

Macro and Micro Data Consistency for Efficient Decision Support Systems

Towards Banking and Fiscal Union

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Abstract

We all dream that data on an aggregate level is highly consistent with that on a micro level. That micro level data tells us exactly the reason for macro behaviour and vice versa. Today's modern data warehouse technology and decision support systems help us to make our wishes come true. We would like to be able to make better decisions. By doing that we are trying to build a highly consistent information system in order to support the better performance of risk management functions by financial institutions and to help efficient policy implementation in overcoming the greatest financial and economic crisis. Institutional development is consequently moving in the direction of creating the EMU as a banking and fiscal union. In this respect the article is examining the very turbulent ride that Slovenia has experienced.

1. The basic of Conceptual framework

My intention is not to go into detail again about the conceptual framework of the information system needed but rather to present its usefulness for taking pragmatic decisions either on the basis of the micro or the macro levels of information. However, we cannot avoid reviewing the fundamental basis of the efficient decision support system. In our opinion, this lies in the consistency between the data on the macro (aggregate) and micro (individual) levels. We should ideally stream to an optimal level. In practice, however, we are happy to settle for a suboptimal level.

From an informational point of view the conceptual framework of the information system should be seen as a big data warehouse with many data marts (building blocks – sector's data), having two basic dimensions: sectors of parties in contractual relationships and the financial instruments concerned. Other dimensions could be deployed into two directions: i) that of financial institutions' needs; i.e., knowing the customer (risk control) or serving the customer (Customer Relationship Management) in the competitive environment, or ii) that of policy needs, in particular for monetary policy, financial stability and supervision as well as for other economic policies. Since financial intermediaries are supposed to be efficient in handling information asymmetries, avoiding moral hazards and adverse selection problems,

they have to be placed in the centre of the conceptual framework. We should request or extract data from their data bases. To avoid a reporting burden and to fulfil different functions by collecting the data only once for many purposes, the policy makers have to closely cooperate with the financial industry. They either need to harmonize different methodological concepts or they have to ask for more granulized data. Furthermore, policy makers are those who have to set up basic dimensions; beside sectors and financial instruments also in some other areas, e.g.: maturity, currency, collateral, residency, etc. For each dimension a unified code list has to be discussed with reporting bodies. Some of those are standardised (e.g. Countries code list) and some are not yet harmonised (e.g. Maturity break down list). So, it would be appropriate that policy makers position the centralized data collecting and quality control function in one place, even in one organizational unit inside their respective institution. Our conceptual framework would recognize the statistical function as the most appropriate one to run this activity. The practice of the policy makers to ask for the data ultimately influences the risk control assessed by the financial institution itself. As we have already mentioned, the multidimensional space - features around the contract agreement can be further freely and systematically deployed in a competitive environment by the financial institution. But the accounting principles require that they include such dimensionality into their integrated accounting information systems. Furthermore, the fact that at least two parties have to be involved in the contractual relationship requires consistent mirror bookkeeping – a quadruple entry system (Shrestha, Mink, 2011, p. 8-9)¹. For policy purposes economic units need to be grouped into stratum – sectors of economies. Consistent micro level recording has to result in accurate sectoral relationships on the level of each national economy and among them.

Better risk control by financial intermediaries is fully in line with the broader banking union goal; not to use any more taxpayer's money to bail out banks. Using a fully consistent set of information – from micro to macro levels of the economy in the decision support system – we can expect a better allocation of funds to the real economy, economic growth and employment.

¹ "The quadruple entry accounting ensures vertical consistency (debits and credits for all transactions for an institutional unit are equal), horizontal consistency (debit entries of a transaction type for all entities are equal to the credit entries of that transaction type for all entities), and consistency in the counterparty relationship. The quadruple entry accounting provides the underlying basis for developing data on a from-whom-to-whom basis."

Slovenia started its journey towards European integration in November 2001, by the Government decision at that time, announcing the goal of joining the monetary union as soon as possible. It became a full member of the EU on 1st May 2004. Running its own monetary policy in a small, export-oriented and open economy, the Bank of Slovenia has constantly been improving and harmonising the information system for efficient decision support. A successful inflation-targeting independent monetary policy allowed Slovenia to step into the ERM2 as early as 28th June 2004 and later to be the first new Central-European EU Member State to adopt the Euro by 1st January 2007. We all know what happened very soon after.

Of course, it is not easy to build up such an information system, and especially not in a short period of time. It could be developed by systematic work in the long term. I would like to present some experiences of the Bank of Slovenia and its efforts in this respect. The information system described has been developing since late 2001. But this time we would like to be much more on the user side of the information system. Let us review the most evident occurrences when the decision support system has proved to be useful either on the macro or micro levels of the information system in the case of Slovenia in a very turbulent environment.

2. External imbalances and sustainable convergence

It is obvious from the "data warehouse" of the information system described, and in particular from the "data mart" of External sector statistics that, as a result of the financial and economic crisis and, above all, the failure to eliminate domestic macroeconomic imbalances, it became increasingly hard for Slovenia at the beginning of the crisis to obtain foreign capital. All sectors other than the government, i.e. corporates and banks, faced an inability to obtain new inflows, either via equity or debt capital. There was an outflow of private capital in the five months between January and June 2009, and in the eight months between January 2011 and May 2012. It is of particular concern that recently the relative size of the outflows has increased sharply, an indication of the ever-diminishing access to foreign capital. In the last year and a half, the government sector has also seen inflows cease, as the price of borrowing became prohibitive. For countries lacking credibility, this development can become the phenomenon known in the literature as the "sudden stop". This occurs when inflows of foreign private capital suddenly stop, meaning that the country in question must apply for official financial assistance in the form of a stabilisation programme from

international financial institutions. Since the outbreak of the financial crisis, some EU Member States inside and outside of the Euro area have also faced this situation. Given the aforementioned understanding of the free movement of capital between the members of the Euro area (EC, One Market, One Money, 1990, p. 24)², in the sense of the ability of a solvent company to borrow anywhere in the monetary union, the hitherto inconceivable balance-of-payments crisis in the Euro monetary union can be defined³ for an individual member as a situation when net outflows of private capital are sufficiently large in comparative terms and exceed the withdrawal of non-resident investors from the member's government securities, which means that there is also an impact on other domestic sectors. This is an additional factor in the decline in the supply of loans or tighter terms for customers.

The impact on other domestic sectors in Slovenia is particularly important from the point of view of the previous model of the net financing of economic growth via foreign savings. Comparative sufficiency takes account of a single (first threshold in Figure 1) or double (second threshold in Figure 1) negative standard deviation from the 24-month moving average of the net inflow of foreign private capital. If at least one of the three comparatively sufficient deviations in the net outflow of foreign private capital in a quarter exceeds double the negative standard deviation, the period denotes a sudden stop in the inflow of foreign private capital, and a balance-of-payments crisis in the EMU member in question.

