FINANCIAL CRISIS:

INSTITUTIONS AND POLICIES

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Introduction

What Paul Volcker, Fed chairman 1979–1987 and today the Chair of the US President's Economic Recovery Advisory Board called "great recession" seems to be over. And what Mohamed El-Erian, the CEO of PIMCO (Pacific Investment Management Company) termed the "new normal" is about to begin.

Indeed, opinions do differ. Polyannish optimism – or should we say "the hope dies last" diehards – still dominates parts of the media and (understandably?) the political circles almost everywhere in the developed world. However, the thoughtful observers and many professionals are apprehensive. The indications of the "new normal" – sluggish growth, persistent high unemployment and periodic fiscal and financial crises – appear more and more to characterize the current phase of the economic dynamic.

The future is always uncertain, but it is to a significant degree determined by the past dynamics. After all, an economic reality is more like a transoceanic tanker – large, slow, clumsy, with enormous momentum of its own and extremely difficult to turn. Contributions in this volume seek to help the understanding of the current and future economic dynamics by looking at the recent past – and, when appropriate, drawing "lessons" for the future. The discussion is divided into three parts.

Four chapters in the first part provide the Eurozone-wide perspectives on the variety of issues. In the first chapter, Karl Aiginger, director of the WIFO Institute in Vienna, Austria, compares the spread and the pattern of the recent crisis across regions to the Great Depression in the nineteen thirties.

His chapter addresses the question of how fast and to what extent the recent crisis spread from its origin in the US. The depth of the recent crisis and the manner in which it spread across regions is compared to that of the Great Depression, which had two epicenters, namely the US/Canada and Germany/Austria. Specifically, Aiginger focuses on the impact of the crisis on Central and Eastern European countries, South America and East Asia. His analysis shows that the recent crisis was much smaller than the Great Depression. The decline was more synchronized at first in the recent crisis, but then growth rates (or rates of decline) became very different across regions/countries in 2009. In general Central and Eastern European countries were not, contrary to many predictions and fears, more affected than Western Europe. The

drop in GDP, if anything, was a nuance smaller in the New Member Countries. However, this tendency comes mainly from the resilience of Poland, and the differences across these countries are large. Asian countries managed to turn the tide after some quarters of declining exports. The high growth of China and India together with a surprisingly coordinated fiscal and monetary policy in industrialized countries prevented the recent crisis turning into a repeat of the Great Depression. From the regional perspective, maybe the largest difference as compared with the Great Depression occurred for the Latin American countries, where, this time round, there was a very mild decline in GDP in one single year, whereas in the Great Depression output dropped 15%.

In the second chapter, Lubor Lacina from the Mendel University in Brno, Czech Republic looks at the performance and history of the EMU (The Economic and Monetary Union, i.e. the group of European countries who use the common currency Euro) and analyzes the fallout from the recent financial and economic dynamics. Both the impacts on the Eurozone as a whole and on the individual member countries are evaluated. Lacina concludes by providing some ideas for future development of Eurozone.

Péter Halmai and Viktória Vásáry from the Pannon University in Veszprém, Hungary address the issues related to the growth crisis in the European Union in Chapter 3. They point out that the financial crisis that has been unfolding since 2008 resulted in the deepest recession we have seen since WWII. But their study clearly demonstrates that the erosion of the European growth potential some people see as a consequence goes much deeper. They show that it is a process lasting for at least two decades. Its decisive structural element is the unfavourable dynamics of the total factor productivity that is lagging more and more behind that of the USA. These unfavourable trends were, however, remarkably exacerbated by the current crisis, even if the recession hit the individual countries to a different extent. The study classifies the EU Member States into five groups based on the initial circumstances and analyzes the resulting vulnerabilities. It shows that in these separate groups the potential growth and the contribution of the individual growth factors might follow significantly different paths. Finally, they conclude that the catch-up countries might face great challenges.

Part I concludes with the study by Stephan Schulmeister of the Austrian Institute of Economic Research in Vienna Austria, addressing the relationship between the asset price fluctuations and the financial crises (Chapter 4).

He shows that within 18 months a mortgage crisis in the US has turned into a deep crisis of the world economy. This process was (and in part still is) driven by the simultaneous reductions of the financial wealth, housing wealth and commodity wealth. That reduced the consumption and investment directly as well as indirectly (e.g., via the decline of the pension and college funds, of credit collaterals and through the deterioration of the current account of commodity exporters). The potential for the decline of stock prices, housing prices and commodity prices had been "built up" during the boom of these prices between 2003 and 2007. Subsequently, the chapter sketches the main causes and effects of long swings in asset prices in the context of the current crisis. These fluctuations are the outcome of "trading as usual" on the (highly regulated) derivatives exchanges. The most popular trading practices like the "technical analysis" contribute significantly to asset price overshooting. Hence, these practices and the related "speed" of transactions strengthened both, the boom of asset prices until mid 2007 as well as their collapse in recent months.

Part II looks at the impact of the global economic crisis on countries outside the Eurozone. Its three chapters start with the work of Mehmet Sahin and Ozge Uysal of Canakkale Onsekiz Mart University in Canakkale, Turkey, addressing the impact of global crisis on the Turkish economy (Chapter 5).

The chapter points out that the Turkish economy experienced many crises in the last fifty years. However, they argue that the economic progress and the political stability achieved in the last eight years have strengthened economic structure of Turkey. Moreover, Turkey as an EU candidate also broke important grounds in other areas, such as adapting her economy standards to the EU standards, fulfilling Maastricht Criterions and harmonizing its economic policy with EU's. Lately, however, the fiscal discipline has been compromised and the current account deficit has become a subject of concern. But in spite of negative effects of the global economic crisis, no serious problems appeared in the financial sector. Important problems are, however, emerging in the real sector. Whether those are caused by the global crisis or are the results and consequences of policies implemented in the last ten years remains yet to be determined.

In Chapter 6 Daniel Stavarek from the Silesian University in Karvina, Czech Republic, analyzes the exchange market pressure in selected "new" EU member states. Author chooses the contemporary specification of

the Girton-Roper model for the eight new EU Member States (NMS) to estimate and compare the exchange market pressure (EMP) over the period 1995–2008. The results suggest that the growth of domestic credit and the money multiplier had a significantly negative impact on EMP. On the other side, a strong positive influence was found for the growth of the real domestic income and the money supply in the euro area. EMP in NMS with flexible exchange rate regime was equally absorbed by exchange rate and international reserves. This forms a solid basis for the potential fulfillment of the exchange rate stability convergence criterion.

The impact of the world economic crisis upon measures of convergence and the preparedness of the candidate countries to join the Eurozone is analyzed in Chapter 7 by Peter Rozmahel from the Mendel University in Brno, Czech Republic.

His chapter focuses on measuring of the preparedness of selected candidate countries to adopt the Euro from the Optimum Currency Areas theory perspective. Particularly, the criteria of business cycles similarity are applied and interpreted in the context of the current economic crisis conditions. The results shed some light on a possibly spurious impact of economic crises on a similarity of business cycles in Europe since most of the European countries share the same phase of the cycle – recession or stagnation of output.

The third part of the book looks at the impact of economic crisis across the economic landscape. Incentives to an irresponsible behavior which some consider an important contributor to ongoing crisis is analyzed in Chapter 8 by Petr Wawrosz from the University of Finance and Administration in Prague, Czech Republic.

The author argues that one of the reasons of present economic problems is that many economic agents do not behave responsibly. When we ask why, the possible answer is that many incentives exist in society supporting irresponsible behavior. The chapter describes how such "incentives" lead to an irresponsible behavior that caused the present economic problems. The chapter also suggests possible remedies. It is shown that even in the market environment laws and other rules (including informal rules) have important influence over the agent's behavior and hence on the macroeconomic performance.

In Chapter 9 Lubos Smutka and Irena Pokorna of the University of Life Sciences in Prague, Czech Republic look at the role of the official development assistance on the economic dynamics of a selected group of

developing countries. The main aim of their chapter is to evaluate the value and flows of possible forms of aid which were offered to developing countries in the period before the financial crisis and is to estimate how the current financial crisis affects these developing aid flows.

Milan Palat of the Mendel University in Brno, Czech Republic evaluates the relationship between the unemployment and the GDP growth in the Chapter 10. The statistical part of this Chapter concerns the correlation determination of inter-quarter increments of the real GDP growth rate and unemployment rate. This is realized via the regression and correlation analysis including testing the statistical significance. The discussion then explains the causes of unemployment which can be found in both the structural and institutional conditions as well as in the unemployment hysteresis explanation.

The book concludes with the intriguing contribution of Antonin Rusek of the Susquehanna University in Selinsgrove, Pennsylvania, USA. He is trying to analyze the role of the information in the economic discourse and analysis – the topic certainly pertinent to any inquiry about the causes and consequences of the "great recession".

Rusek endeavors to investigate the situations where the information even if available is uncertain, often contradictory and subject to often unpredictable revisions. In those circumstances the individual rationality implies the "rule of thumb" behavior, where the expectations formation and hence the resulting behavior are determined in the way which resembles a simple program, inevitably heavily weighted by the past knowledge and experience. And he concluded that the functioning of the economic system is heavily impacted when individual rationality implies programmatic behavior. This permits a wedge between the individual and systemic rationality which then implies an incipient systemic instability. But such an instability makes the evaluation of the available information yet more difficult, increasing the likelihood of the "black swan" event – even if the predictability of such an event (and hence the ability to adjust the individual behavior ex ante) effectively declines. Economies become more unstable.

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I.
Global Economic Crisis Explored

1 Core versus Periphery in the Recent Recession as Compared to the Great Depression

Karl Aiginger
Austrian Institute of Economic Research (WIFO), Vienna, Austria

1.1 Introduction and Outline

The focus of this chapter is to compare the spread of the Recent Crisis across regions and to compare the pattern this time round to that in the Great Depression in the nineteen thirties. It is too early to make a final analysis for at least four reasons: (i) the crisis has not ended in all regions, (ii) unsolved problems which led to the crisis or which made countries more vulnerable (to financial shocks, external and fiscal imbalances; regulatory failures) still persist, (iii) new problems have been added during the crisis (public deficits, unemployment) and (iv) the policy reaction in the exit phase remains unknown. Nevertheless, some tentative conclusions are possible. These are specifically interesting if compared to those hypotheses and predictions at the start or during the first phase of the crises. There are at least three interesting hypotheses for which we can offer tentative answers.

- First the hypothesis that this crisis could become as deep as the Great Depression;
- Second the "gravity hypothesis" that the crisis should have its deepest impact in the economy in which it started (and with decreasing impact according to distance);
- Thirdly the "core-periphery hypothesis" that economic crises always have a stronger impact on the periphery (as marginal suppliers or suppliers of raw material, food) as compared with the core of the world economy.

We use a data set made available by WIFO to compare the activity for industrialized countries for both crises and enlarge the WIFO Long-term Database for the Recent Crisis with the standard data sets by the

IMF, Oxford, and Eurostat (Ameco). Section 2 summarizes the causes of the Recent Crisis according to provide some understanding of the author's point of view. Section 3 presents general stylized facts on the comparison of the depth of the crisis according to different activity indicators, following Aiginger (2010). Section 4 describes the differences in the depth of the crises, between the US (the originator), Western Europe (defined as EU-15), the New Member Countries (defined as EU-10; without Malta and Cyprus), South America (defined as Latin America from Mexico to South America proper) and Asia. Where possible we relate the experience in the regions to the experience in the nineteen thirties. Section 5 summarizes the differences between industrialized countries, non-industrialized countries and EU-10 and presents caveats; Section 6 summarizes the whole chapter.

1.2 The Recent Crisis: Causes and Transmission

i. The Trigger

The Financial Crisis had its origin in the "subprime crisis" in the United States. Credits were given to house owners without checking their ability to pay back the credits. Since property prices had been soaring for more than a decade, rising property values were accepted as sufficient collateral for banks and other financial institutions. Economic policy backed this practice, with the aim that everybody should be able to have affordable housing, including immigrants and people on low incomes and even those without continuous employment records. People accepted the offers of credit since installments were delayed, with low interest payments over the first few years. If problems came up, the annuities or interest rates could be covered by taking on a new credit, since the house prices had risen in the meantime thus providing the basis for this higher credit. In the worst case scenario the debtor could simply return the keys, since credits were connected to the property, not the individuals. Risks for the bank were "outsourced" (distributed), since credits were bundled into mortgage backed securities and sold to other institutions (from hedge funds to government agencies). Rating agencies helped to slice these securities into risk classes and then to evaluate the risk of the bundles. If the securities were still too risky they were re-bundled with other securities, or insurance was provided etc. Many people knew this system could not be sustainable, but nobody knew how long it would work and the actual extent of the risks. The subprime market for US-houses was,

however, only the tip of the iceberg and it could not have caused the whole financial system to explode in the manner it did if there had not been deeper rooted problems[1].

ii. Three causes

The deeper rooted problems behind the Recent Crisis can be classified into three different types of problem – macroeconomic, microeconomic and regulatory failure (see Aiginger, 2009). One macroeconomic problem was the disequilibria between two of the main economies in the world: the large trade surpluses of China (and oil and raw material exporting countries) on the one hand and the triple deficits of the US (in trade, savings, and public budgets). The surplus countries did not want to allow their currency to appreciate; the US did not need to depreciate since capital inflow maintained to be large. The second macroeconomic problem was that the US-Fed had tried to prevent a recession on two occasions namely after the dot-com bubble and then after the terror attack on September 11th. It continued this expansionary monetary policy longer than can be regarded as optimal by hindsight. The result of the disequilibria plus the monetary policy was an oversupply of money looking for investment opportunities and investors who were gradually taking more and more risks. On the microeconomic level innovations in the financial sector provided these investment opportunities by bundling credits, insuring risk, increasing speculation, betting on falling and rising prices with or without being engaged in or acquainted with the business. Shortages of raw materials and oil, and emerging economies provided new investment opportunities for speculators. The diversity of investments and new products created the euphoric notion that high, two digit yields were feasible. They did in fact exist under specific circumstances in some countries and for some products. Specifically profitable were high leveraged products in which a narrow asset base was used to create a large amount of credit. If leverage ratios looked too high, new forms of assets (equity capital) were created or liabilities were shifted to conduits and other special institutions where the requirements for own capital were not monitored. The reward systems for managers were slanted towards bonuses and these bonuses were based on short-run performances. Financial regulation should prevent just this series of events. High and incalculable risks and too much leveraging should be prevented. Financial innovation should be tested, since it is well known that waves of

[1] Subprime credits are estimated to amount to 1% of US GDP and to about 3% of total US debt (see Agarwal – Ho, 2007).

optimism are a characteristic of financial markets. On the one hand the philosophy of regulation had changed. Despite past experience markets were assessed as rational and self correcting. More specifically professional investors were considered to be able to assess risks. Mathematical risk models were intended to make these assessments more and more precise. Regulation was very much segmented into separate markets in the US. Regulation focused on the national perspective and on cross section risks in "normal times" rather than on systemic risks in all countries and was more or less nonexistent in some emerging economies.

iii. Transmission to the real economy

The rest of the story is already well known. After the subprime market burst, several banks (lenders, insurances) failed and were rescued between mid 2007 and mid 2008. But uncertainty lingered around for nearly one year (with little impact on real growth or more precise hidden impact due to high inflation). In September 2008 Lehman Brothers fell into turmoil and was not rescued. Within a few days the credit market broke down, everybody started fire sales, trying to rescue their own firm thereby merely aggravating the problem for other firms. Orders were cancelled, stocks depleted and production fell. The worst crisis since the Great Depression of the nineteen thirties had started, and spread with surprising speed and synchronization across the world. For several months the speed in the fall of world trade, industrial production and stock markets was similar to that in the Great Depression (see Eichengreen – O'Rourke, 2009; Aiginger, 2010). The crisis spread across the world at break neck speed.

1.3 Comparing the Depth of the Two Crises for Industrialized Countries

There are many statements and assessments available comparing the Recent Crisis and the Great Depression, but there are surprisingly few studies which do this with reference to hard facts, especially over a broad range of indicators. Eichengreen and O'Rourke (2009) presented the first hard data which provided quarterly and even monthly data on industrial production, world trade and stock prices. They concluded in March 2009 that "The world is currently undergoing an economic shock every bit as big as the Great Depression shock of 1929–30". This statement became very important since it was extremely well documented by empirical facts. The Vox column in which it was presented shattered all previous

records, with 100,000 hits within a week, the article was sent to me every week by at least one friend, who shared this view. A historian who had turned policy advisor, Christine Romer, now economic advisor to Barack Obama, may be cited as someone who made the opposite assessment at approximately the same time. She wrote in early March 2009 that the current recession "... pales in comparison with what our parents and grandparents experienced in the 1930s" (Romer, 2009, p. 1). None of the big organizations (OECD, IMF, European Commission) forecasting and analyzing economic growth worldwide had a data set available covering both periods. Data exist at different universities and research institutions, but mostly either only covering a few indicators or a few countries. Other data sets concentrate on benchmark years and did not extend to more recent years. Finally WIFO provided a consistent "Long-term data set" covering seven macroeconomic and ten policy indicators, covering both crises. It focuses on ten industrialized countries and reports or calculates data for the world economy. The data makes use of GDP estimates by Maddison, Mitchell, Groningen for the Great Depression, and Oxford Economic Forecasting and IMF data for the Recent Crisis. The data set is used in Aiginger (2010) to provide four stylized facts; the facts are presented based on the consensus amongst economists that the Recent Crisis leveled off in mid 2009 for production but will continue for unemployment well into 2010. This is currently the consensus view, see for example the IMF forecast for growth of the world economy for 2010 of 3% to 4%. A decline in growth rates in late 2010 or 2011 would not change the main results.

iv. Stylized Fact 1: less deep

Transmission to the real economy There is clear cut evidence, that the Recent Crisis did not reach the dimensions of the Great Depression. This holds true for all seven activity indicators presented in Table 1[2]. There are especially large differences for real growth, employment and unemployment. The GDP of industrialized countries dropped by 10% during the Great Depression (1929–1932), this time by 4.4% for annual data and 5.4% for quarterly data. Employment decreased by 13% and this time by 3.5%. Unemployment increased by 13 percentage points (up to 20%) in the Great Depression and by 3 percentage points (up

[2] Table 1 refers to un-weighted averages across countries. Using weighted data would accentuate the difference between the two crises, since the largest economy the US had the largest drop in GDP in the Great Depression (resulting in a drop of weighted GDP of 17% in the Great Depression vs. 3.4% in the Recent Crisis). This time the loss in output was less in the US than in most other industrialized countries.

	Great Depression	Recent Crisis	
	1932/1929	2009/ peak 2007/2008	Trough 2009/ peak 2007/2008
	Annual data		Quarterly data
	Percentage change		
GDP. real1)	-10.0	-4.0	-5.4
Manufacturing	-23.2	-20.2	-23.0
Exports	-58.5	-20.9	-25.7
Stock market[2])	-53.3	-44.9	-53.6
Employment	-17.3	-2.5	-1.6
Unemployment rate 1932 and 2010	19.6	9.2	
Unemployment rate; change[3])	13.2	3.1	2.0
Inflation (CPI)	-12.8	1.0	-0.1

Table 1 The depth of the two crises: Ten industrialized countries

[1]) At PPP.

[2]) Unweighted average over US, FR, DE, UK.

[3]) Absolute difference 1929 to 1932 vs. 2008 to 2010. Ten industrialized countries: Austria, Germany, Belgium, Spain, France, Finland, Sweden, United Kingdom, USA, Japan.

Source: WIFO Long-term Database (see Aiginger, 2010)

to 9%) in the Recent Crisis. Considerable differences for exports and prices can also be shown. The smallest difference was for manufacturing output in real terms. The difference as to stock market indices to some extent depends on whether we use weighted or un-weighted indices (since the decline of stock market prices was considerably less in the Recent Crisis for the US but not for other countries). There had been severe deflation in the nineteen thirties. This time round there were a few but very short episodes where the overall price level declined. Taking GDP as an overall measure for the depth of the Recent Crisis the drop in activity for industrialized countries was about half as strong as during the Great Depression. If we extend the analysis to all countries, world GDP declined by only 1% in 2009 (using annual figures). Viewed from this perspective the Recent Crisis "pales in comparison" to the Great Depression, supporting Romer's assessment.

v. Stylized Fact 2: more synchronized at the start

Economic activity was more synchronized across countries in the build-up period to the Recent Crisis, and also during the first stage of the crisis itself. The Great Depression had two epicenters (Germany/Austria and the USA). This time the crisis had its origin in the US, but almost all

industrialized countries experienced somewhat parallel declines in economic activity during the first three quarters of the crisis (Aiginger, 2010). The measures of dispersion across countries for all activity indicators are lower in this period than during the starting phase of the Great Depression. This is unlikely to be the case for the exit phase, since growth rates are very different across regions in 2010.

vi. Stylized fact 3: for three quarters as fast as the Great Depression (for some indicators)

The decline in the first nine months was stronger in the Recent Crisis for manufacturing and trade than during the Great Depression, going some way to supporting the view that this crisis had the potential to follow in the footsteps of the Great Depression. This was never the case for GDP, employment and unemployment. The share of the decline in the first year, relative to the overall decline for the prolonged crisis, was small in the Great Depression. By contrast this time, most, if not all, of the decline happened in the first nine months. The larger overall drop in activity in the Great Depression was the result of its length. The downturn in the stock market, in world trade, and finally the bank failures in the Great Depression came in different waves spread over several years rather than simultaneously.

vii. Stylized Fact 4: economists had learned their lesson

Economic policy, specifically monetary policy and fiscal policy reacted quite differently in each crisis (Aiginger, 2010). This was partly due to lessons learned from the Great Depression itself. During the Great Depression fiscal policy was restrictive, at least during the first three years. It tried to keep budgets balanced and counteracted the automatic stabilizers by increasing tariffs and taxes and by reducing expenditure. In the Recent Crisis automatic stabilizers were a priori larger. Their effect was amplified by stimulus programs. Bank failures and the breakdown of the credit market were combated through the use of guarantees, recapitalization or nationalization. Furthermore, all these measures were implemented expeditiously and sometimes with coordination at an international level. The same difference in activity holds true for monetary policy. In 1929 interest rates were first increased, and then cautiously reduced. High deflation turned the lower nominal rates into high real rates. Money supply declined over several years for many countries (at least in nominal terms). This time monetary policy slashed interest rates towards zero and engaged in traditional and innovative increases

in money supply. Some institutional factors helped. There was no gold standard to limit money supply and fewer national currencies to defend due to European monetary integration. The share of services in GDP and that of the government section is larger today in industrialized countries. There was more agreement among economists and more international coordination due to the G7, G20, the IMF, and the World Bank.

1.4 The Spread of the Recent Crisis to Non-Industrialed Countries

Aiginger (2010) concentrated on the industrialized countries. This section tries to analyze the impact of the crisis originating in the US to other regions. We specifically present the GDP development for the US and South America, then for Central and Eastern Europe and finally for Asian countries. If we only analyzed the Recent Crisis, we could draw on many indicators (see Table 4 to Table 6 or *Gligorov et al.,* 2010). However, if we want to compare the Recent Crisis to the Great Depression we have to concentrate primarily on GDP data (see Table 2 and Table 3). World output decreased by only 1% this time (using an annual basis) and some recent calculations indicate it could even be less. In the Great Depression which in most countries lasted three years or more, world output dropped by 10%. At that time the US/Canada and Germany/Austria were the epicenters, with declines of 27% in the US and 16% in Germany. The crisis lasted so long since the drop in stock markets, trade and bank failures occurred in stages and economic policy did not mitigate but actually aggravated the crisis.

1.4.1 US and South America

Though the Recent Crisis clearly had its origin in the US, the output loss in the US was, at the end of the day, smaller than that in the euro area, in Japan, and in the ten New Member Countries (EU-10). This holds true for the drop in GDP from its pre-crisis maximum (for annual and quarterly data) and for the recovery phase[3]. The easiest comparison can be made using annual data: 2009 is the only year with a decrease in world economic output: the decrease of GDP was 2.4% for the US, 5.2% for Japan, 4.1% for EU-15 and 3.8% for EU-10[4]. As far as the growth

[3] According to current predictions, i.e. April 2010.
[4] Weighted data for EU-15 and EU-10.

forecast for 2010 concerned, predicted growth for the US is larger than the loss in 2009 (2.8% vs. 2.4% respectively).[5] The South American Countries were surprisingly stable in the Recent Crisis. GDP growth did decline by only 0.5% in 2009. Growth is predicted to be 3.6% in 2010. This is a main difference to the Great Depression. Between 1929 and 1932 GDP declined by 15%, much more than the drop in world output or in Europe.

	Great Depression					Recent Crisis			
	1929	1930	1931	1932	1932/1929	2008	2009	2010	2010/2007
	Percentage change								
USA	6.1	-8.9	-7.7	-13.2	-27.0	0.4	-2.4	2.8	0.7
EU-15	3.0	-1.8	-4.9	-2.7	-9.1	0.4	-4.1	0.8	-3.0
EU-10[1])	1.1	-1.9	-3.4	-5.1	-10.1	4.1	-3.8	1.2	1.3
Russia	2.8	5.8	1.9	-1.1	6.7	7.3	-8.9	4.3	2.0
China		1.3	1.0	3.2	5.6	9.6	8.7	9.5	30.5
India	4.2	0.7	-0.7	1.1	1.2	7.1	6.7	7.3	22.6
East Asian Countries[2])		-0.6	-0.4	2.9	1.8	6.2	4.9	7.3	19.5
Latin America[3])	2.7	-5.1	-6.2	-4.3	-14.7	4.7	-0.5	3.9	8.2
World	3.7	-1.9	-4.2	-4.0	-9.8	3.0	-0.9	3.6	5.7

Table 2 GDP development in main regions

[1]) GD: Czechoslovakia, Hungary, Poland, Bulgaria, Romania. CC: Czech Republic, Slovak Republic, Slovenia, Hungary, Poland, Bulgaria, Romania, Estonia, Latvia, Lithuania.

[2]) GD: China, India, Indonesia, Japan, Philippines, South Korea, Taiwan, Malaysia. CC: China, Hong Kong, India, Indonesia, South Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand.

[3]) GD: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay, Venezuela. CC: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Panama, Paraguay, Peru, Uruguay.

Source: WIFO Long-term Database (see Aiginger, 2010)

1.4.2 Western Europe

GDP declined by 4.1% in EU-15 in 2009. This decline was larger than that for the US where the crisis had originated, and it followed very slow growth in the previous year. Predictions are different for 2010, but all forecasts for EU-15 are lower than those for the US and much lower than the forecast for world output. Medium-term growth is forecast

[5] This holds also for Latin America. For other regions EU-15, EU-10, Russia the recovery is much weaker than the drop in 2009. Canada pretty much mirrors the development in the US in both crises with a drop in GDP of 24% between 1929 and 1932 and 2.5% in 2009.

to be well below previous pre-crisis trends. The crisis specifically hit peripheral countries which either already had high twin deficits (trade and public deficits) or a construction bubble (Spain, Portugal, Greece, Ireland). GDP decline was also strong in Finland, which had surpluses in its public budgets and current accounts. Within the EU-15 the periphery performed worse than the core countries if we combine GDP drop plus budget deficits and unemployment when assessing the impact of the crisis.

1.4.3 Central and Eastern Europe

Let us turn to Central and Eastern Europe.[6] The overall decline in this country group was approximately similar to that of Western Europe or slightly less severe in the Recent Crisis. This came as a surprise, since many analysts had feared that the countries would head towards a crash reminiscent of the East Asian crisis in the late 1990s (*World Bank*, 2010; *Gabritsch*, 2009). Current figures for 2009, which may still be revised a little bit show a decline of 3.8% in GDP for the New Member Countries, as compared to 4.1% for EU-15[7]. Growth had been much higher in the year before the crisis. Growth forecasts for 2010 are slightly lower than for EU-15, but in the most recent IMF forecast even this changed and the IMF predicts growth in Central and Eastern Europe of a few tenths of a percentage points higher than for Western Europe. During the Great Depression the decline in the new member states was also parallel to the decline in the ten industrialized countries, GDP dropped by 10% between 1929 and 1932.

The economic performance during the Recent Crisis was rather different across countries. Poland was the only country in Europe in which GDP did not decline even in 2009, and growth is expected in this country to accelerate towards 3% in 2010[8]. Then follows a group of countries in

[6] It matters whether we take an un-weighted average over the countries to assess performance or a weighted one, since the largest economy, Poland, had an exceptional development.

[7] This result holds true for GDP weighted data and is dominated by the great performance of its largest economy (Poland). Taking un-weighted data gives a stronger decline for EU-10 countries, this time influenced by the large drop in GDP of the three (relatively small) Baltic countries.

[8] The reasons for the good performance of Poland have yet to be analyzed. Current suggestions for it are (1) the strong devaluation of the currency between mid 2008 and March 2009, (2) the lower export shares and a strong private consumption (fuelled by wage increases and a tax cut which had been made just before the crisis started),

which GDP declined in parallel to Western Europe, namely the Czech Republic (−4.3%), Slovakia (−4.7%) and Bulgaria (−4.7%), and a second group (Hungary −6.4%, Romania −7.1% and Slovenia −7.8%) which were hit a little bit harder.

A real backlash occurred in the Baltic countries where GDP dropped between 14% and 18% in 2009, decline had started in Estonia and Latvia in 2008, and forecasts are negative or flat for 2010. These countries had experienced the strongest growth of all New Member Countires since the mid nineties, with growth rates of about 6% p.a. (1994–2008). By any historical standards real and financial convergence, institutional improvements and fast integration with advanced economies occurred over a very short space of time. The currencies were firmly pegged to the Euro. However, rapid growth had led to high inflation, wages were rising faster than productivity, and a housing bubble was created (and ignored by economic policy). Foreign capital was invested more in the financial sector and services and tilted away from tradable goods thus creating large current account deficits. Fiscal deficits increased, it became difficult to borrow more money and Latvia had to get help from the IMF.

The positive experience was that the integration of the Baltic countries (and of EU-10 countries in general) had become so tight that foreign investors did not flee, when financial turbulence hit the region. Nordic-based banks, heavily exposed to the "hard landing" of the Baltic States, remained committed to their subsidiaries in Estonia, Latvia and Lithuania (*World Bank*, 2010), as did the Austrian banks in the other EU-10 countries.

Predictions for 2011 are very uncertain, for this region more than for the EU-15, since a phase of rapid convergence stopped very abruptly. For 2011 most forecasters expect a GDP growth for the region, but opinions as to the extent of this growth differ widely (from a range of between 1% and 3% for the region). For some countries negative growth is still predicted (e.g. Baltic countries, Hungary, Bulgaria). It is possible that the recovery comes slightly later in Central and Eastern European Countries, since foreign direct investment will not increase soon and overcapacities e.g. in the building sector will first have to be reduced. For the medium-term the prospects are good for a resumption of the convergence process. However, due to increasing risk premiums and attempts to deleverage in

and (3) limits to speculations of banks and credits in foreign currency by a prudent financial regulatory authority.

the financial sector as well as in the real economy convergence may occur at a slower speed, meaning that the difference in growth rates between EU-15 and EU-10 may become smaller. The growth model of EU-10 countries may change in the direction of a higher emphasis on upgrading in national capabilities vs. importing technologies (see *Glogorov et al.*, 2010).

Russia and even more so the Ukraine had a deep recession with drops in GDP of 9% and 15% respectively, the decline of oil prices and the political turmoil in the Black Sea Region as well as domestic problems have aggravated the problems coming from the repercussions of the financial crisis. For 2010 growth is predicted to resume.

The diversity between the Central and Eastern European countries also happened in the Great Depression. On average the GDP declined by 10% between 1929 and 1932 in parallel to the drop in Europe and world GDP. The decline had been strongest in Poland and followed the average for Czechoslovakia and Hungary. Russia had a very small drop in one year (1932) and enjoyed 7% growth between 1929 and 1932. In general it looks as if the level of synchronization was lower. While the first drop in Germany occurred in 1929, Hungary, Czechoslovakia and Poland grew between 1.1% and 3.3% in this year. Bulgaria was the exception during the Great Depression enjoying a remarkable growth of cumulatively 27% between 1929 and 1932.

1.4.4 Asia

The specific role of the Asian countries in the Recent Crisis is shown if we look at China where GDP increased by 9% in 2009 and forecasters expect it to increase by another 10% in 2010. India's growth is not far below this at somewhat less than 7% in 2009 and slightly accelerating in 2010. Indonesia's growth was 4.5%, with the forecast for 2010 at 5.6%. The Asian countries played an important role in limiting the crisis worldwide. Specifically China used a (small) part of its past surpluses for stimulus programs. The dynamic of Asia helped to limit the drop in world trade to 13% in 2009, and boosts world trade by 10% in 2010.

During most of the time between 1929 and 1932 China and India experienced positive growth, albeit at very low rates. The cumulative growth over the three years had been 5.6% and 1.2%.[9] Both countries at that

[9] The annual rates are 1.8% vs. 0.4%.

time were not fast growing economies, and had much less weight in world trade. In South Korea and Indonesia GDP declined by 2.8% and 7.9% respectively. But there is no general pattern to show that the periphery (these countries at that time were periphery) did actually, in general, receive the worst part of the Depression.

Future research will have to explain the impact of the Recent Crisis on different regions and countries if more data become available and if we know more about the exit phase or about echo effects. However, what the data do tend to show is that in neither crisis was there a clear core/periphery pattern. If we define as the core the industrialized countries Western Europe and North America the Great Depression was deepest in the core countries. This was mainly due to the influence and large weight of the US and German economies. GDP in industrialized countries, measured by weighted GDP, dropped by 15%.[10] In non-industrialized countries weighted GDP did not decline substantially. There was a tiny decrease in 1931, but GDP increased in 1930 and 1932. This was due to the impact of China and India which proved rather immune during the Great Depression. The majority of the non-industrialized countries had decreases stronger than that of the World average specifically the South-American countries. But the decreases were on average less than in the US and in Germany.

Thus China and India also successfully defied being dragged into the crisis in the thirties. Both countries were agrarian economies, less dynamic, less integrated in world trade and therefore also less important for other developing countries at that time. The drop in GDP of Eastern and Central European countries was in line with the average of the ten industrialized countries during the Great Depression.

1.5 Core vs. Periphery and Caveats

This time the drop in GDP was definitely less in non-industrialized countries (periphery countries) than in industrialized countries (defined as core countries). In our sample and using un-weighted averages it amounted to 1% in the non-industrialized countries and 4% in the industrialized countries. Using GDP-weighted data reduces the drop in industrialized countries a little bit (due to the smaller drop in the US), but it turns the results for non-industrialized countries into the positive range:

[10] Unweighted 7%, ten industrialized countries in WIFO data set 10%.

	Great Depression					Recent Crisis					
	1929	1930	1931	1932	1932/1929	2008	2009	2010	2010/2007	1929	2008
	Percentage change									Weight	
World	3.7	-1.9	-4.2	-4.0	-9.8	3.0	-0.9	3.6	5.7	100.0	100.0
Unweighted average											
Ten industrialized countries[1])	3.3	-2.7	-4.4	-3.4	-10.0	0.5	-4.2	1.2	-2.5		
Industrialized countries (larger set)[2])	3.4	-2.3	-3.8	-1.6	-7.3	0.4	-3.8	1.0	-2.4		
EU-10[3])	0.6	-0.7	-3.3	-5.0	-8.6	2.5	-8.4	0.0	-5.1		
Non-industrialized countries[4])	3.3	-2.0	-5.9	-2.8	-9.9	5.5	-0.8	4.6	9.6		
Weighted average											
Ten industrialized countries[1])	4.3	-5.3	-6.1	-7.0	-17.4	0.2	-3.4	2.0	-1.2	55.7	41.9
Industrialized countries (larger set)[2])	4.1	-4.9	-5.8	-5.3	-15.2	0.2	-3.4	1.8	-1.4	65.0	49.9
EU-10[5])	1.1	-1.9	-3.4	-5.1	-10.1	4.1	-3.8	1.2	1.3	4.4	2.2
Non-industrialized countries[4])	2.3	1.2	-0.7	0.3	0.7	6.5	2.6	6.6	16.5	30.6	47.8

Table 3 Comparison of the two crises: industrialized vs. non industrialized countries; Growth of real GDP

[1]) Austria, Germany, Belgium, Spain, France, Finland, Sweden, United Kingdom, USA, Japan.

[2]) Austria, Germany, Belgium, Spain, France, Finland, Sweden, United Kingdom, USA, Japan, Australia, Canada, Denmark, Italy, Netherlands, Ireland, Greece, Portugal.

[3]) GD: Czechoslovakia, Hungary, Poland, Romania. CC: Czech Republic, Slovak Republic, Slovenia, Hungary, Poland, Romania, Estonia, Latvia, Lithuania.

[4]) GD: USSR, China, India, Indonesia, South Korea, Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay, Venezuela. CC: Russian Federation, Ukraine, China, India, Indonesia, South Korea, Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay, Venezuela.

[5]) GD: Czechoslovakia, Hungary, Poland, Bulgaria, Romania. CC: Czech Republic, Slovak Republic, Slovenia, Hungary, Poland, Bulgaria, Romania, Estonia, Latvia, Lithuania.

Source: WIFO Long-term Database (see Aiginger, 2010)

GDP increased in 2009 despite of the crisis by 2½% (after and before a 6% growth in 2008 and 2010). During the Great Depression the results are less clear cut: on average the decline in industrialized countries was approximately level (un-weighted data), namely –10% in the sample of ten industrialized countries as well as in the non-industrialized countries (see Table 3, 1929/1932). For weighted data the drop in industrialized countries is higher than for unweighted data, for non-industrialized countries there is a small decline of 0.7% in one year (1931), but no decline for the whole period (1929/1932). That means there is no core vs. periphery pattern on this general level, and no such general pattern existed in the Great Depression. During the Great Depression the drop in GDP was less in Eastern and Central European countries than in what we call today EU-15 (if today's EU-10 had been the periphery to Germany or

Austria at that time this again speaks against a core-periphery pattern). The drop was least in Russia (as in the non-industrialized economies in general). On the other hand the drop in GDP in South America (which may be considered as the periphery to North America) was rather steep, specifically if compared to the decline in World GDP. However, the GDP loss in the US and in Canada was deeper during the Great Depression than in Latin America. This also counters a core/periphery notion. Summing up this time round the crisis in industrialized coun-

	Great Depression					Recent Crisis			
	1929	1930	1931	1932	1932/1929	2008	2009	2010	2010/2007
	Percentage change								
Czech Republic	2.8	-3.3	-3.4	-4.0	-10.3	3.2	-4.3	0.7	-0.5
Hungary	3.3	-2.2	-4.8	-2.7	-9.4	0.6	-6.4	-0.3	-6.1
Poland	1.1	-4.6	-7.2	-7.8	-18.4	4.8	1.5	2.6	9.1
Slovakia	2.8	-3.3	-3.4	-4.0	-10.3	6.4	-4.7	2.9	4.3
Slovenia						3.5	-7.8	1.3	3.3
Bulgaria	-1.9	10.2	14.7	0.6	27.2	6.0	-4.7	-0.6	0.4
Romania	-4.6	7.2	2.3	-5.6	3.6	9.2	-7.1	0.9	2.4
Estonia						-3.6	-14.1	-0.1	-17.2
Latvia						-4.6	-18.0	-4.0	-24.9
Lithuania						2.8	-15.0	-3.9	-16.0
EU-10; unweighted average[1])	0.6	-0.7	-3.3	-5.0	-8.6	2.5	-8.4	0.0	-5.1
EU-10; weighted average[2])	1.1	-1.9	-3.4	-5.1	-10.1	4.1	-3.8	1.2	1.3
Russia	2.8	5.8	1.9	-1.1	6.7	7.3	-8.9	4.3	2.0
Ukraine						2.1	-14.7	4.5	-9.0
Turkey	15.9	4.5	6.0	-6.0	4.1	3.8	-8.6	4.7	-0.7
World	3.7	-1.9	-4.2	-4.0	-9.8	3.0	-0.9	3.6	5.7

Table 4 Comparison of the two crises: New Member Countries and Neighbors; Growth of real GDP

[1]) GD: Czechoslovakia, Hungary, Poland, Romania. CC: Czech Republic, Slovak Republic, Slovenia, Hungary, Poland, Romania, Estonia, Latvia, Lithuania.

[2]) GD: Czechoslovakia, Hungary, Poland, Bulgaria, Romania. CC: Czech Republic, Slovakia, Slovenia, Hungary, Poland, Bulgaria, Romania, Estonia, Latvia, Lithuania.

Source: WIFO Long-term Database (see Aiginger, 2010)

tries (core) is definitely deeper than in South America and Asia, which had become "actors" and not "followers". Central and Eastern European countries (periphery) on average did show admirable resistance to the crisis, specifically given the bleak forecasts if foreign direct investment and finance were suddenly to stop. Of course the trend of the past years could not be sustained so that the difference between the dynamics in the crisis and the growth trend before the recent crisis is larger (and larger than for EU-15 and the US). Recovery may also come a little bit

late since there are large overcapacities and investment will require a higher risk premium. Furthermore, differences across countries are large as far as growth predictions, fiscal balances and current accounts are concerned.

There are many caveats to be mentioned with regards to the above findings.

