EUROZONE AND ITS NEIGHBORS: THE THIRD YEAR OF CRISIS

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Introduction

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The financial and economic crisis in Europe entered its third year. What was initially considered a (possibly short) recession reflecting the financial shock in the US metastasized into a protracted crisis. After the "Greek Shock" of the Fall 2009, the dynamics became entirely European. Its impact on the Eurozone and its neighbors poses a key challenge for both the European and national institutions. Some even stress that not only the common currency euro but even the existence of the EU itself may be in doubt.

The contributions in this volume explore the processes via which the economic and financial crisis manifests itself in the variety of international and national environments. Both the situations in the Eurozone itself and in the several "new member states" are examined.

The book is divided into three parts and the Epilogue. The first part discusses the Eurozone problems and hints at the possible solutions.

In the first chapter, Antonin Rusek from the Susquehanna University in Selinsgrove, Pennsylvania, points out that the European crisis arrived at the crossroad. The preservation of the Eurozone in its current shape and scale implies economic changes which are increasingly resented by nations on the Mediterranean littoral – those most affected by the crisis. Alternative policies of monetary and fiscal expansion threaten the EU members north of Alps by both the devastating inflation and, given their demographics, the social justice and wellbeing. However, the restructuring of the Eurozone implies short to medium term undesirable consequences. The author suggests that the introduction of the parallel currency alongside the euro in the most affected counties may be a solution which preserves the current scope and scale of the Eurozone, mitigates the impact of "southern" adjustments and reduces the Eurozone-wide impact of needed financial restructuring.

The second chapter is authored by Luboš Smrčka of the University of Economics in Prague, The Czech Republic. He aims to assess the possibility that the cumulative effects of risk factors may lead to a "stagflation", i.e. the combination of a relatively high inflation and a recession,

which will, in effect, results in unemployment rates that may exceed, even substantially, the natural rate of unemployment.

Dimitri Blueschke and Reinhardt Neck of the University of Klagenfurt in Austria discuss the monetary and fiscal policies using the dynamic game model of the EMU in Chapter 3. In their approach, the union considered is asymmetric, consisting of a "core" with lower initial public debt, and a "periphery" with higher initial public debt. The "periphery" may experience a debt relief ("haircut") due to an evolving high sovereign debt dynamics. Calibrating the model to the Euro Area, authors calculate numerical solutions of the dynamic game between the governments and the central bank using the OPTGAME algorithm. They show that a "haircut" as modeled in their chapter is disadvantageous for both the "core" and the "periphery" of the monetary union. Moreover, the cooperative solution is preferable to the noncooperative equilibrium (both without and with a "haircut"), providing an argument for the coordinated fiscal policies in a monetary union.

The first part concludes with Chapter 4, where Petr Koráb and Klára Burešová of the Mendel University in Brno, Czech Republic, provide an alternative view at the parallel currency idea. They argue that the Theory of Optimum Currency Areas (OCA) is the theoretical foundation of the monetary integration in European Union. But the current Eurozone problems pose questions which are not sufficiently answered within the OCA framework. A significant one is a possible introduction of a parallel currency while keeping the euro for specific purposes for a limited period of time. As the key contribution of this chapter they provide a basic concept which, when properly developed, could lead to establishing a parallel currency market in several Eurozone states. An arrangement is suggested where the euro and a parallel currency both have its own purpose. Common currency should be used mainly in public sector in non-cash form while a new parallel currency in private sector in the form of "no-name" certificates. Main purpose of an introduction of the parallel currency is to boost economic growth and increase the competitiveness through its devaluation. Benefits and costs of establishing a parallel currency market in the Eurozone member state are also outlined.

The second part of the book analyzes the impact of the European financial and economic crisis on the non-Eurozone EU members.

Adam Koronowski from the Collegium Mazovia in Siedlce, Poland, compares the impact of the crisis and the policy responses in Estonia and Hungary in Chapter 5. His aim is to assess the results of the economic

policies and to formulate interpretations and conclusions with regard to different policy outcomes. Such a comparison is justified, by the similarity of the economies of both countries – they are small open economies highly integrated within the European Union. On the other hand, the comparison brings about interesting observations and conclusions due to major differences in economic policies of Estonia and Hungary. Firstly, while Estonia maintained a currency board system, Hungary adopted a wide exchange rate band/floating exchange rate regime during the period analyzed. In fact, while Estonian Kroon remained perfectly stable, the Hungarian forint was highly volatile. This difference also crucially determined the scope for monetary policy – only Hungary could use an active interest rate policy which it applied both to stabilize the economy and the exchange rate. Secondly, both countries executed different fiscal policies. Estonia had a surplus in its public finances before the crisis and it allowed for some minor deficits when economic downturn came. Conversely, Hungary had had high budget deficits and it only chose to improve its fiscal stance shortly before the crisis and it attempted to further limit fiscal imbalances during the crisis.

In Chapter 6, Alfred Sitz of the Vienna University of Economics and Business analyzes the impact of the European financial and economic crisis on Poland and Baltic countries. He points out that neighboring countries in the Eastern part of EU with similar per-capita income experienced very divergent outcomes when the international financial crisis hit. Whereas Poland still grew slightly in 2009, the three Baltic countries experienced economic downturns between fourteen and eighteen percent of GDP. Alternative exchange rate regimes, divergent measures of economic policy actually available as well as used, and very different levels of international indebtedness and large differences in the share of loans in foreign currency represent the main reasons for these different developments.

Pavla Vodová from the Silesian University in Opava, Czech Republic looks at the liquidity ratios of banks in Slovakia in Chapter 7. Her analysis aims to evaluate the liquidity positions of Slovak commercial banks via different liquidity ratios in the period of 2001–2010 and to find out whether the strategy for liquidity management differs by the size of the bank. Due to increase in the lending activity, Slovak banks have become less liquid. However, the level of liquidity fluctuated only slightly during the period 2001–2008. Financial crisis has a very negative impact on bank liquidity in 2009 and 2010. Author finds that while

ensuring the liquidity, big banks rely on the interbank market and small and medium sized banks hold a buffer of liquid assets.

In Chapter 8, Irena Szarowská from the Silesian University in Opava, Czech Republic looks at the relationship between the economic performance and the government expenditures in the Czech Republic. Writer provides the direct empirical evidence on the business cycle relationship between the economic performance and the government expenditure in the Czech Republic over the period 1995–2010 and examines main public expenditure variables (total government expenditure, current government expenditure, non-investment transfers to population, capital government expenditure). The analysis uses annual data from the Ministry of Finance of the Czech Republic. All time series are converted into constant prices and cyclically adjusted.

The third part provides some views on the miscellaneous topics as they relate to the European crisis, but transcend the national boundaries.

In Chapter 9, Barbara Wieliczko from the Institute for Agricultural and Food Economics in Warsaw, Poland, looks at the degree of homogeneity in the EU's Common Agricultural Policy (CAP). She argues that the wide differences in CAP design and implementation result in no actual single market based on the equal conditions for competition. As it is much easier for other sectors of the economy not relying so strongly on weather conditions and environmental endowment to apply common tax system, it is highly probable that the agriculture is not going to be a pioneer in the implementation of a common fiscal policy. However, the common Farm Accounting Data Network should become the basis for analytical works on projects of implementation of common agricultural income tax. Moreover a closer insight into the actual financial situation of the EU agriculture could verify the efficiency and efficacy of the policy instruments in use and the scale of the support really needed. As the CAP is a common EU policy it could also serve as the experimental field for a common fiscal policy. The implementation of common support instruments could facilitate the project of introducing a common tax system.

Jan Vavřina and Jitka Janová from the Mendel University in Brno, Czech Republic discuss the validity of the corporate bankruptcy prediction models in the Czech agriculture in Chapter 10. Their approach is based on Gurčík's G-index which employs economic indicators' discriminate analysis specifically for randomly chosen agricultural enterprises. As the reaction to current trends in the identification of the corporate financial

distress analysis the introductory discussion of Data Envelopment Analysis (DEA) application to a bankruptcy prediction is provided together with the comparison to other popular techniques used so far. The emphasis is placed on the data processing and evaluation of agricultural enterprises. Since – related to agricultural enterprises – DEA has been used only for efficiency evaluation so far, this contribution aims to set up the research on DEA applicability in the agribusiness financial distress prediction.

In Chapter 11, Tomáš Otáhal of the Mendel University of Brno, Czech Republic and Václav Rybáček of the University of Economics in Prague, Czech Republic ask whether tight and centralized financial regulations can prevent financial crises. They explore the historical parallels between the governmental responses to the financial crises at the end of the 19th and the beginning of the 20th century in the USA and the recent response of the European Union. Employing the rent-seeking model with endogenous rent derived from the historical narrative they predict that tight and centralized financial regulations might increase the risk of the inflationary monetary policy.

Finally, in the last chapter, Petr Wawrosz from the University of Finance in Administration in Prague, Czech Republic, discusses the relationship between the "new consensus" in macroeconomics and inflation targeting. His goal is to analyze the problems of the "new consensus macroeconomics" (NCM) and inflation targeting with respect to the world economic crisis. The NCM model for the open economy is introduced and the issues of monetary and fiscal policy in this model are examined. The special attention given to the countries with a small open economy, the effectiveness of the given policies and the question as to what extent was the reaction to the crisis of the European countries consistent with the NCM type of models.

In the Epilogue Lubor Lacina summarizes the steps attempting to solve the European financial and economic crisis up to date and discusses the possible scenarios for the future.

But, indeed, future is always unpredictable and the law of unintended consequences applies here more than anywhere else.

Acknowledgements

I

The Eurozone:

Problems and Some Possible Solutions

1 Eurozone Crisis and Its Solutions: Some Thoughts About Parallel Currency Regime

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1.1 Introduction

Current conventional thinking in Europe argues that there are only two solutions to the Eurozone crisis – a debt monetization, or an Eurobond. The first is illegal under the European law, the second is now illegal under the German constitutional law. Moreover, an increased body of thought inquires about the possibility of the Eurozone's restructuring – effectively implying that some countries leave the common currency entirely.

All these "solutions" face seemingly unsurmountable obstacles. A monetization of debts threatens the Northern Eurozone countries with what they would consider an inflationary Armageddon. Eurobond (or any form of the "joint and common" responsibility for the Eurozone's countries debt) is unacceptable to the northern countries taxpayers, well aware about their growing contingent liabilities for their own future pensions and healthcare. And, indeed, it is argued that if a country would leave the euro entirely, the resulting shock to the integrated Eurozone's financial system would have a significant and protracted negative effect on all European economies.

One possibility, however, is seldom mentioned – that is, the possible introduction of a second currency in the most affected countries, to be used domestically alongside with the existing euro (hence the term "parallel" or sometimes "dual" currency regime).

An introduction of the "dual" currency would facilitate a restoration of competitiveness (as defined in the euro denominated costs – i.e. the internal devaluation) while simultaneously mitigating the devastating impact of current "austerity" arrangements on employment, standards

of living and the political stability. Moreover, it could mitigate fiscal stresses by generating some inflation tax revenue.

Indeed, for this to work a managed bankruptcy (i.e. the debt restructuring) in at least some of the countries introducing the dual currency regime might be necessary, reducing the present value of the euro denominated liabilities to a serviceable level. That would undoubtedly affect the creditors (Northern financial institution) but to a lesser and more manageable degree (if done properly, in a cooperative manner) compared to the case of the country outright leaving the Euro.

Existing discussions and ideas with respect to parallel and dual currency regimes are reviewed in Section 1.2. Section 1.3 then constitutes the analysis of the parallel currency idea as it may apply to current Eurozone circumstances. Section 1.4 concludes.

1.2 Parallel Currency in History and the Economic Thought

Parallel currency regime can be defined in general as the situation where two or more currencies (or currency proxies), including monetary metals, circulate simultaneously and fulfill one or more money functions in a single legal jurisdiction (a state or a group of states).

Parallel currency regimes in the form of bimetallism (or multimetallism, as was more often the case) dominated the world markets and economies for the most of human history, effectively till the last third of the 19th century. Several metals (and their combinations) were simultaneously used for coinage and as a medium of exchange, store of value and often the standards of deferred payments (or letters of credit for the long distance trade as the case might be). The gold and silver dominated in this regime, with copper coinage extensively used for local transactions and other needs.

The causes for these "parallel currencies" regimes varied by countries and regions. But in general a (hypothetical) "monometall" regime would fail to provide a desired quantity of payments specie (i.e. the liquidity), both for long distance exchanges (where both the gold and silver were used) and local markets (where the copper coinage dominated). Problems in this system stemmed from the changing relative market values of the underlying monetary metals. But the lack of viable alternatives maintained these regimes till the onset of the modern economy and often

beyond. For the more detailed and penetrating discussion the interested reader should consult, for example, Davies (2003), or Redish (2006).

The developments in techniques of government, accounting, banking and credit management, together with a seemingly steady growth in the gold supply and advancements in printing technologies resulted in the basically worldwide adoption of the monometallic, "gold" standard monetary regime in the last third of 19th century. The important, even if often overlooked characteristic of this regime is a widespread and expanding use of paper banknotes and transferable bank balances in lieu of a direct use of the monetary metal (gold) for all monetary functions. However, in a gold standard regime these banknotes are redeemable for the gold in predetermined ratios – which limits their issuance and (supposedly) ensures the monetary stability. Banknotes here are simply more efficient and convenient to use compared to gold coins and bars.

Gold standard, by tying the money supply to the supply of gold proved to be too restrictive in the age of the full employment and the growth oriented economic policies, especially when those policies were coupled with the efforts to engineer the social and income redistribution reforms. Hence, it was eventually abandoned in favor of single fiat currency regimes on the nation state basis. The disappearance of any outside constraints on the money creation proved to be too tempting for some governments, who found in a rapid monetary expansion an easy answer to the contradictions and problems of domestic economic and social policies. The results were protracted inflationary waves (especially in South America, but in Israel, Turkey and some other countries as well) in 1970s, 1980s and 1990s. In this environment the fiat paper currency in the affected countries rapidly became rather undesirable, especially in its functions as the store of value and the standard of deferred payments.

As a response, the population in affected countries resolved (gradually) to the use of foreign currencies as price standards, stores of values and the standard of deferred payments, even if the domestic currency (to a degree) preserved its role as means of exchange, but often using the "grey" or black markets exchange rates. What developed was a "dual" or "parallel" currency regime (albeit often of a doubtful formal legality), known as the "dollarization" – i.e. the US dollar being used simultaneously with the domestic currency in several monetary functions in a single country. The thorough survey of this process together with a penetrating theoretical analysis can be found in Agenor (1992).

The advent of globalization, which, among other things, forced domestic political, economic and monetary reforms, halted the dollarization "experiments", even if in many countries the phenomenon itself was never really reversed.

Besides those major episodes of parallel currency regimes in the world economic history, one may mention some more limited, local episodes. Most known is probably the so called Woergl Experiment. The Tyrolean town of Woergl issued local "labor certificates" which were used to pay local laborers wages and could be exchanged for local goods in local stores. The experiment lasted in 1932 and 1933 and is credited with a successful mitigation of a catastrophic impact of the great depression on the town of Woergl and its vicinity. (For details, see Litaer, 2002.) It is interesting to point out that the "Woergl Experiment" addressed the shortage of liquidity in the local economy in the gold standard regime. Experiment was concluded when the gold standard in Austria was abandoned and the liquidity in the "official" paper currency was restored. Several similar experiments in a recent Greece experience are described in Sotiropoulou (2010).

On the pure theory side, the feasibility of a parallel currency regime was investigated by Camera, Craig and Waller (2003). Being purely theoretical, their model is only a highly stylized reflection of a very simple economy. Nevertheless, they show the existence of a stable equilibrium where two distinct currencies will be used simultaneously and their exchange rate will be market determined.

In the context of a current Eurozone problems the discussion of the possible parallel currency regime solution(s) is (somewhat surprisingly) rather meager. A parallel currency regime as the solution to the Eurozone's problems was suggested by Goodhart and Tsomocos (2010), and Butler (2011). The legal aspects of the problem were discussed by Thieffry (2011). Some of the ideas expressed by those authors will be discussed in the next part. However, at the time of this writing (October 2011), the author is not aware of any published academic or policy study addressing the possibility of a parallel currency regime as the possible answer to Eurozone's problems.

1.3 Eurozone's Problem – Could Parallel Currency Regime Help?

To answer the question in the subtitle above, it is necessary to specify what is the nature of the "Eurozone Problem". For many this answer is simple enough – the unsustainable fiscal stands of some Eurozone member countries, which resulted in the so called European sovereign debt crisis. This situation is supposedly the consequence of the fiscal autonomy of individual member states. This fiscal autonomy prevents a centralized "European" fiscal solutions. The answer to the question in the subtitle is then the Eurozone fiscal centralization – so called Economic Government for Europe, which would enforce fiscal policy rules continent-wide. Parallel currency regime is obviously irrelevant here.

However, this answer is simplistic, reflecting more desires of elites for more "paneuropeanism" than the reality of the European political social and economic landscape. After all, both EU and especially the Eurozone are primarily political creations, albeit couched and exercised in mostly economic terms (Weigel, 2008). To define the Eurozone problems realistically, we have to connect the economic and political realities. Pragmatism, not dogmatism is called for.

1.3.1 Eurozone's Problems

In general terms, Eurozone's economic problems can be traced to the dynamic instability caused by the arrangement where the monetary policy is centralized (single currency controlled by a single central bank – ECB), whereas the fiscal policy and the financial control and supervision of the private sector remains the domain of individual states. The Eurozone's establishment intended to deal with this issue by creating the Stability and Growth Pact (SGP) which attempted to restrict the general fiscal policy rules and positions (by specifying the maximum permissible deficits and public debts) compatible with the goals of the monetary policy and the common currency stability. The national autonomy in the financial and regulatory areas was to be coordinated by generally agreed EU directives.

Indeed, such an arrangement was (and is) unwieldy. It necessarily had to rely on the willingness (and the ability) of national governments to put the requirements of a common currency stable functioning over and above of whatever national requirements (and political exigencies) may be.

(Indeed, SGP was "restructured" and in fact softened in 2005 when Germany and France were unwilling to put the interest of the common currency – and hence a progressive integration – ahead of domestic political "conditions". Perhaps that is where the roots the current crisis lie?)

It is easy to criticize those arrangements, as many economists and European integrationist do. But one must always keep in mind that the EU and the Eurozone are, first and foremost, political creations and as such their "organization" is limited by what is politically possible. It should be always stressed that both the EU and the Eurozone are the result of intergovernmental treaties and therefore lack a direct democratic political legitimacy. The latter remains vested in national governments of individual member states. And they are those states who transfer parts of their executive and political powers to the EU and the Eurozone as the consequence of this legitimacy. The extend of those transfers is determined by the Maastrich and Lisbon treaties and, for all practical purposes, constitutes the maximum of governing powers the democratically legitimate national governments are willing to concede to the EU and the Eurozone.

(One should remark here that, indeed, there are attempts – some even successful – to circumvent the legal structure of the EU and Eurozone treaties. The disregard for the "no bailout" rule is the glaring example. But this sneaking EU and Eurozone centralization, conducted under the excuse of an "economic emergency" has its limits. After all, the more centralized EU was rejected by the French and Dutch referenda regarding the so called "EU constitution" in 2005. And there is no political appetite to return to this "idea" today.)

The current economic policy and decision making arrangements in the EU and the Eurozone may be inefficient in the view of many economists and Europeanist elites, but it is the maximum which is politically possible. Attempts to go beyond these arrangements for the sake of preserving the present common currency arrangements threaten to unravel the basis of the postwar European developments and prosperity.

Specifically, the recent discussion identified three areas where the Eurozone problems manifest themselves:

i) "Sovereign Debt" issues (sustainability and financiability) in some ("southern tier") countries

ii) Competitiveness problems in the same ("southern tier") countries

iii) Instability and undercapitalization of the banking sector Eurozone-wide

All three are indeed interdependent. Their genesis and the role the establishment of the common currency area played in their development were discussed elsewhere (Matthes, 2009, DeGrauwe, 2011) and will be not repeated here. However, we will address the dilemmas posed by the proposed solutions.

1.3.2 Proposed Solutions to Eurozone Problems

In general there are two solutions suggested for the Eurozone problems. One, as hinted above, and which command the majority of economists and European elites opinions, is the fast progress toward the centralization of economic decision making in the Eurozone, That is where the intellectual underpinnings for concepts of "EU economic government", "Common EU (or the Eurozone) finance minister", and so called "Eurobonds" come from. Alternatively, some people suggest a dissolution or a territorial reconstruction of the Eurozone.

The centralization of the economic decision making in the Eurozone would indeed solve the problems, assuming that the newly created "economic" government would make reasonable decisions (a very strong assumption indeed).

The centerpiece of this idea is the creation of some kind of a central fund, guaranteed jointly and indivisibly by all Eurozone countries, which would finance, at presumably low interest rates, the member countries fiscal deficits (or parts thereof).

If designed properly, such a fund could mitigate the public financing pressure on some states, providing either loans or guaranties to loans at lower than market interest rates. However, to provide a dynamic stability some stable predictability of the future fiscal dynamics is required – otherwise the proposed fund would be just a maelstrom sucking in the fiscally healthy countries eventually. That implies a commitment to the future fiscal discipline from the Eurozone member countries. And the experience with SGP teaches everybody that the more than an international treaty with a meager enforcement mechanism is needed. Hence the talk about the need for revisions of "European treaties", aimed at the establishing the EU "tzar" with the power to adjust national budgets over the heads of national governments in a case the latter deviate

from the agreed upon path. Applauded by Europeanist elites, such an arrangement would effectively reduce the European countries to the position of American states. 200 plus years of European history and national emancipation would be thrown away.

Perhaps more importantly, a stability of the centralized fiscal stance would require a convergence of tax systems, spending patterns and (implicitly but nevertheless) the reforms and convergences of labor market structures, pensions and healthcare arrangements. Given the rate of the "progress" in those areas in the last almost 20 years (from the Maastricht treaty establishing the European Union) one may assume that required changes are beyond the existing political realities.

But without the establishment of the political structure democratically accepted by the all participating countries, the fiscal (i.e. the economic) government of the Eurozone is an illusion. Or worse, it is the mechanism to transfer resources from the North to South, with no guarantee of the future stable dynamics (that is the meaning of the German term "transferunion").

(One cannot escape the impression that the actually proposed solutions to the Eurozone problems all operate on the hope that the world – and especially American – economy will restore its dynamic growth starting from 2012. If realistic, this would improve the Eurozone growth and automatically mitigate the fiscal pressures. The proposed "centralist" solutions are then designed to "calm down" the markets and hence to reduce the risks of a financial collapse in some countries till the renewed growth "takes care" of the problem. If this is the idea then the political unfeasibility of proposed "centralist" solutions is irrelevant. It will never need to be actually implemented. Well, this is what one European writer (Wolfgang Munchau) calls "kicking the can down the road, but filling it with a high explosive first. American term is "hopium".)

The creation of a centralized fund to help recapitalize European banks is a good, long overdue idea – for the future. (US FDIC structure could serve as a guide). Indeed, the common currency and the transeuropean banking sector do justify the common and centralized regulatory, supervision and bank insurance agency. However, very little progress was achieved in this area from 1999, mostly for political reasons. (Individual Eurozone states consider the bank regulation, supervision and insurance to be the national, not a "Common European" area.) Moreover, even if a centralized solution is achieved for the future (with real powers), that does not solve the current problem.

A bank recapitalization on the individual, state by state basis would just exacerbate a sovereign debt problem on the Mediterranean littoral (here the Ireland's situation may serve as the both example and warning). A transeuropean solution would then require fiscal transfers of a magnitude hardly politically acceptable to the northern "donor" countries.

Finally, the fiscal centralization, i.e. the creation of the "economic government", would do very little (certainly in the short to medium term) for what some consider the Eurozone's dominant problem: the protracted and increasing lack of competitiveness in some countries, especially on the Mediterranean littoral (Greenspan, 2011, Hans-Werner Sinn, 2011).

Indeed, the protracted austerity (i.e. the economic growth below the EU and the world rates) would eventually bring inflation and perhaps wages in the Mediterranean littoral countries below the Eurozone average, reversing the existing 25–35% of the real appreciation compared to Germany. However, the appreciation process took 10 years and the real depreciation is unlikely to happen faster, to say nothing about the domestic political sustainability. The deep and radical changes in labor markets would accelerate the process, but again, who will introduce and enforce those? The required degree of the political and economic centralization in the Eurozone is not politically feasible today.

The converse of this situation, i.e. the protracted inflationary wave in northern countries leading to a real appreciation there is equally politically impossible. Nobody in his right mind would expect the public of northern Eurozone countries to accept the protracted inflationary Armaggedon.

To summarize at this point, the institution of the real Eurozone economic government, which would centralize the most of important economic policy functions and hence created an environment conducive to the solution of the Eurozone crisis and the long-term stabilization of the single currency, is politically extremely unlikely. But without such a solution the European crisis will simmer and perhaps accelerate. Where to? Nobody knows, but the thought about the either collapse or a substantial restructuring of the Eurozone itself gained the currency and attention recently.

The problem indeed is that nobody has an idea what either the collapse or a substantial restructuring of the Eurozone would entail. The problem is the financial sector integration in Europe – curiously enough the one desired result of the common currency regime (assuming indeed that this

regime is sustainable). Setting aside the legal considerations (undoubtedly important, but beyond the scope of this analysis), disentangling the complex web of euro denominated financial assets and liabilities connecting together Eurozone agents across national boundaries is considered a daunting if not impossible task. And one sided solutions would certainly inflict significant and probably cascading losses (even if the apocalyptic estimates of some institutions like USB and HSBC should be dismissed of hand as probably the crack induced fantasies). But anyway, the collapse or even a substantial reconstruction of the Eurozone today is undesirable and should be avoided if possible. . .

Indeed, Eurozone is in the situation where a possible economic solution is not politically viable. This then makes the Eurozone's collapse (or a substantial restructuring) more likely. The fear of this event then pushes Eurocrats toward "solutions" which exacerbate not only Eurozone's difficulties, but increasingly pose threats to the overall architecture of the EU itself.

Nevertheless the question remains: Given the constraints elucidated the discussion above, is it possible to find a compromise solution which would at least interrupt the relentless march toward the collapse?

1.3.3   The Parallel Currency Idea

The parallel currency regime simply means that a country (the Eurozone member) introduces the second currency (SC for short). On this state territory the second currency will be available to perform the same functions as the existing currency (the Euro), subject to regulations elaborated below. The use of this currency will be illegal outside the country which issued it and in all contracts involving the non-residents.

The SC will be provided only to citizens and legal residents of the issuing country. The use of such a currency by anybody else will be strictly illegal anywhere, including the territory of the issuing country. The relationship between SC and euro (the exchange rate) will be determined by the markets.

On the technical side, the SC could be introduced by legislating that a predetermined share of the domestic government expenditures will be in SC, the rest in Euro. The same ratio should be applied to the redenomination of domestic debt being held by domestic entities. Simultaneously, all domestic contracts (both private and public contracts where both

parties are domestic entities) will have a defined minimum share to be serviced in SC and the minimum share to be serviced in Euro. (Those minimum shares should not sum up to 100%, creating a space for private re-contracting.) Finally, the tax liabilities should be determined in both euro and SC such that the tax liabilities in euro are sufficient to cover newly defined euro based government expenditures and the required servicing of the domestic public debt in hands of foreign entities.

All contracts involving foreigners should be denominated and exercised in Euros. Financial sector should offer deposits and loans in both euro and SC, subject to restrictions elucidated above.

On the policy side, a hard constraint (a constitutional amendment?!) should impose a balanced gross public accounts (including a debt service to nonresident entities) in Euros. A public accounts denominated in SC (both revenues and expenditure sides) should remain at the discretion of the country's government. The basic purpose of the parallel currency regime (i.e. the introduction of the SC) is to eliminate the need for new euro borrowings together with the creation of an environment conducive to servicing the existing euro denominated claims. Hence the balanced budget law elucidated above.

But the second purpose of introducing SC is to mitigate the negative (and at least in the Greek case obviously counterproductive) impact of the domestic austerity and the "internal devaluation" on both the economic performance and increasingly the social and political stability of the SC issuing country. Replacing the reduced and subsequently restricted euro expenditures with SC expenditures, the euro accounts balance can be obtained at lower social and political costs.

Moreover, as long as SC accounts are unbalanced (presumably in deficit, otherwise the parallel currency exercise would be pointless) they must be financed by money (SC) creation, triggering the inflation in SC denominated prices. This should then lead to an increased private demand for the euro as an inflation hedge, leading to the SC depreciation relative to Euro. This should facilitate the reduction of the domestic "average" unit labor costs. (Average in the sense of combining the euro denominated labor compensation with the SC denominated labor compensation, the latter expressed in Euros using (the presumably depreciated) SC exchange rate.)

Resulting restoration in competitiveness (a real depreciation based on the ULC) should then improve a current account position, hopefully

generating a surplus. This could be used to service the country's existing euro based commitments.

Through this process an introduction of the parallel currency regime simultaneously improves the issuing country competitiveness (a problem ii) in Section 1.3.1 above, page 27), which is not addressed by a centralization of Eurozone wide decisionmaking) and preserves the use of the euro in the affected country.

As far as the "sovereign debt" issue is concerned, the parallel currency regime as discussed above preserves all "outside" liabilities in their euro denominations (i.e. no forced re-denomination – full or partial – here). The design of the parallel currency regime, with its commitment to the gross budgetary balance – i.e. the one which includes the "foreign" euro debt servicing in full – should, in principle, answer the "sovereign debt" concerns. This could be enhanced by stipulating that the "foreign" euro debt service enjoys the "seniority" status as far as the euro based budget expenditures are concerned. The logic here is that the "domestic" euro based expenditures can be substituted for by SC expenditures if needed, but foreign cannot.

In a case of some countries (Greece? Portugal?), the dynamic sustainability of this arrangement could be enhanced by the ex ante (that is, before the establishment of the parallel currency regime) public debt restructuring. But, obviously, the details will depend on the actual situation and timing.

It is useful to point out that if handled properly, the parallel currency regime(s) establishes the kernel of the "sovereign debt crisis" solvability based on the existing (or, perhaps, only slightly altered) degree of fiscal and economic decision making autonomy. No politically unpalatable degree of economic centralization is required.

Finally, the issue of the bank recapitalization. Obviously, the country introducing the parallel currency regime would recapitalize the domestic banking sector in the new SC. The design of the parallel currency regime as elaborated above (the "foreign" debt holdings issue) would by itself lessen the "additional capital" need of foreign banks.

In this context, it is important to compare the costs of bank recapitalization under the parallel currency regime to the alternatives. Available estimates indicate that the recapitalization costs under the current situation (either centralized or autonomous – i.e. country by country – solutions) would exceed the parallel currency regime for the simple reason of

a persistent uncertainty about the debt service capacity and willingness of crisis countries to honor their obligations.

And, indeed, the costs of leaving the Eurozone entirely (and hence the needs for bank recapitalizations under this scenario) are at this point basically uncalculable. But given the collapse of the cross border debt servicing under the euro exit and/or Eurozone restructuring scenario, the bank recapitalization costs would exceed the same when debt servicing is preserved – i.e. the parallel currency regime(s).

The discussion up to this point indicates that a parallel currency regime in some countries could be a feasible way out from the ongoing Eurozone crisis. But if it is so, why is it essentially ignored?

1.3.4 Cons of the Parallel Currency Idea

Objections and criticism of the above elucidated parallel currency regime idea can be expressed in the four different areas.

First, many would consider the above suggested regime unwieldy, too complicated and open to massive malfeasance. The actual system is unlikely to be the incentives compatible and as a such may invite a significant cheating and evasion. That relates especially to the "balanced euro budget" provision and the restrictions limiting the use of the SC to domestic residents only. In addition some may consider the complexity of the system to be beyond the capacity of at least some governments to implement.

This criticism may certainly be valid, but we will never know unless we try. But to limit the negative possibilities, perhaps some EU wide cooperative arrangement would help to enforce the parallel currency rule and restrictions, especially as far as non-citizens and non-residents are concerned (both individuals and firms).

Second important objection relates to the legality of the parallel currency regime in the Eurozone member state. The current EU law, rooted in Maastricht and Lisbon treaties, simply does not even contemplate a parallel currency possibility, making its introduction in any single country in all probability illegal. However, the speed and frequency with which both the EU as a whole and the ECB ignored the legal restriction imposed on them by communities treaties makes this objection to sound hollow at best. And, indeed, one can imagine a quick approval for the alteration of basic treaties which would preserve the fiscal and economic

policy autonomy and simultaneously address – and significantly alleviate – the "sovereign debt" crisis.

The third area of "resistance and resentment" to the establishment of the parallel currency regime(s) is the fear that such a regime would be the first step toward a country leaving and the Eurozone (eventually) disintegrating. That is certainly possible, but whether it is realistic depends on the actual design of the parallel currency regime. In the type of the system elaborated above, where all "international" euro-based commitments are preserved and so is the euro for a part of domestic transactions and contracting, leaving the euro would be equally traumatic and only slightly less costly under parallel currency regime as it would be today.

After all, the purpose of the parallel currency regime as suggested here is to preserve the use of the euro (albeit with some limitations) and the scale and the scope of the Eurozone in the face of the increasingly hostile and threatening environment.

The last area of objections is purely political in nature, but it has to be mentioned. Some individuals hope that a current crisis will lead to a "more Europe". The current crisis appears to them as an excellent opportunity for the accelerated economic and fiscal "integration" – removing the powers of economic and fiscal policies from national governments and centralizing them on the union level, under the control of "enlightened" Europeanist elites. The solution of the current euro crisis which would essentially preserve the current political arrangements is, indeed, undesirable for those individuals.

1.4   In Lieu of Conclusion

The analysis indicates that the properly structured parallel currency regime could provide a solution to the current Eurozone problems. Indeed, as any realistically conceivable solution it is not "optimal" in the purely economic sense. But its greatest strength is that it preserves the current reality of the fiscal and economic decision-making decentralization. After all, the Eurozone is the political arrangement, albeit the one stated basically in economic terms. If the euro is to be preserved its political base is necessary. Anything else is a fantasy – but the fantasy with possibly extremely dangerous consequences. Europeans should remember their history.

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2 Risks of Stagflation in the European Economy in 2012 and 2013[1]

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2.1 Introduction

2012 and 2013 will be very difficult years for the European economy, with a long list of diverse risk factors threatening the region. We must expect that separate events are very likely to exert a very strong influence over each other, and one can assume that these influences will intensify, rather than set off, each other. This article aims to assess the possibility that the cumulative effect of these risk factors may lead to "stagflation", i.e. a combination of relatively high inflation and recession, which will, in effect, result in unemployment rates that may exceed, even substantially, the natural rate of unemployment.

Several past periods in specific countries or regions have been labelled as periods of "stagflation", a phenomenon that has been used to describe US economy in nearly the entire 1970s and in 1981[2]. What is interesting in this respect is that despite displaying different symptoms to a considerable degree, both these periods are deemed similar from the economic perspective.

"Stagflation" as a phenomenon has been explained from various perspectives. In this article, we will attempt to formulate a new definition that would reflect the reality of today's European economy more accurately. Relying on the new definition, we will then assess various risks currently observed in Europe, including, without limitation, the common currency's instability, the fact that although formally separated from the Euro, the region's other currencies are in effect and in absolute terms strongly linked to the Euro, the demographic risks (that have already

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[1] This article forms one of the outputs of the research project of the Faculty of Business Administration entitled "New Theory of Economy and Management in Organizations and Their Adaptation Processes" under reg. No. MSM 6138439905.

[2] The term "stagflation" is sometimes absurdly used to denote the Japanese economy after 1991, although this use is simply confusing – Japan at that time really was a deflation economy.

begun to exert some influence – although their effect will be felt for a very long time, and the time when they assume a crucial role in the European economy is far ahead of us). We will assess the risks of recession and the issues of demand, debt (both sovereign and private) and some other issues. We will also look at the development of the US economy and the BRICS (Brazil, Russia, India, China, and the Republic of South Africa) economies, and their effect on Europe. It will also be necessary to address the effect of the continuing and rather intensifying regulation on the increasing risk of stagflation.

We will attempt to discover correlations among these problems and the mechanisms through which they will translate into the real economy.

On these findings, we will formulate our final conclusion to answer the question whether the risk of stagflation in the European economic area in the short and medium run is real, or not.

2.2   Defining Stagflation

First of all, we need to make clear what the term "stagflation" actually stands to describe, i.e. what conditions must be met for us to label a specific period in the observed country or region as a period of stagflation. It is generally known that "stagflation" is a combination of the words "stagnation" and "inflation". Therefore, it is assumed by definition that the economic performance does not grow, or tends to drop, during periods of stagflation. The matter is clear[3] in this respect because we have become used to measuring economic performance in year-on-year or shorter comparisons, primarily using the aggregate gross domestic product. Following this tradition, it will be suitable to use this method[4] in our case, too.

Using the term "stagflation", we must also take account of the issue of unemployment: the unemployment rate plays a very important role in many stagflation approaches. These approaches use the term "natural unemployment rate" – a very vague term that is not defined in the form of a specific number as a general constant. Therefore, we will have to ask what is the natural unemployment rate in the EU Member States prevalent at the given time.

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[3] Rising prices accompanied by even larger economic recession have been called "slumpface".

[4] Despite all the doubts to what extent can the gross domestic product truly quantify the performance of an economy.

The definition of "natural inflation", i.e. the level that must be exceeded for inflation to be deemed "high", also entails certain problems. The science of economics often uses terms like "natural inflation" or "common rate of inflations"; however, these terms have different contents in different periods and different regions. To talk about stagflation in Europe at the beginning of the 21st Century, we will have to define a rate of inflation deemed "natural" or "expectable" for this precise time in history.

Having said that, the very first step that must be taken in this regard is to analyse the two most frequently mentioned periods of stagflation and discover the reasons why the US economy witnessed rising prices and high unemployment, i.e. economic stagflation, in certain years[5].

2.2.1 1970s in the United States

The Keynesian theory assumes that economic growth means two things: reduced unemployment, and accentuated inflation tendencies. What ensues is the following inverse relation: low unemployment means high inflation, and high unemployment thus brings low inflation. This is fully in line with the Phillips curve (Phillips, 1958), formulated at the turn of the 1950s and 1960s, which was taken very seriously by President Nixon's administration, as well as others. It was believed, in essence, that a country could buy lower unemployment if it accepts the price of higher inflation. "Stagflation" was first used by Iain McLeod, a British politician, in a speech to the Parliament in 1965, and the newly coined word soon caught on: as the 1960s progressed, situations that the advocates of the traditional Keynesian theory could not explain began to occur with ever-increasing frequency. The correlation between inflation and unemployment (or growth) in various countries did not develop as assumed by the Phillips curve. Instead of dropping as unemployment rose, prices did not even stagnate but kept rising, in some cases even accelerating their rise.

In other words: stagflation had become a known phenomenon before the combination of stagflation and inflation found its fullest expression in the USA. However, the intensity of the US stagflation, which introduced a period of ten years of economic hesitation, exceeded all prior cases of stagflation, and, in addition, influenced the entire developed world

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[5] It must be noted that the stagflation hit more or less all the developed countries in the 1970s; nevertheless, the United States were undoubtedly the centre of this development.

at the time and lead, in effect, to the oil crisis, which in turn further accentuated stagflation tendencies.

Let us summarise the reasons that are usually blamed for making the seventies so difficult for the United States.

Two fundamental reasons of the stagflation are usually mentioned. The first is based on the idea that inflation has two components – real inflation and inertial inflation. If the inertial inflation is too high, for instance after a price shock, inflation tends to remain on the same inertial level. Therefore, inflation does not cease to exist and is actually higher than it would have been without this inertia even after the shock fades away. This is also due to the fact that the price of labour is not created on a clean (i.e. an auction) market, but on a market heavily distorted by state regulation[6] and by the influence of labour unions as an element that strongly regulates the labour market environment. Therefore, the price of labour does not respond to demand and supply in the same way a commodity does on an auction market[7]. Due to inertial inflation, prices may thus rise even as unemployment witnesses a rise or as the economy enters a period of stagnation or even recession. The revised Keynesian theory and the adjusted Phillips curve are derived from this idea.

State intervention and incorrect economic policy are the second traditional culprit. Rising monetary aggregates in the area of monetary policy and the economic policy's regulation of prices and the labour market may lead to simultaneous rise of prices and unemployment.

Both these traditional reasons of stagnation have a shared component: regulation. If we look at the course of the US stagflation in the 1970s, it is hard to overlook certain correlation between regulatory measures and the course of the stagflation. However, theory does not make a sufficient distinction between two phenomena: regulation as a general measure with principally the same impacts on all market participants, and intervention, i.e. selective aid to specific enterprises or specific business fields.

The relation between inflation and unemployment virtually copied the Phillips curve during the entire sixties. Unemployment dropped from

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[6] For instance, the minimum wage and many other provisions common in developed countries.

[7] To some limited extent, this also applies to the prices of goods and services, which are also affected by certain administrative machine of corporations and do not display behaviour common on an auction market. Nevertheless, these mechanisms are undoubtedly vastly more flexible than the labour market mechanisms.

about seven percent in 1961 to 3.5 percent in 1969. The gross domestic product deflator rose from about one percent in 1961 up to five percent in 1970. The decade that followed really saw no logical curve to speak of whatsoever: the rebuttal of the Phillips curve reached its climax in 1975 with 8.5 percent unemployment rate and prices rising by almost ten percent. Neither the eighties did much to confirm the validity of the classic Phillips curve (Samuelson, 1989)[8]. What 1970 development was so crucial that its effects defied any resolution in the decade that followed?

The first culprit was the rising level of regulation as such: the second half of the 1960s was primarily a time of significant interventions by the US federal government in many fields of business, and this practice was retained in the entire seventies. In principle, these interventions included, without limitation, aids to specific corporations, e.g. aircraft manufacturers and primary and secondary sector producers, or interventions on the road, railway and air transport market. A number of federal regulations, spanning from pharmacology to building project supervision, gradually came to being. Apart from that, the government invested substantial funds in the military industry in relation to the Vietnam war, or in the space programme, which yielded results in the form of the first human landing on the moon. Investments and interventions have substantially changed the face of the US economy without anyone really noticing. However, the rate of regulation witnessed unparalleled rise, and the scope of the interventions went far beyond all prior experience.

The details of the aforementioned process are a matter for study of the historians of economics. Nevertheless, its roots can be traced back, for instance, to 1964, when Lyndon Johnson, enjoying a strong majority in the Congress, pushed through Medicare as the basis of a state-funded healthcare system (although the full objective has not been ultimately achieved). The fact remains that Johnson made substantial effort to primarily centralise the United States, which caused a number of diverse disputes, power struggles, and faced opposition in many states of the Union. Richard Nixon came with a plan of new decentralisation, but was not really successful in his effort. Some monopolies and regulatory systems that were impervious to the Republicans' efforts to revise the results of the New Deal and the war economy were inherited from previous years, especially from the WWII years and the first post-war years. Some

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[8] The relevant data can be found, for instance, in *Economics* by Samuelson and Nordhaus (p. 342), which also describes the arguments and the defence of the revised curve.

of these regulations were revised exactly in the second half of the 1960s – with some regulation programmes replaced by even worse programmes. During Nixon's first and his incomplete second presidency, Medicare expenses and other direct transfers from the federal government to citizens rose from 6.3 to 8.9 percent of the GDP. The volume of food subsidies to citizens, for instance, rose from 6.6 billion dollars to more than nine billion dollars in that time. These seemingly unimportant figures[9] must be seen in the context of the fact that the Vietnam war cost about 150 billion dollars, with more than one million of US soldiers deployed in Indochina and in other backup areas abroad when Nixon assumed office. The increase in transfers to the citizens and businesses, enormous for its time, did not cause a dramatic growth of public deficit just because the costs spent on defence dropped from 9.1 to 5.8 percent of the GDP in the same timespan.

Nevertheless, the steep growth of unemployment from 2.5 percent in 1969 to five and then six percent in 1970 and 1971 was not accompanied by decreasing inflation, which exceeded five percent per year throughout these years.

The problem of the US economy, which started in 1970 and climaxed several years later, was thus caused by a combination of multiple phenomena, with the growing rate of regulation and state intervention in the economy being the original and first trigger of events. However, the true impulse for the real stagflation was, first and foremost, the departure from the Gold Standard of 15 August 1971, which Nixon accompanied by a series of tough regulations – not only did he refuse to exchange Britain's and France's dollar reserves for gold in the US depositories, but also introduced wage and price controls in an effort to tame inflation in the USA.

The 1971 collapse of the Bretton Woods system was inevitable: during the second half of the 1960s, the value of US gold reserves dropped from 25 billion to 10.5 billion dollars. The fast-growing economies, especially the economy of the Federal Republic of Germany, sucked in enormous investments, thus appreciating their currencies, which the dollar simply could not withstand. The dollar witnessed an unusually fast depreciation against other currencies: for instance, the 1969 USD-DEM exchange rate was DEM 4 per dollar. Before the collapse of the Gold Standard, the

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[9] According to the "CPI Inflation Calculator", nine billion 1971 dollars today yields the purchasing power of 50.5 billion dollars. (The CPI Inflation Calculator is available at the United States Department of Labor website at www.bls.gov/bls/inflation.htm.)

dollar fell to DEM 3.66, falling to DEM 3.22 in response to the events of August 1971, and then depreciating even further to DEM 2.83 per dollar. The dollar again lost its value during the seventies and at the beginning of the eighties: at the turn of the eighties and nineties, the exchange rate was about DEM 1.8 per dollar. The depreciation of the dollar and the quick appreciation of the Deutsch Mark against other currencies, including the Pound Sterling or the Scandinavian currencies, were the main reasons why the West German economy cooled down in 1971 and shortly afterwards and why the dynamic boom slowed down in 1973.

Although the US economy had never been a heavily export-oriented economy, the departure from the Gold Standard and the adoption of the floating exchange rates mechanism drove export tendencies and, on the other hand, increased the prices of imports on the US market.

That is also why both oil shocks of 1973 and 1979 created strong impulses for stagflation. As regards the first crisis, the formal impulse for the Arab countries' decision to cut down oil production by five percent and, primarily, to impose an embargo on selected countries, was the support and aid provided by these countries to Israel during the Yom Kippur war. Nevertheless, technically, the embargo should not have had devastating effects for the USA, although the prices of oil on the global markets rose quickly[10]. However, the United States' dependence on oil imports only amounted to about one third of its consumption at that time[11], and its dependence on Arab oil was very small – the embargo had a much greater economic impact on some European countries. Nevertheless, the impacts of the oil crisis were aggravated by some steps of the US Administration[12], including, without limitation, the regulation of petrol sales to citizens, and other price control attempts. This lead to greater uncertainty of the consumer, which multiplied the effects of the embargo – petrol shortages lead to lines in front of petrol stations, and the government even attempted to introduce a rationing system. The

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[10] From three to five dollars per barrel and up to 12 dollars per barrel in 1974.

