (IFS) was tested on the statistical data for Russian Federation for 2014-2016.

Due to the lack of public access to official records containing statistical information on a number of indicators used in equations (2-5), we have made the following assumptions when calculating the Index of Financial Stability:

1. The bond market data were evaluated for three markets: corporate, public, and municipal bonds markets. A convenient source of information is the bond returns indices, which are calculated by the Moscow Exchange:
 - “Corporate Bond Index” [9]
 - “Municipal Bond Index” [10]
 - “Public Bond Index” [11]

The main index parameter is the average yield of the corresponding bonds, while the secondary parameter is their capitalization. The historical data for public bonds are incomplete: Capitalization is given only for the last month (December 2016), and the return data is available starting June 2015. The missing data were calculated as follows:

- Return on public bonds is equal to the profitability of municipal bonds minus 1.23% (this number is defined by comparing the profitability of municipal and state bonds from the time when the profitability data became available for the public bonds as well).
 - Capitalization of the public bonds market is calculated based on the internal public debt data published on the website of the Ministry of Finance [12] and the share of the bonds in the total debt. The share of the bonds amounted to 57.9%. It was estimated based on the capitalization of the market bonds at 3472 billion roubles in December 2016 and the internal public debt (minus guarantees) at 5994 billion roubles on the same date.
2. The total amount of outstanding shares (free float) was used as a weight index for the stock market. The rate of turnover was not considered objective. It is highly overstated due to a large number of short-term transactions. Free float was calculated by multiplying the capitalization of shares and the percentage of outstanding shares (free float index). This information is published on the website of Moscow Exchange [13, 14].
 3. Real estate prices were determined based on the statistics for the city of Moscow [15], since this information is the most reliable and is regularly updated. We suppose that the real estate price dynamics should match that of Moscow, although the absolute level of prices in the regions is lower.
 4. The volume of real estate transactions was calculated based on the data of Rosreestr (Federal Service for State Registration, Cadaster and Cartography) by multiplying the number of registered property rights [16], the average size of

the real estate object (assumed to be equal to 50 sq.m.) and the average price per square meter (the price of real estate in Moscow on the corresponding date reduced by 2 times).

The results of the calculation of the Index of Financial Stability and its monthly dynamics for the period from January 2014 to October 2016 are presented in Figure 4.

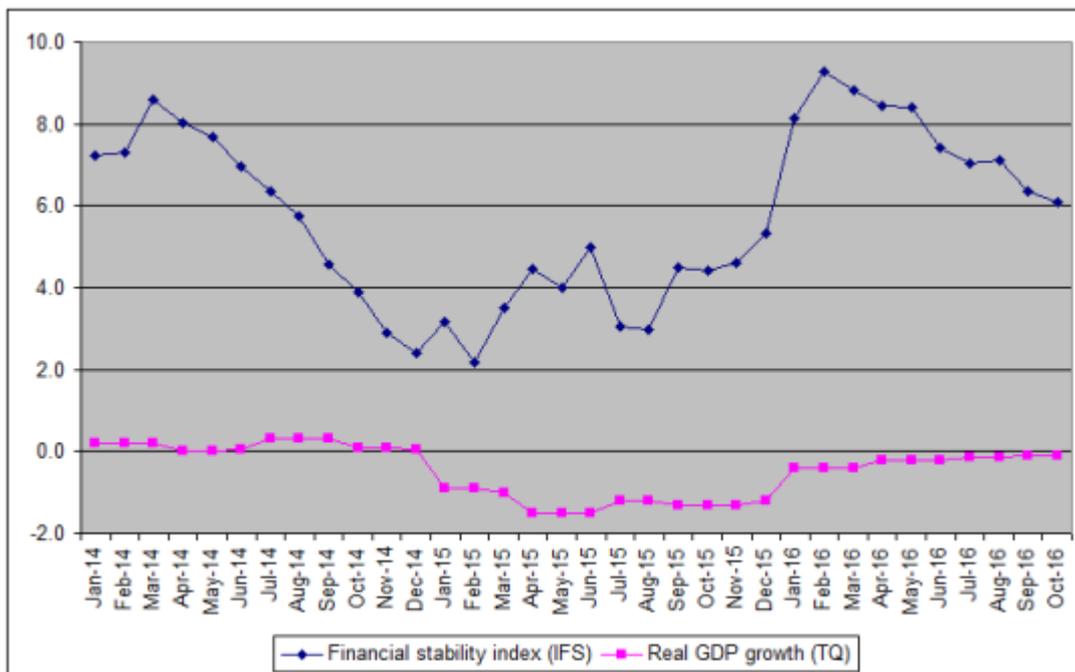


Figure. 3. Dynamics of the Index of Financial Stability (IFS)

and real GDP growth (TQ).

The graph shows a smooth decline of IFS in 2014. At the same time, the real GDP growth rates did not respond to such decline for nine months. Since 2015, there has been a sharp decline in real GDP growth. The reason for the decline was the increased inflation. The cause of inflation was the soaring of foreign exchange rates (rouble depreciation) in the 4th quarter of 2014. There were two reasons for rouble depreciation: excess of monetary mass compared to the accumulated gold and foreign currency reserves and liquidity problems in world financial markets in 2014, which made it difficult for Russian companies to refinance foreign loans. It should be noted that in 2014, M2 was not growing, but declining, and this occurred against the increase in the key rate (Figure 1). These two trends can lead to a false assumption that the Bank of Russia pursued a rigid monetary policy, which makes the acceleration of inflation unlikely. However, IFS was going down, indicating the accumulation of problems in the economy.

Since the beginning of 2015, IFS was growing very slowly, with the acceleration in 2016. The dip in the real GDP almost disappeared by the Fall of 2016. This shows that there is approximately a one-year lag between the changes of IFS and of the real GDP growth.

Based on the arguments presented above, we perceive IFS as a very useful leading indicator, which illustrates the processes of reducing or increasing the financial stability of the economy. This raises the question as to what level the IFS can drop until it becomes unacceptable.

This level can be set based on the following considerations:

1. IFS can help predict a decline in financial stability caused by the formation of bubbles/pyramids and the accumulation of subsequent negative effects. IFS does not detect the other risk growth mechanisms, but they are less important.
2. The bubbles are always formed in specific markets or in certain areas of activity. It follows that in order to monitor the situation in the most important fields one should apply private IFS and demand that each of them stays above a minimum value. We propose to use the indices calculated using formula (1) as a private IFS, which instead of the general IP price index, use the private price indices I_p , I_n , I_a from formula (3). If necessary, the list of private IFS can be expanded by using price indices for other asset groups.
3. The general IFS characterizes the situation as a whole. It requires the introduction of a minimum threshold with a certain leeway.
4. Considering the above analysis of the Russian situation, in the Russian context, it would be reasonable to set the minimum value for private IFS at 1%, and set the minimum for overall IFS at 3%. This is shown in more detail in table 1. It also contains criteria for high stability, which ultimately results in three levels of stability: low (negative zone), medium, and high.

Table 1

Scale of stability levels

Level of stability	General IFS	Private IFS
High	IFS \geq 6%	IFS \geq 4%
Medium	3% \leq IFS < 6%	1% \leq IFS < 4%
Low	IFS < 3%	IFS < 1%

Maintaining the IFS at a high level is a difficult task. The following are the main issues, which have to be addressed:

1. As it has already been mentioned, the increase in IFS increases the likelihood of a financial crisis, if before the increase the IFS was low in a negative zone. Therefore, one has to increase the IFS from lower levels very slowly and gradually, addressing the new issues after each step.
2. In order to achieve stability, IFS should be maintained at a high level for a long time. Accordingly, the increase of IFS should be based on the developed strategy. Utilizing IFS increase to achieve some tactical objectives is useless. On the contrary, IFS can be decreased in order to resolve the short-term liquidity crises. This applies only to short-term crises, however.
3. High IFS makes it difficult to resolve problems that require liquidity. These include financial recovery of organizations, including bank sanitation; providing regular payments during the shortage of monetary resources in corresponding funds; financing unforeseen public expenditures.
4. High IFS complicates the resolution of budgetary problems. Covering the budget deficit by the emissions will lead to an increase in the supply of money and reduce the IFS below the planned level. Covering the deficit through borrowing will be cost-intensive due to high rates. At the same time, it will draw money out of the economy.

The above shows that the impact of IFS on the economy does not depend on monetary policy. IFS is an independent variable. Therefore, the government can fix it at the proper level and continue further development of the key rate policy, taking into account the set level of IFS.

The nominal rate (RN) can be expressed from a formula (1):

$$RN = IFS + IP, \quad (6)$$

On the other hand, the nominal rate can be presented as the sum of the risk-free rate and the risk premium:

$$RN = RNF + RNR \quad (7)$$

where:

RNF is the nominal risk-free rate,
RNR is the risk premium.

If the key rate (*r*) is used as a risk-free rate, it can be calculated from equations (6) and (7):

$$r = IFS + IP - RNR \quad (8)$$

In formula (8), we should use the target value of the Index of Financial Stability for the coming period as the IFS. For Russia, the target value of the IFS should be calculated based on the criteria provided in Table 1. This value is expected to change smoothly, or remain at a constant level. We should also use a realistic forecast of price growth and not a planned value as the IP. It is useful to calculate the RNR risk premium based on the statistics for the previous periods. Let us explore in more detail the behavior of the RNR risk premium. Figure 4 shows a graph of the dynamics of the RNR risk premium in Russia, which was calculated as a difference between the average weighted nominal rate and the key rate. Figure 4 shows that RNR is declining very smoothly. This reduction can be easily approximated using the linear time dependence. The correlation here is rather strong – the coefficient $R^2 = 0.7141$, the coefficient of linear correlation $R = -0.845$.

In the linear dependence equation chart, *x* stands for the date (number of the month starting from January 1900). If we take January 2014 as a zero point, the equation will look as follows: $y = 5.509 - 0.0906x$.

Thus, the key rate will be linked to three indicators, two of which (IFS and RNR) are fixed in the short term, and the third (IP) is changing.

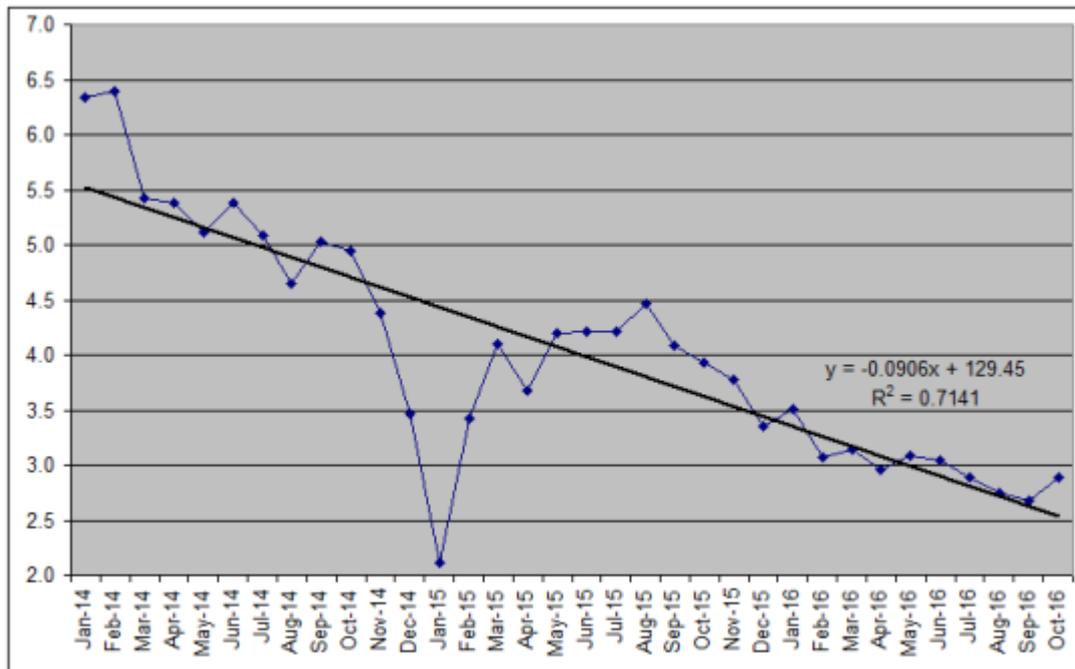


Figure. 4. The risk premium in Russia from 2014 to 2016.