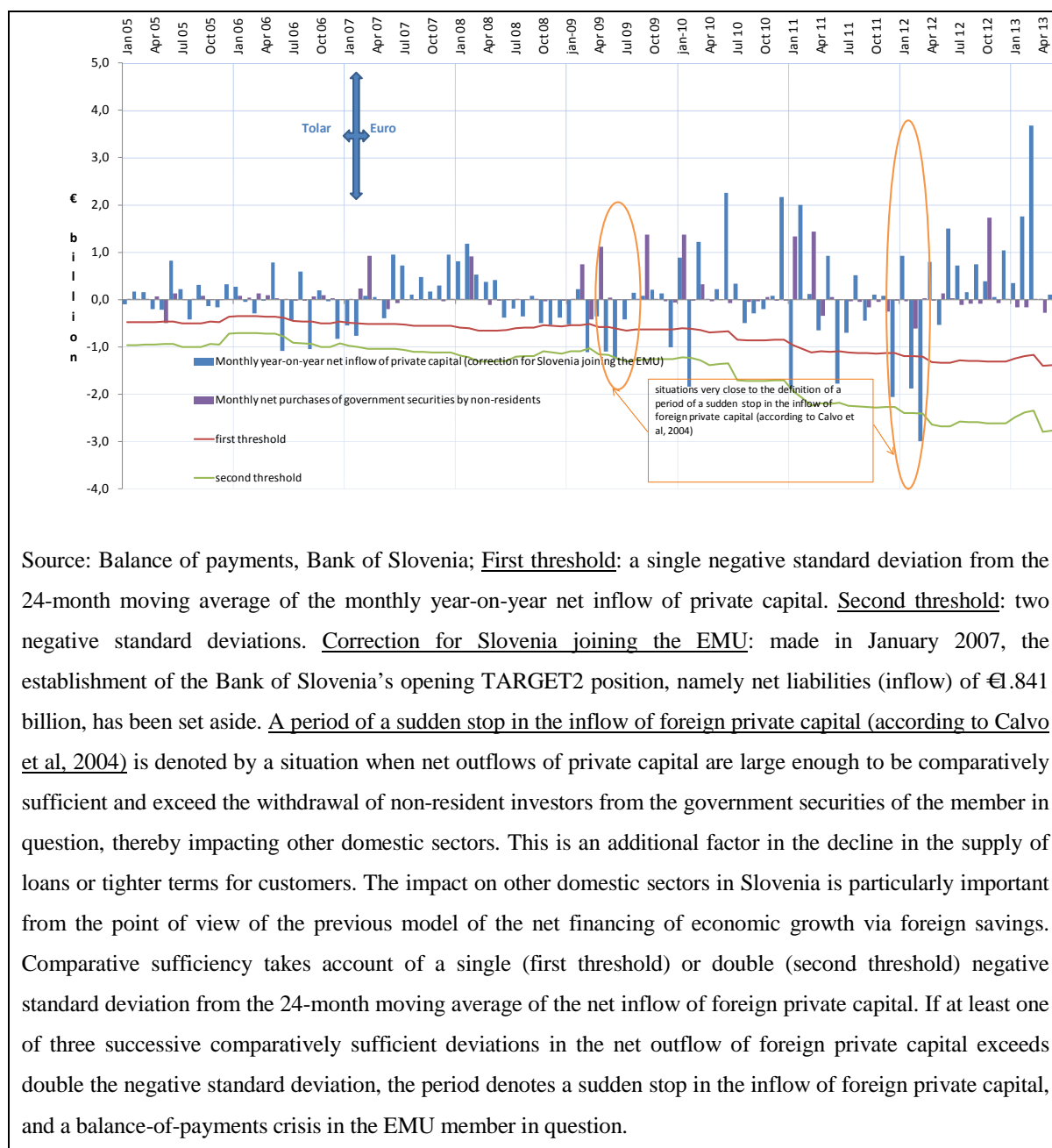
As can be seen in Figure 1, the financial and economic crisis evidently resulted in greater variability in the net inflow of foreign private capital into Slovenia. In 2009 there were four negative deviations exceeding the first threshold and two reaching the second threshold. In 2010, there were two such deviations, one of which (May 2010, the start of the ECB's programme to purchase government securities on the secondary market within the framework of non-standard monetary policy measures [the SMP for Greece]) significantly exceeded the second threshold, while in 2011 the renewed increase in the intensity of the crisis brought three deviations, and there were two more in the first quarter of 2012, in February and March, the March deviation exceeding the second threshold.

² »... a major effect of EMU is that balance-of-payments constraints will disappear... Private markets will finance all viable borrowers, and savings and investment balances will no longer be constraints at the national level.«

³ Calvo, Guillermo A., Izquierdo, A. and Mejia, L-F. (2004): "On the Empirics of Sudden Stops: the Relevance of Balance-Sheet Effects", Working Paper 10520, NBER.

It can be seen that Slovenia was most affected by the debt and financial crisis in mid-2009. It is here that the first potential period of a sudden stop in the net inflow of foreign private capital into Slovenia can be found. Economic policy at the time reacted by issuing government securities and continuing the policy of borrowing in the rest of the world. The instrument of securities issued by the government replaced the instrument of bank loans.

Figure 1: Periods of a sudden stop in the inflow of foreign private capital into Slovenia



The government deposited the excess money with the banks. Numerous economic policy measures were pitched primarily at preserving jobs, with the assumption of a gradual recovery in economic growth.

This policy was insufficient, which meant a double-dip crisis for Slovenia, even if not for all the members of the EMU. The second wave of recession gave rise to a second period of a potential stop in the inflow of foreign private capital into Slovenia, which was significantly more pronounced. The period at the end of the first quarter of 2012 was the second period of an actual stop in the net inflow of foreign private capital into Slovenia indicated in Figure 1, although it does not entirely satisfy the definition, as in April 2012 there was a slight net inflow of foreign private capital (a relatively successful treasury bill issue), but both the net outflows of foreign private capital in February and March markedly exceeded the monthly net sale of government securities by non-residents (net withdrawals of foreign holders), which means that, in terms of net financing via foreign savings, other sectors of the economy, in particular the non-financial sector (S.11), were affected. Slovenia's second "sudden stop" episode was significantly stronger than the first. Unless action is taken by means of economic policy, a third stop, and the strongest so far, is sure to follow, and it is likely to entirely satisfy the methodological definition.⁴

Since 2009 Slovenia has been saved from a final freeze in private capital from the rest of the world by two things: (i) the fact that the current account deficit stalled and did not broaden and (ii) the perception of Slovenia as a country with a relatively low ratio of public debt to GDP.