[11] Nevertheless, it was known that the maximum production in the oil extraction areas known at the time was reached in 1971 due to existing oil reserves, and increased productions could not be expected without further exploration and investments. However, this exploration and development was impossible with the price of oil so fundamentally low. Therefore, the effort of the Arab countries has, among other things, slowed down the growth of demand for oil, and motivated the developed world's increased effort in the area of production technology and exploration.

[12] This was still Nixon's administration, and later the cabinet of its Vice-President, Gerald Ford.

situation calmed down, at least in this area, in the second half of 1974 when this regulatory policy was abandoned. Subsequently, the rate of inflation rose from six to ten, and later even to twelve percent[13].

We could go on listing the reasons of the US stagflation in the 1970s and detailing and analysing the steps that aggravated the combination of high inflation and stagnation witnessed in the US at that time. Nevertheless, the fundamental reasons remain clear:

- Significant increase in regulatory steps in the years leading to the stagflation, and increased number of state interventions in the economy, attempts to control prices and wages in the first stage of the stagflation, which did reduce inflation in the short run, but only intensified the inflationary pressures later.
- The fading economic growth impulses caused by the previous engagement in the Vietnam war, dramatic scaling back of US presence in this conflict, and a vast reduction of war expenses.
- Departure from the Gold Standard, and thus the creation of space for fundamental loosening of the government's monetary policy, loss of the currency's purchasing power against other currencies of business partners.
- External price shocks caused by reduced supply of oil, and the ensuing demand pressure on prices.
- Inconsistent economic policy of the US administration at the time, which mixed decentralisation efforts and planned economy approaches.
- Restriction on trade through the introduction of import premiums, i.e. essentially the creation of customs barriers.

2.2.2   Rome, Year 200 AD

Nevertheless, the world economy witnessed a period of stagflation that was much older and much longer than the US economy's stagflation in the 1970s – namely the last few centuries of the Western Roman Empire. Of course, the sources available from that time are much less accurate and incomparably less exact than the outputs of statistical offices in the past century or two. Nevertheless, we can still formulate a number of specific reasons that caused the stagflation in the declining Roman

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[13] For historical US inflation data, visit InflationData.com operated by the United States Department of Labor
(http://inflationdata.com/Inflation/Inflation_Rate/HistoricalInflation.aspx)

Empire. An attempt to thoroughly summarise and analyse these reasons was presented by Bruce Barlett in How Excessive Government Killed Ancient Rome (Bartlett, 1989).

This text offers some fascinating insights. Relying on very trustworthy sources, the text asserts, for instance, that[14]: *"Beginning with the third century B.C. Roman economic policy started to contrast more and more sharply with that in the Hellenistic world, especially Egypt. In Greece and Egypt economic policy had gradually become highly regimented, depriving individuals of the freedom to pursue personal profit in production or trade, crushing them under a heavy burden of oppressive taxation, and forcing workers into vast collectives where they were little better than bees in a great hive. The later Hellenistic period was also one of almost constant warfare, which, together with rampant piracy, closed the seas to trade. The result, predictably, was stagnation. Stagnation bred weakness in the states of the Mediterranean, which partially explains the ease with which Rome was able to steadily expand its reach beginning in the 3rd century B.C. By the first century B.C., Rome was the undisputed master of the Mediterranean. However, peace did not follow Rome's victory, for civil wars sapped its strength."* We can undoubtedly find very interesting similarities to the development in the United States and some other countries after WWII, when a substantial part of the world either opted for an explicitly planned economy, or at least made efforts to find a "middle ground", i.e. chose a "combined" economy.

Please take note of another element: the fact that this period was a time of increasingly strong and significant regulation: *"Under the dictatorship of Sulla, the grain distributions were ended in approximately 90 B.C. By 73 B.C., however, the state was once again providing corn to the citizens of Rome at the same price. In 58 B.C., Clodius abolished the charge and began distributing the grain for free. The result was a sharp increase in the influx of rural poor into Rome, as well as the freeing of many slaves so that they too would qualify for the dole. By the time of Julius Caesar, some 320,000 people were receiving free grain, a number Caesar cut down to about 150,000, probably by being more careful about checking proof of citizenship rather than by restricting traditional eligibility."* The distribution of grain at a controlled price, and later eventually for free, is also interpreted as a welfare measure of its kind and, above all, as a form of pre-election populism, a social benefit granted to the majority.

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[14] This quote and the quotes below are taken from the aforementioned work by Bruce Barlett.

As indicated by the next quote, a similar approach had an increasingly corrupting effect: *"The distribution of free grain in Rome remained in effect until the end of the Empire, although baked bread replaced corn in the 3rd century. Under Septimius Severus (193–211 A.D.) free oil was also distributed. Subsequent emperors added, on occasion, free pork and wine. Eventually, other cities of the Empire also began providing similar benefits, including Constantinople, Alexandria, and Antioch."*

Nevertheless, the Republic, and subsequently the early Empire, was based on a dynamic development of Rome's foreign trade, as illustrated by the number of shipwrecks dating back to these "golden" ages of Rome from the economic perspective. The economy probably witnessed its first shock in 33 AD, when Emperor Tiberius ordered the enforcement of the usury law (which had been valid for many years but had not been enforced). The dramatic business development helped some classes and specific individuals to amass substantial wealth in a short time; these people possessed substantial capital and offered it to others for appreciation. Tiberius attempted to stop this rising inequality and the creation of new affluent classes by restricting their business, i.e. by regulation. What followed was a financial crisis and shortage of cash on the market after the owners of money withdrew from the market for fears of restrictions. However, misguided economic policy, increasing regulation and costly social policy, and a general rise in the costs of the state went ahead anyway. The Empire stopped expanding, and its income thus failed to rise, which should have triggered (but did not trigger) a change in the fiscal policy of a state that had become used to ever-increasing influx of incoming bounty. What changed, however, was the monetary policy, and the currency, to date based on a guaranteed proportion of gold or silver in each coin, began to be "counterfeited" by the emperors themselves. The proportion of precious metals in issued coins was decreasing, which was reflected in rising inflation. As the general discontent grew, so did the pressure for a general regulation of economic life. It makes no sense to describe the development in its entirety, but the following quote illustrates the problem rather well: *"Despite the fact that the death penalty applied to violations of the price controls, they were a total failure. Lactantius, a contemporary of Diocletian's, tells us that much blood was shed over 'small and cheap items' and that goods disappeared from sale. Yet, 'the rise in price got much worse'. Finally, 'after many had met their deaths, sheer necessity led to the repeal of the law'."* As the years passed, the need for regulation went far beyond the regulation imposed by the Communist regimes in Eastern Europe or in

Russia in the second half of the 20th Century. The situation resembles the alleged conditions in states such as North Korea, Cambodia under Pol-Pot's rule, or Cuba: *"The result was a system in which individuals were forced to work at their given place of employment and remain in the same occupation, with little freedom to move or change jobs. Farmers were tied to the land, as were their children, and similar demands were made on all other workers, producers, and artisans as well. Even soldiers were required to remain soldiers for life, and their sons compelled to follow them. The remaining members of the upper classes were pressed into providing municipal services, such as tax collection, without pay. And should tax collections fall short of the state's demands, they were required to make up the difference themselves."*

It hardly makes sense to list further arguments. Nevertheless, let us summarise the reasons of the phenomenon witnessed in the last centuries of the Western Roman Empire, which we call, using the parlance of our time, stagflation:

- The number of regulatory interventions in the economy rose substantially; free food market was curtailed through price controls in favour of some customers, with grain and subsequently other products distributed for free later on. People were deprived of the right to choose their occupation freely.
- The Empire reached the maximum of its expansion, which limited further income of the state budget, and the state was unable to respond by cutting costs – partly because it needed to finance its military, partly due to the ever-increasing welfare costs.
- The currency was stripped of its "golden" or "silver" standard, i.e. depreciated by ever-increasing issues of new money that was not covered by goods.
- The economic policy witnessed substantial fluctuations, and the fluctuation cycles were getting shorter. In the times of the Republic and in the early Empire, the cycles of legible policies lasted for decades; they began to shrink dramatically from about 100 AD, and later the emperors ruled for single years, sometimes even months. However, their economic concepts differed substantially.
- The Empire faced ever-increasing external pressure, to a large degree due to the increasing aggression in the border regions, but restricted trade, i.e. export of Rome's problems beyond the Empire, also played a role – the trade was curtailed, among other things, by the low quality of the currency and by various administrative barriers and customs measures.

2.3   A Mere Coincidence?

Making a direct comparison between the fundamental features of the two historical cases, one preceding the other by about 1700 years, we will find a disturbing similarity: many aspects are identical, and many others can be interpreted as essentially identical. Nevertheless, what is alarming is that at least in this somewhat vague verbalisation, we will find a number of similarities to the current development in the European Union, as well.

A plethora of new regulatory measures is being adopted in Europe (just like the United States and other developed countries) today. And similarly to the United states in the 1970s or to the Roman Empire in the 2nd to 4th Century AD, these regulatory measures are justified by the interests of the "majority" – restrictions are being imposed on bank fees, investment opportunities; antitrust laws and air pollution laws have been put into place, minimum wage has been adopted (which, in principle, is similar to mandatory occupation succession in male-line descent); hundreds and thousands of restrictions of increasing power are imposed on human decision-making, regulations are adopted to curtail business endeavour etc. Looking back at the few past decades, we can say that the number of these regulations has been rising continuously, eventually multiplying during the crisis of 2008 through 2010.

All this is happening while the expansion of the "developed countries" has apparently came to an end: it is impossible to imagine these countries expanding their territories today; in addition, they are facing the hard pressure of a population crisis – they are running the risk of a true, absolute population decrease in a few decades' time (Smrčka, 2011). This has already entailed, and will continue to entail in the future, a factual decrease of tax income.

We have also witnessed unparalleled rise of another phenomenon that has not yet been mentioned: a striking differentiation of income, and with it the standard of living. With some overstatement, we can say that something similar could be observed in the Ancient Rome and in the United States at the turn of the sixties and seventies: the standard of living of the richest and affluent groups dramatically pulled apart from the lower middle classes and the poorest segments of the population. We mostly understand this phenomenon as a social or sociologic one; nevertheless, it clearly is important in economic terms, too – at least by structuring consumer demand in a substantial manner and by parcelling

the formerly more homogenous markets with many types of goods into multiple markets that, while still formally markets with the goods of the same denomination, they are markets on which the price and quality are worlds apart. Taking the liberty of using a somewhat literary overstatement, the economic segregation of today's society seems to resemble French feudalism rather than a democratic company of equal citizens.

Looking for a similarity in terms of the "Gold Standard", we must realise that this standard has ceased to exist decades ago. Therefore, it is now impossible to find a shock similar to the currency depreciation in the Western Roman Empire or the fall of the Bretton Woods system. However, currencies are now facing an essentially uncontrollable expansion of "quasi-money", i.e. money that come into existence through bank operations and various derivatives to financial and other products. Any factual control over the quantity of money in circulation has ceased to exist. This opens more and more space available for inflation – it is important that this has been occurring without this inflationary tendency having any real or even direct relationship to unemployment. The situation is aggravated by the policies adopted by the countries that have tried to stimulate their economies through budget deficits or by printing new money.

The stability of democratic governments in developed countries is in danger. Here, too, one can find similarity to the events in the Ancient Rome and, with some exaggeration, to the breakthrough years in the United States that gave us desegregation on one hand, and Watergate, probably the biggest scandal in US political history to date, on the other. Looking at the present developments, we can firstly see that the frequency of government shifts is increasing, and the economic visions offered by the main political movements have been diverging with increasing intensity. The problems of the present world and the consequences of globalisation have been so dramatic that even moderate political movements cannot find common ground sufficient to take on a consensual economic policy. In other words, the speed of the shifts in the developed countries' economic policies follows the speed with which their societies replace their political representatives.

Secondly, we see extremist solutions on both sides of the political spectrum gaining momentum, which has triggered further distinctions between the political movements that have been traditionally more balanced. For instance, US conservatives must inevitably move "to the right" under the influence of the Tea Party movement, while the Demo-

crats will use "more leftist" arguments in an effort to gain the protest votes of the "Occupy Wall Street" supporters.

The similarities between the Ancient Rome in the years 100 through 450 AD, the 1970s in the USA and the present situation are not a mere coincidence but the effects of the unforgiving logic of each development of events. What we see are similarities and identical mechanisms in action.

2.4   European Reality of Our Times

Of course, all this does not mean that the developed countries are bound to collapse just like the Western Roman Empire did. The cornerstones of our civilisation have been solid so far, and the society has shown some ability to defend itself. The question is whether that's enough. If we were to look for a political difference between the Ancient Rome and Washington in 1973, we will find a clear one: democracy has shown that it is able to purge, to resolve its problems. The Roman tyranny did not have, and could not have had, this ability. Whether the present society will find the ability to cope with its crisis and find a democratic and free-minded resolution still remains to be seen.

However, the key issue of the European economy in late 2011 is the analysis and decision whether the Union will or will not go trough a period of stagflation, i.e. a period of relatively high inflation combined with stagnating economy, expressed primarily by the unemployment rate. The answer has, in addition to its economic dimension, a very important political dimension, which can be formulated as an exceptionally burning question: Can the societies of developed countries, having hardly absorbed the unpleasant experience of the 2008 through 2011 crisis, withstand further psychological pressure and another period in which these states will potentially have to deal with high unemployment and substantial inflation, i.e. a likely drop in their standards of living?

We can in no case forget that we live in a time of the greatest debt crisis ever experienced in known history, a crisis caused by the debts of governments, municipalities, governmental institutions, towns, families, and in many countries by the highest debt of private businesses in (modern) history.

2.4.1 Economic Conditions for Stagflation

So far, we have found many similarities among the situation of the Western Roman Empire, the United States in the 1970s and our European presence – however, these similarities were found primarily in simple, descriptive terms. To assess the real risks of a stagflation, we must work with real data, especially inflation and unemployment data.

The stagflation potential in the United States was convincingly summarised by Ronald McKinnon (professor of economics at the Stanford University) in its text for the Wall Street Journal (McKinnon, 2011), among others. Similar texts about the situation in Europe were published, for instance, in the Financial Times and in other reputable and important daily newspapers. As we can see, the discussion of this issue is not entirely new, and the predominant opinion expressed in these works of popular journalism is that the upcoming years (2012 and 2013) will form a period of stagflation.

However, the real statistical data of European countries do not provide any dramatic evidence confirming this view. Let us start by looking at the "misery index", i.e. a simple sum of the rates of unemployment and inflation in the given period. If we took the Phillips curve word for word, this index should in principle remain on the same level at all times (with some oscillation, of course), as rising inflation would be offset by dropping unemployment etc. Of course, this is a far cry from the reality.

The chart clearly shows the 2011 trend: the sum of the rates of inflation and unemployment closes in on the level prevalent at the beginning of the 1990s in the United Kingdom and in the 1980s in the United States. Figure 1 matches the level shown by both countries in mid-seventies after the first oil crisis faded away. The chart ends with the first quarter of 2011[15]. Further data is shown in the table that follows.

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[15] It is necessary to point out one of the problems associated with the "misery index" and its practical application: various unemployment and inflation indicators are quite often used. As regards unemployment, we have, above all, the harmonised unemployment rate used by Eurostat. In addition, various national statistics are used. For instance, the harmonised unemployment rate in the Czech Republic reported in August 2011 reached 6.7 percent; nevertheless, the Czech Statistical Office published the figure of 8.2 percent for the same period of time. Inflation data is riddled with a very similar problem: in addition to various methodologies, the specific approach to measuring inflation must be clearly identified, i.e. whether the inflation rate is based on year-on-year data (i.e. the month or quarter compared to the same month or quarter a year earlier), or compared to the previous period, or whether it represents the average rate for a specific period etc. Therefore, if we look at the "misery index"
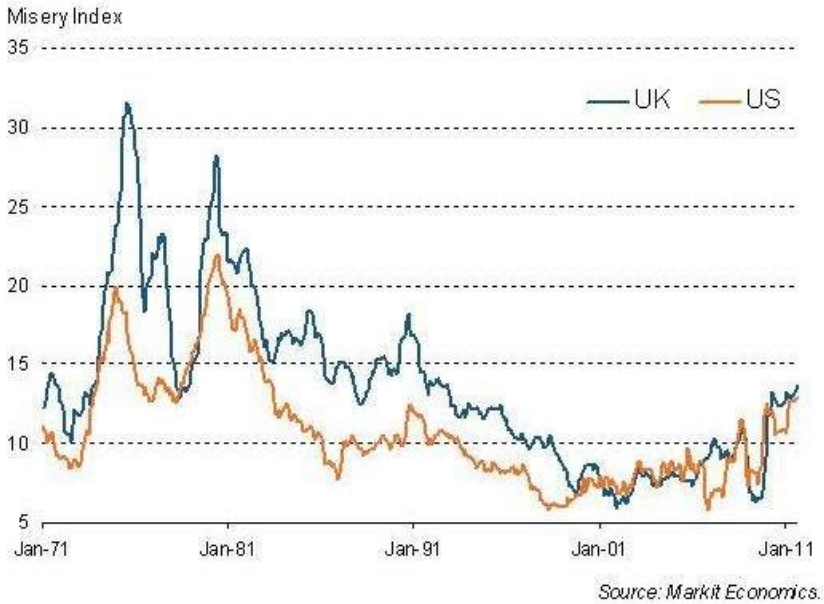
Figure 1 Misery index for the USA and the United Kingdom
Source: Markit Economics.

As we can see, the misery index has been slowly rising in the European countries, adding about one percentage point between October 2010 and September 2011. This is given primarily by the rising inflation, which has witnessed a relatively robust growth and can be blamed for the entire growth of the index on the European level, with inflation dropping ever so slightly when taking Europe as one whole. In any case, the rise in inflation exceeds the reduction of unemployment, and without having the luxury of a long-term view of this data in the mutual correlations in the context of the European Union, we can claim that the importance of the rising inflation has been higher, and its influence on the national economies much stronger, than the decreasing unemployment rate. In most states, the decrease has been marginal, or non-existent in some states,

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throughout certain periods of time, we must clearly identify the data from which the final figures were derived. Therefore, it is not suitable to compare two time series of the index if they have been obtained from different sources.

Country	Inflation		Unemployment		Misery index	
	10/2010	09/2011	10/2010	08/2011	10/2010	09/2011
Euro 17	1.9	3.0	10.2	10.0	12.1	13.0
EU	2.3	3.3	9.7	9.5	12.0	12.8
Czech Republic	1.9	2.1	6.9	6.7	8.8	8.8
Germany	1.6	2.9	6.7	6.0	8.3	8.9
Greece	4.8	2.9	14.2	17.5	19.0	20.4
Spain	2.3	3.0	20.6	21.2	22.9	24.2
France	1.8	2.4	9.7	9.9	11.5	12.3
Italy	1.9	3.6	8.5	7.9	10.4	11.5
Hungary	4.0	3.7	11.1	10.3	15.1	14.0
Slovakia	1.0	4.4	14.2	13.4	15.2	17.8
United Kingdom	3.3	4.6	7.8	8.2	11.1	12.8

Table 1 Rate of Inflation, Unemployment and Misery Index in selected countries

Source: Eurostat, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab= table&language=en&pcode=teilm020&tableSelection=1&plugin=1,

http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table& plugin=1&pcode=teicp000&language=en.

while unemployment has been still rising in some economies despite the rising consumer prices.

Looking at Table 1, we can see that some countries truly face the threat of stagflation – certainly United Kingdom, along with Slovakia, France or Spain. The data for the entire European Union and for the entire Eurozone essentially show a dynamic rise of inflation and a very slow decrease of unemployment. However, can these signs, i.e. the fact that the macroeconomic data of some specific countries truly show signs of stagflation and that unemployment in the entire EU does not drop fast enough to offset the rise of inflation – justify any general conclusions for Europe as a whole? Probably not.

There are several reasons why the risk of stagflation – regardless of the fact that it has been very strongly accented in some media and in academic circles – cannot be deemed a factual and urgent threat at the moment.

First of all, inflation is a monetary phenomenon – therefore, there is a substantial difference between the Eurozone and the rest of Europe, including EU Member States. The key difference is the diversity of policies and the number of economic policy tools in the hands of the countries inside and outside the Eurozone. Second, it is crucial that we can hardly

speak of stagflation where the total unemployment rate and the rate of inflation are relatively low. The stagflation periods in the Ancient Rome and, primarily, in the 1970s' United States were characteristic for dynamic depreciation of money (in Ancient Rome, inflation in many periods reached tens and sometimes even hundreds or thousands of percent each year, while the inflation in the 1970s' United States reached tens of percent annually). This is not the present case: although inflation has risen, it is still in low single-digit numbers, well below five percent.

The case is similar with unemployment. In the Western Roman Empire, the unemployment rate may have reached dozens percent of employable workforce, despite the fact that the Empire was in a state of constant war, and the military drew away substantial portion of employable workforce. The US unemployment rate tripled between the end of the sixties and mid-seventies from less than four percent to well beyond ten percent. Neither Europe as a whole nor the Eurozone are facing such prospects, or at least this development cannot be assumed based on the current data and knowledge.

We can interpret all this as follows: there certainly are some stagflation pressures in Europe that are even reflected in the real economic development figures. In qualitative terms, the parameters of stagflation have been met, admitting – with some overstatement – that prices have been rising and the unemployment has been rising or stagnating in 2011. Nevertheless, these signs have been very small in quantitative terms: the rates of inflation and unemployment are substantially lower than those witnessed in the historical periods labelled as periods of stagflation.

2.5 Conclusion

In light of the foregoing, it seems that we cannot support the notion that Europe as a whole is under a threat of stagflation, at least not in the true sense of the word. Although the term has been used by important economists and investors, the quotes must be seen in the context of the media in which they were uttered, i.e. in the context of popular journalism.

In addition – although stagflation is a somewhat mysterious economic phenomenon that combines rising inflation with rising unemployment, we will probably reserve the term to identify more distinctive periods in which the rise in prices and in the number of people without jobs is still much higher than what we're witnessing in Europe at this time.

Nevertheless, we cannot ignore the fact that the potential for this stagflation does exist, and is even implied by some statistics. And we must not ignore the fact that the future development can and is likely to be increasingly influenced by the debt crisis, the effects of which, when combined with stagflation trends, are very hard to predict. Of course, the need to repay debts and limited lending opportunities should in theory play against the potential stagflation; however, the current economic situation is very unclear, and various phenomena are appearing in correlations that were formerly unheard of. Moreover, the rising inherence of the states in the economy may cause many complications that are now hard to predict. It is apparent that similarly to the responses to the terrorists attacks of 11 September 2001, which have reduced civic comfort and, to some degree, curtailed citizen rights and, above all, some freedoms, the responses to the 2008 through 2010 crisis have reduced economic freedoms, increased regulation and strengthened the role of the state in economic policymaking. We can observe many efforts to pursue further and deeper regulations that can be deemed adequate (Matis, Strouhal, Bonaci, 2009), and many efforts that cannot yield any benefits in the long or even short run – such as the proposal of the European Commission to regulate the publishing of the rating agencies' ratings, which the popular media have labelled as the Brussels institutions' attempt to introduce censorship.

As we can see, the defining feature of the situation in Europe today is that it is unclear. The lack of clarity increases the weight of the risks, because the threat that a risk will be overlooked or underestimated gets serious exactly when the situation is unclear. That is why stagflation is not a phenomenon we should ignore, although the risk of stagflation is relatively low at this time.

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3 Monetary and Fiscal Policies in a Dynamic Game Model of the EMU

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3.1 Introduction

As a consequence of the recent financial and economic crisis, the "Great Recession", many countries found themselves in the uncomfortable situation of rising public sector deficits and debts due to expansionary fiscal policies enacted during the crisis to reduce the loss in output and employment. In most cases, those countries which entered the crisis with a lower stock of government debt had fewer difficulties in maintaining macroeconomic and political stability than those which already had a high burden of public debt before the crisis. Greece, for example, is now at the forefront of the countries threatened by bankruptcy. Other countries are about to follow and the idea of splitting up the European Economic and Monetary Union (EMU) into a "core" of fiscally sound and a "periphery" of unstable states is prominent in the media and among politicians.

Greek bonds are rated 'CC', 'CCC' and 'Ca' by S&P's, Fitch and Moody's respectively. The 'CCC' rating of Greek bonds by S&P's is now the lowest in the world. The last bail-out package for Greece by the troika of IMF, European Central Bank and European Commission includes a "haircut" (debt reduction) of 50% by the banks. There is a long discussion about the costs of such a "haircut" for the economy (e.g., Bulow and Rogoff (1989); Panizza et al. (2009)). A key question is whether financial markets "forget and forgive" the "haircut" or rather how soon they do so and admit access of the country that has defaulted. In this chapter we assume an overall 40% "haircut" for the entire "periphery", of which three quarters are paid by the governments (the taxpayers) of the "core". Due to the high level of the "haircut", financial markets punish this event by a non-negligible risk premium (Cruces and Trebesch (2011)).

In this text we will consider the impact of a negative demand shock, the resulting problems for government debt and the consequences of a "haircut" for the monetary union. We use a small macroeconomic model of an

asymmetric union consisting of two countries or blocs. As in the EMU, national currencies and national central banks are completely replaced by a common currency and a common central bank, which implies that the exchange rate is no longer available as an instrument of adjustment between the members of a monetary union. The two blocs are a "core" and a "periphery", distinct in terms of the initial levels of public debt and budget deficit and correspondingly different policy objectives. We investigate how a negative demand shock of approximately the size of the one which led to the "Great Recession", and a "haircut" for public debt affect the main macroeconomic variables in the union under different policy arrangements. A no-policy scenario assuming no active role for either fiscal or monetary policy is contrasted with scenarios of noncooperative (not coordinated) and cooperative (coordinated) macroeconomic policies. The main trade-off in this model occurs between output and public debt, and the way in which this conflict is resolved is what distinguishes the different scenarios considered. Although our model is only a distant approximation to the actual monetary union of the Euro Area, we intend to derive results which are relevant for the current situation in Europe by outlining some essential features of policy design in a monetary union.

Following the approach of quantitative economic policy, we regard dynamic macroeconomic policy making in a single country as an optimum control problem with respect to a single national policy maker's objective function. As we are dealing with open economies, the interaction of several decision makers with conflicting objectives constitutes an essential element of the policy making process. Different policy making institutions, which are responsible for specific policy instruments, often differ with respect to their preferences. More important, conflicts arise between policy makers from different countries, who primarily pursue their own national interests and do not care about the spillovers of their actions to other countries. These conflicts can best be modeled by using concepts and methods of dynamic game theory, which has been developed mostly by engineers and mathematicians but has proved to be a valuable analytical tool for economists, too (see, e.g., Başar and Olsder (1999), Petit (1990), Dockner et al. (2000)).

Dynamic games have been used as models for conflicts between monetary and fiscal policies by several authors (e.g. Pohjola (1986)). There is also a large body of literature on dynamic conflicts between policy makers from different countries on issues of international stabilization (e.g. Miller and Salmon (1985)). Both types of conflict are present in a monetary union, because a supranational central bank interacts strategically with

sovereign governments as national fiscal policy makers in the member states. Such conflicts so far were analyzed using either large empirical macroeconomic models (e.g. Haber et al. (2002)) or small stylized models (e.g. van Aarle et al. (2002), Neck and Behrens (2009)). In the present text we add to this an analysis of the consequences of asymmetry with respect to the initial level of government debt and of a debt reduction for the "periphery" bloc, a problem of obvious practical importance in the context of the current situation of the EMU.

Dynamic game models are usually too complex to allow for an analytical solution, hence numerical solutions or approximations are generally the only tool available. Here we use the OPTGAME algorithm (Behrens and Neck (2003), Blueschke (2011)) to analyze a macroeconomic policy problem for a two-country asymmetric monetary union. The OPTGAME algorithm delivers approximate solutions of dynamic games with a finite planning horizon for discrete-time nonlinear-quadratic difference games, i.e. games with quadratic objective functions and a nonlinear dynamic system. We apply OPTGAME to calculate the noncooperative feedback Nash equilibrium solution and a cooperative Pareto-optimal solution for our model of an asymmetric monetary union. In spite of the simple character of the model, we can shed some light on current sovereign debt problems in Europe by comparing and interpreting results from this modeling exercise.

3.2   The Model

For our study we use an extended version of the MUMOD1 model as presented in Blueschke and Neck (2011). This is a simplified macroeconomic model of a monetary union consisting of two countries (or two blocs of countries) with a common central bank. We do not attempt to describe a monetary union in general or the EMU in every detail. Instead, the aim is to introduce a model which can help to analyze the interactions between the governments of the two countries (fiscal policy) and the common central bank (monetary policy) in a monetary union when confronted with exogenous shocks on the whole system. Special attention is paid to the problem of containing public debt in a situation that resembles the one currently prevailing in the European Union.

Variables are denoted by Roman letters and model parameters are denoted by Greek letters. Capital letters indicate nominal values, while lower case letters correspond to real values. Three active policy makers

are considered: the governments of the two countries (blocs), responsible for decisions about fiscal policy, and the common central bank of the monetary union, controlling monetary policy. The two countries are labeled 1 and 2 or "core" and "periphery" respectively. The idea is to create a stylized model of a monetary union consisting of two homogeneous blocs of countries, which in the current European context might be identified with the stability-oriented bloc ("core") and the bloc of countries with problems due to high public debt ("periphery"). Of course, in Europe neither of these two blocs is homogeneous in terms of its economic structure or the fiscal policies which are pursued, nor is the distinction between "core" and "periphery" as clear-cut as assumed here. Nevertheless, some insights relevant to current macroeconomic problems in the EMU can be obtained from the model.

The model is formulated in terms of deviations from a long-run growth path and exhibits some Keynesian features of goods and financial markets. The goods markets are modeled for each country by a short-run income-expenditure (goods market) equilibrium relation (IS curve). The two countries under consideration are linked through national goods markets, namely exports and imports of goods and services. The common central bank decides on the prime rate, a nominal rate of interest under its direct control (for instance, the rate at which it lends money to private banks), and can influence the linked goods markets in the union in this way.

Real output (or the deviation of short-run output from a long-run growth path) in country i ($i = 1, 2$) at time t ($t = 1, \ldots, T$) is determined by a reduced form demand-side equilibrium equation:

$$y_{it} = \delta_i(\pi_{jt} - \pi_{it}) - \gamma_i(r_{it} - \theta) + \rho_i y_{jt} - \beta_i \pi_{it} + \kappa_i y_{i(t-1)} - \eta_i g_{it} + zd_{it}, \ (1)$$

for $i \neq j$ ($i, j = 1, 2$). The variable π_{it} ($i = 1, 2$) denotes the rate of inflation in country i, r_{it} ($i = 1, 2$) represents country i's real rate of interest, and g_{it} ($i = 1, 2$) denotes country i's real fiscal surplus (if negative, its fiscal deficit), measured in relation to real GDP. g_{it} ($i = 1, 2$) in (1) is assumed to be country i's fiscal policy instrument or control variable. The natural real rate of output growth, $\theta \in [0, 1]$, is assumed to be equal to the natural real rate of interest. The parameters $\delta_i, \gamma_i, \rho_i, \beta_i, \kappa_i, \eta_i, i = 1, 2$, in (1) are assumed to be positive. The variables zd_{1t} and zd_{2t} are non-controlled exogenous variables and represent exogenous demand-side shocks in the goods market.

For $t = 1, \ldots, T$, the current real rate of interest for country i $(i = 1, 2)$ is given by:

$$r_{it} = I_{it} - \pi_{it}^e, \tag{2}$$

where π_{it}^e $(i = 1, 2)$ denotes the expected rate of inflation of country i $(i = 1, 2)$ and I_{it} denotes the nominal interest rate for country i $(i = 1, 2)$, which is given by

$$I_{it} = R_{Et} - \lambda_i g_{it} + zhp_{it}, \tag{3}$$

where R_{Et} denotes the common (union wide) nominal rate of interest determined by the central bank of the monetary union (its control variable). λ_i is a risk premium for country i's fiscal deficit, i.e., country i's nominal rate of interest increases by λ_i percentage points for each percentage point of the real fiscal deficit-to-GDP ratio; λ_i is assumed to be positive. This allows for different nominal (and *a fortiori* also real) rates of interest in the union in spite of a common monetary policy due to the possibility of default or similar risk of a country (a bloc of countries) with high government deficit (and debt). zhp_{it} is an exogenous variable which models an additional risk premium after a "haircut" occurs (a "haircut penalty" by financial markets).

The inflation rates for each country $i = 1, 2$ and $t = 1, \ldots, T$ are determined according to an expectations-augmented Phillips curve, i.e. the actual rate of inflation depends positively on the expected rate of inflation and on goods market excess demand (a demand-pull relation):

$$\pi_{it} = \pi_{it}^e + \xi_i y_{it} + zs_{it}, \tag{4}$$

where ξ_1 and ξ_2 are positive parameters. zs_{1t} and zs_{2t} are non-controlled exogenous variables and represent exogenous supply-side shocks such as, for instance, oil price increases, introducing the possibility of cost-push inflation (which is not investigated in this chapter). π_{it}^e $(i = 1, 2)$ denotes the rate of inflation of country i $(i = 1, 2)$ expected to prevail during time period t, which is formed at the end of time period $t - 1, t = 1, \ldots, T$. Inflationary expectations are formed according to the hypothesis of adaptive expectations:

$$\pi_{it}^e = \varepsilon_i \pi_{i(t-1)} + (1 - \varepsilon_i)\pi_{i(t-1)}^e, \tag{5}$$

where $\varepsilon_i \in [0, 1]$ for $i = 1, 2$ are positive parameters determining the speed of adjustment of expected to actual inflation.

The average values of output and inflation in the monetary union are given by

$$y_{Et} = \omega y_{1t} + (1 - \omega) y_{2t}, \ \omega \in [0, 1] \tag{6}$$

$$\pi_{Et} = \omega \pi_{1t} + (1 - \omega) \pi_{2t}, \ \omega \in [0, 1] \tag{7}$$

The parameter ω expresses the weight of country 1 in the economy of the whole monetary union as measured by its output level. The same weight ω is used for calculating union-wide inflation in equation (7).

The government budget constraint is given as an equation for government debt of country i ($i = 1, 2$):

$$D_{it} = \left(1 + r_{i(t-1)}\right) D_{i(t-1)} - g_{it} + z h_{it}, \ D_{i0} \text{ given}, \tag{8}$$

where D_i denotes real public debt of country i measured in relation to real GDP. No seignorage effects on governments' debt are assumed to be present. zh_i denotes an exogenous "haircut" on the public debt.

As for the objective functions of the policy makers, we assume both national fiscal authorities to care about stabilizing inflation, output, debt and fiscal deficits of their own countries at each time t. This is a policy setting which seems plausible for the real EMU as well, with full employment (output at its potential level) and price level stability (no inflation) expressing country (or bloc) i's primary domestic goals, and government debt and deficit expressing its obligations from the Maastricht Treaty and the Stability and Growth Pact of the European Union. The common central bank is interested in stabilizing inflation and output in the entire monetary union, taking into account also a goal of low and stable interest rates in the union.

We assume quadratic loss functions to be minimized by each decision maker (player). Hence, the individual objective functions of the national governments ($i = 1, 2$) and of the common central bank are given by

$$J_i = \frac{1}{2} \sum_{t=1}^{T} \left(\alpha_{iy} \left(y_{it} - \tilde{y}_{it} \right)^2 + \alpha_{i\pi} \left(\pi_{it} - \tilde{\pi}_{it} \right)^2 + \alpha_{iD} \left(D_{it} - \tilde{D}_{it} \right)^2 \right) +$$
$$+ \frac{1}{2} \sum_{t=1}^{T} \left(\alpha_{ig} \left(g_{it} - \tilde{g}_{it} \right)^2 \right), \tag{9}$$

$$J_E = \frac{1}{2} \sum_{t=1}^{T} \left(\alpha_{Ey} \left(y_{Et} - \tilde{y}_{Et} \right)^2 + \alpha_{E\pi} \left(\pi_{Et} - \tilde{\pi}_{Et} \right)^2 \right) +$$
$$+ \frac{1}{2} \sum_{t=1}^{T} \left(\alpha_{ER} \left(R_{Et} - \tilde{R}_{Et} \right)^2 \right), \tag{10}$$

where all weights α are positive real numbers in the interval $[0, 1]$. A tilde denotes desired ("ideal") values of the respective variable. The joint objective function for calculating the cooperative Pareto-optimal solution is given by the weighted sum of the three objective functions:

$$J = \mu_1 J_1 + \mu_2 J_2 + \mu_E J_E, \ (\mu_1, \mu_2, \mu_E \geq 0, \ \mu_1 + \mu_2 + \mu_E = 1) \qquad (11)$$

Equations (1)–(11) constitute a dynamic game with three players, each of them having one control variable. The model contains 14 endogenous variables, seven exogenous variables and is assumed to be played over a finite time horizon. The objective functions are quadratic in the paths of deviations of state and control variables from their respective desired values. Several noncooperative and cooperative solutions can be determined for the game, which is nonlinear-quadratic and hence cannot be solved analytically but only numerically. To this end, we have to specify the parameters of the model. This is done with a view to creating a model resembling the macroeconomics of EMU.

T	θ	$\eta_i, \delta_i, \varepsilon_i,$ λ_i, α_{Ey}	$\gamma_i, \rho_i, \kappa_i,$ β_i, ζ_i	ω	$\alpha_{iy}, \alpha_{i\pi},$ $\alpha_{ig}, \alpha_{E\pi}$	α_{iD}	α_{ER}	μ_i, μ_E
30	3	0.5	0.25	0.6	1.0	0.05	3	0.333

Table 2 Parameter values for an asymmetric monetary union,
   $i = 1, 2$
   Source: Authors.

The parameters of the model are specified for an asymmetric monetary union; see Table 2. Here an attempt has been made to calibrate the model parameters so as to fit for the Euro Area. The data used for calibration basically include average economic indicators from EUROSTAT for the present 17 Euro Area countries from the year 2008. Mainly based on the public debt to GDP ratio and fiscal deficits, the Euro Area is divided into the two blocs of "core" (country or bloc 1) and "periphery" (country or bloc 2). The first bloc includes ten Euro Area countries (Austria, Estonia, Finland, France, Germany, Luxembourg, Malta, Netherlands, Slovakia and Slovenia) with a more solid fiscal situation and inflation performance. For reasons of simplification, this bloc is called the "core"; it has a weight of 60% in the entire economy of the monetary union (i.e. the parameter ω is equal to 0.6). The second bloc has a weight of 40% in the economy of the union; it consists of seven

countries with higher public debt and/or deficits and higher interest and inflation rates, on average (Belgium, Cyprus, Greece, Ireland, Italy, Portugal and Spain) and is called the "periphery". The weights correspond to the respective shares in Euro Area real GDP; we apply them to our model to make it resemble the macroeconomic relations in the Euro Area as closely as possible, given the simplified framework of our model. For the other parameters of the model, we use values in accordance with econometric studies and plausibility considerations.

The initial values of the macroeconomic variables, which are the state variables of the dynamic game model, are presented in Table 3. The desired or "ideal" values assumed for the objective variables of the players are given in Table 4. Country 1 (the "core" bloc) has an initial debt level of 60% of GDP and aims to decrease this level in a linear way over time to arrive at a public debt of 50% at the end of the planning horizon. Country 2 (the "periphery" bloc) has an initial debt level of 80% of GDP and aims to decrease its level to 60% at the end of the planning horizon, which means that it will fulfill the Maastricht criterion for this economic indicator. The "ideal" rate of inflation is calibrated at 2 percent, which corresponds to the Eurosystem's aim of keeping inflation close to but below 2 percent. The initial values of the two blocs' government debts correspond to those at the beginning of the "Great Recession", the recent financial and economic crisis. Otherwise, the initial situation is assumed to be close to equilibrium, with parameter values calibrated accordingly.

y_i	π_i	π_i^e	D_1	D_2	R_E	g_1	g_2
0	2.5	2.5	60	80	3	-2	-4

Table 3 Initial values ($t = 0$) for an asymmetric monetary union, $i = 1, 2$

Source: Authors.

$\overline{y}_{it}$	$\overline{y}_{Et}$	$\overline{\pi}_{it}$	$\overline{\pi}_{Et}$	$\overline{D}_{1t}$	$\overline{D}_{2t}$	$\overline{g}_{it}$	$\overline{R}_{Et}$
0	0	2	2	60↓50	80↓60	0	3

Table 4 Target values for an asymmetric monetary union, $i = 1, 2$ and $t = 1, \ldots, T$

Source: Authors.

3.3 Optimal Fiscal and Monetary Policies under a Demand Shock

The model can be used to simulate the effects of different shocks acting on the monetary union, which are reflected in the paths of the exogenous non-controlled variables, and of policy reactions towards these shocks. We assume that policy makers (the governments of each country or bloc, assumed to be homogeneous, and the central bank) aim to minimize their respective objective function subject to constraints which are given by the model, interacting according to some particular solution concept of the dynamic policy game. Here we analyze the results of two different exogenous shocks. First, let us consider a demand shock to the entire monetary union. In the first three periods both countries (blocs) of the monetary union experience a negative symmetric demand shock influencing their economies in the same way. This shock shall reflect a financial and economic crisis like the "Great Recession" of 2007–2010, which hit not only the Euro Area but nearly all countries in the world. It is widely agreed that this crisis can be regarded as mainly being due to a demand-side shock to some advanced economies (notably, the U.S.), which was transmitted to other countries through trade and financial channels. In particular, here we assume a negative demand shock of 2.0% of real GDP for the first period, 4.0% for the second period, and 2.0% for the third period, after which the disturbance vanishes: $zd_{i0} = 0$, $zd_{i1} = -2$, $zd_{i2} = -4$, $zd_{i3} = -2$, and $zd_{it} = 0$ for $t \geq 4$, $i = 1, 2$.

Most countries reacted to the financial and economic crisis by extending public spending and found themselves in the uncomfortable situation of rising public debts. Greece is the most prominent example with its bond rated close to default. A bailing-out package for Greece is on the way which includes a 60 percent "haircut" by non-institutional foreign creditors. In order to simulate this event in our model, we introduce a second exogenous shock. We introduce a 40 percentage points "haircut" for the public debt of country 2 ("periphery" bloc) at time 11, i.e. $zh_{2,11} = -40$ in $t = 11$ and zero for $t \neq 11$. Two thirds of this "haircut" is assumed to be paid by the public sector (the government, the taxpayers) of the "core" bloc. Taking the different ω_is into account, this results in an increase in public debt of country 1 (the "core" bloc) by 20 percentage points. That is, the variable $zh_{1,t}$ is set equal to 20 in $t = 11$ and to zero otherwise.

As shown in a recent study by Cruces and Trebesch (2011), larger "haircuts" are not "forgotten" soon by financial markets; instead, the country

which experiences such a "haircut" has to pay a higher risk premium for several years to follow. We use the average values from the results of their study to calibrate the exogenous variable $zhp_{2,t}$ which denotes the additional risk premium after the "haircut": $zhp_{2,11} = 10$, $zhp_{2,12} = 6$, $zhp_{2,13} = 5.5$, $zhp_{2,14} = 5$, $zhp_{2,15} = 4.5$, $zhp_{2,16} = 4$, $zhp_{2,17} = 3.5$, $zhp_{2,18} = 3$, $zhp_{2,19} = 2$, $zhp_{2,20} = 1$ and $zhp_{2,t} = 0$ otherwise.

Using the two shocks described above, the immediate negative symmetric demand shock and the "haircut" for the "periphery" after ten periods of (endogenously) increasing government debt with the following increase of the risk premium in the "periphery's" interest rate, we run the policy game (1)–(11) for different strategy choices of the policy makers. We calculate three solutions for the dynamic game: a baseline solution with the shocks but with policy instruments held at pre-shock levels (−2 for the fiscal surplus of the "core", −4 for the fiscal surplus of the "periphery", 3 for the central bank's prime rate), a noncooperative (Nash feedback) equilibrium solution and a cooperative (Pareto) solution. The results are shown in Figures 2 to 14, with the left panel showing the scenario without the "haircut" (with the demand shock only) and the right panel showing the results with the "haircut" for the "periphery" bloc.

In the baseline scenario without policy intervention (shown by the path denoted by "simulat" in Figures 2 to 14), the demand shock leads to lower output during the first five periods (a drop by about 1.5% in the first period, about 4.2% in the second period, about 2.5% in the third period, and then slowly returning to the long-run value of zero). This non-controlled ("no policy") simulation also results in a significant increase of inflation (but slightly decreasing during the first three periods) and a dramatic increase in real public debt until period 22. Due to the permanent public deficits, the fall in real GDP and the increase in interest payments, and given the non-availability of policy intervention in this scenario, public debt of country 1 (the "core" bloc) increases up to 120% of GDP; the public debt of the fiscally less prudent country 2 (the "periphery" bloc) even rises to 220% of GDP in period 24 and is still higher than 200% at the end of the planning horizon (see Figures 11 and 12 below).

Including the "haircut" shock (a 40 percentage points "haircut" of public debt for the "periphery" bloc and a 20 percentage points increase of public debt for the "core" bloc in $t = 11$) into this "no policy" baseline solution shall show the results from a scenario where the only policy reaction in the monetary union consists in the debt relief after a certain

amount of debt has occurred but no other reaction of either fiscal or monetary policy. This is not meant to be a realistic possibility but serves for comparisons with the results of the policy game. It implies several changes in the results. In the baseline scenario without policy intervention, such a "haircut" produces higher nominal interest rates for the "periphery" bloc and a correspondingly higher increase of public debt, despite the temporary reduction of public debt through the "haircut". At the end of the planning horizon, this results in a real public debt which is significantly higher than in scenario without "haircut". This is due to the fact that the "periphery" has to pay much higher interest on its debt following the "haircut" due to the higher risk premium. In addition, the real debt of the "core" country is also higher than in the scenario without "haircut" due to the additional debt taken over from the "periphery" by the "core". The values are 140% and 280% of GDP for the "core" and "periphery" blocs, respectively.

When policy makers are assumed to react to the exogenous shocks according to their preferences as expressed by their objective functions, the overall outcomes depend on the assumptions made about the behavior of the policy makers and their interactions as expressed by the solution concept of the dynamic game; see Başar and Olsder (1999), Petit (1990) or Dockner et al. (2000) for details. Here we consider the non-cooperative feedback Nash equilibrium solution of the dynamic game and the cooperative Pareto-optimal collusive solution. In the latter, we assume all players' objectives to be equally important, as expressed by assuming identical weights, $\mu_i = 1/3$, $i = 1, 2, E$).

The following figures show the time paths for all three control variables and the five most relevant endogenous variables. For the two dynamic game solution concepts considered, Figures 2, 3 and 4 show the trajectories of the control variables: real fiscal surplus g_{it} for both countries and the common central bank's prime rate R_{Et}. Figures 5 to 14 show the trajectories of the (short-run deviation of) output y_{it}, the individual (national) nominal interest rates I_{it}, the individual (national) real interest rates r_{it}, public debt D_{it} and the inflation rates π_{it}, respectively.