The reason for this smooth decline of RNR is that, in 2014, the Bank of Russia canceled the refinancing rate and switched to targeting market rates. At the same time, the key rate has become the target for market rates, which leads to their gradual convergence. According to our assessment, the reduction of RNR will stop at 2-2.5%. It will not reach zero, because the Bank of Russia targets the rates using low-

risk instruments rather than aims at the market average. Therefore, for further calculations we are going to assume that the value of RNR = 2%.

4. Some practical aspects of the application of the financial stability-targeting regime will be discussed in the monetary policy of the Bank of Russia, adopted for the period 2017-2019. To this end, let us calculate the values based on IFS and the key rate for the same period using the methodology proposed above.

In order to calculate the strategic objectives in the new format, we used the information from the Bank of Russia on scenario forecasts of the real GDP growth rate and the CPI in the planned period [17]. At the same time, we used the values of the standard scenario as the starting point (table 2).

Table 2

Source information (base version of scenario forecast)

	2017	2018.	2019
Real GDP growth rate, %	0,5-1,0	1,5-2,0	2,0-2,5
CPI,%	4.0	4.0	4.0

As you can see from the Table. 2, the Bank of Russia adopted a 4% CPI as a strategic goal for inflation. However, the GDP growth forecast was defined in the range (0.5-1.0)% in 2017, (0.5-2.0)% in 2018, and (2.0-2.5)% in 2019.

Based on the strategic goal of GDP growth, we set the target value of IFS, corresponding to the positive economic growth rate at 6%, 6.1% and 6.2% respectively. The strategic objective for financial stability in 2017 was established in the light of the current level of financial stability as of the end of 2016 (6.1%) and acceleration of the real GDP growth. However, the growth of the Index of Financial Stability included minor year-to-year changes in order to avoid creating threats to the state of the financial market.

The expected level of the key rate was calculated as the sum of the Financial Stability Index and the Price Stability Index (IP) minus the RNR risk premium. The target-level (IP) calculation has, however, taken into account the CPI goal of 4.0 percent in each year and the trend of IP exceeding the CPI (Figure 2), which came about in the end of 2016.

The results of the calculation of the strategic objectives for the level of financial stability under the base option are presented in Table. 3.

Table 3

Strategic objectives of monetary policy (base scenario)

	2017	2018.	2019
Index of Financial Stability (IFS)	6.1	6.2	6.3

Price Stability Index (IP)	4.5	4.5	4.5
Including Price Stability Index (CPI)	4.0	4.0	4.0
Risk Premium (RNR)	2.0	2.0	2.0
Key rate	8.6	8.7	8.8

As you can see from the Table. 3. in the medium term, the strategic objective for financial stability should most likely be defined at 6.1% in 2017, 6.2% in 2018, and 6.3% in 2019. In such a case, the key rate should stay in the range of 8.6% – 8.8%.

The presented algorithm for calculating monetary policy objectives in the new format was used to define the goals in the light of the different scenarios of economic development. The results of these calculations are presented in Table. 4.

Table 4

Strategic objectives of monetary policy in different scenarios,%

Objectives/ Scenarios	2017			2018.			2019		
	Base	Pessimistic	Optimistic	Base	Pessimistic	Optimistic	Base	Pessimistic	Optimistic
Index of Financial Stability (IFS)	6.1	3.5	6.2	6.2	5.5	6.5	6.3	6.2	6.5
Price Stability Index (IP)	4.5	6.0	4.5	4.5	4.8	4.5	4.5	4.5	4.5
Including Price Stability Index (CPI)	4.0	5.5	4.0	4.0	4.3	4.0	4.0	4.0	4.0
Risk Premium (RNR)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Key rate	8.6	7.5	8.7	8.7	8.3	8.5	8.8	8.7	9.0
Real GDP growth rate *	0,5-1,0	-(1,5-1,0)	1,2-1,7	1,5-2,0	-(0,5-0,1)	2,0-2,5	1,5-2,0	1,3-1,7	2,0-2,5

* for reference

Table 4 shows that, in the face of an adverse external environment, the strategic objective for financial stability is adjusted to 3.5% in 2017, 5.5% in 2018, and 6.2% in 2019. In such a case, we should expect the minimum level of the key rate to be 7.5% (2017) and the maximum – 8.7% (2019). If the economic conditions are more favorable than the basic option, the Financial Stability Index will be in the range (6.2-6.5)%. At the same time, the key rate will reach 9.0% by the end of the medium-term period.

5. The conducted studies lead to the following conclusions:

1. In the key rate policy, targeting financial stability is more appropriate than targeting inflation.
2. The Index of Financial Stability proposed in the article is the leading indicator of the change of financial stability.
3. The target value of the Financial Stability Index should be determined based on the levels and criteria of stability established in the context of the country's economy. It should be positive, exceed the minimum acceptable level, and avoid abrupt changes.
4. For targeting financial stability, the key rate should change in such a way that the Financial Stability Index remains at the targeted level.
5. The benefits of the financial stability-targeting regime are as follows: enhanced coherence between the monetary, economic, and debt policies of the government; increased objectivity and predictability of management decisions of central banks; increased information value of the of monetary policy direction indicator; improved quality control of monetary policy.
6. The proposed methodology for targeting financial stability is universal and can be applied to the activities of central banks in different countries.

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«They say things are happening at the border, but nobody knows which border» (Mark Strand)

Raffaele Mattioli: a european banker

by **Mirella Pellegrini**

Abstract: *This paper reflects a speech held on a day of celebration held in memory of one great and an enlightened banker: Raffaele Mattioli. The key elements of Raffaele Mattioli's ideological iter needs to be replaced in context of the time, with specific reference to the types of subjects operating in the banking sector. This highlights that the modernity of banker Mattioli precludes the changes that our financial system will know from the nineties onwards.*

Summary: 1. *Introduction.* – 2. *Iter vitae and action of an ante litteram European banker.* – 3. *continued: The “palpitating” modernity of his teachings.*

1. I would like to begin by thanking *Professor Calamanti* and the *University of Pisa* for wanting me to be with them on a day of celebration held in memory of one great and an enlightened banker. He studied the financial events of his time drawing from them his inspiration to understand the role played by the financial intermediaries in the development of the economic system.

My gratitude is also connected to a very personal memory of my first paper on the bank-industry relationship, published in 1990. At that time, I had the chance to approach Raffaele Mattioli's thought and get inspired by it. This helped me to interpret the profound changes that our financial system has undergone, starting from the acceleration of the Europeanization process after the Second EEC Directive (n. 1989/646) was enacted.

2. As Andrea Calamanti stresses in the introductory pages of the book we are presenting today, the key elements of Raffaele Mattioli's ideological *iter* needs to be replaced in context of the time, with specific reference to the types of subjects operating in the banking sector. The financial system was characterized by the figure of the so-called '*mixed bank*' which provides funding both *directly* through credit grants and *indirectly* with the acquisition of stakes in the capital of companies in need. Moreover, at that time, banking activities knew no operative coordination between short and medium/long term operations, with the obvious consequence that the funds collected in the short run were often used in long term transactions.

Retracing the steps of the weighty presence of Mattioli in the banking sector, we know that, a few years after his hiring in COMIT, he experiences the great crisis of 1930/31, dealing “successfully” with the rescue of his bank and its difficult change from mixed to ordinary bank. Mattioli is aware of the difference between providing shareholders’ equity and engaging in banking activities; therefore, in the complex historical phase which is the transformation of the banking system experienced in the years immediately following the great crisis of ’29/30, he knows well which are the dangers of the lack of separation between banking and industry.

It’s very clear how he defined this historical moment of the banking system, brilliantly summarized in the sad expression “*Siamese brotherhood*” regarding the aforementioned relationship between banks and industry. For years I’ve been quoting this formula during my lectures at LUISS because this allows the identification of the intrinsic limitations (which we could call ‘insane implications’) of the banking system at that time, which will characterize our country until the mid-thirties of the past century[1].

In short, Mattioli fully understands the limits of the above-mentioned operating model focused – as I pointed out – on both loans granted to the companies (which lack appropriate financial resources) and stakes in the capital of such firms; this explains the operational criterion at the base of his *agere* and, therefore, the *fil rouge* of an increasingly rigorous action on the ethical and highly professional level, as well as the foresight of his choices, always based on a deep humanistic culture. All these things make him a banker of great lineage, a sort of *ante litteram* European Banker, if this expression is about the ability to rationalise the processes correlating the adequacy of the means to the complexity of the goals to be pursued.

Therefore, Mattioli adheres to the ‘*pure bank*’ model introduced by the Banking Act of 1936. He however acknowledges its limits to be identified in the relation with a bank typology focused on the strict separation between companies and banks. Such organizational formula will reveal its limits when, facing the onset (in the mid-70s of the twentieth century) of possible special credit institution crisis (famously devoted to long-term operability) – due to an inadequate flow of funds – the supervisory authorities will adopt the well-known *double intermediation mechanism* in order to avoid systemic imbalances in the banking sector and ensure stability to the economy. Further restraints come from the obstacles arising from the savers’/investors’ option for short-term operative forms, intended obviously for the banks, which limited the supply of funds by the special credit institutions.

This dual credit brokerage mechanism (*doppia intermediazione creditizia*)[2] – theorized by Governor Paolo Baffi in the Bank of Italy report for the year 1975 – reaffirms – albeit late in relation to the ideological construction of Mattioli – the need to reconnect a healthy functionality of the banking system to the quality of the credit and the risks undertaken; operational technique that “our” banker duly considered in order to ensure the bank’s dynamic solvency. In this situation are also placed the subsequent developments of the banking regulation of our country which, in the years following Mattioli’s death, will live a season of particular growth driven by the inputs from other European systems and above all the German one, characterized by the Renan model of the universal bank.

Indeed, the need to reach a separation between bank and industry in our system has been, for a long time, a pretext for banking stability, maintained even after the Consolidated Law on Banking (so-called ‘TUB’) was adopted in 1993, when the mechanism of a structural supervision was overcome and particular attention was paid to the prudential rules which, as it is well known, refer to the guarantee function of the bank’s capital[3] and the ways to preserve it.

Only recently, as a result of the unique indications of the EU regulator (oriented towards the criteria of an increased competition and liberalization) we have come to the elimination of a separation built in particularly rigid conditions according to which the members of the industrial sector were prevented from being present in the capital of banks in measures of 15% (art.19 TUB)[4].

Another significant aspect of Mattioli's work is the special attention he paid to the need to contain risks, not only by restricting the participation of non-financial firms to the capital of banks but also by avoiding forms of risk concentration, ensuring a continuous monitoring of the creditworthiness of borrowers. This is a vision of particular opening to the market; free from any political or external influence. We will need to wait for the issuance of the 1993's TUB to enshrine the principle of 'safe and sound' management at a legislative level, a core principle that puts together risk aversion (that must inspire banks) and the need to correlate credit provision to the borrowers' capacity to repay their debts. That's a conduct paradigm repeatedly quoted by Mattioli as he was concerned with safeguarding the solvency of the bank – guaranteeing the return of credit lines by the beneficiaries – as a prerequisite for any development opportunity.

In fewer words Mattioli, in a correct evaluation of the financial activity, proposes its configuration in an objective manner, consistent with the merit of the beneficiaries of the credit lines. All that said, it is doubtful that we can consider Mattioli a modern banker who has always worked taking into account the rule of safe and sound management, a rule not yet written in Mattioli's historical times and which – as said – will find acceptance only a few decades after his death in art. 5 of the TUB.

3. It is clear how the modernity of banker Mattioli precludes the changes that our financial system will know from the nineties onwards. He is, however, well aware that excessively constraining supervisory rules can create a system that impedes growth and hinders the overcoming of the financial gap in which our country has long been, especially if compared to other European countries. On this matter, certain considerations made (since the time of his death) by Governor Ciampi (in 1984 at a conference in Livorno) and by an historian of the Bank of Italy Piero Ciocca at the beginning of this millennium appear to be particularly significant[5].