Slovenia's financial position against the rest of the world as at a specific day is illustrated by the international investment position (IIP). At the end of 2006, before Slovenia joined the Euro area, it stood at -€3.3 billion or 15.3% of GDP (in 2007). Based on transactions between 2007 and the end of the first half of 2012, there was a net inflow into Slovenia of

⁴ The base year for our analysis is 1994, a period when Slovenia was in external balance (a balanced net investment position) and the time of the Mexican debt crisis. It was said about the latter, during a situation similar to that in Slovenia in late 2012, that "it is not speed that kills, it is the sudden stop". This statement can today be applied to Slovenia, from the point of view of the net inflow of foreign private capital and the model of predominant debt financing of economic growth since 1994. In the case of Slovenia speed is illustrated by the rapid and efficient liberalisation of capital flows with the rest of the world, its integration into the EU and, not least, Slovenia being the first new Member State to join the euro after the major enlargement (on 1 January 2007). Dornbusch, R. and Werner, A. (1994). "Mexico: Stabilization, Reform and No Growth". *Brookings Papers on Economic Activity* 1: 253–316.

€4.7 billion in foreign private and official capital (Merler, Pissani-Ferry, 2012, p. 3)⁵, taking the negative investment position, or Slovenia's net financial liabilities to the rest of the world as at that day, to over €10 billion. However, financial instruments also bear risks that can be manifested as revaluations, even if we are speaking of the same financial instrument. For example, there is a huge difference in Slovenia's country risk between the asset side and the liability side. After it joined the Euro, Slovenia borrowed heavily via loans in the EU, and invested via multiple instruments (loans, direct investments, securities) in the former Yugoslav republics. This is one of the reasons for almost €2 billion in negative revaluations accruing by the first half of 2012. The figure might be even greater if some of the household sector's cash claims from tourism and labour income are treated as bad investments in the rest of the world.⁶ With other changes as a primary result of the treatment of household cash transactions, Slovenia's net international investment position at the end of the first half of 2012 stood at 45.3% of GDP in 2007 or -€15.7 billion. Slovenia had exceeded the threshold for external imbalance (more than 35% of GDP) by the end of 2008.

Empirical analysis clearly points to the urgency of changes to Slovenia's economic policy measures and the introduction of the necessary reforms. Two fluctuations that were potential stops in the net inflow of foreign capital into Slovenia (Figure 1), the second of which was significantly more pronounced, gave clear warning of a lack of confidence in Slovenia on the part of foreign financial markets and investors. The balance of payments or external imbalance is therefore of importance in the monetary union, even though it is not among the Maastricht criteria. The imbalance is itself made up of imbalances in other areas of domestic economic policy, such as a high budget deficit, wage growth in excess of productivity growth, excessive credit growth, etc., which are then passed through to other sectors, thereby reducing competitiveness, an unwillingness on the part of economic policy to tackle unavoidable structural changes by cutting industries with poor prospects (e.g. coal), and inefficiency in public services, which need to be financed by excessive social security

⁵ The accounting identity of the financing of the current account thus reads: $CA = PCI + T2 + OF + SMP$, where CA is the current account deficit (surplus), PCI is private financial flows, T2 is the TARGET2 position, OF is financing via official international financial institutions' programs and SMP is financing via purchases of bonds on the secondary market by the ECB. Pissani-Ferry, J. and Merler, S. (2012): Sudden Stop in the Euro Area, Bruegel.

⁶ Under the Bank of Slovenia's regular annual revision of the balance of payments and the international investment position, the conservative method meant that all accrued household claims in the form of currency from current account transactions (tourism, labour income) were included among other changes, and thus are not recognised as a claim in the international investment position until there is evidence of their existence (e.g. the inclusion of claims arising from the cash purchase of holiday homes in Croatia by residents of Slovenia).

contributions, which are all factors that ultimately prevent the country and its economic operators from accessing foreign capital.⁷ Under such circumstances, the country's sole remaining option is a radical change in macroeconomic and structural policies.

Our information system allows us to look at sectoral dimensions down to the micro level of data. It was not difficult for us to see that the domestic sector that suffered the most from the "sudden stop" effect were banks, and particularly state owned banks. After 10th May 2010 spreads over the state issued bonds of the peripheral countries rose significantly. State owned banks found themselves at risk of mismatches in funding and maturity. The reaction of the Economic policy in 2013 was very decided; an independent AQR and Stress test was done for the Slovenian banking sector and a huge capital injection was provided by the state. The privatization and further consolidation of those banks have been announced. The financial markets have reacted very positively and the "sudden stop" effect has been overcome. Domestic funding has been stabilised and a run on the banks has been avoided.