As can be seen from the left panels of Figures 2, 3 and 4, without the debt relief both fiscal and monetary policies react to the negative demand shock in an expansionary and hence countercyclical way: both countries create a fiscal deficit during the first three periods, and the central bank decreases its nominal interest rate. These Keynesian policy reactions help to absorb the negative demand shock to some extent. However, this

policy has a price in terms of its influence on public debt, and requires a restrictive fiscal policy after the crisis.

The expected effect of a "haircut" affects the policy choice already at this stage dramatically. If we compare the policy scenarios without "haircut" (left panels) and with "haircut" (right panels) in the first two Figures, we observe different intertemporal behavior of the national decision-makers. On the one hand, the "core" bloc exhibits an even more restrictive fiscal policy and creates significant budget surpluses in the "haircut" scenarios because it expects a loss to be written off by the "haircut", which amounts to an additional payment from the "core" to the "periphery". In contrast, the "periphery" bloc produces higher budget deficits in expectation of a "haircut", which is due to the moral hazard effect of the announcement of the "haircut". Afterwards the "periphery" bloc reduces its deficits and runs a more restrictive fiscal policy. Starting with time period 17 in the cooperative Pareto game (period 15 in the Nash game), the "periphery" bloc produces budget surpluses as well to deal with the rising public debt under the high interest regime following the "haircut". The central bank's policy is affected by the "haircut" in the cooperative scenario only, where it lowers its prime rate after the "haircut" to support the debt reduction policy of the entire union.

Comparing the Pareto and the feedback Nash equilibrium solution shows that the Pareto solution requires more active (expansionary) fiscal and monetary policies during the crisis and a few periods after, and less active (restrictive) policies afterwards in the scenario without "haircut". This results in a smaller drop in output for both countries over the whole planning horizon in the cooperative solution as compared to the noncooperative one. In addition, the Pareto solution results in rates of inflation which are closer to the desired value and in slightly lower debt to GDP ratios. Altogether one can say that the cooperative Pareto solution outperforms the feedback Nash equilibrium solution.

In the "haircut" scenarios, both the Pareto and the feedback Nash equilibrium solution show different policies for "core" and "periphery", where the main difference occurs in fiscal policy already before the "haircut" actually takes place, which is again due to the announcement effects already noted above. The "core" bloc runs an even more restrictive fiscal policy while the "periphery" bloc relaxes its austerity policy. This result applies both for the Pareto and the Nash solution, but it is much stronger in the noncooperative case. If we interpret the cooperative solution, which presumes a binding agreement among all parties involved
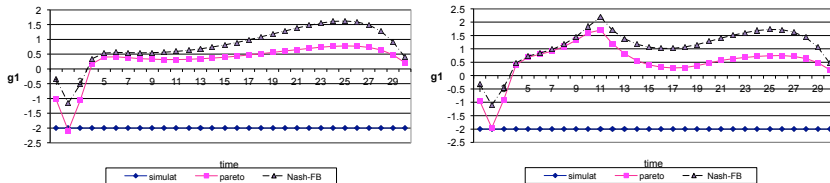
Figure 2 Country 1's fiscal surplus g_{1t}

       Note: Left without "haircut", right with "haircut".
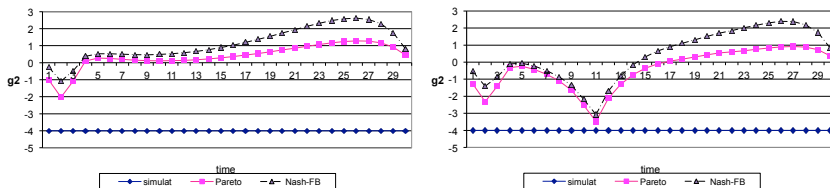
       Source: Authors.

Figure 3 Country 2's fiscal surplus g_{2t}

       Note: Left without "haircut", right with "haircut".
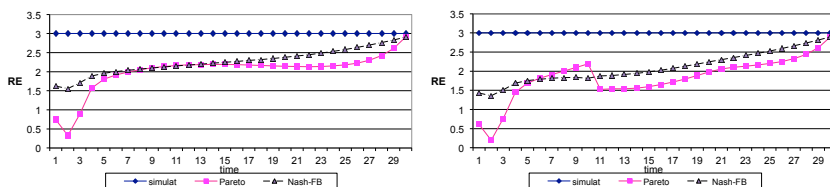
       Source: Authors.

Figure 4 Union-wide prime rate R_{Et} controlled by the central bank

       Note: Left without "haircut", right with "haircut".
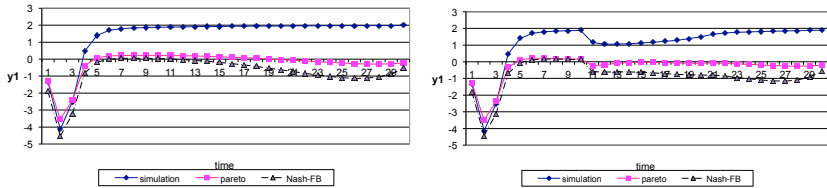
       Source: Authors.

Figure 5 Country 1's output y_{1t}

Note: Left without "haircut", right with "haircut".
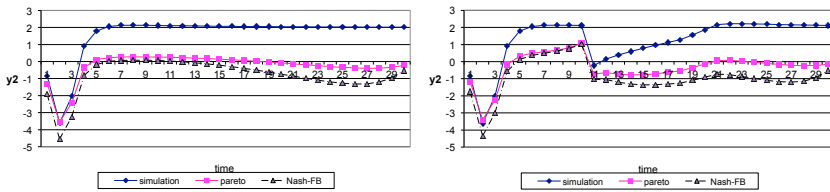
Source: Authors.

Figure 6 Country 2's output y_{2t}

Note: Left without "haircut", right with "haircut".
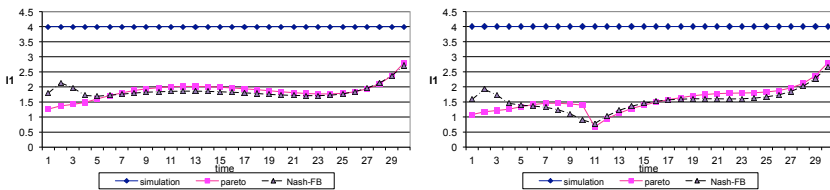
Source: Authors.

Figure 7 Country 1's nominal interest rate I_{1t}

Note: Left without "haircut", right with "haircut".
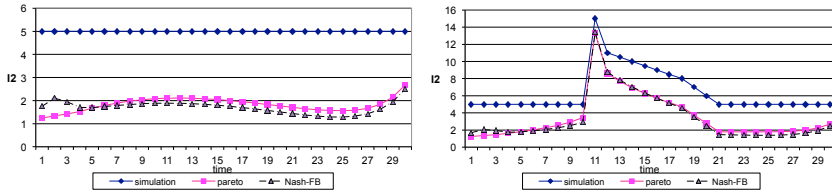
Source: Authors.

Figure 8 Country 2's nominal interest rate I_{2t}

    Note: Left without "haircut", right with "haircut".
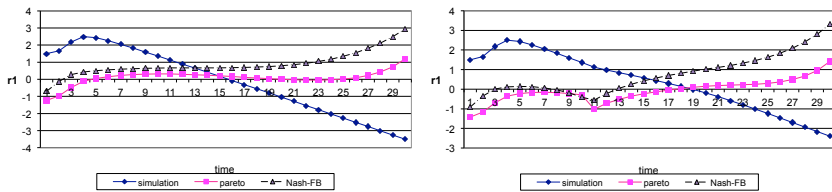
    Source: Authors.

Figure 9 Country 1's real interest rate r_{1t}

    Note: Left without "haircut", right with "haircut".
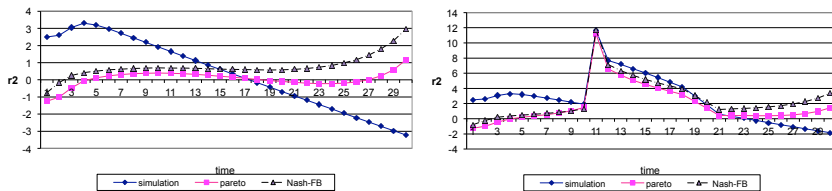
    Source: Authors.

Figure 10 Country 2's real interest rate r_{2t}

    Note: Left without "haircut", right with "haircut".
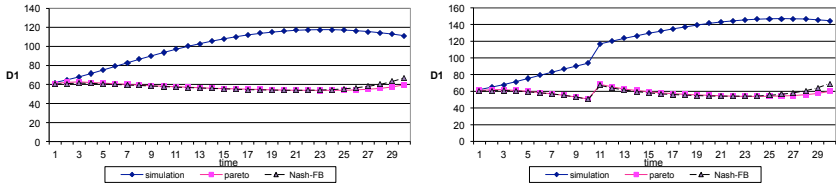
    Source: Authors.

Figure 11 Country 1's debt level D_{1t} (in % of GDP)

> Note: Left without "haircut", right with "haircut".
>
> Source: Authors.
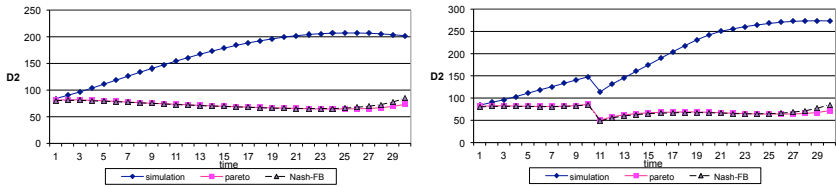
Figure 12 Country 2's debt level D_{2t} (in % of GDP)

> Note: Left without "haircut", right with "haircut".
>
> Source: Authors.
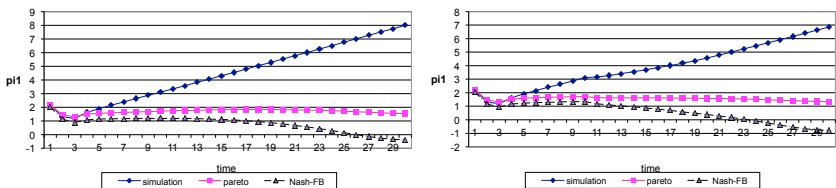
Figure 13 Country 1's inflation level π_{1t}

> Note: Left without "haircut", right with "haircut".
>
> Source: Authors.
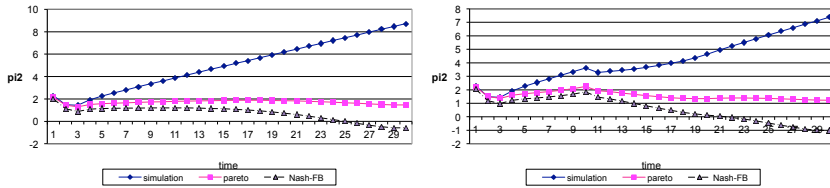
Figure 14 Country 2's inflation level π_{2t}

        Note: Left without "haircut", right with "haircut".

        Source: Authors.

(the "core", the "periphery" and the central bank), as a fiscal pact or even a fiscal union, this shows the advantage of such an institutional arrangement: it allows countries to rely on the joint effort to reduce public debt by (less) restrictive fiscal policies, and a lower prime rate by the central bank can be enacted as it can rely on the cooperation by the governments.

The qualitative behavior of the central bank in the "haircut" scenarios depends particularly on the solution concept. In the case of the non-cooperative feedback Nash equilibrium solution, the central bank shows nearly no reaction. In the case of the cooperative Pareto solution, on the other hand, after the crisis the central bank first disciplines the governments (especially that of the "periphery") by a higher prime rate, but supports them by an expansionary monetary policy after the "haircut" shock. As a result, the impact of the "haircut" shock on the output y_{it} can be reduced nearly completely for the "core" bloc and to a large extent for the "periphery" bloc.

As in to the scenarios without the "haircut", one can say that the cooperative Pareto solution outperforms the feedback Nash equilibrium solution also in the scenarios with the "haircut". These results can be also seen by looking at the minimum values of the loss functions calculated by (9) and (10) and presented in Tables 5 and 6. The cooperative Pareto solution outperforms the feedback Nash equilibrium solution and the uncontrolled baseline simulation in terms of J_1, J_2 and the sum of J_E, J_1 and J_2. The feedback Nash solutions imply lower values of the loss as compared to the Pareto solution for the central bank only. Also the scenario without the "haircut" dominates the one with the "haircut" for the two governments in terms of their loss functions considerably. As our model does not contain rational expectations, we do not have a

counterproductive effect of cooperation here. Instead, the collusive solution, giving equal weights to the two governments and the central bank, comes out as the winner in this macroeconomic policy game.

Strategy	J_E	J_1 ("core")	J_2 ("periphery")	$J_E + J_1 + J_2$
Simulation	111.73	1,203.48	5,126.72	6,441.93
Pareto	51.62	19.45	22.62	93.68
Nash-FB	48.82	49.80	67.15	165.77

Table 5 Values of the objective functions (9) and (10) (loss functions, to be minimized) for the scenarios without "haircut"

Source: Authors.

Strategy	J_E	J_1 ("core")	J_2 ("periphery")	$J_E + J_1 + J_2$
Simulation	67.47	2,184.77	7,845.21	10,097.46
Pareto	67.45	29.67	56.86	153.98
Nash-FB	66.17	68.41	104.93	239.50

Table 6 Values of the objective functions (9) and (10) (loss functions, to be minimized) for the scenarios without "haircut"

Source: Authors.

3.4   Concluding Remarks

By applying a dynamic game approach to a simple macroeconomic model of fiscal and monetary policies in a two-country (two-bloc) monetary union, we obtain some insights into the design of economic policies facing a symmetric excess demand shock, an increase in public debt as a consequence thereof, and possibly a "haircut" (public debt relief) for the country (bloc) with higher debt to GDP ratio. The monetary union is assumed to be asymmetric in the sense of consisting of a "core" with less initial public debt and a periphery with higher initial public debt. Ten periods after the crisis, public debt in the "periphery" reaches a level of 150% of GDP unless fiscal policy action is taken. In this situation, we investigate the consequences of a 40 percentage points "haircut" of the public debt paid mostly by the government of the "core". This is meant

to reflect the current situation in the EMU, where the high level of public debt accompanied by the concerns about irresponsible fiscal policy creates a stability problem for the entire union and seems to threaten the whole project of monetary unification in Europe.

Our model implies that optimal policies of both the governments and the common central bank are counter-cyclical during the immediate influence of the demand shock but not afterwards; instead, if governments want (or are obliged by the union's rules) to keep their public debt under control and avoid state bankruptcy, they have to implement prudent fiscal policies as soon as the crisis is over. The first choice for such a policy is the creation of (primary) budget surpluses, which must be maintained over an extended period. The suggested alternative of a "haircut" is shown to be counterproductive under our assumptions. It creates adverse incentives for the "periphery" and as a consequence considerable disadvantages for the countries of the monetary union. When expecting a debt relief, the best strategy for the "periphery" is to produce even more budget deficits until this event. This result occurs for both the cooperative Pareto solution and the noncooperative feedback Nash equilibrium solution. Taking the higher risk premium that is usually paid after a "haircut" into account results in the outcome that all players of the monetary union perform worse as compared to the scenario without a "haircut".

Of course, it would be very premature to infer strong conclusions for the current macroeconomic situation of the EMU from our very stylized model of strategic interactions among fiscal and monetary policy makers in an asymmetric monetary union. Nevertheless, a tentative result which we consider to be robust is that a "haircut" of public debt in the long run may hurt both the "core" and the "periphery" bloc of the monetary union. Instead, a policy of fiscal prudence with permanent budget surpluses over an extended period is called for to deal with the government debt crisis. Moreover, as in many other macroeconomic dynamic game models, the cooperative solution dominates the noncooperative equilibrium, which is inefficient. This can be interpreted, in terms of the present situation of the Euro Area, that a fiscal pact or a fiscal union may be preferable to noncooperative (nation based) fiscal policies, provided it is based on principles of balanced budgets (or budget surpluses) in normal times. It goes without saying that such an agreement presupposes a strong and credible commitment of all participants and an effective mechanism for monitoring and enforcing its rules.

Acknowledgements

3.5   References

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4 Parallel Currency as the Solution of Macroeconomic Imbalances of Countries in the Eurozone

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4.1 Introduction

The European Union currently faces one of the most serious problems in its history. Indebted countries endanger the stability of the European banking sector and the European politicians look for a convenient solution. Something must be done. Unfortunately, solutions presented so far have proved less effective. There is a need of a constructive solution. One of them may be the introduction of a parallel currency in one or more member states of the Eurozone for a limited period of time. Obviously, it has its benefits and costs as well. But economic research on this topic must be done just because of the need to broaden the variety of possible tools for handling crises similar to the current debt one. This chapter provides a basic concept of introduction of a parallel currency in a Eurozone country, based on which further research should be developed. We strongly believe that a parallel currency market in Eurozone countries may be settled and it may have positive effect on the economy, provided that the introduction is done in a proper and thoughtful way.

4.2 Theory of Optimum Currency Areas as the theoretical foundation of the EMU

The process of European monetary integration is theoretically developed within on the Theory of Optimum Currency Areas (OCA). OCA theory was firstly introduced by prof. Mundell (1969), then McKinnon, Kennen and Krugman contributed. Mongelli (2002) distinguishes four periods of its evolution: the pioneering phase (form the beginning of 1960s to the beginning of 1970s), the reconciliation phase (1970s), the evaluation phase (until the ratification of Maastricht treaty) and the empirical phase (afterwards).

Prof. Mundell was awarded a Nobel Prize in 1999 because of huge contribution to the development of theoretical framework under which modern currency unions are based. During the four mentioned period, the OCA theory has been gradually developed to its current shape. At the heart of the theory the concept of properties lies. Basically, the OCA properties define areas of the economy which should be set in appropriate way so that asymmetric shocks, which affect member states in a different way, are minimised.

Very briefly, the properties which were defined in the pioneering phase, as Mongelli (2002) states, are price and wage flexibility, mobility of factors of production, financial market integration, the degree of economic openness, the diversification in production and consumption, similarities of inflation rates and fiscal and political integration. Also synchronisation of business cycles is highly important, as show Komárek, Čech and Horváth (2003).

At the moment, the OCA theory faces a real empirical problem. It is the current Eurozone debt crisis which revealed several weaknesses of the theory. As one monetary policy may have problems with reaction to different inflation rates of countries in different trajectory of business cycle, and sticky prices block mechanisms of adaptation to asymmetric shocks, the OCA theory empirically faces conditions of a monetary union where its properties probably are not fulfilled in a sufficient way. This was claimed by Glovan (2004) even before the financial crisis erupted, when he says that," The OCA theory is non-operational and irrelevant in dealing with the present international monetary situation." After a couple years late, his words were proved.

Martin Wolf (Financial Times, 5/10, 2011) questions about how could the Eurozone fall into such a deep crisis. He argues that the EU lacks mechanisms for dealing with crises such as the current one. We do not consider directed bankruptcy, gradual write-off the debt or prolonging the bonds maturities as conceptual solution. The European Union really seems not to have an effective tool for solving the current problems which would boost economic growth of less competitive economies. It is therefore crucially important to theoretically complete the OCA theory with an effective conceptual tool for handling with crises such as the current one.

4.3 Parallel Currency Markets: Theoretical Background

When dealing with parallel currency markets several terms need to be explained. Firstly, the definition of parallel currency market (equivalent is parallel currency regime) may be as following: "a market where two or more currencies are circulating serving the purpose of medium of exchange and in some cases as the store of value" as Barro (2008) describes.

Basic distinguishing of parallel currency markets is provided by DeMeulenaere (1998) who divides them into three groups, i.e. markets with parallel, local and community currencies. Parallel currencies are used alongside the national currency on the whole territory of the state. Local currencies are used only on a specific geographical area, and community currencies serve only for purposes to a group of people who established this medium of exchange.

Board of governors of FED (2003) estimated that 55–60% of the total US currency in circulation in 2002 was held abroad. The geographical division was estimated to be 25% in South America (with Argentina the highest demander), 20% in Middle East and Africa, 15% in Asia and 40% in Europe, where particularly high users were Russia and former Soviet republics. Therefore, parallel currency markets are a global and widespread phenomenon.

In case of using the US dollar as a parallel foreign currency we use a term dollarization[16], euroisation for the same in euro. We also distinguish official dollarization, where the government makes the decision of introducing a foreign currency as legal tender, and unofficial dollarization where economic agents spontaneously use foreign currency as there is a need to realise transaction in it (ECB, 2004).

A term dollarization is often used with currency substitution. Currency substitution occurs when foreign currency is partly or entirely used as unit of account and medium of exchange (Feige et al., 2000). One can see that dollarisation and currency substitution are very close terms. Dollarisation is generally used for description of the general process of circulation of a foreign currency in the economy. More precisely, "dollarization is a summary measure of the use of foreign currency in the

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[16] Dollarisation is often used for description of economies where a foreign currency, which may not be US dollar but a different stable globally used currency, is circulating.

domestic economy. On the other hand, the cornerstone of the theoretical research of currency substitution, the theory of currency substitution, technically analyses the coexistence of two media which can be used for making transaction in the economy.

The most sensitive measure of currency substitution is the currency substitution index (CSI), which shows the fraction of a nation's total foreign currency in circulation made up of foreign currency and local currency in circulation (FCC + LCC).

$$\text{CSI} \equiv \frac{\text{FCC}}{\text{FCC} + \text{LCC}} \tag{12}$$

Last point to mention in the theoretical framework is the fact that for the purpose of making transaction any suitable object may serve. Barro (2008) provides an example of a currency which was used in prisons in Germany during the World War II. They were, essentially, cigarettes which were suitable because they were homogenous, durable and of convenient size for the smallest, and in packets also for large transactions. Many local and community currencies have the form of coupons, certificates or cheques, as shows DeMeulenaere (1998). A parallel currency therefore does not necessarily have to have the form of coins or banknotes as people are used to.

4.4 Parallel Currency as the Solution for Selected Eurozone States

The aim of the introduction of a parallel currency and therefore creating a parallel currency market in a Eurozone country is to support private sector activity while, at the same time, preserve the euro as part of the state identity. Boosting growth through increased consumption and company investment is to be realized through devaluation of the parallel currency. All the debt of public sector would, however, still be honored in Euros which would not allow the state to decrease it by devaluation.

The exchange rate would be determined by the national bank of the state which would manage the stock of parallel currency. There would be a need to start issuing some form of coupons to serve as a parallel medium of exchange. It would be a "no-name" form of certificate serving just for a limited period of time. Introduction would have to be done with maximum attention to managing the costs.

Euro	Parallel currency
Public sector	**Private sector**
Non-cash	**Coupons (certificates)**
Public debt	Wages in public and private sector
State social policy	Company investment
Municipal unit	Bank loans for companies and inhabitants
Taxation unit	Bank accounts for companies and inhabitants
	Prices of goods and services

Table 7 Purpose of introduction of a parallel currency
Source: Own compilation.

The introduction should be realized only for a limited period of time until the competitiveness and GDP is in increase. When the parallel currency has fulfilled the purpose of introduction, then, it is the right time to come back to euro for all transactions.

4.5   Benefits of Introduction of a Parallel Currency

There are two main benefits of introducing a parallel currency. The first is boosting the consumption and investment, the second is preserving the idea of European unification, the idea of Europe which stands behind monetary and fiscal integration.

If the parallel currency is devaluated against the euro and taxes are paid in the euro, the companies would save more financial resources. Obviously, this step would lead to lower budget revenues, but, according to the authors of this chapter, only in the short-term. In the long run, boosted economic growth would also result in higher tax revenues. This process should lead to increased competiveness of companies and higher export. As prof. Rusek pronounces "if the national currency after the reintroduction is adequately devaluated and will be driven by the market forces in the future, the reintroduction would mean a nearly immediate restoring and maintaining of competitiveness" (Lacina, Rusek et al., 2007).

The fact that the public debt would stay honoured in euro ensures that there would still be a duty to pay it off and not to get rid of it by devaluation. Therefore, this way is less financially demanding, even if

there would probably be a need of financial support from the EU or IMF sources.

4.6   Costs of Introduction of a Parallel Currency

By traditional distribution theory, adopting a common currency leads to costs which can be divided into these categories: transaction costs, direct costs, indirect costs, single costs, permanent costs, immediate costs and middle-term costs. We can use this terminology for the problem of introducing a parallel currency.

Main costs of introduction are transaction and administration costs, risk of increase of inflation, enlargement of shadow market and the risk of increasing indebtedness of households with connection to moral hazard. We can organize these terms into direct and indirect cost categories.

Direct costs	Indirect costs
Creation of exchange rate risk for parallel currency operations	Increase of price level
Administration and technical costs – shortly after introduction	Increase of indebtedness of households, moral hazard
Specific costs of banking sector	Enlargement of shadow economy

Table 8 Costs of introducing a parallel currency
      Source: Own compilation.

4.6.1   Administration Costs

Introduction of parallel currency is generally disadvantageous for high administration costs. Administration costs stem from the necessity of financial and public institutions to adapt their systems to another currency. For example, institutions need to change the technology and to adopt their software to calculations in two currencies (social transfers, taxes etc.). So, the administration costs highly affect the private and public sector.

4.6.2   Transaction Costs

Another problem related to the introduction is volatility of the exchange rate between common currency (i.e. Euro) and new parallel one. Agénor

(1992) shows the evolution of parallel markets on a group of developing countries in 1980s and according to him, premium typically displays large fluctuations over time and across countries. He states that in the period of uncertainty about macroeconomic policies or unstable political and social conditions, parallel market rates tend to react swiftly to expected future changes in economic circumstances (Agénor, 1992). Liberia experienced the US dollar as parallel currency with significant fluctuation of the exchange rate on the parallel market (Erasmus, Leichter, Menkulasi, 2009).

In our case, parallel currency will depreciate. The problem is that economic agents have to pay taxes in euro, but their income is in parallel currency. When they pay taxes, it will be necessary to exchange their income to the adequate amount of tax, but every exchange is connected with additional costs. On the other hand, when agents receive social transfers from the government in Euro, there may be a need to convert it to consumption in parallel currency.

4.7   Inflation and Shadow Market

The depreciation of parallel currency affects the price level which will lead to higher inflation. Higher inflation may cause a situation when producers only accepted euro and distrust of parallel currency may support shadow market.

But Europe also has its own experience with parallel currencies. Montenegro, at the beginning of its monetary reform, introduced German Mark as a means of payment. "At the beginning of 1999 the Montenegrin government started looking for a way to establish monetary independence for Montenegro. Starting from the practice of several years of both citizens and the business sector to perform transactions in and save in German Marks, the Montenegrin government chose a dollarization model with the German Mark as the local national currency. Instead the Dinar, the world's worst currency at the time, Montenegro introduced a parallel currency system – one in which the German Mark was made the legal tender and allowed to freely float alongside Montenegro's other legal money, the Dinar.", (CB of Montenegro, 2004). The real introduction of German Mark happened in 1996, so there are approximately 6 years of parallel currency market in Montenegro until the German mark became the only tender in January, 2001, resulting in establishing the euro in June 2002 (CB of Montenegro, 2004).

Introduction of a parallel currency market is just one part of the programme for boosting the growth and competitiveness. Strict economic reforms must follow. As CB of Montenegro (2004) states, euroisation itself cannot start economic growth and it should not be a substitute for economic reforms. The same pronounces prof. Rusek about introduction of parallel currency, "Further economic reforms are essential, along with on-going liberalisation of the labour market.", (Lacina, L., Rusek, A., et al., 2007).

4.8   Discussion

In the previous chapters we have outlined a concept of introduction of a parallel currency. So where does this stand in the chain of sequences we should follow? Gujarati (2004) proceeds in traditional econometric methodology in the following lines:

1. Statement of theory or hypothesis.

2. Specification of the mathematical model of the theory.

3. Specification of the statistical, or econometric, model.

4. Obtaining the data.

5. Estimation of the parameters of the econometric model.

6. Hypothesis testing.

7. Forecasting or prediction.

8. Using the model for control or policy purposes.

So, with our concept we are standing roughly about the level 1. We have argued that parallel currency should be able to devaluate which would increase consumption and boost the growth. This is our hypothesis. But for a real introduction there are still sevens steps to be done, so that a parallel currency in a Eurozone state is to be circulating alongside the Euro.

But parallel currency markets in Europe already exist. When a person walks in the street in Prague, she can see that people can pay in Euros. But Czech Republic is still using the Czech Crown. So euro is a parallel

currency there. Also in Germany we can find an example. Bundesbank, when adopting euro as legal tender did not specify a term of withdrawing the German currency from the market. So Deutchmark is a parallel currency in Germany alongside the euro, when some stores accept it. We could find many more examples in Europe. This only confirms the fact that parallel currency regimes are, in certain scale, a broadly spread form of market arrangement.

4.9 Conclusions

In this chapter we have tried to suggest a concept of introduction of a parallel currency in a Eurozone member state as the solution for crises similar to the current European debt crisis. We propose an arrangement where the economy is divided into two monetary sectors for euro and parallel currency. We propose the common currency to be used in public sector in non-cash form while a new parallel currency to be used in private sector in the form of no-name certificates. The main purpose of the introduction it to boost economic growth and increase competitiveness through devaluation of parallel currency. We have also discussed benefits and costs of introduction. We see a significant benefit in improving competitiveness and, at the same time, keeping the euro as legal tender, which means that the Eurozone would not split or that states would not come back to their former national currencies. Cost of introduction include transaction costs, administration and technical costs, specific costs of banking sector, risk of high inflation in parallel currency, aversion to making payments in parallel currency because of its riskiness, increase of indebtedness of households which is connected with moral hazard, and enlargement of shadow economy which stems from distrust to a new currency.

We are aware of the risk of such a step. On the other hand we consider current solutions to the debt crisis as less effective. Broadening the variety of tools for dealing with the crisis is necessary, and further research on parallel currencies as the solution to crises based on lower competitiveness should start.

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II
Eurozone Members
to the East

5 Estonian and Hungarian Economic Paths Into and Through the Crisis; A Comparison

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5.1 Introduction

This chapter compares economic policies before and during the recent financial and economic crisis in Estonia and Hungary. Its aim is to assess the results of the economic policies and to formulate interpretation and conclusions with regard to different policy outcomes. Such a comparison is justified, on the one hand, by the similarity of the economies of both countries; they are small open economies highly integrated within the European Union. On the other hand, the comparison may bring about interesting observations and conclusions due to major differences in economic policies of Estonia and Hungary. Firstly, while Estonia maintained a currency board system, Hungary adopted a wide exchange rate band/floating exchange rate regime during the period analyzed. In fact, while Estonian croon remained perfectly stable, the Hungarian forint was highly volatile. This difference also crucially determined the scope for monetary policy; only Hungary could use active interest rate policy which it applied both to stabilize the economy and the exchange rate. Secondly, both countries executed different fiscal policies. Estonia had a surplus in its public finances before the crisis and it allowed for some minor deficits when economic downturn came. Conversely, Hungary had had high budget deficits and it only chose to improve its fiscal stance shortly before the crisis and it continued efforts to further limit fiscal imbalances during the crisis.

These policy differences between two otherwise similar economies raise questions about their effects. A simple analysis of the data shows that the Hungarian economy was more stable in terms of the volatility of unemployment, inflation, GDP growth rates and current account. Hungary recorded lower average unemployment rates and current account

deficits but economic growth was faster and average inflation was lower in Estonia. This is an interesting observation as it contradicts claims that the single currency (or a credibly fixed exchange rate) creates a more stable economic environment, particularly in small, open economies. These results do not suit neither more general propositions of the theory of optimum currency area which claim that fixed exchange rates (or a common currency) in small, open economies bring nominal stability and that floating rates are ineffective shock absorbers. Moreover, these examples show that the link between stability and economic growth is not a simple relation. In particular, the interpretation provided argues that Estonia is an example of a boom and bust cycle typical for many fixed exchange rate regimes.

Countries most hit by the recent crisis are also the ones which have major problems with budget deficits and financial credibility. Estonia could be an example of fiscal virtues. Its good fiscal position certainly helped the country sustain credibility and to a degree flexibly accommodate to the shock. However it did not help Estonia to avoid a very deep recession. Good fiscal stance is good but it is cannot substitute for flexible exchange rates in the case of external shocks. The example of Estonia, as compared with Hungary, does not support the claim that the common currency should clearly bring advantages if only fiscal discipline were preserved.

The chapter is organized as follows. Section 5.2 presents the characteristics of economies and economic policies of both countries. Section 5.3 describes the effects of different economic policies. Section 5.4 contains an interpretation of the observations. The last section shortly concludes.

5.2 Estonia and Hungary; Similar Economies and Different Economic Policies

Economies of Estonia and Hungary are very similar in many respects. First of all, they are small, open economies. In 2008 GDP of Estonia was equal to 27.7 bln USD and GDP of Hungary reached 198.1 bln USD which is a few times more than in the case of Estonia, but in broader relative terms this is still typical for a small economy. Both countries are members of the European Union and they have introduced respective regulations and liberalized foreign economic relations, including free capital flows. The ratio of foreign trade to GDP is high; in Estonia in 2008 it was equal to 77.7% and in Hungary the value of the ratio was

81.7%; undoubtedly these are open economies. The countries exhibit also very similar levels of economic development. GDP per capita in Estonia was 20.6 thousand USD while in Hungary it was 19.7 thousand USD in 2008. What is also important and what may express the levels of economic development and international integration, Estonia and Hungary had in 2008 similar ratios of their domestic consumer price levels to the Euro Area average; it was respectively 75% and 65%. (OECD data, http://stats.oecd.org/Index.aspx?DataSetCode)

The economies are quite similar but economic policies of the two countries differ crucially.

Each of the countries pursue a different monetary policy strategy and applies a different exchange rate regime. Estonia adopted a currency board regime in 1992 and in 2004 the Estonian kroon entered ERM II. For the whole period the exchange rate remained at the official parity, until Estonia became a member of the Euro Area on January 1st, 2011. The exchange rate was not subject to serious tensions during the reference period, though rising money market interest rates in Estonia and the spreads vis-à-vis euro money market suggest an increase in risk perception in years 2008 and 2009.

The Bank of Estonia did not set monetary policy interest rates. Domestic (kroon) interest rates were directly affected by the monetary policy of the ECB through the operation of Estonia's currency board system and they also expressed specific country risks, as mentioned above. This latter factor meant that money market rates in Estonia during the worst phase of the crisis (years 2008 and 2009) were rising even though the ECB set its interest rate close to zero.

It is worth mentioning that the Bank of Estonia signed in February 2009 an agreement with the central bank of Sweden which strengthened the Bank of Estonia's capabilities to provide liquidity to the financial sector. However, there were no extraordinary needs for liquidity and the agreement has not been activated.

The central bank of Hungary between 2001 and February 2008 pursued an eclectic monetary policy strategy which combined inflation targeting and exchange rate control. The Hungarian forint was pegged to the euro with a fluctuation band of ±15%. On 26th February 2008 the exchange rate band was abolished and a free-floating exchange rate regime was adopted. This change was intended to eliminate possible conflicts between meeting the inflation target and maintaining the exchange rate within the band. However, "in October 2008, the central bank increased

the main policy rate by 300 basis points to stabilize the exchange rate in the midst of the financial market turmoil" (European Commission, 2010).

In fact, the exchange rate of the forint has been rather unstable in recent years and during the financial crisis in particular. An earlier weakening trend of the forint was reversed in mid-2006 when the adoption of fiscal consolidation plans improved investors' perception of Hungary. After some moderate depreciation the forint strengthened further until July 2008 when it started depreciating at a fast pace in the wave of the global financial tensions. In October 2008 Hungary decided to accept balance of payments assistance by international institutions (The European Union, IMF and the World Bank) at the same time tightening the monetary policy, as mentioned above. After a temporary stabilization the forint depreciated further until March 2009 when it started to recover as the situation in global financial markets calmed down – this trend has generally continued until now (September 2011).

This short overview of exchange rate fluctuations of the forint in recent years shows that it was prone to both domestic and external shocks and developments. In particular, it reacted strongly to the developments in the fiscal policy and to changing investors' sentiments reflecting the global financial crisis. These factors influenced the payments situation and the exchange rate played the role of a shock absorber in this respect – whether it has been effective is a matter of general economic policy results, as outlined and discussed further on.

The interest rate policy of the central bank of Hungary has been fairly active in recent years. In years 2006 and 2007 the base interest rate fluctuated between 6.25% and 8%. In April 2008 a series of interest rate increases started and in October 2008 the base rate reached its maximum of 11.5%. From that time on the interest rate was consistently lowered and it reached 5.25% in April 2010. In November 2010 a new series of modest interest rate hikes started as a reply to inflationary pressures and since then the rate has been raised two times more up to 6.0%.

Interest rate policy of the central bank of Hungary was clearly tight only in 2008 and 2009 when interest rate hikes accompanied falling inflation rates. In fact these increases were intended to counter financial market pressures, including the depreciation of the forint, and coincided with declining economic activity. In a sense, monetary policy was forced by the financial market to act pro-cyclically. Accordingly, forint money market interest rates and its spreads to the euro money market were

generally high and they much exceeded those of the money market in Estonia, especially during the crisis culmination in 2009.

What concerns fiscal policies in Estonia and Hungary, they have been quite different in recent years, too.

Public finances in Estonia were in surplus until 2007. However, this positive result was achieved in the situation of a rapid expansion of private sector expenditures and consequently buoyant fiscal revenues. Some part of high revenues was saved and provided fiscal buffers as accumulated assets of the government sector. When the crisis came, Estonia's fiscal position was fairly good.

As a consequence, in the situation of a downturn in the domestic demand and economic activity and in the face of the global crisis the Estonian authorities could avoid a fiscal contraction which would further worsen the economic situation. In 2008 the general government position deteriorated by 5.3 percentage points of GDP and the structural balance worsened by about 3.3 percentage points of GDP (European Commission, 2010). The deficit reached 2.8% of GDP in 2008 and the structural deficit rose to 4.0% of GDP. In the course of year 2008 efforts were undertaken to confine the deficit, which were continued in 2009. As a result the general government deficit declined to 1.7% of GDP in 2009 (structural deficit 0.2% of GDP) and in 2010 public finances were in surplus again (structural deficit 0.4% of GDP) (European Commission, 2011). This fairly good fiscal position was maintained in spite of a deep economic contraction in Estonia in 2008 and – particularly so – in 2009. Due to strong fiscal position before the crisis and the economic downturn Estonia managed to avoid fiscal policy which would be clearly pro-cyclical. Conversely, Estonia pursued fiscal policy which helped to restrain economic slowdown. Although, as the crisis unfolded, Estonia had to correct its rising deficit, it had enough fiscal space to allow for an increase in both headline and structural deficits as compared with pre-crisis years. This relative easing of fiscal policy did not impinge on the financial credibility of the government.

Budgetary positions looked completely different in Hungary. First of all, Hungary had high deficits before the crisis; they peaked in 2006 when the deficit reached 9.3% of GDP. In 2004 the Commission started the procedure of an excessive deficit against Hungary; it has been held in abeyance since February 2010. It was only in mid-2006 when fiscal policy was reversed and budget deficit was reduced to 3.7% of GDP in 2008. Structural deficit declined from 10.6% in 2006 to 4.1% of GDP in 2008

when the financial crisis hit. The economic downturn brought about a moderate increase in the public sector headline deficit which reached 4.5% of GDP in 2009 in spite of strong efforts to keep it under control; the structural deficit declined the same year to 2.2% of GDP. In 2010 the fiscal situation did not change much (headline deficit 4.2% and structural deficit 3.1% of GDP). (European Commission, 2010, 2011)

Hungary did not have much choice as financing needs were difficult to meet due to investors' concerns about the sustainability of budgetary positions and exchange rate stability. Hungary managed to restore confidence and put its public finances on a sustainable path but it had to do that against the winds of the crisis. Fiscal policy could neither support an economic recovery, nor even allow for automatic stabilizers. It had to be tighten to keep the deficit under control as the crisis developed.

The above sketch of economic policies in Estonia and Hungary presents how different they have been in the case of two otherwise similar economies. These policy differences provoke a question about their outcomes. At a first glance it seems that Estonia should do much better before and during the crisis.

According to the theory of optimum currency areas these small, open economies should benefit from having a fixed exchange rate or the euro. A credible peg – as in Estonia – should promote economic stability and enhance general credibility of the country. In fact, interest rate spreads were much lower in Estonia as compared with Hungary both in tranquil and stormy economic conditions.

Moreover, Estonia pursued a conservative, balanced budgetary policy. It was a major factor behind its high credibility. Estonia managed to save some budgetary proceeds in good times and it had enough room for a fiscal maneuver during the crisis not to be forced to run pro-cyclical policy when the crisis hit. Having no its own interest rate policy it was not able to use it to support economic recovery but it experienced a relatively modest rise in money market interest rates.

In the case of Hungary the exchange rate was unstable and it reacted not only to fundamental factors but also to speculative swings. Fiscal policy until 2006 was very lax, it undermined financial credibility of the country and it had to be tighten severely just before and during the crisis, thus exacerbating the downturn. In the situation of low credibility the central bank had to raise its interest rates, in particular to confine excessive changes of the – formally freely floating – exchange rate. This

also could aggravate the economic slowdown. Hungary had to recourse to international financial aid.

What seems so clearly superior at the first glance does not necessarily has to prove its merits when the effects are studied more carefully; that is the subject of the next section of this chapter.

5.3   The Outcomes of the Economic Policies of Estonia and Hungary

Since it is widely believed that a fixed exchange rate – and the single currency even more – should be propitious to economic stability and eventually to prosperity it is interesting to analyze a few variables which are important in this respect. They are unemployment rates, inflation rates, GDP growth and current account balances in both countries.

In Estonia unemployment (Table 9) was steadily declining from high levels at the beginning of the previous decade as the economy was booming and it exploded to record levels during the crisis. In Hungary it was rising for all the period between 2001–2010. However, for Estonia the average of 9.72% is higher than 7.46% for Hungary. Moreover, unemployment rates were much more volatile in Estonia as compared with Hungary: the variance is equal respectively to 14.1 and 3.1. This means that Hungary did much better than Estonia both in terms of the average rate of unemployment and its volatility. In 2011 (data for the second quarter) it dropped considerably in Estonia to 13.3% (as compared to 18.6% in the same period of the previous year) but it still remained higher than in Hungary (10.8 in July 2011) (all the data for year 20011 come from http://www.eestipank.info/dynamic/itp2/itp_report_2a.jsp?reference=502&className=EPSTAT2&lang=en for Estonia and from english.mnb.hu/Statisztika/data-and-information/mnben_statisztikai_idosorok for Hungary).

The average inflation during the period 2001–2010 was 3.21% in Estonia and 5.67% in Hungary. However, in Hungary inflation rates (Table 10) were less volatile; the variances are 8.3 for Estonia and 3.2 for Hungary. Both aspects of stability matter here; low rates of inflation and low volatility. In theory, they should go hand in hand; a major advantage of low inflation should be a reduced inflation volatility and enhanced predictability. What really matters is predictability – it is uncertainty that badly influences economic decisions, investment in particular (Sohmen,

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estonia	12.6	10.3	10.0	9.7	7.9	5.9	4.7	5.5	13.8	16.9
Hungary	5.7	5.8	5.9	6.1	7.2	7.5	7.4	7.8	10.0	11.2

Table 9 Unemployment rates in Estonia and Hungary, 2001–2010

Source: http://www.eestipank.info/dynamic/itp2/itp_report_2a.jsp?
reference=503&className=EPSTAT2&lang=en,
http://english.mnb.hu/
Statisztika/data-and-information/mnben_statisztikai_idosorok.

1971). However, in the case of Estonia (as compared with Hungary) lower average inflation does not mean less volatile and thus more predictable inflation.

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estonia	5.8	3.6	1.3	3.0	4.1	4.4	6.6	10.4	−0.1	3.0
Hungary	9.2	5.3	4.7	6.8	3.6	3.9	8.0	6.1	4.2	4.9

Table 10 Annual inflation rates (CPI) in Estonia and Hungary, 2001–2010

Source: http://www.eestipank.info/dynamic/itp2/itp_report_2a.jsp?
reference=503&className=EPSTAT2&lang=en, http://english.mnb.
hu/Statisztika/data-and-information/mnben_statisztikai_idosorok.

It is also worth noticing that inflation again gets dynamics in Estonia in 2011 – in the second quarter CPI reached 105-2 (100 in the same period 2010); in Hungary, conversely, price level has been further stabilizing (103.1 in July 2011, same month of proceeding year = 100).

GDP growth was much faster in Estonia in the analyzed period (Table 11). On average it was equal 4.12% as compared to 1.93% in Hungary during the previous decade. For the whole period the cumulated GDP growth was 46% and 21% respectively. In terms of economic stability, however, Hungary again had much better records; the variance is 53.6 for Estonia and 10.12 for Hungary.

Year 2010 showed that recovery in Estonia was slightly stronger. In the second quarter of 2011 GDP growth reached in Estonia impressive 8.4% (constant prices, % change to same period of previous year) while in Hungary GDP growth (volume) remained very slow (101.5 in July 2011, July 2010 = 100).

Current account deficits (Table 12) were on average higher and much more volatile in Estonia than in Hungary; the averages are 8.3% and

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estonia	7.5	7.9	7.6	7.2	9.4	10.6	6.9	−5.1	−13.9	3.1
Hungary	3.8	4.1	4.0	4.5	3.2	3.6	0.8	0.8	−6.7	1.2

Table 11 GDP real growth rates in Estonia and Hungary, 2001–2010

Source: http://stats.oecd.org/Index.aspx?DataSetCode=ULC_QUA.

5.7% of GDP and the variances are 47.4 and 12.4 respectively. Estonia's deficits were very high and persistent. What is also important and should be underlined here, the deficits turned into surpluses during the crisis; the change was particularly abrupt in Estonia. Following a strong fall in domestic demand, which led to lower imports, the current account balance of −9.7% of GDP in 2008 turned sharply into a surplus of 4.5% of GDP in 2009.

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estonia	−5.2	−10.6	−11.3	−11.3	−10.0	−15.3	−17.2	−9.7	4.5	3.6
Hungary	−6.0	−7.0	−8.0	−8.6	−7.6	−7.6	−6.9	−7.3	0.4	2.1

Table 12 Current accounts of Estonia and Hungary, as % of GDP, 2001–2010

Source: http://www.eestipank.info/dynamic/itp2/itp_report_2a.jsp?reference=503&className=EPSTAT2&lang=en, http://english.mnb.hu/Statisztika/data-and-information/mnben_statisztikai_idosorok.

Beyond these basic statistics it is also important to note that in the period 1998–2008 the share of foreign trade in GDP rose by 20.4% to 81.7% in Hungary while in Estonia it declined by 1.9% (which is quite exceptional) and it was at 77.7% in 2008, lower than in Hungary (http://stats.oecd.org/Index.aspx?DataSetCode). It is quite interesting in the context of a widely disseminated argument that fixed rates and a single currency promote foreign trade development.