Caveat 1: The crisis is not over. The calculations depend on the assumption that there will be no general, large second dip in the activity indicators, after the indicators on trade, manufacturing output, GDP, stock market prices leveled off in 2009 and then started to grow. The consensus among forecasting institutions is a growth in world GDP of about 3% in 2010 and 2011. A small dip, lower growth rates in 2011 as compared to 2010 or even a growth recession would not change the results. The same holds true for country crises which can be ring fenced and do not spread into larger regional crises. The crisis is definitely not over insofar as unemployment remains high (or is even on the rise in 2010). The prediction for 2010 was incorporated in the calculations,

	GDP		GDP per capita at PPP		Unemployment rate		Inflation
	2008/1994	2010/2007	2008	2008/1994	1995–2008	2010–2007	2008/1994
	Change p.a.		EU-27=100	Change	Average	Absolute change	Change p.a.
Czech Republic	3.4	-0.5	81.0	90.5	6.6	2.6	4.7
Hungary	3.4	-2.1	62.7	103.1	7.4	3.9	10.6
Poland	4.8	2.7	56.1	127.9	14.4	0.3	7.8
Slovakia	5.2	0.7	70.7	155.4	14.9	1.7	6.6
Slovenia	4.3	-1.0	91.2	108.1	6.4	3.4	6.7
Bulgaria	3.2	-0.4	39.3	107.6	13.0	1.1	38.4
Romania	3.5	-0.6	44.9	154.8	6.6	2.3	31.1
Estonia	6.2	-6.0	66.7	222.1	9.2	10.5	8.2
Latvia	6.0	-9.1	55.2	188.1	12.3	13.9	7.9
Lithuania	6.0	-6.8	61.5	192.7	10.2	13.3	7.0
EU 27	2.4	-0.9	100.0	67.4	8.4	3.2	3.6
EU 10[1]) (unweighted average)		-2.5	65.6	149.2	9.8	5.8	10.0
EU 10[2]) (weighted average)	4.4	0.0	61.8	110.8	10.5	2.5	11.8

Table 5 Macroeconomic performance of the EU-10

[1]) GD: Czechoslovakia, Hungary, Poland, Romania. CC: Czech Republic, Slovakia, Slovenia, Hungary, Poland, Romania, Estonia, Latvia, Lithuania.
[2]) GD: Czechoslovakia, Hungary, Poland, Bulgaria, Romania. CC: Czech Republic, Slovakia, Slovenia, Hungary, Poland, Bulgaria, Romania, Estonia, Latvia, Lithuania.

Source: Eurostat (AMECO)

therefore. Budget deficits are high and public debts have to be reduced. Several causes of the crisis (disequilibria in the US/China, regulatory problems in the financial sector, over-liquidity concurring with a credit squeeze) have not to be resolved either. Regulatory change has yet to be implemented.

	Current account/GDP		Budget balance/GDP		Debt/ GDP ratio	
	1995–2008	2010–2007	1995–2008	2010–2007	1996–2008	2010–2007
	Average	Absolute change	Average	Absolute change	Average	Absolute change
Czech Republic	-4.2	1.2	-4.6	-4.8	23.7	11.7
Hungary	-7.4	4.9	-6.2	0.7	61.8	13.9
Poland	-3.0	2.3	-4.2	-5.6	43.2	12.0
Slovakia	-6.2	-0.2	-5.4	-4.2	38.1	9.9
Slovenia	-1.9	4.3	-2.6	-7.0	24.9	19.5
Bulgaria	-7.6	12.7	0.7	-1.2	52.3	-2.0
Romania	-6.9	8.1	-3.0	-4.2	18.9	14.8
Estonia	-10.0	19.3	0.4	-5.8	5.3	7.1
Latvia	-10.0	27.9	-1.4	-11.9	12.9	39.6
Lithuania	-8.9	15.4	-2.8	-8.1	19.0	23.8
EU 27	0.0	-0.1	-2.2	-6.7	62.6	20.6
EU 10[1]) (unweighted average)	-6.5	9.3	-3.3	-5.7	27.5	16.9
EU 10[2]) (weighted average)	-5.0	4.8	-4.0	-4.6	37.5	12.8

Table 6 External and fiscal balances in the EU-10

[1]) Czech Republic, Slovakia, Slovenia, Hungary, Poland, Romania, Estonia, Latvia, Lithuania.

[2]) GD: Czechoslovakia, Hungary, Poland, Bulgaria, Romania. CC: Czech Republic, Slovakia, Slovenia, Hungary, Poland, Bulgaria, Romania, Estonia, Latvia, Lithuania.

Source: Eurostat (AMECO)

Caveat 2: The analysis focuses on a limited number of countries and some very broad categorizations (e.g. industrialized countries vs. non-industrialized countries). For many tentative conclusions the results are different depending whether we use un-weighted or weighted averages to measure economic dynamics. Some regions would definitely need more attention if we want to make any conclusions about the transmission of the crisis across world economies e.g. Central Asia or Africa. A limited number of indicators have been used; the main results focus on GDP only.[11] Employment, unemployment and poverty may be more important indicators for developing countries. Disequilibria in external

[11] See Tables 5 and 6 for more activity indicators for the EU-10 countries.

balances, public deficits, and debts for are important for all countries, as well as living standards and life expectancy.

Caveat 3: This is a descriptive study making use of data and assessments at a time when the crisis is not actually over, data are scarce, and the exit strategies are unknown. Testing hypothesis with hard data and empirical evidence will have to follow.

1.6 Conclusions

(1) The Economic Downturn following the Financial Crisis proved to be much smaller and shorter than the Great Depression of the nineteen thirties, given that it ended with the recovery of output in mid to late 2009 (in most countries). The GDP in ten industrialized countries for which activity and policy indictors are presented in Aiginger (2010) decreased by 4.4% for annual data, and 5.4% for quarterly figures. The drop was 10% in the Great Depression for these ten industrialized countries (un-weighted average; if data are GDP-weighted the difference between the Great Depression and the Recent Crisis increases). Unemployment increased by 3.1% (to 9%) in the Recent Crisis while it had increased by 13.2 percentage points (to 20%) in the Great Depression. If we take data for total World GDP the loss had been only 1% this time round (against 10% between 1929 and 1932). Thus the Recent Crisis was "half a Great Depression" for the industrialized countries and "... pales in comparison with what our parents and grandparents experienced in the 1930s" for the world economy.

(2) The Recent Crisis had its origin in the housing market and the financial sector in the US. The problems in these markets started to come to the surface in 2007. The problems then lingered for a whole year (with governments intervening differently and implementing rescue measures), partly covered by strong inflation and a shortage of oil and raw materials. The crisis entered a dramatic new phase after the breakdown of Lehman Brothers in September 2008. In the following months manufacturing output, world trade and stock markets declined with a speed similar to the starting phase of the Great Depression. But in the nineteen thirties the crisis unfolded from sector to sector over time (first the stock markets, then trade and finally banking failures). This time everything happened at once. This time around governments in industrialized countries tried to mitigate the

downturn by implementing monetary and fiscal policies, which were surprisingly coordinated, and by using guarantees and support programs for weaker regions. China had accumulated and made use of past surpluses to combat the downward trend. Even if not all fiscal stimulus programs were implemented fully, even if not all tax cuts worked immediately and even if not all programs were structurally and strategically ideal, the discretionary fiscal programs plus the automatic stabilizers managed to cushion the downturn. Production in many areas bottomed out and then started to increase in mid or late 2009. Since not all problems which led to the crisis are solved (disequilibria, speculation, regulatory failures), and new problems may arise from the increased debt burden of governments there is no certainty that the crisis is over. Echo effects are likely and the exit phase will not be easy. However, we know that at least for the start of the crisis economists learned their lesson from the Great Depression and economic policy followed the advice of the science. Economists and governments had drawn the correct conclusions from the policy inactivity or pro-cyclicity in the Great Depression.

(3) The Recent Crisis started in the US. Nevertheless the US managed to limit the loss in GDP to 2.4% (or 3.8% on a quarterly basis). This was smaller than in Western Europe where it was 4.1% (on an annual base). During the Great Depression the loss in GDP was 27% between 1929 and 1932 in the US, with some interim growth and a final drop in 1937 when the stimulus was withdrawn too early. In the countries now constituting EU-15 the drop in GDP was 9% with the highest drops in Germany and Austria, however, this drop was still smaller than in the US.

(4) The East-Asian Countries were also more or less stable in the Great Depression, with a very small loss in 1930 and 1931, but an overall growth of 2% in the period between 1929–1932. China never had a decline in GDP, India only a small one in 1931. Other East-Asian countries had drops in GDP at that time (Indonesia). This time round East-Asian countries' economic growth declined from 6% to 5% (and is expected to be 7.3% in 2010). China's lowest growth rate was 9% in 2009, India's 7%. The weight of the Asian economies has increased since the thirties, so that their larger balancing effect was amplified by their greater importance.

(5) A striking difference between the two crises is the remarkable stability of Latin (South) America in the Recent Crisis. In these countries

output declined by 15% in the Great Depression. This time there was a tiny dent in the growth process in 2009 (–0.5%), and growth has resumed in 2010 at 4%. For the three years from 2008 to 2010 together the region's GDP increases cumulatively by 8% (with double digit three years growth in Peru, Uruguay, Argentina, Brazil). In Mexico GDP decreased faster than in the US.

One of the reasons for the better performance of South America may have been that specific crises had already occurred in several countries. Another reason may be that economic policy found a good compromise between the opening up of the economies and domestic development. A third reason may be the sustained demand for food and mineral resources due to higher growth in Asia.

(6) Central and Eastern European countries experience a differentiated performance. Total GDP of EU-10 dropped a trifle less than the EU-15 countries, due to the excellent performance of Poland (which was the only EU-27 country with positive growth in 2009). An unweighted average of the EU-10 countries performed less than the unweighted average of the EU-15, mainly due to the double-digit GDP losses in the three Baltic countries. These countries, however, had been the countries with the highest growth since 1995. The Baltic countries lost the gains of three years of catching up in one year, and forecasts for 2010 are still negative. What follows is a middle group of performers which can be grouped into the Czech Republic, Slovakia, and Bulgaria which had losses between 4.3% and 4.7% and another group containing Romania, Hungary and Slovenia with a somewhat higher loss. The average decline of 3.8% had been much less than feared in early 2009, maybe due to the help of international organizations or reserves built in the exceptional growth period beforehand. Public deficits are above EU-27 average in 2009 only in Lithuania, Latvia and Romania and debt is larger than 50% of GDP only in Hungary and Poland. Current account deficits had been larger than 10% in the pre-crisis period in Bulgaria, Romania, Latvia and Lithuania. The unemployment rate is higher than 10% in the three Baltic countries, Hungary and Slovakia. Thus in general the crisis aggravated existing problems, and interrupted a fast convergence process, but with the exception of the Baltic countries did give rise to completely new problems. However, a discussion was started as to whether the "growth model" of the EU-10 would change towards more domestic oriented policies, making use of endogenous forces, qualifications and institutions. But no complete policy change seems to be necessary or

warranted and European integration and enlargement will continue. During the Great Depression the loss in GDP in today's EU-10 countries was also approximately the same as in Western Europe. That time the exception was Bulgaria, which enjoyed a substantial growth during 1929/1932.

(7) In neither crisis there is a core-periphery pattern in the sense that the periphery suffered more than the core. The Asian countries were relatively stable even in the 1930s, specifically India and China. If anything should indicate a larger impact in the periphery it could be the decline in South America which had been relatively large. This time round China and India helped to turn the recession into a recovery, South America proved very stable and performance in the EU-10 was rather differentiated. Baltic countries and some neighbors of the EU-27 (e.g. Ukraine) suffered stronger losses than the industrialized countries, as did Mexico, which can be interpreted as periphery in respect to the US.

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2 Eurozone Before and During the Financial and Economic Crisis

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2.1 Introduction

Eleven European Union countries have used the Euro for cashless transactions starting in 1999. Since that time, the Eurozone has grown to include a total of 16 countries[12]. The period of the last 10 years provides a basis, albeit in limited form, to judge whether expectations tied to a unified economy and currency have been fulfilled. The goal of this chapter is not simply to assess the initial experience, however, but rather to attempt to identify possible scenarios for the future development of the Eurozone. The financial and economic crisis which has been negatively impacting the macroeconomic development of the majority of European economies so strongly since mid-2008 represents the first real stability test for the monetary union. The purpose of this chapter is thus to answer the question about the condition the economic and monetary union will be in when the economic crisis has ended. This will implicitly provide information about the nature of the grouping to which Eurozone candidate countries will be applying for membership in the future[13].

[12] Slovakia became the most recent country to officially adopt the Euro on 1/1/2009.

[13] Here attention must be called to two facts. The CR is not in the situation of the United Kingdom of Great Britain and Northern Ireland or Denmark, both of which have negotiated permanent exceptions from participation in the economic and monetary union. In signing the contract to become a full member of the EU, the CR promised that it would seek membership in the Eurozone and take all steps necessary to fulfill the membership criteria. In contrast to the countries noted above, then, the CR cannot spend a long period of time deliberating whether or not to become a member without risking sanctions from the EU. On the other hand, it should be noted that simply fulfilling the so-called Maastricht criteria is not enough to guarantee automatic entry to the group of countries using the Euro as a single currency. Entry requires unilateral agreement from representatives of all EU member states, who may also take into account factors other than fulfillment of the convergence criteria in making

In deciding on the timing for entry into the economic and monetary union, political leaders of EU countries outside Eurozone should take into account the experience countries in the Eurozone have had to this point, along with anticipated scenarios for Eurozone development.

The first part of the chapter will focus on assessing the first decade of the monetary union's existence. The second section will be devoted to analyzing the fallout from the financial and economic crisis on the Eurozone as a whole, as well as from the standpoint of individual member countries. The third section follows up by presenting three possible scenarios for the future development of the Eurozone.

2.2 Decade of Experience with the Euro as Single Currency

As noted in the foregoing text, the formal institution of the economic and monetary union and introduction of the single currency began on January 1, 1999 for cashless transactions. As of this date, the European Central Bank also took over responsibility for implementing monetary policy for the monetary union as a whole, while member states lost their ability to react to domestic economic problems by altering interest rates or devaluing their national currencies. A wide range of analyses was published during 2008 evaluating the first ten years of the Euro's functioning as a single currency. The text which follows will attempt to briefly acquaint you with the most significant conclusions to be derived from studies evaluating the costs and benefits of the Eurozone to-date, both as a whole and from the standpoint of individual member countries. Sections will also include brief evaluations of the success or lack thereof in fulfilling goals connected with the monetary policy of the European Central Bank (ECB) or the European System of Central Banks (ESCB).

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their decision. The economic and monetary union project has been political since its inception with the Maastricht Treaty in 1992. With each expansion, however, the existing member countries base their decision-making process for expansion of the Eurozone on a range of factors in addition to economic criteria (the existing economic situation among members of the Eurozone, whether they are convinced that the candidate country will continue to fulfill the criteria after entry to the Eurozone, etc.). The same conclusion also applies to decision-making by the candidate countries themselves.

2.3 Assessing the Economic Development of the Eurozone as a Whole

In evaluating the first ten years of the Eurozone's development, we will focus on three basic macroeconomic indicators – economic growth, inflation and interest rates. A comparison will be made using the decade before introduction of the Euro (1989–1998) and the decade after its introduction (1999–2008).

2.3.1 Economic growth: evaluation

A study by the European Commission (EC, 2008) which assessed economic development in countries officially using the Euro as a single currency showed the average pace of growth in real gross domestic product had been slowed. In this regard, expectations that introduction of a single currency would lead to more rapid economic growth in the Eurozone were not fulfilled. For the comparable period, average real growth in the USA and countries outside the Eurozone was 0.5% and 0.6% respectively versus the data for the Eurozone. The first decade also saw a slowdown of average year-on-year growth in per capita real gross domestic product, from 1.9% in the period between 1989–1999 to 1.6% in the first decade after introduction of the single currency. The remaining members of the EU-15 (the United Kingdom of Great Britain and Northern Ireland[14], Denmark and Sweden), who had decided not to adopt the Euro, showed average growth in per capita GDP over the 1999–2008 period of 2.2%. Growth in per capita GDP in the United States of America was at levels identical to the Eurozone during this period. The Eurozone as a whole thus continues to lag behind the US economy in terms of standard of living by almost a quarter (in terms of per capita GDP). Table 7 evaluates economic growth and other chief macroeconomic indicators for both periods under observation for countries in the Eurozone, the USA and individually for EU-15 countries outside the Eurozone (Denmark, Sweden and the UK).

Table 7 makes clear that in spite of the slowing pace of growth in real GDP, the first decade after introduction of the Euro saw a modest decrease in unemployment throughout the Eurozone (of around 1%). A similar trend may also be observed in the US economy and in countries outside the Eurozone. All countries were also able to reduce their

[14] Hereinafter referred to as the UK.

		Average for Period					
		Eurozone		Denmark, Sweden, UK		USA	
		1989–1998	1999–2008	1989–1998	1999–2008	1989–1998	1999–2008
Real GDP	% change	2.2	2.1	2.0	2.7	3.0	2.6
Real per cap. GDP	% change	1.9	1.6	1.7	2.2	1.8	1.6
Real per cap. GDP	Index, USA = 100	73.0	72.0	74.0	76.0	100.0	100.0
Unemployment	% of workforce	9.3	8.3	7.9	5.2	5.8	5.0
Budget deficit	% GDP	-4.3	-1.7	-3.6	-0.9	-3.3	-2.5
Total debt	% GDP	68.6	68.6	48.7	43.0	67.8	60.7

Table 7 Main Macroeconomic Indicators: Comparison
Source: EC (2008)

state budget deficits during the period under observation. It must be noted, however, that despite the partial improvement, average values for public budgets remained in the red and it was only positive growth in GDP which prevented a more pronounced worsening in overall debt indicators during the period in question. The first decade may thus be evaluated as one in which expectations for accelerated economic growth and strengthened public coffers were not met. As developments to this point in the situation starting in the second half of 2008 make clear, however, the second decade of the Eurozone's existence will be strongly influenced by the depth and length of the financial and economic crisis. It is anticipated that 2009 will witness a drop in economic growth throughout the Eurozone of 5%, with recent estimates showing the recovery will take place at a very slow pace. One negative long-term impact from the economic crisis may be an overall drop in potential product (see Table 7). Negative development in economic growth brings with it a gradual growth in overall unemployment throughout the Eurozone, with markedly asymmetric effects. In the Eurozone as a whole, 10% unemployment is expected in 2009[15]. As the economy slows down, bringing

[15] This growth in unemployment, however, will not follow the same dynamic in all countries of the Eurozone. Countries which carried out politically unpopular labor market reforms in the past aimed at achieving greater flexibility will be better positioned against the fallout of the economic reception than countries in which the necessary reforms failed to find the requisite "political courage". Two extremes are presented by the German and Spanish economies. Although GDP dropped much more rapidly in Germany in 2009 than it did in Spain, Spain's unemployment increased much more rapidly than Germany's. This may be explained by the traditionally high share of permanent employment contracts in Spain. These account for almost a third of all employment contracts (by comparison in the United States, permanent employment contracts make up only 5% of the total). The system of permanent contracts is a motivating factor in acquiring employees during periods of economic

with it lower tax collections and a reduction in other sources of income for the public budget, along with a growth in expenditures in the form of fiscal stimuli (for example, support for the banking sector or rebates) and expenditures for social security and unemployment insurance payments, there will be a definite and pronounced worsening of indicators of state budget deficit indicators, as well those for the overall debt of individual member countries.

The figure below presents three possible scenarios for development of the potential product[16] of 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 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 unemployment. 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 gap in growth[17] continuously expands over time. This may be caused by ineffective fiscal stimuli or by another round of declining confidence in the stability of the

growth but offers inadequate flexibility during a crisis. Companies which must hold on to workers under this type of contract do not take on other, part-time employees. In Germany, by contrast, companies may hire employees under the Kurztarbeit program on a reduced-hours basis, as well as shorten the working hours of existing employees. This allows the number of hours worked to be reduced during periods of crisis, with lower monthly wages paid by the firm. The state then compensates employees for two thirds of the lost wages. The Spanish system impact primarily upon younger persons just entering the labor market and less qualified workers. By contrast, the German system allows the costs to be allocated on a society-wide basis (for more on this issue, see, e.g., Pisani-Ferry, 2009).

[16] The potential product is defined to be the real domestic product created under natural unemployment conditions, i.e., under full employment.

[17] The gap in growth is defined to be the difference between the potential and actual product. It thus shows the product volume which might have been produced under full employment but was not.

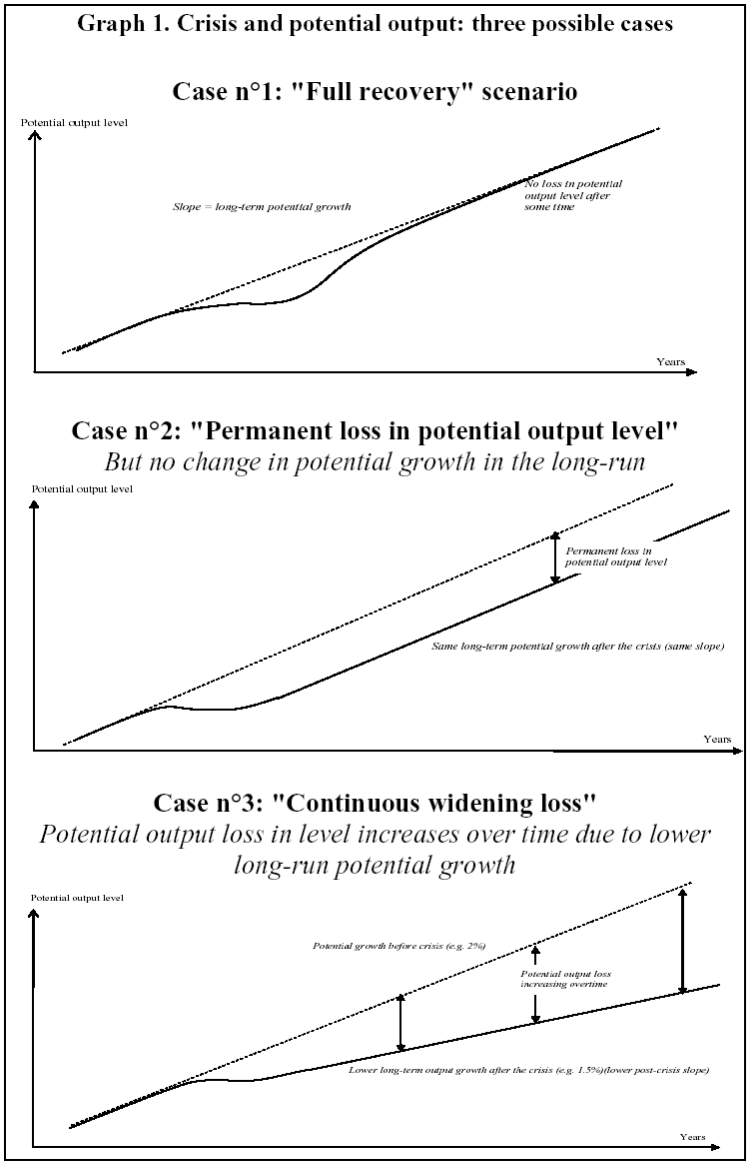

Figure 1 Three Possible Scenarios for the Development of Potential Product in the Eurozone
Source: Koopman, G.J., Székely, I.P. (2009)

financial markets. There may also be further growth in unemployment as a result.

The next decade will present a very interesting opportunity to continue this comparison of the Eurozone with countries outside the Eurozone and the USA. The attentive observer will discover answers to a number of questions connected to the process of building a European economic and monetary union. Will the countries inside the Eurozone deal with the consequences of the crisis better than those outside the Eurozone? Will an advantage become apparent for those with an autonomous monetary policy, including the option to reinvigorate competitiveness by devaluing their currency[18]? Will the trend which sees the economy of the USA come to terms with the crisis more quickly than the Eurozone continue, as a result of greater mobility in the workforce, a more flexible labour market and the existence of a sufficiently large federal budget? The answer to these and similar questions will be very important not only for the future of the existing Eurozone but even more so for potential candidate countries considering the speed with which they wish to introduce the single-currency Euro. The following section of the text will treat the characteristics of two other important macroeconomic indicators: the inflation rate and interest rate evolution.

2.3.2 Inflation and interest rates in the Eurozone to this point

The European Central Bank (hereinafter ECB), which on January 1, 1999 became the sole institution responsible for monetary policy throughout the Eurozone and in particular for maintaining the primary goal of price stability[19], has successfully fulfilled all expectations about its functioning. The average inflation rate between 1999–2008 ranged around the 2.2% mark. The ECB was able to stabilize inflation, as well

[18] For example, the recent development of the British economy shows that not even countries with their own currency and an autonomous monetary policy are immune to the effects of the financial and economic crisis, i.e., they are not coping better than comparable countries using the Euro as a single currency (Germany, France). It is still early for a definitive answer, however. The benefits of devaluing the national currency and using an autonomous monetary policy may become evident only after the crisis has ended, for example, in terms of reinvigorating the economy more rapidly to bring about a return to its pre-crisis levels.

[19] For more on the objectives and legal and institutional organization of the ECB and the entire European System of Central Banks, see, e.g., Kapounek – Přenosil: Evropská centrální banka a její monetární politika, in Měnová integrace: náklady a přínosy členství v měnové unii, pp. 303–361.

as inflation expectations, at a very low level. Thanks to the low inflation rate, there was a pronounced drop in both real and nominal interest rates[20]. A comparison of the evolution of the inflation rate and interest rates for the decade preceding the introduction of the Euro as a single currency and for countries in the EU-15 outside the Eurozone, as well as the USA, is presented in Table 8. As is clear from the Table 8, a low level inflation was attained not only in the Eurozone but in all compa-

		Average for Period					
		Eurozone		Denmark, Sweden, UK		USA	
		1989–1998	1999–2008	1989–1998	1999–2008	1989–1998	1999–2008
Inflation rate	%	3.3	2.2	3.4	1.7	3.3	2.8
Long-term interest rate	%	8.1	4.4	8.6	4.9	7.1	4.8
Real long-term inflation rate	%	4.7	2.4	4.2	3.3	4.3	2.4

Table 8 Development of inflation and interest rates: comparison
Source: EC (2008)

rable groupings as well. It is thus an open question whether praise for achieving inflation targets belongs only to the ECB or whether processes taking place throughout the global economy (for instance, the positive development of commodity prices in the first two-thirds of the decade which markedly reduced pressure on price growth) also substantially contributed to a drop in inflation.

The official statistics, however, fail to give a complete picture of the satisfaction or lack thereof on the part of residents with the development of prices after introduction of the Euro. Ten years after the introduction of the Euro, the discussion among citizens, politicians, the media and academics is still ongoing about the issue of so-called perceived inflation. Most readers will certainly have encountered the phrase "Euro-teuro", used by German and Austrian consumers, which translates to "expensive Euro". It expresses the feeling of most consumers in Germany and Austria that the introduction of the Euro in the form of coins and banknotes in the first half of 2002 led to growth in prices. Public opinion

[20] The impact of reduced interest rates on individual economies will be analyzed further in the section on the development of individual member countries of the Eurozone. We will attempt to show that although lower interest rates had a very positive impact in the near- and medium-term (supporting investment, reducing debt servicing costs for the state), over the long-term they have become the source of a number of imbalances, primarily in the real estate market.

surveys undertaken regularly throughout the Eurozone point to the fact that residents in the majority of Eurozone member countries have had the same experience (feeling). Lacina (2007) focuses in detail on issues to do with perceived inflation, its development and potential impact on official inflation rates. Since the start of 2009, however, the economic crisis has brought about a gradual slowing of price growth in the Eurozone. The Eurozone recorded deflation for the first time ever in June 2009 (Eurostat, 2009).

Economists do not consider it realistic that the Eurozone would fall into a long-term deflationary trap. The worry is rather that implementation of fiscal and monetary expansion might lead to a greater inflationary dynamic when economic growth is renewed, threatening the inflation target of the ECB in the medium term.

2.3.3 Evaluating ECB monetary policy

In what has been written so far, I have maintained that the European Central Bank has been able to meet its inflation target, i.e., to hold inflation below or close to 2% of the year-on-year change in the Harmonized Index of Consumer Prices (HICP). The reality is, however, that inflation differs markedly within the Eurozone countries. Average values for the entire period under observation are indicated in Figure 2. The graphic makes clear that the so-called "catching-up" fast-growing economies (Greece, Spain, Ireland[21]) experienced quicker growth in prices during the entire period under observation than, e.g., Germany, France or Finland. Countries with above-average inflation would therefore most likely prefer a more restrictive monetary policy than that used by the ECB. In contrast, countries with lower than average inflation might legitimately complain that ECB policy is not expansive enough and is thus one source of slow economic growth. So a "one-size-fits-all" monetary policy is not attainable in the Eurozone and a single monetary policy of the ECB will not suit all member countries 100%. Therefore a negative consequence of rapidly growing inflation for countries which cannot compensate the positive inflation differential by faster growth in labour productivity will be a gradual loss of competitiveness under the conditions of the monetary union. This is reflected over time in a growing

[21] Because of their very brief membership in the Eurozone, Slovenia and Slovakia will not figure into the analysis (Slovenia joined 1 January 2007, Slovakia 1 January 2009).

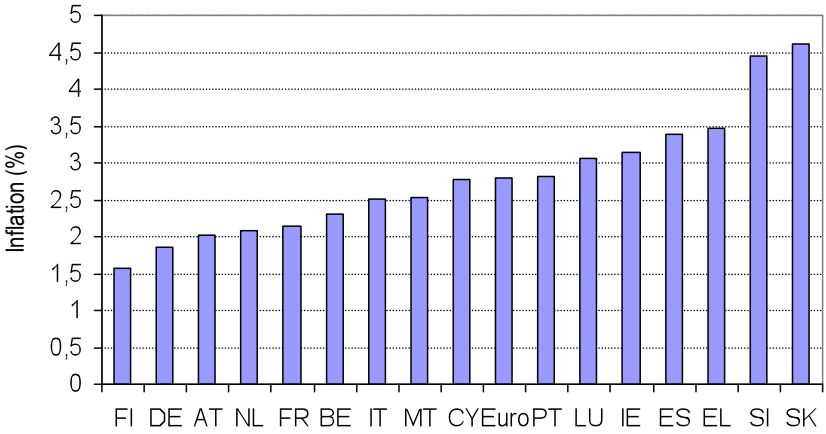

Figure 2 Average yearly inflation in Eurozone countries, 2002–2008
Note: FI – Finland, DE – Germany, AT – Austria, NL – Netherlands, FR – France, BE – Belgium, IT – Italy, MT – Malta, CY – Cyprus, Euro – Eurozone average, PT – Portugal, LU – Luxembourg, IE – Ireland, ES – Spain, EL – Greece, SI – Slovenia, SK – Slovakia
Source: Eurostat (2009)

deficit in the current account balance of payments, which reached a level of almost 10% of the gross domestic product in Spain and Portugal in 2007 and 13% of GDP in Greece. If these countries were using their own national currency such an imbalance of payments would be unsustainable and they would be forced to devalue their currencies[22]. Within the monetary union, this path to renewed competitiveness cannot be taken (the Euro in Spain may not be nominally devalued vis-à-vis the Euro in France). The only path toward renewed competitiveness is thus a lengthy process of real depreciation, ordinarily carried out by slowing the growth of nominal wages compared to the main business partners. A further negative consequence of improperly set interest rates is an overheated

[22] The generally recognized critical value represents a current account balance of payments deficit exceeding 5% of GDP. If the deficit grows beyond this threshold, the financial markets begin to anticipate currency depreciation and their operations contribute to the fulfillment of these expectations. But as we have indicated, in countries using the single currency, this cannot take place and mechanisms other than currency depreciation must be used to renew competitiveness.

housing market[23] in countries for which one of the chief benefits of gaining entry to the Eurozone was a pronounced decline in interest rates (e.g., Ireland or Spain). When economic growth cooled down in the second half of 2008, the bubble burst in the real estate markets of both Ireland and Spain, bringing all manner of negative consequences for both beneficiaries and providers of mortgage loans. Criticism of monetary policy, however, did not just come from countries with rapid growth and inflation. The ECB also took criticism from representatives of countries who accused the ECB of excessive passivity in supporting economic growth. These countries included France, whose president, Nicolas Sarkozy (the former Finance Minister) repeatedly called the single monetary policy too restrictive (independent). (Euractiv, 2004)

Overall the monetary policy may be evaluated as successful in the standpoint of fulfilling targets (particularly price stability). On the other hand, a problem has arisen in arriving at a monetary policy that suits the needs of all countries because of the differing economic situations in which they find themselves. Using a Taylor rule analysis[24] and taking into account the distribution of voting rights in the Governing Council (see, e.g., De Grauwe, 2007), it is clear that monetary policy will always be set in a way which favours the larger countries of the Eurozone, since the ECB creates its monetary policy on the basis of aggregate indicators for the entire Eurozone. It cannot set varying interest rates for different countries to accord with their current needs. In the future, as well, it may be anticipated that the single monetary policy will not always accommodate the needs of all member countries at all times. They will have to use other macroeconomic tools to support their domestic economic goals (for example, fiscal policy, labour market flexibility and workforce mobility).

The following section will focus on the economic development of individual Eurozone member countries between 1999–2009. We will always de-

[23] An overheated housing market, also referred to as a market price bubble, indicates a situation in which the housing market price index deviates significantly from the so-called equal-weighted housing price index. When the majority of market participants decide the bubble is about to burst, property sales offers rise. Many investors wish to sell before prices fall. This, of course, only accelerates the drop in prices. When the bubble bursts, it may cause a sharp rise in interest rates. This reduces new purchase demand and brings property to the market financed by mortgage loans whose payments the owners can no longer keep up with.

[24] The Taylor rule serves as the chief measure for central banks as to how to anchor long-term inflationary expectations and support stable growth and low inflation. Mathematically, it compares real GDP with potential GDP growth and real inflation with target inflation.

vote attention to the development of the German economy and independently to the remaining Eurozone countries, with an emphasis on countries designated in the literature by the acronym PIIGS[25]. We will focus in more detail on the characteristics of differing reactions by national economies to the financial and economic crisis. The knowledge gained will then be used in the following section on possible scenarios for the future development of the Eurozone as a whole, as well as from the standpoint of the role played by individual member countries in the process of further European economic and monetary integration.

2.4 The Experience of Individual Member Countries

Foregoing sections of the text have already briefly characterized the development of the economic growth indicator in the Eurozone as a whole. We have also compared this growth with countries outside the Eurozone and with economic development in the USA. We will now look more closely at the economic growth indicator in individual member countries of the Eurozone. Economic growth can give us immediate help in answering the question of which countries are more satisfied and which less satisfied with their membership in the monetary union to-date. Figure 3 provides a comparison of the development of the gross domestic product indicator for individual countries and the Eurozone as a whole for the years 1989–1998 and 1999–2008. Countries located above the line dividing the quadrant grew more quickly after the introduction of the Euro; countries below it more slowly. The figure also shows the weighted arithmetic average and the unweighted arithmetic average. These values help identify which countries are concerned and how much they contributed to the Eurozone bottom line. If, for example, smaller economies grew more quickly than large economies, the unweighted arithmetic average will be higher than its weighted counterpart. Several fundamental conclusions may be drawn from the values given in the figure. (1) Small member countries had higher average growth than large countries. (2) Two of the three large countries (Italy, France, and Germany) grew more slowly after the introduction of the Euro. Germany experienced a drop

[25] The acronym PIIGS is created from the initial letters of countries which, as a consequence of the financial and economic crisis, have the greatest problems from an unemployment growth standpoint, as well as problematic banking sectors, growing deficits and overall indebtedness. These countries are Portugal, Italy, Ireland, Greece and Spain.

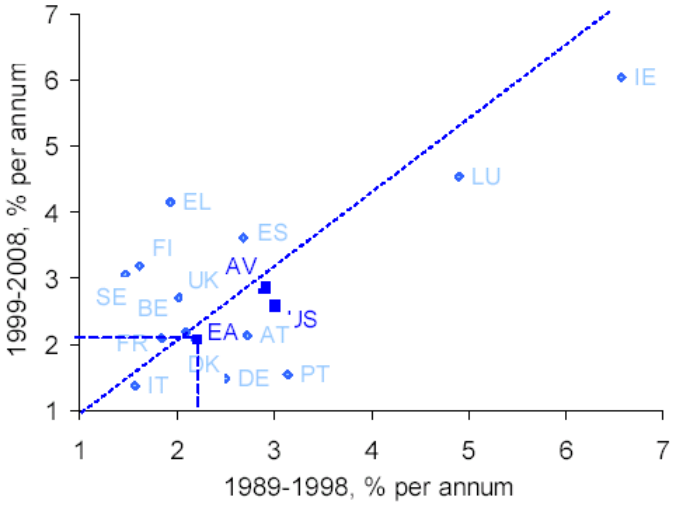

Figure 3 GDP development in Eurozone countries before and after the introduction of the single currency Euro

Note: FI – Finland, DE – Germany, AT – Austria, NL – Netherlands, FR – France, BE – Belgium, IT – Italy, MT – Malta, CY – Cyprus, EA – Eurozone weighted average, PT – Portugal, LU – Luxembourg, IE – Ireland, ES – Spain, EL – Greece, AV – arithmetic average, US – United States of America

Source: EC (2008)

in average growth from 2.5%–3% in the decade before the Euro was introduced to less than 1.5% in the first decade after introduction of the Euro. Italy experienced very low growth levels of around 1% during both periods, with zero economic growth in several of those years. (3) The French economy came in ahead of the other two large countries but its growth, too, was only around 2%. (4) The fourth largest economy in the Eurozone, Spain, was positively impacted by a drop in interest rates and its economic growth was primarily driven by the construction sector until the beginning of 2008. At the same time, however, excessive wage growth led to a loss of competitiveness for the country and a substantial deficit in the current account balance of payments. (5) Pronounced differences may also be identified in the smaller economies of the Eurozone. The Greek and Finnish economies saw a significant quickening of economic growth after the introduction of the single-currency Euro. Ireland

continued its above-average pace of growth, naturally somewhat slower than before its entry into the Eurozone. The most significant slowdown in the pace of economic growth after introducing the single-currency among smaller economies was seen in Portugal and Austria.

The German economy managed to gradually restore its competitiveness chiefly by controlling wages, thereby improving its economic potential at the end of the first decade of use of the single-currency Euro. By contrast, a combination of faster growth in consumer prices and nominal wages in the PIIGS countries (Portugal, Ireland, Italy, Greece and Spain) led to a deepening loss of competitiveness and the attendant negative consequences, embodied in an increase in the current account payment balance deficit. Problems to do with competitiveness were exacerbated in all of these economies by a loss of momentum in the ability to increase labour productivity.

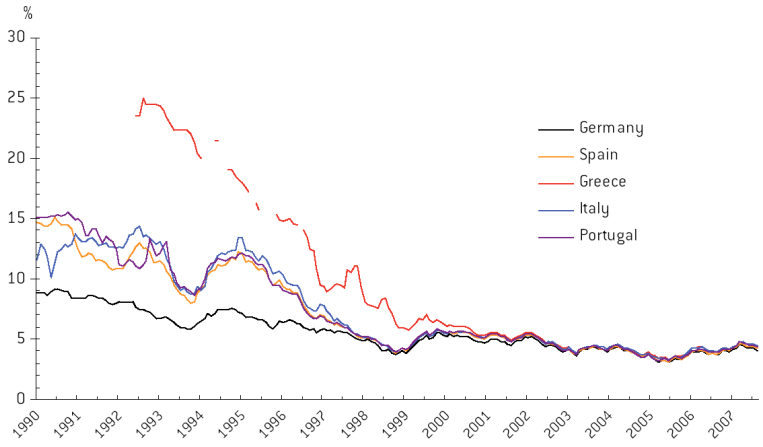

Figure 4 Development in long-term interest rates in selected Eurozone countries (1990–2007)
Source: Pisani (2008)

If we evaluate economic development in the Eurozone member countries up to the beginning of the financial and economic crisis, i.e., to the midpoint of 2008, we obtain a mixed picture. The anticipated acceleration of economic growth after entry into the monetary union failed to materialize in all the large economies. Italy and Germany even experienced a slowdown in the pace of economic growth. Some economies

lost their competitiveness as a result of more rapidly growing inflation and a quickened pace of growth in nominal wages, which became apparent in terms of pronounced deficits in the current accounts balance of payments. A drop in interest rates after the introduction of the Euro had a positive effect on reducing debt servicing costs[26] in countries with a high debt burden (See Figure 4 and Table 9), while it also provided support for "price bubbles" in the real estate sector in economies like Spain and Ireland. Most countries were incapable of decidedly stabilizing their public finances throughout the entire period under observation and only some proved capable of creating a budget surplus during the period of economic growth. Yet as may be seen, thanks to the high pace of growth in GDP, there was a drop in overall indebtedness which persisted until the arrival of the global financial and economic crisis in the second half of 2008. The economies of the Eurozone member countries

	Public indebtedness			Interest payments (debt servicing costs)		
	1989	1999	2008	1989	1999	2008
Eurozone	55.4	71.8	65.2	4.7	4.1	2.9
Ireland	99.2	48.0	26.9	7.7	2.4	0.9
Greece	65.7	102.5	91.1	6.8	7.7	4.2
Spain	40.9	61.5	34.6	3.8	3.5	1.5
Portugal	53.6	51.4	64.7	5.7	3.0	2.9

Table 9 Public indebtedness and debt servicing costs as a % of GDP
Source: EC (2008)

were in various conditions at the start of the financial and economic crisis. It is therefore to be expected that these differences will result in varying dynamics for the impact of the financial and economic crisis on the basic economic indicators of the countries. In the following section, we will attempt an identification of the impact of the financial and economic crisis on individual Eurozone member countries and then make use of these characteristics to rough in possible variants for the subsequent development of the Eurozone in the next decade of its existence[27].

[26] Funds necessary for yearly payments on principal and interest on the national debt. An important indicator is the ratio of debt to gross domestic product. For more, see, e.g., Dvořák (2008, s. 153–158).

[27] Under the optimistic scenario, we anticipate a comeback during the first half of 2010 at the earliest. Even if the recession ends in 2010, however, EU member states will have to resolve its negative impacts (high unemployment, inflationary threats, budget deficits, growth in indebtedness) over a timeframe of several years. It may be expected that most countries will have difficulties getting back to balanced budgets and reducing their debt servicing costs.