3. Impairment of transmission mechanism and financial instability

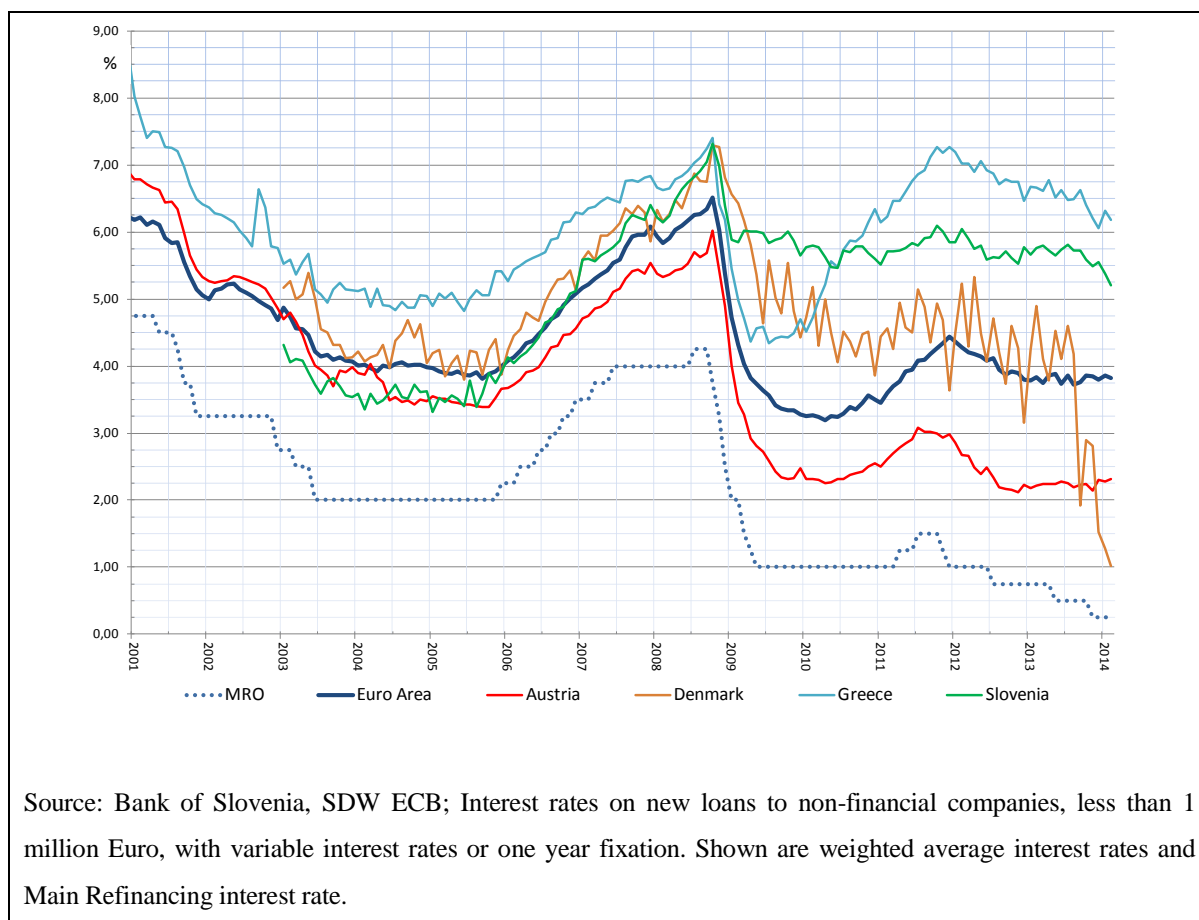
Receiving highly granular and consistent data from monetary financial institutions allows us to analyse the monetary transmission mechanism through interest rate statistics. Coming from an era of over confidence to times of under confidence, we can easily expect that a fragmentation of financial markets in crisis times would result in higher asymmetrical effects of a single monetary policy transmission mechanism. Since we have at our disposal harmonised and granular measuring of data from different EU member states, hypotheses about monetary policy interest rates effects could be tested among several countries. Simple linear regression is suitable for this purpose.

Figure 3 shows us how the dispersion of short term interest rates for loans has increased among selected countries in the Euro Area after the crisis had erupted. Denmark, as a Country in ERM2, has been much more successful than some other Euro Area Member States (e.g. Slovenia, Greece) after August 2008 by running its own monetary policy and cutting interest rates for faster recovery. It is evident that after the early first adoption of interest rates there was not much effect of the expansionary monetary policy of the ECB for

⁷ In the analysis we have ignored the problem of the symmetric adjustment of imbalances in the monetary union as a whole. It is clear that the problems of the peripheral countries would be more easily addressed if the countries with budget or balance-of-payments surpluses raised demand in the periphery.

Slovenia. We can find almost the same situation looking at either short term, medium or long term interest rates. The Slovenian non-financial sector, therefore, has not been supported in any of the period of the financial crisis by the accommodative monetary policy of the ECB. We can conclude here, that the Slovenian institutional framework does not provide the necessary conditions for an efficient transmission mechanism to be in place.

Figure 3: Short term interest rates for loans to non-financial corporations, less than 1 million Euro and Main Refinancing Operation rate of ECB - MRO (selected Countries)

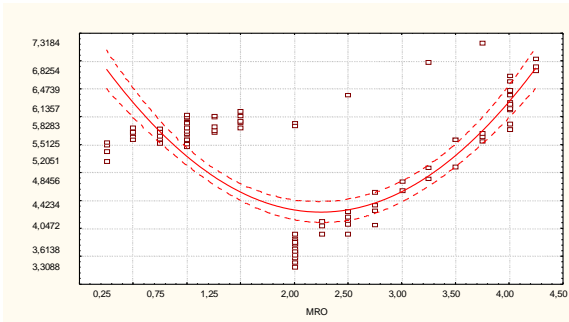


If we compare the effects of ECB key interest rate monetary policy decisions to the Slovenian and Austrian economies we find completely opposing results: unperfected functioning on one side and completely perfect transmission of effects on the other side. This is particularly expressed for short term interest rates for loans less than 1 million Euro, which SME (Small and Medium sized Enterprises) mostly depend on for financing.

In Figure 3 (a and b) we have compared the simple linear regression model for Slovenia and Austria in short term interest rates to non-financial companies in an amount of less than 1

million Euros. The regression models are applied to the changes of interest rates as a result of the changes in MRO in the period from January 1999 to February 2014 for Austria and from January 2003 to February 2014 for Slovenia. We have shown the most notable results in testing the hypothesis for the intercept in the case of Slovenia and for regression slope coefficient in the case of Austria, both at a point of time of extreme expansionary monetary policy of the ECB.

Figure 3.a: Linear regression; Slovenia – interest rates (% p.a.) for loans S.122 – S.11, to one year, less than 1 mill Euro : MRO (Jan. 2003 – Feb. 2014)



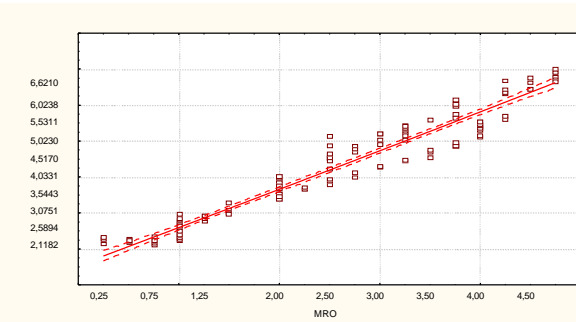
$$H_0 : a = 5$$

$$H_1 : a > 5$$

$$\alpha = 0,05$$

We reject the null hypothesis!

Figure 3.b: Linear regression; Austria – interest rates (% p.a.) for loans S.122 – S.11, to one year, less than 1 mill Euro: MRO (Jan. 1999 – Feb. 2014)



$$H_0 : b = 1$$

$$H_1 : b < 1$$

$$\alpha = 0,01$$

We accept the null hypothesis!

Source: SDW - ECB

We have found that there exists a relatively high possibility that with zero MRO rate nominal interest rates for short term loans to non-financial companies in an amount of less than 1 million Euro in Slovenia would still be higher than 5% p.a. On the other side, the continuing perfect relationship gives additional space to decrease the same interest rates in Austria. We have shown perfection and imperfection of the asymmetric effects of the single monetary policy transmission mechanism. Again, of course, the problems are in the institutional, legal and economic circumstances in the country not enjoying accommodative monetary policy actions. Therefore serious economic policy measures in a Member State are needed.