It should be noted, however, that Mattioli's teaching in the Italian financial system has not been fully understood: the need for a better representation of the credit analysis, of the predisposition of indices to calculate the limits of bank loans issuance, did not find a suitable response to operational realities, as it is evidenced by the crisis events that have sadly characterized the latest periods of our financial sector, not yet overcome (also because of geo-economic and geopolitical complications) (see. Tancredi Bianchi, p. 119). It is true that Mattioli knows and regards a financial sector characterized by family capital and a market of employment mainly consisting in small and medium-sized companies. It is true that when he lives and operates, finance has not yet reached that self-referential character that has been recorded over the last twenty years, so they have increasingly found within it speculation patterns often resulted into derivative financial products whose dissemination (and I would say explosion) occurred only from the nineties. It is equally true that Mattioli understands the relationship between financial credit (intermediaries)/ credit capacity (businesses)/ growth of the economic system; relation that is exactly based on management equilibria, adequate own funds, selection of business deals and technical

appraisals based on trust decisions. Current times, of course, represent a reality far different from that known by our author. The crisis has put the stability of banks to the test, causing a dangerous growth of deteriorated loans and therefore the same ability to continue to be present on the market by a number of creditors.

The well-known changes occurring at a European level since the last few years have introduced a new architecture of the EU financial system involving authorities that supervise the banking (EBA), the financial (ESMA) and the insurance and pension sector (EIOPA). This institutional framework is completed by a further authorities competent for macro-prudential risks (CERS)[6].

The systemic view of the financial system has therefore changed, and recently, following the establishment of the European Banking Union, witnessed the introduction of special supervisory (SSM) and resolution (SRM) mechanisms. The powers of policy makers and the ECB itself, now also a direct supervisory body for significant banks, have changed.

Financial activity itself is nowadays oriented towards a different direction from the past: intermediation is evolving and considerable changes are occurring in insurance companies (which have recently been authorized to provide credit), or in mutual funds to which the market players' seem to be mostly interested for the management of large amounts of non-performing loans (NPLs) that worsens the banks' financial position by requiring them to recover the existing growth paths in the a pre-crisis period.

This is a new world compared to that known in the second half of the fifties by Mattioli; a world that *prima facie* could be considered far from his teachings. Nevertheless, some of the fundamental indications that he adopted remain: supporting the weak parties of the system, using operational schemes that promptly lead to appropriate solutions in the event of a crisis; preserve the bank with its role of promoter of initiatives and, more generally, of substitute for a malfunctioning political system which, due to its instability, delays the recovery of the economic development process and leaves room for disruption factors not only political (such as rampant populism and the inability to identify suitable pathways for a more coherent and more solidaristic policy). Teachings that all contain palpating modernity for economics law scholars who are faced with what my Teacher, prof. Francesco Capriglione, recently defined in his book 'La nuova finanza', which has to deal with rules of European origin not always consistent with the development goals advocated from far away times by Mattioli[7]; Rules that often exalt market logic by pushing it beyond its natural boundaries, as it seems to have happened introducing the resolution procedure for banks in crisis and, in particular, the bail-in mechanism that, apart from justified doubts about constitutionality on its admission, overrides fundamental rules such as *par condicio creditorum*[8].

These are the neuralgic aspects of Raffaele Mattioli's thoughts, to which Andrea Calamanti rightly relies on for the conclusion of the volume that we introduce today. Aspects that identify the most important contribution that Raffaele Mattioli has given to the theory of financial intermediation. And for this reason we thank him.

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[1]See TONIOLO, *L'economia dell'Italia fascista*, Roma-Bari, 1980, passim.; CAPRIGLIONE, *Intervento pubblico e ordinamento del credito*, Milano, 1978.

[2]See ADDIS, *Banca d'Italia e politica monetaria: la riallocazione del potere fra Stato, Mercato e Banca centrale*, in *Stato e mercato*, n. 19 april 1987, p. 73 ff.; PELLEGRINI, *Banca centrale nazionale e Unione Monetaria Europea: il caso italiano*, Bari, 2003.

[3]See SUPINO, *Soggettività bancaria, assetti patrimoniali, regole prudenziali*, Torino, 2017.

[4]See BOCCUZZI, *Gli assetti proprietari delle banche. Regole e controlli*, Torino, 2010.

[5]See CIOCCA, *La nuova finanza in Italia. Una difficile metamorfosi (1980 – 2000)*, Torino, 2000.

[6]See PELLEGRINI, *L'architettura di vertice dell'ordinamento finanziario europeo: funzioni e limiti della supervisione*, in *Riv. trim. dir. econ.*, n.2, 2012, p. 52 ff.

[7]See CAPRIGLIONE, *Nuova finanza e sistema italiana*, Torino, 2016; TANCREDI BIANCHI, *Complicazioni inutili. Banche e pensioni: l'arte di rendere difficile il possibile*, Milano, 2016, p.117 ff., where he highlights that the personal capitals of the banks “are an economic management strategic quantity and “not, mainly, a cushion for possible losses” (p. 118).

[8]See LENER, *Profili problematici del bail-in*, speech at the conference ‘La gestione delle crisi bancarie e l'assicurazione dei depositi nel quadro dell'unione bancaria europea’, organized by the FITD, held in Rome the 22nd of January 2017; CAPRIGLIONE, *L'Europa e le banche. Le incertezze del sistema italiano*, in *apertacontrada.it*, 6/3/2017.

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«They say things are happening at the border, but nobody knows which border» (Mark Strand)

Raffaele Mattioli: A pioneer of modern banking in post-second-world-war Italy

by **Fabiano Colombini**

Abstract: *This paper aims to analyse a selection of key points in the banking thought of Raffaele Mattioli by examining the balance sheet reports issued during Raffaele Mattioli's position of managing director of Comit, essentially during the period 1945-1971. The analysis considers the most relevant points in the evolution of banking business and underlines their importance in the development of modern banking.*

This investigation focuses on selected quotations of Raffaele Mattioli, drawing attention to the modern criteria that inspired Raffaele Mattioli's thought. His approach prefigured the current and rational criteria to be applied to banks in Italy, Europe and world-wide, with awareness of concepts such as corporate social responsibility, credit and debt relationships, financial transformation, production diversification, liquidity, solvency and investment trusts.

Modernism appears in Mattioli's thought: thus it is important to read his writings in order to appreciate the sound principles he put forward, which still have a crucial role to play for management of a bank in modern times. In a period when financial and bank crises still produce a severe impact on economic growth and bank survival, sound and rational management principles should always be kept in mind.

Raffaele Mattioli, a 20th century Italian banker, offers a valid example of good management and stands as an enduring example of a highly competent manager with excellent professional skills and strong moral principles and rectitude. He also offers a highly instructive example for future generations of bank managers in Italy, Europe and throughout the world. His enduring heritage is confirmed by the successful results of the bank during the period of his management and by the highly instructive teachings recorded in his banking reports.

Unfortunately, however, Mattioli's thought is known only to a restricted circle as his writings are in Italian, which does not favour world-wide circulation of ideas and sound and brilliant principles. This paper examines the key points in the banking thought of Raffaele Mattioli, with the aim of underlining the above-mentioned crucial aspects and, especially, of highlighting the significance of his thought in modern times as well as its continued relevance in banking management.

Summary: 1. Introduction – 2. Corporate social responsibility – 3. Credit and debt relationships – 4. Financial transformation. 5. Production diversification 6. Liquidity 7. Solvency 8. Investment trusts. – 9 Final remarks.

1. The yearly balance sheet reports presented at the General Assemblies of Banca Commerciale Italiana for the 1945-1971 accounting periods highlight the thought of Raffaele Mattioli, an Italian banker, on the themes of banking and financial markets. Mattioli devoted considerable attention to the management aspects of banking, while also offering in-depth reflections on the economic situation of Italy during the period in question. His extremely insightful observations still have remarkable present relevance (Calamanti, 2016).

Considered by “Le Monde” as “the greatest Italian banker after Lorenzo dei Medici”, Raffaele Mattioli made an important contribution to Italian economic development during the late twentieth century post-war period. In particular, he applied the rational criterion of selection in financing the investment projects of Italian enterprises. Furthermore, not only was he a highly illuminated banker with a profound cultural background, but he was also a humanist of great value, strongly committed to the promotion of journals, cultural projects and patronage of the arts and culture.

As a banker, Raffaele Mattioli was a rare example of great skill and competence, far-sighted awareness of the complexities of banking and an all-embracing vision of the field as a whole. He was widely appreciated among throughout many fields of public life as one of the most highly accomplished members of the ruling class that governed Italy during the 20th century.

2. With regard to the responsibilities he was called upon to assume in the field of banking, he asserted: “This line of action must be accompanied by a sense of responsibility, which will become the guiding force of a more far-sighted vision of our interest” (Mattioli, 1937).

He further asserted that: “The bank.....is an enterprise *sui generis* which carries on its shoulders a great burden of responsibility. The caution called for can never be exaggerated, its errors are always too severe. Its action must be bold and cautious at the same time, linked to present-day reality but in harmony with the predictable reality of tomorrow” (Mattioli, 1941).

He also makes another significant point: “ We are aware that we bear the responsibility ... for ensuring ... that an increase in our ordinary loans is directed exclusively to financing the production process ... excluding categorically any support for speculative positions...” (Mattioli, 1946). Additionally, he emphasises that “we aimed, during the recently concluded accounting period, to support, within the limits of carefully weighed caution, the effort of the Italian economy to achieve a new and balanced situation adjustment” (Mattioli, 1947).

Raffaele Mattioli expressed an idea of the bank that is still of great relevance today, especially in the light of the recent financial crises that have involved numerous countries in a world-wide perspective (Acharya, Philippon, Richardson, Roubini, 2009; Adrian, Shin, 2010; Allen, Carletti, 2010; Bernanke, 2015; Blanchard, Dell’Ariccia, Mauro, 2010; Boccuzzi, 2011; Bolton, Jeanne 2011; Calabria 2009; Capriglione, Semeraro, 2012; Capriglione, 2015; Cassidy, 2009; Claessens, Dell’Ariccia, Igan, Laeven,

2010; Colombini, 2011; Colombini, Calabrò, 2011; Crescenzi, 2010; Davies, 2010; Dowd, Hutchinson, 2010; Duffie, 2010; Eichengreen, 2008; Estrella, Schich, 2011; Financial crisis inquiry report (2011); Franke, Krahen, 2008; Fratianni, 2008; Fornasari, 2009; Geithner, 2014; Goodhart, 2008; Haldane, 2009; Hubbard, 2009; King, 2016; Marconi, 2010; Masera, 2009; Mishkin, 2010; Reinhart, Rogoff, 2011; Shiller, 2008; Sorkin, 2009; Spaventa, 2010; Stiglitz, 2010; Wolf, 2014). He emphasised the important role played by the decisions adopted, which had ensured survival on the market and, at the same time, appropriate financing of the economy.

Solidity and reputation are acquired by the bank through a series of choices made on the basis of solid principles of rationality in management of the bank. Raffaele Mattioli's statements highlight the need to apply rational criteria for sound management of the bank, while at the same time maintaining a positive relation between revenue and costs so that profit is generated.

A further requirement which must be satisfied at the same time is that of corporate social responsibility (CSR), which basically refers to the principle of social responsibility. This concept has recently been included among the objectives to be pursued and, consequently, among the organisational strategies applied in Italian, European and international banks. In defining their strategies, banks are called upon to take into account the principles of social responsibility and to include environmental, social and governance themes as part of their industrial plans. The commitment of the world of banking in favour of sustainable and socially responsible development goes hand in hand with the aim of encouraging growth on the Italian, European and international level.

In effect, banks devote considerable attention to corporate social responsibility as a driver for innovation and growth, as well as for improvement of skills that will boost competitiveness on financial markets in the medium and long term. Thus the aims embodied in CSR imply the need to create new products and business models and, at the same time, to link public interest with the pursuit of the bank's interests.