Summing up, in spite of its poor economic policy Hungary achieved in the analyzed period much better economic results than Estonia except for the rate of GDP growth and average inflation. In spite of pro-cyclical fiscal and monetary policies, the volatile exchange rate of the forint and volatile interest rates the Hungarian economy was much more stable and on average it was closer to – or less far from – both internal and external equilibrium. The Hungarian economy also opened faster and wider than the Estonian one. Estonia, however, on average recorded

faster growth during the period 2001–2010 even when the recent deep recession is taken into account; it also regained fast growth in 2011. The data above show that Estonia's economy was growing faster not because it was more stable but in spite of its nominal and real instability (high volatilities). How can it be explained that the Estonian economy was relatively unstable and it was growing faster, anyway? These puzzles are considered in the next section.

5.4   A Draft Interpretation of the Difference of Economic Performance of Estonia and Hungary

Investment plays a crucial role in and it has direct impact on economic growth so its rates can help explain the rates of growth. Investment rates are presented in Table 13. It easy to notice that Estonia recorded considerably higher rates of investment each year between 2001 and 2008. The average values for that period are 31.2% of GDP for Estonia and 22.2% for Hungary. Although enthusiast of the euro are inclined to argue that this is a more stable macroeconomic environment that enhances investment we know that this argument does not generally hold in the case of Estonia and Hungary. However, there is one important aspect of stability which was present only in Estonia; this is the stability of the exchange rate. The absence of exchange rate risk could have a strong impact on foreign investment or – to express the same in different terms – on capital inflows and foreign financing of investment. High investment rates in Estonia were boosted by capital inflow. In fact, domestic savings played little role in capital formation in Estonia. There is a significant difference between Estonia and Hungary with respect to households savings rates (Table 14). They were negative in Estonia every year between 2001 and 2008 and sometimes took astonishingly high values. In Hungary, conversely, they were always positive and assumed fairly considerable values. Whatever the source of its financing, higher investment brought about

Country	2001	2002	2003	2004	2005	2006	2007	2008
Estonia	26.4	29.7	31.6	30.9	32.1	34.9	34.5	29.3
Hungary	23.0	23.1	22.3	22.5	23.0	21.7	21.2	20.9

Table 13 Investment rates in Estonia and Hungary – gross fixed capital formation, as % of GDP, 2001–2008
Source: http://stats.oecd.org/Index.aspx?DataSetCode.

Country	2001	2002	2003	2004	2005	2006	2007	2008
Estonia	−4.0	−6.5	−8.4	−11.7	−10.4	−9.6	−5.2	–
Hungary	8.5	6.4	4.3	6.8	6.1	7.5	4.6	3.0

Table 14 Households saving rates in Estonia and Hungary, % of disposable income, 2001–2008

Source: http://stats.oecd.org/Index.aspx?DataSetCode.

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009
Estonia	6.8	6.1	5.8	6.4	6.3	5.3	6.1	−3.8	−2.7
Hungary	6.3	3.8	5.2	5.2	3.4	3.2	1.3	2.1	−3.1

Table 15 Labour productivity growth in the total economy in Estonia and Hungary, annual change, %, 2001–2009

Source: http://stats.oecd.org/Index.aspx?DataSetCode.

higher rates of labour productivity growth (Table 15): the average for Estonia between 2001 and 2009 was 4.0% and for Hungary 3.0%. All in all, in the period analyzed the Estonian economy grew faster.

Even thought capital inflow in Estonia was sometimes excessive, it fuelled the boom and bust cycle and it substituted rather than supplemented domestic savings eventually it helped the economy to grow fast. In Hungary the effects of poor policies and external shocks could have been absorbed easily with a flexible exchange rate but it was not enough to give some positive dynamics to the economy; the situation was not conducive neither to abundant capital inflow (also because of the exchange rate risk) nor to high domestic capital accumulation (big public deficits!) which could boost investment.

The economic growth of Estonia before the crisis might be labeled "capital inflow and domestic spending led growth". The country's net international investment position deteriorated substantially, from −48.2% of GDP in 2000 to −81.8% in 2009. (ECB, 2010) This was not necessarily leading to a deep international division of labour and strong export so that the openness of the Estonian economy was not eventually impressive in terms of the share of foreign trade in GDP, also in comparison with Hungary. Of course, such a development path was unsustainable in a longer run. This proved particularly acute when the international financial crisis started, investors became more risk aware and averse. Es-

tonian economy had to adjust and to become less dependent on foreign financing.

The developments in Estonia before the crisis seem to match the paradigm of a cycle typical for many fixed exchange rate regimes and currency unions. The cycles are presented in the literature in Kiguel, Liviatan (1992), Calvo, Vegh (1992), Santaella, Vela (1996), Khamis (1996). Blejer and del Castillo (1996) present the role of private consumption patterns in the cycle leading to the Mexican crisis of 1994; private spending was also an important reason for large current account deficits in Estonia. The typical cycle starts with economic boom, inflation and rising current account deficits (due to real appreciation and capital inflow) and ends up with a currency crisis or stagnation/recession due to a necessary correction of high current account deficits. In the case of Estonia this second phase coincided with or was triggered by the financial crisis which made the economic downturn particularly acute. As a result Estonia experienced a boom and bust cycle in spite of its generally very responsible economic policy. This kind of a cycle can be also traced in some other countries of the European Union, Italy, Spain, Portugal (IMF, 2006, Basto, 2007) in particular.

What concerns a theoretical background of the phenomenon these cyclical macroeconomic developments which can be ascribed to fixed rates/ currency unions are completely beyond the theory of optimum currency areas. The mechanism of nominal and real divergences in a monetary union, and more generally of the cycle typical for many fixed exchange rate regimes, is theoretically explained with a model presented in (Koronowski 2009). The dynamics of the processes in the monetary union are also well recognized in a paper by Blanchard (2006) who cast an idea of "rotating slumps" and by Wyplosz (2006) elaborating on "diverging tendencies of competitiveness".

Hungary did not applied the recommendations of the optimum currency areas and did not try to join the Eurozone. In spite of its poor economic policy, in particular high public deficits and pro-cyclical fiscal policy, its economy was more stable than in Estonia. The exchange rate provided a useful balance of payments adjustment mechanism, no matter what was the character of the shock to be absorbed. It does not seem, either, that inflationary cost of depreciation have been high. Hungary being less credible than Estonia (and the forint less credible than the krone) paradoxically avoided the boom and bust cycle typical for – mostly credible, at least at the beginning – fixed exchange rates.

The external shock that both countries experienced was capital outflow (changing sentiments and perception of risk) rather than a decline in their exports. Even though one might argue that this was a speculative, non-fundamental change it anyway forced both countries to sharply adjust to this new situation in the balance of payments and to cut excessive current account deficits. In such a scenario Estonia should be more affected than Hungary if we believe that a flexible exchange rate is an effective shock absorption mechanism. Estonia also had to adjust its external position much further than Hungary due to its higher pre-crisis deficits. These deficits could not be financed any longer, at least without a major threat to the country's credibility. The loss of credibility would be particularly costly in the case of Estonia. For Hungary even a certain temporary loss of credibility did not have major negative consequences. In fact, the bail-out program for Hungary helped the country to adjust more mildly, with less acute consequences for necessary cuts in domestic spending, declining GDP and rising unemployment or – generally speaking – at a lower economic cost.

In this context it is interesting to quote Wyplosz (2010): *"Had Greece not been part of the Eurozone, it would have long undergone a major currency depreciation, like in Hungary in November 2008. The euro protects Greece."* In fact, this "protection" seems to be a major part of the problems which countries most hit by the crisis face. The euro not only has led to major balance of payments problems of some Eurozone countries (Koronowski 2011) and as a consequence – more often than not – to a sharp deterioration of the fiscal stance during the crisis but it also inhibits any viable solution of the problems. "Countries which have big external debts, excessive current account deficits, accompanied by high public deficits and public debts have no easy solutions to their problems in the monetary union. Fiscal 'consolidation' may be a reasonable postulate but the reason for which the problems are so severe in some countries is not their particularly strong fiscal expansion; fiscal 'consolidation' is certainly not the remedy. Their weak fiscal stance is rather an effect than a cause of the economic downturn and external imbalances. The trouble is that these countries which face negative, asymmetric developments have no economic instruments to deal with their problems; they gave up individual monetary and exchange rate policy. Moreover, it would not be easy to cut spending or raise taxes now when these economies are deeply in the crisis." (Koronowski, 2011) Fortunately for Hungary when it had to cope with major imbalances it still had its own currency.

This is not, however, the end of the story. It is true that Estonia gave up the exchange rate adjustment mechanism but its economy shows astonishing strength during the present recovery phase which makes it quite exceptional (Economist, 2011). Countries caught in the trap of the second phase of the cycle under a fixed exchange rate usually ended up with a currency crisis (as, for example, Mexico in 1994 or Argentina in 2001) or were condemned to pertaining recession as in the problematic Eurozone countries (where situation is much aggravated by their fiscal problems). None of that happened in Estonia. High credibility of the country certainly matters and this might be at least some reward for its responsible economic policy. However, other factors may play crucial role in this respect. It seems that the Estonian economy preserves fairly high nominal elasticity, in particular wages do adjust to the economic situation (Sippola, 2011). Sticky wages and prices are the constitutive assumption of the theory of optimum currency areas; if wages were elastic there would be no need for the exchange rate mechanism. In fact unit labour cost reacted to the crisis quickly and strongly in Estonia; they first fell down in the second quarter of 2009 (as compared with previous quarter) and were declining till the end of 2010, sometimes by considerable ratios (−6% in the fourth quarter 2009) (http://stats.oecd.org/Index.aspx?DataSetCode=ULC_QUA). Only Ireland underwent a comparable adjustment. In most of the problematic Eurozone countries unit labour costs remained generally stable in the period 2009–2011. It was also the case of our "benchmark" country – Hungary.

Summing up, Estonia before the crisis experienced a period of high but unsustainable growth led by capital inflow and booming private spending. This ended up abruptly when the crisis forced a sudden adjustment in the balance of payments. The fixed exchange rate (currency board/Eurozone membership) was propitious to overheating of the economy before the crisis and then it could not adjust and cushion the shock; the fixed rate caused major instability of the economy. However, it also busted investment and economic growth which – before the crisis and eventually on average – remained fairly high. In this sense both high instability and high growth might be triggered by the same factor. Fortunately, responsible fiscal policy in Estonia was important as it did not reinforce the excessive boom in the private sector and it eased the adjustment process during the crisis. Moreover, the case of Estonia is fairly exceptional due to high elasticity of wages that could to a degree do the job which otherwise demands devaluation ("internal devaluation" took

place). In Hungary the exchange rate of the forint, very unstable itself, was an effective adjustment – or shock absorption – mechanism. It also helped to mitigate the effects of poor economic policy. However, poor policy and volatile exchange rate have not been favourable to high investment (in particular foreign capital inflow) and fast growth. Hungarian economy was much more stable than the Estonian one – no doubt the exchange rate helped in this respect – but poor policies had bad impact on general credibility of the country and its currency and constrained economic growth. In face of major imbalances Hungary was fortunate to keep the forint and its flexible exchange rate. Whether Estonia could achieve better results under a system of a flexible exchange rate will remain an open question.

This limited comparison can only bring about limited conclusions. It covers two cases which are sub-optimal, each in its own way. Hungary had poor economic policy and Estonia had a fixed exchange rate (the euro) which I claim was not a good choice. This makes the comparison sharp: Hungary was not clearly worse than Estonia IN SPITE OF its poor policy. However, it would be interesting to include in the analysis other countries which had good policies and maintained their currencies. Czech Republic or Sweden seem to be good candidates.

5.5   Conclusions

This chapter compared economic policies and their effects in Estonia and Hungary before and during the recent financial and economic crisis. Both economies exhibit major similarities but their economic policies have been quite different. In particular, Estonia and Hungary applied opposite exchange rate regimes; a currency board and flexible rates respectively. Consequently, monetary policies were also different. Moreover, Hungary, in opposition to Estonia, had a rather lax and pro-cyclical fiscal policy.

When it comes to policy results it turns out that the Hungarian economy was more stable in terms of volatility of unemployment, inflation, GDP growth rates and current account. Hungary in the period analyzed recorded lower average unemployment rates and current account deficits but economic growth was faster and average inflation was lower in Estonia. It is paradoxical that the Hungarian economy in spite of its low credibility and poor policies was much closer to internal and external equilibria than the Estonian economy. It may also seem rather strange that Estonia recorded faster economic growth, anyway.

Before the crisis Estonia had exorbitant current account deficits which mirrored excessive private spending. The deficits were financed with high capital inflows. This spurred both economic growth (high investment) and inflation. Abundant foreign financing was possible due to high credibility of the country and its economic policies, including the fixed exchange rate. However, such "capital inflow and domestic spending led growth" was unsustainable and when the financial crisis hit it turned into another phase characterized with economic contraction and balance of payments realignment without the easing impact of a flexible exchange rate. The Estonian economy was "dynamic" both in terms of fast growth in booming years and high volatilities of major economic data in the whole period. In Hungary the economy had not been so overheated before the crisis and the current account deficit was less acute. The economic cost of balance of payments realignment was lower (in spite of pro-cyclical fiscal policy) thanks to the flexible exchange rate of the forint. However, even though Hungarian economy took advantage of the realignment mechanism of the flexible exchange rate and it avoided a boom and bust cycle, it never developed right incentives for and a milieu propitious to high investment and growth.

The comparison of Estonia and Hungary can bring to mind doubts concerning the alleged benefits of having a fixed exchange rate and eventually the common currency, even when fiscal order is preserved.

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6 Investigating the Reasons for Extremely Different Effects of the Recent International Financial Crisis in "New" EU-Member States: Poland Versus the Baltic Countries

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6.1 Introduction

The extremely divergent economic consequences of the recent International Financial Crisis (IFC) in "neighboring" countries of Eastern Europe represent the core topic of this contribution[17]: In 2009 the three Baltic countries experienced an economic downturn between fourteen and eighteen percent whereas the Polish economy still grew slightly. If one would alternatively consider the relevant effects for two years the difference would be further increased because the particular two-year Polish growth rate from 2007 to 2009 was close to 7 percent and the economic downturn in Latvia, e.g., for the same period reached 21 percent. This leads to a difference of about 28 percentage points in the economic outcome for EU countries in the same geographical area with very similar per capita incomes at the start of the crisis[18]. The two-year economic discrepancies in the economic development of Poland and the other two Baltic countries, Estonia and especially Lithuania, have been a bit less extreme, about 25 and 19 percentage points, respectively (see Table 16). After implementing considerable adjustment measures all three Baltic countries started to grow again in the second or third quarter of 2010. In 2011 they already accomplished growth above 5 percent of GDP.

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[17] This is an extended version of an earlier paper on the consequences of international financial crisis in Eastern Europe (Sitz, 2011).

[18] In 2008 the per-capita incomes of Poland and the Baltic countries in purchasing power parity were between 56 percent (Poland and Latvia) and 68 percent (Estonia) of EU-27 average. Lithuania's level was 61 percent.

	Poland	Latvia	Estonia	Lithuania	EU-27
2007	6.8	9.6	7.1	9.8	2.9
2008	5.2	−3.3	−3.6	2.9	0.5
2009	1.6	−17.8	−14.3	−14.8	−4.2
2010	4.0	−0.3	2.2	1.4	2.0
2011[1])	4.3	5.3	7.5	5.9	1.5
first neg. qu.[2)]	–	II/2008	I/2008	IV/2008	IV/2008
first pos. qu.[3)]	–	III/2010	II/2010	II/2010	I/2010

Table 16 Yearly Output Changes and First Quarter of Negative/ Positive Economic Development in the recent IFC

Note: [1)] Preliminary and WIIW estimates

[2)] First negative quarter relative to one year ahead

[3)] First positive quarter relative to one year ahead

Source: Eurostat, TGM interface, March 2011; WIIW, 2011; WIIW, 2012.

According to the following investigation the widely different economic outcomes[19] between Poland on the one hand side and the Baltic economies on the other – all of them countries in EU – are mainly due to different exchange rate regimes in the two "regions" (Poland vs. the Baltics), enormously divergent policy reactions – depending on country-specific room for maneuver of economic policy which has also been influenced by the exchange rate strategies followed –, differing reliance on foreign capital, and on debt denominated in foreign currency built up to finance the long-term process of catching-up to Western economies.

In order to clarify, it should be pointed out that all of the new member states became also members of the Economic and Monetary Union (EMU). A few of them fulfilled the convergence criteria in the last years and therefore have already adopted the Euro: Slovenia in 2007, Cyprus and Malta in 2008, two non-EEC economies, Slovakia in 2009, and in 2011 also Estonia. All the others have not adopted the euro so far. Because (nearly) all economic processes discussed and relevant for this chapter have taken place before 2011 Estonia is considered to be a member country "with derogation" for the period relevant, i.e. "not having adopted the Euro" (until end of 2010). Up to this time Estonia relied on a currency board as Lithuania has done and still does. That is a very rigid fixed exchange rate regime, in these cases anchored to the Euro. Also such a fixing has been and still is pursued by Latvia but as a con-

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[19] It might be added that in the rest of the world only Ukraine and Armenia suffered recently to a comparably extent from this financial crisis (Aslund, 2010).

Country	Status	Mechanism	Regime
PL	EMU-member with derogation:		Flexible rates
LA	NOT having yet adopted Euro	Since 2005: ERM II	Fixed rate
LT		Since 2004: ERM II	Currency board
EE **Until end of 2010:**	Not having adopted Euro	Since 2004: ERM II	Currency board
Since beginning of 2011:	Euro adopted		

Table 17 Status in EMU

> Note: ERM II: Exchange Rate Mechanism II
>   PL: Poland, LA: Latvia, LT: Lithuania, EE: Estonia
> Source: Sitz, 2011.

ventional fixed exchange rate strategy. Poland (also having not adopted the Euro) relies – contrary to the Baltic countries – on flexible exchange rates (see Table 17).

During much of the nineties Poland had been the most successful transformation economy (Becker et al., 2010). This country only relied on limited inflow of foreign capital to finance investment and experienced – of course no coincidence – relatively low current account deficits. As a consequence foreign indebtedness seemed to be generally manageable. Contrary to this strategy the catching up of Baltic countries has been based heavily on foreign capital – and was very, very successful up to 2007, but also increasingly vulnerable (Jevcak et al., 2010, Martin, 2010). Large capital inflows allowed high investment and also enabled to "finance" large current account deficits representing even double-digit (!) percentage rates of GDP in the last years prior to the crises. This provoked increasing vulnerability. Domestically high real growth led finally to tensions on the labor markets and very large wage and price increases followed by stark losses in international competitiveness of the Baltics.

Already in early 2008 – after the first clear signs of financial problems appeared in the middle of 2007 in the US – two of these economies, Latvia and Estonia, experienced pronounced declines in output also as a consequence of the economic development already sketched above. When in September 2008 Lehman Brothers went bankrupt, almost all European

economies were heavily affected and the Baltic countries, with Latvia hit hardest, ran into severe economic problems. The Latvian downturn had been especially intensified by financial problems of Parex Banka, the second-largest bank of that country, which had to be rescued by government intervention (Purfield and Rosenberg, 2010). In all Baltic countries the IFC led to double-digit output declines in 2009.

In what follows it will be attempted to explain the extremely different economic consequences of the IFC in the two "regions" under consideration: Poland being considered to be one and the three Baltic countries Lithuania, Latvia, and Estonia representing the other. Additionally I will also discuss shortly policy options which were available, e.g., with respect to the "choice" of the exchange rate regime.

6.2 Catching up, Exchange Rate Strategy, and Debt Structure

The economic transformation process in Central and Eastern Europe (CEE) started at large with the break-down of communist regimes in late 1989. In the Baltic countries it has been heavily intensified in the early 1990s after independence from USSR.

The differences in the stage of economic development between all these CEE countries and most economies in the "old" EU were (and still are) pronounced (Becker et al., 2010). Per-capita incomes of these two groups of countries in the early nineties could be described as being far apart, but the catching-up process of CEE countries has been in general very successful. Therefore the economic "distance" between "old" and "new" EU-members has been shrinking. But it should be mentioned that transformation and catching-up of some CEE countries (e.g. Czech Republic, Hungary) have been interrupted before IFC for different reasons or have been proved efficient only quite late (Bulgaria, Romania). In 1990 Poland initiated the earliest and an also very successful catching-up process. In the last decade, in early 2000s, two of the Baltic countries (Latvia and Lithuania) were on average the fastest growing among all CEE economies closely followed by Slovakia and Estonia (Landesmann, 2010).

To structure the 10 CEE countries[20] and to understand important characteristics of economic features and their framework for economic policy,

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[20] Eight CEE countries [Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Slovenia (SI), and Slovakia (SK)] became mem-

taking into account our topic here, we should differentiate their exchange rate regimes prevailing in the last years and – as a consequence – their options for monetary policy: Up to 2010 eight of the ten CEE countries had not adopted the Euro. Four countries (CZ, HU, PL, RO) follow(ed) a flexible exchange rate strategy with inflation targeting of varying strictness and (sometimes) managed floating. Four other countries (BG, EE[21], LA, LT) fixed their exchange rates since the nineties in various versions – now they are pegged to the euro – using slightly different versions of a currency board or having – as in the case of Latvia – a typical fixed-exchange-rate regime. Therefore these economies couldn't pursue independent monetary policies, the relevant monetary stance had to be admitted passively and depended mainly on forces driven by decisions of the European Central Bank and capital market developments. Contrary to this, it is well known that flexible exchange rates – as used in the first four countries – allow for autonomous monetary policy. The last two countries, Slovenia and Slovakia had already adopted the euro before 2011. Therefore for both of these economies capital flight has been of no special importance. Whereas Slovakia had not adopted the euro at the outbreak of IFC in September 2008, it introduced the euro sufficiently early so that the currency union represented a kind of protecting umbrella against dangerous capital outflow which would have been especially relevant for a non-member.

Mainly because of short-term hyperinflation in the early transition period public debt eroded almost generally and the (un-weighted) average of the three groups of countries just differentiated has been around the year 2000 approximately between 30 and 40 percent of GDP (Aslund, 2010). Until 2007 it fell almost continuously with the exception of the group of countries with flexible exchange rates[22]. After joining EU in 2004 the debt ratio fell for SI and SK until 2008 quite markedly. For the four currency-board/fixed-exchange-rate countries public indebtedness has been reduced even from an average of 28 percent of GDP in 2000 to only about 14 percent in 2007 (Aslund, 2010). Strong growth with bal-

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bers of EU in May 2004, two more, Bulgaria (BG) and Romania (RO), at the beginning of 2007. For completeness I would like to add that in 2004 also two Mediterranean countries, Cyprus and Malta, joined EU.

[21] It has been already mentioned that Estonia did adopt the euro as the third CEE country at the beginning of 2011.

[22] In 2008 Hungary had a public debt of about 70 percent of GDP, by far the highest among CEE-countries. Poland had the second highest public-debt level of 45 percent of GDP.

anced budgets or surpluses has been the reason for these developments in this last group of countries.

After sketching public indebtedness in CEE countries before the crisis in general gross *foreign* private and public debt will be discussed shortly. Most of the flexible-exchange-rate countries had relatively low gross foreign debt – less than or up to 50 percent of GDP at most: the Czech Republic, Poland, Romania, and additionally Slovakia which – some years before joining EMU – also had flexible rates. Hungary is the exception in this group with a foreign debt ratio of approximately 120 percent of GDP in 2008. The other countries – excluding only Lithuania – belong as Hungary to the club of economies with high international indebtedness having gross debt of about 100 to 130 percent of GDP in 2008: From this group Slovenia is already using the euro (as Estonia since 2011). Hungary – with flexible rates as already mentioned – experienced severe difficulties to cope with the consequences of the economic turmoil starting in 2008. It had to ask for IMF support as one of the first countries in this crisis. The remaining two economies, Latvia and Bulgaria, had fixed rates of the classic type or via a currency board. As long as economic expectations seemed splendid, large amounts of foreign capital flew into these countries, thereby also financing enormous current account deficits in the years before the crisis (Deroose et al., 2010, EBRD, 2010).

Besides also using a currency board, data indicate a clearly better situation for Lithuania in this context. In the last years prior to the crisis it had current account deficits larger than 10 percent of GDP, still relatively "modest" compared to the three other countries with a currency board or a fixed exchange rate (see partly Table 18). This more favorable situation is also reflected by a gross foreign debt share of only about 70 percent of GDP in 2008. Judging based on this information might lead to the following question: have the economic effects of the financial crisis in Lithuania been harsher because of "contagion"? One might probably think so because Bulgaria – also relying on a currency board – had extremely high current account deficits prior to the crisis (of more than 28 percent of GDP in 2007 and close to 24 percent in 2008) and its foreign debt has been larger than 100 percent of GDP, whereas the economic downturn has been with 5.1 percent of GDP in 2009 (Eurostat, 2011) relative to Lithuania comparatively modest. But it should be added that Bulgaria's current account deficit was – contrary to Lithuania – financed mainly by foreign direct investment (FDI) which led to less volatile capital flows. Differentiating by the fact whether such a deficit is financed

Year	PL	LV	EE	LT
2006	−3.8	−22.5	−15.3	−10.6
2007	−6.2	−22.4	−15.9	−14.4
2008	−6.6	−13.2	−9.7	−12.9
2009	−3.9	8.6	3.7	4.4
2010	−4.7	3.0	3.6	1.5
2011[1)]	−4.1	−0.8	3.1	−1.7

Table 18 Current Account Balance Relative to GDP: 2006 to 2011
> Note: [1)] Preliminary and WIIW estimates
> Source: IMF, 2011c, WIIW, 2012.

by FDI represents – according to Darvas and Pisani-Ferry (2008) – the best predictor that an economy may *overcome a crisis.*

On the other hand an efficient *predictor of crises* seems to be currency mismatch which indicates a large share of loans in foreign currency to all domestic loans. A rising "discrepancy" of this type reduces the probability to cope with such a crisis successfully (Darvas and Pisani-Ferry, 2008). As can be seen from particular data (Aslund, 2010) for loans in foreign currency relative to total credit, these ratios were 86 percent in Latvia and close to 80 percent in Estonia, followed by Hungary, Lithuania, Romania and Bulgaria – from almost 60 percent to about 50 percent. On the other end of this spectrum were Poland, Slovakia, and the Czech Republic with only a share of less than 25 percent at the end of 2008.

6.3   The International Financial Crisis and Its Different Consequences in Poland Versus the Baltic Countries

6.3.1   Outbreak of the Crises and Its Early Impacts

At the turn of 2007/08 the end of the real-estate boom could be felt also in some of the European countries which were experiencing such hype before in a remarkable way. For Western Europe see especially Spain and Ireland. The Baltic countries also had such a boom with price increases of about 130 percentage points in average (Purfield/Rosenberg

2010)[23]. The break-down of these price-hikes led also to less inflow of foreign capital and – already in early 2008 – to a significant reduction of GDP (more than 3 percent for the whole year) in two of the Baltic economies, Latvia and Estonia. Until the bankruptcy of Lehman Brothers in September 2008 it was generally expected that most of Europe could overcome this crisis, which started in the US, without pronounced negative impacts. But after the break down of Lehman the worst crisis since the early thirties of the last century developed extremely fast: Lending to enterprises had been reduced, came almost to a standstill between banks, and private investment had been partly cancelled.

In many European countries goods exports fell immediately, i.e. already in the last quarter of 2008 (!) very pronounced. This indicates an almost sudden reaction mainly concentrated on investment and long-term consumption goods and even more so on parts and components produced internationally by vertically integrated manufacturing firms (Stöllinger, 2010) by about or more than thirty (!) percent. Especially the sentiments in the US and Europe could be described as being close to panic. But some experts did not expect major consequences for CEE-countries with the exception of those experiencing the reversal of a large housing boom. Such expectations were based on the fact that "Eastern Europe" had virtually not invested in "toxic" assets offered and sold by US-American banks and investment houses. Indeed large amounts of such securitized credits – partly based on subprime credit to financially weak buyers of private homes – have been sold to Western European banks and investors. As could be seen rather soon the crisis also spread to Eastern Europe mainly because capital flows from the West to Eastern Europe were significantly reduced, stopped or even reversed (EBDR, 2009): A large majority of banking assets in CEE countries belong(ed) to daughters of Western European parent banks which were severely hit by the fall-out of the subprime crisis (Allen et al., 2010, Lahnsteiner, 2011). Flows induced through capital repatriation by mother banks represented another channel of international shock transmission. This particular strategy has been largely kept in check after the "Vienna Initiative" in January 2009 between all the Western banks which had daughter banks in EEC.

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[23] Aslund (2010) reports a little bit lower house price increases in average and differentiates by countries: Actually – and not surprisingly – this type of booms worked a little bit differently in the countries looked at: about 50 percent increases of house prices in Lithuania, 100 percent in Estonia, and close to 140 percent in Latvia.

Dealing with this crisis from a more general point of view it has been shown that the downturn in the "real" part of economy caused by a financial crisis can be properly modeled (Hall, 2010). What's difficult to account for is the typically sluggish recovery afterwards. To model and possibly predict such types of crisis Caballero (2010) calls for macro-model building also encompassing the propagation mechanisms of financial disturbances which are not sufficiently taken into account so far. Up to now these issues have been mostly discussed in the periphery of macroeconomics and not in its core.

6.3.2 Impact of the Exchange Rate Regime Chosen

Additionally to all other problems the partial reversal of capital flows led to a reduction of the money supply in currency board and fixed exchange rate countries, thereby strongly deepening the economic downturn in the Baltics. In countries with flexible exchange rates capital outflow initiated generally very significant devaluations, in Poland of more than 30 percent within a few months. This resulted in a sudden increase of international competitiveness of this economy. The Polish devaluation was estimated to have contributed positively to GDP by 3.2 percent between mid 2008 and mid 2009, during the core of the crisis (OECD, 2010, Welfe and Florczak, 2010).

Contrary to the situation prevailing in Poland having relatively low inflation even when the price effects of the devaluation were especially relevant, the Baltic countries were experiencing very inflationary developments (see Table 19) at the onset of the crisis based on massive inflow of capital and wage and price increases already in the pipeline – as has been mentioned above. Clearly higher inflation in 2007 compared with the rest of EU and generally double-digit inflation in 2008 led to a substantial loss in international competitiveness for goods and services produced in these economies. Already existing forces of contraction have been particularly reinforced by the IFC.

Still in 2008 Latvia, the Baltic country hit hardest, approached IMF and EU for financial support. IMF strongly suggested to devalue Latvia's currency considerably to regain international competitiveness. This has been turned down by the government – in line with public opinion. Economic reasoning was based on the following fact: the overwhelming majority of credits in Latvia, 86 percent at the end of 2007, were loans in foreign currency. Devaluation would have increased indebtedness of

Year	PL	LV	EE	LT
2006	1.3	6.6	4.5	3.8
2007	2.6	10.1	6.7	5.8
2008	4.2	15.2	10.6	11.1
2009	4.0	3.3	0.2	4.2
2010	2.7	−1.2	2.7	1.2
2011	3.9	4.2	5.1	4.2

Table 19 Yearly HICP Inflation Rate 2006 to 2011
Source: Eurostat, 2011, WIIW, 2012.

enterprises and private households considerably and would have led to a large number of bankruptcies thereby magnifying economic disaster sharply. Additionally this small economy, with just above two millions of inhabitants, is rather open and the share of domestic value added in exports is only limited because of the high import content. Therefore only a very large devaluation might have led to a remarkable improvement of the current account. This would have resulted in additional and – what seems even more important – unpredictable inflationary pressure. Based on this reasoning of Latvia's officials the IMF gave in: no change in the nominal exchange rate. The country relied instead on "internal devaluation" to accomplish large adjustment and consolidation measures, which meant wide-spread and partly extremely sharp wage and price reductions (Purfield and Rosenberg, 2010, Jevcak et al., 2010).

6.3.3   Economic Policy Reactions

Without ever approaching IMF the two other Baltic countries, Estonia and Lithuania, also relied on similar adjustment policies. All three economies reduced wages of public employees remarkably, Latvia, e.g., by 36 percent within little more than half a year! In 2009 each of the three Baltic countries reduced public expenditure by around 10 percent of GDP (Aslund, 2010, Purfield and Rosenberg, 2010). It should be added that in spite of these measures the overall effects on the budgets were still negative because receipts fell even more caused by two-digit contractions in GDP (Purfield and Rosenberg, 2010).

Pointing at these very substantial adjustment measures one has to take into account that Baltic governments are generally very market oriented,

the Estonian one is considered to be the most extreme in this context. But even more important seems to be – what must be emphasized – the apparent political inclination of the population to accept and support such sharp adjustment programs (Aslund, 2010).

In contrast to these Baltic policies and economic measures in response to the severe consequences of the IFC in their countries the Polish authorities reacted with expansionary monetary and fiscal policy; they reduced the interest rate from 6 percent to 3.5 percent (OECD, 2010) and increased public demand by about 4.5 percent of GDP (Anderson, 2010). We know now about the successful navigating of Poland through this crisis but in early 2009 experts were deeply concerned. That has been caused especially by the fact that the Polish Zloty was devaluing very sharply in a short time span (i.e. during the first months of the crisis). Therefore Poland discussed and finally has reached an agreement about the adoption of a new IMF facility, the so called "precautionary flexible credit line facility". It allowed the Polish authorities to rely – in case of necessity – on funds of $ 20.5 bil. supplied by the International Monetary Fund. Poland did not use this facility but it helped to stabilize expectations and to calm financial markets. With just this motivation in mind this facility has been "extended" in January 2011 and the relevant amount has been increased to more than $ 30 bil. (IMF, 2011a, IMF, 2011b).

Already before the crisis started, the Polish parliament passed a law establishing a reduction in income tax rates which came into effect only one year later. This resulted in an additional expansionary stimulus in the most vulnerable year (2009) positively affecting domestic demand (OECD, 2010).

6.3.4 Foreign Indebtedness and Indebtedness in Foreign Currency

After discussing the first two factors – the type of the exchange rate regime actually used and the nature of policy responses, respectively – at least partly responsible for the diverging country-specific economic outcomes during the crisis – a third aspect also relevant for explaining the vastly different effects of the international multi-dimensional shock will be discussed: Here we concentrate on possible vulnerability caused by a) high foreign indebtedness and additionally b) indebtedness of domestic economic agents in foreign currency. In a following subsection (6.3.5) also the different public debt situations of these economies will be discussed.

Ad a) Whereas in 2008 Poland had a ratio of gross foreign indebtedness of less than 50 percent of GDP, these figures have been a little bit above 115 percent of GDP for Estonia and 130 percent for Latvia, respectively, and (only) about 70 percent for Lithuania (see Figure 15). For three of these countries these figures increased during the crisis (up to the end of 2011), only Estonia did successfully reduce gross foreign indebtedness by almost 20 percentage points of GDP.

Ad b) The numbers investigated differ still more widely when concentrating on country specific ratios of loans in foreign currency to overall loans in that country. The relevant figures end of 2007 are 86 percent for Latvia and close to 80 percent in Estonia, about 55 percent in Lithuania, but less than 25 percent in Poland[24]. The percentage share of foreign currency loans in overall loans increased up to the end of 2010 in all investigated countries: in Latvia to 92 percent, in Estonia to 90 percent, in Lithuania to 74 percent, and in Poland to 32 percent (see Figure 16).

6.3.5 Public Debt

This leads to the fourth argument which should be considered dealing with the topic. This argument now – contrary to our results in discussion so far – would work "in favor" of the Baltic economies. For a long time their budgets have been mainly balanced or did exhibit even surpluses. Consequently their public indebtedness – the results of some earlier deficits – has been very low as can be verified by using figures for 2007 based on EU-definition: less than 4 percent for Estonia, about 17 percent of GDP for Lithuania, with Latvia's debt ratio lying in between. Poland's public indebtedness – in the same year – has been 45 percent of GDP, markedly higher than in the Baltics but still clearly below the Maastricht limit. This relatively high share of public indebtedness, the second highest number among the CEE-member states, could have also shaken somehow the confidence of international financial markets into the sustainability of economic policy. It might have been an additional reason why Poland asked for potential IMF support. It should be added that a Polish law demands the implementation of restrictive adjustment measures – with rising severeness – if public indebtedness reaches 50, 55 or even 60 percent of GDP. At the end of 2011 indebtedness is estimated to have risen in Poland to about 54 percent of GDP – thus closely avoiding further restrictive government measures –, in Latvia to 43 percent,

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[24] A result strongly influenced by Polish regulation which restricts loans in foreign currency.
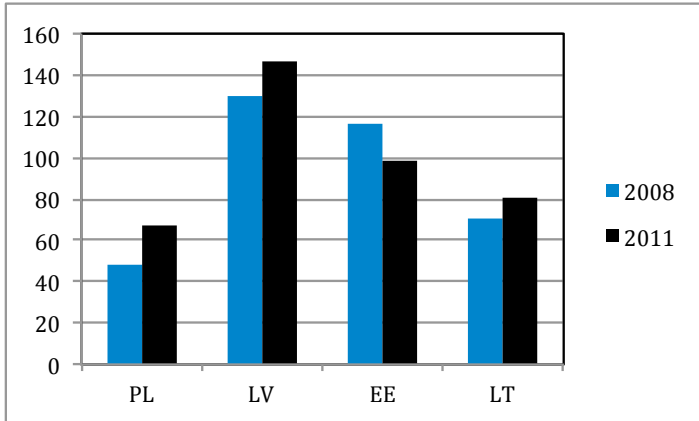
Figure 15 Gross Foreign Debt as Share (in percent) of GDP, end of 2008 and end of 2011

Source: Aslund, 2010, p. 17; different statistics of the relevant national banks 2012.
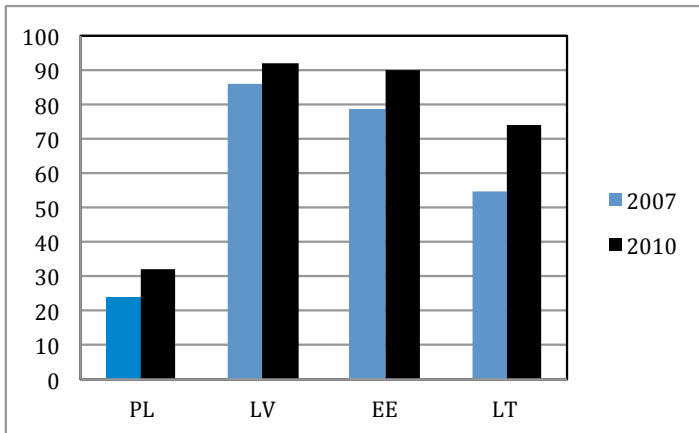
Figure 16 Share (in percent) of Foreign Currency Loans in Total Domestic Credit, end of 2007 and end of 2010

Source: Darvas and Pisani-Ferry, 2008; different statistics of the relevant national banks 2012.

in Lithuania to 38, and Estonia – only marginally – to 6 percent of GDP (WIIW, 2012).

6.4   Summary

Three arguments are at the forefront in explaining the vastly different economic impact of the IFC in the two "regions" focused on: Differences in the exchange rate strategy, very diverse reactions in economic policy, and vastly different degrees of international indebtedness and encumbrance in foreign currency.

I will begin with the last issue: When the crisis started, international overall indebtedness of two Baltic countries had been already very high (less so for the third economy, Lithuania), in Poland comparatively low. There has been also a very sharp difference in the currency denomination of loans between the two "regions": Whereas in Poland slightly less than a quarter of the total aggregate of loans has been denominated in foreign currency, this ratio has been close to 80 percent in Estonia and 86 percent in Latvia.

Taking into account such characteristics it would have been extremely dangerous for Baltic countries to devalue their currencies after having lost international competitiveness. Many more debtors would have been forced into bankruptcy and the inflationary developments caused by large depreciations would have been almost impossible to control. Therefore these countries kept their (nominal) exchange rates fixed. Contrary to that the Polish currency has been devalued by more than 30 percent which increased the economy's competeiveness considerably.

This leads to our final point trying to understand the very diverse economic outcome in the countries investigated: Besides the depreciation of the Zloty's exchange rate the Polish central bank reduced the interest rate appreciably and the government used expansionary fiscal policies to stabilize the economy when the crisis hit. Contrary to this strategy the Baltic countries did and had to resort to a deflationary strategy: Instead of "regular" depreciations they used and implemented "internal devaluations". In order to regain international competitiveness they reduced, at least partly, wages and prices – and in fact reached within one year surpluses in their current accounts; but these results have been also due to strong reductions in domestic demand caused by sharply falling income.

What seems necessary is a re-orientation of the growth model (Landesmann, 2010, Becker et al., 2010) for the Baltic economies, e.g., which

has been based so far very much on foreign capital allowing also extreme current account deficits. There seems to be some reason for hope on this matter because in 2011 Latvia and Lithuania managed to keep their current accounts almost balanced in spite of growth rates above 5 percent. Estonia reached a clear surplus in this account whereas even growing more pronounced. But one can't judge about success of economic policies after only one good year following the crisis. Whereas Poland was steering very successfully through economic turmoil and is also growing at a relatively high rate in the last two years, the twin deficits (in budget and current account) and also inflation seem to be matters of concern.

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7 Liquidity Ratios of Banks in Slovakia

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7.1 Introduction

Many banks struggled to maintain adequate liquidity during global financial crisis (BCBS, 2009). Unprecedented levels of liquidity support were required from central banks in order to sustain the financial system. Even with such extensive support, a number of banks failed, were forced into mergers or required resolution. The crisis showed the importance of adequate liquidity risk measurement and management.

The aim of this chapter is therefore to evaluate comprehensively the liquidity positions of Slovak commercial banks via different liquidity ratios in the period of 2001–2010 and to find out whether the strategy for liquidity management differs by the size of the bank.

There exist a relatively large number of studies which use liquidity ratios. However, most of them use liquidity ratios only as an input for further analysis, for example of investigation of the relationship between business cycle and bank performance (Jiménez et al., 2010; Maechler et al., 2007), determinants of bank lending activities (Ghosh, 2010; Tamirisa and Igan, 2008), determinants of bank liquidity (Aspachs et al., 2005; Bunda and Desquilbet, 2008; Moore, 2010), or for liquidity scenario analysis (Rychtárik, 2009). The other studies focus more on the liquidity of the whole banking sector and so does not use the values of ratios of individual banks (Andries, 2009; Praet and Herzberg, 2008; analysis of central banks and regulatory authorities). The contribution of this chapter is therefore obvious, as it evaluates the liquidity of significant part of banks operating in the Slovak banking sector in the past ten years.

The chapter is structured as follows. After introduction as a first section, second section defines liquidity and liquidity risk. Next section describes methodology and data used. Section 7.4 deals with values of liquidity ratios of Slovak commercial banks. Last section captures concluding remarks.

7.2   Liquidity and Liquidity Risk

Bank for International Settlements (BCBS, 2008) defines liquidity as the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. Liquidity risk arises from the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans.

The term liquidity risk includes two types of risk: funding liquidity risk and market liquidity risk. Funding liquidity risk is the risk that the bank will not be able to meet efficiently both expected and unexpected current and future cash flow and collateral needs without affecting either daily operations or the financial condition of the firm. Market liquidity risk is the risk that a bank cannot easily offset or eliminate a position at the market price because of inadequate market depth or market disruption (Drehman and Nikolau, 2009).

According to Aspachs et al. (2005), there are some mechanisms that banks can use to insure against liquidity crises:

- Banks hold buffer of liquid assets on the asset side of the balance sheet. A large enough buffer of assets such as cash, balances with central banks and other banks, debt securities issued by governments and similar securities or reverse repo trades reduce the probability that liquidity demands threaten the viability of the bank.
- Second strategy is connected with the liability side of the balance sheet. Banks can rely on the interbank market where they borrow from other banks in case of liquidity demand. However, this strategy is strongly linked with market liquidity risk.
- The last strategy concerns the liability side of the balance sheet, as well. The central bank typically acts as a Lender of Last Resort to provide emergency liquidity assistance to particular illiquid institutions and to provide aggregate liquidity in case of a system-wide shortage.

7.3   Methodology and Data

7.3.1   Liquidity Ratios

Liquidity ratios are various balance sheet ratios which should identify main liquidity trends. These ratios reflect the fact that bank should be

sure that appropriate, low-cost funding is available in a short time. This might involve holding a portfolio of assets than can be easily sold (cash reserves, minimum required reserves or government securities), holding significant volumes of stable liabilities (especially deposits from retail depositors) or maintaining credit lines with other financial institutions.

Various authors like Aspachs et al. (2005), Moore (2010), Praet and Herzberg (2008) or Rychtárik (2009) provide various liquidity ratios. For the purpose of evaluation of the liquidity positions of commercial banks in the Czech Republic we will use following four different liquidity ratios (13)–(16):

$$L1 = \frac{\text{liquid assets}}{\text{total assets}} \cdot 100 \ (\%) \tag{13}$$

The liquidity ratio $L1$ should give us information about the general liquidity shock absorption capacity of a bank. As a general rule, the higher the share of liquid assets in total assets, the higher the capacity to absorb liquidity shock, given that market liquidity is the same for all banks in the sample.

Nevertheless, high value of this ratio may be also interpreted as inefficiency. Since liquid assets yield lower income liquidity bears high opportunity costs for the bank. Therefore it is necessary to optimize the relation between liquidity and profitability.

$$L2 = \frac{\text{liquid assets}}{\text{deposits + short-term borrowing}} \cdot 100 \ (\%) \tag{14}$$

The liquidity ratio $L2$ uses concept of liquid assets as well. However, this ratio is more focused on the bank's sensitivity to selected types of funding (we included deposits of households, enterprises and other financial institutions). The ratio $L2$ should therefore capture the bank's vulnerability related to these funding sources. The bank is able to meet its obligations in terms of funding (the volume of liquid assets is high enough to cover volatile funding) if the value of this ratio is 100% or more. Lower value indicates a bank's increased sensitivity related to deposit withdrawals.

$$L3 = \frac{\text{loans}}{\text{total assets}} \cdot 100 \ (\%) \tag{15}$$

The ratio $L3$ measures the share of loans in total assets. It indicates what percentage of the assets of the bank is tied up in illiquid loans.

Therefore the higher this ratio the less liquid the bank is.

$$L4 = \frac{\text{loans}}{\text{deposits} + \text{short-term financing}} \cdot 100 \ (\%) \qquad (16)$$

The last liquidity ratio $L4$ relates illiquid assets with liquid liabilities. Its interpretation is the same as in case of ratio $L3$: the higher this ratio the less liquid the bank is.

These liquidity ratios are still in common. It is possible to calculate them only on the basis of publicly available data from banks' balance sheets and it is easy to interpret their values. Their disadvantage is the fact that they do not always capture all, or any of liquidity risk.