Besides, the funding risk from abroad expressed as a market fragmentation effect in the great crisis which has been recognised by consistent external statistics data, it is possible to go deeper in our information system to the level of a single bank. Domestic funding risk can also be observed as a risky business model with outliers or extremely high deposit interest rates. Consistent sets of data could provide detailed information to the supervisory body on a bank by bank basis for a certain category of interest rate.

Figure 4: Frequency distribution of MFI Deposit interest rates (3 month to 1 year maturity) for Households

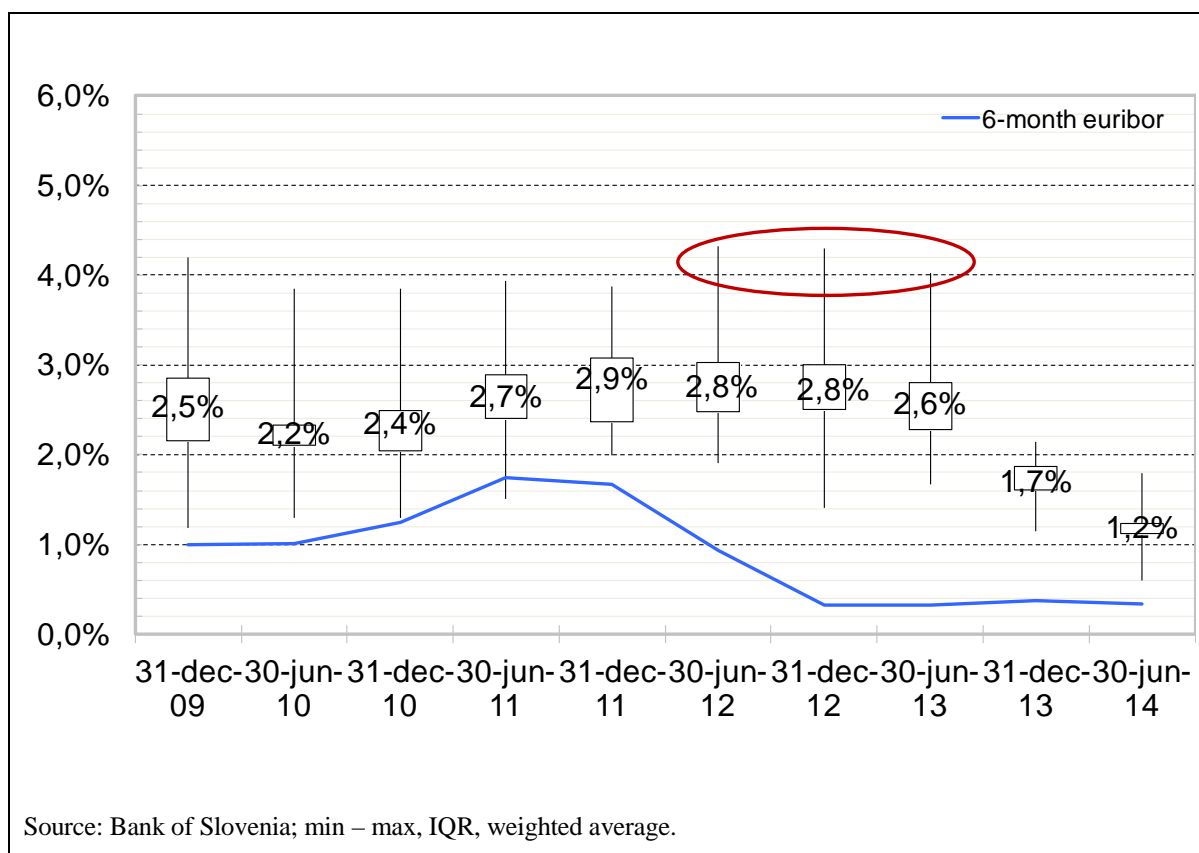
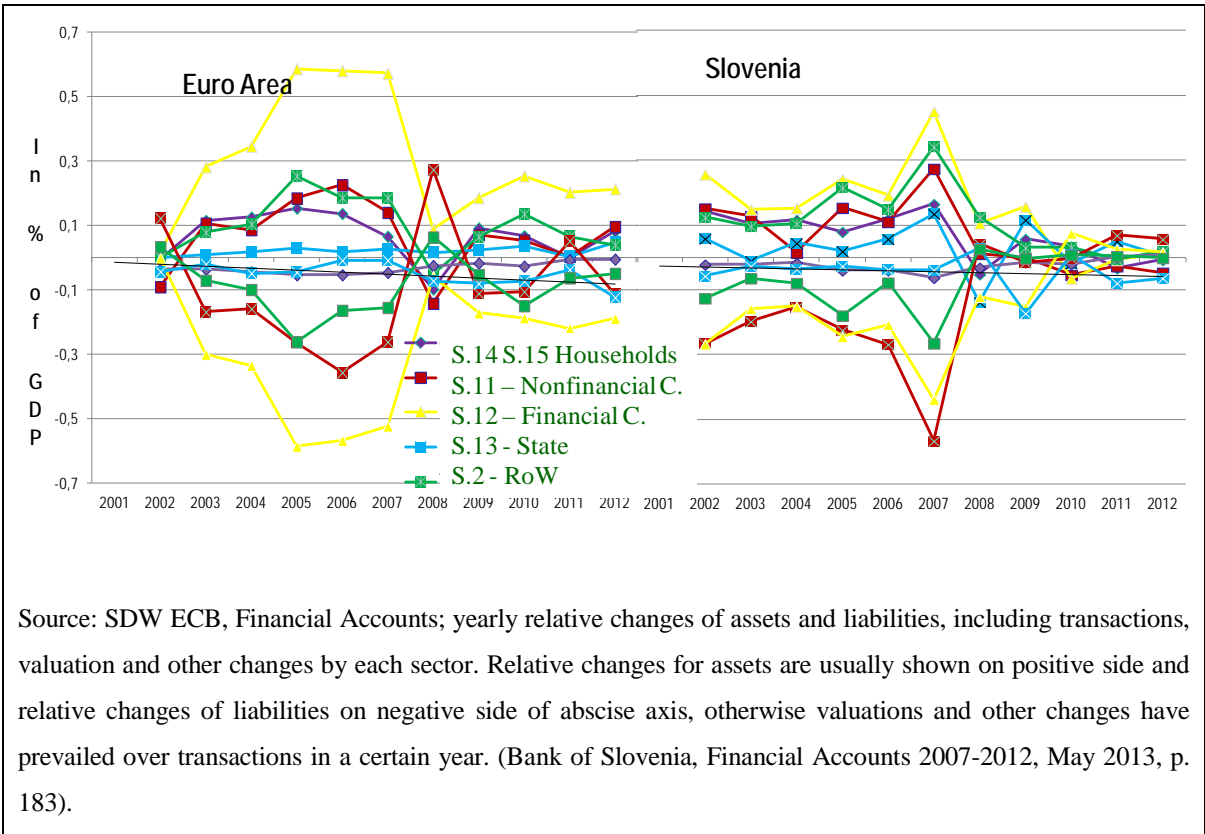


Figure 4 shows us how, after the provision of funding by ECB or implementation of non – standard monetary policy measure, the so called VLTRO (Very Long Term Refinancing Operation) at the end of 2011 and the beginning of 2012, deposit interest rates of Slovenian MFIs remained high and outliers have even broadened and maximums have risen. Consistent micro level data indicated two domestic banks (red circle in Figure 4) were funding and attracting deposits of different sectors at extremely high deposit rates. Their business models were viable in the pre-crisis time of extreme economic growth but not after that.