3. A further observation by Mattioli is of considerable significance: "More than once we have emphasised, in this context, a truth that is self-evident only in its formulation: namely, that the bank exists in order to grant credit. The gathering of funds provides the bank with its raw material. The so-called 'intermediation' sets the two aspects side by side. Considered jointly, it can be seen that the essential function of the bank is precisely that of mediating: mediating in two complementary senses. Namely, mediating between the raising of funds and their utilisation, and mediating between saving and investment. The result of the former type of mediation is the granting of credit, which in turn prompts renewed attention to the raising of funds . The result of the second type – or intermediation, as it is generally called in banking circles, namely the buying and selling of currencies and securities on behalf of clients – is the channelling of some quantities of savings towards the financial market, their integration in the production process by means of the subscription of shares and corporate bonds and government bonds.

It is the responsibility of whoever is in charge of such tasks to keep watch over the two forms of mediation and ensure that rather than becoming unfavourably entangled with each other, they are appropriately harmonised and integrated" (Mattioli, 1961).

In this context, banks and financial intermediaries establish credit and debit relations with a great mass of subjects, for the utilisation and gathering of monetary resources (Boyd, Prescott, 1986; Partington, 1989; Williamson, 1987). The existence of a vast range of credit relations with many different subjects thus calls for the establishment of rational management methods. This, in turn, requires the correct functioning of banks and other financial intermediaries.

A great variety of options is available for composition of assets. To a certain extent this constitutes one of the distinguishing features of banking intermediation, as credit relations can be established with a great mass of subjects (Bencivenga, Smith, 1991; Boyd, Prescott, 1986; Williamson, 1986). At the same time, this also allows application of the law of large numbers in predicting the possibility of default on loans. Similarly, choices for composition of liabilities in banking intermediation also present a large selection of options, debt relations being established with a considerable range of subjects. By the same token, this allows easy application of the law of large numbers for calculating the length of time required for debt repayments.

In short, the extension of the number of subjects and sectors creates the conditions for production diversification, by broadening the series of available instruments, as well as the channels for their placement and the production volumes (Colombini, 2008). Accordingly, the interconnection between loans and debts is associated with the series of credit relations between the bank and a number of different subjects and sectors: this creates the appropriate conditions for stability and development.

Banking intermediaries fulfil the task of creating credit, thereby increasing the potential for expenditure by the various subjects and sectors (Cotula, Pittaluga, 1989; Lindsay, 1970; Pierce, Shaw, 1979; Howells, Bain, 2007). This also distinguishes between the manner of utilisation of the credit, either for consumption or investment, with a range of differentiated implications.

Basically, then, the creation of credit and, therefore, the growth in the lending potential of subjects and sectors is a distinguishing feature of banking intermediaries, in the sense that credit and money creation is a prerogative of banks rather than of other financial intermediaries. It is important to underline the distinction between the behaviour of banks in comparison to other financial intermediaries with regard to the expansion of loans, as the different influx of the monetary base must be taken into account. By the same token, the different proportion of the flowback due to the demand for liabilities resulting from expansion of loans negotiated with the above-mentioned intermediaries must also be considered (Arcelli, 2007; Goodhart, 1989; Lindsay, 1970). Naturally, each individual typology makes a different contribution on the plane of the capacity for expansion and credit creation; consequently, these typologies also differ with regard to the granting of loans in the context of the economic system.

The financial intermediaries create their own financial instruments, essentially in the form of a debt by means of the purchase of money (Campbell, 1982; Gurley, Shaw, 1960; Partington, 1989; Revell, 1987).

The issuing and sale of liabilities is linked to the choice and preference expressed by subjects in surplus, who wish to make decisions concerning the composition of their financial portfolio. Such choices are influenced predominantly in terms of the formation of differentials among the rates of return, although the level of risk and other economic-technical aspects must also be taken into consideration.

It can be noted that the financial intermediaries display differences in return on assets and also in the extent of profit achieved. This implies divergences in remuneration of their liabilities and also a difference in the capacity to attract the preference of subjects in surplus.

Unquestionably, the innovative processes that have been developed have sought to extend the range of liabilities of bank intermediaries, with the aim of adjusting to the trends that have become apparent in the economy. While it cannot be doubted that these innovative processes are of considerable importance in the composition of financial portfolios, this aspect by no means eliminates the important role of differentials in interest rates: rather, in certain cases it reinforces operators' ability to orient their decisions and choices on the basis of better yields, other conditions being equal.

4. Raffaele Mattioli also draws attention to another important aspect: "the raw material of this impalpable manufacture of ours, credit isthe credit that we, in turn, receive from depositors – crude credit, indistinct or only very minimally refined, and restricted by constraints and requirements of advance notice, which it is our task to set up in a myriad 'made to measure' credit operations" (Mattioli, 1956).

However, as Mattioli additionally points out, "there is always a downside as well. An account in which operations follow one another at a fast pace is certainly a sign of activity: thus it is a demonstration of the usefulness of our function as a bank, and this gives us great satisfaction. But the faster the operations take place, the shorter is the average length of time during which the funds remain in our accounts, and this is not so satisfactory. And it is even less pleasing when, concurrently, there is a decrease – even though it may be only by a fraction of a second, in the repayment speed at which our loans follow one another" (Mattioli, 1957).

Mattioli also notes that "in the long run, if the two opposite tendencies were to persist and lead to more noticeable divergences than the current minimum percentages, we could be faced with a situation of having to finance increasingly less fluid loans with increasingly volatile funds" (Mattioli, 1957).

In this context, the financial transformation consists partly in negotiation of assets with a longer maturity than that experienced in connection with the corresponding liabilities; it also consists in modification of the respective interest rate attributes, liquidity, divisibility of the amounts, repayment techniques and risk (Edmister, 1986; Gilbody, 1988; Gurley, Shaw, 1956; Greenbaum, Thakor, 1995; Krasa, Villamil, 1992; Mishkin, Eakins, 2006; Podolski, 1986; Saunders, Cornett, 2008; Tobin, 1963; Williamson, 1987). Banks are usually characterised by credit with longer maturities, and higher interest rates, in addition to more limited liquidity and divisibility, difference in repayment methods and in risk as compared to those defined on debts to the banks' own clients (Deshmukh, Greenbaum, Kanatas, 1983b; Diamond, Dybvig, 1986; Podolski, 1986).

In actual fact, it is helpful to distinguish the broker model from the asset transformer model. The broker model is suitable above all in cases where there is a need to find an offset for the exchange of credit, with the aim of expanding assets and liabilities without changing their respective and identical attributes. The asset transformation model, on the other hand, involves the need to obtain better conditions that will satisfy the preferences expressed by subjects in surplus and in deficit, pursuing the

development of assets and liabilities and modifications in their respective attributes. From this it follows that the financial transformation and the range of risks are noticeably higher in the second model that has been presented.

The arguments presented above basically reflect the asset transformer model, which corresponds to a more complete concept of the financial intermediary. It is therefore more acceptable also on the basis of events forming part of what can be noticed in concrete experience (Chant, 1987; Deshmukh, Greenbaum, Kanatas, 1983a; Lacker, 1989; Merrick, Saunders, 1985; Niehans, 1981).

Therefore, banks do not merely handle the passage of funds from sectors in surplus to sectors in deficit, but they also deal with changes in maturities and in the overall attributes on liabilities and assets, thereby influencing the range of risks.

It should also be noted that the manner in which the financial transformation function is carried out typically also affects the interest rate risk (Bhattacharya, Foley, 1991; Dermine, 1985; Haley, 1982; Toevs, Haney, 1986). This is a risk that arises from interest rate changes when there is a different rate of repayment on liabilities and assets, or when there are differences in the typologies of interest rates that have been negotiated, or in the periodicity of the flows or the indexing parameters. This is reflected in the oscillations of value of the profit and loss account and of the capital account, with potentially negative effects that may be quite substantial.

In this context, it can be noted that an accentuation of the financial transformation function must be accompanied by adoption of initiatives and policies designed to control the interest rate risk. Accordingly, economic and/or capital-related targets that are considered to be of priority importance, and similarly the appropriate instruments, must be fixed at the same time. The concrete modes of operation of the above-stated function exert an influence both on the rise and the dynamics of other risks, which are basically attributable to the composition of assets and liabilities of banks and of other financial intermediaries.

5. In Mattioli's own words: "The interest margin between the mean return on our loans and the mean cost of our deposits was shrinking uninterruptedly, resulting in a contraction of over a fifth, which has left no trace in our profit and loss account because, in parallel, the overall bulk of our operations was expanding vigorously. This has left no trace on our profit, but we are genuinely confident – indeed, we can say we are 'certain' that it has left a strong mark on the economy of the whole country" (Mattioli, 1962).

In this context, the idea of production in the financial intermediaries can be understood essentially as forming part, on the one hand, of the production approach and, on the other, of the intermediation approach (Berger, Humphrey, 1997). In the production approach, items concerning assets, liabilities and off balance sheet are considered as output, while labour and capital are considered as input. This approach implies an extended concept of production. The intermediation approach, on the other hand, considers the items of assets and off balance sheet to be the output, while labour, capital and liabilities are regarded as input. This implies a restricted idea of production.

It should be noted that in arguments forming part of subsequent passages from the paper in question, the concept of production corresponds to the production approach.

Although intensity of operation varies, the commercial banks pursue product diversification by inserting and expanding balance sheet and off-balance-sheet items. This typically increases the growth of off-balance sheet items (OBSIs). Also pursued, at the same time, is the creation of more intense customer relations and a profit increase.

Naturally, the different importance that can be awarded to the above described instruments is highly regulated. It forms part of the strategies pursued by financial intermediaries for maintaining or expanding their market share. The techniques and manner of implementation of such strategies affect the solidity and future prospects of financial intermediaries.

Banks can implement direct production diversification by augmenting the range of products, sales and revenue, or they can adopt indirect production diversification by obtaining a controlling stake in financial intermediaries, financial institutions or financial companies by increasing dividends and revenue or, in other cases, “agency” production diversification with an increase only in sales and revenue (Llewellyn, 1990; Mottura, 2006).

The need for production diversification is prompted by the rise of stiffer competition, which erodes market share in the traditional areas of loans and debts. Although the individual financial intermediaries are subjected to constraints and specificities, the production range can be amplified by making use of items pertaining to assets, liabilities and off-balance sheet.

The question of whether production diversification will lead to positive or negative results depends essentially on the choices adopted by the management. There can be no doubt that the changes which have come about have led to the problem of the redefinition of business areas, and of the search for appropriate ways of expanding the production volumes. It is indispensable for commercial banks to address these problems.

That is to say, the model of the specialised bank does not preclude such answers, but it reveals rigidities and limits in direct diversification. The model of the universal bank postulates concrete answers and reveals element of flexibility even in conditions of direct diversification. The model of a life insurance company is based on the implied possibility of engaging in direct diversification. The model of a non-life insurance company manifests rigidity and limitations in direct diversification. Likewise, the model of a banking or insurance group does not prevent similar responses, although it is emphasised the indirect diversification. “Agency” diversification can be achieved without any kind of problem in the context of banking models.

Choices concerning production diversification lead to additional costs and revenue and problems concerning the fixing of the prices involved. This leads to the need for proper assessment of the economic aspects.

The existence of financial intermediaries and the extensive diversity within their range of products certainly offer the opportunity for expansion of the range of financial instruments.

Thus there emerges an interdependence between choices made by the financial intermediaries concerning asset and liability classes, in relation to the different modes of financing and investments of subjects and sectors in deficit and in surplus.

The degree of sophistication of the various financial choices is linked to evolution of the financial systems of the different countries. On the other hand, elasticity in the composition of assets is still always an important factor in the adjustments, which have to take a number of different motivations into account, in particular the rate of return in relation to analogous time constraints, risk and taxation. Likewise, elasticity in the composition of liabilities still remains an important factor in relation to similar time constraints as well as similar risk and taxation.

Moreover, the ongoing process of innovation is oriented towards an increase in financial choices, and aims to boost competitiveness. However, research and experimentation with new forms of assets and liabilities must always be pursued with full respect for market requirements.

6. Let us take another look at a significant observation by Raffaele Mattioli. "... liquidity, even though it may be at an elevated level in percentage terms, is not very meaningful unless it expresses an adequate capacity to continue 'granting credit'. That is to say, it is not sufficient merely to be in a condition to cope with the extreme hypothesis of a demand for repayment of a large proportion or indeed the total of all deposits. What is required is to be in a position to cope with the actual day-by-day and fully justified requests for new credit facilitations. A bank that finds itself having to reimburse its depositors is a bank that is going into liquidation. A bank that does not continue to grant credit goes into hibernation. Thus in order to maintain a good degree of effective liquidity, a bank of commercial credit has only one means at its disposal: to ensure the rapid turnover of its credits.