2.5 Varying Dynamics in the Impact of the Financial and Economic Crisis on Eurozone Member Countries

The Eurozone member countries we have previously identified as PIIGS – Portugal, Italy, Ireland, Greece and Spain – are evaluated by economists as the weakest members of the entire Eurozone, at the most risk from the ongoing financial and economic crisis. As noted, all of these countries gradually lost competitiveness during the first decade of the single-currency Euro's existence. Italy and Greece were incapable of dealing with chronic national budget deficits even before the onset of the crisis. Ireland and Spain, which had long profited from development in the construction sector, experienced gigantic drops in their real estate markets with all the attendant negative consequences for employment and the stability of the banking sector. Portugal experienced economic problems throughout almost the entire first decade after the introduction of the single-currency Euro. As a result of fiscal expansion (the need to stabilize the banking sector, growth in spending on unemployment benefits, etc.), budget deficits have risen in all of these countries (significantly more than 3%), thereby increasing the risk that they will be unable to repay their entire debt and raising the risk premium the countries must pay to obtain funding to cover budget deficits and refinance the debt. Rising interest rates (especially as a consequence of risk premium growth) also markedly heighten debt servicing costs (see Figure 5). In some countries, there is a real risk the state will have to declare bankruptcy. Growth of this risk in these countries threatens the overall stability of the Eurozone, as well. Table 10 compares growth in selected indicators of the impact of the economic crisis in the EU-27 countries for 2008–2010[28].

The Eurozone as a whole has had a difficult time dealing with the impacts of the financial crisis on the banking sector. Classified loans in the banking sector are growing in number and member countries have already had to provide funds on the order of dozens of billions of Euros to rescue some banks. According to the International Monetary Fund

[28] Data given in the table are from European Commission reports officially published in May of 2009. Readers should compare the values given with current data available at the time they are reading. Comparison data may be had, for example, in regular publications from Eurostat, the European statistical agency. A look at the state of the Eurozone economy in autumn of 2010, for example, will make it possible to judge the degree of pessimism/optimism of the European Commission forecast made in spring of 2009 concerning the economy in 2010.

	Selected indicators illustration the impact of the crisis in:								Manifested in:				
	Overall depth of crises		Risk exposure of industrial sector		Labour markets			Private sector consumption	Public finance sustainability			Competitiveness issues, long term	
	Estimated GDP growth 2009	GDP growth 2009 – GDP growth 2008	Fall in industry production (index 2-09/ 2-08)	Export growth 2009 – export growth 2008	Change unemployment rate 2008–2010	Employment growth accumulated 2009–2010[1)]	Unemployment rate 2010[1)]	Private consumption growth 2009 – p.c. growth 2008	Budget balance 2009 – budget balance 2008[1)]	Government debt ratio 2010[1)]	Budget balance 2010[1)]	Current account balance, % of GDP, 2009	Real effective exchange rates growth accumulated 2008–2009
AT	-4.0	-5.8	-14.6	-12.9	3.3	-3.6	7.1	-0.8	-4.9	75.2	-5.3	2.7	2.0
BE	-3.5	-4.7	-19	-15.2	3.3	-2.7	10.3	-1.7	-4.9	100.9	-6.1	-2.0	4.6
BG	-1.6	-7.6	-17.4	-14.0	2.2	-3.2	7.8	-5.1	-1.8	17.3	-0.3	-18.8	18.3
CY	0.3	-3.4	-5.1	-7.3	2.2	-0.3	6.0	-6.0	-3.5	47.9	-2.6	-13.9	5.4
CZ	-2.7	-5.9	-20.3	-18.5	3.0	-3.0	7.4	-2.7	-3.4	37.9	-4.9	-3.2	8.0
DE	-5.4	-6.7	-20.58	-18.8	3.1	-3.7	10.4	-0.4	-5.8	78.7	-5.9	3.6	3.2
DK	-3.3	-2.2	-11.83	-12.9	3.3	-4.2	6.6	-1.5	-7.5	33.7	-3.9	0.4	8.7
EE	-10.3	-6.7	-30.22	-13.0	8.6	-10.6	14.1	-5.2	-0.9	7.8	-3.9	-1.1	18.2
ES	-3.2	-4.4	-22.0	-10.9	9.2	-8.0	20.5	-3.2	-6.0	62.3	-9.8	-6.9	1.2
FI	-4.7	-5.5	-19.91	-17.2	2.9	-3.7	9.3	-3.4	-7.1	45.7	-2.9	1.4	8.5
FR	-3.0	-3.7	-16.26	-12.9	2.9	-3.4	10.7	-1.2	-3.6	86.0	-7.0	-4.3	0.9
GR	-0.9	-3.8	-4.9	-9.5	2.0	-1.2	9.7	-1.8	-0.7	108.0	-5.7	-11.5	6.1
HU	-6.3	-6.8	-25.45	-16.5	3.4	-5.0	11.2	-5.9	-0.5	82.3	-3.9	-5.0	-8.6
IE	-9.0	-6.7	n.a.	-8.5	9.7	-13.0	16.0	-7.1	-8.5	79.7	-15.5	-1.8	1.0
IT	-4.4	-3.4	-20.71	-11.9	2.6	-3.9	9.4	-0.8	-2.1	116.1	-4.8	-2.6	3.4
LT	-11.0	-14.0	-8.3	-26.4	10.1	-10.1	15.9	-22.2	-4.8	31.9	-8.0	-1.9	-1.1
LU	-3.0	-2.1	n.a.	-6.6	2.1	-0.3	7.0	-0.6	-5.4	16.4	-2.8	6.1	n.a.
LV	-13.1	-8.5	-24.16	-11.6	8.5	-12.2	16.0	-11.0	-9.6	50.1	-13.6	-1.5	13.6
MT	-0.9	-2.5	n.a.	6.2	1.7	-0.3	7.6	-3.3	1.5	68.9	-3.2	-7.6	1.0
NL	-3.5	-5.6	-5.9	-13.3	3.4	-12.2	6.2	-1.8	-7.1	63.1	-6.1	5.7	6.4
PL	-1.4	-6.2	-12.36	-16.8	5.0	-3.7	12.1	-4.7	-3.4	59.7	-7.3	-4.7	-7.9
PY	-3.7	-3.7	-15.59	-11.2	2.1	-2.0	9.5	-2.9	-4.1	81.5	-6.7	-9.8	1.6
RO	-4.0	-11.1	-13.9	-36.3	1.9	-1.6	7.7	-12.8	-0.2	22.7	-5.6	-7.4	-3.2
SE	-4.0	-3.8	-20.28	-11.1	4.2	-4.7	10.4	-2.8	-6.4	47.2	-3.9	7.0	-13.6
SI	-3.4	-6.9	-21.2	-15.1	3.0	-5.3	7.4	-2.6	-5.6	34.9	-6.5	-4.6	3.9
SK	-2.6	-9.0	-27.4	-13.4	2.6	-1.3	12.1	-5.6	-3.2	36.3	-5.4	-7.5	18.9
UK	-3.8	-4.5	-13.9	-10.6	3.8	-3.3	9.4	-4.8	-8.3	81.7	-13.8	-2.8	-27.2

Table 10 Selected indicators on the size and impact of the economic crisis in EU-27 Member States

Note: [1)] 2010 projections are based on the assumption of unchanged policy. They include only measures adopted at the time of the finalization of the Commission Spring forecast published on 4th May 2009.

Source: EK (2009)

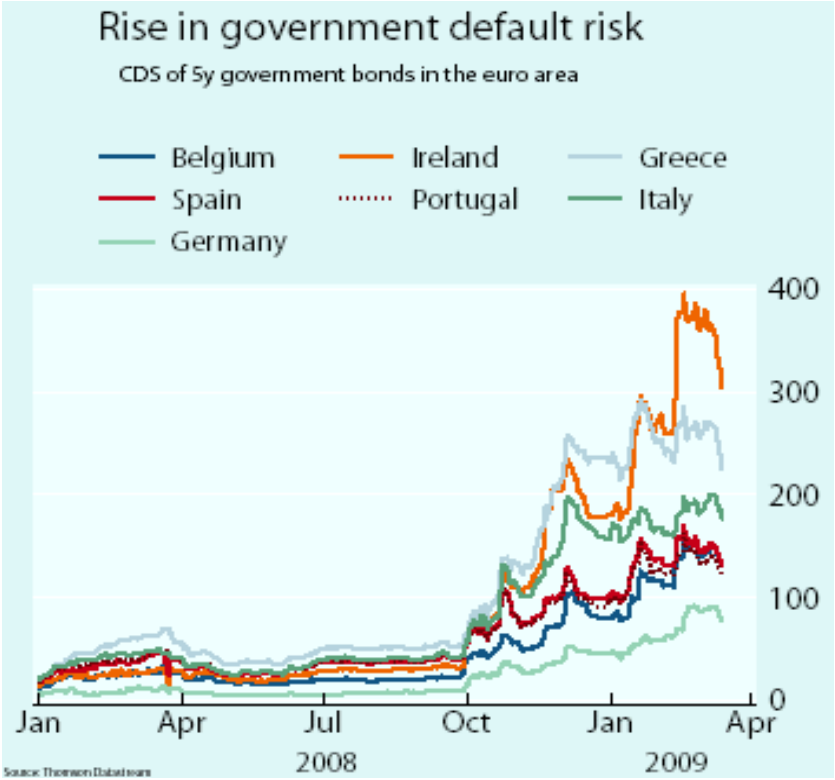

Figure 5 Growth in Government Default Risk (the interest rate on CDS contracts for government bonds in selected Eurozone countries)
Source: Pisani (2008)

(IMF), write-offs of bad loans throughout the EU will have reached a volume of USD 900 billion by 2010. The IMF notes that as of April 2009, only 17% of the amount had been written off (Pritchard-Evans, 2009). In this context, as the financial crisis began to spill over into the real sector (with reduced industrial production, inadequate funding, rising interest rates and rising unemployment) it once again became obvious how weak the Eurozone is in terms of its capability and that of the European Union as a whole to react by means of a common fiscal policy to economic developments. In spite of attempts at a coordinated fiscal stimulus, at

the pan-European level there was only limited agreement[29], with each member state reacting to domestic problems via its own strategy (instruments used, legislative changes, funding volume, timing of changes). In July of 2009, the European Commission published a comprehensive study comparing the instruments used and the funding volume of individual member states[30]. The study analyzes both funding volume and the type of intervention used at the level of individual member countries. While countries like, e.g., Belgium, Ireland and the Netherlands invested funds exceeding 10% of their GDP in support of the financial sector, countries may be identified which offered no financial sector support whatsoever (e.g., the CR and Poland). Sharp differences may be observed as well in the volume of funding member states are planning to direct to the support of the real sector in 2009–2010, for example by supporting households, the labour market, business and investment. While Germany and Spain are planning to "spend" almost 5% of GDP, for example, Italy and France are looking at only 1% of GDP.

2.6 Conclusions

The introduction of Euro in 11 countries on January 4$^{\text{th}}$ 1999 was greeted with great hopes by some and with apprehensions and unease by others. 10 years later, during the first half of 2008 (note, before the real impact of the European Economic and Financial crisis become obvious to all), the

[29] See Communication from the Commission to the European Council. A European Economic Recovery Plan (COM(2008)800). Key points of the communication are: (1) An immediate budgetary impulse of €200 billion, an amount corresponding to 1.5% of the EU GDP. The impulse is to be comprised of expanding the budget of EU member states by €170 billion (approximately 1.2% of the EU GDP), along with EU funding for the support of immediate measures (€30 billion, approximately 0.3% of EU GDP); (2) Member states may make use of a large amount of financial support for the banking sector to encourage banks to return to normal lending services. Banks must ensure that the interest rate cuts implemented by the ECB are passed on to borrowers; (3) To enable the European Investment bank to increase its financial activity, the member states must decide by the end of 2008 on incorporating the reserves of the European Investment Bank to strengthen its capital base to €60 billion, which will provide a visible political signal to the markets and markedly increase the lending activities of the bank (Euroskop, 2009). These three points, however, were only implemented on a partial basis and the member states primarily concentrated on aid at the level of their national economies. The volume of funding used in the "fight" against the crisis exceeded by several times the funds proposed for use at the pan-European level via the EU budget and the European Investment Bank.

[30] EC (2009): The EU's response to support the real economy during the economic crisis: an overview of Member States' recovery measures.

creation of the common currency was celebrated as the one of the greatest achievements of the European integration process, not only economically, but politically as well (EC, 2008). Overwhelming majority of opinions regarded the first (albeit incomplete) decade of the Euro experience as positive. Even if the hopes of accelerating European economic dynamics and improving pan-european economic conditions were only partially realized, in the international comparison the results were perhaps more than respectable.

The dynamics of the Eurozone performance changed with the onset of what is sometimes referred to as the Global Economic and Financial Crisis (GEFC). The very recent development, especially on the Mediterranean littoral, indicates that not all what glitters is gold and the Eurozone may face a turbulent period. To understand the causes of a current instability and to analyze possible future dynamics, the look at the individual countries dynamics is necessary. Eurozone in its present form may well be unsustainable. But again, Euro is the political project first and foremost – hence a political action is necessary to save it, even in perhaps somewhat reformed shape.

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3 Growth Crisis in the EU

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3.1 Erosion of the European Growth Potential

Due to the severe structural productivity problems of the EU-15 and the insufficient adjustment to the globalization a permanent and significant decline in the potential growth rate is to be expected. (See European Commission (2006), Carone et al (2006), Halmai (2007), Halmai-Vásáry (2008) etc.) The unfavourable investment environment promotes a higher level of capital outflow and a notable increase in the share of imported products and services.

Applying the *production function* approach the longer-term simulations indicate that the potential growth rate both in the EU-15 and the EU-27 falls.[31](European Commission (2006), (2008b), (2009b)) This reduction will be continuous, moving from an annual 2.4% in 2004–2020 to an average 1.7% in 2021–2030 and then down to 1.3% in 2031–2060.

The forecast decline in the potential rate of growth is far greater in the EU-10 and EU-12 countries than in the EU-15 states.[32] Output in the EU-12 between 2007 and 2030 will expand far more rapidly than in the EU-15 countries, i.e. the convergence process will continue. But as time passes the pace of convergence will slow down, and then stop after 2030. (Based on the simulations, annual GDP in the EU-10 will grow by only 0.6% in 2041–2060, compared to a figure of 1.5% for the EU-15 countries.[33] That is, there is a switch from convergence to divergence, see Table 11.

In the EU-12 countries, demographic developments are likely to be a particularly important factor in the decline of the potential growth rate.

[31] In this section we used the quality analysis-based on the production functions-that was carried out for the European Commission. See European Commission (2006), (2008b), (2009b), Carone et al (2006); Denis et al (2006).

[32] EU-10 covers the MSs which joined the EU in 2004. The trends indicated are similar also considering the EU-12 – i.e. the country group containing Bulgaria and Romania.

[33] The average growth rate in the EU-12 is expected to be 2.6% in 2020, 1.8% in 2030, 1.2% in 2035, 0.8% in 2040, 0.6% in 2045 and 0.4% in 2050!

According to the simulations the labour input might grow until 2010. Afterwards the working age population is expected to decline significantly, in the long run by about one third. In the EU-12 the working age population will decrease by 37% according to the simulation. It will be an important factor of the decrease in the potential growth rate. The

	2007–2020	2021–2030	2031–2040	2041–2050	2051–2060	2007–2060
CZ	4.0	1.7	1.1	0.8	0.9	1.8
HU	2.9	2.1	1.5	0.9	0.9	1.7
Pl	4.3	2.3	1.0	0.3	0.4	1.7
SL	3.7	1.4	0.8	0.7	1.0	1.6
SK	5.3	2.3	0.9	0.3	0.4	2.0
RO	4.9	2.1	1.6	0.6	0.4	2.0
EU–27	2.4	1.7	1.4	1.3	1.3	1.7
EU–15	2.2	1.7	1.5	1.5	1.5	1.7
EU–10	4.2	2.1	1.1	0.6	0.6	1.8

Table 11 Potential GDP growth rate (annual average as percentage)
Source: European Commission, 2008b

increases in productivity per worker are converging between the EU-15 and EU-10 countries. In the long run we are likely to see an average productivity growth rate of 1.7%, which – in the case of the EU-12 – constitutes a substantial slowdown of more than 50% over approximately three decades (Table 12). The majority of productivity growth per worker is attributable to total factor productivity (TFP). In the long run, the increase in TFP will be followed by capital deepening. According to an analysis of long-term development, total factor productivity growth may converge between the EU-15 and EU-12 countries at an annual rate of 1.1%. This enables a 1.7% increase in labour productivity per year, which will also converge between Member States in the long run. (European Commission, 2008b, p. 101.)

In the EU-15 the contribution of capital deepening to the productivity growth will be averagely 0.6% of the GDP in the long run.

	2007–2020	2021–2030	2031–2040	2041–2050	2051–2060	2007–2060
EU–27	1.9	2.0	1.8	1.7	1.7	1.8
EU–15	1.6	1.8	1.7	1.7	1.7	1.7
EU–10	3.4	2.7	1.9	1.7	1.7	2.4

Table 12 Labour productivity (annual average growth rate as percentage)
Note: labour productivity per hour
Source: European Commission, 2008b

In the case of the EU-12 countries this contribution between 2004 and 2020 will be roughly 1.6% each year. This high rate is one of the indicators of convergence. Later on, such contribution will gradually fall to 0.6%, the level of long-term growth in the EU-15. Based on these developments, productivity per worker in the countries of the EU-10 will rise to 83% of the level recorded in the EU-15 states by 2050.

Changes in total factor productivity are of crucial importance both in terms of long-term economic growth and convergence. In comparison to the annual average over several decades indicated above (1.1%) the growth of total factor productivity in most countries of the EU-15 has fallen since 1990 and grown by only 0.8% each year. *If we base our forecast on this slower growth, then the long-term growth prospects are substantially worse than those presented in the baseline scenario.*

The decrease in the per capita GDP growth rate is more moderate than the decline in the dynamics of total output in the period studied, as the EU population is diminishing in the long term.

GDP per capita in the EU-10 and EU-12 countries compared to the EU-15 shall catch up significantly in the coming two decades. Later, the convergence may come to a halt, and by the end of the period under review the GDP per capita in the EU-10 and EU-12 countries may fall somewhat compared to the EU-15. The estimated dynamics of per capita GDP are based on the productivity growth of the country-group concerned.

Besides these tendencies the *growth rate might differ country by country.* It can be explain – especially in the first half of the period examined – through the different productivity dynamics of the countries. (A major

factor of that is considered the catch-up potential of the countries.) In the second half of this period the development of demographic factors and labour input will be of great importance.

By means of the growth accounting methods the impacts of the sources of growth can be measured. The impacts of the slight increase in population and employment rate are exceeded by the decrease in the working age population rate. (The impact of the former factors is 0.1% and that of the latter one is 0.3% per year expressed in GDP.) The labour input altogether contributes negatively to the potential growth in the decades studied.

Summarizing: according to the simulations the annual potential growth rate of 2.4% in the EU-27 in 2007–2020 is expected to decrease to 1.3% after 2040. In the new MSs the potential growth rate will decline at a greater pace, thus the real convergence will stop from *2030 onwards and even a moderate divergence from the EU-15 might occur.* It can be explained by the following factors: on the one hand the productivity growth rate might be rebalanced by 2050, on the other hand the demographic simulation are significantly more unfavourable in the NMSs than in the old ones. Nota bene: the labour productivity and the employment depend on several factors and the simulation took the one as a basis that is the most likely.

3.2 Crisis and Potential Growth

3.2.1 Growing Risks, Slowing Growth

The financial and economic crisis started in 2008 caused an extraordinarily rapid decline in the economic performances. The slow-down has gradually become a global recession. This hit especially the USA and the EU. *New risks* have emerged, which will burden the economic activities in the future, too. The recovery of the economy is expected to be drawn out.

It is a real risk that weak potential *growth performance and slow recovery can be expected in that prolonged period.* The following main reasons explain that:

- *Fundamental lack of confidence* which leads to the postponement of household consumption and effective entrepreneurial investments;

- Real economy effects of balance sheet adjustment in the financial sector; downsizing of banks' assets including writing off 'impaired' or 'toxic' assets, *increases the cost of capital* also despite large recapitalisation packages;

- *Pervasive credit constraints* and *higher borrowing* costs in the non-financial sector simultaneously with the restructuring of banks; (In the EU deleveraging needs for households are generally lower than in the US, but firms are more heavily indebted there. At the same time the persistent credit squeeze was one of the key factors of the relative Japanese slump recorded in the last two decades);

- A persistent impact on the EU's growth potential might occur if *an attitude to risk and a higher cost of capital dominates*;

- *Slower* growth in TFP in the short and medium terms, induced by the reduction in ICT and knowledge-based investment such as R&D. The postponement of key innovation-prone investments may have a lasting effect on productivity and growth;

- *Permanent destruction in human capital* due to an increase in structural unemployment rate (NAIRU) induced by a protracted recession. (This permanent negative effect in terms of 'knowhow' or professional knowledge is often called 'hysteresis' effect (See Blanchard and Summers, 1989);

- The collapse of world trade and the drastic fall in import demand pose risks for a *higher degree of protectionism.* (European Commission, 2009b).

Taking all these risks and threatens into account more negative growth prospects can be observed as it was outlined by the method (production function based on supply-side approach) used so far.

This is confirmed also by the medium-term simulations. (See Section 3.2.2.)

The financial crisis causes lower contribution of the labour and capital formation to the growth and results in unfavourable TFP. The *longer-term* labour market trends (e.g. the unfavourable dynamics of the working age population) affect negatively the potential growth rate. The recession intensifies these negative impacts.

The 2009 Spring Forecast of the European Commission indicates the increase in the structural unemployment. (European Commission, 2009a). *According to the simulations 1% increase in the Non-Accelerating Inflation Rate of Unemployment (NAIRU) results a decrease of 0.6% in the potential growth rate.*

Due to the financial disturbances the investment trends deteriorate severely. *A decline of 2–3% expressed as a percentage of the GDP decreases the potential growth rate by further 0.2–0.3% in the countries concerned.*

As a result of the unfavourable effects the contribution of the TFP to the growth declines by about 0.1% a year. The TFP-assumptions are conservative: these assumptions don't take into account the one-off downward change to be expected in the TFP level and the development of the potential output related to the structural change in a sector. The performance of certain sectors e.g. financial services, car production etc. is likely to decline due to the crisis.

Empirically it is to be proved, that a *financial crisis might coexist with drawn-out or steady-state output decline.* According to empirical researches a significant decrease in the potential growth rate was to be observed together with extended bank and financial crisis. (Cerra, Saxena et al. (2008), Haugh et al. (2009)) According to experiences gained in certain countries (Japan, Finland, Sweden) at the beginning of the 1990's the financial shock causes a significant decline in the potential growth rate. This process is led by *permanent increase in unemployment and fall in investment rate.*

Factors of the downward pressure on the investments:

- increase in risk premia calculated for entrepreneurial and household credits;
- correction towards the 'normal' rate of the investment level, which evolves following the excessive investment rate of the boom period (generated by the financial and housing bubble).

Simulations carried out using the Quest model (see Ratto – Roeger – in't Veld (2008)) confirm the negative effects of the adjustment disturbances on the labour and product markets, the nominal stiffness and the higher structural unemployment on the potential growth. The simulations show the function failure of the labour market, they show that there is no

nominal wage adjustment after the crisis. This *nominal stiffness might result in the decrease in employment* and the increase in the structural unemployment.

3.2.2 Deceleration of Potential Economic Growth (Medium-Term Quantitative Analysis)[34]

In 2009–2010 the *potential growth rate of the Eurozone* (and the EU-3: Denmark, Sweden, United Kingdom) *is expected to drop to the half of that measured in 2008.* (I.e. the annual growth rate of 1.3–1.6% is likely to decrease to 0.7–0.8%.) The new MSs show the same situation, the growth rate is, however, higher in their case as they are catch-up countries. See Table 13.

In the Eurozone and the EU-3 the decrease in the potential output is to be explained mainly by the significant decrease in labour- and capital factors. The structural unemployment is expected to rise by 1–1.5% and the investment as a share of GDP might decrease by 3%. The dynamics of TFP is averagedly low in the Eurozone and it is decreasing by approximately 0.1% per year in the EU-3. (This TFP assessment is relatively conservative. It does not take into account that there is a one-off downward shift in the TFP level related to the change in the industrial structure.)

In the EU-8 the financial crisis is likely to result in the strong decrease in the potential growth rate: from an annual 4% in 2008 to 2.9% in 2009 and 2.4% in 2014. The different factors of the potential growth react basically similarly to the financial crisis both in the Eurozone and the EU-3.

As regards the direction of the growth dynamics in 2009–2010 it is to be considered similar both in the old and the new MSs. *There is, however, a significant difference in the case of the medium term trends of 2011–2014.* The potential growth rate in the Eurozone and the EU-3 is expected to be recovered by and large in this period. (The dynamics will be similar to that prior the crisis.) *The prospects of the EU-8 are much more unfavourable.* The contribution of the investments and the TFP won't be recovered from the 2009–2010 level. The labour market trends might even worsen further on. (Primarily, due to the significant deceleration of the growth rate of the working age population.)

[34] The analysis is based on the database calculated according to the production function methodology of the EPC Output Gap Working Group (OGWG). The data were grouped and processed by the authors.

	Potential growth (as percentage of the annual change)	Contribution to the potential growth			NAIRU (as percentage of the labour force)	Investment rate (as percentage of the potential output)
		Labour	Capital	TFP		
Euro zone (EA-16)						
2001–2005	1.8	0.5	0.7	0.6	8.5	20.9
2006	1.5	0.3	0.8	0.4	8.4	21.9
2007	1.5	0.3	0.9	0.4	8.4	22.6
2008	1.3	0.1	0.8	0.4	8.6	22.3
2009	0.7	-0.2	0.5	0.4	9.1	19.8
2010	0.8	-0.1	0.4	0.5	9.5	19.3
2011	1.0	0.0	0.4	0.6	9.8	19.5
2012	1.5	0.4	0.5	0.7	9.9	19.9
2013	1.6	0.4	0.5	0.7	10.0	20.3
2014	1.7	0.4	0.6	0.8	10.0	20.6
EU-3 (DK, SE, UK)						
2001–2005	2.4	0.3	0.8	1.4	5.1	17.6
2006	2.2	0.3	0.9	0.9	5.4	18.9
2007	2.0	0.2	1.0	0.8	5.6	19.9
2008	1.5	0.0	0.8	0.7	6.0	19.1
2009	0.8	-0.3	0.4	0.7	6.5	15.9
2010	0.8	-0.2	0.3	0.7	6.9	15.3
2011	1.1	0.0	0.3	0.8	7.3	15.5
2012	1.5	0.2	0.5	0.9	7.5	16.4
2013	1.8	0.2	0.6	0.9	7.6	17.4
2014	1.9	0.2	0.7	1.0	7.6	18.2
EU-8 (BG, CZ, EE, HU, LT, LV, PL, RO)						
2001–2005	3.6	-0.4	1.6	2.3	11.7	22.5
2006	4.4	0.7	2.0	1.7	10.1	25.2
2007	4.4	0.7	2.3	1.5	9.3	27.8
2008	4.0	0.5	2.3	1.2	8.7	28.3
2009	2.9	0.2	1.7	1.0	8.5	24.9
2010	2.4	0.0	1.5	0.9	8.6	24.4
2011	2.3	-0.2	1.5	0.9	8.7	25.0
2012	2.4	-0.2	1.5	1.0	8.7	25.6
2013	2.2	-0.3	1.5	1.0	8.7	25.7
2014	2.0	-0.4	1.4	1.0	8.7	25.4

Table 13 Potential growth in the European Union
Source: own compilation based on the OGWG database

3.2.3 Potential Growth in the Main Country Groups

The financial crisis has affected the different MSs to different extent. *The symmetric shock has had asymmetric consequences.*

The intensity of the impacts of the financial crisis depends on the *initial circumstances* and the *vulnerability* originating from them. The overestimation of the housing markets, export dependency of the economies, their current account position, the size of the financial sector and the exposure to risky assets might have a significant role. In the individual MSs – in relation to the factors mentioned – the potential growth rate, the investment rate, the structural unemployment (NAIRU) etc. differ to a great extent. Henceforth the countries of the EU-27 are categorized into 5 groups based on the potential growth dynamics, the investment as a share of the GDP, the main economic and economic policy peculiarities, the advancement in the field of the Lisbon Agenda and to less extent their location.

The *'continental countries'* (BE, DE, FR, LU) are members of the Eurozone. The potential growth rate fell remarkably prior the crisis. These are countries with current account surplus (with the exception of FR). The Lisbon-type reforms have been carried out restrainedly.

The 'reform countries' (AT, DK, FI, IE, NL, UK, SE) have shown significant improvement as regards the structural reforms. The 'Anglo-Saxon' and the 'Scandinavian' model have proved to be more competitive than the continental one during the globalization period. The potential growth rate exceeded that of the continental countries. At the same time the growth dynamics moderated preceding the crisis and it converged towards the dynamics of the continental countries. The smaller countries belong mainly to the Eurozone. 3 MSs (DK, SE, UK) are not members of the Eurozone. Characteristically there is a current account surplus (with the exception of UK and IE).

The potential growth dynamics has been very low in some 'Mediterranean countries' for years (IT, PT), but it fell also in the others (EL, ES, MT) at the outset of the crisis. The current account deficit and significant structural deficiencies are typical in these MSs.

In the *'catch-up'* group there are the MSs joined the EU in 2004 which showed favourable growth and convergence prior the crisis (CZ, CY, PL, SK, SL). 3 smaller countries among them are members of the Eurozone, but the two bigger countries are not. All the countries classified as 'catch-

up' countries have current account deficit. (It is, however, relatively moderated in this group – with the exception of CY.)

The 'vulnerable' group contains the Baltic States and Hungary which joined the EU in 2004 and Bulgaria and Romania which joined the EU in 2007. With the exception of these two countries (BG, RO) the potential growth rate decreased before the crisis. There is little advancement as regards the structural reforms. None of the countries is a member of the Eurozone. The current account deficit is mostly high (two digit!), *the dependency on the external financing and their vulnerability is very high.*

The characteristics of the groups and the countries in the groups are indicated in Table 14.

The potential growth for the period 2006–2014 is shown in Figure 6. Based on the dataset the following needs to be stressed in terms of the country groups.

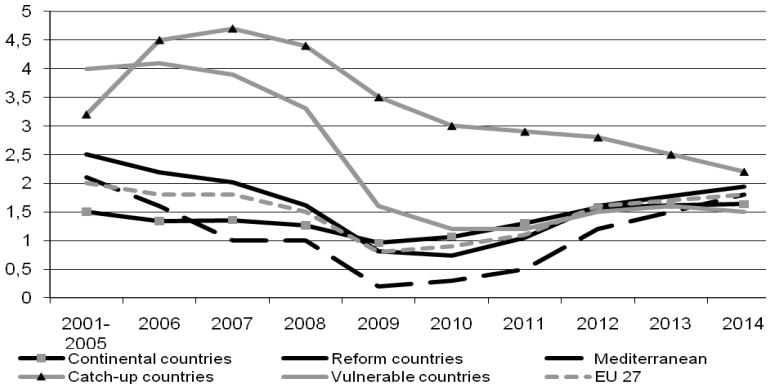

Figure 6 Potential growth in the country-groups of the EU
Source: own calculation

The potential growth rate in the *'continental'* countries is significantly decreasing during the crisis, then it will recover, it might even outdo the first decade which is very unfavourable in their case. Among the decisive factors of the potential growth there is a slight intensification in the contribution of the TFP (the annual 0.3% in 2007–2010 will increase to 0.8%). According to the simulation there is no increase in the struc-

Country group	Current account deficit (as percentage of the GDP)		Current account deficit (as percentage of the GDP)		Investment ratio (as percentage of the potential output)	
	2005	2008	2005	2008	2005	2008
'Continental' [(a)] (BE, DE, FR, LU)	0.8–1.9 [(a)]	1.0–1.7 [(a)]	2.2–5.2[(a)] (except FR)	0.2–6.6 [(a)]	18.7–22.0 [(a)]	21.2–23.5 [(a)]
'Reform countries' (AT, DK, FI, IE, NL. UK, SE)	1.4–3.6	1.4–2.6	3.9–7.5 (except IE, UK)	2.2–8.3	17.7–22.3	18.6–22.0
'Mediterranean' (EL, ES, IT, MT, PT)	0.6–3.3	0.4–2.6	-1.2;-11.0	-3.0;-13.8	20.3–28.3	15.7–28.2
'Catch-up' (CZ,CY, PL, SK, SL)	3.5–5.4	3.3–5.0	-1.2;-8.6 (except CY)	-3.3;-5.1	18.7–28.0	22.8–31.2
'Vulnerable' (BG, EE, HU, LT, LV, RO)	3.1–7.0	0.8–5.1	-7.1;-12.5	-6.6;-22.9	24.8–37.0	24.6–40.0
EU-27	1.8	1.5	-0.3	-1.1	20.5	21.8
USA	2.5	1.8	-5.9	-4.9	19.9	18.0

Table 14 Potential growth, current account and the investment ratio in the country groups
Note: (a): Without the date of LU
Source: own calculation

tural unemployment in this country-group. The investment ratio will, however, decrease by roughly 2% of the potential GDP.

The growth performance of the *'reform countries'* exceeded highly that of the previous country group during the first half of the decade. The decrease is bigger during the crisis in these countries than in the 'continental' countries. The financial turmoil is significant in certain 'reform' countries: the exposure to the international capital flow, the impacts of the risky financial assets, the risks of the toxic assets, the housing-bubble burst might have an impact, too. Due to all that – based on the simulations – the investments decrease to an extent that equals 5% of the GDP when the crisis hits its bottom. The structural unemploy-

ment increases by approximately 2%, but even so it is lower than that of the 'continental' countries. Among the individual growth factors the decrease in the contribution of the capital accumulation to the potential growth is significant. (This factor which equalled 1% of the potential GDP in 2005 will be decreased to 0.7% by 2010.) The decrease in the TFP that started prior the crisis is a significant trend. During the recovery period from 2011–2012 onwards the TFP – together with the capital factor – will increase. At the same time the TFP will exceed the similar indicator of the continental countries all the time.

In the 'Mediterranean' country group the potential growth rate is only 0.2% in 2009. During the critical years of the crisis the contribution of the labour factor to the growth develops particularly unfavourably (negative). The investment ratio expressed as the share of the GDP decreases by more than 5% during the crisis. The NAIRU increases by over 3% and it keeps growing also in the recovery period. The TFP shows low dynamics – that is lagging behind the other two countries all the time. (It will slightly increase from 2011 onwards.) *As regards the potential growth rate the 'Mediterranean' countries have been not converging towards the more developed countries of the previous two groups since 2008.*

The 'catch-up' countries have been converging persistently, but the potential growth rate is decreasing also while the countries are getting out of the recession. The catch-up is slowing and the labour input will be particularly unfavourable in 2013–2014. The structural unemployment (especially in Poland) keeps decreasing and it hits a lower level than the 'continental' countries after 2010. When the crisis hits the bottom the investment ratio decreases about 3% and then it starts to increase again, but it won't reach the previous ratio. The contribution of the capital factor to the potential growth has been continuously decreasing since 2008. The dynamics of the TFP decreases until 2009 and later on it will be stabilized at an annual rate of 1.3%.

In the 'vulnerable' countries the structural unemployment rate will increase by more than 2%. The investment ratio will decrease by approximately 7% in two years. That's why the *decrease in the potential growth dynamics is dramatic*: from an annual 3.3% in 2008 to 1.2% in 2010! The contribution of the labour factor has been negative since 2008. The TFP has hit the level of the 'Mediterranean' countries and from 2010 onwards it won't even reach it. The potential growth rate won't reach the EU-27's average from 2012 onwards. This group is highly character-

ized by the *convergence crisis*, the catch-up will stop completely so this group will lag behind the average development level of the EU-27.

The following consequences offer themselves based on the analysis of the medium-term growth processes of the country groups (the main factors of which are listed in Table 15).

	Potential growth rate		Contribution to the potential growth					
			Labour		Capital		TFP	
	2010	2014	2010	2014	2010	2014	2010	2014
Continental	1.1	1.6	0.1	0.2	0.5	0.5	0.5	0.8
Reform countries	0.6	1.9	-0.3	0.2	0.3	0.7	0.7	1.0
Mediterranean	0.3	1.8	-0.2	0.6	0.3	0.5	0.2	0.6
Catch-up	3.0	2.2	0.2	-0.5	1.5	1.3	1.3	1.3
Vulnerable	1.2	1.5	-0.5	-0.3	1.6	1.6	0.1	0.3
EU–27	0.9	1.8	-0.1	0.2	0.4	0.6	0.5	1.0
USA	1.4	2.1	0.0	0.2	0.5	0.9	0.9	1.0

Table 15 Potential growth and its factors in the country groups
Source: own calculation

- *Summarising: the financial crisis might generate significant decrease in the potential output and it might have a remarkably negative impact on the labour (on the non-demographic driving forces, such as the NAIRU), capital and TFP.*

- As regards the potential growth the individual country groups show substantially different trends. While the more developed countries and those being a member in the Eurozone will get close to their previous growth performance, the potential growth rate will decrease in the Member States which are less developed than the average. *Due to that the growth dynamics of the country groups will converge.* (But it cannot occur as regards the level of the potential growth.) That is: *a surprising convergence might develop in the growth rate of the basically different country groups.* (See Figure 6.)

- *The contribution of the individual factors to the potential growth is very different.* The structural unemployment (NAIRU) will slightly decrease in the 'catch-up' countries, it won't change in the 'continental' group, it will increase by about 2% in the 'reform' countries and it will increase by about 3% in the 'Mediterranean' and the 'vulnerable' country groups. The investment ratio in the 'continental' and the 'reform' countries will be recovered by and large at the level preceding the crisis. It decreases by 2% in the 'catch-up' countries and by about 4% in the 'Mediterranean' and 'vulnerable' countries. The contribution of the labour input is modest on the whole, while its contribution is negative in the case of the 'catch-up' and 'vulnerable' countries. The contribution of the capital factor is the most modest in the 'continental' and 'Mediterranean' countries. (See Figure 7.) The TFP as the decisive factor of the potential growth in structural terms will grow after the crisis has hit the bottom but it will remain at a low level on the whole. (See Figure 8.) The most unfavourable dynamics of this structural component is to be expected in the 'Mediterranean' and 'vulnerable' country groups.

- As regards the potential growth and the contribution of the individual factors the *most unfavourable trends were to be experienced in the case of the 'Mediterranean' and 'vulnerable' countries.* In the

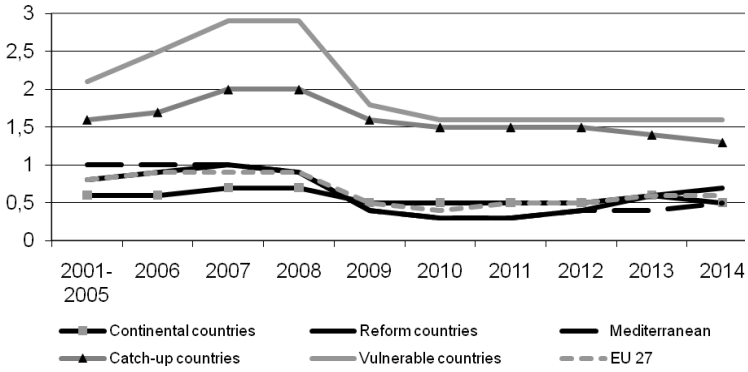

Figure 7 Contribution of the capital accumulation to the potential growth
Source: own calculation

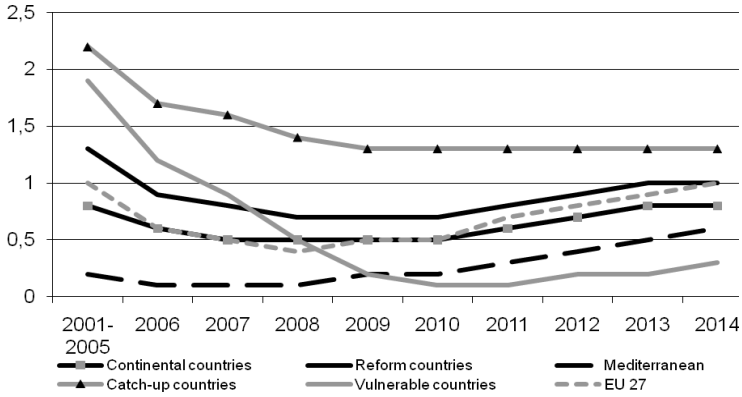

Figure 8 Contribution of the TFP to the potential growth
Source: own calculation

period analysed the catch up will practically stop in the country group indicated.

- The decrease in the dynamics of the potential output to be predicted for the coming years shows a dramatic size. (Figure 9 and Figure 10)

In the Baltic States the annual increase in the potential output will fall from 5–6% to 1–2%. In the case of Hungary the dynamics of 3–4% might fall under an annual 1%! That is: *in certain new member states the real convergence might stop in the short run and even divergence might occur compared to the more developed countries.* This convergence crisis might cause severe tensions in the medium-term period indicated both in the countries affected and the EU.

3.2.4 Potential Growth in the EU and the USA

In a broader context it is to state that the potential growth rate shows in general a downward trend both in the USA and the Eurozone countries. (There is an exception in the USA from the mid 1990s onwards.) The potential growth rate represented a downward trend both in the Eurozone and the USA prior the financial crisis. The acceleration of

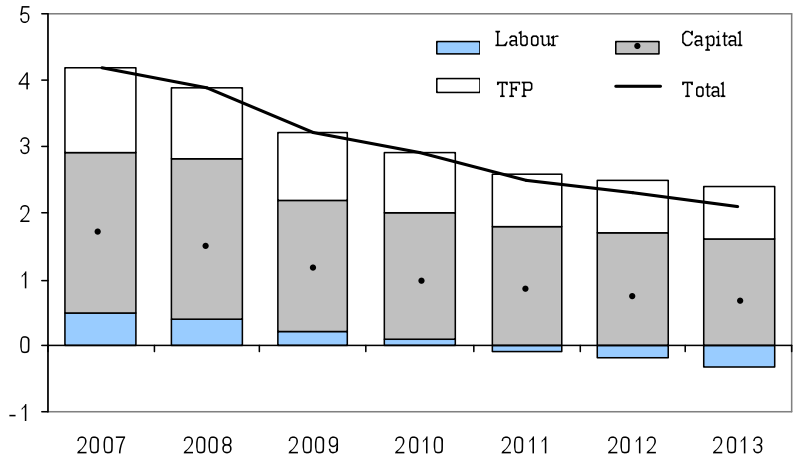

Figure 9 Potential growth in the new MSs (annual change in %)
Source: based on the database of the EPC Output Gap Working Group

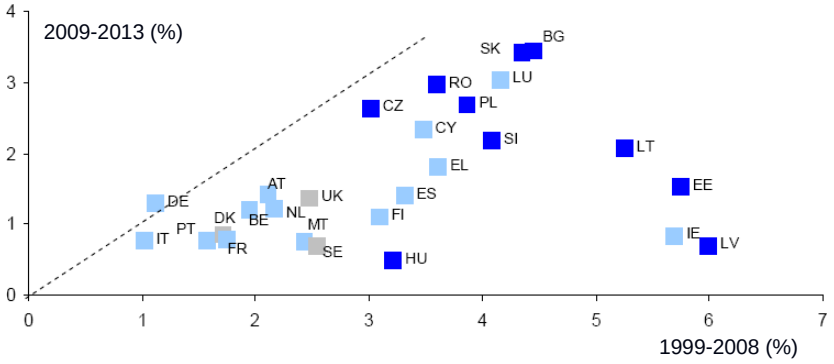

Figure 10 Potential growth in the EU Member States
Source: based on the database of the EPC Output Gap Working Group and the AMECO database

the potential growth related to the ICT proved to be short-lived in the middle of the 1990s in the USA. The potential growth rate decreased around 2000 once again.