Policy reaction has been strong by establishing a "bad bank" (Bank Asset Management Company) and taking some very serious supervisory measures (liquidation procedures) over banks with risk behaviour and unsustainable business models (non – viability). The result, by the end of 2013, was a significant drop in average deposit interest rates, providing to the viable banks an additional margin for recovery. Interest rates on loans are slowly following deposit interest rates which call for further consolidation efforts towards the competitive banking system where monetary policy decisions can be effective.

External Data mart and Monetary financial institution data mart from our information system provides us all the detailed information, but for the economic policy decision support they have to be incorporated into a sectoral relationship. Transmission mechanism and financial stability concerns should be analysed in the much broader context of sectoral – accounts.

Figure 5: Gross financial position of sectors before and after the crisis – Euro Area: Slovenia



Source: SDW ECB, Financial Accounts; yearly relative changes of assets and liabilities, including transactions, valuation and other changes by each sector. Relative changes for assets are usually shown on positive side and relative changes of liabilities on negative side of abscise axis, otherwise valuations and other changes have prevailed over transactions in a certain year. (Bank of Slovenia, Financial Accounts 2007-2012, May 2013, p. 183).

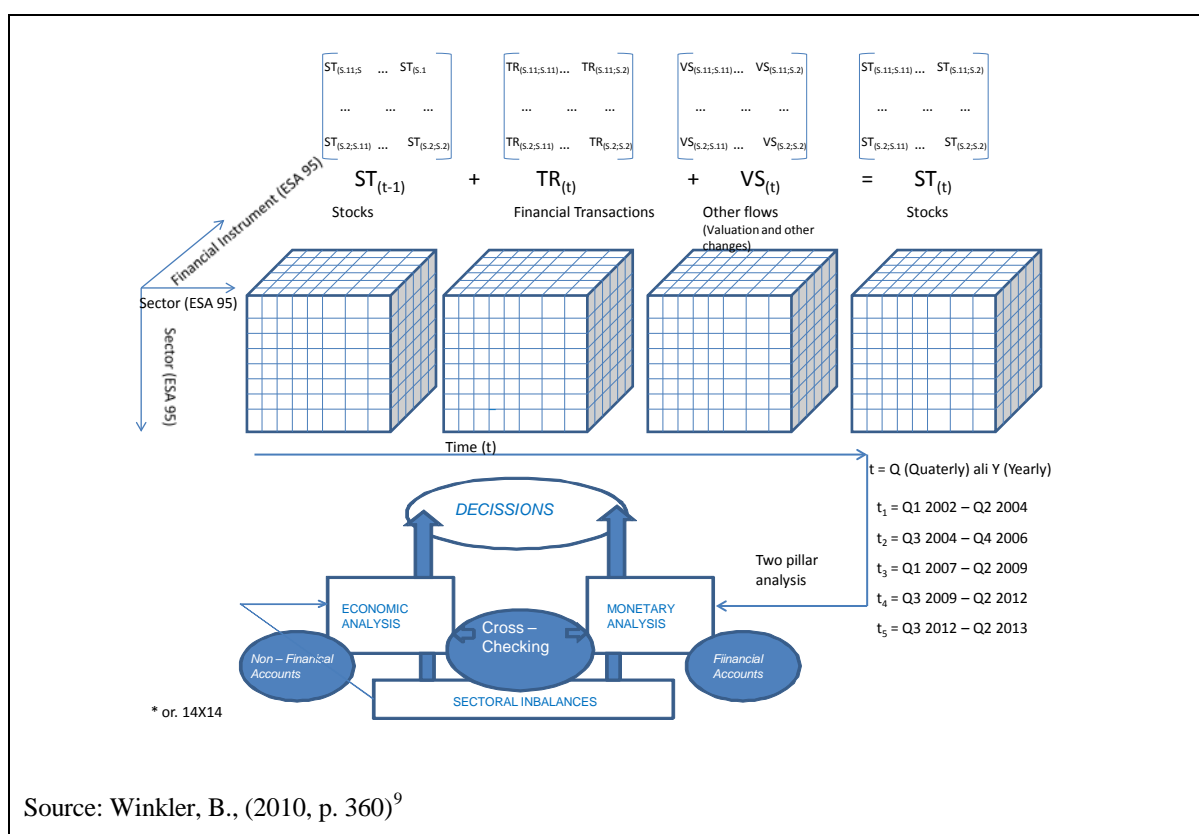
From Figure 5 we can observe that the financial sector of the Euro Area is responsible on the whole for the crisis (Tichy, 2013, p.110)⁸. But for Slovenia, the non-financial sector was

⁸ Tichy, G. (2013). What Can Sector Accounts Tell About the Financial Crisis? Intereconomics, 2, p. 106 – 115.

even more heavily in debt in the two years before the crisis emerged. With the lack of capital market development, both the credit and the balance sheet channel of the transmission mechanism in Slovenia have been seriously impaired. How serious is this problem? Does it matter for financial stability?

Tremendous recent statistical development and work incorporated in comprehensive richness of financial accounts statistics allows us to explore them better. Staying at the very aggregate level of financial account matrix we were applying some stochastic methods - namely the Markov chain approach.