Thus the turnover speed of our credits, which is an intrinsic part of the general picture of the economic activity of the country, no longer merely measures our potential for elasticity and liquidity Rather, it also reflects, as in a mirror, the liquidity within the market, considered overall, and in the individual sectors and the different areas" (Mattioli, 1956).

A further observation by Mattioli is of considerable interest: "Evidently there has arisen, between ourselves and the choir of those with whom we engage in conversation, a fundamental misunderstanding, a confusion regarding the meaning of a word. Liquidity is not the liquid that stagnates, but liquid that flows. It is the possibility for entrepreneurs to find prompt availability of funds, both fixed and circulating, that they need for their projects. Our interest focuses on this aspect, and on this matter we unfortunately perceive an inadequate response. Liquidity taken in the 'static' sense, (i.e. as the ability to pay one's debts and to 'go out of business' without going bankrupt, *rectius* 'solvency') has a defensive character, it protects and guarantees the *status quo*, it respects and assures balance in the relations of giving and taking. But effective liquidity is the crucial factor, it is essential liquidity that has a dynamic function, and which ensures the continued agility, flexibility and propulsive nature of the productive organism in all its ramifications: this is the liquidity that most keenly interests us" (Mattioli, 1965).

In almost all countries, the bank has to satisfy the requirement of the creation and maintenance of the obligatory liquidity reserves, by applying rates on deposits and, consequently, observing the requirement of liquid resources in its assets.

More generally, the bank does not utilise all the available resources for investments to increase its assets; rather, it creates very liquid instruments for a fraction of the liabilities. This is necessary in order to be able to cope with demands resulting from rapid and unexpected requests for repayment of liabilities, or from temporal mismatches with regard to placing them on the market, or because of sudden rapid expansion of loan expenditure or failure to recover loans.

There is a trade-off between profit and liquidity. The higher the use of monetary resources for risky instruments, particularly with regard to loans to clients, the lower is the level of freely created liquid reserves, and the greater are the risks but also the opportunity to achieve a profit. In contrast, the higher is the proportion of freely created liquid reserves in comparison to loans, the lower are the risks and the opportunity to achieve a profit while facing fewer problems.

Spontaneously created liquid reserves can be distinguished into primary reserves and secondary reserves (Santomero, Babbel, 1997; Kidwell, Peterson, Blackwell, 1997; Kohn, 2004). Primary reserves consist of cash and free deposits held at the central bank, where they contribute to building up immediately available and utilisable resources. Secondary reserves, on the other hand, consist of instruments forming part of the money market that are easily negotiable, thereby increasing the resources that become available subsequent to the negotiation on the market.

The return on freely created liquid reserves is naturally situated at a lower rate than the return on a decidedly more risky class of loans. The level and composition of liquid reserves are the outcome of management decisions.

Liquidity consists in the capacity to repay debts at maturity. This, in turn, presupposes the availability of sufficient monetary resources for current business. Availability is measured by the ratio between liquid assets and total deposits or total assets. Such a concept implies that monetary outflows will occur at various dates when payments fall due. Therefore, this involves the need to identify and maintain proportions among liquid asset aggregates and total liabilities or total assets (Revell, 1975).

The liquidity risk refers to the capacity of a bank to settle its debts at the various maturities. There would be no liquidity risk under the hypothesis that the bank could achieve a perfectly symmetrical composition of its assets and liabilities with respect to the values and maturities involving the classes of instruments that appear in its balance sheet. However, such a hypothesis is rather remote; in addition, it would disregard capital or the eventuality of missed interest payments or missed loan reimbursements. Naturally, the pursuit of liquidity by synchronizing deadlines concerning assets and liabilities would presuppose the ability of a given bank to reconstruct and obtain knowledge of maturities on loans and debts (Revell, 1973; Ricci, 1988).

Let us suppose that a given bank has exact knowledge of its maturities t_i con $i = 0, 1, \dots, n$; let us also assume that it is capable of replicating and matching values and maturities of assets and liabilities, reducing values as maturities increase with $=$ and $.$ This would achieve a perfectly balanced situation.

Apart from the almost insuperable obstacles in this regard, if many banks and, even more strikingly, almost the total number of banks present within the banking industry of a given country, were to achieve perfect symmetry in maturities and in the values of their respective financial instruments, this would end up by eliminating the financial transformation that is typical of financial intermediaries and, above all, of banks themselves. In such a manner, the supply of liquidity to the economic system would be reduced or annulled (Diamond, Dybvig, 1986; Freixas, Rochet, 1997; Wallace, 1996).

Cases where loan utilisation and conversion of deposits into money involve amounts and times that are not easily foreseeable affect above all the liquidity risk, causing pressures involving monetary outlays.

Since banks make use of the fractional reserve system, there exists no perfect equivalence between volume of sight deposits and volume of liquid reserves. Such a situation leads to problems arising from unexpected, rapid and massive demands for conversion of deposits into money or from unexpected large increases in loan utilisations.

A decline in the general public's trust tends to increase the liquidity risk, which can turn into an insolvency risk. In order to estimate the demand for liquidity, it is necessary to forecast monetary receipts and outflows for given intervals of time, in order to quantify excess outflows as compared to monetary receipts. This allows identification of the appropriate monetary resources to cover imbalances. The estimate in question requires reconstruction of the monetary flows associated with the various asset, liability and off-balance sheet instruments.

In the evolution of the banking business, matching and management of maturities involving instruments dealing with assets, liabilities and off-balance sheet cannot be separated from liquidity management. In particular, interest rate movements influence the conditions negotiated for the raising or use of additional liquidity over time. The very presence of an interest rate risk can be associated essentially with the different maturities: accordingly, the difference in repositioning of the rates on asset and liability instruments should be considered by means of appropriate variations in the types of instruments available to the banks and also in the interest rates.

It can thus easily be seen that there exists a close link between liquidity problems and solvency problems, even if different time periods are taken into consideration.

7. It is interesting, additionally, to examine Mattioli's reflections on the turnover of loans: "Although the turnover of loans may be satisfactory, a certain portion will inevitably slow down from time to time or may even stagnate. The stagnating portion may, in actual fact, be perfectly healthy and remunerative, but it cannot be offset by an equivalent portion of deposits, because the latter – even though they may be bound by various constraints – must always be 'liquid' for the client. These portions of 'slow-moving' credit could have the disadvantage of freezing part of the deposits, and would thus reduce, to the same extent, the bank's capacity to grant credit. The bank has to address this situation with its capital, namely the means that cannot be withdrawn upon request and which therefore ideally lend themselves to the task of 'financing' the less liquid part of the loans. In this sense, a bank's capital serves as an "antifreeze" (Mattioli, 1956).

In this framework, capital management is designed to encourage the growth of available resources, reinforce the bank's business wealth and ensure respect for adequacy criteria. Its development and management constitute an intrinsic aspect of the maintenance of solvency and profitability.

The financial structure of banks rests to a large extent on indebtedness, rather than capital. The following categories of indebtedness can be distinguished: short-term, medium-term or long-term maturities, fixed or indexed interest rate and the consequent financial charges that reduce the level of profits; the bank's capital, on the other hand, is characterised by indeterminate maturity, an oscillating rate of return and dividends that affect the distribution of profits that have been obtained.

The peculiarity of the financial structure of banks is associated with the trust and reputation acquired on the market. The acquisition of trust and reputation facilitates the emission and placement of the bank's liabilities: accordingly, indebtedness may rise to considerably high levels. Changes in the financial structure and, therefore, the utilisation of instruments involving debt and capital respond to different needs on the part of the public: essentially, these divergent needs involve insufficient – or, alternatively, a vast quantity – of information concerning the business areas with which a given bank is concerned.

The strategic role of capital arises from the protection awarded to depositors and purchasers of liabilities in the hypothesis of failed repayment of credits, which would reduce the value of a bank's assets and could lead to its insolvency and bankruptcy. Such circumstances are by no means a purely remote eventuality, since there exist well-known problems of adverse selection and moral hazard that can generate negative outcomes and ensuing chain reactions.

Capital is regarded as the bulwark of the stability and solidity of commercial banks for three fundamental reasons: absorption of fluctuations in the value of assets; stabilisation in the sources of financing; absence of contractually established remuneration constraints (Berger, Herring, Szegő, 1995; Pecchioli, 1987; Pringle, 1974; Taggart, Greenbaum, 1978).

Differences among risks, when the latter are linked to different business areas, lead to unequal requirements as regards capital and processes aimed at increasing on capital within banks (Lindquist, 2004). The presence of information asymmetries, the extent of available instruments, the danger of massive and rapid requests to convert deposits into money must be taken into account when a bank seeks to identify the suitable level of capital.

An increase in capital creates the appropriate preconditions for development of intermediate and productive volumes, with positive effects on the formative process of the profit and loss account. This is not all: the increased incidence of capital over liabilities reinforces the solidity of the bank's financial situation and, therefore, the solvency of the individual banks.

A capital increase creates the premises for development of intermediated and productive loans, with positive influence on the formative process of the profit and loss account. Furthermore, the increased incidence of capital versus liabilities reinforces the degree of solidity of the bank's financial situation and, therefore, of solvency of the individual banks.

The increase in capital and in available resources is reflected in the effects on investments, with particular regard to investment in new technologies.

With regard to commercial banks, for a medium and long period time horizon there exists a direct relation, as can easily be noted, between the expansion of capital and that of loans. This progressively enhances available resources, and also ensures protection of buyers of liabilities (Gunther, Moore, 1993; Moore, 1992).

The increase in capital is linked to the following aspects: retention of profits for reserve formation, placement of shares on the market, and creation of subordinate liabilities.

In this context, it is worth taking another look at a meaningful observation by Mattioli on related questions: “We have always made an effort to help small enterprises become larger and large companies to acquire the size that is economically most advantageous for them; moreover, we have not held back from exhortations urging them to discard old clothes” (Mattioli, 1965).

In the activity of screening and monitoring concerning the range of loans, the Comit headed by Raffaele Mattioli aimed to encourage the size development of companies and, at the same time, to create the premises for economic growth. By granting loans to reliable clients the bank pursues its own interests but also pursues the general interest consisting of the reinforcement of enterprises which, more than others, can contribute to economic growth while maintaining solid bases for the future.

8. Another innovative proposal that Mattioli viewed in a favourable light was the possible introduction of investment trusts: “ it is also to be hoped that legislation will soon be passed – a comprehensive and adequate legislation – concerning the measures that have long been under study, which will allow the establishment of investment trusts fully identical with those already in operation in other countries “ (Mattioli, 1965).

In this context, it is worth highlighting that investment trusts would indeed subsequently be introduced in Italy, albeit many years later, during the 1970s. This confirms the intelligent judgment and farsightedness of the proposals expressed many years earlier by the Italian banker Raffaele Mattioli, who sought to modernise and reinforce the Italian financial system.

Investment funds are specialised in the selection of a portfolio of financial instruments. The management pursues an increase in value of the assets and, therefore, aims to achieve positive results in the medium and long term. Additionally, the management pursues growth of intermediated volumes and, therefore, the best distribution of fixed costs. However, it should be pointed out that these objectives raise the problem of rational choices and strategies, in line with principles and techniques that are an intrinsic aspect of the theory of portfolio choices.

The above described processes are carried out mainly by means of technology, which is deployed in order to deal with a considerable volume of fixed costs. At the same time, the technology renders the procedures accessible to the investment funds but not to individual persons.

The investment fund determines the choice, centralisation and collective management of the monetary resources of many small and medium-sized savers: without this fund, such savers would not have been able to participate in diversified portfolios composed of monetary items, bonds, shares and derivatives. Therefore, they would have been unable to benefit from such investment funds, which make it possible to lower or eliminate non systematic risk (Haslem, 2003; Hubbard, 1994; Mishkin, Eakins 2006; Saunders, Cornett, 2008).