The current crisis is linked with the repeated deterioration that occurred on the supply side earlier both in the USA and the Eurozone. The potential growth rate was much lower in 2008 than in 2000. (It is lower by 1.5% in the USA and by 0.8% in the Eurozone.) The current financial crisis decreases these rates by 0.25–0.50% in 2009–2010. According to Table 16 the deterioration induced by the financial crisis might be relatively short-lived. The main scenario of the *medium-term simulation based on the production function indicates the recovery of the potential growth rate (annual 2%) until 2013 in the USA. In the Eurozone the potential growth rate might reach the level of 1.6% prior the crisis.*

According to the analyses carried out using the production function method, the financial crisis might strengthen the models that differ between the Eurozone and the USA as regards the contribution of the growth factors to be experienced. The contribution of labour exceeds that of the USA further on, while in the latter the *increase in the investment* is expected to be significantly stronger from 2011 onwards.

Despite the ICT bubble burst the TFP growth is still twice as high as in the Eurozone. In the USA the contribution of labour to the potential growth was one sixth of the 1990's level before the crisis. At the same time in the Eurozone in 2007 the contribution of labour to the growth was twice as high as in the USA. Due to the crisis the contribution of the labour is expected to be moderated in both regions. The annual contribution of the labour to the potential growth will be 0.25–0.5% in the medium term (2012–2013) in the Eurozone, while it will be only 0.1% in the USA. The contribution of the capital accumulation is expected to show convergence at a level of 0.5% in 2009–2010. At the same time the investment will decrease by 10% in both regions. In the medium-term in the USA the investment dynamics will reach the rate that has been prevailing from 1990's on and has been exceeding the European rate.

The annual contribution of the TFP to the potential growth decreased from the 1.5% prevailing at the end of the 1990s to approximately 0.8% in 2007–2008. But this dynamics was still twice as high as the rate in the Eurozone. In both regions the TFP contribution will be moderated due to the financial crisis in 2009–2010. These contribution rates return to the level prior the crisis. According to the forecast the contribution of the TFP to the potential growth in the USA will be significantly higher

	Potential growth (As percentage of the annual change)	Contribution to the growth			NAIRU (As % of the labour force)	Investment ratio (as percentage of the potential output)
		Labour	Capital	TFP		
EU-27						
2001–2005	2.0	0.2	0.8	1.0	8.6	20.2
2006	1.8	0.4	0.9	0.6	8.2	21.3
2007	1.8	0.4	0.9	0.5	8.1	22.2
2008	1.5	0.2	0.9	0.4	8.2	21.8
2009	0.8	-0.1	0.5	0.5	8.6	19.2
2010	0.9	-0.1	0.4	0.5	8.9	18.6
2011	1.1	0.0	0.5	0.7	9.2	18.9
2012	1.6	0.2	0.5	0.8	9.3	19.4
2013	1.7	0.2	0.6	0.9	9.4	19.9
2014	1.8	0.2	0.6	1.0	9.4	20.3
USA						
2001–2005	2.5	0.2	1.1	1.2	4.9	19.2
2006	2.4	0.2	1.2	1.0	5.6	19.8
2007	2.1	0.2	1.0	0.9	5.9	19.2
2008	1.8	0.1	0.8	0.9	6.3	18.0
2009	1.1	-0.1	0.4	0.9	7.0	15.2
2010	1.4	0.0	0.5	0.9	7.4	15.7
2011	1.7	0.3	0.5	0.9	7.6	16.1
2012	1.8	0.1	0.7	1.0	7.8	17.3
2013	2.0	0.2	0.8	1.0	7.8	18.2
2014	2.1	0.2	0.9	1.0	7.9	18.3
Japan						
2001–2005	0.8	-0.6	0.3	1.1	4.2	23.4
2006	0.7	-0.5	0.3	0.9	4.6	23.4
2007	0.6	-0.5	0.3	0.8	4.8	23.5
2008	0.7	-0.3	0.2	0.8	4.9	22.1
2009	0.3	-0.3	-0.1	0.7	5.1	19.3
2010	0.2	-0.5	-0.1	0.7	5.3	19.3
2011	1.0	0.3	-0.1	0.8	5.3	19.1
2012	-0.1	-0.8	-0.1	0.8	5.4	18.9
2013	0.0	-0.8	-0.1	0.9	5.4	18.9
2014	0.0	-0.8	-0.1	0.9	5.4	19.1

Table 16 Potential growth in the EU, USA and Japan
Source: own compilation based on the OGWG database

during the period from 2009 to 2013 than in the Eurozone. In order to explain why the performance of the USA is continuously higher there is a need to analyse the key driving forces of the tangible and intangible investments.

3.3 Alternative Long-Term Scenarios

In order to calculate the impacts of the current crisis alternative scenarios need to be set up. In view of the large uncertainty regarding the length of the slump in economic activity the case of the temporary shock and the case of the permanent shock needs to be defined.

Two temporary shock scenarios can be described: a *'lost decade'* and a *'rebound' scenario*. These scenarios consider potential growth i.e. they are based on the supply-side factors but take into account the actual growth, too that are affected by business cycles. (And which cannot be simulated by means of the production function approach.)[35] Those figures are much lower than the baseline projection for the period until 2013. Therefore the annual potential GDP growth in the EU-27 included in the latest analysis carried out by the European Commission is lower by around −0.9% in both scenarios than in the baseline scenario.

The potential growth components will then converge to reach the growth rate projected in the baseline:

- in the *'lost decade'* scenario, labour productivity is assumed to reach the baseline growth rate in 2020. Labour input is assumed to reach the baseline growth rate in 2020, too.
- in the *'total rebound'* scenario, labour productivity and labour input are expected to reach the baseline level in 2020.

Given the current economic crisis and a very considerable degree of uncertainty, the impact of a permanently worse situation of the growth potential can also be analyzed. This is the 'lasting and increasing loss' (or *'permanent shock'*) scenario.[36]

[35] In the short term, the projections are based upon the Forecast carried out by the European Commission in January 2009 up to 2010, in the medium term the projections are extended until 2013 with the EPC Output Gap Working Group method that extrapolates the trends for the components of potential GDP (European Commission, 2009b).

[36] It requires sensitivity scenarios embedded in the long-term projection exercise.

According to the 'lasting and increasing loss' scenario from 2014 to 2020 the labour productivity growth and labour input growth will reach the baseline figures, but the unemployment rate will be permanently 1% higher than in the baseline from 2020 onwards; and the labour productivity growth rate will be 0.25% lower than that from 2020 onwards.

The *'lost decade scenario'* causes a reduction in the per-capita GDP level by the end of the period examined compared with the baseline. It implies a *lower expected potential growth* up to 2020. This period is 'lost' in terms of accumulated wealth creation. The loss in GDP per capita in the EU-27 is around 8% in 2020. This scenario carries over the loss in the rest of the projection period. The growth projection remains broadly unchanged between 2020 and 2060. In the *'total rebound'* scenario, the GDP per capita by 2060 is the same as in the baseline (the deterioration relative to the baseline up to 2014 is offset by the improvement between 2015 and 2020). (European Commission, 2009b)

A more marked reduction in the GDP per capita level occurs in the 'lasting and increasing loss' *scenario.* In that case the GDP per capita is 10% lower than in the baseline in 2020, 14% lower in 2040 and 18% lower in 2060. It means that this scenario reflects significant lower growth throughout the projection period than it was assumed before. (The growth path of the different variables is summarized by Figure 11.)

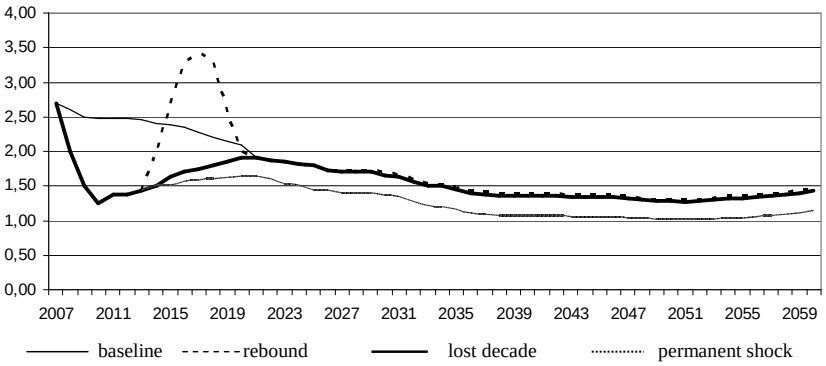

Figure 11 Potential GDP growth under different shocks (annual growth rate)
Source: European Commission, 2009b

The permanent shocks would result in the complete collapse of the growth and catch-up models in Europe. In the long term one fifth of the GDP would fall out and the chances of real convergence would deteriorate dramatically, though differently country by country.

3.4 Conclusions

The main conclusions are the following:

(1) In relation with challenges of the globalisation and competitiveness problems of the European Union's economy – the current average annual rate of *potential growth in the European Union of 2.4% could fall to half this level on average in the coming decades.* The potential growth rate will be cut in half, despite the prognosis containing relatively benign development in labour productivity. This may also indicate adverse demographic changes. But its decisive structural element is the decreasing dynamics of the total factor productivity.

Since accession the new Member States have been following transition paths leading to substantial convergence. Yet *the pace of this catch up will dwindle over time and may eventually stop.* The growth in these countries might be more moderate in three decades than the average of the EU-15 at that time. It is possible that the convergence of the new Member States will reach around three-quarters of the per capita GDP level of the EU-15, i.e. after the rapid initial convergence the EU-10 *countries will increasingly constitute a stagnating "convergence club".*

(2) The present global crisis resulted in the deepest recession we have seen since WWII. New risks appeared. The new MSs have been experiencing a continuous fall in potential growth since 2008. The potential decrease in the dynamics of the potential growth in the medium term is of dramatic size in certain new NMSs. In these countries *real convergence might stop in the short run and it might even come to a divergence.* We call it *'convergence crisis'.*

As regards the potential growth and the contribution of the individual factors the *most unfavourable trends were to be experienced in the case of the Mediterranean and vulnerable countries.* In the period analysed the catch up will practically stop in the country group indicated.

(3) The risk of shock repetition is high. These changes project *further erosion of the growth potential in Europe.* That is: due to the

crisis and its potential long-term impacts there might be scenarios which are more unfavourable than those indicating decreasing potential growth in the previous point. *The trajectory of the permanent shocks threatens with the complete collapse of the European growth and catch-up model.*

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4 Asset Price Fluctuations and the Financial Crises[37]

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4.1 The "Fundamentalist Hypothesis" and the "Bull-Bear-Hypothesis" of Asset Price Dynamics

According to mainstream economic theory, asset prices are determined by the respective equilibrium conditions, i.e., by the so-called market fundamentals. Hence, destabilizing speculation will influence prices at best over the very short run (if at all). In this chapter, I shall at first summarize the main assumptions of this theoretically (deductively) derived concept of asset price formation which I term "fundamentalist hypothesis". I will then discuss the key elements of the alternative "bull-bear-hypothesis" which is rather empirically oriented.

The main assumptions of the "fundamentalist hypothesis" can be summarized as follows (see also Figure 12 and Table 17):

- The theoretical benchmark model of the "fundamentalist hypothesis" is an ideal, frictionless market where all participants are equipped with perfect knowledge and where no transaction costs exist ("world 0").
- The model underlying the "fundamentalist hypothesis" relaxes the assumptions of perfect knowledge and of no transaction costs. Also in this "world I" actors are fully rational, but they do not know the expectations of other actors. Hence, prices cannot reach a new equilibrium instantaneously but only through a gradual price discovery process.

[37] This chapter was originally published by SUERF – The European Money and Finance Forum in SUERF Study 2010/3 "The Quest for Stability: The View of Financial Institutions", who have authorized this reprint. The chapter was delivered at the 28th SUERF Colloquium – The Quest for Stability held in Utrecht, The Netherlands on 3–4 September 2009.

- The high transaction volumes in modern financial markets stem mainly from the activities of market makers. The latter provide just the liquidity necessary for facilitating and smoothing the movements of asset prices towards their fundamental equilibrium.
- Speculation is an indispensable component of both, the price discovery process as well as the distribution of risks. As part of the former, speculation is essentially stabilizing, i.e., it moves prices smoothly and quickly to their fundamental equilibrium (Friedman, 1953).
- An endogenous overshooting caused by excessive speculation does not exist. Any deviation of asset prices from their fundamental equilibrium is due to exogenous shocks and, hence, is only a temporary phenomenon.
- The emergence of news and shocks follows a random walk and so do asset prices. Therefore, speculation techniques based on past prices cannot be systematically profitable (otherwise the market would not even be "weakly efficient" – Fama, 1970).

The "bull-bear-hypothesis" perceives trading behaviour and price dynamics in asset markets as follows ("world II"):

- Imperfect knowledge is a general condition of social interaction. As a consequence, actors use different models and process different information sets when forming expectations and making decisions[38].
- As human beings, actors' expectations and transactions are governed not only by rational calculations, but also by emotional und social factors.
- Not only are expectations heterogeneous but they are often formed only qualitatively, i.e., as regards the direction of a price movement. E.g., in modern financial markets traders try to gauge within seconds if a news will drive the price rather up or rather down.
- Upward (downward) price movements – usually triggered by news – are lengthened by "cascades" of buy (sell) signals stemming from trend-following technical trading systems.

[38] In a recent, pathbreaking book, *Frydman – Goldberg (2007)* demonstrate that recognizing the importance of imperfect knowledge is key to understanding outcomes in financial markets.

- The "trending" behaviour of asset prices (based on daily or intra-day data) is fostered by the dominance of either a "bullish" or a "bearish" bias in expectations. News which are in line with the prevailing "market mood" gets higher recognition and reaction than news which contradict the "market mood".

- In the aggregate, this behaviour of market participants cause price runs in line with the "market mood" to last longer than counter-movements. In such a way short-term runs accumulate to long-term trends, i.e., "bull markets" and "bear markets".

- The sequence of these trends then constitutes the pattern in long-term asset price dynamics: Prices develop in irregular cycles around the fundamental equilibrium without any tendency to converge towards this level.

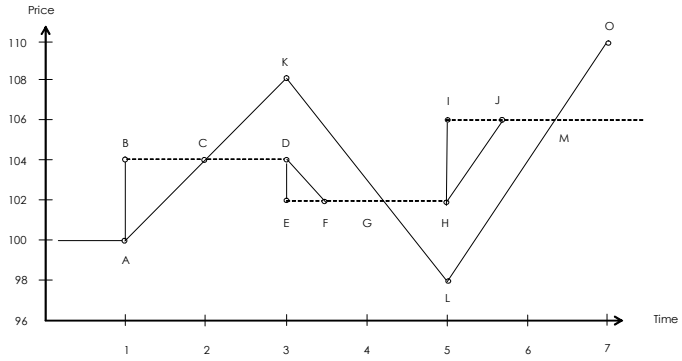

Figure 12 Three stylized paths of asset prices
Source: Author

In order to clarify the theoretical differences between the "fundamentalist hypothesis" and the "bull-bear-hypothesis", it is useful to distinguish between three (theoretical) paths of asset prices, depending on the assumptions made about market conditions (Figure 12):

- In "world 0", new information at $t = 1$ causes the asset price to jump instantaneously from the old equilibrium at $P = 100$ (at point A) to the new equilibrium at $P = 104$ (B). The price stays there until news in t = 3 cause the price to jump to $P = 102$ (E). Finally,

in $t = 5$ new information once again causes an instantaneous price adjustment to $P = 106$ (I).

- In "world I", it takes a series of transactions to move the price from $P = 100$ to $P = 104$, i.e., from A to C. Since there are only rational traders in this world, the price movement will stop at the new fundamental equilibrium level and stay there until $t = 3$ (then the price starts to move from D to F, and later from H to J).

- In "world II", there exist traders who form their expectations according to the most recent price movements, i.e., when prices move persistently up (down) they expect the respective short-term trend to continue. Hence, they buy (sell) when prices are rising (falling), causing the price to overshoot (from C to K, from G to L, and from M to O).

As a consequence of asset price "trending", rational investors (in the sense of profit-seeking) will try to systematically exploit this non-randomness in price dynamics. The conditions of "world II" will therefore almost inevitably emanate from those of "world I": If prices move smoothly from one fundamental equilibrium to the next, and if this price discovery process takes some time, then profit-seeking actors will develop trend-following trading strategies (for models dealing with the interaction of heterogeneous actors see *DeLong et al.*, 1990A and 1990B; *Frankel – Froot*, 1990; *De Grauwe-Grimaldi*, 2006; *Hommes*, 2006; *Frydman – Goldberg*, 2007).

Over more than 100 years people have developed and used a great variety of "technical" trading systems. All models of "technical analysis" have in common that they attempt to exploit price trends and by doing so they reinforce the pattern of asset price dynamics as a sequence of upward and downward trends (for a comprehensive treatment of technical analysis see *Kaufman*, 1987; the interaction between technical trading and price dynamics is explored in *Schulmeister*, 2006, 2009B).

In our stylized example those transactions (in "world II") which cause the price to overshoot (driving it from C to K, from G to L and from M to O) have to be considered "excessive" (as in "world I" price movements are triggered by news also in "world II"). These overshooting price changes amount to 12 between $t = 1$ and $t = 7$. The overall price changes over this period amount to 30 $(8 + 10 + 12)$, whereas only cumulative price changes of 10 $(4 + 2 + 4)$ would be fundamentally justified.

	World 0	World I	World II
General characteristic	Perfect knowledge and foresight. Rational expectations. No transaction costs (frictionless markets)	As in world 0 with two exceptions: – Transaction costs matter – Expectations of other actors due to news have to be discovered in a gradual adjustment process	Imperfect knowledge as general condition of social interaction: Actors process different information sets using different models. Actors are human beings: Expectations and transactions are governed by rational, emotional und social factors
Expectations	Homogeneous	In general homogeneous, but heterogeneous during the price discovery/adjustment process	Heterogeneous
Expectations formation	Quantitative	Quantitative	Often only directional (qualitative)
Price adjustment to news	Instantaneous jumps to the new fundamental equilibrium	Gradual price movement towards the new fundamental equilibrium	Price movement overshoots the ("region" of) the new fundamental equilibrium. Short-term trending of asset prices accumulates to medium-term trends due to optimistic or pessimistic biases in expectations ("bullishness/bearishness")
Transaction volume	Low (counterpart of the "underlying" transaction in goods markets)	"Basic" liquidity necessary for the price discovery process => Trading volume higher than the "underlying" goods markets transactions, moving in tandem with the latter over time	"Excessive" trading causes transaction volumes to grow significantly faster than the "underlying" transactions in goods markets
Trading is based on	Fundamentals	Fundamentals	Fundamentals, technical models as well as on psychological factors on the individual level (e.g. emotions) as well as on the social level (e.g. market moods, herding)

Table 17 Features of three hypothetical "worlds" of financial markets
Source: Author

This stylized example shows that once prices start to overshoot, their overall price path becomes much longer and the related transaction volumes get much bigger than under purely rational expectations (as in "world I"). At the same time the trending of asset prices provides opportunities for technical (i.e., non-fundamental) speculation, and the use of these speculation systems in turn strengthens asset price trends.

4.2 Pattern of Asset Price Dynamics

I shall now investigate how short-term runs of asset prices bring about long-term overshooting. Hence, I address the relationship between the following two phenomena:

- Exchange rates but also stock prices and commodity prices move in a sequence of upward trends ("bull markets") and downward trends ("bear markets") which last for several years.
- Trading volume in financial markets has expanded enormously, at present it is almost 100 times higher than nominal GDP of OECD countries. This expansion is mainly driven by the acceleration of trading: The time horizon of most transactions is shorter than a few hours.

The coincidence of both developments constitutes a puzzle. How can very short-term transactions generate asset price movements which accumulate to long-term "bull markets" and "bear markets"? To put it differently: Which properties of asset price dynamics cause asset prices to move in long-term irregular cycles, i.e., in a sequence of upward and downward trends? To find preliminary answers to these questions, I investigate the movements of the Dollar/Euro exchange rate with respect to the following hypothesis (a special case of the more general "bull-bear-hypothesis"):

- Over the short run, asset prices fluctuate almost always around "underlying" trends. If one smoothes the respective price series with simple moving averages, one can easily identify the "underlying" trends.
- The phenomenon of "trending" repeats itself across different time scales. E.g., there occur trends based on 1-minute-data as well as trends based on daily data. However, the volatility of fluctuations around the trend is higher the higher is the data frequency.

- Long-term upward or downward trends ("bulls and bears") are the result of the accumulation of price runs based on daily data which last for several years longer in one direction than the counter-movements.

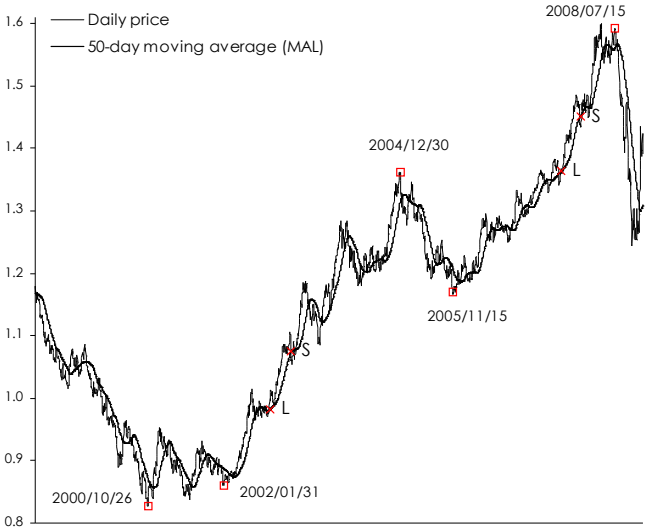

Figure 13 The movements of the Dollar/Euro exchange rate and technical trading signals, 1999–2008
Source: Schulmeister (2009D), author

At first, I look at the "Gestalt" of exchange rate movements taking the Dollar/Euro rate as example. The (irregular) cycle of the Dollar/Euro exchange rate between 1999 and 2005 was shaped by two pronounced long-term trends, a downward trend lasting from January 1999 to October 2000, and an upward trend lasting from January 2002 to December 2004 (marked by A and C in figure)[39]. Both long-term trends were realised in a sequence of shorter (medium-term) trends. For example, the Euro depreciation over period A was brought about in three downward trends which were interrupted by only small counter-movements (Figure 13). In a similar manner the Euro appreciation during period C

[39] In the following, I present some results on a recent study (Schulmeister, 2009D) which covers the period 1999 to 2006. Hence, the second Dollar/Euro "bull market" between end 2005 and mid 2008 is not included in the analysis.

was realised in a sequence of several trends, each lasting some months. Figure 13 shows how an extremely simple technical model would have exploited exchange rate trends: whenever the price crosses the 50-days moving average from below (above), a buy (sell) signal is given (marked in some cases by L(ong) and S(hort) in Figure 13).

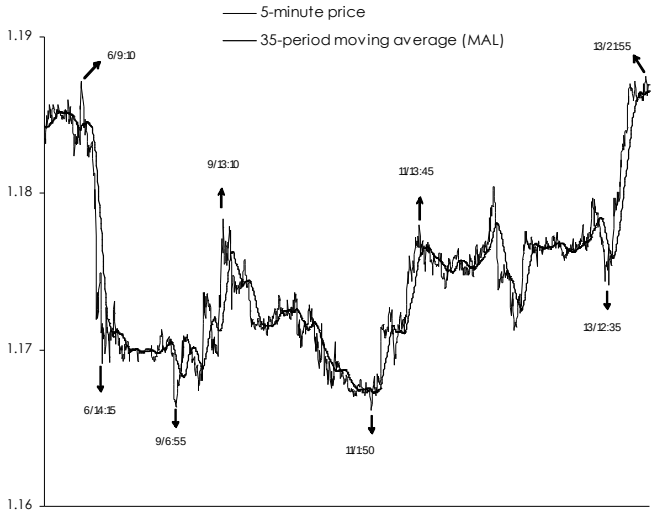

Figure 14 Technical trading signals based on intraday Dollar/Euro exchange rates, June, 6–13, 2003, 5-minute data
Source: Author

The pattern of exchange rate dynamics as a sequence of trends, interrupted by counter-movements and – comparatively seldom – by non-directional movements ("whipsaws"), seems to repeat itself across different time scales. Figure 14 displays exchange rate movements based on five-minute data over six business days in June 2003 (also the trading signals of a simple MA model are given). As next step, I demonstrate how the accumulation of monotonic movements ("runs") of the daily exchange rate brings about exchange rate trends lasting several years (as during period A and C). As Table 18 shows, the Euro depreciation in period A was primarily due to downward runs lasting by one third longer than upward runs (2.4 days versus 1.8 days), the average slope of upward and downward runs was approximately the same.

This pattern is particularly pronounced on the basis of 5-days moving averages of the original price series (Table 18): The long-term appreciation (depreciation) trend of the \$/€ exchange rate in period A (C) is primarily brought about by upward (downward) runs lasting longer than "counter-runs" – the differences in the slopes of upward and downward runs play only a minor role[40].

I will now document the distribution of the single upward and downward runs according to their length for two periods, first, for the period of a long-term depreciation trend of the Euro (period A), and, second, for the period of an appreciating Euro (period B).

Over the depreciation phase A, short upward runs occurred more frequently than short downward runs (93 runs compared to 69 runs; short runs are defined as lasting up to 2 days). By contrast, within the set of medium runs (between 3 and 6 days) and long runs (longer than 6 days), downward runs occurred more frequently than upward runs (Table 19).

By the same token, short downward runs occurred more frequently than short upward runs over the appreciation phase C, however, medium and long runs were more often upward directed than downward directed (Table 19).

In order to test for the robustness of these results, I generate 1000 random series ("random walks without drift"). I then compare the observed distribution of monotonic price movements to the expected distribution under the random walk hypothesis (RWH). This comparison shall reveal in which class of runs (by length) and based on which smoothing parameter (length of moving average = MA) does the observed number of runs deviate (most) significantly from the expected number according to the RWH.

Based on the original data (MA = 1), there occurred significantly more short runs than under the RWH over the appreciation period C (this holds to a larger extent true for short downward runs as compared to short upward runs). At the same time there occurred significantly less medium and long downward runs (Table 19). Over the depreciation period A, by contrast, there occurred significantly less short downward runs, but significantly more medium downward runs, and less medium and long upward runs than under the RWH (Table 19).

[40] This result was already obtained in a study which elaborated the pattern of exchange rate dynamics by measuring the path of the daily deutschemark/Dollar exchange rate between 1980 and 1986 (Schulmeister, 1987). Also the "bull markets"

Period	Upward runs			Downward runs		
	Number	Average duration in days	Average slope 1)	Number	Average duration in days	Average slope 1)
			Based on original data			
A	113	1.8	0.47	113	2.4	- 0.48
B	79	2.0	0.51	79	2.1	- 0.46
C	210	1.9	0.56	209	1.7	- 0.51
D	57	1.7	0.53	58	2.2	- 0.57
			Based on 5 days moving average			
A	44	3.8	0.23	45	6.6	- 0.24
B	37	4.0	0.25	36	4.8	- 0.20
C	70	6.8	0.24	68	4.1	- 0.24
D	9	8.4	0.12	10	13.4	- 0.16

Table 18 Runs of the $/€ exchange rate 1999/2005, daily data
Note: Period A: 1/1/1999 to 25/10/2005, period B: 26/10/2000 to 31/1/2002, Period C: 3/1/2002 to 30/12/2004, period D: 31/12/2004 to 14/11/2005
1) Average change in exchange rate level per day in cents.
Source: WIFO

Based on smoothed series (both, the observed exchange rate series as well as the random series are smoothed by a 5 days and 20 days moving average), the most significant deviations of the observed number of runs from their expected values under the RWH concern the most persistent runs (lasting longer than 14 days in the case of a 5 days MA, and longer than 34 days in the case of a 20 days MA – Table 19). Over the depreciation period A, e.g., there occurred many "abnormally" long lasting monotonic downward movements (many more than upward movements). In an analogous way, over the appreciation period C there occurred many "abnormally" long lasting upward movements (many more than downward movements).

Finally, I show the results of the same exercise based on 30 minutes data. The frequency of these data is by a factor of 48 higher than the frequency of daily data. Hence, the length of the moving averages is

("bear markets") of commodity futures are realized by upward (downward) runs lasting longer than counter-movements (Schulmeister, 2009A).

much longer than in the case of daily data. The most important results for the original (unsmoothed) 30-minutes exchange rates are as follows (Table 20):

- Short lasting exchange rate runs occurred significantly more frequently than expected under the RWH, whereas persistent runs occurred less often than under the RWH.

		Upward runs		Downward runs		Upward runs		Downward runs	
		observed	RWH	observed	RWH	observed	RWH	observed	RWH
		Period A: 1/1/1999 bis 25/10/2000				Period C: 1/2/2002 bis 30/12/2004			
Original data	1-2	*93*	*88.7*	*69* ***	*88.8*	*163* **	*141.9*	*177* ***	*141.8*
	3-6	*20* **	*27.7*	*42* ***	*27.5*	*43*	*44.3*	*32* ***	*44.3*
	≥7	*0* *	*1.8*	*2*	*1.8*	*4*	*2.9*	*0* **	*2.9*
	All	*113*	*118.2*	*113*	*118.2*	*210* ***	*189.0*	*209* ***	*189.1*
5 days	1-6	*37*	*35.9*	*27* *	*36.0*	*44* **	*57.2*	*53*	*57.1*
moving average 1)	7-14	*5* **	*10.4*	*11*	*10.4*	*18*	*16.6*	*15*	*16.8*
	≥15	*2*	*2.0*	*7* ***	*2.0*	*8* ***	*3.3*	*0* **	*3.2*
	All	*44*	*48.4*	*45*	*48.4*	*70*	*77.1*	*68* *	*77.1*
20 days	1-14	*16*	*18.0*	*11* *	*18.0*	*29*	*28.7*	*31*	*28.7*
moving average 1)	15-34	*3*	*4.1*	*5*	*4.1*	*4*	*6.5*	*6*	*6.6*
	≥35	*0* *	*1.4*	*4* ***	*1.4*	*5* **	*2.4*	*0* **	*2.3*
	All	*19*	*23.5*	*20*	*23.5*	*38*	*37.5*	*37*	*37.5*

Table 19 Non-random components in the duration of exchange rate runs, daily data

Notes: The table compares the observed numbers of exchange rate runs by duration to their expected means under the random-walk-hypothesis (RWH). These means are derived from a Monte-Carlo-simulation based on 1000 random walk series (without drift). The random walks were constructed with an expected zero mean of the first differences and with an expected standard deviation of the first differences as observed in the original exchange rate series over the respective period. * (**,***) indicate the significance of the difference between the observed means and the expected means under the random-walk-hypothesis at the 10% (5%, 1%) level.

Source: Author

		Upward runs			Downward runs			Upward runs			Downward runs		
		observed		RWH	observed		RWH	observed		RWH	observed		RWH
		Period A: 1/1/1999/01/01bis 25/10/2000						Period C: 1/2/2002 bis 30/12/2004					
Original data	*1-2*	*4571*	***	*4037*	*4611*	***	*4037*	*7105*	***	*6594*	*7203*	***	*6594*
	3-9	*1234*	***	*1325*	*1196*	***	*1324*	*2118*	*	*2164*	*2019*	***	*2162*
	≥10	*3*	***	*10*	*2*	***	*11*	*6*	***	*16*	*6*	***	*18*
	All	*5808*	***	*5372*	*5809*	***	*5372*	*9229*	***	*8773*	*9228*	***	*8773*
5 days	*1-6*	*1907*	***	*1631*	*1863*	***	*1631*	*3040*	***	*2664*	*3054*	***	*2664*
moving	*7-14*	*468*		*477*	*495*		*479*	*789*		*779*	*788*		*782*
average 1)	*≥15*	*52*	***	*93*	*69*	***	*92*	*101*	***	*152*	*88*	***	*150*
	All	*2427*	***	*2202*	*2427*	***	*2202*	*3930*	***	*3596*	*3930*	***	*3596*
50 days	*1-14*	*492*		*516*	*488*		*515*	*772*	**	*843*	*785*	*	*841*
moving	*15-34*	*85*	**	*69*	*63*		*70*	*87*	***	*112*	*114*		*115*
average 1)	*≥35*	*91*	**	*103*	*117*	***	*102*	*205*	***	*169*	*164*		*167*
	All	*668*		*688*	*668*		*688*	*1064*	*	*1124*	*1063*	*	*1124*
100 days	*1-14*	*350*		*363*	*330*		*364*	*559*		*595*	*575*		*596*
moving	*15-34*	*41*		*46*	*36*	*	*47*	*63*	*	*75*	*77*		*77*
average 1)	*≥35*	*70*	*	*78*	*95*	***	*76*	*145*	***	*128*	*114*	*	*125*
	All	*461*		*488*	*461*		*488*	*767*		*798*	*766*		*798*

Table 20 Non-random components in duration and slope of exchange rate runs, 30-minutes data

Notes: The table compares the observed numbers of exchange rate runs by duration to their expected means under the random-walk-hypothesis (RWH). These means are derived from a Monte-Carlo-simulation based on 1000 random walk series (without drift). The random walks were constructed with an expected zero mean of the first differences and with an expected standard deviation of the first differences as observed in the original exchange rate series over the respective period. * (**,***) indicate the significance of the difference between the observed means and the expected means under the random-walk-hypothesis at the 10% (5%, 1%) level.

Source: Author

- The overall number of observed exchange rate runs is significantly higher than is to be expected if 30 minutes exchange rates followed a random walk.

When the 30-minutes data are smoothed by a 50 period MA and by a 100 period MA, respectively, a very different picture emerges (Table 20):

- Over the depreciation period A, there occurred less short exchange rate runs than under the RWH. At the same time, there occurred significantly more long downward runs, but significantly less upward runs than under the RWH.
- Also over the appreciation period C, the number of short lasting runs is smaller than expected under the RWH. Analogously to the depreciation period A, there occurred significantly more long lasting upward runs than under the RWH. At the same time there occurred less persistent downward runs.
- The overall number of upward and downward runs is in all but one case (period A/50 period MA) lower than expected under the RWH.

To conclude: the volatility of exchange rates based on intraday data, i.e., the frequency of short lasting ups and downs, is even higher when measured on the basis of intraday data than on daily data. In both cases the observed short-term volatility is higher than in the case of a random walk. However, in both cases the exchange rate fluctuates around an "underlying" trend. As a consequence, there occur less short lasting runs and more long lasting (persistent) runs when the exchange rate series is smoothed by moving averages. Persistent upward (downward) runs last longer during an appreciation (depreciation) phase than the counter-movements. Hence, the sequence of these runs results in a stepwise appreciation (depreciation) process, i.e., in long-term exchange rate trends.

This pattern in the dynamics of speculative prices conflicts with the most fundamental assumption of the "efficient market hypothesis". According to this concept any asset price reflects the fundamental equilibrium value of the respective asset. If new information arrives, actors will drive the price instantaneously to its new equilibrium. This (rational) behavior assures that asset prices follow a random which in turn implies "weak market efficiency". This concept means that one cannot systematically

make trading profits from exploiting just the information contained in past prices (as do the popular trading rules of technical analysis)[41]. Since the most popular trading technique in financial markets, the so called "technical analysis", is based on the (assumed) exploitability of asset price trends, I shall finally sketch the interaction between this trading practice and asset price dynamics.

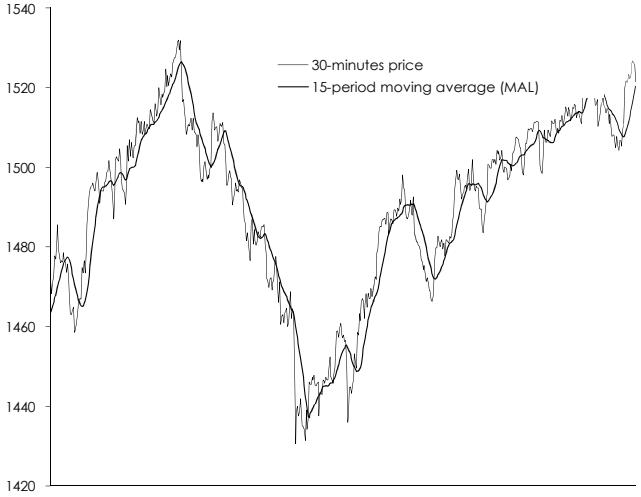

Figure 15 Technical trading signals for the S&P500 futures contract, July and August, 2000
Source: Author

4.3 Technical Trading and the Trending of Asset Prices

Technical analysis tries to exploit price trends which "technicians" consider the most typical feature of asset price dynamics ("the trend is your friend"). Hence, these trading techniques derive buy and sell signals from the most recent price movements which (purportedly) indicate the continuation of a trend or its reversal (trend-following or contrarian mod-

[41] Recent contributions to the debate about the efficiency of asset markets are Le Roy, 1989; Shiller, 2003; Lo, 2004.

els)[42]. Since technical analysts believe that the pattern of asset price dynamics as a sequence of trends interrupted by "whipsaws" repeats itself across different time scales, they apply technical models to price data of almost any frequency, ranging from daily data to tick data.

According to the timing of trading signals, one can distinguish between trend-following strategies and contrarian models. Trend-following systems produce buy (sell) signals in the early stage of an upward (downward) trend, whereas contrarian strategies produce sell (buy) signals at the end of an upward (downward) trend, e.g., contrarian models try to identify "overbought" ("oversold") situations.

Technical analysis is omnipresent in financial markets. In the foreign exchange market, e.g., technical analysis is the most widely used trading technique (for recent survey studies see Cheung – Chinn – Marsh, 2004; Gehrig – Menkhoff, 2006; Menkhoff – Taylor, 2007). It seems highly plausible that technical analysis plays a similar role in stock (index futures) markets as well as in commodity futures markets (Irwin-Holt, 2004, provide evidence about the popularity of technical analysis in futures markets).

Many factors have contributed to the popularity of technical trading systems among practitioners. First, these systems can be "universally" used, i.e., they can be applied to any kind of price data frequency. Second, these price data have become easily available (at ever falling costs). Third, computer software has been continuously improved (and got cheaper at the same time). Fourth, the internet has enabled traders (professionals as well as amateurs) to trade in real time on all important market places in the world.

Figures 13 to 16 show how simple MA models based on different data frequencies operate in the Dollar/Euro market, the stock index futures market and the oil futures market (if a model uses two moving averages, then their crossing indicates a trading signal). There is one universal property of the performance of technical trading systems in asset markets of all kinds: These models produce (much) more often single losses than single profits, however, profitable positions last on average three to four times longer than unprofitable positions which causes the models to (often) produce an overall profit. This profitability pattern reflects the fact that technical trading systems focus on the exploitation of

[42] Kaufman (1987) provides an excellent treatment of the different methods of technical analysis. For a short description of the most important trading rules see Schulmeister, 2007A.

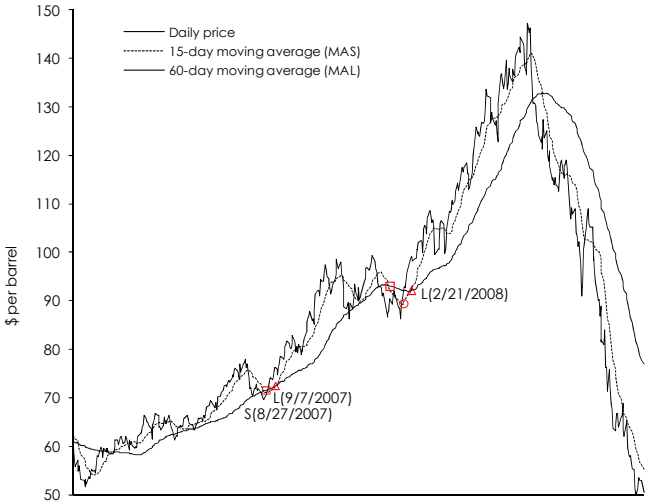

Figure 16 Technical trading signals for WTI crude oil futures contract 2007–2008
Source: Author

price trends (for a detailed analysis of profitability of technical models in different asset markets see Schulmeister, 2008A, 2008B, 2009A, 2009C, 2009D).

There operates an interaction between the "trending" of asset prices and the use of technical models in practice. On the one hand, many different models are used by individual traders aiming at a profitable exploitation of asset price trends, on the other hand the aggregate behavior of all models strengthen and lengthen price trends. Figure 17 documents this interaction, it compares the change in the aggregate position of 1092 technical models in the oil futures market to the movements of the oil futures price (a value of +100 (−100) of the net position index means that 100% of the models hold a long (short) position).