7.3.2   Data Used

We used unconsolidated balance sheet and profit and loss data over the period from 2001 to 2010 which were obtained from annual reports of Slovak banks. The panel is unbalanced as some of the banks do not report over the whole period of time.

Table 20 shows more details about the sample. The sample includes significant part of the Slovak banking sector (not only by the number of banks, but also by their share on total banking assets).

Bank	01	02	03	04	05	06	07	08	09	10
ČSOB					x	x	x	x	x	x
Dexia banka Slovensko	x	x	x	x	x	x	x	x	x	x
ISTROBANKA				x	x	x	x	x		
OTP Banka Slovensko	x	x	x	x	x	x	x	x	x	x
Poštová banka	x	x	x	x	x	x	x	x	x	x
Privatbanka	x	x	x	x	x	x	x	x	x	x
Slovenská sporiteľňa	x	x	x	x	x	x	x	x	x	x
Tatra banka	x	x	x	x	x	x	x	x	x	x
UniCredit Bank	x	x	x	x	x	x	x	x	x	x
VOLKSBANK Slovensko	x	x	x	x	x	x	x	x	x	x
VÚB banka	x	x	x	x	x	x	x	x	x	x
% share of observed banks on total assets	52	48	52	55	61	63	67	70	70	69

Table 20 Sample of banks
Source: Author's processing.

7.4   Results

We have calculated four different liquidity ratios (13)–(16) for each bank in the sample. In this chapter, we present descriptive statistics of liquidity ratios. Furthermore we focus on the relationship between bank liquidity and the size of the bank.

7.4.1   Descriptive Statistics of Liquidity Ratios

Descriptive statistics of liquidity measured by liquidity ratio $L1$ can be found in Table 21. Higher value of this ratio means higher liquidity. During the period 2001–2008, value of the ratio fluctuated only slightly. About one-third of assets of Slovak banks were liquid assets. However, the financial crisis has very negative impact on bank liquidity: the share of liquid assets in total assets has decreased rapidly in 2009. The liquidity situation has been even worse in 2010.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
mean	29.42	30.72	26.28	28.80	26.89	27.92	28.94	29.60	13.57	12.09
median	26.46	31.21	23.82	24.81	24.71	27.25	27.42	27.87	13.57	11.15
st. dev.	7.64	10.48	10.31	15.17	13.10	12.84	11.83	11.28	5.13	6.92
max.	47.52	43.87	44.71	60.76	47.16	49.84	53.87	53.99	22.40	28.66
min.	22.62	14.04	15.50	13.43	4.85	4.73	14.39	16.02	4.26	2.74

Table 21 Descriptive statistics for liquidity ratio $L1$ (in %)
    Source: Author's calculations.

Average values can be sometimes tricky so it is useful to consider other items of descriptive statistics as well. The lowest share of liquid assets in total assets has mainly VÚB banka and Tatra banka. In both cases, the volume of liquid assets decreased as a result of reduction of interbank transaction in the respective years. Due from banks in VÚB banka amounted to only one tenth of the values from previous years. Although the decline in due from banks in other banks has not been so huge, the trend has been the same. This could be a signal of market liquidity risk – the interbank market has frozen because individual banks have not trust to each other. Maximum values were recorded by Privatbanka and Poštová banka which were strongly focused on trading on the interbank market.

Table 22 contains values of the liquidity ratio $L2$ which has been calculated as a share of liquid assets in deposits and short-term borrowing.

Although values of this ratio differ slightly from values of ratio *L1*, the trend is the same. Results confirm that due to the financial crisis, the liquidity of Slovak banks has sharply decreased.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
mean	36.69	36.68	30.91	35.56	33.43	37.03	42.19	42.81	16.71	16.17
median	35.53	39.74	28.35	31.53	32.64	32.82	36.02	35.36	16.66	13.58
st. dev.	7.94	11.06	10.74	19.08	13.11	18.18	28.83	26.85	6.22	11.64
max.	52.89	49.91	49.49	71.51	55.03	78.40	117.97	113.44	25.53	46.36
min.	27.62	15.75	18.01	15.60	14.45	9.95	17.89	22.14	5.68	3.73

Table 22 Descriptive statistics for liquidity ratio *L2* (in %)
Source: Author's calculations.

Minimum values of the ratio have occurred in VÚB banka, Tatra banka and Slovenská sporiteľňa, which is caused by high value of deposits. Relatively higher value of this ratio had UniCredit bank and Privatbanka. According to the values recorded in Table 22, almost all Slovak banks are sensitive to potential massive deposit withdrawals.

Descriptive statistics for liquidity ratio *L3* is presented in Table 23. Increase in lending activity confirms that Slovak banks have become less liquid.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
mean	33.00	38.17	41.32	39.81	43.29	45.92	52.06	51.17	57.59	60.57
median	30.86	43.09	43.71	39.42	43.98	50.01	53.94	54.55	59.48	62.65
st. dev.	12.26	13.47	12.74	15.22	16.72	11.66	10.72	14.59	16.20	13.46
max.	52.63	57.63	61.83	63.05	71.41	59.36	67.84	72.01	75.69	79.06
min.	14.87	18.76	26.25	11.77	16.23	26.47	31.56	22.98	23.05	34.78

Table 23 Descriptive statistics for liquidity ratio *L3* (in %)
Source: Author's calculations.

Minimal and maximal values indicate significant differences in business strategies of banks. Volksbank and OTP Banka have the highest share of loans in total assets and are most willing to provide loans. On the contrary, Privatbanka, Poštová banka and Slovenská sporiteľňa reached minimum values of the ratio *L3*. Slovenská sporiteľňa started to focus on lending in 2004; the values of the ratio were very low until the end of 2003. Privatbanka and Poštová banka belongs to banks that rather than lending focus on trading with securities and on transaction on the interbank market.

Results of the liquidity ratio $L4$ can be found in Table 24. As in case of results from Table 23, high value of this ratio means low liquidity. The value of the last ratio also confirms that the liquidity of Slovak banks is gradually decreasing.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
mean	43.53	47.43	49.63	49.39	57.46	62.86	70.62	69.54	71.82	78.73
median	36.40	47.31	51.79	47.10	52.68	61.82	71.06	69.32	78.90	83.54
st. dev.	25.48	23.61	18.68	22.53	24.49	19.80	17.61	23.17	22.66	21.91
max.	101.90	98.82	87.82	85.81	103.22	104.10	99.87	112.06	93.21	103.82
min.	16.36	20.83	29.76	13.85	25.61	35.70	36.06	37.03	27.83	41.43

Table 24 Descriptive statistics for liquidity ratio $L4$ (in %)

Source: Author's calculations.

Due to significant lending activity, together with other source of financing, OTP, ISTROBANKA and Dexia banka have the highest share of loans in deposits and short-term financing. In contrast, Slovenská sporiteľňa, Privatbanka and Poštová banka significantly contributed to reducing the average value of the ratio $L4$. As it was mentioned above, they do not focus only on lending.

7.4.2   Liquidity Ratios by Group of Banks

Now we focus on the relationship between the size of the bank and its liquidity. We will take into account only the values of ratios $L1$ and $L3$, because these ratios are easy to interpret and did not achieve so extreme values.

As it can be seen from Figure 17, big banks are least liquid. It seems that big banks insure against liquidity crises mainly by strategies connected with the liability side of the balance sheet: they rely on the interbank market or on a liquidity assistance of the Lender of Last Resort. This finding fully corresponds to the well known "too big to fail" hypothesis. If big banks are seeing themselves as "too big to fail", their motivation to hold liquid assets is limited. The liquidity of medium sized banks is above average, the liquidity of small banks is about average. Small and medium sized banks hold buffer of liquid assets.

The results of liquidity ratio $L3$ by group of banks are quite surprising: small and medium sized banks are most willing to lend and thus theoretically the least liquid (see Figure 18). This is the completely opposite
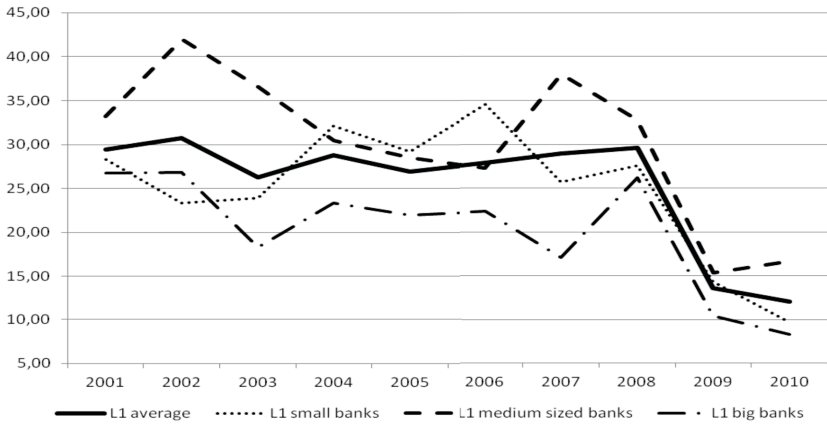
Figure 17 Liquidity ratio *L1* by group of banks
Source: Author's calculations.
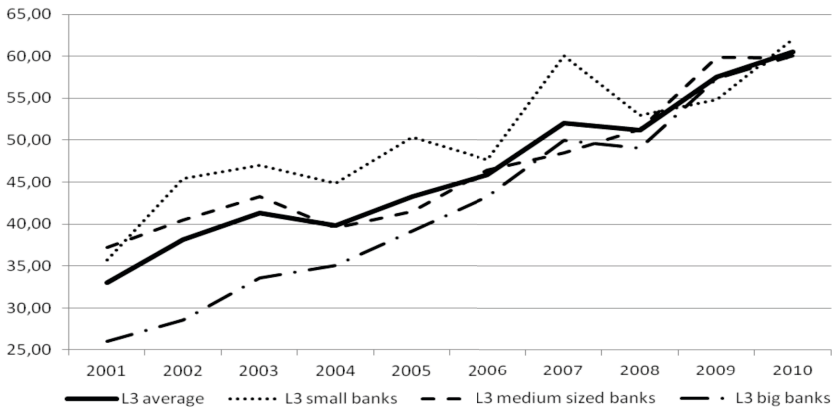
Figure 18 Liquidity ratio *L3* by group of banks
Source: Author's calculations.

finding. To interpret the values of both ratios together, we should conclude that big banks lend only little but at the same time, their liquidity is also very low. However, it should be emphasized that the average is deceptive in this case because it was strongly influenced mainly by the values of Slovenská sporiteľňa (as it was mentioned above). Values of other big banks (Tatra banka and VÚB banka) are higher and closer to the average.

7.5 Conclusion

The aim of this chapter was to evaluate comprehensively the liquidity positions of Slovak commercial banks via different liquidity ratios in the period of 2001–2010 and to find out whether the strategy for liquidity management differs by the size of the bank.

We have calculated four different liquidity ratios for each bank in the sample. Results of ratios based on the share of liquid assets showed that during the period 2001–2008, the level of liquidity fluctuated only slightly. However, the financial crisis has very negative impact on bank liquidity in 2009 and 2010. Results of ratios based on the share of loans showed that due to the increase in lending activity, Slovak banks have become less liquid. Almost all Slovak banks are sensitive to potential massive deposit withdrawals. Values of ratios are influenced by business strategy of banks.

Furthermore we focused on the relationship between the size of the bank and its liquidity. We have found that big banks are least liquid. While ensuring liquidity, big banks rely on the interbank market or on a liquidity assistance of the Lender of Last Resort. On the contrary, small and medium sized banks hold buffer of liquid assets. Big banks (mainly Slovenská sporiteľňa) are simultaneously least willing to provide loans.

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8 Relationship Between Economic Performance and Government Expenditure in the Czech Republic

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8.1 Introduction

The economy of the country is greatly influenced by the level and the structure of government expenditure. The government expenditure is an important tool for national governments to mitigate the uneven economic development and economic shocks across individual countries. Government expenditure plays important role in a fiscal policy of each country as a possible automatic stabilizer as from a Keynesian perspective, there is a view that government expenditure should act as a stabilizing force and move in a countercyclical direction. Procyclical fiscal policy is conversely policy expansionary in booms and contractionary in recessions. Serven (1998) points that procyclical fiscal policy is generally regarded as potentially damaging for welfare: it can raise macroeconomic volatility, depress investment in real and human capital, hamper growth, and harm the poor. If expansionary fiscal policies in "good times" are not fully offset in "bad times", they may also produce a large deficit bias and lead to debt unsustainability and eventual default. If a government respect a basic prescription that fiscal tools should function countercyclical, the optimal fiscal policy involves a decreasing of government expenditure in "good times" and a increasing of government expenditure in "bad times". Contrary to the theory (it implies that government expenditure is countercyclical), a number of recent studies found evidence that government expenditure is procyclical. See Hercowitz and Strawczynski (2004), Alesina et al. (2008), Rajkumar and Swaroop (2008 or Ganeli (2010) for more details. Talvi and Vegh (2005) show that fiscal procyclicality is evident in a much wider sample of countries. Lane (1998) finds procyclicality in a single-country time series study of Irish fiscal policy. As Fiorito and Kollintzas (1994) document for G7 countries, the correlation between government consumption and output indeed appears to show no pattern and be clustered around zero. Lane (2003) also

shows that the level of cyclicality varies across expenditure categories and across OECD countries. Abbot and Jones (2011) test differences in the cyclicality of government expenditure across functional categories. Their evidence from 20 OECD countries suggests that procyclicality is more likely in smaller functional budgets, but capital expenditure is more likely to be procyclical for the larger expenditure categories. Many of researches like Gavin et al. (1996), Gavin and Perotti (1997) focuse on Latin America. Previously published studies are weakly supported by the data particularly in emerging and post-transition economies in which results can vary. We would like to eliminate the literature gap in this field and analyze government expenditure in the Czech Republic. The aim of the chapter is to provide direct empirical evidence on business cycle relation between Gross Domestic Product (GDP) government expenditure (G) and estimate long-run relationship between these variables in the Czech Republic.

We follow Abbot and Jones (2011) and apply the cross-correlation technique and cointegration on annul data of GDP and government expenditure during the period 1995–2010 from the Ministry of Finance of the Czech Republic. The chapter is organized as follows. In the next section, we describe the dataset and empirical techniques used. In Section 8.3, we present the results of government expenditure development and cross-correlation. In Section 8.4, we estimate long-run relationship between output and government expenditure. In Section 8.5, we conclude with a summary of key findings.

8.2   Data and Methodology

The dataset consists of annual data on total gross domestic product (GDP), household consumption (CH), gross capital formation (I), import (M), export (X) and main public expenditure variables – total government expenditure (G), current government expenditure (GC), non-investment transfers to population (GCP), capital government expenditure (GI) during the period 1995–2010 (the longest available time series). All the data (in millions CZK) were collected from the Ministry of Finance of the Czech Republic and were adjusted at constant prices. We converted all series into logs and applied the Hodrick-Prescott filter with smoothing parameter 100 to each series with the aim to isolate the cycle component of time series. We apply cross-correlation to all combinations of GDP – category of government expenditure. Johansen

cointegration test and the error correction model (ECM) were used to estimate the long-run relationship between output and government expenditure predicted by, for example, Wagner's Law. Most of the results were calculated in econometric program Eviews 7.

Many studies point out that using non-stationary macroeconomic variable in time series analysis causes superiority problems in regression. Thus, a unit root test should precede any empirical study employing such variables. We decided to make the decision on the existence of a unit root through Augmented Dickey–Fuller test (ADF test). The equation (17) is formulated for the stationary testing.

$$\Delta x_t = \delta_0 + \delta_1 t + \delta_2 x_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta x_{t-i} + u_t \tag{17}$$

ADF test is used to determine a unit root x_t at all variables in the time t. Variable Δx_{t-i} expresses the lagged first difference and u_t estimate autocorrelation error. Coefficients δ_0, δ_1, δ_2 and α_i are estimated. Zero and the alternative hypothesis for the existence of a unit root in the x_t variable are specified in (18). The result of ADF test, which confirms the stationary of all time series on the first difference, is available on request.

$$H_0: \ \delta_2 = 0, \ H_\varepsilon: \ \delta_2 < 0 \tag{18}$$

The cross-correlation assesses how one reference time series correlates with another time series, or several other series, as a function of time shift (lag). Consider two series x_i and y_i where $i = 0, 1, 2, \ldots, N-1$. The cross correlation r at delay d is defined as:

$$r = \frac{\sum_i [(x_i - m_x) \cdot (y_{i-d} - m_y)]}{\sqrt{\sum_i (x_i - m_x)^2} \cdot \sqrt{(y_{i-d} - m_y)^2}} \tag{19}$$

where m_x and m_y are the means of corresponding series.

The Hodrick-Prescott (HP) estimates an unobservable time trend for time series variables. Let y_t denote an observable macroeconomic time series. The HP filter decomposes y_t into a non-stationary trend g_t and a stationary residual component c_t, that is:

$$y_t = g_t + c_t \tag{20}$$

We note that g_t and c_t are unobservables. Given an adequately chosen, positive value of λ, there is a trend component that will minimize:

$$\min \sum_{t=1}^{T}(y_t - g_t)^2 + \lambda \sum_{t=2}^{T}[(g_{t+1} - g_t) - (g_t - g_{t-1})]^2 \qquad (21)$$

The first term of the equation is the sum of the squared deviations which penalizes the cyclical component. The second term is a multiple λ of the sum of the squares of the trend component's second differences. This second term penalizes variations in the growth rate of the trend component. The larger the value of λ, the higher is the penalty. Hodrick and Prescott advise that, for annual data, a value of $\lambda = 100$ is reasonable.

The Johansen method (1991) applies the maximum likelihood procedure to determine the presence of cointegrating vectors in non-stationary time series as a vector autoregressive (VAR):

$$\Delta x_t = C + \sum_{i=1}^{K} \chi_i \Delta x_{t-i} + \pi Z_{t-1} + \eta_t \qquad (22)$$

where x_t is a vector of non-stationary (in log levels) variables and C is the constant term. The information on the coefficient matrix between the levels of the Π is decomposed as $\Pi = \alpha \cdot \beta'$, where the relevant elements the α matrix are adjustment coefficients band the β matrix contains the cointegrating vectors. Johansen and Juselius (1990) specify two likelihood ratio test statistics to test for the number of cointegrating vectors. The first likelihood ratio statistics for the null hypothesis of exactly r cointegrating vectors against the alternative $r + 1$ vectors is the maximum eigenvalue statistic. The second statistic for the hypothesis of at most r cointegrating vectors against the alternative is the trace statistic. Critical values for both test statistics are tabulated in Johansen–Juselius (1990). If the variables are non-stationary and are cointegrated, the adequate method to examine the issue of causation is the Error Correction Model (ECM), which is a Vector Autoregressive Model VAR in first differences with the addition of a vector of cointegrating residuals. Thus, this VAR system does not lose long-run information.

8.3 Development and the Cyclicality of Government Expenditure

Government expenditure can help in overcoming the inefficiencies of the market system in the allocation of economic resources. It also can help

in smoothing out cyclical fluctuations in the economy and influences a level of employment and price stability. Thus, government expenditure plays a crucial role in the economic growth of a country. Table 25 shows basic descriptive statistic of variables.

	CH	G	GC	GCP	GDP	GI	I	M	X
Mean	1278617	744674.7	673966.9	288318.9	2558477	69731.92	724947.4	1523074	1544734
Median	1231485	719603.2	670382.9	289010.5	2425435	60410.39	695372.5	1502702	1470185
Maximum	1537613	945092.3	838700.2	367995.1	3187090	107399.0	922405.8	2048537	2130713
Minimum	1077138	591649.4	528416.3	193540.3	2126856	46121.67	599822.4	1105593	1028534
Std. Dev.	158263.6	137075.0	120406.8	52547.39	387693.6	20963.38	93207.26	314522.7	398837.1
Skewness	0.465746	0.312158	0.147651	–0.060566	0.423212	0.737537	1.006580	0.168476	0.177966
Kurtosis	1.752071	1.479370	1.417136	2.027612	1.575054	2.040652	3.272710	1.813518	1.630669
Jarque-Bera	1.616670	1.801391	1.728441	0.640141	1.831270	2.064127	2.751457	1.014184	1.334503
Probability	0.445599	0.406287	0.421380	0.726098	0.400262	0.356271	0.252656	0.602244	0.513117
Sum	20457875	11914795	10783471	4613102	40935630	1115711	11599158	24369184	24715740
Sum Sq. Dev.	3.76E+11	2.82E+11	2.17E+11	4.14E+10	2.25E+12	6.59E+09	1.30E+11	1.48E+12	2.39E+12
Observations	16	16	16	16	16	16	16	16	16

Table 25 Descriptive statistics

Note: household consumption (CH), gross capital formation (I), import (M), export (X), gross domestic product (GDP), total government expenditure (G), current government expenditure (GC), non-investment transfers to population (GCP), capital government expenditure (GI)

Source: Author's calculations based on data from the Ministry of Finance of the Czech Republic.

8.3.1 The Structure of Government Expenditure and Its Development

Firstly we analyzed the structure of government expenditure in a period 1995–2010. Figure 19 shows the share of capital expenditure GI and current expenditure GC on total government expenditure. Figure is complemented by share of non-investment transfers to population GCP on total government expenditure.

Current expenditure was higher than 88% of total government expenditure during the whole analyzed period. Its share on total government expenditure grew until 2002, when it reached a peak (93.4%). In subsequent years, the proportion gradually declined up to 88.7% of total government expenditure in 2010. Current expenditure included expenditure on expenditure on wages and salaries, other payments for work done, and premiums, non-investment purchases and related expenditure, non-investment transfers to private entities, non-investment transfers to
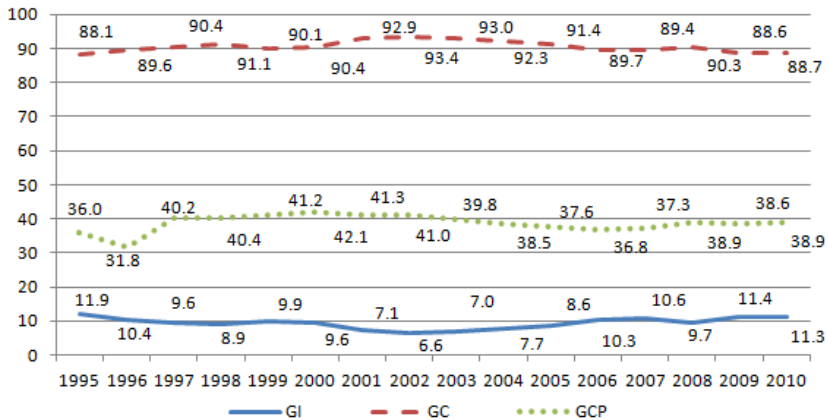
Figure 19 Share on total government expenditure in percentage

> Note: capital government expenditure (GI),current government expenditure (GC), non-investment transfers to population (GCP)

> Source: Author's calculations based on data from the Ministry of Finance of the Czech Republic.

public entities and between intra-entity money funds, non-investment transfers to population, non-investment transfers to the municipalities, non-investment loans, non-investment transfers to National Fund. Non-investment transfers to population were the highest item on current expenditure. Its share on current expenditure varied between 35.5% and 46.6%. The smallest value was in 1996 and it was due to government saving packages. In 2000, the highest value was connected with populism coupled with election.

8.3.2 The Cyclicality of Government Expenditure

As was already noted, government expenditure is a possible automatic stabilizer. From this point of view, government expenditure should move in a countercyclical direction. We decided to assess the relationship between GDP and government expenditure and we analyzed the correlation between cycle components of GDP and main government expenditure categories. Figure 20 shows GDP and government expenditure before and after using HP filter.
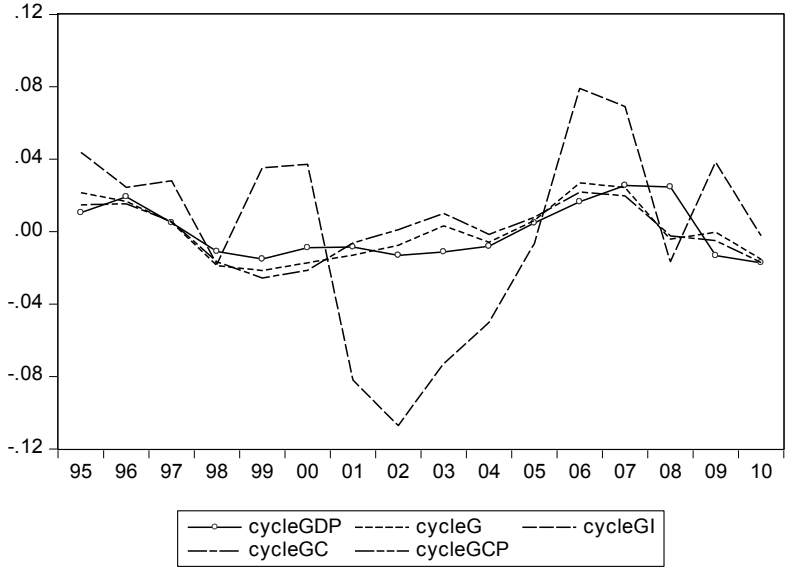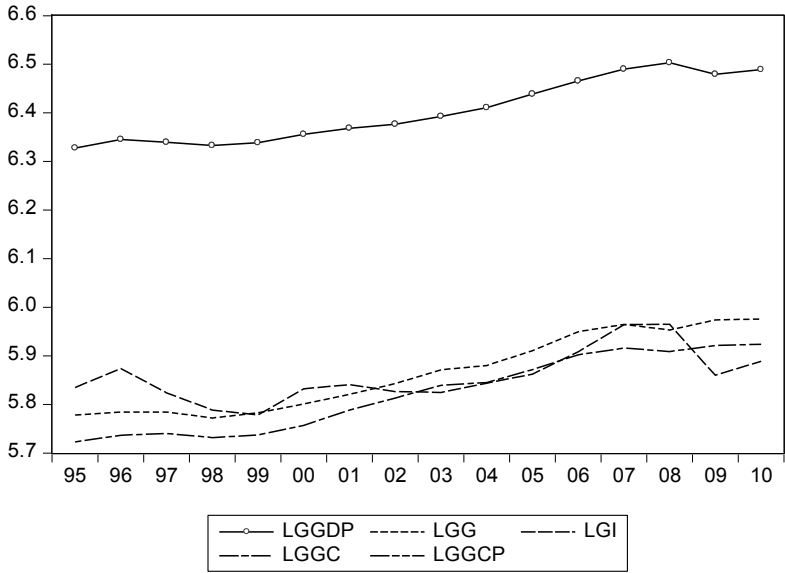
Figure 20 Development of GDP and government expenditure

Source: Author's calculations based on data from the Ministry of Finance of the Czech Republic.

Correlation is a statistical technique that can show whether and how strongly pairs of variables are related. The correlation coefficient can vary from −1 to +1. The correlation coefficient −1 indicates perfect negative correlation, and +1 indicates perfect positive correlation. Its value smaller 0.4 means weak correlation, from 0.4 to 0.7 moderate correlation and higher than 0.7 express strong correlation. A positive correlation coefficient indicates the procyclicality of government expenditure, negative value means that variables are countercyclical and value close to zero express acyclicality. We run cross-correlations for all possible combinations of total GDP and government expenditure. But it is necessary have on mind, that total GDP is significantly influenced by government consumption. So we decided to eliminate the impact of general government consumption on GDP and we also calculated cross-correlations for all possible combinations of other GDP components (household consumption, gross capital formation, import, export) and government expenditure. The results are reported in Table 26. Here we present coefficients with no lag / lead; all results are available on request.

Variables	Correlation coefficient	Correlation	Cyclicality
G & GDP	0.7667	strong positive	procyclical
GI & GDP	0.7133	strong positive	procyclical
GC & GDP	0.4760	moderate positive	procyclical
GCP & GDP	−0.1593	weak negative	countercyclical
GI & CH	0.3873	weak positive	procyclical
GI & I	0.2991	weak positive	procyclical
GI & X	0.3101	weak positive	procyclical
GI & M	0.2589	weak positive	procyclical
GC & CH	0.5382	moderate positive	procyclical
GC & I	0.5955	moderate positive	procyclical
GC & X	0.3811	weak positive	procyclical
GC & M	0.5371	moderate positive	procyclical
GCP & CH	−0.1037	weak negative	countercyclical

Table 26 Cyclicality of government expenditure

Note: gross domestic product (GDP), total government expenditure (G), current government expenditure (GC), non-investment transfers to population (GCP), capital government expenditure (GI), household consumption (CH), gross capital formation (I), import (M), export (X)

Source: Author's calculations based on data from the Ministry of Finance of the Czech Republic.

The results indicate significant difference across GDP components. The cyclical properties of total GDP are found as strong positive correlated to total government expenditure and capital government expenditure, moderate positive correlated to current government expenditure. It can be explained by a significant proportion of government consumption on total GDP. Interesting results were found between total GDP and non-investment transfers to population as the correlation coefficient was weak negative and it confirms countercyclical relation between these expenditure and GDP. It is in line with theory recommendation. Contrary to the theory, the correlation coefficients of GDP components and expenditure variables were, in average, weak positive and it reports procyclical development of these sub-categories of government expenditure and GDP components. The only exception is relation between non-investment transfers to population GCP and household consumption CH as the correlation coefficient (-0.1) was found weak negative and it reported countercyclical development.

8.4 Long-Run Relationship Between Government Expenditure and GDP

We also analyzed the long-term relationship between GDP, GDP components and government expenditure variables. The Johansen cointegration test, which is also used in this chapter, is nowadays frequently used for testing cointegration. Assumption for implementation of cointegration is done by the fact that time series are stationary at first difference. Individual series are non-stationary, but their common cointegration movement in a long time lead (for example as a result of various market forces) to some equilibrium, though it is possible that in the case of short time periods there is a misalignment of such a long balance. The aim of cointegration test is to determine the number of cointegration relations r in the VAR models. It is also necessary to identify an optimal time lag. The optimal time lag is two periods (years) and it was found with using Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion applied to estimation of the non-differenced VAR model. The results of Johansen cointegration test proved the existence of the long-run positive relationship between total GDP and non-investment transfers to population, and between non-investment transfers to population and household consumption (see Table 27).

Variables	Cointegration	Number of cointegration equitions
G & GDP	no	
GI & GDP	no	
GC & GDP	no	
GCP & GDP	yes	1
GI & CH	no	
GI & I	no	
GI & X	no	
GI & M	no	
GC & Ch	no	
GC & I	no	
GC & X	no	
GC & M	no	
GCP & CH	yes	1

Table 27 Cointegration between variables

Note: gross domestic product (GDP), total government expenditure (G), current government expenditure (GC), non-investment transfers to population (GCP), capital government expenditure (GI), household consumption (CH), gross capital formation (I), import (M), export (X)

Source: Author's calculations.

Cointegration equations have for the cointegrated variables the form expressed in (23) and (24).

$$\Delta GDP \quad = \quad 1.106 \; \Delta GCP + 0.360 \tag{23}$$
$$(0.201)^*$$
$$\Delta GCP \quad = \quad 1.183 \; \Delta CH - 1.757 \tag{24}$$
$$(0.163)^*$$

A symbol Δ means difference of log variables: total GDP, non-investment transfers to population GCP, household consumption CH. A symbol * denotes significance at 1% level. The above equation shows that increase of non-investment transfers to population GCP by 1% is connected with increase GDP by 1.1%. We can find similar relationship between increasing CH and GCP (1.18%).

The cointegration regression considers only the long-run property of the model, and does not deal with the short-run dynamics explicitly. Therefore, ECM is used to detect these fluctuations as it is an adequate tool to

examine the short-run deviations necessary to the achievement of long-run balance between the variables. Here, the optimal number of lag is two as was found. We define the ECM for variables GDP and GCP in (25) and (26), the ECM for variables GCP and CH is analogical.

$$\Delta GDP_t = \alpha_0 + \omega_1(GDP_{t-1} - \gamma GCP_{t-1}) + \alpha_1 \Delta GDP_{t-1} + $$
$$+ \alpha_2 \Delta GDP_{t-2} + \alpha_3 \Delta GCP_{t-1} + \alpha_4 \Delta GCP_{t-2} + u_{1t} \qquad (25)$$

$$\Delta GCP_t = \beta_0 + \omega_2(GDP_{t-1} - \gamma GCP_{t-1}) + \beta_1 \Delta GDP_{t-1} + $$
$$+ \beta_2 \Delta GDP_{t-2} + \beta_3 \Delta GCP_{t-1} + \beta_4 \Delta GCP_{t-2} + u_{1t} \qquad (26)$$

In (25) and (26), GDP_t and GCP_t are cointegrated with cointegrating coeffiient γ, α_0 and β_0 are constants of the model, ω_1 and ω_2 note the coefficients of cointegration equition, u_{1t} and u_{2t} mean residual components of long-term relationship. The model specification was tested by several residual components tests. We used the autocorrelation LM-test based on Lagranger multipliers, the normality test, and heteroskedasticity test. The performed tests reject the existence of all three phenomena. The results of the ECM for founded cointegrations are reported in Table 28. Standard errors are in parenthesis.

Cointegration	Dependent variable	ω_1 resp. ω_2	α_1 resp. β_1	α_2 resp. β_2	α_3 resp. β_3	α_4 resp. β_4	α_0 resp. β_0
GDP and GCP	GDP$_t$	−0.326 (0.306)	0.580 (0.355)	−0.502 (0.465)	−0.051 (0.270)	−0.048 (0.209)	0.014 (0.011)
	GCP$_t$	0.332*** (0.202)	0.114 (0.234)	−0.121 (0.306)	−0.447** (0.178)	−0.2*** (0.137)	−0.2* (0.007)
GCP and CH	GCP$_t$	−0.219 (0.241)	0.375** (0.194)	−0.118 (0.157)	0.047 (0.284)	−0.324 (0.313)	0.027* (0.008)
	CH$_t$	**0.477**** (0.245)	**−0.126** (0.198)	**0.0**	**0.011** (0.289)	**−0.090** (0.319)	**0.013**** (0.008)

Table 28 Cointegration between variables

Source: Author's calculations.

Symbols *, ** and *** denote significance at the 1%, 5% and 10% level. The findings report that the ECM does not provide significant results for short-run relationship between variables. Long-run relationship between GDP and non-investment transfers to population GCP is significant only at 10% level. In the case of non-investment transfers to population GCP and household consumption CH, the ECM through lagged values

explains convergence to long-run relationship in the context of short-run shocks and dynamics at the standard level. Adjusted coefficients express the speed of return to equilibrium. Here it means that about 47.7% of disequilibrium is corrected each period (year) by changes in *GCP*. We proved long-run relationship between *GCP* and *CH* and the value of coefficient suggests that household consumption *CH* tends to follow non-investment transfers to population *GCP* (adjusting coefficient for *CH* is higher than for *GCP*) and it adapts to non-investment transfers to population *GCP* changes.

8.5 Conclusion

The aim of this chapter was to provide direct empirical evidence on business cycle relations between GDP and government expenditure in the Czech Republic from 1995 to 2010. Government expenditure plays important role in a fiscal policy as it can help to reduce cyclical fluctuations in the economy. Many studies suggest government expenditure is procyclical despite the recommendations of the theory, our research also proves it. The results confirm procyclical development of government expenditure on GDP in the Czech Republic during 1995–2010. The cyclical properties of total GDP were found as strong positive correlated to total government expenditure and capital government expenditure, moderate positive correlated to current government expenditure. It can be explained by a significant proportion of government consumption on total GDP. The correlation coefficient between total GDP and non-investment transfers to population as was weak negative and it confirms countercyclical relation between these variables. When GDP components were analyzed, most expenditure categories correlated weak positive and it suggests procyclical movement of expenditure variables. The only exception is relation between non-investment transfers to population *GCP* and household consumption *CH* (and GDP also) as the correlation coefficient (−0.1) was found weak negative and it reported countercyclical development. It is in line with theory recommendation of using public expenditure as automatic stabilizer.

We also analyzed the long-term relationship between GDP components and the government expenditure variables. The results of Johansen cointegration test proved the existence of long-run positive relationship only between non-investment transfers to population *GCP* and household consumption *CH* at the standard level. As findings verify, household

consumption CH tends to follow non-investment transfers to population GCP and it adapts to non-investment transfers to population GCP changes. The tests indicated no cointegration between GDP and other government expenditure variables.

Acknowledgements

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9 Common Agricultural Policy – the Most Common EU Policy the Least Homogenous

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9.1 Common Agricultural Policy in Brief

The history of common agricultural policy (CAP) started in the Treaty of Rome, signed in 1957, with the stipulation of this policy's aims. These have not been altered so far. Currently they are presented in the article 33 of the Treaty Establishing the European Community and are written as follows:

a) "to increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilisation of the factors of production, in particular labour;

b) thus to ensure a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture;

c) to stabilise markets;

d) to assure the availability of supplies;

e) to ensure that supplies reach consumers at reasonable prices."

Decades of implementation of CAP witnessed numerous policy modifications and reforms. Policy toolkit was revised a number of times with some policy instruments cancelled, some added and some modified. Initially the core of the policy consisted of market intervention instruments. This was due to the shortages in supplied resulting from the distraction of agriculture during the World World II. Farmers were encouraged to produce more and more. This policy already in the 60s led to surpluses in some agricultural markets and exacerbated the costs of running the

CAP. Therefore the intervention prices were lowered. Yet, the changes did not stop pilling up of surpluses and increasing amounts spent on this policy. A next step was the introduction of production limits for some agricultural products, like milk or sugar.

The most significant CAP reform was decided in 1992. Instead of a system of intervention prices a compensatory direct payments mechanism was launched. The amounts offered were based on income losses related with the cancelation of intervention system. This change led to a diversification in the support given to farmers in different countries that was further extended by the introduction of Pillar 2 of the CAP that happened in 1999[25].

With each EU programming period the CAP undergoes some changes. Yet, its structure has not been changed since 2000 and it includes:

- Pillar 1 consuming over 75% of the CAP's budget and consisting of direct payments and market intervention mechanism;
- Pillar 2 given about 25% of the CAP's budget and encompassing instruments for rural development.

The changes applied with the reform of 2003 and health check were generally an introduction to a next reform. They brought into discussion such vital issues as simplification of the CAP and risk management, yet with no real policy alterations (Figure 21).

9.2 CAP's Current Challenges in the Context of the EU Strategy "Europe 2020" and the Crisis

In 2020 the European Commission published a new strategy for the European Union that was to replaced the Lisbon Strategy. In this new document it named three mutually reinforcing priorities for its development:

1. "Smart growth: developing an economy based on knowledge and innovation.

2. Sustainable growth: promoting a more resource efficient, greener and more competitive economy.

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[25] A more detailed brief history of the CAP can be fund in the publication: European Commission, Directorate General for Agriculture and Rural Development, The Common Agricultural Policy Explained.
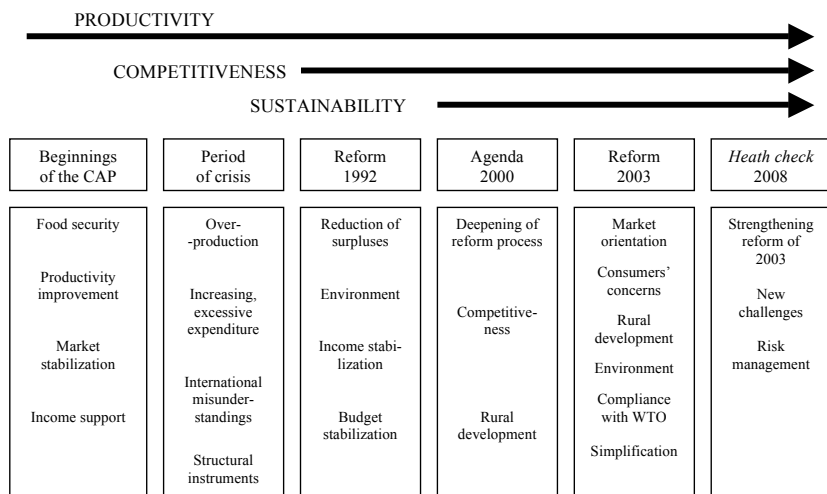
Figure 21 CAP evolution

Source: T. Edwards (2011), CAP Reform: Proposals for 2014–20. SPICe Briefing, Fig. 1.

3. Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion."[26]

The challenges considered by the EC as the most important are: globalization, pressure on resources and aging. It seems that the last two should be widened and be named as nature concerns (including both climate change and depleting resources) and demographic changes.

In the context of agriculture EC named in its CAP reform proposal package three policy aims:

1) viable food production;

2) sustainable management of natural resources and climate action;

3) balanced territorial development.[27]

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[26] EUROPEAN COMMISSION (2010). *Communication from the Commission – Europe 2020. A strategy for smart, sustainable and inclusive growth.* COM(2011)2020, p. 3.

[27] EUROPEAN COMMISSION (2011). *Proposal for a Regulation of the European Parliament And Of The Council establishing a common organisation of the markets in agricultural products (Single CMO Regulation).* COM(2011)625, p. 2.

These general priorities do not show the complexity of challenges facing agriculture in the EU. In the context of general economy crisis and climate change issues the EU agriculture has to struggle with decreasing competitiveness of its agriculture. This is a result of numerous reason such as entering the global food market by agricultural production from China, Russia and many other country not present there in the recent years, GMO production especially in USA and Brazil and higher health and animal welfare standards in the EU compared with the other parts of the world. All this leads to lower production costs outside the EU and reduces the competitive potential of the EU agriculture.

9.3   European Commission's Proposal of Reforming CAP

For the new financial perspective 2014–2020 the EC prepared a reform of the CAP. This has as its key aim facing the challenges named in the strategy "Europe 2020". Yet, it should also serve strengthening the synergy effect between other EU policies and the CAP's pillar 2. The proposal presented by the EC in October 2011 are the keystones of the new CAP. The overview of the proposed regulations shows that there is no real revolution planed in any field of the CAP. This is a result of lack of political will and long-term vision.

The two pillar structure is to be preserved together with the division of budgetary resources. For pillar 1 the allocation of 317.2 billion euro is planed, whereas for pillar 2 only 102.1 billion euro in the period 2014–2020.

The changes in policy instruments to be applied are also not revolutionary. Some rural development instruments, least efficient or considered to have already served their purpose, are to be eliminated and replaced by new ones. The most significant change in the future CAP is a new direct payments' system. It is to be applied in the whole EU and offer a flatter rates of payment than the current ones. Moreover, it will include a so-called greening component with 30% of the national financial envelope for payments for agricultural practises beneficial for the climate and the environment to farmers who apply three practises beneficial for the climate and the environment:

- have three different crops on their arable land where the arable land of the farmer covers more than 3 hectares and is not entirely

used for grass production (sown or natural), entirely left fallow or entirely cultivated with crops under water for a significant part of the year;

- maintain existing permanent grassland on their holding; and
- have ecological focus area on their agricultural area[28].

The proposals have not been discussed yet at the EU level. However, the opinions expressed by different official from EU member states and farmers' lobby groups suggest that the final shape of the CAP in the period 2014–2020 can be much different that the EC's proposal.

9.4 CAP as a Base for Creating Common Fiscal Policy

Among the EU member state the differences in accounting, social security systems or fiscal policies are still enormous. This does not only influence the competitiveness of each of the countries and inequitable conditions of functioning in the common market regulations but it also creates a problem when an EU policy instruments with a financial support for a given branch or sector are applied. This is the case of the CAP. From the very beginning of this policy's implementation this issue was not taken into account. This was not an important problem in the period when the food supplies were still not matching the demand of the EU consumers.

Yet, when the postwar food shortages ended it was the right time to start working on the data on costs, revenues and incomes. Huge diversity in natural conditions for conducting agricultural activity as well as capital equipment and technologies applied lead to significant differences in efficiency. Therefore, the support received within the agricultural policy plays a different role depending on the region and type of production. Moreover, differences in general economic situation in a given country and its fiscal policy as well as social security safety net strongly influence the actual gains from agricultural activity. Agricultural policy at the national level must also be added to that. All these differences create for the EU farmers conditions of conducting their agricultural activity that can be called anything but common.

Undoubtedly, the differences in natural endowment are an unchangeable part of the agriculture. Yet, all external conditions influenced by authorities could be homogenized. The EU already in 1965 started to compile

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[28] Article 29.

statistical data on economic performance of its farmers. An EU wide accountancy network called Farm Accountancy Data Network (FADN) serves this purpose. It enables the evaluation of incomes in agriculture and impacts of the CAP. In each member state there is a special unit responsible for carrying out an annual survey in a representative group of agricultural holdings. The data collected is processed using harmonized bookkeeping principles. Yet, the national differences lead to certain simplifications in the approach towards particular economic events that have to be filled under adequate titles present in the FADN system.

The most important shortcoming of FADN is that it does not cover all the agricultural holding operating in the EU. The choice of representative farms for all the regions, sizes and types of farming is limited to the units that "due to their size could be considered commercial"[29]. Currently it includes approximately 80,000 holdings, representing 6,400,000 farms. This limitation makes the data on incomes and their changes often contested by the politicians.

Detailed information on costs, incomes from agricultural activity and received support could be used not only to access efficiency but also to test the tax and social security burden. Nowadays, such comparisons are not made and the FADN based analyses are limited only to efficiency of all the production factors. The process of unification would not be easy. For the time being it should be restricted only to tax burden paid by the farmers. The effort of conducting such a task is worth while as such an experiment could show both the impact of fiscal policy on agriculture when compared with the data already available and reduce the number of factors differing the conditions of conducting agricultural activity. Moreover, it would be possible to create a simpler system of supporting farmers' incomes that direct payments. As the balance of subsidies and taxes is in all the EU member states is positive, it is clear that the farmers are net receivers of support. They could be exempt from income taxes and receive lower direct payments decreased by these amounts.

As it comes to other taxes, especially VAT, the rates should be homogenized. Naturally this would create a significant burden on administration responsible for tax collection. Moreover, farmers in the countries with the lowest tax rates would be hit the hardest. Yet the already highly developed control system and data bases used for the direct payments. Therefore the implementation of common taxes should not be that much

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[29] http://ec.europa.eu/agriculture/rica/concept_en.cfm

of a problem. The only serious problem lies in different systems of taxation applied to agriculture all over the EU. This is show in the relation of taxes to subsidies and the lack of VAT on investment in numerous countries.