The creation and management of a portfolio of financial instruments aim to achieve the optimal risk-return combination which, being situated on the efficient frontier, can succeed in lowering risk while maintaining the same level of return, or vice-versa (Markowitz, 1959; Sharpe, 1970; Tobin, 1965).

The function of diversification can successfully be applied to an appropriately sized portfolio of financial instruments, and has the advantage of making it possible to eliminate non systematic risk, thereby stabilising the return on assets. On the other hand, clients of investment trusts suffer the consequences of the risks inherent in portfolio management: in other words, they have their share of the gains but also of the losses (Mack, 1993; Robinson, Ochel, 1993).

Investment trusts are present systematically on the financial markets and can be considered as equivalent to institutional investors.

The assets are typically composed of securities that give rise to liquid assets, while the capital most frequently consists of tranches of the same unit value, which similarly give rise to liquid instruments.

These circumstances do not imply any particular financial transformation, since extensively similar attributes are present in the transition from asset to capital or viceversa.

A connection can generally be observed between the inflow of monetary resources deriving from the sale of shares, and the outflow resulting from investments. At least in the open model, the investment trust must always be ready to act in accordance with the preferences expressed by the public and thus to purchase (outflow of money) or to sell (influx of money) shares with different risk profiles, and different returns at the time of disinvestment. Naturally, such actions typically have repercussions in terms of contraction or growth of assets.

Securities that are fairly liquid, or securities that involve only scanty liquidity as far as assets are concerned, basically correspond to the choice of either very short or extremely prolonged maturities in composition of the portfolio. Additionally, they reflect a lower or higher risk-return profile.

Furthermore, careful examination of such situations shows that the return is linked to management ability of the portfolio including interest, dividends, increases in value, net of operational costs. A positive result enhances the value of the assets side and, at the same time, of the share values, and shows more accentuated or reduced variability. It follows that there exists a symmetry between oscillations in the asset values and in the share values and, consequently, in the return and the accumulated or distributed remuneration.

Successful management is measured by the rates of increase in value of the assets: that is to say, by the overall return obtainable as a result of the management policies in the respective areas of monetary, bond and share activity. Therefore the investment trusts in question specialise in the selection and

management of securities with diverse characteristics and maturities: attention thus focuses on aims involving the growth asset values and of the intermediated volumes, together with period performance, albeit adjusted and interpreted with respect to risk.

These volumes undergo change over time, and reflect subjective conditions of the individual subjects in surplus as regards their preferences concerning composition of their financial portfolio. At the same time, however, the volumes in question also reflect objective conditions of the individual financial markets, and above all the trend of short, medium and long term interest rates.

9. This paper examined the banking thought of Raffaele Mattioli, a famous Italian banker who worked in the twentieth century at Comit in Milan. The banking ideas of Raffaele Mattioli have been extracted from his balance sheet reports drawn up over many years and now kept in the Archivio Storico of Intesa SanPaolo.

His writings clearly highlight the relevance and importance of studying and applying principles for bank management which he addressed in numerous cases and which can be clearly derived from an examination of the topics he addressed and his manner of expression. At the same time, emphasis should also be placed on the upright, highly principled rectitude of the Italian manager Raffaele Mattioli, in running the business of the bank which had experienced the turmoil of the great crisis of 1929.

Raffaele Mattioli showed professional skills at a high level. His writings, documented in his yearly balance sheet reports, reveal solid foundations that enabled him to avert banking crises and, at the same time, to build up a strong performance and reputation. At a crucial time in Italian postwar history, he accepted the responsibility of running a banking business, introducing rational ideas and rational principles that are now the essence of modern banking. His achievements must not be forgotten.

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«They say things are happening at the border, but nobody knows which border» (Mark Strand)

FinTech and the “Hunting Technique”: How to Hit a Moving Target

by **Andrea Minto**

Abstract: *This paper reproduces the Opening Speech delivered at the Conference “The Transition to the FinTech Era: Survey, Challenges and a Way-Forward”, held at the University of Utrecht, 8 May 2017.*

Summary: *1. Financial innovation and technological changes under a law and economics perspective. – 2. The evolution of financial regulation. – 3. Concluding remarks.*

1. Traditionally, financial innovation has been regarded as a change in the type and variety of available financial products[1]. Technological changes relating to telecommunications and data processing have spurred financial innovations that have altered bank products and services and bank production processes alike[2]. A vast amount of literature studied the development of novel financial products and scrutinized the implications that have come with it. One strand of economic scholarship mapped out the ability of technological improvements to increase efficiency, whenever something new that reduces costs, reduces risks or provides an improved product/service is being created[3].

On the other hand, the 2007-2008 global financial crisis (GFC) showed that financial innovation might land far from attaining services that better satisfy financial system participants’ demand. Quite to the contrary, financial innovation could result in products which are designed to obscure the attendant risks and which are traded in opaque dealer-intermediated markets by opaque financial institutions, ultimately making end financial consumers worse off[4]. Credit default swap, residential mortgage-backed securities, collateralized debt obligations have indeed ignited a great deal of discussion on informational asymmetry between intermediaries and investors, agency cost problems and transaction costs[5] as well as on the relationship between financial innovation and financial stability[6]. The negative economic and societal consequences provoked by these sophisticated products have exerted a profound influence on how to perceive financial innovation and, perhaps most significantly, revealed the intellectual challenge to adequately account for both the “good” and the “bad” of it[7].

From a regulatory perspective, the wake-up call made by the GFC caused policy makers to approach financial innovation as a *process of change* – but not necessarily one of improvement – which needs to be closely looked at[8].

More recently, however, along with the creation and marketing of new financial products, a more radical process of change has started off in the financial sector.

Over the past few years, in fact, new providers who combine digital technologies with financial services have been entering the market. Innovative business models, applications, processes, and products have been coming about, with an appreciable effect on competitive pressure and patterns, consumers' experience and market dynamics.

This process is relentlessly projected to affect competition in some parts of the financial system and to impact on its structure and dynamics. Several digital-based technologies as applied to financial services, such as distributed ledger technology, usher in new products, new business models and new ways of affecting transaction and intermediation. Fintech companies are already nibbling away at incumbents' market share and their profitability and thus changing financial industry's competitive patterns[9].

2. The financial sector is thus rapidly evolving under the impetus for changes triggered by information technology. Not only had competitive pressure become more intense, but the institutional structure of financial institutions and the dividing line between institutions and financial markets have been transformed and blurred respectively[10].

Coupled with that, the current macro-financial environment as characterized by exceptionally low nominal interest rates makes banks face profitability pressure and growing competition from the non-banking sector[11]. The low interest rate environment is likely to accelerate the transition towards a more “market-based” structure while increasing the odds for fintech companies to successfully establish themselves at the expense of financial institution incumbents dragged down by unsustainable business models[12]. A joint Task Force at the ESRB-ECB has recently expressed serious concerns on how the current macro-financial scenario, along with the competitive trends technological innovation is bringing up, might entail a risk of higher sensitivity to market shocks: not only are fintechs (able to) enticing customers away from banks and so raising concerns about business models' sustainability, but they are also more profoundly contributing in building up vulnerabilities to financial stability[13].

Despite considerable scholarly ink has been spilled on financial innovation, little attention, if any, has been paid on how technological innovation creates significant repercussions at industry level and causes structural change to the industry itself, opening up new markets and value networks while shaking up established market players[14]. And nor has it been researched on whether the current regulatory “thinking” and approach (pretty much based on the traditional intermediation) is still appropriate to deal with the rise of dis-intermediation.

To my mind, the process of change ignited by FinTech should be approached as a moving target to get captured. Interestingly enough, the regulatory engagement with FinTech – and the host of societal challenges that comes with it – resembles a hunting expedition.

Let me explain you the hunting analogy.

Assume you want to figure out the best hunting technique to hit a moving target.

You will be thinking of moving the rifle such that it follows the trajectory of the target, staying slightly ahead of where the target lies. This technique is called leading the target and it is easier to accomplish when the target is barely moving, such as a deer slowly walking in the distance.

As the speed of the target increases, leading does not work out that well. You might use the trapping technique, holding still your rifle and shooting in advance such that the target basically walks into the path of the bullet. It is harder than leading, since you must accurately judge the speed of the target and its trajectory.

Either way, you try to make an estimate of your target's moves and trajectory.

Now, the same holds particularly true for what is happening on financial markets.

Policy and law-makers and supervisors are indeed holding their rifles as to keep a close eye on financial innovation, striving to predict its pace and trajectory. And yet, what makes hunting a challenging activity goes way beyond the target itself. A good hunter should account for the specific environment they found themselves in. It all comes down to the capability of capturing a target *in a given environment, in a specific setting*. And in fact, before squeezing the trigger a hunter needs to carefully consider, for instance:

- The type of rifle they handle.
- The direction and strength of the wind.
- Brush, vegetation, or other obstacles between the hunter and the target.
- The movement of other animals and its influence on the movement of our target (herding behaviour)

To understand why “regulating Fintech” can be compared to hunting, it is useful to start by recognizing an awkward reality: we are way too much focused on the target, while overlooking the environment and the other factors affecting our capability to shot.

As the metaphor goes, to my mind, capturing FinTech (or the process of change behind it) requires in fact focusing on the financial environment and ecosystem, rather than on innovation itself. Not only are new species – new providers and services – entering the market and being offered respectively, but the infrastructure[15] – the framework, platforms and structures that determine how firms, consumers and policy- and law-makers interact – is changing. Consequently, in my opinion, the regulatory approach and engagement with financial innovation should take into account that the industry itself and the environment – as a nexus of parties – are confronting technological change. Some of the recent inventions in information technology such as distributed ledger technology, big data and robo-advisors have indeed the *potential* to significantly affect the basic infrastructure for financial services and to change the way consumers and financial institutions interact when buying or selling financial products

In other words, to give you an example, FinTech is not about Bitcoin itself, but about re-thinking money and how commercial transaction are effected and substantiated.

Technological advancement is in fact affecting “money”, “ledgers”, “risk and time allocation”, “information” and all the basic infrastructures financial activities have been traditionally based upon[16].

Innovation is challenging the ability of regulators to respond and adapt. The proliferation of new market infrastructures as a result challenges academics and policymakers alike at both conceptual and operational levels of regulatory design, and calls for an alliance between different branches of knowledge. In accounting for the complexity of modern financial intermediation we need to duly foster cross-fertilisation between disciplines and methodologies. Only by building upon a rich foundation of approaches that span law, finance, economics and sociology, we are able to move the debate towards the examination of questions respecting the best policy and regulatory responses.

Utrecht University is committed to embrace such a challenge. Fintech is in fact one of the strategic themes that Utrecht University is pursuing, with the involvement of many research hubs and centres.

3. In that respect I want to close by thanking some of these research hubs who kindly sponsored this event. We wouldn't be here today without the support of reinforce, resilient society project and institutions for open society. Thank you all.

Besides, I would like to thank all the speakers for accepting my invitation and to travel across Europe, and beyond, as to join and contribute in the debate.

I am proud of having a terrific line-up, today. The key-note speech is assigned to Mr. Andrea Enria, Chairman of the European Banking Authority. I am thrilled by the idea that today the EBA is for the very first time publicly sharing their regulatory and supervisory strategy to cope with FinTech.

Mr. Andrea Enria will introduce the EBA, its objectives, tasks, scope of action and available legal instruments. He will explain the EBA's methodological approach to FinTech innovations, using three recent case studies for illustration: Virtual Currencies, Automation in Financial Advice (“Robo-advice”); and payment initiation and account information services under PSD2. His lecture will then outline the EBA's focus for 2017, when the EBA will be looking at the topic of FinTech more broadly, by assessing banks' responses to FinTech challenges and opportunities; the impact of FinTech on banks' business models; and issues around the perimeter of regulation, authorisation, and ‘sandboxes’ and similar approaches and regimes.

Creating a suitable regulatory framework for addressing financial innovation thus requires optics accurate enough to concretely evaluate and sift the functional implications of technological advancement and financial innovation on the market. Distributed ledger Technology is not making our life different in itself, but its implementation and application is capable of modifying consumption patterns, attitudes and behaviors in ways that upend market practices that demand specific regulatory responses. The pace of innovation and the uncertainties relating to the placement and interaction of fintechs with traditional financial intermediation render it more difficult for supervisors to locate, assess and oversee potential risks.