Figure 17 shows the gradual adjustment of the 1092 technical models to oil futures price movements between January 2007 and June 2008. On February 7, 2008, e.g., all models hold a short position due to a preceding decline in oil futures prices. The subsequent price rise causes the models to gradually switch their position from short to long, the "fast" models at first, the "slow" models at last. On February 21, all models hold a

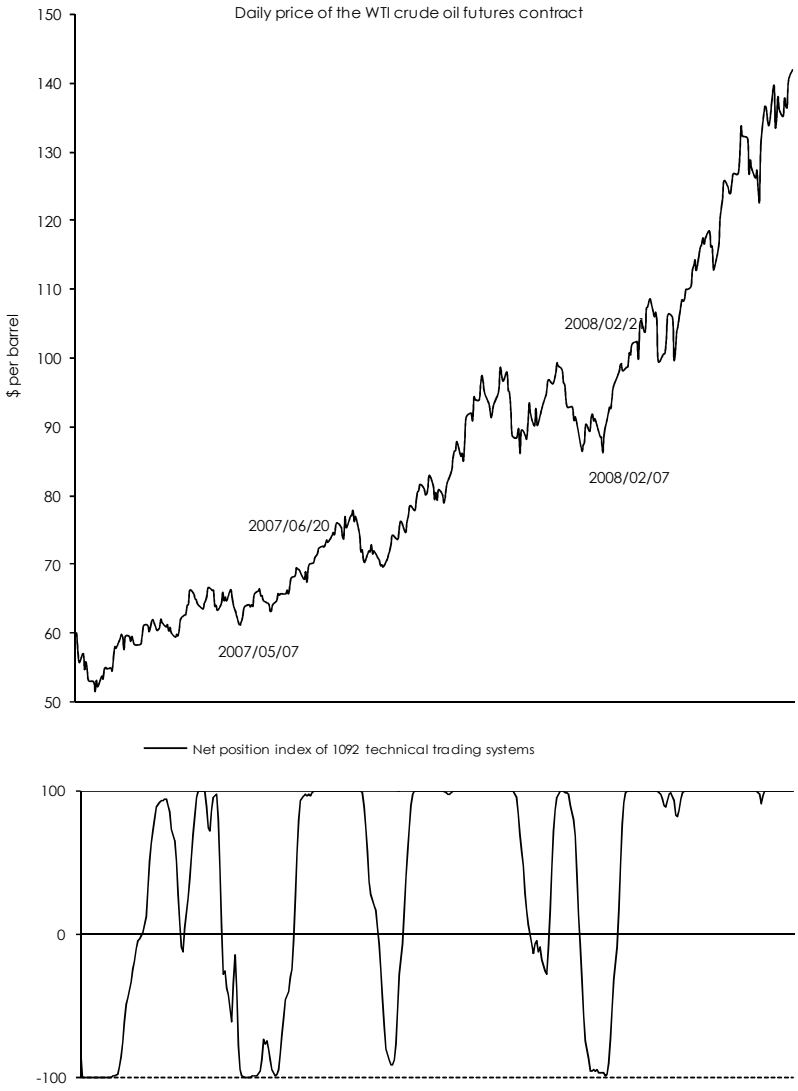

Figure 17 Aggregate trading signals of 1092 technical models and the dynamics of oil futures prices, January 2007 to June 2008
Source: Author

long position. During this transition period from short to long, technical models exert an excess demand on oil futures since any switch implies two buy transactions, one to close the (former) short position, and one to open the (new) long position.

Studies on the aggregate trading behavior of the many different models, based on daily as well as on intraday data and operating in different markets reveals the following (Schulmeister, 2006, 2009A, 2009C, 2009D). First, most of the time the great majority of the models is on the same side of the market. Second, the process of changing open positions usually takes off 1 to 3 days (or 30-minute intervals) after the local futures price minimum (maximum) has been reached. Third, it takes between 10 and 20 trading days (or 30-minute intervals) to gradually reverse the positions of (almost) all models if a persistent price trend develops. Fourth, after all technical models have adjusted their open positions to the current trend, the trend often continues for some time.

One can therefore conclude that the widespread use of technical trading systems strengthens and lengthens short-term asset price trends (runs). At the same time, the sequence of price runs accumulates to long-term trends when an expectational bias ("bullishness" or "bearishness") prevails in the market. Hence, the technical trading together with the frequent predominance of a "market mood" can be considered the most important causes of the overshooting of asset prices. I shall present some empirical evidence on this phenomenon.

4.4 Overshooting of Asset Prices

Figure 18 shows the wide fluctuations of the US-Dollar/Euro(ECU) exchange rate around its theoretical equilibrium level, i.e., the purchasing power parity (PPP) of internationally traded goods and services (for the calculation of PPP based on tradables see Schulmeister, 2005).

Figure 19 displays the sequence of booms and busts of the US-Dollar exchange rate and of the crude oil price since the late 1960s. Even though one can hardly quantify the fundamental equilibrium price of crude oil, it seems implausible that the latter fluctuates as widely as the market price (Figure 19). It is much more plausible that oil price overshooting is the result of the interaction between news-based trading and technical trading in oil futures markets.

This presumption is confirmed by the development of supply and demand in the market for physical oil as well as by the expansion of trading

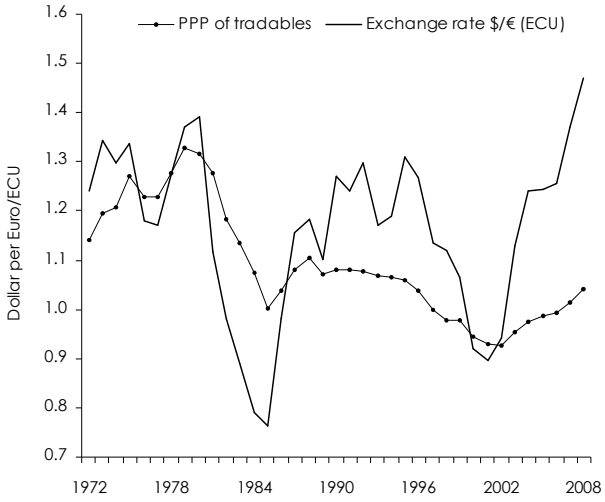

Figure 18 Dollar/€ exchange rate and purchasing power parity
Source: OECD, WIFO, Schulmeister (2005)

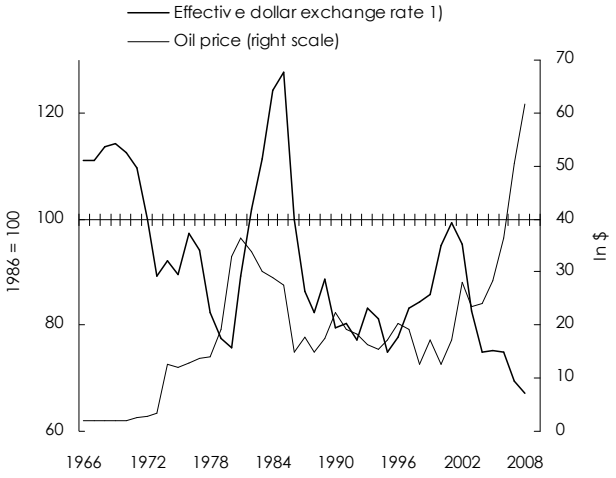

Figure 19 Dollar exchange rate and oil price fluctuations
[1)] Vis-à-vis DM, Franc, Pound, Yen.
Source: OECD, IMF

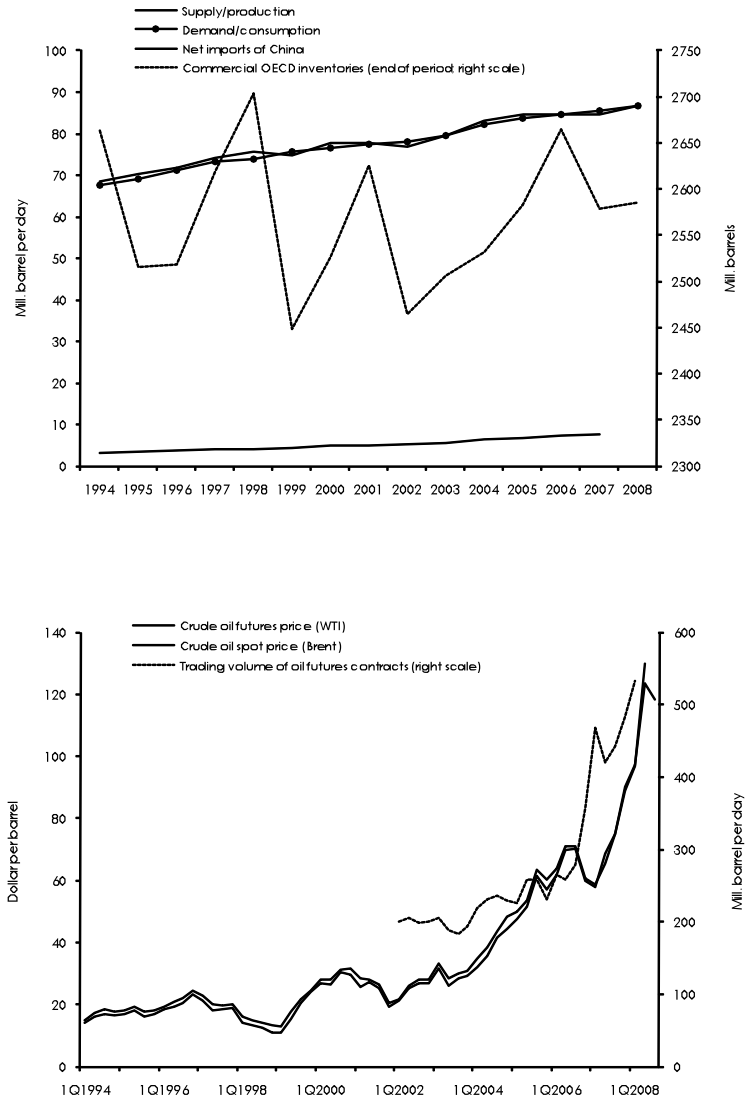

Figure 20 World market for crude oil, oil futures trading and oil price movements
Source: Author

activities in the oil derivatives markets (Figure 20). During the oil price boom between 2002 and 2008, oil production rose slightly stronger than demand, causing inventories to rise. The demand for oil of China – often quoted as the most important single cause for the oil price boom – can hardly explain the extent of the oil price increase. Net oil imports of China account for only 9% of global demand (China still produces roughly half of its oil consumption). Moreover, China's net oil imports have expanded very continuously over the past 15 years (Figure 20). The tremendous increase in trading activities in oil futures markets since 2003 suggests that (technical) speculation might have contributed significantly to the oil price boom (Figure 20). This presumption gets support from the fact that also the boom of other commodity prices coincided with a spectacular rise in trading of commodity derivatives in general, in particular since 2006 (Figure 21).

Figure 20 also suggests that the overshooting of the Dollar exchange rate and the overshooting of the oil price are inversely related to each other, at least during periods of marked "bull markets" and "bear markets". Since the Dollar serves as global key currency, crude oil is priced in Dollars (like all other commodities). As a consequence, any Dollar depreciation devalues real oil export earnings. This valuation effect in turn strengthens the incentive for oil-producing countries to increase the price of their most important export good. If their market power is strong, oil exporters are able to put through oil price increases which by far overcompensates them for the losses due to the preceding Dollar depreciation. The oil price "shocks" 1973/74, 1978/80 and 2002/2007 are the most impressing examples for the inverse relationship between Dollar depreciations and subsequent oil price movements (see also Schulmeister, 2000).

Figure 22 shows that stock prices in the US and Germany became progressively undervalued over the 1960s and 1970s: The stock market value of non-financial corporations strongly declined relative to their net worth (real assets at goods market prices minus net financial liabilities[43]). This development can be explained by the fact that during this the striving for profits focused on the real side of the economy. As a consequence, real capital accumulation was booming und stock prices rose comparatively little (partly because corporate business financed investments through increasing the supply of stocks). The stock market boom of the 1980s

[43] The relation depicted in Figure 22 is an estimate of Tobin's q. For the data series and the method to calculate this relation see Schulmeister, 2003.

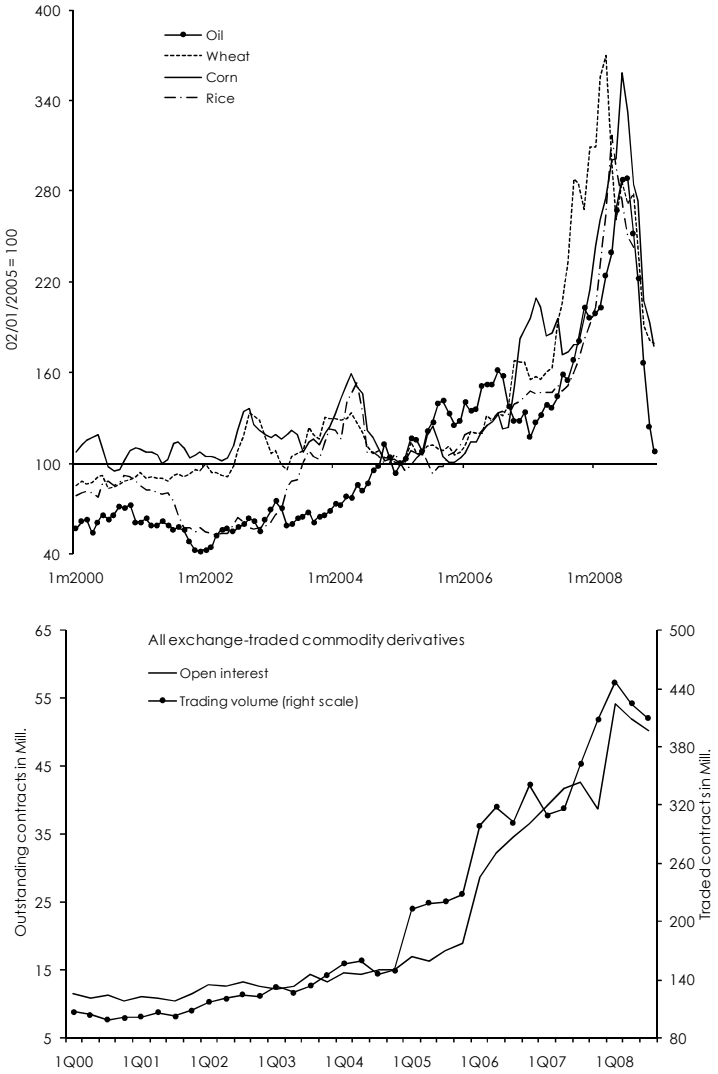

Figure 21 Dynamics of commodity futures prices and derivatives trading activities, 2007–2008
Source: New York Mercantile Exchange (NYMEX), Chicago Board of Trade (CBOT), BIS

and 1990s and the slow-down in real investment dynamics caused stock prices to become progressively overvalued. By the end of the 1990s the stock market value of corporate business in the US as well as in Germany was roughly 80% higher than its net worth. This discrepancy was the most important cause of the "tilt" from a "bull market" into a "bear market" in 2000.

Between spring 2003 and summer 2007 stock prices were again booming, in Germany even stronger than in the US. At the same time real investment expanded in the US much stronger than in Germany. Hence, the discrepancy between the stock market value of non-financial corporate business and its net worth rose much stronger in Germany than in the US (Figure 22). Unsurprisingly, since summer 2007 stock prices have fallen much stronger in Germany as compared to the US.

Figure 23 shows the two "bull markets" and two "bear markets" which developed since the mid 1990s. The amplitude of the irregular cycles is much higher in the case of Germany as compared to the traditional market places in the US and the UK. Also this observation confirms the presumption of a systematic overshooting of asset prices: The real econ-

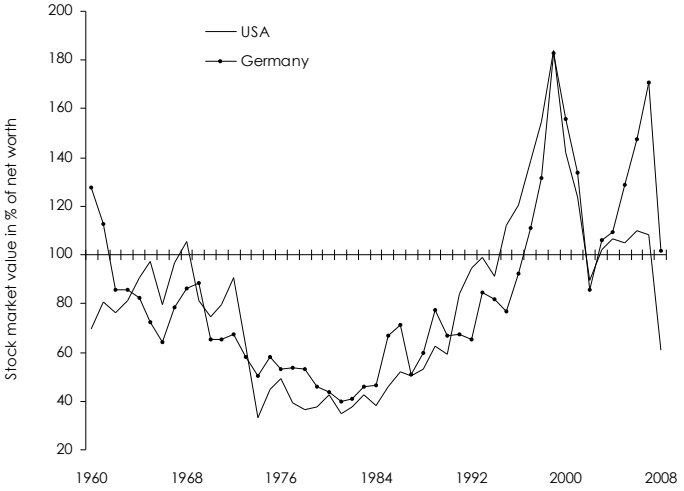

Figure 22 Stock market value and net worth of non-financial corporations
Source: Fed, Deutsche Bundesbank, Schulmeister (2003)

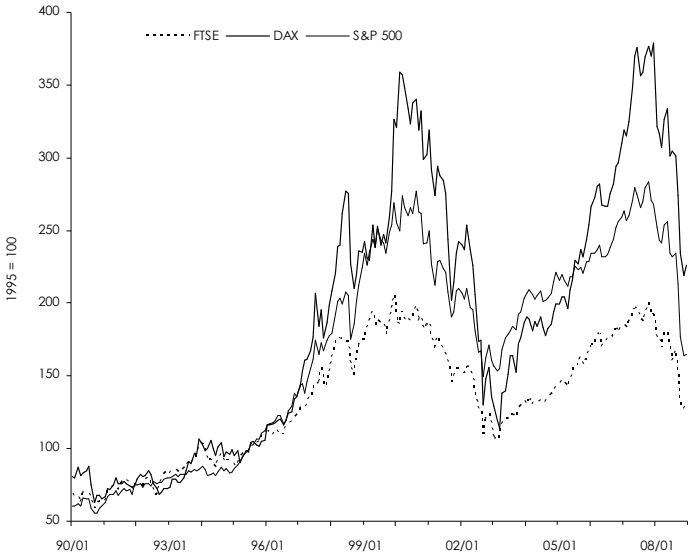

Figure 23 Stock price fluctuations in Germany, the United Kingdom and the US
Source: Yahoo Finance

omy in Germany fluctuated less than in the US or the UK (the German economy was stagnating most of the time since the mid 1990s), and also the recovery between 2003 and 2007 was much weaker in Germany than in the US or the UK.

Equilibrium economics under rational expectations cannot account for wide fluctuations of asset prices around their fundamental equilibrium. This is so because conventional theory can only explain two types of equilibrium paths, either convergence towards the fundamental equilibrium or a bubble. Hence, exactly that phenomenon, which can most easily be observed in real life and which practitioners call sequences of "bulls" and "bears", remains unexplained in mainstream economics.

Empirical exchange rate studies, e.g., conceive the "purchasing power parity puzzle" primarily as the (unexplained) low speed at which an over- or undervalued exchange rate returns to its fundamental equilibrium. The preceding process of "overshooting" is simply attributed to "shocks" and, remains unexplained (Rogoff 1995; Sarno – Taylor 2002;

Taylor – Taylor 2004). This kind of perception prevents conventional economists from looking at the interdependency between upward trends and downward trends in asset price dynamics.

Empirical stock market studies focus in most cases on specific "anomalies" like the "momentum effect" (caused by the "trending" of stock prices) or the "reversal effect" (caused by trend reversals). However, these phenomena are not analyzed in the context of the irregular cyclicality of asset prices (for surveys of empirical stock market studies see Campbell 2000; Cochrane 1999; Lo-MacKinlay 1999; Shiller 1999). An important reason for this "myopic" perception lies in the fact that the relatively new and popular school of "behavioral finance" uses equilibrium concepts as the reference or benchmark models, too. As a consequence, observations which contradict equilibrium models can only be perceived as "anomalies"[44].

4.5 Development of the Current Crisis

The sequence of "bull markets" and "bear markets", and, hence, the overshooting of exchange rates, commodity prices and stock prices, affects the real sphere of the economy through many channels, e.g., by increasing uncertainty, by producing waves of positive and negative wealth effects (strengthened by the rising importance of pension and college funds), by inflating and deflating the balance sheets of financial institutions and by redistributing trade earnings between consumers and producers of commodities:

- The boom of stock prices in the 1990s and again between 2003 and 2007 as well as the boom of house prices between 1998 and 2005 stimulated the US economy through positive wealth effects (Figure 24). At the same time, however, the "twin booms" led the ground for the subsequent "twin busts". The related devaluation of financial as well as housing wealth will depress consumption and investment for years (Figure 24).

- After the outbreak of the sub-prime mortgage crisis the third "bull market", i.e., the commodity price boom, accelerated, mainly

[44] Schulmeister (1987) and Frydman – Goldberg (2007) offer models which explain asset price dynamics as a sequence of systematically overshooting upward and downward trends ("bulls" and "bears"). For the "long swings" of the Dollar exchange rate see Engel – Hamilton, 1990.

driven by speculation of financial investors in commodity derivatives markets (Figure 16, Figure 17 and Figure 21). This development further deteriorated global economic prospects.

- Since mid 2008 the devaluation process of stock wealth, housing wealth and commodity wealth is globally "synchronized" (as was the preceding "triple booms"). This – in part still ongoing – process sets free several contraction forces, not only through wealth effects and balance sheet compression but also via import reductions on behalf of commodity producers (commodity prices fell by roughly 60% within 4 months – Figure 21).

- The fall of stock prices and commodity prices has been strengthened by trend-following technical trading via taking huge short positions in the respective derivatives markets. Due to the extraordinary strength of these "bear markets", hedge funds using these models (in many cases "automated trading systems") reported higher returns than ever before (Figure 21).

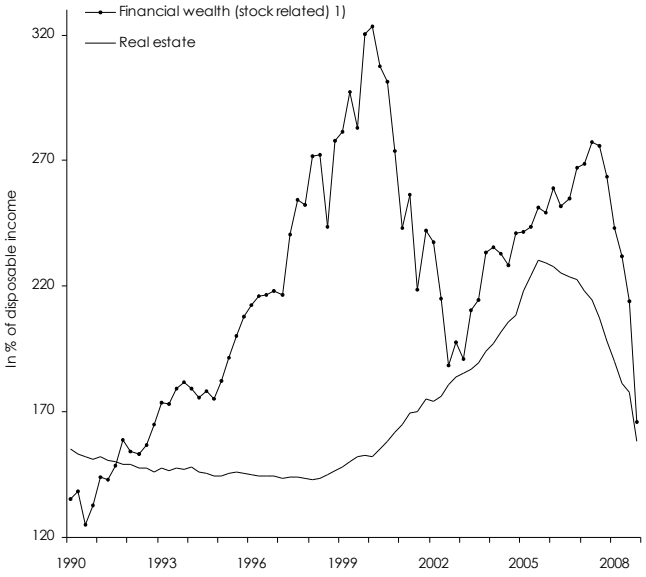

Figure 24 Wealth of private household in the US
Source: Federal Reserve Board, OEF

The – still active – "epicenter" of the "financial tsunami" is the threefold wealth devaluation process (the last time when stock wealth, housing wealth and commodity wealth collapsed simultaneously was between 1929 and 1933). The extent of this devaluation process was made possible through the preceding overvaluation through the simultaneous boom of stock prices, house prices and commodity prices. The three "bull markets" and the three "bear markets", are the result of "business as usual" in modern financial markets (I do not need exceptionally greedy bankers etc. to explain how the potential for the crisis was built up).

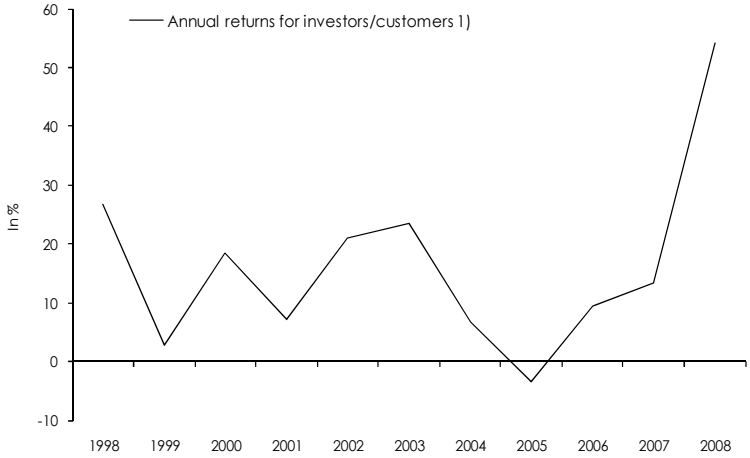

Figure 25 Profitability of trend-following hedge funds
Note: [1)] Unweighted average of the returns net of fees and transaction costs of 17 hedge funds using trend-following technical trading systems.
Source: www.turtletrader.com

Many feed-back processes strengthened the process of wealth devaluation (e.g., the fall in house prices caused more and more homeowners to default on their mortgage, the subsequent foreclosures depressed house prices further). One feed-back process is most typical for modern "finance capitalism" (Figure 25): Trend-following hedge funds opened huge short positions in the markets for stock and commodity derivatives in reaction to the price decline in these markets (in particular after the default of Lehman Brothers). This "bear speculation" became extremely profitable for these hedge funds due to the steepness of the asset price fall. At the

same time, this strategy strengthened the asset price decline and, hence, the devaluation of the savings of 100 millions people all over the world.

The transformation of financial markets and institutions from a sector servicing the "real economy" to an (dominant) sector to which the "real economy" has to adjust, can only be understood in the context of the latest "long cycle" (Schulmeister, 1998). The trough of this cycle was the Great Depression of the 1930s. The learning process enforced by this crisis resulted in a new macro-economic theory (Keynesianism), an active economic policy focusing on stable growth and full employment, a stable international monetary system ("Bretton Woods"), de-regulation of goods markets (e.g. though the GATT rounds), but strict regulation of financial markets. The essential characteristic of the system was the following: The driving force of capitalist development, the striving for profits, was systematically directed towards activities in the "real economy" (hence, I termed this regime "real capitalism" – Schulmeister, 2004). Under these conditions the "Golden Age" of capitalism was realized over the 1950s and 1960s.

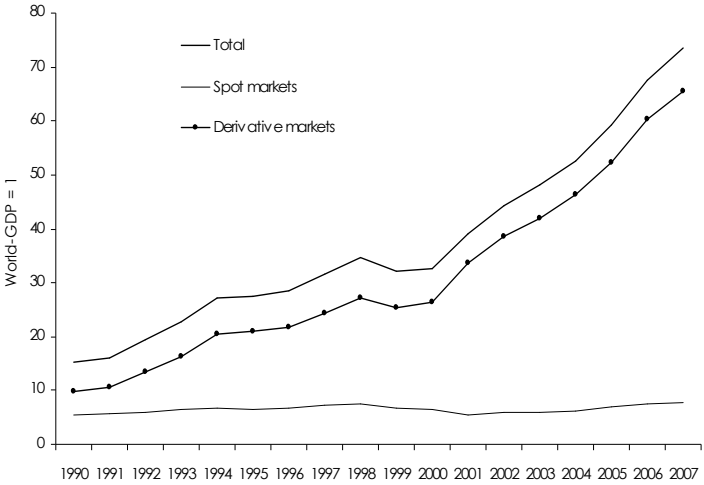

Figure 26 Overall financial transactions in the world economy
Source: OECD

The "monetarist counterrevolution" of the late 1960s got support from "big business" because permanent full employment had strengthened trade unions as well as the welfare state. The stepwise realization of

the monetarist/neo-liberal demand for de-regulation of financial markets changed the "rule of the capitalistic game" fundamentally. Under the condition of widely fluctuating exchange rates and commodity prices, and of a high interest-growth-differential (until the late 1970s interest rates had been kept lower than the rate of economic growth), financial and non-financial business shifted activities from the "real economy" to financial investment and short-term speculation ("finance capitalism"). This shift was supported by the tremendous amount of financial innovations (i.e., derivatives of all kinds) which have been realized since the 1980s as well as by the rising instability of asset prices. Both factors provided more and more chances for making huge speculative profits from short-term trading.

The expansion of financial transactions is therefore one of the most typical characteristics of the late phase in a "finance-capitalistic" development (together with the rising instability of those asset prices which are most important for the "real economy" like exchange rates, commodity prices and stock prices).

4.6 Dynamics of Financial Transactions

Trading activities in financial markets have exploded over the past 20 years[45]:

- There is a remarkable discrepancy between the levels of financial transactions and the levels of transactions in the "real world". In 2007, the former was roughly 74 times higher than nominal world GDP. This discrepancy has risen tremendously since the late 1990s (Figure 26).
- Trading in derivatives markets has expanded significantly stronger than trading in spot markets, this holds true for any kind of asset/instrument. In the world economy, derivatives trading volume is roughly 66 times higher than world GDP, whereas spot trading amounts to "only" 8 times world GDP (Figure 26).
- Trading of futures and options on organized exchanges (which is open to the general public) has risen stronger than "over-the-

[45] A comprehensive estimate of financial transaction in the global economy, differentiated by types of instruments and regions, is provided by Schulmeister – Schratzenstaller – Picek, 2008.

counter"-transactions (which are restricted to professionals), in particular since 2000 (Figure 27).

- These developments are particularly pronounced in Europe where the volume of financial transactions was more than 100 times higher than nominal GDP.
- Given the spectacular level of derivatives trading only a comparatively small share of transactions stem from hedging activities. The greatest part of transactions is related to speculative trades between actors with heterogeneous price expectations.

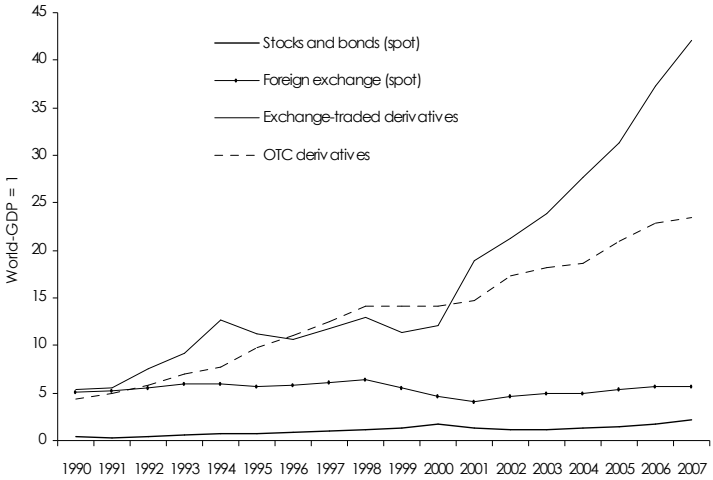

Figure 27 Financial transactions in the world economy by instruments
Source: OECD

4.7 Stabilizing Effects and Revenue Potential of a General Financial Transaction Tax

A small financial transaction tax would dampen the fluctuations of exchange rates, stock prices and commodity prices over the short run as well as over the long run. At the same time, such a tax would yield substantial revenues.

A general FTT would specifically dampen very short-term oriented and destabilizing trading in derivatives markets. There are two reasons for that. First, a FTT makes trading the more costly the shorter its time horizon is (e.g., technical trading based on intraday data). Second, a FTT will dampen specifically derivatives trading since the tax rate refers to contract value (e.g., the effective tax on the margin "invested" is by the leverage factor higher than the tax relative to the value of the transaction). Derivatives transactions for hedging purposes as well as "real-world-transactions" (spot) would hardly be affected by a low FTT between 0.1% and 0.01%.

Assuming that trading declines due to the introduction of a FTT of 0.01% (1 basis point) by roughly 30%, overall tax revenues would amount to 0.529% of world GDP or 287.3 bill. $ (based on 2007 data – Table 21). More than half of the revenues (164.4 bill. $) would stem from derivatives transactions on exchanges (these transactions could be taxed most easily due to the use of electronic settlement systems). Taxes on spot transactions would amount to only 11.6 bill. $.

In Europe (EU-27 plus Norway and Switzerland) a FTT at the (low) rate of 0.01% would yield roughly 130 bill. $ or 0.734% of nominal GDP (Table 21).

	World		Europe		North America		Asia and Pacific	
	In % of GDP	In Bill. $	In % of GDP	In Bill. $	In % of GDP	In Bill. $	In % of GDP	In Bill. $
Spot transactions on exchanges	0.0214	11.6	0.0253	4.4	0.0311	4.8	0.0342	2.2
Derivatives transactions on exchanges	0.3027	164.4	0.3232	56.9	0.6007	91.7	0.2202	14.1
OTC Transactions	0.2049	111.3	0.3889	68.5	0.1501	22.9	0.2937	18.8
All transactions	0.5290	287.3	0.7374	129.8	0.7820	119.4	0.5482	35.0

Table 21 Hypothetical transaction tax receipts in the global economy 2007
Source: Author

The introduction of a general FTT could help to overcome the current economic crisis and to prevent similar crises in the future. This is so for several reasons. First, such a tax addresses one of the most important factors of building up the potential for the ongoing devaluation of financial and commodity wealth, i.e., the "manic-depressive" fluctuations of stock prices, exchange rates and commodity prices. Second, a low

FTT of 0.01% would specifically dampen short-term and destabilizing transactions in derivatives markets. Third, the revenues of a FTT are substantial (even at a rate of only 0.01%), and this would help governments to consolidate their fiscal stance.

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II.
Global Economic Crisis Outside of Eurozone

5 The Effects of the Global Crisis on Turkish Economy and Existing Fiscal Policies for this Crisis

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5.1 Introduction

Global financial crisis, which thoroughly adumbrates itself since 2007, affects all of the countries without exception. In elapsed period, the crisis changed its form of being just a financial crisis; it also became an economic crisis which embodies real sector. Global financial crisis razed the neoliberal wave which had been blowing since the last quarter of the century to the ground and it has led to a serious paradigm shift in an unexpected moment. Neoliberal philosophy which is effective on the emerging, spreading and intensifying of the crisis falls in disfavor at a fast pace.

Turkey's economy, also, was influenced by a certain percentage from this crisis. Of course, this is not the first crisis in Turkey's economy. Turkey also was faced with serious economic crisis in the years of 1980, 1994 and 2001–2001. It is claimed, especially by the government, that Turkey will not face with this type of crises by means of the measures which have been taken after the crisis of 2000–2001. Indeed, macro-economic policies implemented after the 2000–2001 crisis and structural reforms along with Turkey's economy, has attained a certain stability conditions again. As a result, the period between the years 2002–2007 the average growth rate accrued 6.8 percent. Likewise, serious improvements have been realized in basic fragile areas of Turkey's economy like price stability, fiscal discipline, and exchange rate stability.

The other hand, many economists have argued that the policies implemented in 2000s led Turkey to a serious economic crisis and the structural fragilities are continuing. Exactly, in this environment, Turkey remained alone in the effects of financial crisis. According to some opinions, even if there would be no global financial crisis, Turkey was moving forward to a serious economic crisis which shows itself with unemployment, foreign debt and foreign trade deficit. In this context, it has been argued

that the negative indicators which have appeared since the second half of 2008 are the result of politics which have been applied since 2001 or the incidences of the global crisis. However, the problems which show themselves since 2008 indicate that Turkey's economy is in a different point which is so far from the experienced crisis.

5.2 International and National Environment that Prepares 2008–9 Crisis in Turkey

The crisis began in the summer of 2007 in the United States and began to evoke its its effects all over the world with the announcement of bankruptcy of Lehman Brothers in September 2008, which was the fourth biggest investment bank of USA, with debts of 600 billion Dollars. Following Lehman Brothers, several companies have asked their bankruptcy consecutively and then many company rescue operations came up to an unprecedented extent in domino effect. The crisis process which is viewed as the biggest crisis in the world and still has the effects of its intensity, exercised Turkey's economy under its influence since the third quarter of 2008. However, the current crisis in Turkey's economy firstly showed itself with the problems appearing in real sector instead of appearing in finance sector. An important reason of the appearance of the global crisis firstly in the real sector is based on the transformation of Turkish economy in recent years and its integration form with the world economy. For this reason, in order to detect the current crisis in Turkey's economy correctly, international and national environment should be evaluated properly in crisis process.

In order to perceive the current crisis correct, global integration is firstly necessary to understand the phenomenon with all the results. No doubt that the most popular rhetoric of 2000's has become globalization. As with all matters regarding the economic crisis may be talking about a global interaction. Today, the indicators of economic crisis emerging in a country, can spread to other countries quickly with "contagion effect" is to be an important area of discussion. With the global integration of economies, such a diffusion mechanism became an important risk factor.

The crisis which we are facing is being decomposed from the other crisis which had experienced to the present, with a character of "being global from the start point". This crisis doesn't only feature the need of referring to the economic coordination of the independent states in the global

environment. It is also the source of the arguments which is about the presentation of new global mechanisms (TEPAV, 2008, p. 1).

The widespread opinion regarding to the formation process of the crisis is that the crisis firstly started in financial sector and then spreaded to real sector. According to this view the crisis, in fact, is a crisis of investment banks. Excess of financial assets, qualified as toxic papers, in the assets of the mentioned banks and, required reserves of banks damage them significantly. In this sense, they couldn't perform their liabilities and couldn't have enough capital. The use of techniques (hedge), which are developed to avoid and protect them from risk, in a speculative purpose increased risks substantially in aforementioned banks (Akgüç, 2009, p. 6). Beginning with the United States and continuing in the developed countries, the crisis spread into all countries with channels such as credit contraction, contraction of international trade, and falling commodity prices.

Figure 28 demonstrates the development of Gross Domestic Product (GDP) in the process of pre-crisis and the starting period in a global scale. To the view that the GDP growth rates since 2005 in both developed and developing countries started to decrease in a serious way. The GDP growth rate in the period 2008–9, especially in developed countries has reached negative levels. A slow down in growth and shrinking has been experienced in crisis process in a global scale. Another important

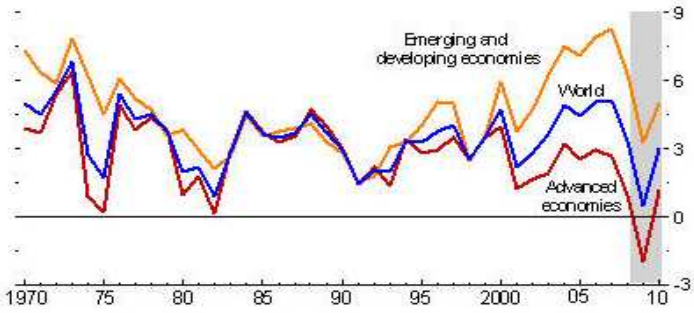

Figure 28 Global GDP Growth
Source: IMF, World Economic Outlook, January 28 2009, http://imf.org/external/pubs/ft/weo/2009/update/01/pdf/0109.pdf, p. 1

element of the world economy which caught attention up to 2007 was the unbalances related to current account deficits and surpluses. Figure 29 shows the global current account deficits and surpluses between the years 1996–2008. During this period the U.S. economy has given a very high amount of current account deficit, current account surpluses in oil exporting countries and Asian countries have been concentrated. High levels of the potential consequences of global financial imbalances,

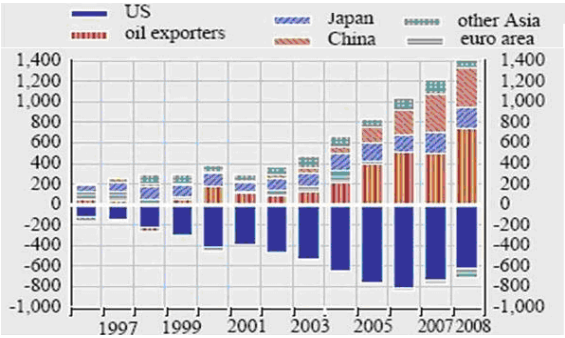

Figure 29 Global Current Deficits and Surpluses (1996–2008, USD Billions)
Source: European Central Bank, Financial Stability Review, June 2008 www.ecb.int/pub/pdf/other/financialstabilityreview200806en.pdf, p. 19

especially since the beginning of the 2000's are being discussed. Two alternative opinions have been hypothesized in this matter. One of these is the opinion of global imbalances, particularly the U.S. current account deficit is too high as too risky, if the necessary policy measures are not taken this imbalance may lead to a crisis in the future. The second and opposing view has been the argument that the Asian countries are willing to finance these deficits as long as they are not a major problem. According to this second optimistic scenario, during slow periods of capital inflows to the U.S., decreases in the value of Dollar which is not worrisome can provide reaching equilibrium rather than resulting in crisis. Recent developments demonstrated that this second argument is more optimistic and the results of large long lasting global imbalances can be severe (Özkan, p. 5).

Indeed, the unsustainability of these imbalances is proven with the developments that we are facing. As a result of this imbalance which caused the crisis affected all countries including primarily the United States.

Of course, the degree of contagion from crisis in all countries is not the same. Some countries have come to almost bankrupt state, while others overcome the crisis with serious injuries. Even, according to some ideas in the case that the crisis continues, there will be an increase in the risk of serious armed conflict on earth.

It is clear that the developing countries which host foreign-owned organizations in its financial sector are more affected by this crisis (for example, such as Ukraine, Georgia, Hungary...). Also Iceland's economy has entered into risk with the risk of carry trade. Italy with the lowest foreign share in the banking sector, among western countries, is overcoming the crisis with a minimum damage (Apak, 2009, p. 14). Turkey which couldn't put the process of opening the banking sector to foreign capital into force exactly got the best of this time lag by chance.