Figure 6: Using matrix algebra in analysing monetary policy transmission mechanism and financial stability via consistent set of Financial Accounts of Slovenia



Also, by using matrix algebra, we proved the very serious impairment of the transmission mechanism for Slovenia. There is a split in the Markov chain between the financial and non-financial sectors, which is significant as we are studying a highly banking-focused financial economy. This is a particularly important aspect in the light of banking union efforts to

⁹ Cross-Checking and the Flow of Funds. Papademos, L. D., Stark, J., (ed.). Enhancing Monetary Analysis (p. 355 – 380). Frankfurt am Main, European Central Bank.

stream for efficient financial intermediation or allocation of access funds to the real economy for economic growth and employment. We deployed transition matrix from the 8x8 sector financial accounts matrix. The Matrix is therefore quadratic. Each sector is treated as a state. Positive flows indicate claims from sector in the row to sector in the column of the matrix, e.g. from banks to companies (S.122→S.11). The probability is a simple share of each flow in the total sum of the row. The total row probability has to be one. We can of course deepen the sector and get to a matrix of higher level, but we can also deepen the instrument. For the monetary analysis pillar we can add up some instruments into M1, M3 etc.

Figure 7: Characteristic of states in the Markov Chain probability distribution for 8x8 sectors of Slovenian economy flows on the level of transferable deposits F.22

	S11	S121	S122	S123+24	S125	S13	S14+15	S2
2002	R	R	R	R	T	R	T	R
2003	R	R	R	R	T	R	T	R
2004	R	R	R	T	T	R	R	R
2005	T	T	R	R	R	T	T	R
2006	R	R	R	R	T	R	T	R
2007	T	T	R	T	T	R	R	T
2008	A	T	T	T	T	T	T	T
2009	A	R	R	R	T	T	T	R
2010	A	T	T	T	T	T	T	T
2011	A	R	R	R	T	T	T	R
2012	T	R	R	R	T	R	T	T
2013	A	R	R	T	T	R	T	R

Source: Aggregated tables of Financial Accounts for Slovenia, Bank of Slovenia. ESA 95 – F.22 – including on net claims for transferable deposits. Net claim S.122 →S.11 represent the lack of liquidity for non-financial sector (S.11) and vice versa. **A** – Absorbing state, **R** – Recurrent state, **T** – Transient state. In years with states characteristic as **A** or **R**, the Markov chain is closed, non-broken with non-period in transition. In years whereas also **T** states are presented, the Markov chain is closed and broken with non-period in transition. In both cases steady state probability distribution exists.

The more we go into the detail of the dimension of a financial instrument, e.g. on the level of a single financial instrument, such as F.22 – transferable deposit, and tracing positive flow as proposed by Copeland (1947, p. 41)¹⁰ or Cohen (1972)¹¹, the more we can expect to find the split of the Markov chain. If not, and this concerns financial intermediation providing

¹⁰ "Debits to individual accounts have often been taken as an approximate measure of the debit total of the money circuit".

¹¹ Copeland's Moneyflows After Twenty-five years: A Survey. Journal of Economic Literature, 10(1), p. 1-25.

excessive funds to real sectors (S.122→S.11, S.14+S.15), the better the transmission mechanism performs.

Going deeper into some dimensions of our information system the total break of the Markov chain on the level of Loans or Transferable deposits reveals the pattern for financial instability. Such is the total break of the Markov chain shown in Figure 7 for the years of 2008 and 2010 for the Slovenian economy. It is an illustrative example of double-dip recession. The unique approach to the analysis of the transmission mechanism via financial sectoral accounts is possible since we have proved that the steady state probability distribution for the matrix of financial sectoral accounts usually exists. Not only the very low steady state probability distribution for example for claims of S.11 to S.122 for transferable deposits (higher liquidity) but also the characteristic of the state itself – S.11 indicated as A – Absorbing state almost in all periods of crisis call our attention to the fact that the transmission mechanism of monetary policy is highly impaired. The absorbing characteristic of the non-financial sector means that it mainly depends on its own intra-sectoral financing. The transient characteristics of all other sectors in the years at the bottom of a double dip crisis represent the very low level of connectedness between the financial and real sectors of the economy. The financial instability is very high and the transmission mechanism is highly impaired (Figure 7 – red characters).

At the time of the second sudden stop episode for Slovenia, at the end of the first quarter of 2012, economic policy reaction was that alongside the financial sector the non-financial sector also has to deleverage and restructure.

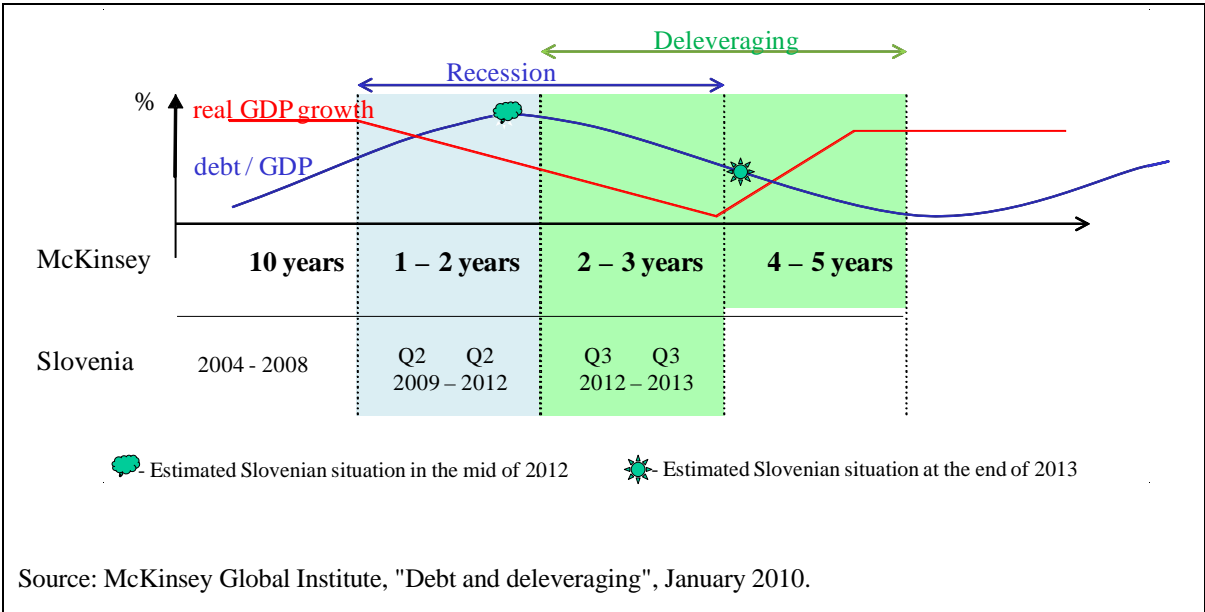
4. Phasing out strategy of Economic policy and some further necessary deployment of information system

The economic policy decisions which were taken have to be put into the broader context of sectoral accounts, financial and non – financial. Deleveraging and the economic growth of the economy have to be observed close together. History has recognised the most common successful scenario for a phasing-out episode (Roxburg et. al, 2012, p. 15)¹² in which the sectoral sequence of deleveraging plays an important role.