Financial innovation hence requires policy- and law-makers to examine a diverse and dynamic market ecosystem *vis-à-vis* expanding sets of policy goals and regulatory mandates.

I hope that this conference, through active and lively discussions, will lead to many creative and practical ideas on how to devise the best “hunting technique” as to hit a moving target.

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«They say things are happening at the border, but nobody knows which border» (Mark Strand)

New economic challenges for managing disease prevention and monitoring

by **Pablo Collazzo – Mauro Romanelli – Paola Briganti – Paolino Fierro – Davide de Gennaro**

Abstract: *Managing disease prevention and monitoring its progression benefits professionals facing the challenge of acquiring new knowledge and information for fighting the many diseases that negatively affect the life of people in areas such as public health systems, families, economic and business systems. From economic and operational points of view, Cancer Registries as organisations managing information by collecting, storing, reporting and interpreting data to improve cancer monitoring which is needed to plan health policies evaluation and design. Sustaining the role of the Cancer Registry as information system for fighting against cancer relies on paying attention on regulatory and ethical aspects with regard to the protection of confidential data, understanding and meeting the organisational challenges, learning from theory and practice emerging from the comparison of international experiences, bringing together voluntary, private initiatives of associations and public programs for sustaining the relevance of gathering and collecting data, information for knowledge about managing prevention and monitoring of the disease as core competence for driving public health systems towards sustainable development. Regulatory and organizational infrastructures help improve both information and knowledge management and design and implement effective measures and initiatives leading to efficacy in preventing and monitoring cancer disease as support to medical scientific research for cancer cure.*

Summary: *1. Introduction. – 2. Managing disease prevention systems. – 3. Disease registries as organisation: regulation and ethical aspects – 4. Managing information and knowledge – 5. International experiences and practices – 6. The Airtum as organisational form and coordinating mechanism. – 7. A case study for improving the disease prevention and monitoring. – 8. Conclusions.*

1. Managing disease prevention and monitoring helps professionals facing the challenge of acquiring new knowledge and information for fighting against many diseases that negatively affect the lives of people in terms of public health systems costs. Cancer Registries as organisation responsible for ensuring effective collection, storage, reporting and interpretation of data help to improve cancer monitoring and build new knowledge for disease treatment, analysis, prevention and monitoring which

can in turn drive improved health policy planning, evaluation and design. The aim of this study is to investigate how Cancer Registries may operate as systems for gathering, collecting and managing information to create new knowledge base with regards to cancer disease prevention and monitoring. The study relies on archival and qualitative data drawn by considering the Cancer Registries as organisations and information sources for managing disease prevention, monitoring and control. A literature review on the international experiences and practices is presented. Finally, to facilitate the study aims, the data gathering and collection concerning the role of the AIRTUM *Associazione Italiana Registri Tumori* as an organisational form for coordinating the activities related to cancer prevention and analysis, and the case study represented by the *Terra dei Fuochi (The Land of Fires)* as laboratory and case study highlighting the need to strengthen and improve the Cancer Registries as informational sources for knowledge improvement, sharing and creation will be examined.

The study is organised as follows. Following this introduction, in the second section, some considerations on management systems for disease prevention are presented. In the third section, the features of Cancer Registries as organisations with regards to regulatory and ethical aspects of the treatment of confidential data are presented. In the fourth section, the role of Cancer Registries as organisations managing information and knowledge for disease prevention is elucidated. In particular, the analysis explores international experiences and practices; to explain the role, the goals and the task of AIRTUM as organisational form and mechanism of coordination for the activities related to the cancer prevention and monitoring. Also in this section, the *Terra dei Fuochi (The Land of Fires)* as case study is discussed, as an experiment to improve the role and value of Cancer Registries to better manage and share information and knowledge for improving the cancer prevention.

2. Chronic diseases such as heart conditions, cancer, diabetes, chronic respiratory disease, or visual and auditory defects contribute significantly to premature deaths and disabilities, and thus heavily affecting the quality of life of individuals[1], particularly those in disadvantaged socio-economic people[2].

Generally, the chronic illness originates at an early age, but can take decades before becoming clinically apparent, thus requiring long term care. It is at this latter stage that the disease offers the opportunity for analysing, studying and finding solutions for prevention and monitoring, and efficacy in its cure. Employing medical record systems may lead to major health care savings while improving individuals' health, even if benefits may materialize themselves at a later stage[3] and prevention systems are still poorly implemented[4].

Prevention systems deal with the continuous monitoring of the distribution and progression of a disease incidence in a population through systematic data collection, analysis and evaluation of morbidity, mortality and other relevant data, as well as the disclosure of information to everyone who contributed to the system and to everyone who needs to know about the issues[5].

Monitoring systems allow researchers to classify and categorise diseases to provide a useful overview to address these issues and offer results that permit healthcare professionals to develop plans to be targeted at specific interventions and to evaluate their effectiveness over time. The international cases about general disease prevention systems, structures, methods and techniques encompass a range of monitoring and prevention models (epidemiological data collection, analysis, interpretation, prevention

initiatives ranging from information and training to the population to specific diagnostic services on the territory).

The automated telephone communication systems (ATCS), unidirectional (one-way, non-interactive voice communication), interactive voice response (IVR) systems, ATCS with additional functions such as access to an expert to request advice (ATCS Plus) and multimodal ATCS, where the calls are delivered as part of a multi-component intervention, contribute to improve and increase healthcare effects in terms of immunisation, screening, and compliance medications and tests[6].

3. The Cancer Registry is both an organisation and the process to systematically collect, store, analyze, interpret and report data of persons suffering from the disease, in order to improve cancer control, and evaluate and compare the effects of health policies and practices on this disease. Hospital-based Cancer Registries provide readily accessible information on patients with cancer in terms of the treatment they receive and the results. Population-based Cancer Registries help gather data and produce statistics on cases of cancer concerning a population in a well-delimited geographical area, providing a framework to appreciate and assess an effective cancer control and impact with regards to epidemiological aspects which helps define public health priorities, based on etiological studies[7]. Cancer Registries as valuable database and information systems should help evaluate the impact of cancer prevention, screening and treatment programs, and improve the cancer planning, focusing significantly on the quality of life and meeting the needs of patients[8].

Ensuring better health care implies prevention, control and measurement as a registration determinant. Cancer registration may rely on voluntary or compulsory notification of patients' outcomes resulting from legislation or from an administrative act in virtue of an executive healthcare authority. Designing an effective cancer registration service requires the development of appropriate guidelines to protect patient confidential data to promote high quality of data and to use those data to benefit patients and monitor cancer control advancing medical research[9]. Confidential data permit the identification of an individual or patient's condition. Personal data should be processed lawfully, fairly, in a transparent manner in relation to the data subject; collected for specific, explicit and legitimate purposes, adequate, relevant and limited to what is necessary, and kept for no longer than necessary, processed in a manner that ensures confidentiality and protection against unauthorised or unlawful processing against accidental loss, destruction or damage[10]. The guidelines on confidentiality, in this context, and the ethics for Cancer Registries should provide specific measures in order to ensure the preservation of personal data[11]. Worldwide guidelines developed since 1991 (IARC[12]) and European guidelines (ENCR[13]) developed since 1992 have defined the measures needed to ensure the protection of privacy (patients, doctors and the hospitals), specifying which is considered confidential information. Cancer Registries should follow the same standards about how to identify and manage confidential data. Providing an adequate legal framework helps the effectiveness of the Cancer Registries by ensuring privacy to protect the confidentiality of the personal data as the more important threat to cancer registration[14], an ethical issue to be considered in terms of completeness and accurateness of registry data to minimize risks of loss of privacy and breaches to confidentiality facilitating planning and implementation of public health programs and research activities[15]. Regulations and directives should help bring together measures for both data and information protection and exchange for producing new knowledge and scientific results in terms of therapies, diagnostic and prevention[16].

4. Appreciating cancer survival allows health care providers and policy makers to evaluate the effectiveness of health management systems. According to the World Health Organisation (WHO), 16 million of new cancer cases per year will be by 2020, seventy per cent in developing countries, largely resulting from growing environmental pollution and unhealthy eating styles, along with extreme working conditions in the exploitation of land natural resources, such as gold, diamonds or petroleum.

The WHO conducted a study on the frequency and characteristics of latent or overt carcinomas in specific body areas, by employing Cancer Registries. Introducing worldwide Cancer Registries for comparison data collected helped solve disagreements in diagnosis and increase the effectiveness of cancer care and cure[17].

Cancer Registries as information management systems should help to improve knowledge and information sharing about cancer disease evolution, diagnosis and prevention. It is valuable to consider the international experiences and practices in comparison with the organisational form implemented for the collection and management of data and information. Cancer Registries help to support strategic decision processes regarding complex issues, such as the definition, implementation, and improvement of care protocols for diseases, often characterised by incomplete and confused epidemiological data, and information about etiology, dynamics and effective treatments with sustainable side effects by patients. Cancer Registries collect data and information on all cancers in all residents of a given area (single city, entire region, province or nation territory). 'Specialised' Cancer Registries collect data and information on specific tumours (the colon–rectum, lung, breast, etc.) or on specific age groups (all childhood tumours, etc.)[18]. Cancer Registries foster knowledge creation and information management through cooperation at inter-organisational levels. Scientific expertise and skills, information technology management systems represent strategic resources^[19] leading Cancer Registries to be considered as decisional support systems helping to learn how to make decisions facing and solving difficult and not structured problems[20]. By using flexible data processing systems for advancing scientific and organisational learning, and improving the processes for cancer prevention and treatment, the knowledge on cancer information management and monitoring proceeding coherently with a double-loop learning[21].

5. Information on different cases of cancer emerged in the first half of the twentieth century and continuously grew over time. Cancer Registries, which originally focused on analysing cancer's patterns and trends on patient survival, developed in order to plan and evaluate activities of cancer control and care based on comparability, validity and timeliness of the log data[22]: comparability refers to understand a comprehensive review about the registration procedures under place; validity as examined through numerical indices; timeliness refers to specific rules for abstraction and register signaling[23].

In the 1970s best practices were developed and laid down by national agencies based on detailed programmatic criteria (United States, Northern Europe and Japan). In Southern Europe countries, Cancer Registries developed in 1990s, as a spontaneous scientific rationale of individual clinicians, pathologists, epidemiologists and public health doctors arising from their commitment as physicians, to improve the knowledge about the disease and better understanding the causes and mechanisms of cancer development^[24], in response to significant growth of cancer diseases in the past few decades[25].

Cancer Registries allow professionals to specifically record incidence, mortality and the prevalence of cancer. Inequality in cancer prevention and monitoring emerge in low-and middle-income countries (LMICs) leading to a continuing cycle of poverty. High-income countries (HICs) mostly have population screening programmes (for example, cervix, breast and bowel cancer); however, in LMICs 70% of patients do not have access to adequate cancer cures (vaccine, radiotherapy). Socioeconomic status tends to influence the possibility of survival. It is necessary to invest in the training of oncologic surgeons particularly in LMICs, in acquiring and managing methods to control and prevent the cancer by developing adequate population-based cancer registries[26]. The United Nations (UN) has set rules to improve global cancer registries adoption to monitor the epidemiological data, which is aimed at bridging the clinical and global gap[27].

Attention should be paid to the reliability of Cancer Registries in terms of completeness and precision of data[28]. For example, while between 1990 and 1996, the Finnish Cancer Registry had recorded the morbidity of 4.922 patients with pancreatic cancer with 89 surviving for at least five years, Carpelan–Holmström and colleagues[29](2005) showed that the data were inaccurate and only 10 patients survived for at least five years.

It is arguably necessary to effectively plan an active research program tracking records and statistics of cancer cases[30]. Some experiences and attempts emerged over time. The EUROPREVAL[31] is a European project for studying cancer by highlighting and evaluating the differences between countries, in terms of epidemiological evidence and effectiveness of care. EUROPREVAL is based on 38 Cancer Registries in 17 European countries, providing data on almost 3 million patients diagnosed with cancer between 1970 and 1992. Standardised procedures were used for collecting and validating data by identifying large geographical, gender and wealth differences within and among countries. Many types of tumours have a higher prevalence in Sweden, Switzerland, Germany and Italy, while showing lower trend in Poland, Estonia, Slovenia and Slovakia. Breast cancer accounted for 34% of all women's cancers and colorectal cancer was prevalent in about 15% of males.