A point that must be emphasized on the process of the emergence of the crisis is the speed of the capital flows concerning developing countries. Private capital flows towards these countries increased rapidly since 2002. In 2007, such flows of these countries' GDP's have reached around 9% on average. These trends which rapidly decline with the process of crisis are expected to decrease even better. Of course this development is such a serious risk factor for developing countries such as Turkey which provides intensive growth from such streams. The debts which are provided especially from private sector have been thoroughly swollen in recent years within such flows. The fastest narrowing private capital flows with the crisis, have become this type of sources (Figure 30). Turkey's economy, between these international developments, has experienced serious political tensions with presidential and general elections in 2007. During this tension, the economy has become an overlooked field between political debate in 2007. In Turkey, the effects of global crisis has begun to be felt perceptibly particularly since the second half of the year 2008. Before these effects show themselves, some economists and politicians stated that especially the foreign trade deficits and rapid growth of foreign debt are serious risk factors in Turkey's economy. As a result of policies implemented to attract private foreign capital flows in the 2000s, the foreign trade balance systematically have been in deficit as imports increase rapidly in the Turkey's economy. From 2001 until the third quarter of 2008, external deficits are increased at a serious and ominous size (Figure 31). Exports became dependent to imports after the crisis of 2001. By utilizing of the opportunity of cheap foreign exchange, real sector imported cheap intermediate goods. They transformed these goods into durable consumption goods and then sold them

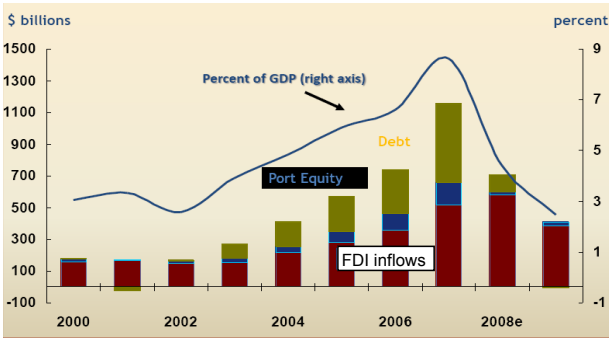

Figure 30 Changing Composition of Private Capital Flows to Developing Countries
Source: Otaviano Canuto, Fiscal Policy in Developing Countries: Implications from the Curent Crisis, 65th Annual Congress of the International Institute of Public Finance (IIPF), Cape Town, South Africa, 13–16 August 2009, p. 14

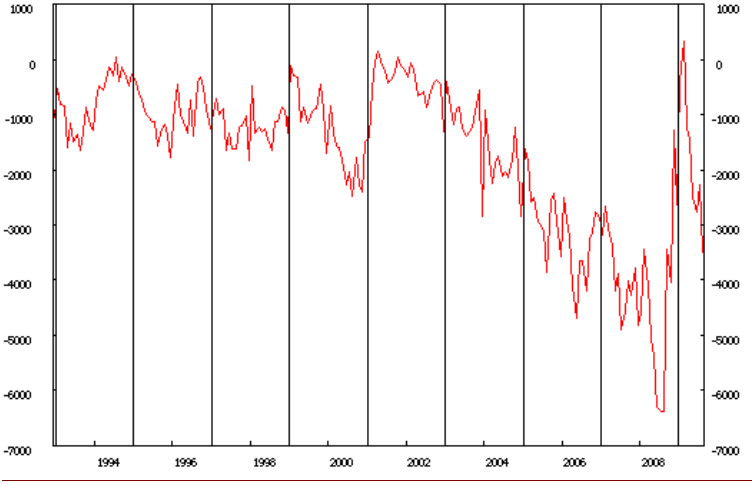

Figure 31 Foreign Trade Balance
Source: http://evds.tcmb.gov.tr/, 15.10.2009

to different markets. As a result of this, Turkey faced with high foreign debts and current account deficits. The high rate of increasing imports after the period of 2003 primarily has been provided by withdrawal of hot money to the country and then was met with the revenues obtained by privatization and the sale of real estate which comply with the trend in the whole world and characterized as cold money.

Moreover, the private sector chooses to use direct borrowing by capitalizing from financial expansion, abundant liquidity and cheap credit facilities in the world in order to finance these imports (Yeldan, 2008).

As a result of these developments, on the one hand, Turkey's foreign debts increased rapidly. This situation wasn't perceived as a threat because the ratio of foreign debts to GDP is under the international averages due to the rapid increase in GDP. However, the private sector debt in Turkey's foreign debt increased rapidly especially from 2005 (Figure 32). The ratio of private sector foreign debt to GDP has exceeded 25% by 2008. Sustainability of these debts which was provided from international private capital by this part has become almost impossible with the crisis. This state of private sector debt structure has been ignored by government for a long time. Based on more public debt sustainability, these threats have been ignored or could not be foreseen. The rotation of private sector debt has become a serious problem together with the recession experienced in international capital movements as of 2008. Turkey's economy traditionally has faced serious financial discipline problems in times of crisis. However, in recent years, significant improvements were observed in the area of fiscal discipline. Providing fiscal sustainability and not facing downturns in public finance delayed the crisis to be predicted.

Two criteria in the evaluation of the performance of public finances should be taken into account. One of them is the budget deficit to the gross domestic product ratio, and another is the development of the primary surplus. Turkey's economy which entered to 2000–2001 crisis with high public deficits, was significantly reduced its public deficit by using tight fiscal policy and an understanding of fiscal discipline after the period of crisis and correspondingly the interest burden on the budget has declined steadily. In addition, in accordance with Public Financial Management and Control Law No. 5018, beginning from 2006, the application of the central government deficit, as a more comprehensive application which is more compatible with the international standards,

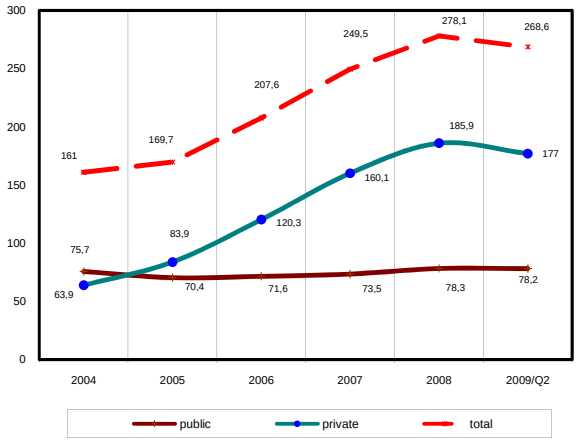

Figure 32 The Gross Foreign Debt Stock of Turkey (Billion Dollar)
Source: The Undersecretariat Turkish Treasury, Borç Göstergeleri, http://www.hazine.gov.tr/irj/go/km/docs/documents/HazineWeb/İstatistikler/Borc_Gostergeleri_Sunumu/borc_gostergeleri.pdf, p. 16

was implemented instead of using consolidated budget (Susam & Bakkal, 2008, p. 84).

In the light of all this digression, without more details, the international and national environments while Turkey's economy enters into 2008–9 crises are summarized in Table 22. In the initial phase of the crisis, the international environment is a structure which has increasing the risk for Turkey. There is the contraction of the international conjecture, the proliferation of unemployment globally, the increase of capital accumulations to the developing economies allied with global current account deficits and surpluses, and the increase of commodity prices. However, there is a time period in question in which global inflation has ceased to be a problem.

National environment is a trigger incident for the crisis while also having mitigating factors. Providing the political stability which has not seen for a long time is the biggest advantage. In addition, achieving fiscal discipline, making serious improvements related to price stability and finding foreign sources, can be unknown source, are important advantages. The contraction of the international conjecture, high unemployment rates, rapid increase of foreign deficits and foreign debts of

International Environment	International conjuncture	Contraction
	Global unemployment	Increase
	Global current account deficit and surpluses	Increase
	Capital flows that converge to emerging economies	Increase
	Commodity prices	Increase
	Global Inflation	Decrease
National Environment	Political stability	Strong
	External balance	Rapid Decay
	Fiscal discipline	Recovery
	Price stability	Recovery
	National conjuncture	Decrease
	Outstanding foreign debt	Increase
	The value of TL against foreign currencies	Valuable
	Capital inflows	Increase
	Consumer confidence	Decrease
	Unemployment ratio	Increase

Table 22 Environment of The Crisis
Source: Author

private sector, and the permanent decrease in the consumer confidence are important elements which create negative national environment in the course of beginning of the global crisis. Despite the warnings of international and national media, Turkey was too late to detect global crisis and take precautions. There was a well accepted view which argues that the crisis would not affect us. Then, R. Tayyip ERDOĞAN, the Prime Minister of Turkish Republic, claims that "there is a crisis but it will be tangent touch to us". Finally, from the beginning of 2009, the crisis itself felt in the most severe form real sector, the existence of crisis and that measure have been moved to the agenda. The economic management have been mistaken in five basic points in the process of 2008–9 crises (Türel, 2009, p. 26):

1. The main interest area is the banking sector because the depression comes to Turkey by means of banks. Moreover, the effects of the crisis were underestimated because none of the banks fell

into insolvency in 2008. With its solid institutional and financial structures, it's believed that, Turkey would overcome the crisis in a short time and with less damage.

2. It is assured that the expansion in the international financial markets after 2003 transformed into the incidental contraction at 2007–2008. It is hoped that the crisis would be over as a result of the increase in foreign sources.

3. It was failed to notice that the fragility mainly was caused by excessive borrowed companies in real sector and declines in real product and employment was counted as a temporary fluctuation in strong real economy.

4. It is thought that the society which highlights the deep-rooted and systematic features of the crisis had fueled the social psychology and if optimistic expectations can be adopted to society and especially to entrepreneurs, the crisis can be overcame quickly.

5. Banks' liquidity and lending preferences in crisis times, explained by opportunism and sordidness instead of behavioral and cyclical reasons and it was thought that the negative effects of these preferences can be overcame with political pressure and threats.

Also, local elections in March of 2009 have been effective in the underestimation of the crisis. Nevertheless, the crisis in 2009, has felt itself in many ways, especially in the real sector. Of course, the process of crisis is affecting the Turkey's economy from different channels and format which we have ever seen. Therefore, this effect process should be analyzed well.

5.2.1 The Effects of Global Financial Crisis to Turkey's Economy

In the global world, it can not be thought that the economic developments in another country can not affect a country. With globalization in recent years, economic interactions between countries have become important. Now, the economic crises are too far from being problem that a country faces alone. Therefore it can not be thought that the last crisis would not taken Turkey under its influence. This effect can operate in different channels. We can align this channels as (TEPAV, 2008, p. 4):

1. ***Credit Channel:*** In Turkey, both banks and companies have used loans from foreign banks whose balance sheet becomes damaged today. Closing of these channels as a result, the credit volume which will be narrowed will force companies and banks to shrink the balance sheet. The reduction in credits which large companies had taken will affect these companies' supply chains. In this case, the impact on SME's which is created by the supply chain will be in the form of domino effect.

2. ***Portfolio Investment Channel:*** Hedge funds and private equity funds are important in movement of financing in Turkey. In the period of expansion of global liquidity, it should be considered that both the two channels are operating with leverage effect which is provided from high amounts of credit. In the coming period, the reduction of funds which will be transferred from there will decrease supply of foreign exchange in significant amounts. This will lead to problems in terms of foreign currency liquidity and the process of depreciation of the Turkish lira will be able to speed up.

3. ***Foreign-Trade Channels:*** As a result of reflection of the crisis in the financial markets to the real sector, the growth rate predictions were to be updated downwards worldwide. It would almost be certain that especially most of the developed economies will face recession. Beyond the forecasts, there are indicators available as saying that the global trade volume is shrinking rapidly.

4. ***Increased Risk Perception And Decreased Confidence Which Affects Consumer And Investor Behaviors Negatively:*** The item which will be affected most quickly and negatively from current uncertainty is private investment spending. The same environment will cause deterioration in households psychology and thus in thier expectations. Therefore, especially the rapid contraction of durable consumption will be inevitable.

By the end of 2008, when the crisis starts to feel itself thoroughly, this effect channels started to process. In this process, especially in the real sector, effects of the crisis are seriously felt. In this process, the crisis effects that are occurring will be explained in more detail in the following graphs.

Turkey didn't experience similar financial problems faced in developed countries in this crisis. When financial data of finance sector were examined, it is observed that Turkey has a strong structure compared to

other countries. Thanks to the structural reform experienced during the 2001 crisis, banking system has almost no damage from global crisis today. Of course, Turkey's banking system which is in different structural characteristics have been effective in this development. There is no investment banking in Turkey. Also commercial banks, have not invested in this bonds called as "toxic substances". Therefore, the banking system has not faced a "toxic substance" problem. However, in the period that the crisis starts to feel its effects, that by the end of 2008, the nonperforming loans in total credits of banking sector are increased (Figure 33). However, within this interval, the ratio of loans in total loans is still far from creating a serious concern. With the support of money politics,

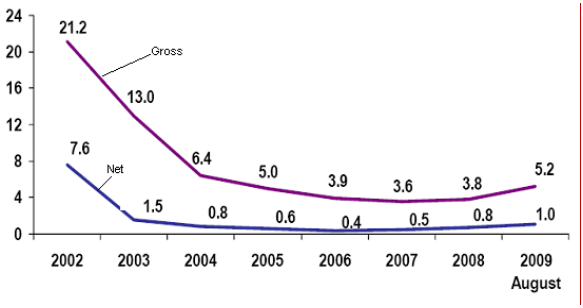

Figure 33 Banking Sector: Asset Quality (NPL Ratio, %)
Source: The Undersecretariat Turkish Treasury, Ekonomi Sunumu, http://www.hazine.gov.tr/irj/go/km/docs/documents/TreasuryWeb/Statistics/Economic%20Indicators/egosterge/Sunumlar/Ekonomi_Sunumu_ENG.pdf, p. 122

the credit expansion in Turkey was achieved more temperately than the other countries and this situation causes the deferral of consumption demand of the household. Between the first quarter of 2006 and the last quarter of 2008, the increase in household consumption remained behind the growth rate of the economy and the share of household consumption in GDP decreased to 69.7% from 72% (Yilmaz, 2009, p. 15).

Of course, this development is caused by the slowdown of consumer credits' growth rate and on the other hand, it is caused by the weakening of consumer confidence and consumers' negative expectations for the future. Figure 34 shows that especially consumer credits are started to diminish by the effects of the crisis since the end of 2008 in Turkey. The developments in consumer confidence index in Turkey since 2004 has

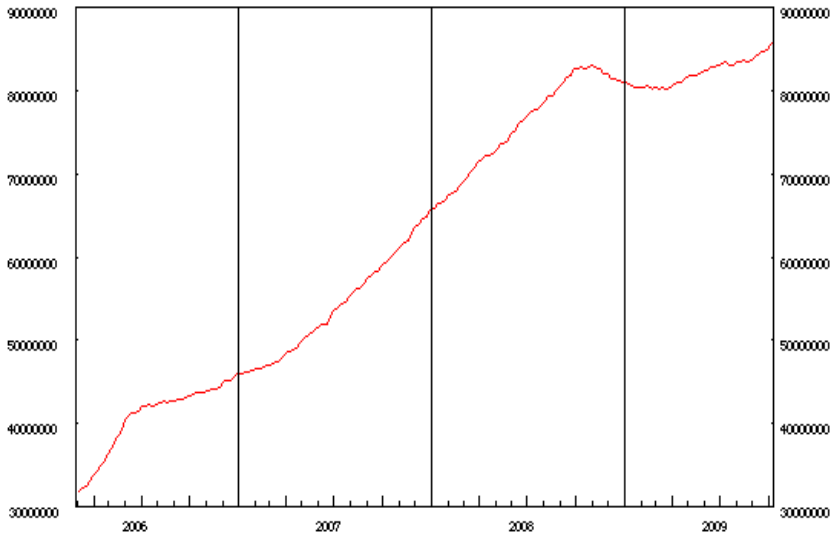

Figure 34 Consumer Credits of Deposit Banks (Thousand TL)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

displayed in Figure 35. Consumers' expectations for the future are constantly weakening since 2004. Consumer confidence reached the lowest levels at the end of the year 2008. Then in 2009, it rose in a moderate way. Of course, the decline in consumer credit and consumer confidence has been directly linked with the problems in real sector. It will not be true to connect this situation to only liquidity tightness. Real sector started to face serious problems with the crisis. The GDP which grows annually at average over 6% since 2002 has passed negative growth in the last quarter of the year 2008. This serious recession has continued also in the first half of the 2009 (Figure 36). An estimated total GDP will decline at a rate of 5–6% on average in the year 2009. The crisis into which the real sector has fallen can also be shown more clearly by other indicators except GDP growth rate. Manufacturing capacity utilization rates are shown in Figure 37. As can be seen from the chart, perhaps Turkey's economy has seen the lowest capacity utilization rate in its history at the beginning of 2009. Capacity utilization rates of dropped to 64% which is even less than in 1994 and 2000–1 crisis. This decrease in the rate of capacity utilization, industrial production also led to fall. With the crisis,

Figure 35 Consumer Confidence Index
Source: http://evds.tcmb.gov.tr/, 15.10.2009

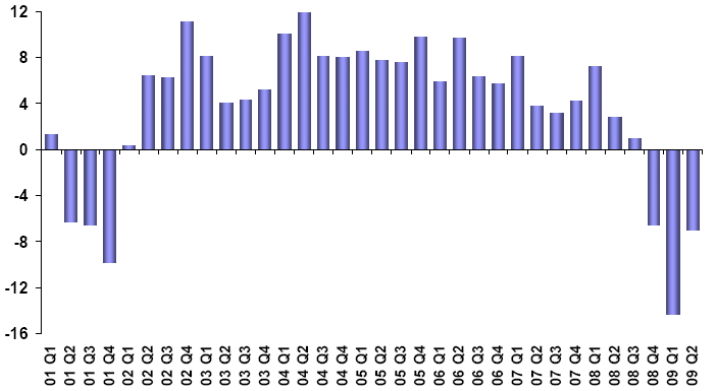

Figure 36 GDP Growth Rates (%, YoY)
Source: The Undersecretariat Turkish Treasury, Ekonomi Sunumu, http://www.hazine.gov.tr/irj/go/km/docs/documents/TreasuryWeb/Statistics/EconomicIndicators/egosterge/Sunumlar/Ekonomi_Sunumu_ENG.pdf, p. 12

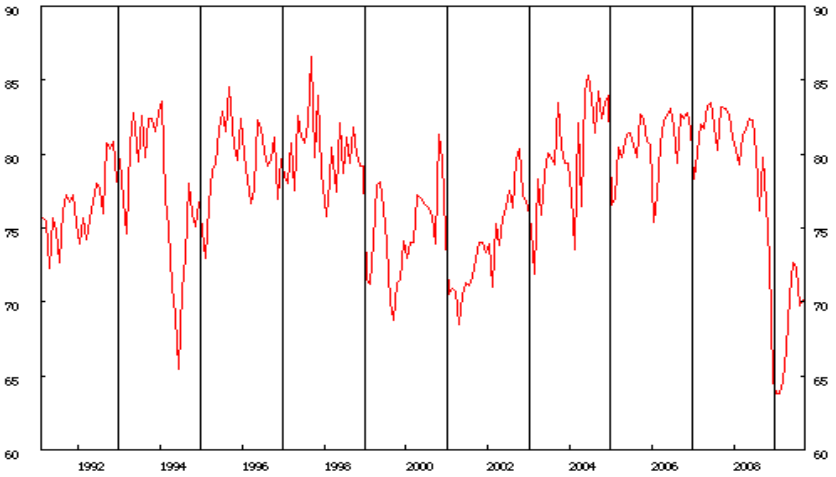

Figure 37 Capacity Use Rates of Manufacturing Industry (Public + Private Sector)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

from 2008 onwards, industrial production index also decreased rapidly and as the beginning of 2009 it reached its lowest level (Figure 37). The decrease in industrial production has been the hardest contraction which experienced in recent years. Even in 2001 which is known as the biggest crisis in the history of Turkey, industrial production has not experienced such a decrease. Industrial production has been lessened 16.3% in the 1994 crisis, 10.2% in the 1999 crisis, and 11.4% in the 2001 crisis respectively. In February 2009, contraction in industry resulted approximately 25%. The decrease in capacity utilization and industrial production index also has brought a dramatic decline in unemployment rate. In the middle of 2008 the unemployment rate of 9.5% in the middle of 2008 came to 16% with a rapid rise in February 2009 (Figure 39). It should be remembered that Turkey's economy has provided its production and growth in recent years by continuous outsourcing. However, there has experienced a recession with the crisis in foreign capital inflows which rapidly flowing into the country in recent years. As seen in Figure 40, the amount of foreign capital coming into the country has decreased in the year 2008. This decrease is particularly rooted in long-term capital reduction. Because with the crisis, it has become difficult to find long-

Figure 38 Industrial Production Index (2005=100)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

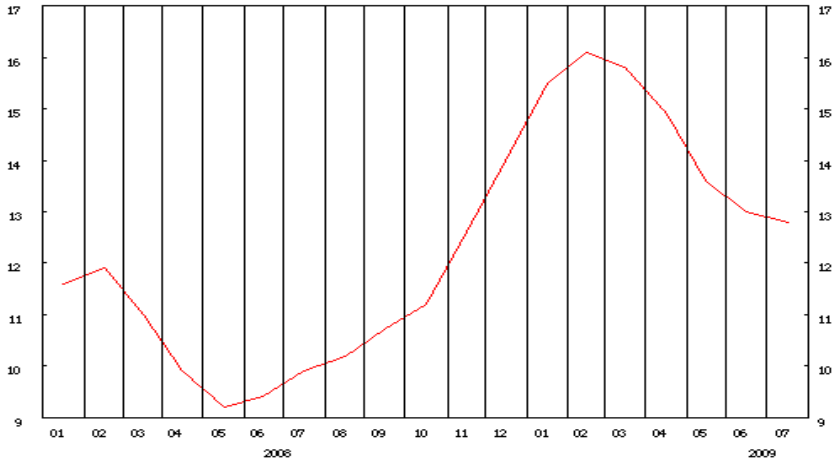

Figure 39 Unemployment Rate (%)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

term foreign capital in particular. The inward portfolio investment flows which started to decline in 2007 began to flow out in the year 2008. On one hand, the problems have occurred in the real sector; on the other hand, the developments, mentioned above, have been appeared in the capital mobilizations. In this context, the crisis take its effects on Istanbul Stock Exchange Market. The Istanbul Stock Exchange 100 Index (ISE 100) which has high percentage of foreign participation inside was affected negatively by these developments. Since the end of 2007 until

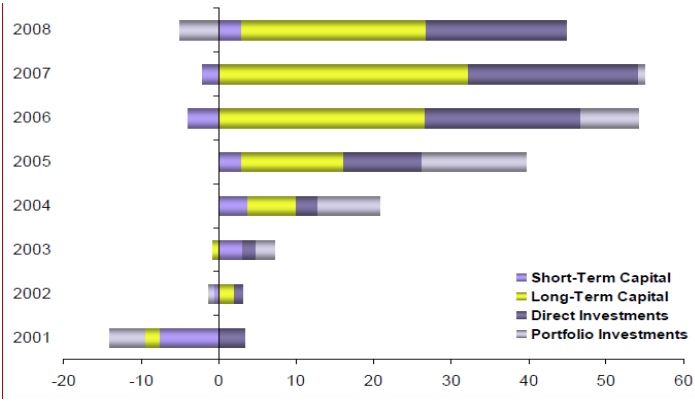

Figure 40 Capital Inflows (Billion USD)
Source: The Undersecretariat Turkish Treasury, Ekonomi Sunumu, http://www.hazine.gov.tr/irj/go/km/docs/documents/TreasuryWeb/Statistics/EconomicIndicators/egosterge/Sunumlar/Ekonomi_Sunumu_ENG.pdf, p. 44

the fall of 2009, ISE100 index faced the bottom levels with continuous declines (Figure 41). Dollar exchange rate was also started to stir depending on foreign capital flows. The TL/Dollar Exchange rate which fleets under the 1.20 level in the middle of 2008 reached to the level with a rapid rise in April 2009 (Figure 42). Of course, it is important for the development of the export sector that the exchange rate which is fleeting under the real levels long time to get closer to the real level. But, the rapid rise of exchange rate in Turkey's economy which based entirely on imports and has growing dependence on imports makes a serious concern. In addition, the sudden increase in the foreign exchange rates affects the expectations negatively at the Turkish economy which experienced the crises based on the foreign exchange pressures. Another

cause of concern is the increasing foreign debt of private sector in recent years in foreign currency. Of course, the cost of borrowing in foreign currency increased due to reasons such as reduction in foreign capital flows with crises and difficulties in finding credits around the world. The increase in the cost of borrowing in foreign currencies in Turkey's economy, which fed itself with continuous external resources, henceforth will increase the cost of growth in outsourcing. This has also increased the cost of borrowing in Dollars in Turkey's economy with crisis as you can see in Figure 43. The cost of borrowing in Dollars in 2009 compared to 2007 increased by 0.4% points. As you can see, Turkey's economy faced serious economic problems with the effects of global financial crisis in the period of 2008–2009. However, the effects of the crisis which reached maximum damage in most indicators in the first quarter of 2009 have lightened their effects since the second half of the year 2009. Of course it can be said that, in these developments, the financial measures which were taken by economic management after the March of 2009 became effective.

Figure 41 ISE National 100 Index (Based on the Closing Prices)
Source: The Undersecretariat Turkish Treasury, Ekonomi Sunumu, http://www.hazine.gov.tr/irj/go/km/docs/documents/TreasuryWeb/Statistics/EconomicIndicators/egosterge/Sunumlar/Ekonomi_Sunumu_ENG.pdf, p. 129

Figure 42 Foreign Exchange Rates (TL/USD)
Source: The Undersecretariat Turkish Treasury, Ekonomi Sunumu, http://www.hazine.gov.tr/irj/go/km/docs/documents/TreasuryWeb/Statistics/Economicndicators/egosterge/Sunumlar/Ekonomi_Sunumu_ENG.pdf, p. 127

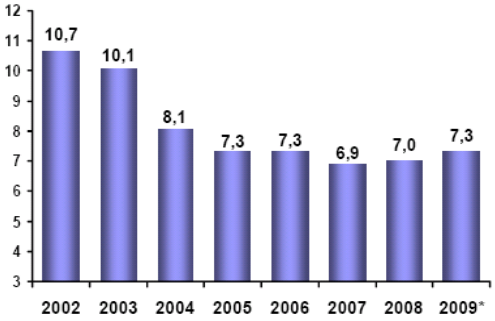

Figure 43 The Cost of Foreign Indebtedness Denominated in Dollars (%)
Note: * Since 16th Semptember
Source: The Undersecretariat Turkish Treasury, Borç Göstergeleri http://www.hazine.gov.tr/irj/go/km/docs/documents/HazineWeb/İstatistikler/Borc_Gostergeleri_Sunumu/borc_gostergeleri.pdf, p. 23

5.3 Fiscal Policy Measures and Implementation Results Received against the Global Crisis in Turkey

The export-led economic recovery option which has seen as a way out of the crisis in some countries, could not have become a solution in this period when all the countries are facing such an economic slowdown. Indeed, both import and export volumes of many countries has made serious decline. Monetary policy which is another solution way hasn't had the desired effect as a result of the decay of monetary transmission mechanism Also, the global monetary expansion option already used at the start of the crisis in many countries and in terms of interest rate reductions, central bank policies were narrowed. Forming the other side of the solution to the crisis of the financial system is being reconstructed, only it will be a part of a long-term plan for many others. In such an environment, fiscal policy become to be seen as the most important policy choice which can rapidly accelerate the declining aggregate demand in short-term period. Many industrialized countries which are affected by the crisis, as being in the first place, started to put weight on expansionary fiscal policies and IMF announced that fiscal expansion is the most efficient path to exit for the crisis. Finally, the participating countries of the G-20 summit in April 2009, agreed on fiscal expansion in order to have economic growth (Bocutoğlu, 2009, p. 67).

Until the effects of the crisis were mentioned, the administration of economy in Turkey claimed that there wasn't the crisis and would not be the crisis. On this basis, until the symptoms of the crisis exacerbated, almost any policy measures have not been applied. Of course, there are several reasons for this.

Today, there is no possibility for Turkey to apply and prepare a serious crisis package because of its political structure, bureaucratic capacity, level of education and common values. It's expected that the Turkey will wavy passively parallel to the developments in world economy (Akgüç, 2009, p. 11).

After the end of 2008 and especially from the first quarter of 2009, the crisis made feel itself thoroughly and various measures have been taken for the global crisis. The most important ones in these measures are the ones about financial quality. However, these measures are not in a serious integrity for the supply. Some of them are serious measures taken by public opinion pressure. It should be remembered that, the developments

emerging in Turkey's public financial balance in the face of global crisis produce risk-reducing effects largely. Because Turkey's economy has a better financial balance which is different from the crisis of 2001. On the other hand, consecutive crises attack against Turkey's economy has brought the country to become more experienced to crises. However, unlike previous crises, this crisis is associated with the real economy than the financial markets. Therefore, it is reflected in the form of an exogenous supply shock to Turkey's economy rather than developments in international financial markets reflections. So, it is important to take fiscal measures which recovers production contraction (Şimşek & Altay, 2009, p. 18–19).

In the official website of the undersecretary of Treasury, an information kit was prepared in order to give information about the policy measures taken in Turkey against global financial crisis. This data set, is continuously updated depending on the measures described. This data set was updated at last in August 10, 2009 in the date of October 20, 2009.

According to these data sets, the crisis-oriented policy measures taken from the beginning of global crisis, are listed under the following headings (http://www.hazine.gov.tr/doc/Guncel/Politika_Tedbirleri.pdf):

1. Liquidity Supports
2. Employment Supports (Strengthening Active Labor Programs)
3. Investment Supports
4. Credit and Guarantee Arrangements Provided to Manufacturers and Exporters
5. Arrangements About Credit Use and Credit Cards
6. R&D Supports

Of course, in the precautions in which are about fiscal policy does not have an integrity. However, as described in a wide range of substances in crisis measures, those relating to fiscal policy can be grouped as follows:

1. The validity period of Asset Peace application, which aims to bring the assets abroad to the country and includes tax reductions and exemptions, had been extended until December 31, 2009. Any tax review will be made due to the assets reported or declared in

the context of Asset Peace related to the period before January 1, 2008. For the assets which weren't registered but then declared and registered, the ratio of the tax which must be paid in domestic is 5% and in abroad is 2%.

2. Reschedule and installment opportunities are provided for public receivables which are unpaid although their maturity has become.

3. Periodic reductions of VAT, private consumption tax and other tax and charges have been put into force in order to prevent declines in sales of housing, workplaces and durable goods.

4. Reductions are applied in on 2009 Budget Law and agricultural support payments' unit prices.

5. Regulations, which increase public spending in order to protect and improve employment, are started to use. In this context, the regulations mainly include: Unemployment compensations were increased, resources for developers to develop employment projects were increased, short employment compensation amount were increased and its duration was extended, the trainings were arranged for the unemployed people in the content of the employing training programs and some fee were given to the course attendees, and also the development of job opportunities are targeted for 120 thousand unemployed by developing programs of temporary employment.

6. Selective changes have been made in indirect tax rates and loan interest rates in order to actualize a ultimate demand and expenditure structure which encourages the use of domestic inputs and sources and inhibits the sectors operating with high imported inputs.

7. In order to revive automotive sector, amnesties in taxes and penalties are introduced for old model motor vehicles which will be scrapped.

While some of these measures are revenue-reducing, some of them are in the quality of spending-enhancing. Therefore, with these measures, divergence from fiscal discipline has become inevitable. Thus, under the influence of fiscal policy changes to the global crisis has occurred and the fiscal discipline which has been tried to achieve since 2002 wasn't achieved last two years. Primarily, the size of the general budget spending started to increase significantly in last two years in order to revive

decreased aggregate demand. As shown in Figure 44, general budget expenditure trends have entered into a substantial increase from the second half of 2008. The budget expenditures didn't increase at this scale in 2007, the year of general election. So this situation shows that the crisis has affected Turkey significantly. Under the influence of the crisis

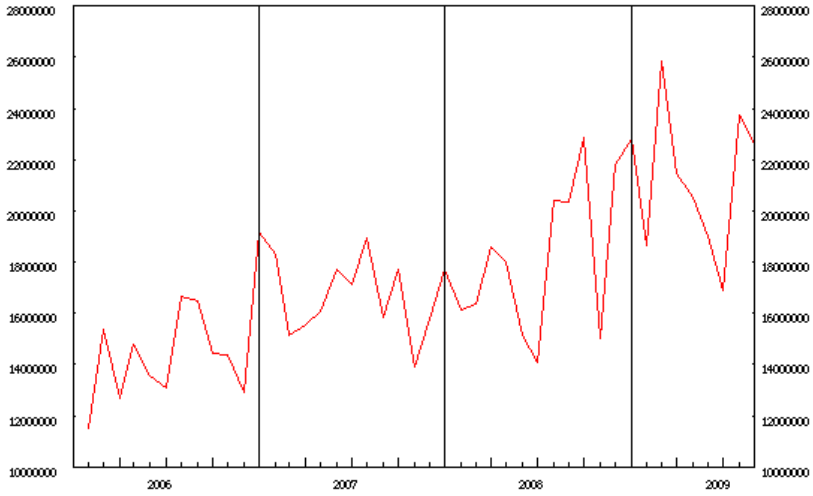

Figure 44 General Budget Expenditures (Thousand TL)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

the general budget revenues are also negatively (Figure 45). The general budget revenues could not keep pace with this increase in expenditures, or even decreased. 83% of budget revenues are consist of general tax revenues by the end of September 2009. The main reason for this stagnancy in general budget revenues is the decrease in indirect tax revenues. While direct tax revenues do not be affected from global crisis, indirect tax revenues have entered a serious contraction from the mid-2008 (Figure 46). Good and service taxes which are taken inward and value-added takes which are taken from imports contains the essential amount of indirect taxes. A 20% part of this includes private consumption tax. Private consumption tax is taken from oil and natural gas products, motor vehicles, alcoholic beverages, tobacco products, cola and soda, and other durable goods. As it can be seen in Figure 47, in time of crisis, private consumption tax has decreased rapidly since the last quarter of

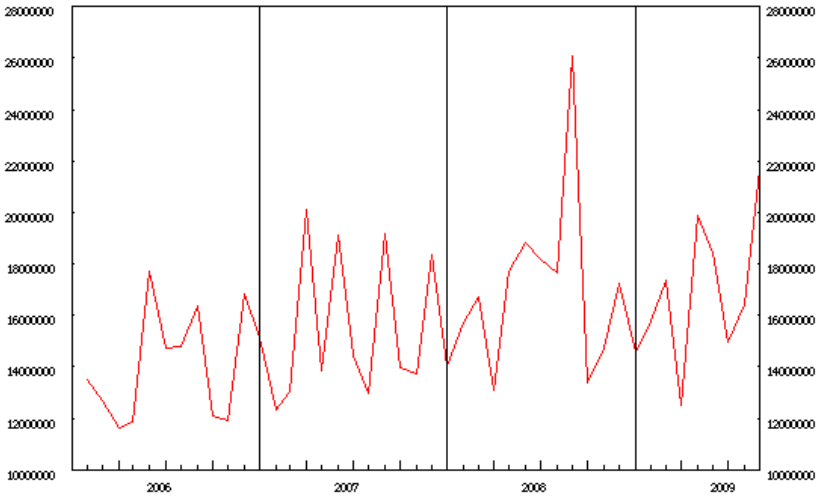

Figure 45 General Budget Revenues (Thousand TL)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

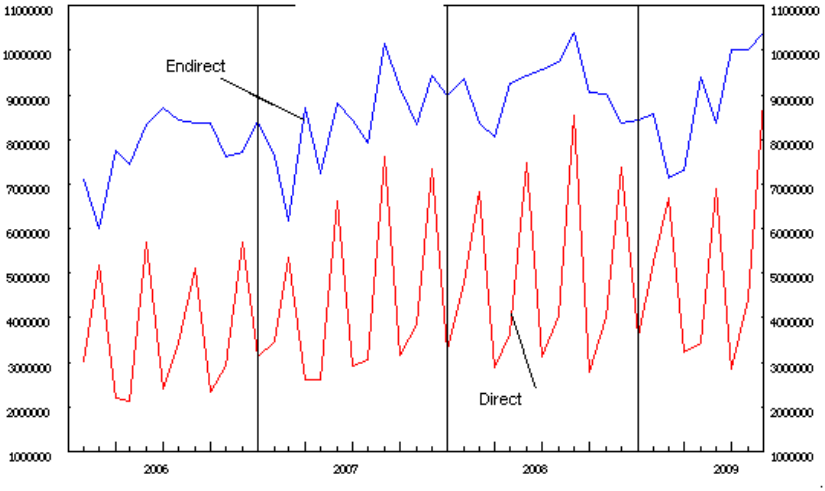

Figure 46 Direct and Indirect Tax Revenues (Thousand TL)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

2008. As of 2008/2009, share of taxes received from foreign trade (customs duties, import value added tax and the other taken in the foreign trade income) in the budget is approximately 16%. Approximately 15% of this includes the value added tax taken from imports. Value added tax which is taken from imports has entered into a quick decline trend due to rapid declines in imports from mid-2008s in the crisis process (Figure 48). The share of budget measures in GDP is approximately around 23%. The budget revenues aren't harmonious with the increase in the budget expenditures during the crisis. So, the general budget balance has had significant deficits since the middle of 2008 (Figure 49). The budget deficit increased 747.4% between the periods 2009 January–September / 2008 January–September (www.bumko.gov.tr). Finance Minister Mehmet Şimşek has made this review while announcing the 2010 budget to public; The increase in the budget deficit which is appeared in 2009 arised from the decrease in the revenues at the rate of 16% and the increase in the expenditures at the rate of 14%. According to Şimşek; 86% deviation in budget arised from the reduction of revenues related with global crisis (Hürriyet, 18.10.2009). Transferring the costs of global crisis from the private sector to public sector can improve balance and relatively expectations, but this time the risks of the cri-

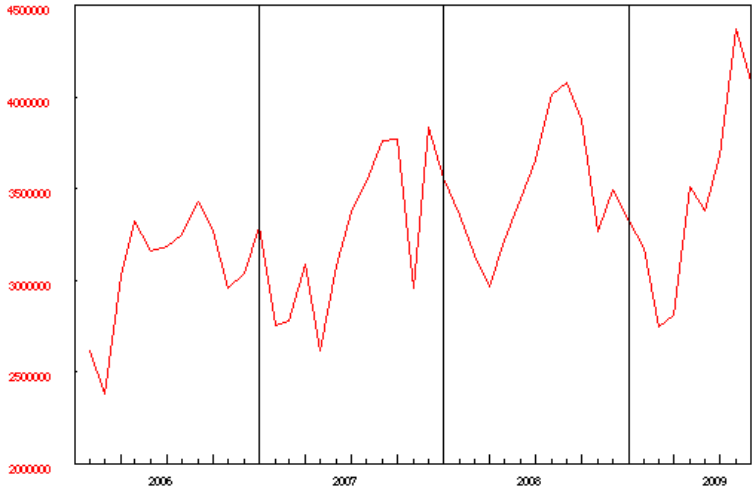

Figure 47 Private Consumption Tax (Thousand TL)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

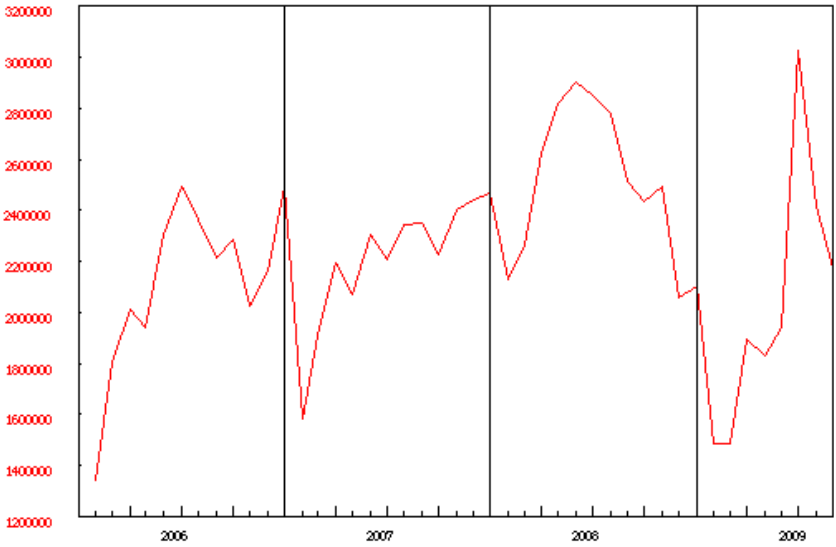

Figure 48 The Value Added Tax Taken From Imports (Thousand TL)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

sis can be transferred to the public sector. At the cost of corruption of public balance, public sector tries to recover financial fragility of the private sector and also the demand level. If the public sector which has the responsibility of defusing the financial crisis bomb created by the private sector can't achieve this duty at time, the bomb may explode in its face. Of course, here the discovery of this bomb attack and neutralize not just the responsibility of the public sector, also it is in the responsibility of all economic units surviving in the economic ecosystem. If the problem in the economic ecosystem can't be solved at time, no matter what the source of it, everyone will be affected from that. Also, everyone in this economic ecosystem is taking their ways in the same ship. The damage received by the ship (economic system) will affect all passengers adversely. In this framework, private sector, especially the financial sector, will improve the real sector with its support taken from the public sector by taking lessons from the crisis and should provide support for public sector balance with wheels of the economy which will provide the opportunity to work again. Otherwise, a crisis which would be caused

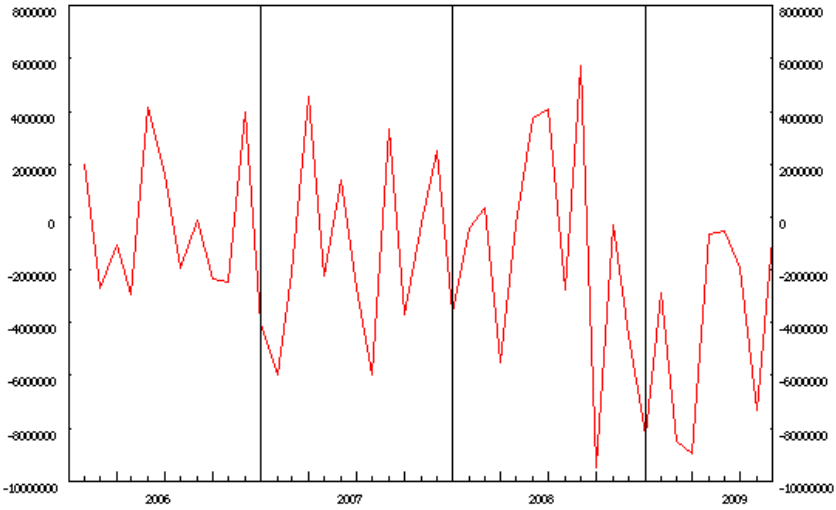

Figure 49 General Budget Balance (Thousand TL)
Source: http://evds.tcmb.gov.tr/, 15.10.2009

by the public sector can cause much more severe consequences from the crisis arising from private sector (İnsel & Saridoğan, 2009, p. 1).