The FADN data show that currently taxes paid by the farmers in the EU-15[30] are only a friction of the subsidies[31] received by them (Figure 22). In the period 1994–2008 the average relation between taxes and subsidies was lower than 7%. The median is even lower with the average lower than 4%. This shows a great diversity of the level of tax burden among the EU-15 member states.
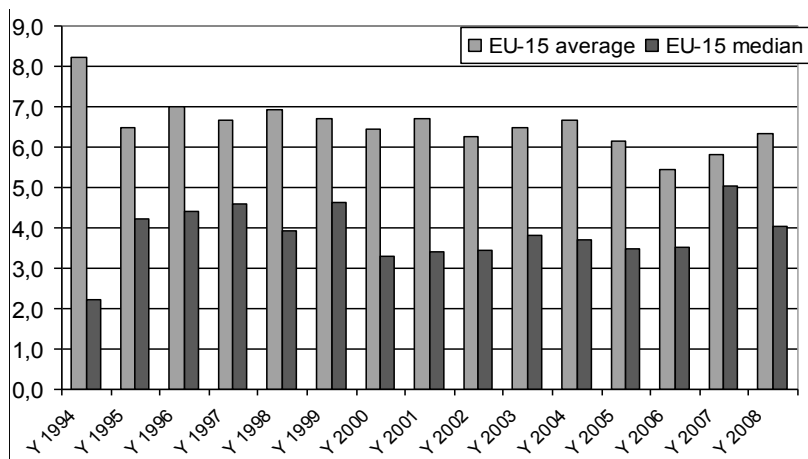
Figure 22 EU-15 Taxes (SE390) to total subsidies excluding on investment (SE605) in EU-15 in the period 1994–2008 (in %)

Source: Own elaboration based on FADN data.

The highest ratio of taxes to subsidies is observed in the Netherlands with the average for the analysed period of almost 41% (Table 29). The second highest ratio was in Italy – over 14%. Whereas the lowest was noted in Sweden – 0.5%. Also Finland and Ireland had the averages lower than 1%.

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[30] EU members that joined the EU before 2000.

[31] Titles of figures and tables give the names and codes of the FADN variables. Definitions of FADN variables are presented in the Section 9.7 (Appendix, p. 158).

Country	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Belgium	8.0	7.3	7.5	8.7	10.0	7.4	10.0	8.4	8.4	8.8	9.3	8.6	7.5	7.7	7.7
Denmark	12.7	10.7	9.9	11.1	12.0	11.7	12.3	14.6	13.8	14.7	13.1	12.5	11.3	12.5	11.9
Germany	8.3	7.5	7.9	8.3	8.5	7.8	8.2	7.8	6.9	6.9	6.6	6.4	5.9	6.0	5.9
Greece	1.3	1.3	1.0	1.1	0.9	0.8	0.9	1.1	0.9	1.0	1.6	1.5	2.2	1.0	1.0
Spain	5.6	5.6	5.6	4.6	3.9	4.6	3.3	3.4	3.5	3.8	4.2	4.1	4.3	5.0	4.0
France	10.4	9.0	9.6	9.3	9.4	9.1	8.5	7.7	7.8	7.3	7.3	7.1	6.3	6.6	6.6
Ireland	1.3	1.1	0.9	0.9	0.9	0.9	1.0	1.0	0.8	0.9	0.8	0.7	0.6	0.7	0.7
Italy	18.3	11.9	13.5	11.3	15.4	13.8	12.9	13.2	13.1	14.5	16.5	12.5	11.2	12.1	22.0
Luxembourg	2.2	2.5	2.8	2.8	3.2	3.0	3.0	2.5	2.5	2.3	2.6	2.5	2.4	2.7	2.9
Netherlands	54.3	42.8	45.4	48.7	56.8	62.0	50.4	52.2	46.4	32.2	33.1	24.2	20.7	22.4	19.3
Austria	0.0	4.2	4.4	4.8	5.4	5.1	5.2	4.6	4.4	3.8	3.7	3.5	3.5	5.1	4.9
Portugal	1.3	1.8	1.3	1.3	1.3	1.2	2.2	1.8	1.8	2.7	1.5	1.5	1.7	2.5	2.1
Finland	0.0	0.4	1.4	2.0	0.7	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5
Sweden	0.0	0.7	1.1	0.7	0.6	0.6	0.6	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.4
UK	1.4	1.2	1.3	1.5	1.6	1.7	2.1	2.1	2.0	2.7	2.7	2.6	2.0	1.9	1.8
EU-15 average	8.2	6.5	7.0	6.7	6.9	6.7	6.4	6.7	6.3	6.5	6.7	6.1	5.4	5.8	6.3
EU-15 median	2.2	4.2	4.4	4.6	3.9	4.6	3.3	3.4	3.5	3.8	3.7	3.5	3.5	5.0	4.0

Table 29 Taxes (SE390) to total subsidies excluding on investment (SE605) in EU-15 countries in the period 1994–2008, in %

Source: Own elaboration based on FADN data.

Also among the EU-12 countries[32] there are huge differences in the level of taxation in agriculture as a relation to subsidies received (Table 30). In case of these countries the generally falling tax burden is partly explained by a gradual increase of the EU direct payments received by the farmers in these countries. The lowest tax burden in this group of the EU member states is observed in Slovenia and Cyprus and the highest in Romania.

Country	2004	2005	2006	2007	2008
Bulgaria*				7.8	1.5
Cyprus	0.7	0.1	0.2	1.2	0.8
Czech Republic	10.4	7.2	5.7	5.4	4.6
Estonia	1.8	1.7	1.8	1.4	1.4
Hungary	7.0	8.8	3.9	4.9	5.3
Latvia	3.8	3.2	2.0	2.1	2.0
Malta	0.9	1.2	0.5	0.5	0.8
Poland	9.7	10.7	6.2	6.7	7.0
Romania*				10.3	10.3
Slovakia	17.5	10.2	7.4	6.4	6.7
Slovenia	0.7	0.4	0.5	0.6	0.4
EU-12 average	6.7	6.1	5.4	5.8	6.3
EU-12 median	3.8	3.2	2.0	4.9	2.0

Table 30 Taxes (SE390) to total subsidies (SE610) in EU-12 in the period 2004–2008 (in %)

Note: * No data available as the country was not an EU member.

Source: Own elaboration based on FADN data.

The data on VAT balance excluding VAT on investment shows that there are several countries where farmers financial positions are not affected by this tax (Table 31). On average the EU-27 farmers have a positive VAT balance. Yet the situation varies. There are several countries with a negative balance. The most affected by this tax are farmers in Slovenia with about 600 euro in negative. Whereas farmers in Austria, Germany and Luxembourg have positive balances of over 2000 euro.

In case of investment the situation of the European farmers is even more diverse. The comparison of subsidies on investment to VAT on investment shows a different situation than the already presented relation between taxes and subsidies (excluding the ones on investment). On average subsidies on investment received by the EU farmers balance their VAT on investment obligations, with a median showing that the

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[32] EU member countries that joined the EU in 2004 and 2007.

Country	2004	2005	2006	2007	2008
Belgium	1466	1547	1539	1511	780
Bulgaria	–	–	–	0	0
Cyprus	−19	−1	0	0	0
Czech Republic	0	0	0	0	0
Denmark	0	0	0	0	0
Germany	2274	2112	2686	3675	2766
Greece	−1	42	69	88	43
Spain	366	363	190	356	150
Estonia	168	149	139	163	147
France	−2	−1	−2	−2	−2
Hungary	40	47	−10	−87	−210
Ireland	991	835	−671	−342	−470
Italy	828	829	865	1090	590
Lithuania	−163	−187	−176	−175	−184
Luxembourg	5304	5568	5839	6554	7017
Latvia	−43	−84	−75	−58	−78
Malta	0	0	0	0	0
Netherlands	−49	−75	15	0	−81
Austria	2684	2688	2828	3219	3300
Poland	54	−4	−4	28	11
Portugal	−188	−169	−180	−175	−169
Romania	–	–	–	−19	−25
Finland	0	0	0	0	0
Sweden	0	0	0	0	0
Slovakia	0	0	0	0	0
Slovenia	−546	−684	−561	−719	−594
United Kingdom	0	0	0	0	0
EU average	410	390	353	395	241
EU median	0	0	0	0	0

Table 31 VAT balance excluding VAT on investment (SE395) in the period 2004–2008 (in euro)

Source: Own elaboration based on FADN data.

subsidies exceed the VAT obligations (Table 32 and 33). Yet, there are many EU countries with no VAT on investment. Farmers in the Netherlands are in the worst situation compared with the other countries as the subsidies they receive amount to only several per cent of the VAT on investment they have to pay.

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Belgium	3.2	7.7	3.7	4.5	3.5	8.9	2.4	8.5	36.0	30.9	24.0	28.0	38.7	42.4	66.5
Denmark*															
Germany	4.7	8.4	5.7	6.4	5.6	8.1	5.8	9.6	10.2	14.6	13.4	9.1	14.4	11.5	15.7
Greece	287.5	195.7	266.7	381.8	896.4	278.9	488.9	271.4	812.5	138.1	364.3	116.0	692.0	421.1	423.5
Spain	76.1	11.7	11.5	11.2	19.8	36.4	38.4	51.8	90.6	62.6	30.8	66.0	225.6	54.4	77.7
France								56550.0	71700.0	75850.0	38800.0		48533.3	109500.0	119600.0
Ireland	184.8	2633.3	3133.3	3783.3	2771.4	5625.0	2625.0	19700.0	4483.3	47.9	32.6	51.7	39.1	87.5	115.9
Italy	101.8	126.5		14.7	14.3	16.3	73.8	86.3	80.8	59.9					105.4
Luxembourg										87.7	117.8	146.0	161.9	174.9	141.0
Netherlands	24.8	18.1	10.1	11.5	12.5	17.1	16.6	3.0	5.1	8.5	1.0	56.0	13.9	7.7	5.4
Austria		17.3	45.5	47.2	51.0	43.0	46.8	58.1	46.6	41.6	38.1	48.7	55.2	26.5	57.9
Portugal	976.9	1068.8	1347.4	1576.9	2068.0	572.7	1808.3	1163.9	779.7	1052.4	514.6	1286.7	1329.3	743.2	648.7
Finland		36000.0	40500.0												
Sweden															
United Kingdom															
EU-15 average	94.9	95.1	105.5	93.0	108.5	106.7	92.2	125.5	133.5	105.2	107.8	118.0	137.5	100.0	122.7
EU-15 median	158.0	188.0	227.0	222.5	200.0	107.9	150.5	269.0	226.0	210.0	394.6	305.0	282.0	418.0	122.7

Note: * Empty cells indicate the VAT on investment amounted to 0. Only in 1994 in case of Austria, Finland and Sweden there is no data available as these countries were not EU members at that time.

Table 32 Subsidies on investment to VAT on investment in EU-15 in the period 1994–2008 (in %)

Source: Own elaboration based on FADN data.

Country*	2004	2005	2006	2007	2008
Estonia	6582.2	3438.7	715.1	929.6	9063.7
Hungary	1004.7	1063.4	704.2	900.0	939.1
Poland	0.0	5.9	11.4	36.2	72.6
Slovenia	456.6	215.4	43.9	147.0	163.5
Average	107.8	118.0	137.5	100.0	122.7
Median	605.8	273.2	491.5	619.0	163.5

Table 33 Subsidies on investment to VAT on investment in EU-15 in the period 2004–2008 (in %)

Note: * There was no VAT on investment in the other new member states.

Source: Own elaboration based on FADN data.

9.5   Conclusions and Recommendations

Creation of a common fiscal policy in the whole EU is a demanding and challenging task. Therefore, it should be preceded by a big scale project of implementation of a common tax system in a significant but limited number of entities. The EU agriculture with its 12 million agricultural holdings could be just the right representation.

The already created system of paying agencies with their databases and control system can be of help in implementation of a common fiscal policy for agriculture as the Court of Auditors' estimates for the most likely error rate for payments in agriculture underlying the accounts is 3.7%[33]. This is a lower figure than for many other EU activities.

Currently the EU agricultural policy is, similarly to the euro-zone construction, based on a common, but not homogenous support instruments and eligibility criteria, however, it lack the same financial burdens imposed on farmers in the form of taxes. Naturally this is a result of lack of a common EU fiscal policy and still national character of this policy. Yet, it is surprising that given the strong emphasis on a common conditions for competing in the agricultural sector no country or lobby group has ever mentioned the need for homogenous taxes in the agricultural sector.

The tax burden applied to farmers in different EU member states varies significantly. This is not only a problem of lack of homogenous conditions for competing on the EU single market. It also affects the efficiency and effectiveness of the common agricultural policy.

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9.6   References

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9.7 Appendix

SE390 – Taxes: Farm taxes and other dues (not including VAT and the personal taxes of the holder) and taxes and other charges on land and buildings. Subsidies on taxes are deducted.

SE395 – VAT balance excluding on investments: The general rule is for all entries to be made exclusive of VAT; this poses no problems when the holder is subject to the normal VAT system. When the special agricultural system applies, the different VAT amounts should be recorded so that when the results are calculated any advantages of national agricultural VAT systems can be taken into account.

= VAT balance on current operations = (VAT on sales + flat-rate refund of VAT – VAT on purchases).

SE605 – Total subsidies excluding on investments: Subsidies on current operations linked to production (not investments). Payments for cessation of farming activities are therefore not included.

Entry in the accounts is generally on the basis of entitlement and not receipt of payment, with a view to obtain coherent results (production/costs/subsidies) for a given accounting year.

Formule: SE610 + SE615 + SE650 + SE699 + SE624 + SE625 + SE626 + SE630

SE406 – Subsidies on investments: Subsidies on investment

SE408 – VAT on investments: It was considered preferable, for the purposes of calculating income, to treat this amount separately from the overall VAT balance. It is generally a large amount and has no connection with the year's production. If it were taken into account in the VAT balance, it would distort the balance of subsidies and taxes on current operations.

SE600 – Balance current subsidies and taxes: Subsidies and taxes arising from current productive activity in the accounting year. Balance of subsidies and taxes on current operations.

= Farm subsidies + VAT balance on current operations – Farm taxes.

III

Miscellaneous

10 Validity of Corporate Bankruptcy Prediction Models Within the Recent Financial Crisis Period with Focus on the Czech Agricultural Enterprises

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10.1 Introduction

Financial analysis of the corporate economic performance and its sustainability is a multi-disciplinary science field area using various methodological approaches. It consists of various mainly economical, however, also statistical tools and techniques being used with corporate financial statements and other supplementary data resources. The approach to financial analysis differs according both target output user-groups and requested outputs' objectives. There are obviously specific needs for information content concerning financial analysis for each user group – namely stakeholders, investors, banks, policy makers and other related entities. In other words for instance Berstein (1998) states, that financial analysis provides essential data for operational decision making processes of management and also investment purposes both stakeholders and other external entities involved.

Tools and techniques of prediction of corporate financial distress or failure bring together outputs of financial analysis related to past economic performance of company and future estimates concerning further respective enterprises' performance. Taking into account the fact, that these processes are interconnected with risk and uncertainty, there have been presented a lot of criticism related to business failure prediction techniques. Nevertheless, these techniques are actively used for instance by banks, providers of private equity / venture capital investments and as well by government authorities in connection with provision of public subsidies.

The agricultural sector is the biggest recipient of public subsidies from EU public budget via Common Agricultural Policy and the focus of

this policy is to provide sustainable development of agricultural enterprises across European Union, however especially investment subsidies are intended to be provided only to financially healthy enterprises with further perspectives of their sustainable economic performance. The actual problem is how to distinct the well performing enterprises from those likely to drive into serious financial problems. During several last decades a number of different approaches were developed for corporate bankruptcy prediction. The emphasis was given mainly to industrial and financial enterprises. The specialized problem of the applicability of the methods of bankruptcy prediction developed so far on agribusiness has not been satisfactorily investigated yet.

The objective of this article is to validate reliability of different types of corporate bankruptcy prediction models during the recent financial crisis, which has stroke right after the period of strong growth of world economy without any predictable signals. The focus is given on step wise discriminant analysis approach, namely Z-Score, G-index and application of Data Envelopment Analysis (DEA) for bankruptcy prediction. While the indexes have already been investigated for the use in agribusiness before, application of recently theoretically developed DEA bankruptcy classification represents a novel approach in the field. Until the end of 20th century DEA was applied only scarcely to agricultural applications (Coelli, 1995). Since then DEA has become a favorite tool for farm efficiency measurement and number of local studies applying the DEA methodology in agriculture has been elaborated. DEA was used to evaluate efficiencies of distinct definition (apart the most common technical efficiency also environmental efficiency has been studied e.g. in Reinhard, 2000), the determinants of efficiency were studied (Bojnec nad Latruffe, 2009) and also some studies discussing DEA with respect to the problem of sampling variations existence were provided for the specific field of agriculture (e.g. Balcombe, 2008). The national FADN databases were employed as data sources and this implied also the selection of DEA input and output variables used in particular studies. In Davidova (2007) DEA was employed to estimate the technical efficiency of sample of Czech farms. Premachandra et al. (2009) introduces Data Envelopment Analysis (DEA) as a non-parametric approach for analysing enterprises performance and may be used as a help for bankruptcy prediction. This new approach for financial distress prediction has not been studied for the agriculture industry so far.

10.2   Methods and Resources

This contribution is based on proceeded secondary research concerning predictability of business failures by econometrical and financial analysis methods among agricultural enterprises in the Czech Republic within the beginning of recent world financial crisis, namely year period 2008–2009.

Database Amadeus of Bureau van Dijk was used as the ultimate means for identification of on one hand failure and on the other hand well performing enterprises' sample. The sample of well performing enterprises represents 21 entities and the sample of failure enterprises represents 19 entities. The mentioned database Amadeus was also source of basic corporate's financial data. There were also additionally utilized corporate data issued in the Czech Business Register as the supporting source of financial and other juridical data concerning the adequate business failure time specification, which were not available from the database Amadeus.

Other information resources employed are the reports of the Czech Statistical Office and data sets of Czech Farm Accountancy Data Network (FADN CZ), that collects structural and accountancy data of farms, based on system of sample surveys conducted every year.

Financially distressed agricultural companies were primarily identified via establishing the searching strategy in Amadeus database, that was based on classification of economic activities CZ NACE revision 2, namely section 01 – Crop and Animal Production. Another element of searching strategy was the activity status, when it was focused on enterprises with status bankruptcy, in liquidation or inactive (no precision). This mentioned activity status was revised for respective business entity via officially issued documents in the Czech Business Registers.

There are employed two developed models for analysing and predicting bankruptcy, which are based on step wise discriminant analysis approach, namely Z-Score, G-index and one model based on non-parametric method, namely Data Envelopment Analysis (DEA).

10.2.1   Index Approach

Altman (1968) employed for bankruptcy prediction purposes financial ratio analysis interrelated with statistical multiple discriminant analysis for the first time. The dataset in his study was limited to 33 bankrupt and 33 non-bankrupt corporations from manufacturing branch only. He evaluated 22 potential financial analysis ratios, which were classified into the

following categories: liquidity, profitability, financial leverage, solvency and activity indicators. The final discriminant function that iteratively provided the best results in classification of entities heading towards bankruptcy was as followed and it was formed of bellow mentioned indicators:

$$\text{Z-Score}_{1968} = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5 \quad (27)$$

Where:

X_1 = Working Capital/Total Assets as the liquidity indicator,

X_2 = Retained Earnings/Total Assets as the cumulative over time profitability indicator,

X_3 = Earnings Before Interest and Taxes/Total Assets as the profitability indicator,

X_4 = Market Value of Equity/Book Value of Total Debt as the solvency indicator,

X_5 = Sales/Total Assets as the activity indicator. (Altman, 1968)

The Altman's Z-Score model that was developed in the year 1968 was modified by its author in 1983. There was employed the new variable, that substituted book value of equity for the market value in former variable X_4. The mentioned substitution led to discriminant function as follows:

$$\text{Z-Score}_{1983} = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5 \quad (28)$$

Where:

X_4 = Book Value of Equity/Book Value of Total Debt as the solvency indicator.

Other variables are the same as in discriminant function (27). (Altman, 2000)

There is developed the classification according to Z-Score$_{1983}$ results for classifying enterprises into the proper performance groups, namely:

- Well performing enterprises Z > 2.9,
- Indifferent performance enterprises ("gray zone") 1.2 < Z < 2.9,
- Enterprises heading towards bankruptcy Z < 1.2. (Altman, 2000)

Gurčík (2002) proceeded bankruptcy classification analysis for 60 randomly selected Slovak agricultural enterprises. There were 50% of entities performing their agricultural production on low quality agricultural land and the rest 50% on high quality one. The frontier for initial sorting of agricultural enterprises as non-bankrupt were the fact that an enterprise achieved profit within last three accounting years and in last year there were value of Return on Equity indicator higher than 8%. On the other hand, enterprises which achieved only loss within last three years were sorted as bankrupt ones. There was utilised discriminant analysis for developing G-index equation, similarly to Altman's Z-score, however it employed only below mentioned pre-selected financial analysis indicators:

$$\text{G-index} = 3.412X_1 + 2.226X_2 + 3.277X_3 + 3.149X_4 + 2.063X_5 \quad (29)$$

Where:

X_1 = Retained Profit or Loss / Total Liabilities as the cumulative over time profitability indicator,

X_2 = EBIT / Total Liabilities as profitability indicator,

X_3 = EBIT / Revenues as profitability indicator,

X_4 = Cash Flow / Total Liabilities as liquidity indicator,

X_5 = Inventory / Revenues as inventory conversion indicator. (Gurčík, 2002)

There is developed the classification according to G-index for sorting enterprises into the proper performance groups, namely:

- Profitable enterprises G ≥ 1.8,
- Mean performance enterprises −0.6 < G < 1.8,
- Non-profitable enterprises G ≤ −0.6. (Gurčík, 2002)

10.2.2 Data Envelopment Analysis Approach

DEA model is a special case of optimization (operational research) problem. It could be used for evaluating effectiveness, performance or productivity of observed homogenous units, i.e. in this case companies. Every unit consumes inputs and produces outputs. Weighted ratio of all outputs to all inputs can be used as the criterion of effectiveness. DEA uses

so-called effective frontier of acceptable production capability aggregate. Units lying on this effective frontier are considered to be effective and evaluation of each individual unit is derived from detection of effective units. The additive model (Charnes et al., 1985) evaluates the relative efficiency of the specific oth firm as follows:

$$\text{Max } es^- + es^+$$

subject to

$$
\begin{aligned}
X\lambda + s^- &= x_0 \\
Y\lambda - s^+ &= y_0 \\
e\lambda &= 1 \\
\lambda &\geq 0 \\
s^+ &\geq 0 \\
s^- &\geq 0
\end{aligned}
\tag{30}
$$

Premachandra et al. (2009) introduces Data Envelopment Analysis (DEA) as a non-parametric approach for analysing enterprises' performance and uses model (30) for bankruptcy assessment. The frontier used in this approach is a "bankruptcy frontier" (not efficiency frontier found in conventional use of DEA based production analysis). Healthy firms are expected to be found in the possibility set while the frontier contains "poor performers". The mathematical definition of the bankruptcy possibility set is the same as the production possibility set in production economics. However, the nature of outputs and inputs in bankruptcy evaluation is opposite to that of production analysis: smaller is better for outputs and larger is better for inputs in bankruptcy evaluation. In this study, we follow the definition of outputs and inputs in Premachandra et al. (2009):

Inputs:

- cash flow / total assets
- net income / total assets
- working capital / total assets
- EBIT / total assets
- EBIT / revenues
- book value of equity / book value of total debt
- current assets / total assets

Outputs:

- total debts / total assets
- current liabilities / total assets

The DEA calculations were obtained with the help of DEA Solver available via http://www.saitech-inc.com/Products/Prod-DSP.asp (for details see Cooper, 2007).

10.3   Results

The influence of recent world financial or rather economic crisis on the whole agricultural industry in the Czech Republic can be measured by the Economic Accounts for Agriculture (EAA). EAA are held by Czech Statistical Office and provide methodological instruments for measuring the economical size and performance of agricultural sector as a part of the national economy of the Czech Republic.

EAA consist of four sub-accounts, namely the Production Account, the Generation of Income Account, The Entrepreneurial Income Account and Elements of the Capital Account. The overall performance of Czech agricultural enterprises can be stated via indicator Output of the Agricultural Industry within the Production Account. Output of the Agricultural Industry is enumerated as a sum of sub-indicators: Crop Output, Animal Output, Agricultural Services Output and Non-agricultural Secondary Activities (Inseparable).

The financial crisis started to significantly affect the agricultural sector of the Czech Republic in the year 2009. The ultimate evidence of the mentioned fact is year-on-year decrease by 18.3% of the indicator Output of the Agricultural Industry related to year period 2009/2008 and its direct impact on the amount of the Entrepreneurial Income Indicator, as can be seen in Fig. 23. The Entrepreneurial Income slump, which is enumerated as difference among indicators Operating Surplus / Mixed Income, Rents and Other Real Estates, Rental Charges to be Paid, Interest Paid, increased by indicator Interest Received, related to year-on-year 2009/2008 was 7.3 billion CZK measured by current prices, that represents year-on-year decrease by 72%.

Nevertheless, despite the described significant decrease of Output of the Agricultural Industry within the financial crises, the year-on-year 2009/2008 change of indicator Intermediate Consumption was only –11.5
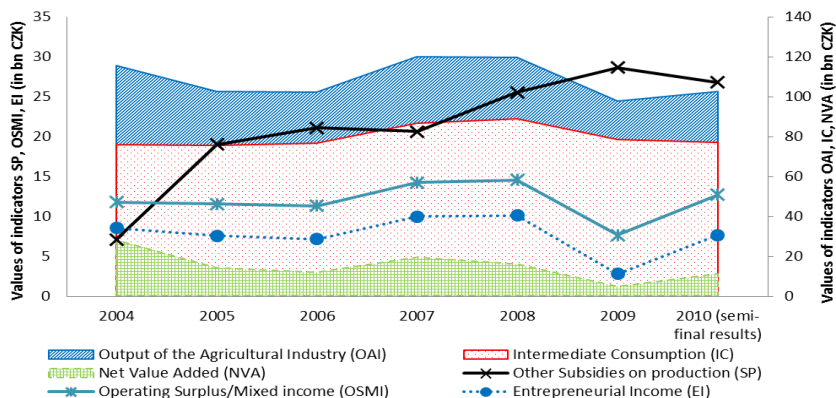
Figure 23 Development of selected indicators of the EAA in the Czech Republic within the year period 2004–2010

Source: Own work based on data of Czech Statistical Office (2011).

percent. This coherence can be measured via Intermediate Consumption Cost-effectiveness indicator, which reveals decreasing level of cost-effectiveness. More precisely, year-on-year 2009/2008 increase of intermediate consumption costs related to 1 CZK of gained Output of the Agricultural Industry represents 8.4%. This assumption is also proved via Coefficient of Intermediate Consumption's Reaction within year-on-year period 2009/2008, which value 0.63 reveals slower degressive development of Intermediate Consumption indicator than degressive development of Output of the Agricultural Industry indicator. More precisely, there can be enumerated the difference in the degression between Intermediate Consumption that decreased for about 0.53 CZK is related to decrease of Output of the Agricultural Industry by 1 CZK.

The world economic crisis stroke the Czech agricultural industry sector after period of the Entrepreneurial Income's growth. It was connected mainly with growth of demand for agricultural commodities with positive influence on prices of agricultural producers. The growing demand encouraged agricultural producers in further investments into their property, namely machinery, production buildings and other technological investments for instance in connection with renewable energy resources. Nevertheless, the Entrepreneurial Income in the year 2009 was in positive numbers, according to EAA, only thanks to public subsidies of Common Agriculture Policy. The research question is, how effectively can serve

the bankruptcy prediction models for managers, stakeholders or policy makers in their decision making processes related to specific features of agricultural enterprises.

Beavers' (1967) empirical research related to financial ratio analysis and bankruptcy classification is stated as the pioneer work in area of business failure prediction. This mentioned work defines a business failure as the inability for paying financial debts on term. In broader context, an enterprise is considered to be failed under any of following event's occurrence: bankruptcy, bond default, an overdrawn bank account or non-payment of preferred stock dividends (Beaver, 1967).

There was proceeded enumeration of the Z-Score and G-index using discriminant functions (27), (28) and being applied on the datasets of database FADN CZ for sample survey of more than 1400 agriculture enterprises in the Czech Republic that can be considered as the representative sample of the Czech agricultural industry sector. As it can be seen in Fig. 24 the Z-Score classifies with exception for years 2004 and 2007 the whole agricultural branch as heading toward bankruptcy. Nevertheless, mentioned EAA evidence proves that Czech agricultural enterprises are able to generate the positive Entrepreneurial Income. That is why G-index, as can be seen in Fig. 25, outperforms Z-score in correctness of overall classification of Czech agricultural industry sector as the "mean performance enterprises" within the year period 2004–2010.

As the final step in evaluation of the validity of bankruptcy prediction models was employed the data sample from the database Amadeus of identified bankrupt and non-bankrupt enterprises within the strongest impact of world financial crisis period on the Czech agricultural industry, i.e. the year 2009. The proceeded enumeration of Z-score, G-index and DEA using 0.1 cut-off score frontier were plot using 0.1 cut-off frontier into Fig. 26 and 27.

The result of comparison between Z-score and DEA classification using 0.1 cut-off score frontier (see Fig. 27) militate against Z-score, when Z-Score misclassified as much as 12 from overall 19 bankrupted enterprises, while DEA misclassified only 2 enterprises. The similar results are, when it is compared DEA using 0.1 cut-off score frontier and G-index. In this case DEA outperformed G-index approach, because G-index misclassified 7 bankrupted enterprises.

Considering the classification of well performing enterprises Z-Score and G-Index approach were 100% successful in the classification of well per-
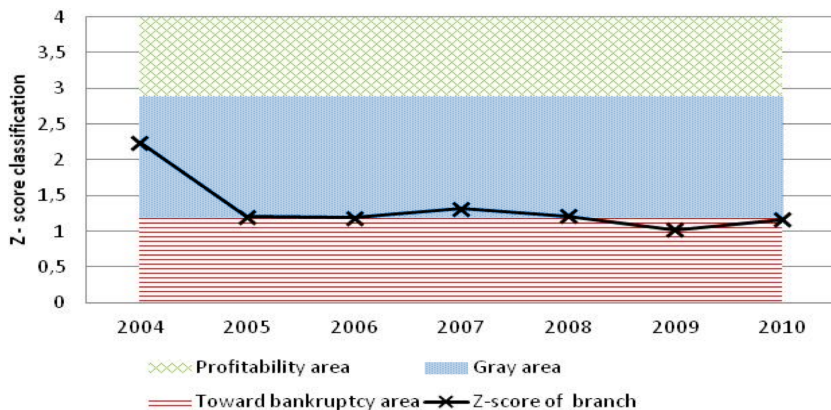
Figure 24 Development of Z-score for representative sample of the agricultural industry sector enterprises in the Czech Republic within the year period 2004–2010

Source: Own work using data of database FADN CZ.
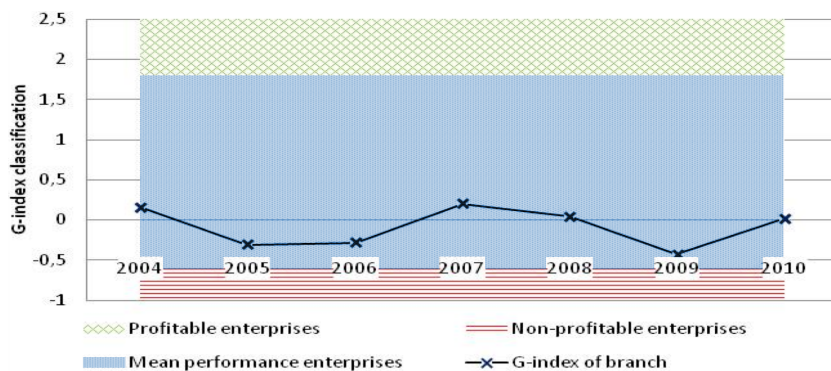
Figure 25 Development of G-index for representative sample of the agricultural industry sector enterprises in the Czech Republic within the year period 2004–2010

Source: Own work using data of database FADN CZ.

Figure 26 Comparison of validity in classification of well performing and failured enterprises' sample by method Z-Score vs. DEA

Source: Own work using data of the database Amadeus and financial statements issued in the Czech Business Register.

Figure 27 Comparison of validity in classification of well performing and failured enterprises' sample by method G-Score vs. DEA

Source: Own work using data of the database Amadeus and financial statements issued in the Czech Business Register.

forming enterprises, while DEA approach misclassified 2 of 21 well performing enterprises.

Note that the score frontier separating the bankrupted enterprises from the rest was chosen 0.1, i.e. we classify the units with score higher than 0.1 to go bankrupt, which reflects very precisely the observed reality. In original theoretical framework, only the units (enterprises) on the frontier are classified as going bankrupt. The reasons why not only the bankruptcy frontier, but also the units are laying deep in the bankruptcy possibility set appears to go bankrupt, may be found in specifics of agribusiness, but also in the inappropriate choice of input and output variables. This should be the subject of further investigation.

10.4 Conclusion

The validity of classification of well performing and failed agricultural enterprises within the observed sample was verified via employing both classical and rather novel approaches. It can be stated that all the utilized approaches have got their pros and cons related to proper classification of financial health status. On the one hand the classical approach as the Z-Score and derived G-Index approach outperformed DEA analysis in the classification of well performing enterprises, on the other hand DEA analysis was more successful in the classification of financially distressed entities. That is why the potential decision maker who employs methodology for classification of financial health status should consider the aim of such a classification, i.e. identification of either well-performing or financially distressed companies taking into account specifics related to respective business area. Subsequently employment of different approaches for different required information content should be well considered.

This chapter presents possible approaches for predicting the bankruptcy or financial distress of enterprises, which were identified by authors and were based on primary study of this problem area. The given results will be continuously verified and the following studies will be broadened to identify and analyse particular factors, which can influence validity of bankruptcy classification by Data Envelopment Analysis.

10.5 Summary

Financial analysis of corporate economic performance and its sustainability is a multi-disciplinary science field area using various methodological approaches. Tools and techniques of prediction of corporate financial distress or failure bring together outputs of financial analysis related to past economic performance of company and future estimates concerning further respective enterprises' performance. The financial crisis started to significantly affect the agricultural sector of the Czech Republic in the year 2009 and caused financial distress or bankrupt to many Czech agricultural enterprises.

Bankruptcy prediction models were employed on the data sample of identified bankrupt and non-bankrupt enterprises within the world financial crisis period via database Amadeus. The proceeded enumerations of Z-score, G-index and DEA approaches revealed, that the most efficient approach for predicting the bankruptcy of agricultural enterprises within the observed sample was the DEA analysis approach that correctly classified more than 74% of bankrupted enterprises one year prior the bankruptcy, followed by G-index approach with correct classification of 63%, respectively. The least efficient approach for identifying bankruptcy of the sample of agricultural enterprises was the Z-score model, which correctly classified only 37% of bankrupted companies. On the other hand the classical approach as the Z-Score and derived G-Index approach were 100% successful in classification of well performing enterprises.

The presented basic utilization and results of Data Envelopment Analysis concerning classification of bankruptcy or financial distress of business entities are the motive for authors to carry on further next research of particular Czech agricultural enterprises and also of other agricultural enterprises from EU member states or other industry sectors.

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11 Can Tight and Centralized Financial Regulations Prevent Financial Crises? Effects of Financial Regulations on Monetary Policy

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11.1 Introduction

Every financial crisis induces governmental responses. Governments promising that disastrous financial crises will not happen again are keen to implement various controlling mechanisms to regulate the financial and banking systems. The recent financial crisis culminating in the autumn of 2008 is not an exception.

The European Commission as a response to the financial crisis proposed to set up new controlling bodies. These bodies should be responsible for (i) gathering information on all macroprudential risks in the EU; (ii) legally binding mediation between national supervisors; (iii) the adoption of binding supervisory standards; (iv) the adoption of binding technical decisions applicable to individual institutions; (v) supervision and coordination of supervisory bodies; (vi) licensing and supervision of specific EU institutions (e.g. Credit Rating Agencies and post-trading infrastructure); (vii) binding cooperation with the European Systemic Risk Council to ensure adequate and prudent supervision; and (viii) strong coordinating role in crisis situations (EU Commission, 2008). These proposals should prevent the next financial crises via tight and centralized regulations. But, why should such regulations work?

Traditional arguments for regulation of the financial and banking systems put emphasis on market failure. However, the proponents of financial and banking system regulation do not explicitly argue that tight and centralized regulation prevents financial crises. Some even argue

that tight and centralized regulations might cause the governments to become corrupt (Stiglitz, Jaramillo-Vallejo and Park, 1993, p. 13).

In this chapter, we follow this argumentation. Using the theoretical apparatus of Virginia Public Choice applied to central bank decision-making,[34] we describe the behavior of the central bank after financial crises, when the government responds with tightening and centralizing the financial regulation. We provide a historical insight into the behavior of the government at the end of the 19th and the beginning of the 20th century in the USA. This historical period in the financial history of the USA is very interesting, because it explains the behavior of the government before the establishment of the central bank (FED). We hypothesize that there might be some parallels between the behavior of the executive bodies of the European Union and the US Federal Government.

In the next section, we describe a general concept which explains the functioning of the financial institutions under the gold and silver standard and under the fiat money standard when the central bank decision-making is dependent on government. We also explore the case of fiat money standard when central the bank decision-making is independent of the government. While in the case of the gold and silver standard governments gain zero seignorage, in the case of central bank decision-making dependent on government, the government gains substantial seignorage. These cases, however, do not correspond with the modern central bank decision-making when the central bank is independent of the government. In this case, the government preferentially maximizes the bond seignorage.

We go further and derive a rent-seeking model with endogenous rent (Lambsdorff, 2002) explained in a historical narrative in accordance with the theoretical concept above. We assume that additional liquidity provided by central banks represents rent. Our rent-seeking model predicts that when the central bank is independent of the government, the government tends to tighten and centralize financial regulation to provide protected private banks with additional government bonds ΔB. Generally, this is the interest-bearing debt held by non-government public D to encourage private banks to exchange these bonds for additional liquidity provided by the central bank. Since bond prices set by law are usually higher than the true price of bonds in the market, this process might increase the risk of inflationary monetary policy.

The last section summarizes our findings.

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[34] For pioneering study see Toma (1982).

11.2 A Simple Model of Inflation and Regulation

In this section, we develop a model of tightening and centralizing financial regulation as a governmental response to financial crises.[35] Firstly, let us assume that the main goal of the government is to maximize non-interest-bearing debt held by public. Non-interest-bearing debt held by non-government public is the revenue generated from printing fiat money by the central bank. Then let us assume that the second goal of the government is to maximize the interest bearing debt held by public. The interest-bearing debt held by non-government public is the revenue generated from selling government bonds by the government. In an institutional environment where the central bank is independent from the governmental decision-making it is realistic to assume that the government would rather maximizes the revenue generated from selling government bonds than the revenue from printing fiat money by the central bank.

Secondly, let us assume that the goal of the central bank is to maximize its own power (Toma, 1982, White, 1999, Chapter 8). Naturally, the central bank might seek additional goals. For instance, it could create a political business cycle. Nevertheless, in the case of tightening and centralizing financial regulation, the other goals of central banks are of minor importance.

11.2.1 Government as a Maximizer of Non-interest-bearing Debt and Interest-bearing Debt Held by Public

To explain our model in detail, first let us assume that an economy without a central bank operates under the gold and silver standard. As a result, seignorage is the difference between the face value of coins minted and their actual bullion content minus the cost of minting. The money supply therefore, could be expressed by the following equation:

$$M = PQ + C + S,$$

where M is the nominal value assigned to the batch of coins, P is the nominal price paid by the mint per ounce of precious metal, Q is the number of ounces of precious metal embodied in the batch of coins, C are the average costs of operating the mint (called "brassage"), S is the nominal seignorage.

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[35] We build on White (1999, Chap. 8).

Now, let us assume that providing gold and silver money is a perfectly competitive industry. Assuming this, perfect competition would enforce the price conditions equal to marginal cost, $M = PQ + C$, implying $S = 0$.

Under perfect competition, seignorage is reduced to zero. The nonexistence of barriers to entry ensures that the profit in the form of seignorage will be eliminated because new mints could be operating with lower costs. Not even the government could earn seignorage, unless it restricts potential competitors by creation of barriers to entry.[36]

Nevertheless, to be more realistic, let us now suppose that an economy with a central bank operates under the fiat money standard. Then the bullion content of base money is zero $Q = 0$, and the production costs are almost zero. Even though the production of fiat money is not cost-free, it would be useful to assume that $C = 0$. Then the equation describing money supply under the fiat money standard could be rewritten as $M = S$. Under the fiat money standard the government seignorage per year is simply equal to the change in stock of base money per year. The relationship is as follows:
$$S = \Delta H,$$
where ΔH indicates the change in H, the stock of "high-powered" money or base money in existence. Real seignorage is

$$S = \frac{\Delta H}{P},$$

where P is the price index used as a deflator.

Forder (2003) argues that politically, the independence of the central bank at the beginning of the 20th century in the USA was understood as the independence from bankers' interests. An independent central bank should have been obligated to provide "easy money" to every citizen. Throughout the 20th century this kind of independence was transformed into the independence of the central bank from the governmental interests. This is why we need to assume that the government does not just maximize the non-interest-bearing debt held by public. With increasing independence of central banks from the governmental interests such source of revenue would be limited.

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[36] Kirzner (1973) argues that the perfect competition model is unrealistic in its assumptions. According to Kirzner (1973) sufficient conditions ensuring free competition is no barriers to entry. For this reason we might abandon the assumption of perfectly competitive market and assume competition as a dynamic process without barriers to entry. For recent explanation see Otáhal (2008).

Let us therefore suppose that an economy with a central bank operates under the fiat money standard and the central bank is independent from the governmental decision making. Within this assumption, the government rather maximizes the revenue generated from selling government bonds than the revenue from printing fiat money by the central bank. Under the fiat money standard when the central bank is independent from the governmental decision-making, revenues generated from selling government bonds is simply equal to the change in stock of government bonds per year. The relationship is as follows:

$$D = \Delta B,$$

where ΔB indicates the change in D, the stock of government bonds.

Change of real interest-bearing debt held by public is

$$b = \frac{\Delta B}{P},$$

where P is the price index used as a deflator.

Previous assumptions allow us to describe the government budget constraint under the fiat money standard as follows:

$$G = T + \Delta B + \Delta H,$$

where G is the government spending including debt service, T is the tax revenue, ΔB is the change in the interest-bearing debt held by non-government public, and ΔH is the change in non-interest-bearing debt held by public, which is the nominal seignorage. Definition of nominal seigniorage ΔH, however, can be further extended with bond seignorage, which is government revenue generated from printing fiat money by the central bank when the central bank is independent from the governmental decision-making.

11.2.2 Tight and Centralized Financial Regulation with Exogenous Money Supply

To explain our rent-seeking model, let us assume that the government, in order to maximize the interest-bearing debt held by non-government public D, obligates private banks to hold government bonds B. We can demonstrate this issue on the historical example of the so-called "wild

cat banking" of the end of the 19$^{\text{th}}$ century in the USA.[37] Government bonds served as a collateral for the distribution of private banks' currencies. When the market value of bonds fell, the banks obligated to hold overpriced bonds faced the problem of insufficient liquidity (Kvasnička, 2008, pp. 34–35, Rybáček and Šíma, 2010). This process brought the government to provide additional liquidity through distribution of additional government bonds ΔB to private banks to satisfy the money demand.

Through financial regulation the government protected private banks from competition and created rents encouraging private banks to rent-seeking. Stigler (1971) generally argues that: *"... every industry or occupation that has enough political power to utilize the State will seek to control entry. In addition, the regulatory policy will often be so fashioned as to retreat the rate of growth of new firms."* (Stigler, 1971, p. 5)[38] In banking and financial sector, rents were represented by additional liquidity, which private banks obligated to hold government bonds B as a collateral, were allowed to create and distribute.[39] Simply, private banks were protected against competition in exchange for holding overpriced government bonds as a collateral, which allowed them to create and distribute additional liquidity.

Fig. 28 presents the classical rent-seeking diagram. Let us assume that in a competitive market, a certain amount of government bonds B *can be distributed* at price Cb for which there is a demand shown by Db. Quantity O would thus be distributed at the price of Cb. Let us suppose, however, that it is possible for the government to set the financial regulation so that it protects certain private banks against competition. Then the government is allowed to distribute a different amount of government bonds B at price Pb for which there is constant demand shown by Db. This process might bring the government to encourage provision of additional liquidity through the distribution of additional government bonds ΔB. Additional government bonds ΔB, which generally is the interest-bearing debt held by non-government public D is represented by rectangle $PbCbBA$. Within this rent-seeking diagram, governmen-

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[37] This period started in 1837 when Free Banking Act was passed on national level.
[38] Stigler (1971) assumes that the political control of citizens is very limited. Similar argument was presented by Olson (1965).
[39] Today private banks are obligated to hold governmental bonds by Capital adequacy ratio (CAR) regulations. CAR regulations classify governmental bonds as less risky financial instruments thus it indirectly incites banks to hold governmental bonds even though the true quality of governmental bonds might be different.
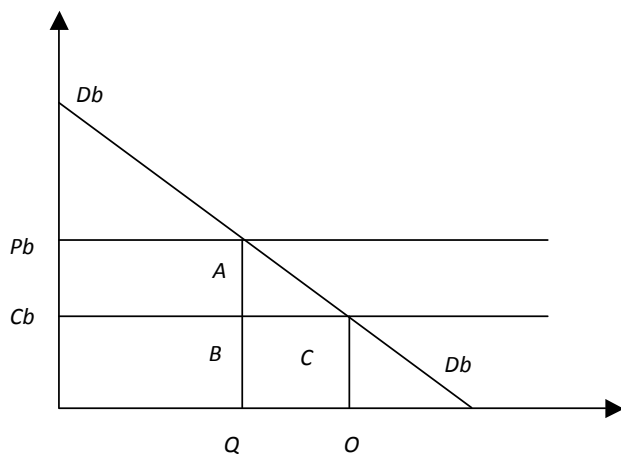
Figure 28 Rent-seeking

Source: Tullock (1967).

tal financial regulation restricts competition and raises the price of the interest-bearing debt held by non-government public. This allows private banks to create and distribute additional liquidity.

This kind of behavior of the state and private banks was recorded in human history at the end of the 19th and the beginning of the 20th century in the USA. During the period called "wild cat banking" at the end of the 19th century in the USA, banks were allowed to issue money, especially in exchange for government bonds. Due to government bond estimation, banks were able to reach additional profit (rent). Competition was restricted, even if very softly, while the banks had a strong incentive to purchase government bonds because this was an extremely easy way to issue money. Bond prices set by law were usually higher than the true price of bonds in the market. As a result, banks were legally permitted to issue money that was not covered from the very beginning. Because of this regulatory arrangement, governments and banks were in the privileged position of institutions reaching additional funds to the detriment of the society.

This situation was very advantageous for the government. To issue money backed by government bonds gave rise to stable demand for government debt. As already mentioned, an important feature of this period was the mechanism of the bond pricing. Once the price of bonds dictated

by law was higher than their true market price, rent-seeking conditions were created. It was favorable to buy bonds the market price of which fell under the regulated nominal value of bonds, as was the case of Michigan (Rockoff, 1972). The net profit of banks was the difference between the nominal and market prices of bonds.