Within richer European countries both a greater presence of cancer cases and a lower number of deaths emerge[32]. Introducing and employing Cancer Registries therefore helps achieve positive results in terms of improvement in health techniques[33]. Higher levels of cancer survival are shown (Australia, Canada and Sweden). Intermediate levels were apparent (Norway) and lowest levels were (Denmark, England, Northern Ireland and Wales).

Analyses tend to check the validity of the cancer registry (Norway, between 2001 and 2005). It has been shown that the routines involved were reasonably accurate, close-to-complete and timely[34]. With regard to the Sweden, the quality of data provided by the hospitals and the state was confirmed in relation to a study of 13,434 cancer patients (1995-2003)[35]. In Japan, a computerised system has been developed with the aim of reporting cases of pancreatic cancer[36]. In Iran, Cancer Registries, as constructed on regional basis, gathering and collecting data about 3,500 cancer patients, provided interesting information[37].

6. In Italy there are no mandatory prescriptions for storing data related to the diagnosis of the cancer treatment. The AIRTUM^[38] (Associazione Italiana Registro dei Tumori), aims at actively seeking, storing and making information available for scientific study and research. The AIRTUM working group (2013) showed 4.473 new cases of malignant neoplasie on children and adolescents between 2003 and 2008.

The Association of Italian Cancer Registries, established as AIRT in Florence in 1997, aims at coordinating the 43 regional Cancer Registries providing data and information on the type of cancer diagnosed, the name, address, age and sex of the patient, the clinical conditions, the medical treatments and the evolution of the disease with regard for 28 millions patients, corresponding to 47% of the total resident population.

The association through its connection with equivalent bodies in Europe and worldwide supports the research, the editorial output and methodological development of various Cancer Registries.

Since 2006 AIRTUM has aimed to enable the comparison of epidemiological data for cancer between the different parts of the country; to survey and measure oncological pathology in terms of mortality, incidence and survival; to examine trends over time and to compare the results obtained with those observed in other countries. The objectives of the AIRTUM are: to make available to health service bodies and the scientific community, data on incidence, mortality, survival and prevalence data for tumours in Italy in order to facilitate research, disease prevention and oncologic welfare planning to stimulate data analysis so as to shed light on the frequency of cancer in Italy; to contribute to the planning of new initiatives in data registration and their evaluation; to foster the standardisation of registration techniques; to promote a national and international network; to represent and safeguard, at home and abroad, the professional interests of researchers and technical assistants in Italian cancer registries; to improve the usage of data registration through guidelines enabling the standardisation of results and the setting up of a forum for sharing recent epidemiological research.

The activities of AIRTUM are focused on establishing a national database for the estimation of frequency indicators for cancer in Italy using the information collected from accredited cancer registries; to continuously assess the quality of the data collected from associated cancer registries; to stimulate, promote and support study and research and conduct the editorial work by disseminating publications based on the national database; to organise training courses designed especially for the staff of cancer registries; to organise the collection of funds and materials to promote and support research activities; to organize seminars and conventions and to collaborate with organisations, bodies, institutions and national and international foundations with similar or complementary aims.

Today, AIRTUM plays a significant role in managing and sharing data and information with regards to cancer care. The Italian Health Ministry mandatorily imposed a duty on to public and private hospitals to keep all records about the diagnosis and treatment of tumours: the Cancer Registries permit to collect information about those sick with cancer resident in a specified area known as *population registries*, and gather data about the tumours of all residents in a specific area which could be a single city, an entire region or province, or the area covered by an ASL (Azienda Sanitaria Locale – local public bodies providing health services); including data of people affected by a specific type of tumour, named *specialised registries on a single type of tumour* (for example, tumours of the colon, the rectum and breasts), or belonging to a *specific age group* (for example, children aged 0 to 14, and adolescents aged 15 to 19).

The data from Cancer Registries are essential for research about the causes of cancer, the evaluation of the efficacy of treatments, the planning of preventive interventions and scheduling expenditure on health services. 34 Cancer Registries cover a quarter of the Italian population. The information collected includes the type of tumour diagnosed, the name, address, the age and sex of the patient, the clinical

circumstances in which the cancer was found, the current treatment and treatment history, and the development of the disease[39].

Cancer registries collect the data from hospitals, family doctors, local health authorities (ASL), and regional health agencies. The main sources are: *hospital discharge notes* holding a summary of every patient admission; *anatomical and pathological cytology archives* generally ensuring the highest level of accuracy of the diagnosis of individual cases following international coding rules with a great acquisition of the characteristics of neoplasms (morphology of the cancer, biological structure, grading and classification); *clinical records* disclosing case data that computer processing is often not able to achieve, consulted at the hospital, and, rarely, with the treating doctor; along with *death certificates* all accounting for the main sources for information acquisition.

Cancer Registries are created by the initiative of doctors and professionals operating in the public health system. Such initiative is voluntary rather than mandatory. The diffusion of Cancer Registries is not homogeneous in Italy. In Southern Italy, there are fewer Cancer Registries (32% in 2013) in comparison to North Western (41%), Eastern (69%) and Central Italy (26%). Recently, the Health Ministry promoted programmes in order to encourage to extend the registration in all regions of Italy.

The organisational structure and governance of AIRTUM, as determined in the Statute, is articulated in: *Members; Organs and Commissions*.

The *Members* are researchers and technical personnel of Cancer Registries, citizens and people interested in health information systems. *Members* can vote, be elected as officers and participate in all the activities of the assembly.

As for the *Organs of the Association: The Assembly of Members* (ordinary or extraordinary) is chaired by the Secretary and convened at least every year. The ordinary assembly approves the budget and annual accounts, discusses and approves a programme of activities and appoints the members of the *Board of Directors* and of the *Audit Office*.

The *Board of Directors* consists of 8 members *pro bono*, elected by the Assembly before the beginning of the year and remaining in charge for two years, potentially re-electable. The *Board of Directors* is responsible for making strategic choices as agreed by the Assembly in terms of designation of collaborators, drawing up the budget and annual accounts, presenting an annual report of the Association's scientific endeavour, and convenes the Assembly of Members, appointing delegates for workgroups and committees and conducting the business of the Association. The Board of Directors elects the Association's Secretariat and treasurer from among the board members. To accredit a new registry, a board meeting may be enlarged to include the directors of all Italian Cancer Registries.

The *Secretariat* consists of the Secretary and two Vice-secretaries. The Secretary is the legal representative of the Association, responsible for all administrative matters drawing up contracts and signing correspondence for and on behalf of the Association.

The *Audit Office*, consisting of two members of the Association checks the regular keeping of accounts and accounting documentation.

The *Commissions* are grouped and specialised for specific matters and affairs (database, financial, accreditation, publications, press and web, quality of cancer registries, education, international relations). The *Commissions* have to present an annual programme comprising the objectives and activities, the account of the activities performed to be debated and discussed in the annual assembly of the Association.

The AIRTUM *database*, available online and periodically hosted by the ISPO (Institute for Oncologic Research and Prevention, Florence), is the main national archive on cancer data, collating all tumour data, collected by the individual accredited registries.

There are specific rules that govern the accreditation of a Cancer Registry. The Board for assessment appointed by AIRTUM will issue a written judgement within three months of receiving the documents and material discussed below. It reserves the right to request further information that, if necessary, will be inspected at the offices of the applicant registry.

The Cancer Registry, to secure accreditation, must submit incidence data covering at least three consecutive years, and the production and submission by the applicant registry of complete documentation and materials indicated in the AIRTUM Statute. The cases are codified by the individual registries following the International Classification of Diseases (ICD-O 3) before being submitted to the national database. Their quality is checked before and after being submitted to the database. Analyses of quality indicators show a high level of completeness and validity of the collected data, and give reassurance of the comparability of the different areas. The high quality of the data produced by AIRTUM is suggested by its regular inclusion in international publications on cancer, such as cancer incidence or Eurocare 4, Cancer in Five Continents.

7. Many factors, particularly the biological ones and life conditions, affect human health[40]. Historically, the Italian region of Campania was known as *Campania Felix* by virtue of the fertility and fruitfulness of its territory[41]. Recently, a large urban and rural area of 1.076 km² and comprising more than two million and four thousands of inhabitants (ISTAT, 2013) between the cities of Naples and Caserta was negatively renamed by local, national, and international mass media as *Terra dei Fuochi* (*Land of Fires*) because of toxic and black smoke trails ascending to the sky as a result of the incineration of toxic waste burned down along not particularly busy road arteries, and as a territory in which criminal economic activities developed by activating an illegal waste cycle that produced large scale pollution to the environment[42].

The Italian government intervened by identifying 32 municipalities in the province of Naples and 23 municipalities in the province of Caserta as the *Terra dei Fuochi* and passing the law n. 6/2014 in conversion of the Decree n. 136/2013 in order to solve the so-called *waste emergency* having a very negative impact on public health and the natural environment by the contamination of farmland and creating danger for agro-food products within the Campania region. An Inter-Ministerial Committee was set up, from which a specific Commission was placed in charge of coordinating a program aimed at protecting health, safety, site reclamation and economic revitalization of the territories in question. The Campania region was called upon to define the type of examinations for the cancer prevention and the control of the health status of the resident population in the municipalities concerned, without any cost for patients; it was also determined to update the epidemiological study “Sentieri” by the Higher Institute of Health[43].

The epidemiological picture of people living in the 55 municipalities of Campania within the *Land of Fires* was characterised by a higher incidence of cancer in for male (11%) and female (9%) compared to the national average; the mortality rate for male (9%) and female (7%) tends to exceed the the national average according to the data provided by Istituto Superiore della Sanità (2016).

As of 2017, there are seven accredited Cancer Registries supplying data and information on 71% of the population living in the Campania region, whilst the national average covers only 52% of the population of any given region. They are monitoring 20% more of cancer cases in comparison with the Italian average, and cover 100% of the cases in the *Terra dei Fuochi* area, excluding the city of Naples. Moreover, the Campania Region is the third Italian region in adopting and obtaining the accreditation from AIRTUM of an Infantile Cancer Registry of regional coverage, tracking all new cancer cases occurring in the age range of 0–19 years. At present, the Campania Infantile Cancer Registry is the one with the highest percentage of supervised children and youngsters in Italy. The AIRTUM has activated three Cancer Registries in Naples, Salerno and Caserta. The first two, set up in 1996 and 1997 respectively, are already part of the AIRTUM network and they are accredited; the Cancer Register in Caserta, set up in 2012, is completing its first registration, relating to the data for the 2008-2010 triennium. In addition, AIRTUM has recently set up the Regional Cancer Registry Network with the aim of ensuring, in coming years, a cancer register for each province of Campania region.

8. Cancer Registries tend to emerge as important organisational forms for managing data and information that support the initiatives and the efforts of public health systems to control, prevent, analyse and battle cancer, a disease that slashes people's lives, while impacting the structure of costs and spending within public health systems.

The Italian experience suggests that AIRTUM as a mechanism of coordination helps Cancer Registries better develop important functions and performing the task by strengthening their role and contribution. Prevention is typically better, more useful and less costly than providing a cure. Managing disease prevention and monitoring helps the development of a public health system and creating communities and public awareness on the importance to gather, collect, interpret and analyse data and information to anticipate and prevent the negative consequences of cancer.

New forms of regulatory and formal, international and national governance are arguably necessary to discipline the activities of the Cancer Registries so as to effectively fight cancer disease by providing useful data, inputs and outputs leading to improved public health policies, while encouraging private and public-sector cooperation and collaboration for sustainable economic growth. Bringing together voluntary, private initiatives of associations and public programs for sustaining the collecting data, for the prevention and monitoring of the disease is seen as a core competence for driving public health systems towards greater impact and efficiency. Providing adequate regulatory and organizational infrastructure helps improve both information and knowledge management and design and implement effective measures and initiatives leading to efficacy in preventing and monitoring cancer disease as support to medical scientific research for cancer cure.

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