¹² "In our research into historic episodes of deleveraging, we see that countries often progress through two distinct, yet overlapping, phases of private – and public – sector deleveraging. Today's deleveraging economies face what seems to be a uniquely difficult situation: a weak global economy, banking troubles across many major economies, and little room for fiscal manoeuvring. Yet, they share many of the same

It is obvious that the deleveraging process is easy to be implemented in a time of economic growth. In recession times, we usually expect the State sector would help other sectors of the economy. We have seen that the fiscal position of Slovenia in pre-crisis times was stable enough in this respect. The deleveraging of the private sector has therefore begun sharply from the second half of 2012 by the financial sector at a level of 30 % of GDP (recapitalization by state of around 10 % of GDP), followed by the non-financial sector deleveraging in 2013 by 5 % of GDP. In the last three years we have observed a current account surplus in Slovenia of an average of more than 6% of GDP. This gives more opportunity for further deleveraging or recapitalization in particular for the non-financial sector and improving external imbalances as the most basic imbalance. The Slovenian economy came out of formal recession by recording a positive growth in the last quarter of 2013, but investments in the private sector, as a real first sign of recovery, are still negative.

Figure 8: Debt and Deleveraging, 100 years crisis experiences and Slovenia



The indebtedness and restructuring problem in the Slovenian economy is concentrated very much in some pre crisis over-confidence activities (construction, MBO, holdings, shadow banking – leasing) and could be sold. Two thirds of the economy is performing well and has

challenges that faced deleveraging nations in the past. The way debt reduction played out in Sweden and Finland in the 1990s provides a useful frame of reference... we see that both economies went through a distinct, initial phase of deleveraging in the private sector, leading to a second phase of growth and public-sector deleveraging." (Roxburg, C., Lund, S., Daruvala, T., J., Dobbs, R., Manyika, J., Forn, R., Croxson, K., 2012). Debt and Deleveraging, Uneven progress on the path to growth: updated research. Brussels: McKinsey Global Institute.

contributed much to the last three years' significant current account surplus. But the Slovenian economy is small and open and is also a highly interconnected economy, from the business as well as from the ownership perspective.

To efficiently manage the credit risks by banks and to supervise those risks by the ECB and NCBs we need to base the credit register not only on the client (customer – sector) level but on the loan (instrument) level. By overall (financial, business, ownership) restructuring of large indebted non-financial companies in the highly interconnected economy usually SMEs as their suppliers are additionally suffering in terms of liquidity (Rotemberg, 2009, p. 2)¹³. The credit register should be on a micro level connected to ICAS – Internal Credit Assessment System of each NCB as a part of ECAF for proper management of the Collateral Framework. By such infrastructure it is assumed that the creation of an appropriate non-standard monetary policy instrument would be much more efficient and applicable to different (asymmetric) countries' infrastructures in a single monetary area. We believe AnaCredit project of the ECB is being developed in these directions.

Conclusions

The great financial and economic crisis has severely damaged the Slovenian economy. There had been an overheating of the economy before the crisis which erupted in the autumn of 2008 followed by the second biggest drop of GDP growth in the EU. In seven years of double-dip recession, the fundamental problems of the Slovenian economy emerged. We investigated the period from early 2002, when the very fast Slovenian European integration journey started, until the end of 2013. A two-pillar approach to monetary analysis is used for the Slovenian economy, similar to the one of the ECB. We apply it to the developing concept of the decision support information system on a national level.

The Slovenian economic policy had allowed a serious external imbalance or over-indebtedness in the pre-crisis period from 2004 to 2008. For the time of crisis the "Sudden Stop" method was applied for Slovenia. For the most part, monetary analysis was applied by using consistent sets of available financial accounts statistics. The pre-crisis period of independent Slovenian monetary policy could be divided into two periods; the one before the

¹³ " ... more interconnected financial systems require more liquidity (from exogenous sources) to settle a given volume of debt." (Rotemberg, 2009). Liquidity Needs in Economies with Interconnected Financial Obligations. CQER Working Paper no.1. Atlanta: Federal Reserve Bank of Atlanta.

inclusion of the Slovenian Tolar into ERM 2, and the second one after the inclusion. Monetary policy is very efficient in the first period, but in the second period in the pre-crisis time, independent activity was limited and the ECB monetary policy already showed pronounced restrictive tendencies.

Overall consistency of the proposed and developed integrated information system made it possible for us to prove the asymmetric effects of the ECB monetary policy transmission mechanism on the economies of Member States. We have analysed the monetary transmission mechanism for the Slovenian economy further by applying stochastic processes into the matrix of financial sector accounts. Consistent macro-micro accounting and statistical information systems allow us to go deeper into some dimensions, in particular for the sector, the financial instrument and time. We deployed the Markov chain for the matrix of sectoral financial accounts. In addition, by using this method all the risk determinates in the sectoral imbalances analysis were proved. We believe this is extremely important for financial stability. The method applied could be a contribution to greater efficiency in the exploitation of the richness of financial and sectoral accounts statistics in their support to monetary policy and financial stability.

In the last chapter we further support the development of a complex statistical information system by a proposed credit register, fully consistent and incorporated into the monetary and supervisory function. The concept of the developed and proposed information system offers to and requests from financial institutions better control over information asymmetries or risks taken. Our opinion is that the main parts of the concept proposed are built into the architecture of the coming Single Supervisory Mechanism.

We strongly suggest the building of a similar statistical information system for decision support on the national level for each Member State. By reaching sustainable convergence (Draghi, 2013)¹⁴, a national dimension could be replaced by a regional one to support fiscal

¹⁴ 38. "Sustainable convergence means more than meeting a set of nominal targets at a certain point in time. It requires real economic, legal and institutional convergence prior to adopting the euro. And crucially, it requires continued efforts once inside monetary union." Keynote Speech by Mario Draghi, President of the ECB - Euro Conference – Latvia, Riga, 12 September 2013.
http://www.ecb.europa.eu/press/key/date/2013/html/sp130912_1.en.html

union in a further efficient allocation of funds by the common EU economic policy to primarily support investment and cooperation at the level of SME¹⁵.

Dealing with the consequences of the crisis, the common EU economic policy should be based more on a pragmatic basis (Caballero, 2010)¹⁶, such as on the decision support system presented, as well as on the differentiating approaches towards specific situations of the Member States.

¹⁵ EU COHESION POLICY 2014-2020, Targeting Investments on Key Growth Priorities:
http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/fiche_sme_en.pdf

¹⁶ Caballero R., J., (2010). Macroeconomics after the Crisis: Time to Deal with Pretense-of-Knowledge Syndrome. *Journal of Economic Perspectives*, 24 (4), p. 85-102.