Specific regulatory procedures could differ state by state during this period, resulting in different banking techniques to reach profit due to the perverse incentives created by regulation. For example, banks in Illinois were allowed to issue paper money amounting to only 80% of Illinois' government bonds value. Regardless of the measures taken to avoid "wild-cat" behavior, "free" banks could reach additional profit because of the high volatility of bond prices. Once the price had fallen rapidly, difference between the "legislated price" and market price created a clear incentive to purchase bonds and to issue money covered by the "legislative price" of bonds.

These mechanisms motivating banks to purchase government bonds was naturally very welcomed by the government, because the resulting rise in supply of money diminished the real value of dollar and government bonds at the same time. In other words, the government reached bond seignorage. It is worth mentioning that regulators were also under the pressure of interest groups, such as the steel or railway industries. Inflation of fiat money was seen by these interest groups as welcomed profit of exporters due to the impact of inflation on the exchange rate or beneficial for highly indebted industries such as the railway construction industry.

Otáhal (2011) explicitly argues that throughout the period of the end of the 19th and the beginning of the 20th century in the USA, the federal government tried to control rent-distribution through money supply control and banking sector regulation. It had systematically tried to tighten and centralize financial regulation to provide certain private banks and investment companies with privileges to use securities and bonds with regulated nominal value as a collateral for distribution of federal government currency. Striking example is the period of the Civil War. "In 1863 and 1864 two laws were passed, the *National Currency Act* and the *National Banking Act*. These acts started off a period in the US monetary history referred to as the *National Banking Era*. By these acts the federal government empowered itself by chartering banks operating on the national level. The reason for central regulation was simple. The federal government wanted to enlarge the national debt, so it created

a system of national banks distributing federal currency, fiat money, United States Notes, also referred to as *greenbacks*. This ensured the distribution of the national debt in the form of federal bonds." (Otáhal, 2011, pp. 8–9) Otáhal builds a rent-seeking model with endogenous rent that predicts that the described state and private bank behavior led to centrally-controlled financial regulation by the federal government and to the establishment of Federal Reserve System at the beginning of the 20th century. The Federal Reserve System fully controlled the fiat money supply throughout the entire banking sector and the financial regulation. A similar model describes our logic below.

11.2.3 Tight and Centralized Financial Regulation with Endogenous Money Supply

The concept above derived from a historical example has made an assumption that rent is given exogenously. However, in an economy with a central bank, which operates under the fiat money standard, money supply is given endogenously. In the perspective of the discussed historical concept it means that additional liquidity is distributed by the central bank to the private banks in exchange for government bonds and the private banks then supply credit to satisfy the existing money demand.

To explain our rent-seeking model with endogenous rent, let us assume that the probability p_i that the banks get additional government bonds is proportional to the investment of banks into rent-seeking x_i. Since financial regulation allows all banks to exchange government bonds for additional liquidity provided by the central bank and since all probabilities must add up to one, a single bank's probability of getting additional government bonds, which allow the bank to get additional liquidity from the central bank, decreases with the investments undertaken by its competitors. In case of n banks, this results in

$$p_i = \sum_j^{x_i} x_j \quad i, j = 1, \ldots, n$$

with x_i being the expenses for rent-seeking of bank i. The resulting equilibrium can be determined once the following assumptions are introduced: banks are risk-neutral, they act symmetrically, they are unable to influence the rent-seeking investments of other competitors x_j.

Assuming that the government increases the interest-bearing debt held by non-government public D by additional government bonds ΔB, banks

maximize their profit $E(\bar{r}p_i\Delta B - x_i)$ from getting additional liquidity from the central bank in exchange for additional government bonds ΔB.[40] Maximization of the profit of the banks looks as follows:

$$\frac{d(\bar{r}p_i\Delta B - x_i)}{dx_i} = \frac{d(\bar{r}\Delta B x_i / \sum x_j - x_i)}{dx_i} = \frac{\bar{r}\Delta B}{\sum x_j} - \frac{\bar{r}\Delta B x_x}{(\sum x_j)^2} - 1 = 0 \quad (31)$$

Assuming that banks are symmetrical, $x_i = x_j = x$, the Cournot-Nash-equilibrium could be followed by optimal levels of rent-seeking.

$$\frac{\bar{r}\Delta B}{nx} - \frac{\bar{r}\Delta B x}{n^2 x^2} = 1 \Leftrightarrow n\bar{r}\Delta B - \bar{r}\Delta B = n^2 x \Leftrightarrow x = \frac{n-1}{n^2}\bar{r}\Delta B$$

Total expenses R for rent-seeking then could be summed up as follows:

$$R = nx = \frac{n-1}{n}\bar{r}\Delta B \quad (32)$$

The last equation implies the following. If banks face a problem with liquidity and the central bank provides additional liquidity in exchange for additional government bonds ΔB, banks will spend more resources on rent-seeking R when the number of banks n is larger. The government thus must provide additional government bonds to larger number of banks n.

Now, let us assume that ΔB is positively dependent on the total rent-seeking expenses: $\Delta B = \Delta B(R)$, with $\Delta B' > 0$ (Lambsdorff, 2002). The larger the size of the additional government bonds ΔB that banks seek to obtain additional liquidity provided by central bank, the larger bank's total expenses for rent-seeking R required to induce the government to provide them with additional government bonds ΔB. This equation might be introduced into the model above. Since $\Delta B = \Delta B(\sum x_j)$, equation (31) can be rewritten:

$$\frac{d\left(\frac{\bar{r}\Delta B(\sum x_j)x_i}{\sum x_j} - x_i\right)}{dx_i} = \frac{\bar{r}\Delta B' x_i}{\sum x_j} = \frac{\bar{r}\Delta B}{\sum x_j} - \frac{\bar{r}\Delta B x_x}{(\sum x_j)^2} - 1 = 0 \quad (31')$$

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[40] Private bank maximizes $E(\bar{r}p_i\Delta B - x_i)$ where $\bar{r}$ is a constant, $\bar{r} > 0$, which represents the ratio of difference between interest received from government and interest paid to central bank.

Assuming that banks are symmetrical, $x_i = x_j = x$, the Cournot-Nash-equilibrium could be followed by optimal levels of rent-seeking.

$$\frac{\overline{r}\Delta B' x}{nx} + \frac{\Delta R}{nx} - \frac{\overline{r}\Delta B x}{n^2 x^2} = 1 \Leftrightarrow n\overline{r}\Delta B - \overline{r}\Delta B = nx(n - \Delta R') \Leftrightarrow$$

$$\Leftrightarrow x = \frac{n - 1}{n(n - \overline{r}\Delta B')}\overline{r}\Delta B$$

Total expenses R for rent-seeking then could be summed up as follows:

$$R = nx = \frac{n - 1}{n - \overline{r}\Delta B'}\overline{r}\Delta B \qquad (32')$$

The last equation implies the following. If ΔB is larger (smaller) than 1, R is larger (smaller) than ΔB and an increase in the number of banks n will decrease (increase) the total expenses for rent-seeking. Under the gold and silver standard, banks' seignorage S dissipates through competition. As seignorage S attracts new entries into the market, the increasing money production drives down the nominal seignorage S and reduces banks' profits. But assuming the economy with a central bank that operates under the fiat money standard, as soon as additional government bonds ΔB, which allow banks to get additional liquidity provided by the central bank, are seen to depend on rent-seeking expenses, the additional liquidity distribution might lead to a decrease of number of rent-seeking banks n protected by financial regulation. Economically, this relates to the fact that the positive impact of rent-seeking expenses R on the additional government bonds ΔB might be felt more when a few protected banks exist. If there is too many banks competing for additional government bonds ΔB, they might rather increase their market share instead of devoting more resources to rent-seeking in order to get additional liquidity provided by the central bank.

This implication of our rent-seeking model with endogenous rent means that if the government maximizes the interest-bearing debt held by non-government public D, it will protect a few banks with financial regulation to induce them to exchange additional government bonds ΔB for additional liquidity provided by the central bank. A situation with a few protected banks competing for additional government bonds ΔB might be optimal, because a few protected banks are rather encouraged to rent-seeking than to increasing their market share. This situation, however, raises the price of the interest-bearing debt held by non-government public D above its q market clearing price and thus it brings a risk of inflationary monetary policy.

11.3 Conclusions

In this chapter, we used the theoretical apparatus of Virginia Public Choice applied to the central bank decision-making to describe the behavior of central banks after financial crises, when governments responds by tightening and centralizing the financial regulation. We assumed that additional liquidity provided by central banks represents rent.

We provided the historical insight into the behavior of the US government at the end of the 19th and the beginning of the 20th century and derived a rent-seeking model with endogenous rent to explain how the process of tightening and centralization of financial regulation might increase the risk of inflationary monetary policy.

Nevertheless, we do not necessary claim that every financial regulation increases the risk of inflationary monetary policy. We found it very important to provide lessons from the period in the financial history of the USA when FED had not yet been established and the US Federal Government wanted to consolidate its power (Otáhal, 2009). Naturally, the historical circumstances of the European Union and those of the USA between the 19th and 20th were different. However, the interesting part of this narrative is that the US Federal Government had been systematically tightening and centralizing the financial regulation till the FED was established. The effect of this process on the frequency and depth of financial crises in the USA, however, needs to be further explored.

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12 A New Consensus in Macroeconomics and Inflation Targeting – Successful Policy or One of the Reasons for the Crisis After 2007?

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12.1 Introduction

The term "New Consensus in Macroeconomics" (NCM) started to be used more widely at the turn of the 21st century (Blinder, 1998, Bernanke and Gertler, 1999, Clarida, Galí and Gertler, 1999, McCallum, 2001, Meyer, 2001). It has been used commonly since then, as evidenced by contemporary texts (e.g. Arestis, 2007, Arestis, 2009a, Arestis, 2011a). The term itself wanted to express the conviction that, after a period when various theoretical trends existed which followed after the disintegration of the so called great neoclassical synthesis over the course of the 1970's, it had been managed in macroeconomics to integrate various contradictory theoretical concepts and to form a unified comprehensive scientific theory. As stated by Wren-Lewis (2007), since this breakdown, several alternative schools of thought existed side-by-side – for example, in the form of the Keynesian approach, the monetarist approach, the new classical approach, whereas each one of these approaches had its own models and it was not clear if and how these models are related. In the beginning of the 21st century, it seemed that the various schools of macroeconomics had practically disappeared and that a majority approach based on the principles of microeconomics and joined with the idea of a representative company striving to maximize its profit, a representative consumer who in the meantime maximizes his gain and both are occurring in the environment of a perfect capital market, has emerged even in macroeconomics. The NCM integrates in itself the so called new Keynesianism including wage and price rigidity in a short period with assumptions of rational expectations, real business cycle theory (RBC) and other approaches. The NCM presumes that price stability can be reached

through monetary policies – that is because inflation is a monetary phenomenon – specifically through interest rate changes of the central bank. In the NCM, fiscal policy loses the positions of a policy that can (in the long-term) influence real variables.

The development of the NCM theoretical models was in progress at the same time when numerous central banks (CB) were changing their approach in the specific policy. They explicitly or implicitly[41] converted to the policy of inflation targeting. The NCM models then provide a theoretical background for the central banks' specific procedures. The policy of inflation targeting seems to be successful – most CB that followed inflation targeting managed to get and keep inflation at low values in the first decade of the 21st century, whereas the GDP of the given countries usually increased[42]. Before the breakout of the world economic crisis at the end of the first decade, everything seemed to suggest that macroeconomics has got not only an integrated economic theory, but that, at the same time, practical procedures are available for maintaining price stability and simultaneously reducing GDP fluctuation and other indicators such as the unemployment rate (Goodfriend, 2007).

Even before the outbreak of the given crisis, various critical reservations to the NCM models existed. They pointed, for example, to the fact that a complete unification of all mental approaches did not occur – for example, post-Keynesian theories and the ideas of the Austrian School remain aside. The NCM also seemed to be a bit one-sided – it focuses too much on monetary issues and does not deal with other problems, such as the role of positive and negative supply shock (see Smith and Wicknes, 2007, Sawyer, 2007a, Sawyer, 2007b). The first NCM models were often constructed for a closed economy (e.g. Meyer, 2001, McCallum, 2001), which is not the case of any real functioning country.[43] The critics also focused on, according to their point of view, weak points of the NCM – e.g. the role of monetary aggregates (Fontana and Palacio-Vera, 2004), omitting the possibility, that monetary policy can be inefficient in case of the liquidity trap or if you like the credit crunch, underestimating fiscal policies, etc. (Sawyer, 2007a). The crisis after 2007 then confirmed that the assumptions of the NCM were too optimistic – especially that economic fluctuations can be significantly reduced, respectively that the

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[41] Explicit inflation targeting means the fact that CB has expressed that its goal is to keep inflation at a certain level. Implicit inflation targeting policy is when CB acts in this way even though it has not set a specific inflation goal.

[42] Statistics are listed in Section 12.3.

[43] The NCM model is even now sometimes presented only for a closed economy.

production gap can be limited in the long-term. Efficiency of the monetary policy was challenged, fiscal policy, on the other hand, proved as a policy that can also solve the crisis. A question with a greater urgency has arisen – how to react to possible price bubbles, when prices of various assets do not correspond with their actual value.

The goal of this chapter is to analyze the problems of the NCM and inflation targeting with respect to the world economic crisis. The chapter is organized in the following manner. First, the NCM model for the open economy is introduced. Then the issue of monetary and fiscal policy in this model is examined with special attention given to countries with a small open economy, the effectiveness of the given policies and the question as to what extent was the reaction to the crisis of the European countries consistent with the NCM models. The last section then contains critical methodological evaluation of the NCM approach with respect to the course of the economic crisis after year 2007.

12.2   NCM Model

In an open economy, the NCM can be formally expressed with a system of six equations (Agénor, 2002, Arestis, 2007, Angeriz and Arestis, 2007, Arestis and Sawyer, 2008, Aresrtis, 2009a, Aresrtis, 2009b)[44]:

$$Y_t^g = a_0 + a_1 Y_{t-1}^g + a_2 E_t(Y_{t+1}^g) + a_3[R_t - E_t(p_{t+1})] + a_4(rer)_t + s_1, \ (33)$$
$$p_t = b_1 Y_t^g + b_2 p_{t-1} + b_3 E_t(p_{t+1}) + b_4[Et(p_t^w + 1) - E_t\Delta(er)_t] + s_2, \ (34)$$
$$R_t = (1 - c_3)[RR^* + E_t(p_{t+1}) + c_1 Y_{t-1}^g + c_2(p_{t-1} - p^T)] + c_3 R_{t-1} + s_3, \ (35)$$
$$(rer_t) = d_0 + d_1[[(R_t - E_t(p_{t+1})] - [(R_t^w) - E(p_{t+1}^w)]] +$$
$$+ d_2(CA)_t + d_3 E(rer)_{t+1} + s_4, \ (36)$$
$$(CA)_t = e_0 + e_1(rer)_t + e_2 Y_t^g + e_3 Y_t^{gw} + s_5, \ (37)$$
$$er_t = rer_t + P_t^w - P_t, \ (38)$$

where individual symbols are the following: index t marks the current time period, index $t + 1$ the future period, index $t - 1$ the past period, index w refers to the world, Y_g is the production gap in a given economy, Y_t^{gw} is then the production gap in the world economy, R is the domestic nominal interest rate and R_t^w is the world nominal interest rate, p^T is

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[44] Other texts (e.g. Setterfield, 2007, Fontana, 2009) formulate the system of equations expressing NCM model a bit differently, the purpose of the system remains the same.

the inflation target of the central bank, RR^* is the equilibrium interest rate (meaning an interest rate where the real value of inflation in a given period equals the inflation target and where the production gap equals 0), rer marks the real exchange rate and er nominal exchange rate in terms of x units of foreign currency per one unit of domestic currency (indirect record[45]), p_t^w is the foreign price level and p is the domestic price level (price levels are expressed logarithmically), CA expresses the current account of the balance of payments, s_i (for values even from 1 to 5) labels random shocks, E is then the symbol for expectation. The change in nominal rate, which is part of the second equation (34) (expression $\Delta(er)$), is derived from equation (38) and can be expressed in the following way $\Delta er = \Delta rer + p_t^w - p_t$.

The first equation (33) is a function of aggregate demand, or aggregate expenses (AE), and states that the present production gap depends on the past and future production gap, the real rate and the real interest rate (expression $R_t - E_t(p_{t+1})$ in the first equation (33)). Even though it is a demand function, the potential product (in the NCM[46] concept a product which exists on condition of flexible prices) is determined by the supply side (stock of available production factors, technologies, etc.). The second equation (34) is a Phillips curve equation, in which the present inflation depends on the production gap, past and expected future domestic inflation and inflation abroad and a change of the nominal rate. The model assumes that prices are rigid in the short-term and flexible in the long-term. The expression $E_t(p_{t+1})$ in the equation PC expresses that individual subjects (agents) act in accordance with the theory of rational expectations – they do not deduce future inflation only from the past development, but also from their ideas about the future development, while keeping track of the policy of the central bank and understanding it. That, at the same time, allows for a credible policy of the CB – if CB announces low inflation as its target and manages to keep this target, the agents adjust their actions to it.

The third equation (35) describes a reaction function (monetary rule) of CB, when the current interest rate of CB is dependent on the expected inflation, the production gap and diversion of inflation from the inflation target of CB (inflation gap), the equilibrium interest rate and the interest rate of CB in the past. The equation describes the actions of CB: if inflation is above the inflation target, CB raises its interest rates; if

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[45] In CZ, nominal exchange rate is usually expressed in the form of a direct record, meaning x units of domestic currency for one unit of foreign currency.

[46] See Arestis, 2009a.

inflation is below it, CB lowers its rates, while gradually (the individual interest rate changes can be radical) adjusting its past rates. Furthermore, the equation states that if inflation equals the inflation target and the production gap equals 0, then the interest rate of CB equals the equilibrium interest rate and AE equals the potential product. In this case, the amount of savings and investments is also in balance (Arestis, 2009a).

The fourth equation (36) states that current value of the real exchange rate is the function of the interest differential of real measures, current account balance of payments and the expected future value of the real rate. The fifth equation (37) defines the value of the current account balance of payments as a function of the real exchange rate, domestic and world production gap. Finally, the sixth equation (38) expresses the nominal exchange rate by means of the real exchange rate. In total we have 6 equations available for 6 unknowns – output, interest rate, inflation, real exchange rate, current account and nominal exchange rate.

The theme of the NCM can be stated as follows (e.g. Arestis and Sawyer, 2002b): monetary policy can, by changing the interest rate, modify the degree of inflation to the inflation target of CB (this target is usually set at a low level – usually around 2% p.a.) and the real product to the potential product (or to get the production gap to a zero level). CB has this ability because (in the short-term), in individual markets, we come across rigid wages (input prices) and prices of outputs, imperfect information, or more generally, individual agents are in an environment of imperfect competition. By changing their nominal interest rates, CB can then influence the real interest rate and in turn the actions of individual agents, on the aggregate level then AE. This mechanism can be described (Fontana, 2009):

$$\Delta R_t \Rightarrow \Delta R_t - E_t(p_{t+1}) \Rightarrow \Delta C_{t+1} \ \& \ \Delta I_{t+1} \Rightarrow \Delta AE_{t+1} \Rightarrow$$
$$\Rightarrow \Delta Y_{t+1} \ \& \ \Delta u_{t+1} \Rightarrow \Delta(Y_{t+1}^g) \Rightarrow \Delta p_{t+1},$$

where Δ is the sign for change, C is consumption spending, I stands for investment expenses, and u is the unemployment rate.

It is also due to CB's policy that economy, in the long-term, aims to the level of natural unemployment rate in the NAIRU concept, meaning unemployment that does not cause acceleration of inflation, whereas the level of this natural unemployment is given by the supply side of economy, meaning by the conditions that govern the job market and other production factors.

12.3 Monetary Policy in the NCM

12.3.1 Monetary Policy Without Money

Even though NCM stresses the role of monetary policy, the amount of money in circulation – supply of money in the form of individual monetary aggregates (M) plays a minor role in the given approach – the NCM is hence sometimes characterized as monetarism without money (Fontana and Palacio-Vera, 2004)[47]. The NCM basically understands the supply of money as endogenous (Arestis and Sawyer, 2002a, Korda, 2010), while it is determined by the demand for money, GDP, price level, interest rate of CB and other factors. The NCM accepts that there is a relationship between M and the price level (P), but it understands it the other way around compared with the traditional monetary approach – in the NCM concept, M adapts to P. The given fact can be expressed by adding a seventh equation (39) to the system of equations above, e.g. in this form (Meyer, 2001):

$$M_t = d_0 + d_1 R_t + d_2 Y_t^g + d_3 E_t(p_{t+1}) + s_5, \qquad (39)$$

In this equation, M acts as a dependent, not as an independent variable. To be complete, let's add that some other publications dealing with the NCM (McCallum, 2001) include the change of M's growth rate in the first equation (33), p. 189, claiming that an unexpected growth rate of M changes the transactional expenses of agents[48] and that influences AE and, in turn, even the production gap. But this effect is minute (McCallum, 2001, Ireland, 2001).

Individual publications dealing with the NCM state numerous reasons why CB should not have M as their target. One of the reasons is the fact (Bean, 2007, Goodhart, 2007) that changes in M lead to unexpected changes in the rate of money turnover, so the total supply of money is then difficult to determine. Volcker (2002) questions the role of a monetary multiplier in the creation of the total amount of money – individual multipliers cannot capture the rules commerce banks use for providing loans or the fact that many loans are provided from outside the bank sector. Bean (2007), Arestis and Sawyer (2008) use monetary

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[47] As is stated in the cited publication e.g. in the basic model of the Bank of England (BoE) the supply of money is not included. Same is the case of the American FED (Federal Reserve Board, 1996).

[48] Decrease of M increases transactional expenses, growth of M decreases them.

policies of Great Britain and the USA in the 1980's as practical examples to show that targeting the monetary reserve did not lead to desirable outcomes. Bernanke et al. (1999) is even more radical when he states that no CB has managed to accurately influence the growth of M for a sufficient amount of time (a period that could be taken as a confirmation that targeting M works). Generally, the Goodhart's Law (Goodhart, 1984) can also be called upon in this context. It states that any stable empirical relationship has a tendency to become unstable if it starts to be used for reasons of practical policy[49] – specifically, it can be said that previously stable relationship between M and V on one hand and nominal GDP on the other became unstable (as has happened in the case of the above mentioned and other countries), if they became the subject of macroeconomic policy, in other words, if they started to be targeted.

As it was said in the introduction, the NCM is not only a theoretical approach. Inflation targeting, which can be labeled as one of the cornerstones of the NCM (inflation targeting is expressed by the third equation (35), p. 189, in the NCM equations), has been used since the 1990's by many CB[50]. Although two most significant banks, American FED and European Central Bank (ECB) are among them explicitly, it can be stated that, at least until the outbreak of the economic crisis in 2008, these banks performed their monetary policy with the goal to ensure a low level of inflation through changes in their interest rates[51]. At least in

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[49] Goodhart's law can be labeled as a validation of Lucas' critique (Lucas, 1976) saying that it is a mistake to anticipate effects of any arrangement based on past actions. By starting to use the given relationship empirically, the rules changed. Therefore, changes in actions of the individual agents can occur and even the relationship itself can change.

[50] Presently it includes CBs of the following countries (alphabetically): Australia, Brazil, Canada, Columbia, Czech Republic, Ghana, Great Britain, Guatemala, Hungary, Chile, Island, Israel, Indonesia, Mexico, New Zealand (as the first country ever), Norway, Peru, Philippines, Romania, Serbia, South Africa, South Korea, Sweden, Switzerland, Thailand, Turkey (more details in Scott, 2010).

[51] As is stated in article 127 of the Treaty about the Functioning of the Monetary Union: *"The primary goal of the European system of central banks (ESCB) is to maintain price stability. Without affecting the target of price stability, ESCB supports general economic policies in the Union with the intent to assist in achieving the goals of the Union, as they are defined in article 3 of the European Union Treaty."* ECB itself then defined price stability so that the rate of inflation measured with the harmonized index of consumer prices is under, but close to 2% p.a. (Bean, 2007, Poole, 2007), FED has a similar theory about the level of inflation (see e.g. Federal Open Market Committee, 1995, Federal Open Market Committee, 1996, Greenspan, 2003)

developed countries, the NCM policy was successful – inflation was kept at low values (Table 34). A question arises in this connection whether it was the consequence of inflation targeting or if the particular countries were simply lucky. Many studies[52] reach the conclusion that the level of shocks between 1990 and 2007 has decreased compared with the past. From this point of view, the success of inflation targeting could be viewed as a matter of luck. However, Gurney (2007) argues that the opposite view is possible saying that shocks are a consequence of individual economic agents' actions, including CB's, and that, from this perspective, CB's policy could have helped in the reduction of shocks. Gurney (2007) further adds that at least in the case of GB, who introduced inflation targeting in 1997, this country had to deal with a number of shocks – for example, with an increased volatility of the financial markets, which had its take-off in the Asian crisis of 1997, in the Russian crisis of 1998, with the burst of the technological bubble at the turn of the century, with the consequences of the events of 9/11/2001, with the war in Afghanistan and Iraq and with the increasing prices of oil and other commodities. All of these events could have significantly influence inflation which, however, remained low in the case of GB.

12.3.2 Monetary Policy and Countries with a Small Open Economy

In case of the Czech Republic (CZ) as a country with a small open economy it makes sense to point out that decision making of CB (equation (35), p. 189), or the changes in interest rates of CB, is not influenced by the real or nominal exchange rate – neither one of these rates is present in the equation. Nevertheless, it is obvious that currency values have the usual effect on inflation – valorization of currency leads a raise of prices of imported goods and in turn to lower inflation, devaluation has the opposite effect. The change in interest rates itself does not affect the actions of agents only through the interest mechanism, but also through the mechanism of exchange rates – if the domestic real interest rate rises as a result of CB rising rates and is higher than the world interest rate, than an inflow of capital, valorization of domestic currency and a decrease of AE should occur, which should influence the level of production and the price policy of companies and, therefore, have an effect on inflation. Even though the mechanism of exchange rates shows

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[52] See e.g. Stock and Watson (2002), Bernanke (2004), Bean (2005), Benati and Mumtaz (2006).

		2001	2002	2003	2004	2005	2006	2007
Euro area	GDP (growth rate in %, current price)	1.883	0.941	0.812	2.167	1.698	3.060	2.856
	Average inflation (in %)	2.420	2.263	2.108	2.183	2.186	2.202	2.135
United States	GDP (growth rate in %, current price)	1.080	1.814	2.490	3.573	3.054	2.673	1.947
	Average inflation (in %)	2.817	1.596	2.298	2.668	3.366	3.222	2.867
United Kingdom	GDP (growth rate in %, current price)	2.461	2.097	2.808	2.951	2.173	2.788	2.685
	Average inflation (in %)	1.182	1.274	1.363	1.344	2.041	2.300	2.346
Australia	GDP (growth rate in %, current price)	2.674	4.005	3.290	3.762	3.125	2.607	4.588
	Average inflation (in %)	4.381	3.003	2.771	2.344	2.669	3.538	2.332
Canada	GDP (growth rate in %, current price)	1.784	2.925	1.881	3.120	3.019	2.823	2.200
	Average inflation (in %)	2.507	2.276	2.742	1.841	2.230	2.018	2.131
Israel	GDP (growth rate in %, current price)	−0.062	−0.580	1.543	5.110	4.872	5.697	5.315
	Average inflation (in %)	1.113	5.699	0.694	−0.393	1.346	2.078	0.521
Korea	GDP (growth rate in %, current price)	3.973	7.150	2.803	4.619	3.957	5.179	5.106
	Average inflation (in %)	4.067	2.762	3.515	3.591	2.754	2.242	2.535
New Zealand	GDP (growth rate in %, current price)	2.656	4.909	4.190	4.477	3.269	0.990	2.837
	Average inflation (in %)	2.630	2.648	1.748	2.317	3.038	3.362	2.377
Norway	GDP (growth rate in %, current price)	1.990	1.502	1.014	3.864	2.739	2.281	2.731
	Average inflation (in %)	3.017	1.288	2.475	0.465	1.522	2.332	0.729
Switzerland	GDP (growth rate in %, current price)	1.152	0.443	−0.198	2.533	2.641	3.630	3.645
	Average inflation (in %)	0.989	0.643	0.638	0.803	1.172	1.060	0.732

Table 34 Growth rate of GDP and rate of inflation in chosen countries targeting inflation

Source: International Monetary Fund, World Economic Outlook, http://www.imf.org.

itself as significant (Arestis and Sawyer, 2002a), a certain uncertainty remains (Goodhart, 2007, Smith and Wickens, 2007) as to how exactly it works. It is evident that its significance will depend on the level of openness of the given economy and whether an inflow or outflow of capital will actually occur after the change of interest rates. With a rise in rates, investors can view the real rates in the given country as too low, considering the risks and other factors connected with buying assets in this country. Or, with a decrease in domestic real interest rates as a result of CB decreasing rates, they can continue holding on to the domestic assets for various reasons. The fact that inflation and exchange rate targets could easily get into conflict, therefore, CB would have to prioritize one target, speaks against the notion that CB should also set an exchange rate target. In case it would not be obvious which target to prefer, CB's actions would be less predictable and credible. On the other hand, if it would be obvious, then the second target is redundant.

From the point of view of foreign relations, it still holds true that the equation of monetary rule of CB in the NCM does not consider that setting a domestic interest rate is also dependent on the interest rate of other central banks (Arestis and Sawyer, 2003a). It is clear that if these rates will differ, then a greater movement of capital and greater volatility of the domestic currency is probable, which can have an effect on net export. Specifically, low rates of domestic CB, who should stimulate domestic demand, can lead to a certain decrease of export as a result of a greater volatility of the exchange rate. On the other hand, CZ's experience, when the repo rate of CNB was 0.75 percentage points lower than the repo rate of ECB[53] since June 13, 2011,[54] does not verify any massive exchange rate fluctuation of CZK to the EUR. As L. Lízal,[55] a member of the bank council, mentioned in this connection, the impact on Czech assets is now smaller than before, because investors are better at distinguishing between different countries and CZ seems as a safe bet even in case of a negative rate differential. In other words, interest rates in the Eurozone seem to at least some agents low, considering the present risk, and they prefer the Czech Crown. Generally it can be said that the effect of foreign rates cannot be expressed with a solid coefficient. That is probably the reason why the authors of equations describing the NCM do not work with this effect.

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[53] Repo rate of CNB was 0.75%, repo rate ECB 1.5%.
[54] This chapter was finished in August 2011.
[55] See Lízal (2011)

12.3.3 Measuring Inflation, Asset Prices

If the goal of CB is to keep inflation at a low rate, the issue of measuring inflation arises. Smith and Wickens (2007) point out the differences between inflation expressed using the index of consumer prices and using a deflator – CPI expresses prices of domestic consumption, the deflator prices of domestic production. The more open the economy will be, the more will these two indexes differ. The traditional argument is that the individual indexes (especially CPI, which is relatively easier to determine compared to the deflator) overestimate inflation (e.g. Mankiw, 2000a). Moreover, if inflation pressures occur, which will not show in CPI, CB might not react even though it should. On the other hand, CPI can include items that increase inflation in case of CB rate growth (a typical example are costs related to housing, especially mortgage expenses[56]). To be complete, this text does not deal with issues of setting the production gap and it makes reference to other literature (e.g. Mankiw, 2000a). It only emphasizes that a wrong estimate of the production gap can have long-term effects. If CB believes that this gap is positive[57] and raises interest rates, but this assumption is incorrect, it no doubt influences the development of the production gap in the future.

The objective of CB is not only price stability. Even if it is not explicitly set in their goals, they must be interested in the stability of the financial system and the stability of the currency, at least because the given instabilities can threaten the price stability. In this connection the question arises as to what extent should CB engage itself in the prices of (financial) assets (especially in case of their growth), including whether these (at least some) assets should be included in measuring inflation. Before the outbreak of the financial crisis, most publications from the NCM field (Bean, 2007, Goodhart, 2007) gave a negative answer to the question of possible interferences with possible bubbles in the asset market and to including more assets in measuring inflation. The reasons for this attitude were the following:

- Prices of assets are difficult to predict, including the fact that it cannot be said with certainty whether the asset price is too high.
- Prices of various assets can develop in various ways; a simple aggregation cannot be done. It is possible that the growth of prices

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[56] In CZ, mortgage expenses are not represented in CPI. Nevertheless, it is clear that these expenses, at least indirectly, influence rent price, which is included.

[57] The real GDP is higher than potential GDP, or the rate of growth of real GDP is higher than the rate of growth of potential GDP.

is caused by fundamental factors, so then it is alright. Speculative growth of assets is dangerous; however, it is not always possible to differentiate which growth occurred.

- Prices of assets are reflected in inflation through other factors and with a significant time delay. An exact transitive mechanism is not known; from this standpoint, interference of monetary policy can be wrong.
- A bubble burst (a sudden decrease of previously high asset prices) can cause a reduction of wealth of individual agents, but the impact of the given burst on their consumption and possibly on inflation is indirect in the long-term and individual policies should manage to stabilize it.
- CB pays attention to asset prices within the scope of caring for financial stability. Other special proceedings are not needed then. If CB were to solve the issue of asset prices separately from the issue of inflation, it would lead (just as if another target would be the nominal or real exchange rate) to two-tracking and to a less predictable behavior of CB, which would decrease their credibility, which is the key factor for success in targeting inflation.

The NCM has identified with the opinion expressed, for example, by Bernanke and Gertler (2001) or Greenspan (2002), that the idea that raising interest rates can prevent bubbles is an illusion, whereas this rise, especially if it occurs immediately before the burst, can have serious macroeconomic impacts – it can lead to a more drastic fall of GDP (if assets were purchased on credit, then higher rates can make it more difficult for the debtor to pay off the debt etc.). Monetary policy should focus especially on reducing possible consequences of bubble bursts. Some publications[58] realized even before the outbreak of the crisis after 2007 that a bubble burst can lead to tighter conditions in the debtor – lender relationship – more agents will face liquid restrictions, which can threaten the success of monetary policy. The crisis reopened the question whether CB should actively interfere with bubbles[59].

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[58] E.g. Borio and Love (2002), Bordo and Jeanne (2002).
[59] For more details see e.g. Blanchard, Dell'Ariccia, Mauro (2010), or Zamrazilová (2011).

12.4 Fiscal Policy in the NCM

12.4.1 Truly an Ineffective Tool?

Fiscal policy is not viewed as an efficient tool in the NCM models. The following are the most often stated reasons of the given attitude (Arestis and Sawyer, 2002a, Setterfield, 2007, Arestis, 2009b, Fontana, 2009):

- Time lags during implementing individual arrangements (most of them must go through a legislative process) lead to an uncertainty among agents (it is not clear if the arrangements will be passed and in what form) and also to the fact that at the time of implementation, the arrangements they can have a procyclical effect.
- The fact that raising taxes or lowering expenses in a situation when the economy is overheating can be politically unpopular or be opposed by the public, so it can be delayed, which will lead to serious macroeconomic problems of the given economies. Problems in Greece and several other countries at the end of the first decade of the 21st century confirm the significance of this argument.
- The fact that frequent changes in government expenses and taxes have a negative effect on entrepreneurs, who are then in greater uncertainty. Generally speaking, these changes can negatively influence the supply side of economy and have an effect on GDP.
- The assumption that the Ricardian Equivalence (or Barro-Ricard hypothesis) works at least partially, and that growth of government expenditures is accompanied by a decrease of other components of AE. Here the NCM emphasizes the role of expectation – agents at least partially expect that an expansionary fiscal policy will have to be, sooner or later, accompanied by an increase in taxes or decrease in government spending and they adapt their actions. Specifically consumers cut back their current expenditures and create savings to pay the future taxes.
- Growth of the public sector, which is a consequence of the expansionary fiscal policy, leads to a decrease of persons who work in the private sector and to an increase in their wages. That obviously increases company's expenses, effects their production and can have an effect on the rate of inflation.

Already at the time of the NCM's conception, several objections were raised against these conclusions. Based on data analysis, Wren-Lewis (2000) came to the conclusion that changes in government expenditures, transfers and taxes still, at least in the short-term, greatly influence AE.

Hemming, Mahfouz and Schimmelpfennig (2002) point to the fact that the affect of the fiscal multiplier is positive, even though it is small.

The issue whether the Ricardian Equivalence (RET) really happens in practice is often seen as the key conflict. Briotti (2005) states that even though empirical results do not really confirm its validity, the actions of households can be partially in accordance with the RET. Coenen and Straub (2005), Arestis (2009b) and other authors have tried to shed more light on this partial validity. They point out that fiscal policy can have different consequences in advanced and developing countries. In advanced countries, there are two types of households – Ricardian and non-Ricardian. The first type strives for interim optimization of their consumption, acts rationally, looks to the future, is not restricted by liquidity and has access to the asset market. These characteristics are not true for the other type – empirical research truly shows that many households do not look to the future and that they deal with liquidity restrictions (Campbell and Mankiw, 1989, Mankiw, 2000b, HM Treasury, 2003). Even though, according to Coenen and Straub (2005), the share of non-Ricardian households is relatively small in Europe[60], their behavior (together with the fact that companies are in an environment of imperfect competition and existence of menu cost) has an affect also on the behavior of the Ricardian households that are not capable to optimize their consumption – the presence of non-Ricardian households brings with itself friction and informational asymmetry, therefore, total optimization is impossible. Then, fiscal policy can influence AE, product and unemployment rate.

According to Coenen and Straub (2005), Arestis (2009b), in case of the developing countries, fiscal policy has a rather procyclical effect; in recession it deepens the crisis. One of the significant reasons is that the tax system here is de facto regressive. A greater presence of corruption also plays its part. As a result of corruption, voters (interested parties) want the government to give them various benefits, whereas these benefits stimulate AE. Providing benefits is possible primarily at a time of growth, when the budget has sources for the given benefits. In recession, these countries start dealing with budget restrictions, so benefits are cut, which influences the development of GDP. Empirically given claims are confirmed by a study by Alesina and Tambellini (2005), which researched 87 countries during 1960–1999 and reached a conclusion that in 36 out

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[60] According to the authors of the given text, it is given primarily by liberalization of financial markets, that has been going on since the 1980's.

of 64 countries of OECD non-members, fiscal policy has a procyclical character.

12.4.2 Fiscal Policy Affects Product, Inflation, and Equilibrium Rate of CB

From the standpoint of constructing equations expressing the NCM, it can be objected that effects of a fiscal policy are expressed in the first equation (33), p. 189, specifically in the value of coefficient a_0, possibly in the change of this value. If the current coefficient value leads to a creation of a production gap, CB should interfere. On the other hand, it is clear that fiscal policy itself, if it is set correctly, can close the production gap, as it can also influence inflation. This can be stated:

$$\Delta G \ \& \ \Delta tax \Rightarrow \Delta a_0 \Rightarrow \Delta AE_{t+1} \Rightarrow \Delta Y^g_{t+1} \ \& \ \Delta u_{t+1} \Rightarrow \Delta(Y^g_{t+1}) \Rightarrow \Delta p_{t+1}$$

Fiscal policy also affects the extent of equilibrium interest rate RR^*. Let's express the individual components of GDP $(Y = C + I + G + NX)$[61]:

$$C_t = f_1 + f_2(1 - tax - im)Y_{t-1} - \alpha[R_t - E_t(p_{t+1})], \qquad (40)$$

$$I_t = f_3 + f_4 E_t(p_{t+1}) - \beta[R_t - E_t(p_{t+1})], \qquad (41)$$

$$NX_t = EX_t - IM_t, \qquad (42)$$

where C are consumption expenses, I investment expenses, G government expenses, NX net export, EX export and IM import, tax is the income tax rate and im is the marginal propensity to import.

Production gap $(Y^g = Y_t - Y^*$, where Y^* is potential product), can then be expressed:

$$Y^g = (f_1 + f_3) + G_t + [f_2(1 - tax) + (f_4 - 1)]Y^* +$$
$$+ [f_2(1 - tax - im)](Y_{t-1} - Y^*) + f_4 E_t(Y_{t+1}) - Y^*) -$$
$$- (\alpha + \beta)[R_t - E_t(p_{t+1})] + EX_t - IM_t \qquad (43)$$

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[61] The text is based on Arestis and Sawyer (2003b). Symbols are a bit fixed because the given texts describe NCM for a closed economy, whereas we are working with an open economy. For synoptic reasons, dependences of export and import are not broken down. It holds true that export is dependent on the world production gap and the real exchange rate, import on the domestic production gap and real exchange rate.

Equilibrium interest rate (rate, where $Y^g = 0$) is then:

$$R_t - E_t(p_{t+1}) = \frac{f_1 + f_3}{\alpha + \beta} + \frac{G_t + NX_t}{\alpha + \beta} + \frac{f_2(1 - tax - im) + (d_4 - 1)}{\alpha + \beta}Y^* \ (44)$$

Equation (44) makes it clear that the value of equilibrium rate is influenced by the level of government expenses as well as by the income tax rate (and the change of these values); therefore, a single value of this equilibrium interest rate cannot exist. Its level is influenced by the parameters of the consumption function and dependence of investment expenses, where these two parameters can change in time. If CB does not recognize the given changes, logically, it can set its rate incorrectly, which will have a negative effect on the value of the production gap and inflation.

Monetary policy, unlike fiscal policy, has the benefit of a greater flexibility – most monetary decisions can be carried out faster. Nevertheless, every policy has to battle with the time lag principle. In case of monetary policy, the problem is the fact that a forward facing CB does not know the future inflation rate – it can only estimate and obviously these estimates can be wrong[62]. Even the up-to-date inflation rate can be inaccurate, not only as a result of the measurement method used (e.g. construction of a consumer basket), but also as a result of not managing to find out all relevant data. For these and other reasons, monetary policy should not be overrated. Presently, ideas that a fiscal policy has its place in solving crises are more common[63].

12.4.3   Fiscal Policy and Recession, the Japanese Experience

The importance of a fiscal policy can be theoretically explained with the liquidity trap situation. However, it now appears that this situation needs a more detailed theoretical explanation than as it is described in standard economic texts (Blanchard, 2010). It is necessary to pay attention to a situation when a recession is caused by a bubble burst, or when it is a so called "balance-sheet" recession. An eye-opening example can be the Japanese recession after 1990 (Koo, 2008). At the end of

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[62] If CB uses DSGE models for estimating future inflation, they can make a significant error considering the construction of these models and what these models lack.

[63] E.g. Blanchard, Dell'Ariccia and Mauro (2010), Arestis (2011b).

the 1980's, a drop in real estate and stock[64] prices occurred in Japan. In case of many subjects, their liabilities exceeded the value of their assets. In this case, a company should go bankrupt. Nevertheless, the Japanese firms still had a stable demand; their products were still desired by the market[65], so there was no reason for them to stop production. The firms massively (many firms made this decision around the same time) decided to start paying off their debts and to solve their balance-sheet problems. At the given time, the firms were not too willing to take loans, because new loans would reveal problems on the asset side, or the fact that the value of company assets is lower than the value of their liabilities. "Balance-sheet" recession can then be characterized as a problem on the asset side of companies, when the value of company's assets (for various reasons) decreases and the firm technically goes into bankruptcy. However, if the company is capable of production, then it can avoid bankruptcy, or try to avoid it – pays its debts, strives to clear its balance-sheet. But if many firms act this way, then it must show in a negative development of the GDP index and the unemployment rate.

Various texts explain the liquidity trap differently. Mach (2001) gives the reason that prices of other financial assets (e.g. bonds) are high and, therefore, interest rate is low, so individual subjects prefer to hang on to their money – by purchasing financial assets, considering the expected price drop, they would realize a loss. In case of the current crisis, it can be noted in opposition to this explanation, that prices of financial assets decreased, so the interest rate was supposed to increase. Blanchard (2010) explains the liquidity trap saying that demand for money is so low that the curve of money supply intersects the money demand curve at a zero (or a very small) interest rate. If demand for money is low, it can be assumed that debtors do not want to borrow. That is the case of the Japanese crisis after 1990 according to Koo (2008). Banks in Japan were willing to lend during most of the time between 1990–2003[66]. That means that the liquidity trap was not caused by the banks' unwillingness to provide loans, but by the actions of companies, who, as a result of the

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[64] Value of Nikkei 225 stock index which includes the stock of the 225 most significant companies fell from its peak of 38916 reached on December 29, 1989, to its bottom of 14309 on August 18, 1992. A gradual recovery followed, index value has never exceeded 21000 points. At the time of writing of this chapter (August 2011) it was under 10000 due to the crisis.

[65] During most of the time after 1990, Japan had the largest trade surplus in the world, meaning that international subjects were willing to buy Japanese goods.

[66] Year 1990 is usually said to be the beginning of Japanese problems. Since 2003, growth rate of Japanese GDP steadily higher than 1.00% (up to and including 2007).

problems with their balance-sheets, were rather paying off their existing debts and were not willing to (in a greater extent) take new bank loans. In a way it does not matter whether banks and other financial organization are not willing to lend or if companies do not want to borrow[67]. The consequence is always the ineffectiveness of the monetary policy, be it in the form of decreasing interest rates of the growth of the value of M.

In case of the Japanese economy, the drop in loans the companies took led to the decrease of their investment expenses. At the same time, problems of the Japanese economy did reflect on the consumer behavior of Japanese households. Net export itself cannot usually balance out the given problems, so it is desirable to increase government spending (even at the price of a deficit growth). Under normal conditions (not in a recession), an increase in government expenses leads to a displacement effect. Firms are generally more effective in using outside sources. But if companies do not want to borrow, then the risk of a displacement effect is minimal. It is worth mentioning that Koo (2008) thinks that the Japanese recession lasted so long because the fiscal policy was sparsely expansive. Moreover, the Japanese government made several mistakes – e.g. in the course of the recession (in 1996), it decided to increase taxes aiming to increase tax income in order to reach a surplus budget. The result was completely opposite – in 1997, tax income dropped compared to 1996 and the budget sunk into a greater deficit.

12.5   Problematic Aspects of the NCM and Their Possible Solutions

A number of problems the NCM is connected with, like the fact that none of the macroeconomic policies has sufficiently dealt with the influence of financial asset prices on the total stability, or more generally, that the effect of financial stability and development on the financial markets on the production gap and inflation was underestimated. Or the fact that policy of cheap money can lead to an excess credit expansion, which can be reflected in the financial markets (in the prices of financial assets). Doubt over the conviction of the ineffectiveness of a fiscal policy was already mentioned or discussed in this text and in other works (Arestis,

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[67] Situation when banks are not willing to lend, especially because they think that loans are too risky, is usually called the credit crunch (Bernanke and Lown, 1991). Nevertheless, a situation when debtors do not want to borrow can also be labeled a credit crunch.