During this period, temporarily reductions used in tax rates applied to various goods has contributed to form an amount of positive expectations in the domestic market by providing the future demand to be highlighted. Financial measure taken to mitigate the effects of global crisis and reduction of tax revenues recently caused the budget deficits to increase. In the economic conjuncture that we have, an amount of relaxation in fiscal policy is a situation expected to happen. Current debt structure of the public sector provides even a limited amount of maneuvering space in order to implement a stabilizing fiscal policy. However, it should not be forgotten that average maturity of Turkey's public sector debt is still short and financial depth is relatively low. In conjunction with the recover in the domestic demand, the significant and permanent increase in public borrowing presses for the increase the interest rates and so decreases the efficiency of monetary policy. Establishing a mechanism which cares for "cyclical movement" in economic activities without compromising fiscal discipline, and supporting fiscal easing emerged in

short time with a medium term tangible fiscal framework is important (Yilmaz, 2009, p. 16).

Inflation rate and inflation expectations are declining despite the concessions given from fiscal discipline (Figure 50). This is a pleasing situation in a sense for Turkey's economy which is fighting against high inflation for many years. But, also this is a sign of the recession that continues and will be. Of course, this is not a desirable situation. The most effective fiscal measures taken are the tax reduces. Indeed, especially the positive effects of measures taken since the second half of 2009 started to be seen. When earlier graphics of 2009 is taken into consideration, the positive results caused by the measures taken can be sorted as follows:

1. an increase is seen in indirect tax revenues since the second quarter of 2009,
2. consumer confidence index began to increase,
3. manufacturing industry capacity utilization rates rose a little,
4. industrial production index began to rise,

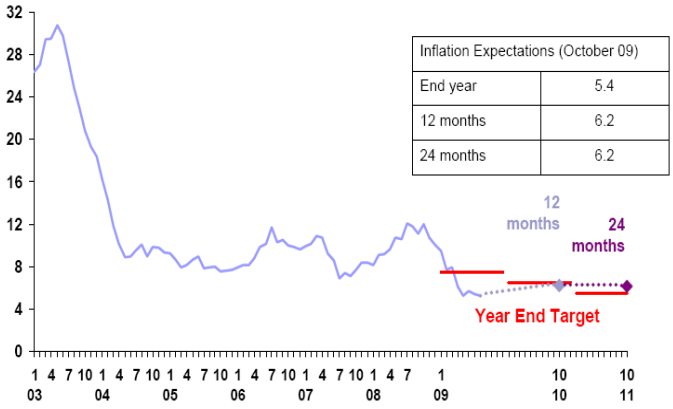

Figure 50 Annual Inflation and Expectations (%)
Source: The Undersecretariat Turkish Treasury, Ekonomi Sunumu, http://www.hazine.gov.tr/irj/go/km/docs/documents/TreasuryWeb/Statistics/EconomicIndicators/egosterge/Sunumlar/Ekonomi_Sunumu_ENG.pdf, p. 66

5. unemployment rate decreased to 12% from the level of 16%,

6. finally, depending on these developments occurring in real sector, financial sector has experienced positive developments. In this context, ISE 100 index is elevated and exchange rate began to fall.

As Central Bank President Durmus Yılmaz's saying in a speech made in June 17, 2009 in relation to improvement in some economic data: *"We entered into the tunnel, it was pitch-dark, light appeared in the other side. It's not clear that is this headlight of a car or the exit. Let us therefore be cautious."* (Referans, 17.06.2009) Turkey's economy has shown a serious resistance to destructive effects of global crisis, with the impact of the measures taken so far. However, the potential fragility areas still continue. The most important ones of them are the situation of hosting the risk of deterioration of this stability at every moment despite of ongoing political stability in the country. If the Democratic Society Party (DTP) is closed as the result of the closure case pended by the Constitutional Court, by-election has to be made according to the constitution. There may be a probability of converting a possible by-election to a general election (Ünal & Kaya; 2009, p. 33). Even the closure decision isn't taken by the Constitutional Court, however there may be a by-election. In addition, the government's latest initiative policy and the problems arised from the relationships between EU can tense political environment and increase the economical fragility in Turkey. In this context, it will be right to not to give concessions from fiscal discipline in the medium and long term and to form the fiscal policy according to this.

5.4 Conclusions

Turkey's economy has been faced with serious economic crisis in the last quarter of the century. Liberal policies are used with the aim of being less impacted by global crisis and having a stable growth during the same periods. Turkey which is one of the twenty biggest countries of the world achieved to integrate with the global economy significantly by means of her policies. But this process of articulation does not contain only good within. At the same time it makes the country to be opened for the risk that came from outside. The interactions of the last global crisis affirm this judgment.

Turkey's also has been negatively affected by the process of the last crisis which is perhaps the first global crisis of the world. However, Turkey

hasn't got serious problems in financial sector in current crisis with the effects of measures that were taken during 2000–1 crisis. But this development has lead decision-makers to an understanding that Turkey would not have a crisis in the short and medium term at least. Therefore, they got late to foresee the effects of the crisis that occur in real sector. When the stage of taking measures reached, a comprehensive and coherent package of measures couldn't form. Fragmentary and non-integrated policy measures have been established in six stages. Moreover, some measures which are expressed to take against the crisis have no concern with the crisis.

Most serious and effective measures taken in the crisis period are the ones which have financial qualifications. In this context, to revive the real sector, expenditure-reducing and revenue-enhancing measures have been put into effect. However, tax reductions which considered as income mitigating factors, has led tax revenues increase due to the country's distorted tax system. Because of the weight of indirect taxes within tax system, serious booms are faced in some sectors when indirect tax reductions combined with price reductions resulting from stagnation. At least the return of the stocks and debt to be dissolved in these sectors during this process could be achieved. The supports for the employment which are taken to increase the expenditures relieve the private sector for a time.

A policy approach which is giving attention to fiscal discipline is in practice in last years. However, within the year 2009, applying a fiscal policy which is moving away from fiscal discipline due to these measures taken during the crisis has become an obligation. The present government continues to apply the politics which aims to achieve fiscal discipline because the withdrawal of the fiscal discipline is seen as a risk. However, with the risk of having a second wave of the crisis, a pause in the use of current fiscal policies against the crisis can bring the problems that are facing in real sector to serious levels. It is clear that more permanent and comprehensive fiscal policy measures should be applied if the risks of the political ground are considered.

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6 Determinants and Absorption of Exchange Market Pressure in Selected New EU Members

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6.1 Introduction

Although the role and significance of foreign exchange issues differs from country to country, according to adopted exchange rate regime, a monitoring of foreign exchange markets is essential for successful monetary policy in any country. Exchange market pressure (EMP) is one of the appropriate tools to oversee the conditions in the foreign exchange market. Thanks to its universality it is conveniently applicable to any exchange rate arrangement.

Various concepts of EMP have been developed and empirically tested in literature. Girton and Roper (1977) used a monetary approach to balance of payments and exchange rate determination to derive EMP as simple sum of the rate of change in international reserves and the rate of change in exchange rates. Weymark (1995) revised the original model and introduced a more general approach. Eichengreen et al. (1994, 1995) developed a simpler and model-independent EMP measure.[46]

The present study applies the original Girton-Roper (G-R) model and implements some model modifications on eight new European Union Member States (NMS) over the period 1995–2008. The countries can be sorted into two groups according to the exchange rate regime applied. The group of NMS following some kind of exchange rate floating consists of the Czech Republic, Hungary, Poland, and Slovakia. The group of NMS with fixed exchange rate regime comprises Bulgaria, Estonia, Latvia, and Lithuania. Although many researchers have used the G-R model on a variety of countries[47], the current chapter is the first com-

[46] See e.g. Stavárek (2008) for more detailed discussion on EMP concepts and approaches.

[47] For example, Thornton (1995) on Costa Rica, Bahmani-Oskooee and Bernstein (1999) on G7 countries, Mathur (1999) on India, Pollard (1999) on a group

plex application of the model on countries from Central and Eastern Europe.[48]

The aim of the chapter is twofold. First, we choose the correct model specification to estimate EMP and compare the magnitude and development across the nations. Second, we test whether the magnitude of EMP is independent of whether the pressure in NMS is absorbed by the changes in international reserves or exchange rate. While EMP should be accommodated by reserves in countries with a fixed regime, EMP should not be sensitive to its composition in floating countries since this arrangement allows both channels of absorption.

The importance of such analysis stems from two crucial factors. All the NMS analyzed are supposed to join the euro area. Hence, they have to fulfil the official convergence criteria that include, beside others, a requirement of stability of exchange rate development. Fulfilment of the criterion requires the exchange rate to have been maintained within a fluctuation margin around the central parity "without severe tensions". We consider EMP as a good proxy for monitoring of tensions in the foreign exchange market. All NMS are rather small open economies with a thin foreign exchange market. If, in such a country, EMP is substantial, persisting, and predominantly absorbed by an exchange rate one could expect an adverse effect on exports and imports with potentially inflationary consequences.

The remainder of the chapter is organized as follows. Section 2 briefly introduces the concept of the G-R model and derives the equations and model modifications used in empirical testing. Section 3 deals with methodology, data selection and reports the estimation results. Section 4 closes the chapter with conclusions.

6.2 Girton-Roper Model and its Modifications

The main theoretical proposition of the G-R model is that the domestic money market equilibrium, if disturbed, is restored through some combination of the currency depreciation/appreciation and international reserves outflow/inflow. The excess domestic money supply will cause a

of Caribbean countries, Pentecost et al. (2001) on selected EU countries, Younus (2005) on Bangladesh, Parlaktuna (2005) on Turkey, Khawaja (2007) on Pakistan, García and Malet (2007) on Argentina or Ziramba (2007) on South Africa.

[48] Please note that Stavárek and Dohnal (2009) is earlier, restricted and somewhat differently focused version of the present chapter.

combination of currency depreciation and reserves outflow while excess domestic money demand will cause some combination of currency appreciation and reserves inflow to restore the money market equilibrium.

This makes the model equivalently applicable in fixed, floating as well as intermediate exchange rate arrangement. In a completely fixed exchange rate regime, the change of the exchange rate is zero, while in absolutely flexible exchange rate regime the change of international reserves is zero. In the intermediate regime (e.g. managed float), the exchange market pressure is absorbed by either currency depreciation, or reserves losses, or a combination of the two.

The G-R model organises the analysis around demand and supply of national monies. The assumptions, explicit and implicit, in G-R model are: Stable demand for money function (money multiplier is held constant), purchasing power parity holds, flow equilibrium in money market and domestic and foreign, interest rates are assumed to grow at equal rate, that is, interest rate differential is held constant.

The demand for money is taken to be stable function of real income (Y) and the domestic price level (P) given by

$$M^d = kPY \tag{1}$$

where k denotes a constant. The supply of money is specified as the product of the money multiplier (m) and the monetary base ($B = R + DC$), where R and DC respectively denote net foreign asset holdings and domestic credit creation:

$$M^s = mB \tag{2}$$

The next step is to incorporate into the model the assumptions on continuous money-market equilibrium and purchasing power parity relationship:

$$M^d = M^s \tag{3}$$

$$P = EP^* \tag{4}$$

where E is the nominal exchange rate, measured in units of domestic currency for one unit of foreign currency and P^* is the foreign price level. Replacing P in (1) with EP^* from (4) and substituting (1) and (2) into (3) leads to (5):

$$kEP^*Y = mB \tag{5}$$

This equation can also be rewritten as (6):

$$kER^{*}Y = m(R + DC) \tag{6}$$

Taking natural logarithms of both sides of the equation

$$\ln k + \ln E + \ln P^{*} + \ln Y = \ln m + \ln (R + DC) \tag{7}$$

differentiating with respect to time and assuming the constant k yields the following:

$$0 + \frac{\left(\frac{\mathrm{d}E}{\mathrm{d}t}\right)}{E} + \frac{\left(\frac{\mathrm{d}P^{*}}{\mathrm{d}t}\right)}{P^{*}} + \frac{\left(\frac{\mathrm{d}Y}{\mathrm{d}t}\right)}{Y} = \frac{\left(\frac{\mathrm{d}m}{\mathrm{d}t}\right)}{m} + \frac{\left(\frac{\mathrm{d}R+DC}{\mathrm{d}t}\right)}{(R + DC)} \tag{8}$$

Rearranging (7)

$$\frac{\left(\frac{\mathrm{d}m}{\mathrm{d}t}\right)}{m} + \frac{\left(\frac{\mathrm{d}R+DC}{\mathrm{d}t}\right)}{(R + DC)} \tag{9}$$

and simplifying (8) by assuming specific letters leads to:

$$\frac{\left(\frac{\mathrm{d}R}{\mathrm{d}t}\right)}{(R + DC)} + \frac{\left(\frac{\mathrm{d}E}{\mathrm{d}t}\right)}{E} = -\frac{\left(\frac{\mathrm{d}DC}{\mathrm{d}t}\right)}{(R + DC)} + \frac{\left(\frac{\mathrm{d}Y}{\mathrm{d}t}\right)}{Y} + \frac{\left(\frac{\mathrm{d}P^{*}}{\mathrm{d}t}\right)}{P^{*}} - \frac{\left(\frac{\mathrm{d}m}{\mathrm{d}t}\right)}{m} \tag{10}$$

where r and d denote ratios of changes in reserves and of domestic credit changes with respect to the monetary base. The remaining variables are growth rates of nominal exchange rate e, domestic income y, foreign prices p^{*} and money multiplier m.

The model's intuition is that, for given growth rates of foreign prices and domestic income, increase of domestic credit and/or money multiplier stimulates a proportionate loss in reserves with no change in the exchange rate (extremely fixed regime), or a proportionate depreciation of the domestic currency with no change in reserves (extremely floating regime), or some combination of these two (intermediate regime). On the contrary, an increase in domestic income and/or foreign prices results in a proportional appreciation of domestic currency and inflow of international reserves.

The original G-R model seems to be strict for NMS and, thus, this chapter employs less restrictive versions of the G-R model inspired by Wohar and Lee (1992). The modifications relax some assumptions of the original approach. Specifically, purchasing power parity is not assumed

to hold and foreign and domestic assets are imperfect substitutes with different interest rates.

The recent empirical literature on purchasing power parity in NMS (e.g. Sideris 2006 or Bekö and Boršič 2007) provides virtually no support for validity of purchasing power parity. Because EMP in NMS is estimated in relation to the euro area the assumption of constant interest rate differential is not legitimate. A change in the short-term money market interest rate differential is included among explanatory variables since interest rates are frequently changed to alleviate EMP (Eichengreen et al. 1995). Further, the modified formulations incorporate foreign disturbances transmitted through foreign real income, foreign money supply and foreign interest rates. Due to substantial level of integration of NMS with the euro area and prospective membership of NMS in the euro area we assume that the transmission of disturbances from the euro area is an important contributor to EMP in NMS.

Therefore, we estimate two alternatives to (10) defined as follows:

$$r - e = -d + y + p^* - m + i^* + q - n \tag{11}$$

$$r - e = -d + y + s^* - m - y^* + q - n \tag{12}$$

where i^* is the change in foreign interest rate, q is the differential of the domestic inflation rate from the purchasing power parity condition, n is the difference between changes in domestic and foreign interest rates, s is the growth of the foreign money supply; and the other variables are defined as above. Equations (11) and (12) represent different approaches to the way in which foreign disturbances enter the model. While (11) is based on disturbances through the foreign inflation and interest rate (12) accounts for disturbances driven by foreign money supply and real income. All the expected signs reflect the monetarist nature of the model. A growth of variable with a positive (negative) sign leads to proportional appreciation (depreciation) of domestic currency and inflow (outflow) of international reserves.

6.3 Methodology, Data and Empirical Results

Estimation of all three alternative models for all NMS would make the interpretation of the results more difficult. Thus, as the first step in empirical analysis, we have to identify the correct model specification

for each NMS. Let us consider the models described by equations (10), (11) and (12) as Model 1, Model 2 and Model 3, respectively.

Model 1 is said to be nested with Model 2 since Model 1 is Model 2 with the restrictions $i^* = 0$, $q = 0$, and $n = 0$ imposed. Hence, we use an F-test to determine whether the full Model 2 contributes additional information about the association between EMP and the predictors. A restricted Model 1 is preferable to Model 2 as long as both have similar predictive power.

Next, we proceed with selection of the appropriate model between Model 1/Model 2 and Model 3. We cannot use an F-test because these sets of equations are not nested within each other. Neither equation is a special case of the other, i.e. we do not have a restricted and a full model. Two alternative procedures are applied to find the correct model: the testing techniques proposed by Davidson and MacKinnon (1981) and by Mizon and Richard (1986).

Once the correct model is chosen for each NMS we extend it by inclusion of the variable $a = (-e - 1)/(r - 1)$ in the right-hand side of the equation as suggested by Pollard (1999) or Bahmani-Oskooee and Bernstein (1999). The main purpose of such an extension is to determine whether EMP is sensitive to its composition and how much of EMP is absorbed by change in the exchange rate and how much by the change in reserves. A significant and positive coefficient of a implies that the monetary authority absorb more pressure by the currency depreciation, while a significant and negative a implies that more pressure is absorbed by reserves losses. An insignificant coefficient implies that the monetary authority is not sensitive to components of EMP.

The quarterly data from 1995:1 to 2008:4 are employed in the chapter yielding 56 observations for each of the NMS.[49] Most of the variables were obtained from the IMF's International Financial Statistics and the Eurostat's Economy and Finance database. The missing observations in the time series were replenished from databases accessible on the NMS central banks' websites. The detailed description of all data series and their sources is presented in the Appendix.

We applied Augmented Dickey-Fuller (ADF) tests to examine the stationarity of the time series used. According to the character of each time series we tested the stationarity using one the three test specifications: with intercept, with a linear trend and intercept, or with none of them.

[49] The time span for Bulgaria was reduced to 1997:1–2008:4.

The results of ADF tests suggest that all time series are stationary at levels and can be used in a regression analysis. The only two I(1) series are the differentials of the domestic inflation rate from the purchasing power parity q for the Czech Republic and Slovakia.

We estimated Model 1 and Model 2 for all NMS using Ordinary Least Squares and a calculated F-test to determine the validity of Model 1. Results are reported in Table 57. They suggest that the restrictions concerning the change in foreign interest rate, differential of the domestic inflation rate from the purchasing power parity, and the interest rate differential are rejected at the 5% level only for Bulgaria and Estonia. Hence, Model 1 is valid for all remaining NMS.

Bulgaria	Czech Republic	Estonia	Hungary
6.2874 (0.0014) Model 2	0.8019 (0.4991) Model 1	2.8616 (0.0469) Model 2	0.7111 (0.5504) Model 1
Latvia	**Lithuania**	**Poland**	**Slovakia**
1.9096 (0.1412) Model 1	1.3231 (0.2784) Model 1	1.8313 (0.1548) Model 1	0.5318 (0.6627) Model 1

Table 23 Results of F-tests

Note: p-values in parentheses, identification of the non-rejected model

Source: Author's calculations

Next, Model 3 was estimated for each NMS and the Davidson-MacKinnon and Mizon-Richard tests were calculated between Model 1 and Model 3 for the Czech Republic, Hungary, Latvia, Lithuania, Poland and Slovakia, and between Model 2 and Model 3 for Bulgaria and Estonia. The test statistics are reported in Table 24.

According to results of Davidson-MacKinnon test Model 3 is rejected at the 5% level for the Czech Republic and Poland and Model 1(2) is rejected in Bulgaria, Czech Republic, Hungary, Latvia, Poland and Slovakia. As far as Mizon-Richard test statistics are concerned, Model 3 is rejected in none of NMS and Model 1(2) is rejected for the Czech Republic, Latvia and Poland. Summarizing the results of both tests, we can conclude that Model 3 is the correct specification for Bulgaria, Czech Republic, Hungary, Latvia, Poland and Slovakia. Neither alternative model was clearly rejected for the remaining NMS. Thus, we opt for

	Davidson-MacKinnon test		Mizon-Richard test	
	H_0: Model 1(2)	H_0: Model 3	H_0: Model 1(2)	H_0: Model 3
Bulgaria	1.0661 (0.0005)	1.2170 (0.0683)	0.8847 (0.4214)	0.5209 (0.5983)
Czech Republic	1.0044 (0.0000)	1.0521 (0.0004)	5.2134 (0.0015)	1.0258 (0.3164)
Estonia	1.0561 (0.0843)	2.1625 (0.3178)	1.8214 (0.1733)	1.2873 (0.2859)
Hungary	0.9760 (0.0075)	0.3299 (0.7530)	1.7798 (0.1491)	0.0121 (0.9129)
Latvia	1.0301 (0.0000)	-0.7958 (0.4279)	4.9040 (0.0022)	0.0398 (0.8426)
Lithuania	1.0366 (0.0775)	1.8178 (0.3306)	1.8011 (0.1449)	0.0978 (0.7559)
Poland	1.0151 (0.0048)	1.3646 (0.0102)	2.6596 (0.0444)	0.5239 (0.4728)
Slovakia	1.0672 (0.0006)	1.6431 (0.0563)	2.2971 (0.0733)	0.6412 (0.4275)

Table 24 Results of Davidson-MacKinnon and Mizon-Richard tests
Note: p-values in parentheses
Source: Author's calculations

the one with the higher adjusted R2. This rule leads to the conclusion that Model 3 is the correct model specification for all NMS analyzed. The results of Model 3 estimations as well as results of some diagnostic tests are provided in Table 25. Estimations of Model 3 lead to generally plausible results. All the models passed most of the diagnostic tests. However, we found evidence of potential heteroscedasticity of residuals in the models for Bulgaria and Hungary. Therefore, we corrected the standard errors of parameter estimates by the White procedure. The Jarque-Berra tests indicate that the distribution of residuals is not normal for Poland and Slovakia. The Ramsey RESET tests confirmed the appropriate functional form of Model 3 in all NMS.

	Bulgaria	Czech Republic	Estonia	Hungary
constant	0.044 (0.026)	-0.003 (0.011)	0.019 (0.011)	0.012 (0.022)
d	-1.040* (0.064)	-1.055* (0.036)	-0.500* (0.166)	-0.868* (0.038)
y	-0.906 (1.316)	1.731** (0.818)	1.705* (0.411)	1.079 (1.226)
*s**	1.424** (0.580)	1.014* (0.192)	0.493 (0.282)	0.943** (0.365)
m	-0.921* (0.179)	-1.023* (0.048)	-0.856* (0.038)	-0.766* (0.087)
*y**	-0.290 (4.128)	-1.148 (1.517)	-0.719 (1.297)	-1.430 (2.994)
q	0.020* (0.006)	0.261 (0.163)	0.191* (0.046)	-0.086 (0.089)
n	-0.038** (0.017)	-0.029 (0.030)	-0.019 (0.011)	-0.090** (0.042)
Adj. R^2	0.930	0.933	0.892	0.927
S.E.	0.055	0.029	0.031	0.044
D-W	2.053	1.787	1.886	2.206
J-B	1.603 (0.448)	0.579 (0.748)	0.632 (0.728)	3.944 (0.139)
LM	0.943 (0.450)	0.241 (0.913)	0.420 (0.793)	1.686 (0.170)
ARCH	1.322 (0.279)	2.342 (0.084)	0.689 (0.602)	5.049 (0.002)
WHITE	2.562 (0.028)	2.014 (0.073)	0.860 (0.544)	0.102 (0.997)
RESET	0.083 (0.775)	0.483 (0.490)	0.246 (0.621)	0.131 (0.718)
	Latvia	**Lithuania**	**Poland**	**Slovakia**
constant	0.03 (0.021)	0.007 (0.018)	-0.027 (0.021)	0.027 (0.031)
d	-1.007* (0.078)	-0.911* (0.109)	-0.839* (0.085)	-0.907* (0.076)
y	1.311* (0.478)	0.801 (0.664)	1.845 (1.394)	-1.028 (1.054)
*s**	1.395* (0.411)	0.731 (0.385)	0.064 (0.505)	1.526* (0.459)
m	-0.743* (0.121)	-0.871* (0.109)	-0.713* (0.218)	-1.056* (0.059)
*y**	-3.506 (3.416)	5.441** (2.390)	6.817** (2.948)	-5.126 (3.232)
q	-0.243 (0.133)	-0.140 (0.102)	-0.009 (0.121)	0.412 (0.342)
n	-0.085* (0.024)	-0.024 (0.031)	0.042 (0.077)	0.001 (0.071)
Adj. R^2	0.797	0.874	0.753	0.915
S.E.	0.049	0.048	0.051	0.069
D-W	1.747	2.056	2.148	1.801
J-B	0.432 (0.805)	0.164 (0.921)	10.18 (0.006)	709.2 (0.000)
LM	1.164 (0.340)	0.316 (0.865)	0.357 (0.837)	0.188 (0.943)
ARCH	0.130 (0.970)	0.969 (0.433)	0.225 (0.922)	1.798 (0.147)
WHITE	0.547 (0.794)	1.654 (0.143)	1.565 (0.169)	0.909 (0.507)
RESET	0.152 (0.698)	4.044 (0.051)	0.543 (0.464)	0.050 (0.822)

Table 25 Estimation of Model 3

Note: standard errors in parentheses for regression coefficients and *p*-values in parentheses for diagnostic tests; * and ** denote significance at 1% and 5% level respectively

Source: Authors' calculations

With regards to coefficient estimates, growth of domestic credit (d) and change of the money multiplier (m) are significant and correctly signed in each individual model. This finding is in line with the monetarist logic that excessive growth of money supply, stimulated through growth of domestic credit and/or the money multiplier, results to depletion of reserves and/or depreciation of domestic currency. Furthermore, the coefficients of d and m are not significantly different from minus unity in all NMS except Estonia and Hungary.

Taking the Czech Republic's model estimation as an example, the coefficient of d (−1.055) implies that a 10% increase in the domestic credit causes the exchange rate to depreciate by 10.55%, or a loss of reserves by 10.55% or a combination of the two to the same extent.

The deviation from the purchasing power parity (q) is significantly different from zero and correctly signed in models for Bulgaria and Estonia. Thus, the condition that the purchasing power parity holds can be rejected only for these two NMS. This conclusion is to some extend contradictory to estimation results of Model 1 and Model 2 since foreign inflation turned out to be significant explanatory variable only for the Czech Republic, Poland and Slovakia.

The coefficient on domestic real GDP growth (y) has an expected positive sign in six NMS. However, it is significant only for the Czech Republic, Estonia and Latvia. The growth of real domestic income in these countries therefore influences EMP through accumulation of reserves or appreciation of domestic currency. The coefficient on the interest rate differential (n) has a negative sign, as suggested by monetarist theory, in most of the national models, but is significantly different from zero only for Bulgaria, Hungary and Latvia. Hence, one can conclude that the changes in the interest rate differential between NMS and the euro area do not influence EMP in most of the NMS analyzed. This finding is supported by estimation results of Model 2 that includes the change in the foreign interest rate among explanatory variables. We found this variable to be significant only for Poland.

Foreign disturbances enter the model via foreign money supply and foreign real GDP. The growth of money supply in the euro area (s^*) positively influences EMP in all NMS. The coefficient is significant in five countries and coefficients for Estonia and Lithuania are significant at the 10% level. Such results provide clear evidence that the euro area money supply is a crucial source of international disturbances and an important variable in explaining EMP in the new part of the EU. On the

other hand, the euro area real GDP growth has virtually no impact on EMP in NMS. The respective coefficient is significant only for Lithuania and Poland, but has an opposite sign than expected.

Differences between NMS with fixed exchange rate regime and NMS with floating arrangement are hard to find. The estimation results suggest that only the deviation of domestic inflation from the purchasing power parity is significant solely in some of the "fixing" countries. The occurrence of signs opposite to theoretical is rare and equally distributed among all NMS regardless the exchange rate regime applied.

All models have good explanatory power and seem to be consistent over the whole estimation period. We performed the Quandt-Andrews test which tests for unknown structural breakpoints in an equation's sample. The null of no structural changes cannot be rejected in any model. The tests tend to designate 1999Q2 for Bulgaria, 1997Q3 for Estonia and Poland and 2006Q3 for Slovakia as major though insignificant breakpoints.

One of the chapter's objectives is to estimate EMP in NMS and assess the EMP development in the context of the exchange rate stability and convergence criterion. For this purpose Figure 51 depicts development of actual EMP (dependent variable from Model 3) along with fitted EMP calculated according to the equations estimated. To evaluate EMP correctly it is necessary to remember some elementary facts. First, a negative value of EMP indicates the pressure either to depreciate domestic currency or to sell more international reserves to maintain equilibrium in the domestic money market. On the contrary, a positive EMP shows that the domestic currency is pressured to appreciate. Second, the value of EMP represents the magnitude of the foreign exchange market disequilibrium which should be removed by a respective change of the exchange rate and/or international reserves depending on the exchange rate regime.

The graphs in Figure 51 contain, besides the EMP curves, horizontal lines representing a 1.5 multiple of the standard deviation above and below the mean actual EMP value. A breach of the corridor is considered as an excessive EMP, signalling to a potential crisis. Such a construction of thresholds has been widely adopted in many studies and has become the preferred method to other methods such as the extreme value theory (see Pontines and Siregar, 2006).

One can find almost no feature of the EMP development that NMS share in common. All the countries went through periods of higher and

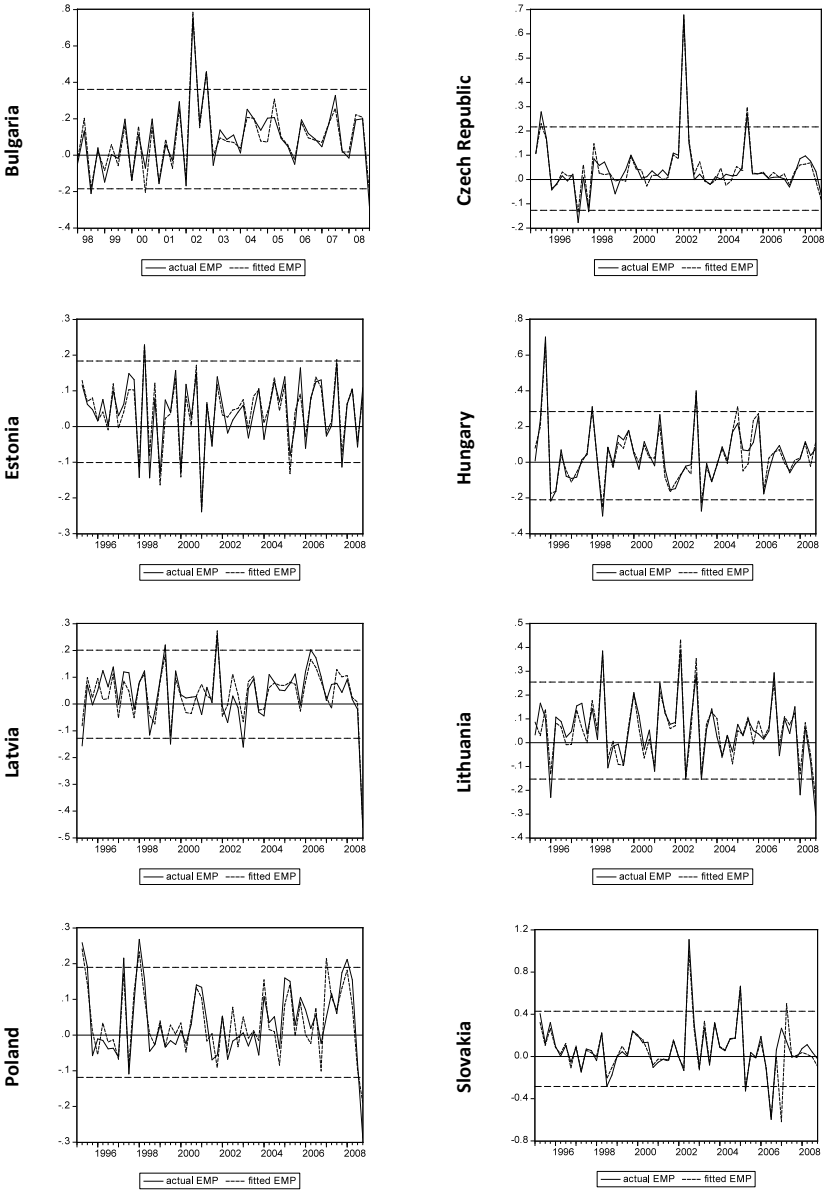

Figure 51 Actual and fitted EMP in Model 3
Source: Authors' calculations

more volatile EMP as well as lower and less volatile EMP. However, the timing of these periods differs across the countries. Whereas the appreciation pressure prevailed in the case of Bulgaria, Czech Republic, Latvia, Lithuania and Slovakia, the proportion of appreciation-pressure and depreciation-pressure observations was more balanced in the remaining NMS.

The most significant example of analogous EMP behaviour was the drop of EMP into the negative zone during the period of financial crisis in 2008 that occurred in six NMS. A magnitude of negative pressure ranged from 2.1% in Slovakia[50] to 46.1% in Latvia. We can also reveal several episodes of common EMP development in some NMS. For instance, a sharp increase of EMP in the Czech Republic, Hungary and Slovakia in 2002 reflected a rapid appreciation of national currencies against the Euro accompanied by corresponding interventions in the foreign exchange market. Likewise, during the period 2003–2005 all Baltic States shared a homogenous EMP development with low volatility and slightly increasing trend. This can be also documented by a similar EMP mean and median as well as the width of the "standard EMP zone".

Moreover, the graphs illustrate many cases of disequilibrium in the foreign exchange market in individual NMS coming through excessive EMP. For instance, the financial crisis in the Czech Republic in 1997 that resulted in abandonment of a currency peg with fluctuation band and extensive depreciation of the Czech koruna is distinctly identified. In 2002–2003, the Hungarian forint was first under speculative attack on the strong size of the fluctuation band and appreciation pressure. Then, the central parity was unexpectedly devalued which caused a massive capital outflows from the country. One can also mention the effect of parliamentary elections in Slovakia in 2006 whose results were accepted by market participants with scepticism about effort of the new government to continue in integration to the euro area.

The frequency of breaches of the excessive EMP thresholds decreased after the EU enlargement in 2004.[51] Likewise, EMP development became less volatile. One can argue that the corridor denoting the "standard EMP zone" is usually wider than the standard fluctuation band in ERM II (a part of the exchange rate stability convergence criterion).

[50] EMP in Slovakia was substantially softened by the coming integration to the euro area in January 2009.

[51] Only observations on Slovakia are not so clear as they reflect an active intervention policy of the National Bank of Slovakia.

However, if we apply the band ±15% around the zero EMP, which simulates ERM II, the number of cases of excessive EMP increases only marginally. It is also worth noting that the episodes of excessive EMP were not likely to persist for a long time (more than one quarter).

The next step in the empirical analysis is the extension of Model 3 by the variable a to realize whether EMP is sensitive to its distribution on foreign exchange and reserve components. This specification (Model 4) is defined in equation (13).

$$r - e = -d + y + s^* - m - y^* + q - n + a \tag{13}$$

Although Model 4 was estimated for each NMS, the attention is primarily paid to countries with a flexible exchange rate regime. Since the Baltic States and Bulgaria apply a fixed exchange rate regime the imbalance in the foreign exchange market is fully captured by changes in a country's international reserves. Hence, the variable a shall be highly significant and positive in these NMS. On the contrary, a flexible exchange rate regime applied in the remaining four NMS allows for absorption of EMP through changes of international reserves as well as exchange rate. Thus, we expect the variable a to be statistically insignificant. In other words, an insignificant a implies that monetary authority does not make choices between reserves and exchange rate changes in response to monetary shocks. The estimation results are reported in Table 26 including results of standard diagnostic tests.

The results confirm the expectations of the coefficient of a as positive and significant in all NMS with a fixed exchange rate regime. However, the inclusion of a into the model changed the estimation results for these countries substantially. Although the explanatory power of the models demonstrated by the adjusted R^2 increased the coefficients of previously significant variables, it usually decreased or even lost significance. On the other hand, the constant terms of the equations carry highly significant coefficients. A lower quality of the Model 4 estimates is also documented by results of the diagnostic tests that confirm the presence of heteroscedasticity and inappropriate functional form.

The estimation of Model 4 for NMS with a flexible exchange rate regime shows that the variable a is not significant in any country. Hence, one can conclude that there is a one-to-one trade-off between reserve losses/gains and exchange rate depreciation/appreciation. The monetary authorities tend to "balance" both channels of EMP absorption. This conclusion seems to be plausible from the perspective of participation in the

	Bulgaria	Czech Republic	Estonia	Hungary
constant	-0.059 (0.048)	-0.039 (0.053)	-0.748* (0.045)	-0.021 (0.030)
d	-0.833* (0.109)	-0.980* (0.144)	-0.163* (0.058)	-0.799* (0.077)
y	1.204 (1.346)	1.774** (0.833)	0.102 (0.125)	0.829 (1.286)
*s**	1.340** (0.608)	0.960* (0.212)	0.119 (0.075)	0.527 (0.458)
m	-0.815* (0.193)	-0.943* (0.144)	-0.194* (0.048)	-0.698* (0.114)
*y**	0.360 (4.467)	-1.041 (1.577)	-0.069 (0.795)	-1.065 (3.005)
q	0.008 (0.006)	0.267 (0.161)	0.017 (0.028)	-0.149 (0.093)
n	-0.045** (0.021)	-0.036 (0.034)	-0.002 (0.003)	-0.091** (0.040)
a	0.071* (0.025)	0.035 (0.050)	0.749* (0.044)	0.042 (0.027)
Adj. R^2	0.943	0.932	0.986	0.929
S.E.	0.049	0.029	0.011	0.043
D-W	2.081	1.724	1.786	2.181
J-B	4.109 (0.128)	0.521 (0.770)	7.251 (0.026)	1.306 (0.520)
LM	0.692 (0.602)	0.319 (0.863)	0.145 (0.964)	2.527 (0.055)
ARCH	0.718 (0.584)	1.863 (0.131)	0.615 (0.653)	1.443 (0.250)
WHITE	8.244 (0.000)	1.640 (0.149)	4.996 (0.000)	0.170 (0.993)
RESET	20.66 (0.000)	0.052 (0.820)	130.5 (0.000)	1.459 (0.231)
	Latvia	**Lithuania**	**Poland**	**Slovakia**
constant	-0.723* (0.139)	-0.251** (0.115)	-0.004 (0.161)	0.035 (0.036)
d	-0.313** (0.132)	-0.603* (0.147)	-0.860* (0.217)	-0.859* (0.094)
y	0.695 (0.421)	0.227 (0.742)	1.861 (1.468)	-0.809 (1.042)
*s**	-0.166 (0.390)	0.247 (0.339)	0.079 (0.504)	1.762* (0.468)
m	-0.165 (0.149)	-0.682* (0.112)	-0.730** (0.325)	-1.063* (0.067)
*y**	3.859 (3.122)	6.013** (2.434)	6.794** (2.899)	-5.634 (3.904)
q	-0.041 (0.122)	-0.137 (0.082)	-0.001 (0.123)	0.552 (0.409)
n	-0.049** (0.023)	-0.036 (0.030)	0.041 (0.081)	-0.033 (0.053)
a	0.701* (0.126)	0.256** (0.110)	-0.022 (0.169)	-0.017 (0.012)
Adj. R^2	0.859	0.888	0.748	0.919
S.E.	0.041	0.045	0.051	0.067
D-W	1.814	2.027	2.155	1.603
J-B	0.922 (0.630)	0.462 (0.793)	11.20 (0.003)	492.7 (0.000)
LM	0.372 (0.827)	0.350 (0.842)	0.373 (0.826)	0.385 (0.817)
ARCH	0.307 (0.871)	1.351 (0.265)	0.221 (0.925)	0.791 (0.595)
WHITE	1.837 (0.094)	1.194 (0.323)	1.845 (0.092)	1.953 (0.081)
RESET	2.808 (0.101)	16.26 (0.000)	0.698 (0.407)	1.437 (0.236)

Table 26 Estimation of Model 4

Note: standard errors in parentheses for regression coefficients and *p*-values in parentheses for diagnostic tests; * and ** denote significance at 1% and 5% level respectively

Source: Author's calculations

ERM II and fulfilment of the exchange rate stability convergence criterion because the pressures on the national currency are not likely to be absorbed exclusively through exchange rate changes.[52] The coefficients of other variables in Model 4 differ only marginally from those in Model 3. Likewise, the model's goodness of fit remained almost the same as indicated by the adjusted R^2. With some exceptions regarding normality of the residuals all the models passed the diagnostic tests.

6.4 Conclusions

In this chapter, we estimated and compared EMP in eight NMS. We experimented with several modifications of the Girton-Roper model and performed a set of tests to determine the optimal EMP model specification for each NMS. Although the vast majority of existing empirical literature have used the original "restricted" version we found that is does not hold for NMS. Instead, a specification that contains changes in interest rate differential, accounts for deviation from the purchasing power parity and incorporates foreign disturbances is chosen.

The estimation results suggest that EMP in the region was significantly influenced by growth of domestic credit, the money multiplier and real domestic income. We also revealed that EMP was determined by foreign disturbances transmitted to NMS particularly through changes of the money supply in the euro area. The EMP development in individual NMS was rather heterogeneous, though some episodes and trends were shared by more countries. Above all, one can see that the EMP development stabilized after the EU enlargement in 2004; and EMP exceeding the width of the standard ERM II fluctuation band of ±15% occurred sporadically.

This finding has a strong policy implication if it is considered along with another conclusion of the chapter that EMP in NMS with a flexible exchange rate regime is not sensitive to its distribution on individual components. The chapter confirms that EMP in these countries was equally absorbed by exchange rate and international reserves. Hence, one can expect that EMP during the period of participation in the ERM II would not be absorbed by substantial exchange rate changes, thus endangering fulfilment of the exchange rate stability convergence criterion.

[52] See e.g. Mirdala (2008) for more on how able the NMS monetary authorities are to manage the exchange rate development after the accession to the EU.