2009a, Arestis, 2011a). Here we would like to call attention to the following problematic aspects of the NCM that we think are significant and important:

- The NCM is based on the presumption of forward looking agents without liquidity restrictions and with perfect information (excluding uncertainty) and on a perfect capital market. These presumptions are not met, though. That can cause problems from the long-term point of view – subjects, for example, accept loans in the short-term, even though they are not capable to pay them off in the long run. Let's emphasize though that this behavior of agents is rational to a great extent, and is influenced by incentives that are present in the given economy. If agents are encouraged to run into debt and their ability to repay is not sufficiently checked and if a conviction that a possible inability to repay will not cause a significant harm is created, behavior that in its consequences threatens the financial stability is logical. If conditions were set differently, agents would also act differently.

- The NCM pays little attention to the fact that past decisions affect the present state – even though the NCM equations imply that the present production gap, among other things, depends on the past production gap and decisions of CB on the past rate of inflation, then past decisions can significantly influence agents' actions (e.g. their willingness to borrow, consume, invest, level of government spending, etc.) In the NCM, investments are de facto dependent on the decisions of domestic (in case of an open economy also foreign) agents to consume and levels of savings derived from this decision. But if investments depend also on other factors, especially their expected rate of profit and expected risk, an incongruity can arise between savings and investments, where the level of investment can, among other things, result from the past and current stock of capital assets, that is be affected by time.

- CB usually decide about setting their rates approximately once per month, where the change usually is not higher than 0.25 of a percentage point. Although this change might not affect inflation much, it creates costs to subjects whose decisions depend on CB's rates – these are called "menu cost" and they can show up in inflation. Frequent changes of interest rates create opportunities for speculations and contribute to a financial instability. On the other hand, CB's decision itself can have a minute effect on the decisions of financial organizations that lend money – in a real

economy, there are many interest rates, where their level depends on many factors (type of risk, time, market character). Especially in the situation of the "liquidity trap" type, lowering of CB's rates does not have to have an effect on other subjects.

- At least from the short-term standpoint, inflation is caused primarily by demand. Supply shocks can be included in the coefficient value s_3 in equation (35), p. 189, nevertheless, these shocks can have a significant effect on inflation, whereas overcoming these shocks is connected with changes in the unemployment rate when there are inflexible prices. In a way, the NCM omits the experience which most countries experienced in the 1970's with the oil shocks and price increases of raw materials and groceries, which occurred especially in 2007, that is just before the main breakout of the crisis. If CB react on the negative supply shock by raising interest rates, (which was the case of FED, ECB, BoE), then it is their decisions that contribute to the financial instability, because many decisions of agents were based on expecting low interest rates.

The question remains, how do we react to these findings the crisis has brought? Here we will not deal with practical recommendations for monetary or fiscal policies. Discussion on this topic is included in many texts[68]. Rather, we will aim for a more general generalization from the standpoint of constructing macroeconomic models. The NCM models belong (Zamrazilová, 2011) into the group of dynamic stochastic general equilibrium (DSGE) models. Their advantage is their microeconomic anchoring, based on which it is easier to describe behaviors of macroeconomic magnitudes more realistically. It makes sense to consider whether, even in the long run, general equilibrium is truly established. Various shocks, especially entrepreneurial discovering (Kirzner, 1998) and innovation, constantly throws any system out of balance. Thanks to the technological advancement, the number of shocks rather increases. But agents have limited information which is spread over time and place (Hayek, 1945). They are in a world of imperfect competition and do have a time-unlimited outlook. Various research (Coyle, 2010) shows that, from the stand point of profit, short-term advantages are overrated and long-term advantages are underestimated, where (as is emphasized above) this overrating is caused by the incentives that agents encounter at a given time and react on them while not being able to estimate all the long-term consequences of their decisions.

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[68] E.g. Carmassi, Gros, Micossi (2009), Poole (2010), Willet (2010).

All the above mentioned factors, together with the fact that, in the short-term, prices of many production factors and outputs are inflexible, lead to the fact that a universal balance is not accomplished even in the long-term. We do not agree with Coyle (2010) that DSGE models are a dead-end street of economic development. However, it seems that these models, despite their dynamic character, overrate the state of equilibrium, which is in its substance static and does not account for the dynamic world, the flow of time, unfamiliarity and uncertainties enough. In other words, the concept of equilibrium is overrated on account of the fact that economic systems only aim for equilibrium, without actually reaching it. The model de facto ignores the role played by disequilibrium prices – most transactions do not happen under equilibrium prices, but prices that do not ensure equilibrium (Boetkke, 2011). In consequence of adjusting these prices, the system comes closer to equilibrium. On the other hand, other changes take the system out of equilibrium again. The given changes of disequilibrium prices and production changes that follow from this change of prices must be necessarily reflected also in macroeconomic indexes such as the GDP and the inflation rate. If the model is focused too much on the state of equilibrium, the given changes might not be sufficiently included in its reasoning. Among other things, this can lead to a faulty estimate of macroeconomic quantities. More generally, equilibrium conditions or values have no meaning to agents – the environment for entrepreneurial discovery, for improving the present unsatisfactory state with an expected better future state is not in equilibrium.

Agents' decision making processes always happen in a certain context – agents consider what effect will their decisions have not only in the current game,[69] but also in future games; however, they are not capable to recognize all the games they participate it. The structure of incentives that affect their decisions comes from a system of institutions – formal and informal rules structuring and limiting human interaction (North, 1991). Especially the influence of formal institutions depends on the quality and functioning of institutionary governance[70] that ensure enforcement and adherence to formal rules. All the factors listed

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[69] The word game is understood in the usual meaning of game theory, interactive economic situation, when making decisions (actions) of a certain subject is affected by decision making (actions) of other subjects while at the same time affecting decision making (actions) of other subjects, where conflicts among individual participants can arise. (Maňas, 2002, Dlouhý and Fiala, 2007)

[70] See Wawrosz (2011).

here have an effect on reaching general equilibrium and on macroeconomic indexes; it would be desirable to include them in the individual models. Of course, one can object that by including these factors any model would become too complicated and confusing[71]. After all, one of the benefits of the NCM model is its internal consistency – the mutual ties of the individual quantities which are preferred over the external consistency – or over the model's correlation with empirical data (Wren-Lewis, 2007). But if the inclusion of various factors is not possible and if the external consistency can be disputed, a permanent validity of the model, or its long-term functioning from the standpoint of the reality of too simple ties (such as that a change in CB's interest rates will always affect inflation and the production gap), cannot be expected. The NCM models at least tempted to preferring such ties[72].

The NCM models showed their validity in times of economic growth. This chapter agrees with the opinion that policy of cheap money, which to a certain extent stemmed from the NCM and which was practiced by a number of CB in the first half of the first decade of the 21$^{\text{st}}$ century, at least indirectly contributed to present problems (e.g. White, 2009). Nevertheless, this does not exclude the practical uses of the NCM models. On the other hand, procedures that are not contained in the NCM (massive use of a fiscal policy, purchasing of government bonds by CB etc.) were used in solving the crisis. From the standpoint of inflation targeting, the above mentioned holds true – in most countries targeting inflation, the given policy led to a lower inflation rate before the crisis, respectively that it remained at a low level. Nevertheless, there are problems with measuring inflation – increasing prices of some assets (especially financial assets) were not reflected in the consumer basket. It is therefore necessary to look for alternatives or expansions of the NCM models for cases of crisis, liquidity trap situations, etc. From the standpoint of measuring inflation, it is then a question of whether the consumer price index (CPI) is a suitable tool – as the name of the index implies, it only monitors the prices of goods that are purchased by consumers and neglects the prices of other goods, or assets. It is not possible to rely on the fact that simple solutions will always work, that relationships between these individual coefficients are direct and linear (as the NCM model assumes) and that, in reality, these relationships will always function only in accordance with the model. It is true for

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[71] Economically said, costs for inclusion are higher than the benefit that would come from it.

[72] A similar opinion is also expressed in Blanchard, Dell'Ariccia and Mauro (2010).

inflation targeting that this targeting by itself will not ensure financial stability; it does not guarantee that financial organizations will not invest into risky instruments that can cause a crisis. On a more general level, it can be said that, from the standpoint of various model construction describing human actions and actions of macroeconomic values, a crisis should make us more humble and help us realize that human knowledge can never embrace everything and that reality is more complex than any model; therefore, no model can be conclusively trusted.

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IV
Epilogue

13 Epilogue: Ten Possible Scenarios for the Future Development of the Eurozone

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Since January 1999, the Eurozone has been enlarged from 11 countries to the current 17. It is worth noting that, for example, Estonia decided to enter the Eurozone at the height of the crisis. Other Baltic countries are ready to do the same at the earliest opportunity, even with the Eurozone crisis escalating and the entire project coming under sustained criticism. A look at the macroeconomic data shows the first decade of its existence has been quite successful. Using the USA as a benchmark, the Eurozone performed on a comparable level with the US economy. But the greatest expectations remain unfulfilled. The euro has not brought faster, more robust economic growth. In fact, the opposite has taken place. From the outset there have been marked imbalances in terms of competitiveness, economic growth and inflation. The financial crisis has brought about the neglect of economic problems in individual member countries, leading to significant losses in GDP. Unemployment in peripheral countries such as Greece and Spain has exceeded 25% and four countries (Greece, Ireland Portugal and Spain) have now been forced to search for the financial aid from the EU, the IMF and the ECB. The EU's inability to react to the problems in Greece and the spill-over effect that has been generated in other peripheral Eurozone countries has completely overshadowed the successes achieved during the first ten years of the Eurozone existence.

13.1 Assumptions in Evaluating the Scenarios

It is always difficult to predict the future, especially as national (and transnational) economies are concerned, even though such predictions are the sine qua non for both general and economic policy purposes. The reason for this is that modern economies (and societies) represent more than just the interplay of rational market forces, which form the bread and butter of economic modeling. They are affected by a variety of social, political and random factors. These are in general unpredictable,

often even for the actors participating. Hence whenever an analysis pertaining to the future is contemplated, it pays to specify some basic assumptions.

All of the scenarios indicated below are based upon some basic assumptions.

Firstly, as was true of economic crises historically, it may be assumed that this crisis, too, will be connected to a slowdown in integration process and the growth of "eurosceptic" tendencies within the individual member countries.[73] Even before the outbreak of the crisis, it was possible to observe declarations by some politicians blaming their countries' economic problems on the euro, i.e., on the inappropriate monetary policy of the European Central Bank.[74] As the current recession expands in both length and breadth, the frequency of such eurosceptic opinions is increasing. The European economic and monetary union project has been a political process from the outset and it may be anticipated that those who pose the first questions about the cost of continued membership by their countries in the Eurozone will be politicians.[75] The second important assumption which must be taken into account with all of the envisioned scenarios is the nonexistence of legislation or (a precedent) under which a country might exit the Eurozone. Current EU legislation does not prescribe a procedure by which any country may give up its membership in the Eurozone. The Lisbon Treaty speaks only

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[73] A typical example would be at the end of the 1970s and the start of the 1980s, during the period following the first and second oil crises of 1973 and 1979. European Community members reacted to economic problems by suspending the process of deepening economic integration. The Single European Act, which shifted the European Community by creating a common market with free movement of goods, services, capital and persons, was not adopted until 1986, after economic growth had been renewed in the majority of member countries. The period from the end of the creation of the customs union in 1968 until 1986 (almost 18 years) is often referred to in the literature of the history of the European integration process as the period of "eurosclerosis" (for more, see, e.g., KÖNIG, P., LACINA, L., PŘENOSIL, J. (2009): *Učebnice Evropské Integrace,* pp. 49–61).

[74] The best-known would be the declaration by French president Sarkozy on the overly restrictive policy of the ECB (e.g., Euractiv, 2007) or that of Italian president Berlusconi on the negative impact of the euro on the Italian economy (e.g., Guardian, 2005).

[75] An example would be the reaction of voters to the negative economic developments in Greece, or the significant ally oral success enjoyed by the True Finns Party in Finland. By contrast, Geert Wilders was unsuccessful with his anti-European politics in the Netherlands. Pro-European parties are currently in charge in Ireland, Spain and Italy. It will be interesting to study campaign themes in the approaching German parliamentary elections, which are due to take place in 2013.

of an exit from the EU as a whole. Any country which were to decide to replace the euro with its national currency would, in all likelihood, need to consider giving up its membership in the European Union as a whole[76] and finding a new way of cooperation with the remaining EU countries[77]. The third point which fundamentally impacts how well the scenarios presented conform to reality is the fact that any withdrawal of the country from the Eurozone would likely lead to a deepening of economic problems for the economy in question instead of an immediate improvement in the country's situation. In particular, countries with low competitiveness, budget deficits and high indebtedness would be faced immediately upon exiting the Eurozone with extensive depreciation of the newly introduced national currency, growth in inflation and an inability to pay their debts.[78] These and other negative impacts could be

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[76] The Lisbon Treaty, which replaced Treaty of Nice deals with the exit of a member State from the EU in Article 49a: *"(1) Any Member State may decide to withdraw from the Union in accordance with its own constitutional requirements; (2) A member State which decides to withdraw shall notify the European Council of its intention. In the light of the guidelines provided by the European Council, the Union shall negotiate and conclude an agreement with that State, setting out the arrangements for its withdrawal, taking account of the framework for its future relationship with the Union. That agreement shall be negotiated in accordance with Article 188n Par. 3 of the Treaty on the Functioning of the European Union. It shall be concluded on behalf of the Union by the Council, acting by a qualified majority, after obtaining the consent of the European Parliament; (3) The Treaties shall cease to apply to the State in question from the date of entry into force of the withdrawal agreement or, failing that, two years after the notification referred to in paragraph 2, unless the European Council, in agreement with the Member State concerned, unanimously decides to extend this period.*

[77] As has already been seen with Norway and Switzerland, it is possible to stand outside the structure of the EU and still take advantage of the common internal market. Countries exiting the Eurozone or the EU itself could negotiate a status similar to that currently held by countries in the so-called European Economic Area with the EU as part of the exit procedure.

[78] The only country in which these impacts would be minimal upon exit from the Eurozone is Germany. It may be argued that it is very likely that the credibility of the German economy would even be enhanced upon exit from the Eurozone. It is of course a fact that a reintroduced German currency would appreciate vis-à-vis the remaining Eurozone countries and their own newly introduced currencies. But the Deutschmark appreciated during the entire period of time from the collapse of the Bretton Woods system of fixed exchange rates and, in spite of this, the German economy was able to maintain its competitiveness by controlling growth in nominal wages and productivity. The German economy retained this capability into the start of the 21st century. It may therefore be presumed that any appreciation of the Deutschmark would impact on Germany's competitiveness only temporarily. The second negative impact noted is the issue of the settlement of payables and receivables under the TARGET system. Germany is a major lender on the order of hundreds of millions of euros and it is
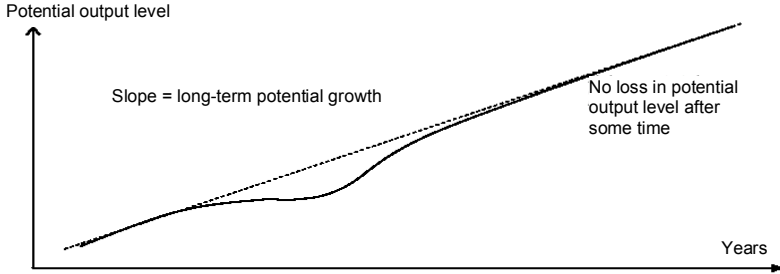
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partially eliminated if exiting from the Eurozone took place in a single step without consultation with other member states and all preparations geared towards replacing the euro with a national currency took place behind the closed doors. The entire process of exchanging the euro for the national currency would need to take place very quickly.[79] The last significant assumption in the scenarios defined below is the length of the current crisis and the capability of the Eurozone countries to renew an economic growth. The longer the crisis lasts, the greater is the threat that the Eurozone will disintegrate or that some countries will exit the monetary union. The reason would be the lack of capability of countries on the periphery to renew an economic growth. This leads to a situation in which, in spite of attempts to stabilize budget deficits, the overall debt burden grows unsustainably vis-à-vis economic output.

Figure 29 shows three possible scenarios for the development of potential product in the Eurozone as a consequence of the impact of the financial and economic crisis on individual national economies starting in the second half of 2008. The first scenario anticipates a strictly temporary drop in the development of the potential product vis-à-vis the trend in place before the start of the economic crisis, with a return to this level after a certain period. The loss to the economy is dictated by the length of time for which the potential product diverges from its long-term trend. The second scenario foresees a drop in the potential product as a result of the recession which perseveres at its lower level over the long-term (e.g., as a consequence of an inadequate response in economic policy – failure to solve the problem of maintaining stability in the financial system). This simultaneously causes the unemployment rate, of course, to stabilize at the level reached at the end of the recession. A long period of stagnation flows as a consequence from the negative impact of long-term high un-

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not completely clear how the balance sheet would be settled (see Sinn, 2012, and De Grauwe, 2012).

[79] The process itself of replacing the single-currency euro with the national currency would have costs on a similar scale as those the countries experienced upon introducing the euro (costs for printing banknotes, stamping coins, revaluing accounting items, changing accounting systems, etc.). The fact is that, while the transition to the euro was in preparation for several years, the return to the national currency would have to take place with minimal preparations and would be sure to bring a number of complications for the functioning of national economies. On the other hand, it should be noted that national central banks have continued to function after introduction of the euro in all member states at roughly the same size as before they transferred their decision-making powers on monetary policy to the ECB. Each country thus possesses adequate specialists and technical capacity to renew the national currency and to formulate an autonomous monetary policy.

Case No. 1: "Full recovery" scenario

Potential output level

Slope = long-term potential growth

No loss in potential output level after some time

Years

Case No. 2: "Permanent loss in potential output level"
But no change in potential growth in the long-run

Potential output level

Permanent loss in potential output level

Same long-term potential growth after the crisis (same slope)

Years
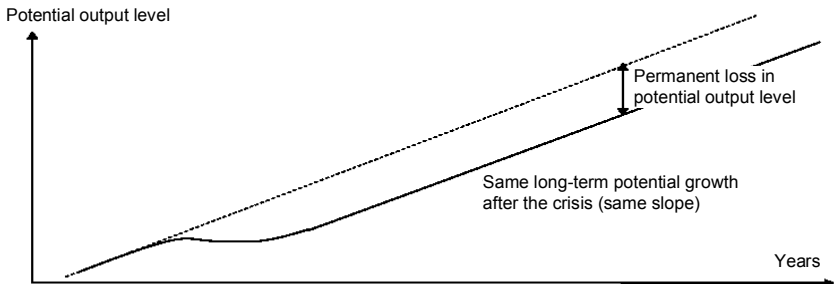
Case No. 3: "Continuous widening loss"
Potential output loss in level increases over time due to lower long-run potential growth

Potential output level

Potential growth before crisis (e.g. 2%)

Potential output loss increasing overtime

Lower long-term output growth after the crisis (e.g. 1.5%) (lower post-crisis slope)
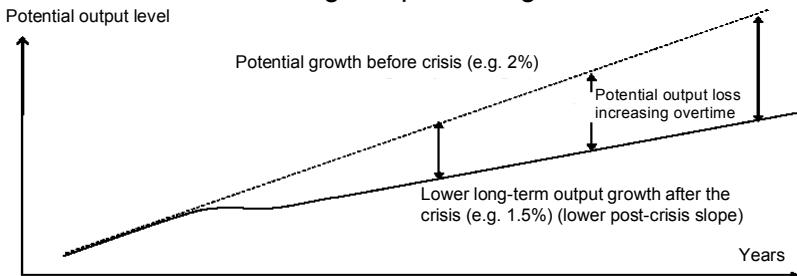
Years

Figure 29 Three Possible Scenarios for the Development of Potential Product in the Eurozone

Source: Koopman, G. J., Székely, I. P. (2009).

employment. The third, pessimistic scenario is illustrated by a variant in which the consequences of the economic crisis bring about a drop in potential product and the output gap[80] continuously expands over time. There may also be further growth in unemployment as a result.

All these assumptions must be taken into account in assessing scenarios for the potential future development of the Eurozone. For each scenario, an assessment will be offered of its likelihood, feasibility, temporal dynamics and any restrictions posed by, e.g., European Union legislation.

13.2   Scenarios for the Future Development of the Eurozone: The Euro at the Crossroads

The following section identifies ten possible future developmental scenarios, with variants ranging from more thorough political integration tending toward the creation of a fiscal union all the way to the breakup of the entire Eurozone and a return to national currencies.

Scenario 1: Collapse of the Eurozone and a Return to National Currencies

The first scenario to be considered is the breakup of the entire Eurozone, an event which, although possible, is fairly unlikely. A similar scenario might be envisioned if the majority of current members came to the joint consensus that the existence of the Eurozone and the common monetary policy stands in the way of overcoming the crisis and that it would be better for everyone to return to national currencies. Were such an event to take place, it would result from a joint political decision by the most important EU member countries and would be kept secret for as long as possible to buy time for the Eurozone countries to return to their national currencies. The instigator of the collapse of the entire Eurozone might be Germany, if the Germans were to evaluate continued participation in the group as being too expensive and fraught with risk. It was already clear from the outset of preparations for the economic and monetary union that the project could only be pulled off with the participation of Germany. The conclusion is therefore that any decision by Germany to return to the German mark would lead to the collapse

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[80] The output gap is defined as the difference between the potential and actual product. It thus shows the product volume which might have been produced but was not.

of the entire Eurozone. The "advantage" of this scenario might be a lesser negative reaction by the financial markets than if only countries on the periphery of the Eurozone (Greece, Portugal, Spain, Italy) were to exit. These countries would pay for their exit in terms of currency depreciation, a inflation, interest rate hikes, asset devaluation, and outflow of foreign capital, etc. As has been indicated, a return to national currencies would not be athe simple step technically but it would not be completely undoable. It would very much resemble the introduction process for the euro. It would only involve the exchange of the euro for the national currency and a return of the decision-making power concerning monetary policy to the national level. The likelihood of this scenario increases with the length and depth of the economic crisis. One possible variant on development of the economic crisis could be the so-called "Japanese path". Economies will cease falling off after a certain period of time but will then remain at this lower level for a number of years[81]. This brings about a long-term reduction in the standard of living and double-digit unemployment with its negative consequences. In such a case, society increases the pressure on political representatives to take radical steps to resolve the situation. Demands to replace the euro with national currencies or leave the European Union altogether cannot be far behind.

Scenario 2: The Exit of Italy, Greece, Spain, Ireland and an End of Enlargement of the Eurozone

In the media, one of the most frequently presented developmental scenarios concerns the exit of countries which have suffered the most from the impact of the financial and economic crisis. Most frequently mentioned is Greece. There are significant concerns that an exit by Greece would initiate a domino effect and the financial markets would turn their attention to other countries on the so-called periphery of the Eurozone,

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[81] This kind of economic development is referred to in the literature as the "hockey stick effect". The economy first records a steep decline in production. After hitting bottom, however, there is no speedy recovery. Rather, the economy continues to function at a lower level over the long-term. This state is largely the result of an inefficient monetary policy which exhausts all available tools as production drops and at a certain point, loses its efficiency. The central bank announces interest rates approaching zero. Real interest rates take on negative values, etc. An inefficient monetary policy may then result in an overactive fiscal policy and growth in total government debt. Japan is currently among the most indebted countries in the developed world, with government debt reaching 200% of GDP.

forcing them to withdraw from the common currency (Italy, Spain, Portugal and Ireland). These countries are not only exposed to the impact of the economic crisis but are also gradually losing one of the greatest advantages of membership in the monetary union: very low nominal and real interest rates. When the crisis started, the financial markets began once again to evaluate these countries as risky and began to demand higher interest rates (a higher risk premium) in exchange for providing capital to finance budget deficits and refinance debts. In the case of Greece, there has already been a partial declaration of insolvency and some countries on the periphery are under the real threat of having to announce a state bankruptcy in the near future. The more stable economies of the Eurozone would also "welcome" the exit of these countries. They worry that the financial markets will evaluate the Eurozone as a whole and that the tax for participating in a monetary union with these countries will be an increased risk premium for all member countries. Countries like Germany also have increasing worries about the policies of the European Central Bank. The bank's almost unlimited intervention in the secondary government bond market, the provision of liquidity to commercial banks and other forms of quantitative easing under consideration threaten the price stability across the Eurozone. Although this scenario is essentially a highly pragmatic one, in all likelihood it will not come to pass. The problem economies are aware that in the short run, the costs of leaving the Eurozone would substantially exceed any benefits.[82] And in addition, the remaining member countries have no legislative instrument by which to exclude the "problem" countries. The probability that this variant would be implemented is very low. This probability increases only if elections in some problematic economies create a populist-led coalition which will not take the negative economic and political impact of terminating the country's membership in the Eurozone, or potentially the European Union, into account.[83]

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[82] For instance, the low level of openness on the part of Greece to international trade leads to the conclusion that adopting a national currency with its subsequent depreciation would be counterproductive for growth in exports and indirectly for the Greek economy as a whole, as well.

[83] Examples would be the election results noted in Greece and Finland, and the strengthening of virulently eurosceptic political parties.

Scenario 3: Further Expansion of the Eurozone: Status for New Countries as "Half" Members

Another possible scenario comes from the proposal by the International Monetary Fund. At present, the Eurozone consists of only 17 countries out of a potential 27. Full membership, however, is possible only for countries which fulfilled the so-called Maastricht criteria. Economies hit by the economic crisis will have the greatest problems in fulfilling budget deficit criteria. The deficit may amount to a maximum of 3% of the gross domestic product. In reaction to the negative economic developments, most countries have increased their expenditures from public budgets and at the same time their revenues have been substantially reduced because of the drop in economic activity. The result is that most candidate countries substantially exceeded the public budget deficit criteria for several years in a row.[84] This could result in postponement of entry into the Eurozone for a number of years. Despite the current prevalence of criticism of the European monetary integration process, there are groups of countries which are eager to enter the Eurozone as soon as possible (e.g., Lithuania and Latvia). The International Monetary Fund has proposed in the past that existing member countries might permit all candidate Eurozone countries an exception from the fulfillment of the convergence criteria in exchange for status as so-called "half members". New member countries which do not fulfill the criteria could officially make use of the euro but would not receive the share of voting rights in determining the shape of the common monetary policy. This scenario, however, has two important limitations. The conditions for filling the convergence criteria are anchored in the primary EU legislation and their amendment would require the unanimous agreement of all EU member countries. Critically, Germany would have to support the notion of allowing exceptions and it has consistently supported the "letter of the law" in demanding the performance criteria be fulfilled. There would seem to be no problem in granting this sort of exemption to the Baltic countries, but there are significant concerns about the negative precedent it might set.[85] Some existing Eurozone countries which are

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[84] As is clear in the case of Estonia, public budgets may be stabilized even under crisis conditions. Estonia fulfilled the so-called Maastricht Criteria in the reference year 2010 and became a full member country of the EU as of January 1, 2011.

[85] On the other hand, there are already three countries which would unilaterally introduce the euro as their national currency, these being Montenegro, Bosnia and Herzegovina and Kosovo. The reason is that these countries made significant use of the Deutschmark and upon its demise, logically turned to the euro.

highly indebted might see admitting countries without requiring they fulfillment of the criteria as a relaxation of fiscal rules for countries inside the Eurozone, as well. Germany's representatives are well aware of this and will therefore never support such a proposal. The second problem lies in the political support for a "second-class" membership in the candidate countries themselves. Citizens in the Baltic countries would, of course, gladly "exchange" the rapid adoption of the euro for the loss of rights to take part in decision-making about the single monetary policy.[86] "Halfway membership" status looks at the first glance to be an acceptable solution to the problem of the Baltic republics, in particular, but is practically unrealizable in practice due to these limitations.

Scenario 4: Unilateral Euroization

The foregoing scenario focused on the possibility for some countries to enter the Eurozone without fulfilling the convergence criteria by exchanging a share in deciding the shape of the common monetary policy. In the end, we concluded that the scenario is not particularly realistic, in the view of the negative precedent it would set. For the Baltic countries in particular, an alternative would be the so-called unilateral euroization. This would involve introducing the euro with no prior application for membership. Similar steps have been taken by non-EU-member countries in the past, such as Montenegro and Kosovo. Given the size of the Baltic republics, the scenario is technically feasible. These countries should have no problem over the short-term gaining adequate quantities of banknotes and coins to provide for all transactions and exchange the domestic currency. As has been indicated, these countries have already pegged their currency to the euro long-term and there are already severe restrictions on the autonomy of their monetary policy. But there is still the question of how the existing Eurozone member countries would react to such a unilateral step. In the case of Montenegro and Kosovo, as non-member states of the EU, the member countries possess no direct tools by which to react. This is, of course, not true for the Baltic republics which became full members of the EU in 2004. They are therefore obligated to maintain the rules designated in the primary and secondary legislation. This scenario appears realistic but with the one unknown

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[86] Countries which have decided to peg their currency to the euro by using the so-called currency board, for example, have very restricted opportunities in this regime to undertake an autonomous monetary policy. The loss of voting rights on the Governing Council would thus not bring any significant cost vis-à-vis their current situation.

variable: the reaction of other members of the Eurozone. The scenario is restricted only to very small member countries. For economies such as Hungary's and Poland's, such a step is unrealizable for technical reasons.

Scenario 5: Germany Agrees with More Rapid Growth in Inflation than the Current ECB Target

An elegant solution to the problem of countries with high levels of debt and a growing risk that they will be unable to repay their debts would be to reduce the real value of the debt by allowing higher inflation.[87] A fixed interest rate for public debt finance instruments and higher inflation will result in a drop in real debt servicing costs. Such a method could reduce the likelihood of countries on the periphery having to announce bankruptcy. At present, however, the situation is quite at variance with this. Central banks are independent of governments and within the monetary union; governments no longer have control over the central bank and monetary policy like they had in the past. The Eurozone inflation target is anchored in EU law (ECB statute) and can only be changed with the unanimous agreement of all EU member countries. First of all any such freeing of the inflation target would have to be agreed to by all member countries, and in particular Germany, which cited the price stability as one of the basic conditions for its entry into the economic and monetary union. There is a very pragmatic explanation for this demand. Germany attained one of the highest standards of living in the world for its citizens during the latter half of the 20th century. Currently, it has one of the highest levels of population ageing. Thus the political demands placed by German citizens on their political representatives are clear. There is no need to further increase the standard of living. Rather, priority must be given to maintaining the current status quo, i.e., to maintaining a stable real value for attained wealth.[88] This goal

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[87] This method has always resolved the situation of unsustainable debt in the past. When wars were over, kings found their treasuries empty after having accumulated debts during the war that exceeded the capacity of their economies to repay them. The usual solution was to recall gold coins issued by the crown (usually with a portrait of the reigning monarch), melt them down and return them to the market with lower gold content, which amounts to nothing other than inflation.

[88] German retirees have no wish to be richer, but they are interested in seeing that the wealth they have accumulated during the active portion of their lives maintains its real value until they die. The greatest threat to this is inflation. It negatively impacts on both the real purchasing power of accumulated assets (e.g., fixed-yield bonds) and fixed incomes of the type normally possessed by retirees (whether from the state or from pension funds).

would be threatened by inflationary growth. Because of Germany's position within the Eurozone, the notion of raising the inflation target for the Eurozone seems unrealistic.[89] The problem of countries with high debt servicing costs will have to be resolved by an alternative route.

Scenario 6: Germany Agrees to the "Temporary" Withdrawal of Countries and Their Return to the Eurozone When They Once Again Meet the Maastricht Criteria

This scenario makes use of the experience of the majority of existing Eurozone countries during the time when the so-called European Monetary System was in force between 1979 and 1999. This was a system of fixed exchange rates under which the currencies participating in the system were only allowed to increase or decrease their value within a range of ±2.25%, and later ±15%.[90] Countries which found themselves incapable of intervening to maintain their currencies within the prescribed limits could ask the permission of the other countries to exit the system. This normally resulted in the devaluation of the affected country's currency, leading to renewed competitiveness and balancing the books. Once the problem had been resolved, the country was able to request the reentry into the system. A similar solution would, then, be available for the existing countries in the Eurozone. If problems arose, they could temporarily leave the monetary union and future membership would be conditioned upon once again fulfilling the Maastricht Criteria. This scenario thus forms an alternative to Scenario 2, involving the permanent exit of some countries from the Eurozone. But this scenario, too, has some significant limitations. In the case of the European Exchange Rate Mechanism (ERM), countries would fix their exchange rate but continue to use their national notes and coinage. As it stands currently, they would have to reinstate their national currency upon exiting the Eurozone, something which would incur one-time costs amounting to as much as several % of GDP. At the same time, EU law would have to be amended, since it currently does not allow temporary exits from the Eurozone. This variant could be highly attractive to problem countries. The financial markets would be notified in advance that this is only a

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[89] Germany could, however, show partial solidarity with countries afflicted by the debt crisis if the government makes a deal with unions and employers on faster growth in nominal wages, with the end result potentially leading to increased price growth (inflation) in the German economy and indirectly for Germany's trade partners.

[90] Dědek (2009) goes into the functional mechanisms of the system in greater detail.

temporary step and would undoubtedly react much less negatively than they would to an announcement of a total exit from the Eurozone. On the other hand, such a solution would harm countries remaining within the Eurozone. The highest costs would be borne by the German economy which, as we have noted, is one of the most important trading partner of the majority of member countries in the Eurozone. Depreciation of the currency of the country temporarily exiting the Eurozone would mean gaining competitiveness primarily at the expense of Germany. Germany could thus not agree to such a solution, particularly if the country in question was, e.g., Italy. A similar scenario might be seen as setting a negative precedent for misusing membership in the Eurozone.[91] Instead of implementing long-term unpopular measures to maintain the competitiveness (such as setting limits on nominal wages), countries would be able to resolve their problems at the expense of their trading partners via currency depreciation. It would be a negative signal for the future which would harm the economies attempting to undertake long-term policies whose goal is to maintain or promote competitiveness.[92] Germany is one such responsible economy and it is therefore highly unlikely that it would agree to such a proposal.

Scenario 7: Emergence of a Fiscal Union: Consenting to Share Debt Refinancing with Problem Countries

One real threat to the Eurozone since 2008 has been the fear that some countries will be unable, as a result of the continuing economic crisis, to refinance their high debt servicing costs and will at some point declare bankruptcy. This fear was borne out in 2010 when the Greek government, prompted by growing interest rates in the financial markets and the continuing recession of the Greek economy, was forced to ask for a financial assistance. But current EU law forbids the European Central Bank or individual states in the Eurozone from taking part in the rescue[93] of such an economy. But a financial collapse of a single economy may threaten the trustworthiness of the entire Eurozone in the eyes of the financial markets and thus impact negatively on all member countries in the form of growing risk premiums. Because of this and in spite

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[91] Similar things took place in the 1930s. Countries engaged in so-called competitive devaluation. The result was simply growth and inflation without attaining any competitive advantages whatsoever.

[92] For example, in the form of limits on nominal wages or supporting growth of labor productivity (via structural changes).

[93] By means of a "bailout".

of the legal restrictions, member states of the EU and the Eurozone have sought ways to offer financial assistance to impacted economies. The goal of this assistance is to preserve the trustworthiness or stability of the entire monetary union. But this scenario, too, faces a range of limitations in addition to the legal barriers. The joint EU budget is of limited size (roughly 1% of the gross national income of all EU member countries) and, aside from the Globalization Fund (approximately €500 million per year), there is no mechanism by which to support the financial situation of member countries with growing deficits and obligations. Funding allocations from the EU budget are therefore insufficient and additional required sources must therefore be found at the national level (in national budgets) outside the existing EU budget. Another significant stumbling block is the volume of funding which must be found. It is possible that the member countries would be able to join with the International Monetary Fund to find funding needed to help small countries like Greece, Portugal or Ireland, which indeed has already taken place. But it is quite impossible to imagine what would happen if it became necessary to find funds for the collapse of the public budget of a country like Italy or Spain. In this case, a funding would have to be found on the order of hundreds of billions of euros.[94] Public opinion forms another significant barrier to support for such measures. It is very difficult to explain to the citizens of a country like Slovakia why they should pay the way of the citizens of Greece or Spain. Politicians within the member countries have a difficult enough time finding budget savings to stabilize their own public finances. Finding public support and consensus across the political spectrum for sending money to other countries seems highly unrealistic in the middle of an economic crisis.[95]

One option discussed to reduce the burden on national budgets is the issuance of so-called common Eurobonds. As we have already noted, a basic problem for countries like Italy and Greece is growth in the risk premium because of the growth in the risk that debt servicing costs will

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[94] The European stabilization mechanism recently has at its disposal up to €500 billion, which is still viewed as inadequate should it be necessary to provide financial assistance to the economies of Spain and Italy. Estimates are that it would require a tripling of current values to provide adequate assistance to countries like Italy or Spain.

[95] The sending of funds to Greece, Ireland and Portugal has given rise to a fairly negative reaction from both opposition parties and the public at large. A good example is the fate of the Slovak government of Prime Minister Radicova upon the announcement that the Slovak parliament had voted to provide funding for the so-called European Stabilization Mechanism.

not be paid. Funding debt servicing by means of Eurobonds guaranteed by the all Eurozone member countries could lead to a pronounced reduction in risk premiums, thereby lowering debt servicing costs. But this variant, too, has major limitations, coming primarily from the Germans. The advantages of this solution would be enjoyed only by the problem countries, which would thereby benefit from lower interest rates. Other countries would continue to be subject to the risk that they must pay back the value of the bonds issued if a countries such as Italy or Greece announces bankruptcy in the future. Two further restrictions should be noted in connection with this scenario. Most mature economies impacted by the economic crisis must finance state budget deficits. An issue thus arises as to whether global financial markets will be capable of generating enough lending capital to satisfy the demand. Another basic reality is that even countries like Germany and France are having problems with deepening deficits. It is thus possible that rather than financing the debts of other countries, they will choose a "closer to home" strategy and focus only on rescuing their own economies. Another barrier is the unwillingness of member countries requesting financial support to subject their budget policy to a supranational authority, i.e., the EU. Most countries are unwilling to give up autonomous control over fiscal policy priorities. Countries providing such financial conditions insist that part of the decision making power in fiscal policy be transferred to the supranational level if a fiscal (transfer) union is to be established[96] in a manner similar to the monetary union with regard to monetary policy. Support for a scenario which would bring the EU closer to a federal organization is much higher at the level of the chief EU bodies (the head of the European Commission and the head of the European Council) than it is at the level of the member states.

Scenario 8: Internal Devaluation and a Policy of Savings (Fiscal Restraint)

One potential approach to renewing competitiveness and economic growth – alongside the debt servicing costs the two most important issues for peripheral states – is the so-called internal devaluation process. It is clear that Eurozone members cannot renew their competitiveness by depreci-

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[96] The result may be an unwillingness on the part of some EU countries such as Great Britain and the Czech Republic to sign on to a so-called Fiscal Pact or discuss the introduction of new EU budget income from sources such as a tax on financial transactions.

ating their currencies. It is technically impossible to nominally devalue the Greek euro as opposed to the identical German euro. A reduction in nominal wages and prices is thus the only option for at least partially renewing competitiveness in countries using the single currency. From a long-term perspective, however, this is highly dangerous. If governments are forced to simultaneously limit their spending, there will be a significant drop in the aggregate demand in the economy. This will manifest itself in a drop in economic output: recession. A good example of the limited power of economic policy to come to terms with deflationary developments is the situation in the Japanese economy over the previous 20 years. The Japanese Central Bank maintains interest rates over the long-term near zero. A policy of quantitative easing and an expansive fiscal policy has made Japan one of the countries with the highest government debt levels. In spite of this, Japan is unable to renew economic growth. The combination of pressure to reduce nominal wages, attempts to improve and stabilize public finances and the ineffectiveness of the common monetary policy could thus become a trigger mechanism for a pessimistic scenario for the development of the potential product – a long-term drop or significantly slower growth of the economy compared to the period before the crisis. Under this scenario, unemployment would remain at high levels for a long period,[97] substantially burdening the state budget, increasing the social tensions and testing the willingness of member countries to remain in the Eurozone.

Scenario 9: Preservation of the Euro and the Introduction of Dual Currencies for Domestic Transactions in Economies with High Levels of Indebtedness.

This scenario envisions a variant in which, e.g., Greece would begin to use a "parallel" currency for domestic transactions, while continuing to use the euro for deposits and foreign transactions. The Greek government would issue financial instruments (coupons) which would not have the status of official currency because this is forbidden by European treaty, but whose use would allow the development of a new informal market. Their value would be relatively weak vis-à-vis the euro and could be used as a parallel currency for settling domestic transactions. The Greek government would then be able to obtain financing in the "internal" currency and its use would lead to a drop in state sector wages in euros.

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[97] For example, in Greece and Spain, unemployment has already exceeded 25%, with unemployment in the 18–25 age group greater than 50%.

This plan would in all likelihood not prevent a deepening recession. But because the Greek government would issue an unlimited amount of the parallel currency, it would lead to growth in inflation and a drop in the public debt in real value terms. In the past, most governments have dealt with the issue of debt financing by inflation: reducing the size of the debt in real value terms. By using a parallel currency, Greece could remain in the Eurozone and in the EU. It would gain the chance to gradually achieve a primary budget surplus and repay its foreign debt. It should be noted that even if the introduction of a parallel currency would not allow countries like Greece to guarantee repayment of all debts and they would have to undertake partial debt write-offs and bank restructuring.

Scenario 10: Collapse of the Eurozone in Its Existing Form and the Creation of a New Monetary Union Featuring Countries which Have Traditionally Pegged Their Currency to Germany's and Countries with a Substantial Amount of Foreign Trade with Germany – a So-called "Markzone", a Shift Toward Political Union

One of the main benefits of membership in the monetary union derives from the elimination of a currency risk for economies with high levels of mutual trade. Data showing the volume of the mutual trade between EU member countries indicate that there is a number of small, open economies whose most important trading partner is Germany. Even before the introduction of the single-currency euro, these countries had pegged their currency to the German mark. They included Austria, the Netherlands and Denmark. Others – the Baltic republics – pegged theirs to the euro at the beginning of the project to create an economic and monetary union. The final scenario is based upon the following notion. Germany, or German voters, will no longer accept negative developments in the economies of the southern Eurozone. The leadership of the German government will evaluate the costs connected to the further membership in the Eurozone as extreme and decide to return to the national currency.[98] This situation, however, may simply represent a transition to a new monetary union in the future. This new union would consist of countries with

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[98] A variant might be the creation of a rigid core within the Eurozone. Here though we come up against a legislative wall: the inability of Germany and other potential countries forming this future core to exclude problem members from the Eurozone. In such a case, Germany might place the resolution of its own economic problems before the interests of the Eurozone as a whole.

a high percentage of foreign trade with Germany. These countries might include Austria, the Netherlands, Belgium, Luxembourg and Denmark. Of the new member countries, the Czech Republic, Slovakia, Hungary, Poland and the Baltic republics might be involved. Future members of the "markzone" could include Finland, Sweden, Norway and the Balkan countries (Romania, Bulgaria, Croatia, Kosovo, Montenegro, Serbia and others).[99] A question remains as to what role France would play. There is a significant worry that not including France in the newly created monetary union could lead to the crisis of the whole European integration process.

Figure 30 summarizes the basic scenarios and their potential results.
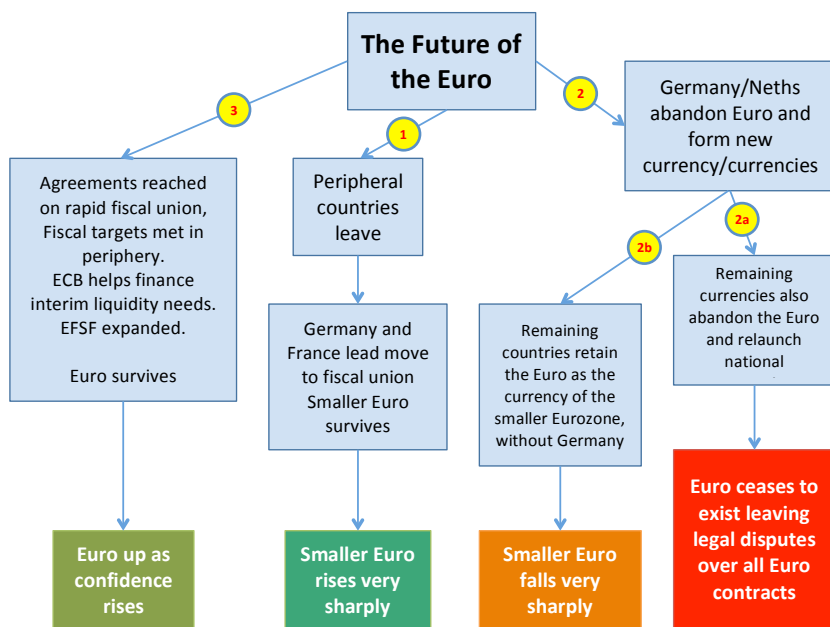
Figure 30 Basic scenarios and their potential results
Source: Financial Times, Nov 2011.

So, what will the Eurozone look like in the year 2020? Who will be the winners and losers in the project at that point in time?

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[99] Some of them already using euro as an official currency or as storage of value.

As we have already noted at the start of the chapter, it is very difficult to predict future developments. The ten scenarios given above do not pretend to precisely describe future development of the Eurozone. Instead, they map potential pathways. What is clear from all of these variants is that Germany plays the key role. German Parliamentary elections are planned for fall 2013 from which a new government will emerge. Most existing measures implemented in the Eurozone to rescue the countries at the periphery and stabilize the banking sector have only bought time rather than presenting a comprehensive solution for the problem. If any of these scenarios or any combination of them, or any scenario which we have not been able to envision with the state of knowledge we possess in the latter half of 2012 comes to pass, it will likely only be with the initiative of the new German government elected in 2013. Significant progress in solving the Eurozone crisis by EU political elites may thus only be expected in 2014 and 2015.

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Lubor Lacina, Brno, CZ
November 14th, 2012

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EUROZONE AND ITS NEIGHBORS: THE THIRD YEAR OF CRISIS

The financial and economic crisis in Europe entered its third year and the Eurozone (and implicitly the whole EU) finds itself at the crossroad. Economic dynamism of the last few years revealed fissures in the European economic and increasingly political edifice. The vaunted achievement – the common currency Euro – proved itself to be the double-edged sword. The common currency certainly contributed to the increased integration both in the real and the financial sectors. However, in the presence of the persistent differences between the "northern core" and the countries on the Mediterranean littoral, this enhanced integration acts more as an undesirable weight and obstacle rather than the dreamed about engine of progress.

What was initially considered a (possibly short) recession reflecting the financial shock in the US metastasized into a protracted crisis. After the "Greek Shock" of the Fall 2009, the dynamics became entirely European. Its impact on the Eurozone and its neighbors poses a key challenge for both the European and national institutions. Some even stress that not only the common currency Euro but even the existence of the EU itself may be in doubt.

The contributions in this volume explore the processes via which the economic and financial crisis manifests itself in the variety of international and national environments. Both the situations in the Eurozone itself and in the several "new member states" are examined.

But, indeed, future is always unpredictable and the law of unintended consequences applies here more than anywhere else.