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6.6 Appendix

e Percentage change of nominal exchange rate. NMS national currencies vis-à-vis Euro in direct quotation (number of NMS currency units for one Euro) Obtained from Eurostat's Economy and finance database (EEF) section Exchange rates and Interest rates, line Euro/ECU exchange rates – Quarterly data. Logged values.

r Proportional change in domestic international reserves. Obtained from IMF's International Financial Statistics. The change in reserves = minus 'financing of the balance of payments' (IFS line 79 dad) deflated by the seasonally adjusted inherited money base (IFS line 14).

d Proportional change in domestic credit. Proxied by the percentage change of the seasonally adjusted money base (IFS line 14) minus r.

y Annual growth rate of the domestic permanent income. Permanent income calculated as two-year moving average of logged values of Gross Domestic Product (IFS line 99bp).

p^* Percentage change in foreign price level. Eurozone Harmonized indices of consumer prices Obtained from EEF section Prices, line Harmonized indices of consumer prices – Monthly data (index 2005=100). Converted from monthly to quarterly data by averaging the three monthly figures and then logged.

m Percentage change of money multiplier. Multiplier calculated as ratio of M2 aggregate on money base. M2 obtained from NMS central banks' databases or IFS line 34 + IFS line 35; and money base from IFS line 14.

i^* Percentage change in the euro area 3-month interbank market interest rate. Interest rate obtained from IFS line 60b.

s^* Percentage change of the euro area money supply. Money supply obtained as the sum of logged values of demand deposits (IFS line 34), deposits of agreed maturity (IFS line 35a) and deposits redeemable at notice (IFS line 35b).

y^* Annual growth rate of the euro area permanent income. Permanent income calculated as two-year moving average of logged values of Gross Domestic Product (IFS line 99bp).

q Differential of the domestic inflation rate from the purchasing power parity condition. Obtained by subtracting the sum of the euro area inflation rate, CPI (IFS line 64) and e from the domestic inflation rate measured by CPI (IFS line 64).

n Difference between the percentage change in the domestic money market rate (IFS line 60b) and the percentage change in the euro area 3-month interbank market interest rate (IFS line 60b).

7 Impact of the World Economic Crisis upon Measures of Convergence and Preparedness of the Candidate Countries to Join the Eurozone: Are We Better Prepared for the Euro?

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7.1 Introduction

Since the European Union enlargement in 2004 the new EU member countries solve the problem of an appropriate timing of joining the Eurozone. All new member countries accepted the obligation of fulfilling the Maastricht criteria and forthcoming adoption of the common European currency. No opt-out clause is allowed in case of new EU member countries. Apart form the official convergence criteria mentioned in the Maastricht treaty; the candidate countries also use alternative tests of convergence and preparedness to join a common monetary union. The current discussion on timing of Euro adoption in the candidate Central and Eastern European countries (CEECs) is based on the evaluation of traditional Maastricht criteria as well as the alternative similarity and convergence criteria mostly defined in the context with the theory of optimum currency areas (OCA). This theory proposed by the Nobel Price Laureate Robert Mundell in his classical article from 1961 defines the characteristics of optimum currency areas determining an effective formation of a common currency area. Besides Mundell, the list of original OCA characteristics is enhanced by the other authors and pioneers of this theory such as McKinnon (1963), Kenen (1969) or Ingram (1962). A latter approach to OCA theory called the "New Optimum Currency Areas Theory" (Mongelli, 2002) brings other characteristics including business cycles similarity, a/symmetry of shocks. High long-term similarity of business cycles reduces the risk of potential asymmetric shocks and also decreases the significance of an autonomous monetary policy in an acceding economy.

The business cycle similarity and convergence measures are currently used by the central banks, government institutions and academic researchers to give some evidence of the continuing economic and monetary integration process. The studies on business cycles similarity also provide arguments for the policy makers to discuss the timing of the Euro adoption in the candidate countries. A majority of the studies use some form of correlation of stylised economic activity time series to measure the cycle similarity.[53] Fidrmuc and Korhonen (2006) provide an overall literature analysis of the business cycle correlation literature. Apart from correlation methods there are also studies using the alternative approaches to the business cycle synchronicity measuring. Harding – Pagan (2006), Artis et al. (2004) or Rozmahel (2009) measure the concordance index of selected European countries. The index defined by Harding-Pagan (2002a) measures the fraction of time the cycles are in the same phase (Harding-Pagan, 2002). The concordance technique requires applying of some business cycles dating rules to identify the turning points and phases of cycles.[54]

A variety of studies measuring the business cycle similarity in the past decade provide many results of actual synchronicity or convergence trends in the European economies. However, many of them bring different and rather spurious results. Firstly, it is obvious that the selected indicator, time frequency of input data, detrending techniques or similarity measure can influence the results. Secondly, the final economic interpretation of the numeric results usually suffers from missing mention of the context with the used methodology as well as the subjective interpretation by the author. The OCA theory does not specify what exact techniques to use to measure the defined characteristics. Therefore, one might ask: Do the Central and Eastern European (CEE) economies really converge to the Eurozone and how similar they actually are? How reliable are the interpreted results?

A current global economic crisis seems to revive the discussion on the Eurozone enlargement in these days. Many countries like the Czech Republic and Hungary had to revoke and postpone their planned terms of joining the Eurozone. It is mainly due to worsening the fiscal positions of the candidate countries. However there is still an interesting question. What are the results of the alternative OCA criteria for joining the

[53] See e.g. Artis – Zhang (1997, 1995), Boone – Maurel (1998), Inclaar – DeHaan (2001), Boreiko (2003), Backé (2004), Darvas – Szapáry (2004).

[54] For explorations of dating business cycles dating rules see Canova (1999) or Harding – Pagan (2002a).

Eurozone by the candidate CEE countries during the crisis time? Many of the criteria are based on the principle of measuring the economic similarity. During the global crises majority of developed economies come through a similar phase of the business cycles decline or stagnation. In this sense their economic performance can become more similar. Can it influence the business cycle similarity tests defined in the frame of the OCA theory?

Accordingly, the main goal of the chapter is to shed some light on possible impact of the global economic crisis revealed as the aggregate economic activity downturn upon the measures of preparedness of the candidate countries to join the Eurozone. In particular the impact of the global recession on the measures of business cycles similarity in the European countries is analysed. The results of the analysis should contribute to a discussion on reliability and significance of the OCA criteria in the process of Eurozone enlargement. The chapter is structured as follows. The following part describes used methodology and data. Third chapter presents the results of the analysis including the descriptive statistics of analysed time series and results of business cycles correlations. Particularly, cross correlation for the whole analysed period and selected consecutive periods are used. In the fourth part the problems of analysing regional GDP similarity or shock asymmetry are discussed. The conclusion follows as the final part.

7.2 Methodology and Data

Input data contains seasonally adjusted time series of quarterly gross domestic product (GDP) in 1996–2008 (descriptive statistics) and 1996–2009 (correlation analysis) provided by the Eurostat database source. The selection of Central and Eastern European countries (CEECs) covering Hungary, Poland, Slovakia, Czech Republic and Slovenia was made in relation to former intensive economic and political relations as well as to a similar position at the beginning of the transformation period in 90's. Although Slovenia and Slovakia have joined the Eurozone since 2007 and 2009 respectively, they were the candidate countries during most of the analysed time period and it is useful to compare the similarity and convergence trends with the other CEECs. The selection of the Eurozone member countries includes dominant Germany, France and periphery economies with relatively lower GDP per capita such as Spain, Portugal and Greece. The sample of EMU member countries finally includes Austria, which is structurally similar to the majority of selected

CEECs, and formerly dynamically growing Ireland. The Eurozone GDP average was the reference benchmark in the analysis.

From a technical point of view on the business cycles identification process the economic literature distinguishes between the classical and growth (deviation) business cycles. The classical approach defines a business cycle as cyclical fluctuations covering the decline and growth in an absolute level of aggregate economic activity of a nation (Burns – Mitchell, 1946). The growth cycles are considered as an alternative to the classical cycles. The growth (deviation) cycle specifies business cycles as cyclical fluctuation in the cyclical component of an economic variable around its trend (Lucas, 1977). The later approach therefore needs the application of selected time series detrending techniques.

The classical approach to the business cycles identification was used in the analysis. Accordingly, the natural logarithms of quarterly GDP indicator were stylised with the first order differences procedure (FOD).

The technique of cross correlation was used to measure the actual similarity and the convergence trends when applying correlation in two consecutive time periods. To analyse a possible impact of the global economic downturn on the convergence measures, the correlation analysis in two consecutive periods was done for the whole analysed data period 1996–2002 and 2003–2009 in the first phase. In the second phase, the crises period, in which majority of the countries shared the same phase of the cycle was cut off. Thus the following correlation analysis covered the consecutive periods of 1998–2002 and 2003–2007.[55]

7.3 Results

7.3.1 Descriptive Statistics

The input data of descriptive statistics comprises the first log difference of seasonally adjusted quarterly GDP (Table 27). Descriptive statistics allow measuring the average quarterly growth rate (in percentage), standard deviation indicating volatility of the cycles, minimum and maximum rate. The normalised deviation denotes the relative volatility comparing to the Eurozone average. Comparing to the 0.5% average quarterly growth rate of the Eurozone average (0.35 in Germany), the CEE

[55] We assume 2008–2009 as the crises years since the data for 2010 were not available at the moment of publishing the study.

	Mean	Median	St.deviation	Norm.st.dev.	Min	Max
AT	0.0059	0.0066	0.0033	0.5823	-0.0019	0.0114
GER	0.0035	0.0035	0.0067	1.1752	-0.0213	0.0159
EUR	0.0054	0.0051	0.0057	1.0000	-0.0161	0.0284
FRA	0.0050	0.0053	0.0044	0.7796	-0.0112	0.0126
ESP	0.0084	0.0090	0.0041	0.7150	-0.0098	0.0153
POR	0.0048	0.0042	0.0076	1.3260	-0.0159	0.0210
IRL	0.0133	0.0127	0.0233	4.0910	-0.0741	0.0722
GRE	0.0096	0.0093	0.0041	0.7177	0.0006	0.0183
CR	0.0075	0.0095	0.0074	1.2904	-0.0109	0.0214
HU	0.0087	0.0102	0.0053	0.9372	-0.0118	0.0158
POL	0.0108	0.0121	0.0115	2.0105	-0.0324	0.0598
SLO	0.0098	0.0097	0.0105	1.8457	-0.0419	0.0390
SVK	0.0125	0.0129	0.0162	2.8428	-0.0341	0.0674
EE	0.0147	0.0184	0.0166	2.9196	-0.0442	0.0505
LT	0.0147	0.0173	0.0125	2.1979	-0.0229	0.0390
LV	0.0140	0.0191	0.0217	3.8058	-0.0524	0.0617

Table 27 Descriptive statistics of GDP growth in Eurozone members, CEE and Baltic countries

Note: First log differences of seasonally adjusted quarterly GDP in 1996–2008. Two members of CEE-5 (SLO, SVK) already adopted the Euro.

Source: Eurostat, author's calculations

as well as Baltic countries could be considered as converging economies. Czech and Hungarian Economies raised by 0.75 and 0.87 respectively in the analysed period (finishing with 2009). In addition to that, Poland and Slovakia overreached 1% GDP quarterly increase in average. Also dynamically growing Ireland and Greece show significant real convergence to the average. Normalised standard deviation depicts Hungary as the less volatile CEE economy closely to the Eurozone cycle volatility. Also growing Ireland reveals high GDP growth volatility.

7.3.2 Business Cycles Correlation

Cross correlations

In the first phase the cross correlation of the GDP cycles of was done for the whole analysed period. It covers candidate CEE as well as selected Eurozone member countries. The resultant coefficients presented in the Table 28 show the higher GDP cycles similarity among the core Eurozone countries. Naturally, these countries also reveal high correlation to the Eurozone average. Hungary and Slovenia show the highest

cross correlation coefficient to the Eurozone average and Germany respectively. It is surprising that Slovakia as the second CEE country joined the Eurozone in 2009 has the lowest correlation coefficients to the Eurozone average, Germany and other Eurozone members among the candidate countries. It gives an interesting evidence that the GDP cycle of Slovakia is characterised with a very weak level of association to the Eurozone average and could be considered as rather dissimilar. Despite weak business cycle synchronization in Slovakia to the Eurozone, Slovakia officially joined the Eurozone in 2009. Having considered low similarity of Slovakian GDP cycle to the Eurozone average during the whole analyzed period 1996–2009, one can expect that the OCA criteria had very low significance for the Slovakian policymakers in the decision on timing of joining the Eurozone.

	EUR	GER	FRA	AUT	SP	POR	CR	HU	POL	SLO
GER	0.85***									
FRA	0.77***	0.68***								
AUT	0.68***	0.68***	0.73***							
SP	0.75***	0.63***	0.74***	0.77***						
POR	0.48***	0.49***	0.51***	0.56***	0.53***					
CR	0.42***	0.52***	0.36***	0.53***	0.51***	0.21				
HU	0.65***	0.55***	0.68***	0.68***	0.86***	0.41***	0.39***			
POL	0.24*	0.21	0.32**	0.30**	0.27*	0.22	0.13	0.15		
SLO	0.64***	0.70***	0.63***	0.74***	0.67***	0.47***	0.58***	0.59***	0.16	
SVK	0.19	0.32**	0.17	0.33**	0.25*	0.21	0.50***	0.18	-0.05	0.44***

Table 28 Cross correlations of GDP cycles in the Eurozone members, CEE countries in 1996–2009
Note: */**/*** denote significance at the 10%, 5%, 1% levels.
Source: Eurostat, author's calculations

The Table 28 and Table 29 show the cross correlation coefficients of the GDP cycles in the consecutive periods 1996–2002 and 2003–2009. Increased correlation implies rising similarity of the business cycles over the two analysed periods. From this prospect we can also consider rising correlation as a mean of the real convergence since increasing similarity

in business cycles can denote deeper integration of the economies, higher bilateral trade intensity, and structure of the economy.

Looking at the resultant correlation coefficients (Table 29 comparing to Table 28) we can summarise that the similarity of the business cycles generally increased across Europe. In addition to that the coefficients reveal higher statistical significance in the latter period. In the first period only Gemany and France reveal stronger level of association to the Eurozone cycle. Correlation of the Eurozone average and CEE countries is close to zero or negative and statistically insignificant. On the contrary synchronisation of the GDP cycles increased considerably over time. It is obvious when comparing the higher and statistically significant coefficients in the Table 29 and Table 28. Rising correlation denotes increasing business cycle similarity and thus real convergence according to the OCA theory.

The convergence process is also clearly apparent in the Figure 52. The left part of the figure describes the change in the correlation coefficients of selected Eurozone member countries with respect to the Eurozone average in two consecutive periods 1996–2002 and 2003–2009 among. The right part of the panel illustrates changing correlation of the CEE

	EUR	GER	FRA	AUT	SP	POR	CR	HU	POL	SLO
GER	0.67***									
FRA	0.46**	0.27								
AUT	0.16	0.16	0.61***							
SP	0.46**	0.35*	0.65***	0.49***						
POR	0.01	0.12	0.18	0.36*	0.25					
CR	-0.09	0.1	-0.17	-0.24	-0.01	-0.14				
HU	0.1	-0.04	0.51***	0.3	0.15	-0.27	-0.17			
POL	0.14	0.07	0.33*	0.28	0.42*	0.22	-0.09	0.06		
SLO	-0.01	-0.09	0.2	0.2	0.06	-0.01	-0.24	-0.1	0	
SVK	-0.21	-0.1	-0.25	-0.21	-0.31	0	-0.09	-0.23	-0.27	-0.15

Table 29 Cross correlations of GDP cycles in the Eurozone members, CEE countries in 1996–2002
Note: */**/*** denote significance at the 10%, 5%, 1% levels.
Source: Eurostat, author's calculations

	EUR	GER	FRA	AUT	SP	POR	CR	HU	POL	SLO
GER	0.93***									
FRA	0.92***	0.84***								
AUT	0.91***	0.84***	0.78***							
SP	0.83***	0.69***	0.76***	0.87***						
POR	0.77***	0.72***	0.70***	0.72***	0.60***					
CR	0.80***	0.74***	0.72***	0.85***	0.85***	0.64***				
HU	0.77***	0.65***	0.72***	0.79***	0.91***	0.56***	0.71***			
POL	0.64***	0.57***	0.58***	0.56***	0.53***	0.45**	0.42**	0.50***		
SLO	0.89***	0.91***	0.79***	0.88***	0.80***	0.76***	0.87***	0.71***	0.49***	
SVK	0.54***	0.58***	0.52***	0.66***	0.59***	0.54***	0.79***	0.43**	0.34*	0.75***

Table 30 Cross correlations of GDP cycles in the Eurozone members, CEE countries in 2003–2009
Note: */**/*** denote significance at the 10%, 5%, 1% levels.
Source: Eurostat, author's calculations

countries and the Eurozone. The common north-eastern direction of the correlation lines denotes increasing correlation of all analysed countries in the two consecutive periods. The sharp slope implies a substantial progress in convergence which can be interpreted as an impact of fast economic and integration process in Europe. From the prospect of the OCA theory one can asses it as a significant means of improving preparedness of the candidate countries to join a common monetary union.

Having taken into account the nature of the business cycle similarity measure and the global economic crisis we should ask: Can the global economic downturn act as a common symmetric shock? Such a shock affects all countries in a similar way to slow down or decrease economic growth. Thus, the analysed Eurozone member and candidate countries share the same phase of the business cycle in the global crises period. Despite different intensity of economic decline in selected countries a common change in the GDP growth time series evolution might influence the correlation results. Paradoxically the cross correlation coefficients could increase in the crisis period which one might interpret as improving preparedness of the candidate countries to join the common monetary

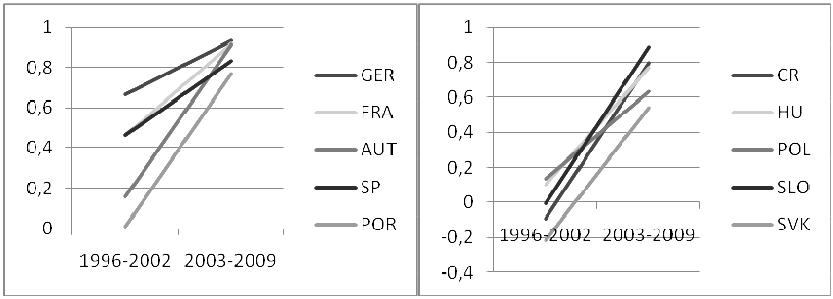

Figure 52 The convergence trends in the GDP cycles in the Eurozone member and CEE countries towards the Eurozone average in periods 1996–2002 and 2003–2009
Source: Eurostat, author's calculations

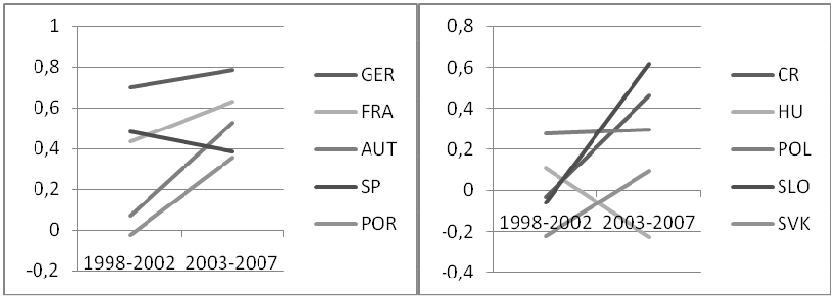

Figure 53 The convergence trends in the GDP cycles in the Eurozone member and CEE countries towards the Eurozone average in periods 1996–2002 and 2003–2007
Source: Eurostat, author's calculations

union from the OCA theory prospect. However, such an interpretation would be spurious due to a common GDP shock influence.

To test the hypothesis mentioned above we excluded the crises years 2008 and 2009 from the analysed periods. The cross correlation test in the two consecutive periods was done in the same manner as in the previous case in the periods of the same length 1998–2002 and 2003–2007. The resultant correlation coefficient change is illustrated in the Figure 53. Comparing Figure 52 and Figure 53 generally slower convergence process is obvious in the case of Eurozone as well as CEE candidate countries.

In addition to that, economies of Spain, and Hungary diverged in the analysed periods and Poland rather stagnates. The concrete values of correlation coefficients after cutting off the crisis period are included in the Table 31 and Table 32.

Totally opposite results in the cases of two countries and slower convergence process with lower reached correlation coefficients in the second period 2003–2007 after cutting the crisis years imply a possible influence of the crises on the business cycles similarity measures. Thus, the hypothesis that the impact of the crisis acting as a common shock can lead to spurious results on the business cycle convergence cannot be rejected. Accordingly, actual interpretation of the business cycle similarity in terms of evaluation of preparedness of a country to adopt the Euro must be done carefully in the context of used methodology and general economic factors.

	EUR	GER	FRA	AUT	SP	POR	CR	HU	POL	SLO
GER	0.70***	1								
FRA	0.43*	0.38	1							
AUT	0.07	0.14	0.56	1						
SP	0.48**	0.52	0.65***	0.41*	1					
POR	-0.02	0.09	0.20	0.42*	0.29	1				
CR	-0.03	0.13	0.02	-0.13	0.08	-0.12	1			
HU	0.11	0.17	0.51**	0.28	0.08	-0.22	0.20	1		
POL	0.28	0.51**	0.66***	0.43	0.63***	-0.13	0.08	0.54**	1	
SLO	-0.06	-0.17	0.16	0.28	0.13	-0.05	-0.20	-0.20	0.12	1
SVK	-0.22	-0.19	-0.24	-0.22	-0.30	-0.01	-0.11	-0.23	-0.52**	-0.17

Table 31 Cross correlations of GDP cycles in the Eurozone members, CEE countries in 1998–2002
Note: */**/*** denote significance at the 10%, 5%, 1% levels.
Source: Eurostat, author's calculations

	EUR	GER	FRA	AUT	SP	POR	CR	HU	POL	SLO
GER	0.79***	1								
FRA	0.63***	0.44***	1							
AUT	0.53***	0.36***	0.04***	1						
SP	0.39***	0.23***	0.04***	0.43***	1					
POR	0.36***	0.09***	0.10***	0.30***	-0.01***	1				
CR	0.46***	0.23***	0.12***	0.39***	0.62***	0.04***	1			
HU	-0.23***	-0.07***	-0.07***	-0.08***	0.13***	-0.02***	-0.11***	1		
POL	0.30***	0.38***	0.07***	0.13***	-0.44***	0.10	-0.14	-0.32***	1	
SLO	0.62***	0.70***	0.19***	0.43***	0.39***	0.24***	0.21***	-0.24***	0.03***	1
SVK	0.09***	0.13***	-0.11***	0.43***	0.08***	0.03***	0.15***	-0.26	0.15	0.17***

Table 32 Cross correlations of GDP cycles in the Eurozone members, CEE countries in 1993–2007
Note: */**/*** denote significance at the 10%, 5%, 1% levels.
Source: Eurostat, author's calculations

7.4 A Note on a Regional Approach to Measure the GDP and its Similarity: the Case of the Czech Republic

Integration and globalisation processes imply reducing the meaning of national economic borders and stresses the significance of regions. A possible impact of economic and monetary integration upon selected regions in the monetary union provided Krugman (1993) in his early work on the European monetary integration. He points out a problem of possible regional concentration and specialisation of production due to economic integration in Europe. This opinion was an opposite argument to the European commission presented in the well-known study One market, One Money (1991).

onsidering measuring the convergence and actual similarity of the business cycles in selected regions in Europe, one must identify the regional business cycles. To identify such cycles the regional GDP statistics is a necessary source for the analysis. The Case of the Czech Republic pro-

vides an interesting example how the methodological aspects can complicate the convergence analysis.[56]

The method "top-down" of measuring regional GDP based on counting the gross value added in individual regions (starting at the national level and coming down to the regional one) was accepted by Eurostat in 1997. Despite a numeric consistency of the national and regional accounts, the method remained criticised because it provided inaccurate results. The gross value added was allocated for the official firm domicile (usually in big cities). Thus the subsidiaries in a smaller cities and regions were allocated no value added (contribution to GDP). Accordingly, the "top-down" method overvalues the contribution to GDP by the big cities and small regions' production is undervalued[57]. In 2000 the new regional classification was established in the Czech Republic. The new regional levels NUTS 2 (Nomenclature Units Territorial Statistics) were constituted. The existing Czech counties at the NUTS 3 level were considered too small for the Eurostat statistics. Since 2000 the Czech Statistical Office has begun to count over the regional GDP for the newly established regions at NUTS 2 level.

The critique of the "top-down" method resulted in a change of the regional GDP measuring and the method of "pseudo-bottom-up" was implemented. This method include the combination of "top-down method" is still used for the financial and public sectors due to a difficult allocation of gross value added contribution by the subsidiaries. The "bottom-up" method is applied in case of productive and manufacturing units. The Czech Statistical Office is able to receive partial information from the manufacturing firms (and their regional subsidiaries) and aggregate them. However, such approach is timely consuming and still suffers with a certain inconsistency with the national accounts. The perspective of regional statistics in the Czech Republic is to use the "bottom-up" method in the financial as well as in non-financial sector as the method is considered the most accurate way of counting the regional GDP.

Accordingly, the methodological change in the regional GDP measuring during the transformation period (in 2004) decrease the reliability of data, short time series in an annual frequency available reduce an ability to analyse the business cycles similarity among the regions. Also

[56] An overall analysis of current problems and perspectives of regional GDP measuring see Nováková – Kouba (2008).

[57] It results for an extremely high value added measured in Prague and the lowest value of GDP contribution in Prague surroundings – the Central-Bohemia region.

an analysis of the contribution of the regional production cycles to the national GDP cycle is rather limited.

Considering the problems in measuring of regional GDP that can be expectable also in the case of other CEE countries we can hardly count with measuring business cycles similarity and convergence within Europe irrespective to the national borders.

7.5 Conclusions

The chapter deals with the hypothesis that the global economic crises acts as a common shock in the European economies. The global economic downturn can increase the business cycles similarity indicators, which can be spuriously interpreted as an improving preparedness tests from the prospect of the Optimum Currency Areas theory (OCA). The reason is that in the global crises times the economic growth in all countries stagnates or is negative. The affected countries likely share the same phase of the business cycle, which improves the business cycle similarity measures. However, such an improvement in the OCA tests results does not give an evidence of higher integration of the economies in term of higher bilateral and multilateral trend intensity, similar economic structures, similar policy intentions etc. Thus, we can hardly interpret it as an evidence of improving preparedness of the candidate countries to join the Eurozone.

The correlation analysis to measure the convergence tendencies among the Eurozone member and CEE countries was done in two phases. Firstly, two consecutive periods included years 1996–2002 and 2003–2009. All analyzed countries revealed strong convergence tendencies with absolutely very high correlation coefficients at the second period implying a strong association of the GDP cycles relatively to the Eurozone. In the second phase the crises years 2008 and 2009 were excluded from the analysis. Generally we can conclude that in the period before crises majority of countries revealed convergence tendencies, but weaker comparing to the results from the first phase. Two countries even diverged and one stagnated. Based on the results of this brief analysis and considering the problems with the regional GDP measuring one should interpret the OCA criteria tests in the context of used methodology and global macroeconomic factors. Particularly, the interpretation of the correlation results in terms of evaluating the preparedness of candidate countries to adopt Euro should be done carefully;

The general purpose of the chapter is not to postpone the term of the Euro adoption in the CEE candidate countries. The message of the text is to point out that one should prevent from mechanical and absolute interpretation of the OCA criteria tests without taking into account possible methodological problems and the actual macroeconomic issues influence.

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III.
Impact of Crisis Across the Economic Landscape

8 Incentives to Irresponsible Behavior and Present Crisis

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8.1 Introduction

As is told in the report of The High-Level Group on Financial Supervision in the EU (see EC, 2009): "Since July 2007, the world has faced, and continues to face, the most serious and disruptive financial crisis since 1929. Originating primarily in the United States, the crisis is now global, deep, even worsening. It has proven to be highly contagious and complex, rippling rapidly through different market segments and countries. Many parts of the financial system remain under severe strain. Some markets and institutions have stopped functioning. This, in turn, has negatively affected the real economy. Financial markets depend on trust. But much of this trust has evaporated. Governments and Central Banks across the world have taken many measures to try to improve the economic situation and reduce the systemic dangers: economic stimulus packages of various forms; huge injections of Central Bank liquidity; recapitalizing financial institutions; providing guarantees for certain types of financial activity and in particular inter-bank lending; or through direct asset purchases, and 'Bad Bank' solutions are being contemplated by some governments. So far there has been limited success."

If we want to find solutions of present economic and financial problems we need to know the sakes causing these problems. A lot of articles have been already published trying to identify sakes of present economic and financial crisis. If we make their comparison it is possible to write that present problems have many different types of sake and we cannot point one thing as main reason. This recognition is not surprising, the crisis affected many economic subjects (people, firms, states, government agencies and so on) and the sakes of problems of the each subject must be, at least slightly, different.

When we look at the crisis as a product of human behavior, it is clear that economic subjects behave in many ways and some combination of

their conducting can cause economic, financial and other problems. Almost every human action is connected with both intended results as unintended results that together could lead to crisis. However, we thing that we are able to define some sakes as more significant than others. According to our opinion, one of the main sake is irresponsible behavior of economic subjects. When some subject does not act responsibly it can easily damage not only itself but also other subjects. The damage includes economic and financial losses. And if many people do not act responsible the losses and damages can multiply and cause serious economic problems that subject, who behaved irresponsible, is not alone able to solve and serious remedies for instance government action must be done. What we see now are examples of such actions – for instance huge government spending to stabilize the financial system. However governments respond to their own mistakes as they help to create environment allowing people to act irresponsible.

The economic theory says people react on incentives. In Mankiw (2007) is written: "An incentive is something (such as the prospect of punishment or a reward) that induces a person to act. Because rational people make decision by comparing costs and benefits, they respond to incentives... Incentives are crucial to analyzing how market works... Public policymakers should never forget about incentives because many policies change costs or benefits that people face and, therefore, alter their behavior... When policymakers fail to consider how their policies affect incentives, they often end up with results, they did not intend."

In our chapter we try to summarize main reasons of more than two years lasting economic problems and show how they allowed people to act irresponsible. Our goal is to show that before year 2007, when crisis and problems started, a lot of incentives leading to irresponsible behavior existed in economic environment. We think that description of the incentives leading to such behavior must be first step. To the next steps belong the finding reasons why these incentives occurred. We can look on the incentives as a part of institutions – the humanly devised constraints that shape human interactions[58]. They can be divided into formal institutions (e.g. law and other legal acts) and informal institutions (e.g. habits, customs and so on). Institutions are always products (results) of human behavior but it is difficult to see and describe the process of creation (invention), adaptation and retention new institutions (new formal or informal norms). In some cases the process is conscious

[58] See North (1990).

– for instance when a parliament accepts a new law. On the other hand in many cases the process is the result of human actions it means the unintended or unconscious results of human behavior[59]. We emphasize the fact of unconscious creation of institutions and incentives (as a part of institutions) because we are aware that our goal to find reason for their creation can be difficult to achieve.

However we do not think that our goal is impossible. If we ask[60] "to whom some institutions help or serve or benefits from some institutions?" we can also find the reason for its invention, adaptation and retention. Of course we can be mistaken but we believe that motive of incentive must be looked and analyzed.

8.2 Expansive Monetary Policy of Central Banks

Economic theory now agrees that as a main reason of present economic problems can be identified monetary and fiscal policy that lead to the ample money creation. Generally speaking central bank, especially US central bank (FED), made after year 2001 a policy of cheap money – their interest rates were too low. For instance in EC (2009) is written: "Ample liquidity and low interest rates have been the major underlying factor behind the present crisis. Very low US interest rates helped create a widespread housing bubble." When we looked on the bubble more carefully we can see that adjusting for inflation, real U.S. house prices rose 34% during 2000–2005 (they rose 51% if not adjusted), which is more than double any five-year rate in the past 30 years[61]. Specific regions experienced even faster appreciation; in 2004 alone, housing in Miami, Los Angeles, and West Palm Beach appreciated more than 20% and Las Vegas appreciated 35%.

Another author emphasizing the role of low interest rate is for example: Taylor (2009): "Monetary excesses were the main cause of the boom. The Fed held its target interest rate, especially in 2003–2005, well below known monetary guidelines that say what good policy should be based on historical experience. Keeping interest rates on the track that worked

[59] For instance shaking hand in the case of greeting and send off is institution (habit) that developed unconsciously. Some people started to shake hand in the case of this events and other follow. No body ordered shaking hand as a duty. However using shaking began to be considered as a habit and may be a sign of peaceful intentions.

[60] In Latin: "Qui bono?"

[61] For details see for instance Geter (2007).

well in the past two decades, rather than keeping rates so low, would have prevented the boom and the bust. Researchers at the Organization for Economic Cooperation and Development have provided corroborating evidence from other countries: The greater the degree of monetary excess in a country, the larger was the housing boom."

Boeri and Gusio (2007): "The monetary policy of low interest rates – introduced by Alan Greenspan in response to the post-9/11 recession and the collapse of the new economy 'bubble' – injected an enormous amount of liquidity into the global monetary system. This reduced short-term interest rates to 1% – their lowest level in 50 years. What's more, Greenspan spent the next two years maintaining interest rates at levels significantly below equilibrium. Interest rates were kept at low levels for a long time, and were often negative in inflation-adjusted terms. The result was no surprise. Low returns on traditional investments pushed investors and lenders to take bigger risks to get better returns. Financial intermediaries, in search of profits, extended credit to families and companies with limited financial strength. Investors with varying degrees of expertise duly reallocated their portfolios towards more lucrative but riskier assets in an attempt to increase their wealth and preserve its purchasing power. The low borrowing rates for both short and long-term maturity attracted throngs of borrowers – families above all who were seduced by the possibility of acquiring assets that for had always been beyond their means. At the same time, house prices soared, ultimately encouraging the additional extension of credit; the value of real estate seemed almost guaranteed."

So, why central banks, especially FED, made the policy of cheap money? The policy responded to the economic slowdown in the year 2001. The US GDP decreased first two or three quarters of this year. Events of 11th September 2001 increased uncertainty about other economic development. In such case, the central bank decreasing of interest rates belongs to the logic step how to fight with recession. However it seems that the interest rate was too low too long time. Even in year 2001 the US GDP totally grew – the growth was slight but positive (so the decline GDP in the first two or third quarter was offset by growth in the end of the year). After year 2001 the growth continued and was quite good. Productivity growth was also unusually high – in 2002 a 2003 was about 3.7%. However the growth of GDP and productivity was not accompanied by decreasing of unemployment in this time. The reason is simple – many firms and consumers had turned skeptical of the continuing New Economy and despite the good news on the growth of the US GDP and

productivity, they did not want same mistakes as in 1990s when firms increased employment and consumers increased consumption. As a result there was insufficient boom in investment and consumption and demand and output growth were not sufficient to increase employment.

	1993	1994	1995	1996	1997	1998	1999
GDP (Annual % change)	2.852	4.074	2.515	3.741	4.457	4.355	4.826
Inflation (Annual % change)	2.970	2.596	2.805	2.937	2.338	1.547	2.193
Unemployment (% of total labor force)	6.908	6.100	5.592	5.408	4.942	4.500	4.217

Table 33 Main US economic indicators 1993–1999
Source: International Monetary Fund, World Economic Outlook, October 2009, www.imf.org

In previous paragraph we mentioned the term "New Economy". The term is used for the period of the second half of 1990s when growth of US GDP was high, unemployment and inflation was low. It was little surprising as period of high GDP growth was usually accompanied also by increasing of inflation. Some economic theories published at that period told that this rule (growth of GDP leads to higher inflation) will valid never more and that economy came to the new period[62] where both inflation and unemployment are low. However the rational explanation of the New Economy period is quite simple: positive supply shocks occurred between years 1996–2000 in the US economy. Yes, aggregate demand was quite high – in the AS-AD model the aggregate demand curve (AD) moved to the right as usual. Due to positive supply shock the aggregate supply curve (AS) moved to the right more than it would be in "normal" years. So the possible increase of price level (inflation) caused by AD movement was offset by higher AS movement. The movement of AS curve caused that the price level did not rise. However the positive supply shock did not take without end. It ended in 2001, when investments declined and due to their declination also productivity failed. The result was 2001 recession[63].

The low unemployment occurred in New Economy period, however, started to be taken as something usual. The increasing of unemployment

[62] The new period is reason for calling it New Economy.
[63] The more detail description of reason of the recession in the year 2001 can be found for instance in Blanchar (2009).

between years 2001–2003 was taken as something unacceptable and FED was under strong pressure to fight with increasing unemployment. However, it seems that the US rate of unemployment in the second half of 1990 was under the natural rate of unemployment[64]. So the increasing of unemployment after year 2001 can be seen as a logic and normal process when the rate of unemployment returned to its natural level. We recognize hurtfulness the process – increasing of the US unemployment about 1 percentage points means that the number of unemployment people increased about 2 million people[65]. That actual US unemployment in 2003 was 5.9% – it seems to be about 1 percentage points about the US natural level. In such case the policy of low interest rate belongs to the inadequate remedies, unemployment could be reduced by different steps. The US authorities chose simple and visible solution and did not think over possible negative effects connected with the solution. Generally speaking, the government concentrated on visible effects and did not concentrate on non-visible effects. Such mistake is made quite often and is described in literature[66].

Recognizing above mentioned facts we think to the both practical and theoretical economic problems belongs discussion about freedom of central banks to determine interest rates. Generally is agreed the central bank must be independent from government and must be able to respond to the actual economic development. To the used devices of central bank belongs also freedom in increasing and decreasing interest rates. We do not support reducing the freedom. We do not, for instance, agree with opinion that central banks should always follow strict rule[67]. The economic environment always changes. Although some situations in different time period can be seen as same (for instance the rise of unemployment) it can be cause by different factors – for instance in one period decrease consumption and in second period the negative supply shock occurred. Following strict rule does not allow responding to the different

[64] It is necessary to emphasize that no exact number is assigned to the natural rate of unemployment. However many economists believe, and also in the present US official government reports is written, the natural rate of unemployment is the USA slightly above 5%. For detail see Baumol and Binder (2006). If we consider 5% as the natural rate of unemployment it is possible to write that in the end of New Economy period the actual rate of unemployment was under natural rate.

[65] The number is estimated on the development of the number US unemployed between years 2000 and 2003. For detail see Abel, Bernanke, Croushore (2008).

[66] See Bastiat (1877).

[67] Quite simple rule can be described for instance: if real GDP decreases about 1 percentage point, central bank must decrease interest rate about 0.5 percentage points.

events and can cause more serious problems than independence of central banks. However we think that decision of central bank must be put under stronger public control. It must be discussed possible effects of the central banks decision. May be, in strict defined case, some body should have right to ask the central bank to change its decision (for instance to increase too low interest rates). But central bank has no duty to meet such demands.

From our point of view it is necessary to discuss about control of central bank. We do not want to reduce independence and freedom of central bank. But if central bank makes a wrong policy it can cause serious problems. People respond to such policy[68] and can behave irresponsibly. As is mentioned above present crisis can be seen as the result of central bank low interest rate policy. So some control of central bank that does not threaten the independence of central bank has its sense and possible organization the control should be discussed.

8.3 Support of US Mortgage Market

The low interest rates alone could not cause problems on mortgage market. Economic theory says: if the interest rates are tow low and the growth of money is higher than growth of gross domestic product (GDP) the county should suffer from inflation. However if we look at the inflation value in the USA between 2001 and 2007 (see Table 34) there is no sign of inflation. The growth of consumer price index was not yearly higher than 2.5%. The reason of such development includes several factors. First amply money were used only in some sectors such housing construction. The higher demand for houses, flats ant other kinds of real estates lead to the growth of their prices (see above). However the increase was offset by decline of other price such as oil and other raw materials.

Why people started to invest into real estate? The answer is due to political reason. There was strong political pressure on the US government sponsored entities (GSEs) like Fannie Mae and Freddie Mac to promote home ownership for low income households aggravated the situation. Some acts as Community Reinvestment Act, which was already accepted in 1977, in fact ordered banks to lend the people who, from the point of view of the banks, have not enough money for paying. As

[68] The policy is an example of an incentive.

	2000	2001	2002	2003	2004	2005	2006	2007
GDP (Annual % change)	3.7	0.8	1.6	2.5	3.6	2.9	2.8	2
Inflation (Annual % change)	2.2	2.1	1.5	1.8	2	2.3	2.4	2.2
Unemployment (% of total labor force)	3.9	4.7	5.7	5.9	5.5	5	4.6	4.6
Interest rate (in bracket month)	6.50 (5)	6.00 (1) 1.75 (12)	1.25 (11)	1.00 (6)	2.25 (12)	4.25 (12)	5.25 (6)	4.25 (12)
M2 a M3 Annual % change)	6.2	9.6	6.5	4.5	5.6	4	5.3	5.8

Table 34 Main US economic indicators 2000–2007
Source: International Monetary Fund, World Economic Outlook, October 2009, www.imf.org. Federal Reserve, www.fed.org

the results house prices in many regions grew rapidly after interest rates declined in 2001.

When people buy real estate they usually have not enough money to pay it in advance and they must finance whole operation due to credit. Massive demand for the mortgage credit, however, affects personal saving. The saving was also used for financing of real estate purchase. As the result in the US, personal saving fell from 7% as a percentage of disposable income in 1990, to below zero in 2005 and 2006. Consumer credit and mortgages expanded rapidly. In particular, subprime mortgage lending[69] in the US rose significantly from $180 billion in 2001 to $625 billion in 2005. This process was accompanied by the accumulation of huge global imbalances. The credit expansion in the USA was financed by massive capital inflows from the major emerging countries with external surpluses, notably China.

By pegging their currencies to the Dollar, China and other economies such as Saudi Arabia in practice imported loose US monetary policy, thus allowing global imbalances to build up. Current account surpluses

[69] Subprime lending in finance means making loans that are in the riskiest category of consumer loans and are typically sold in a market from prime loans. Although there is no single, standard definition, in the United States subprime loans are usually classified as those where the borrower has a FICO score below 640. (A credit score representing the creditworthiness of a person or the likelihood that person will pay his or her debts. The FICO score is calculated statistically, with information from a consumer's credit files.)

in these countries were recycled into US government securities and other lower-risk assets, depressing their yields and encouraging other investors to search for higher yields from more risky assets. In this environment of plentiful liquidity and low returns, investors actively sought higher yields and went searching for opportunities. After year 2001 when interest rates became low and due to inflation real interest became negative many companies entered the market allowing modest subprime rates to flourish. Traditional lenders were more cautious and historically turned away from their traditional borrowers to potential borrowers with impaired or limited credit histories. Pegging currency of China and other countries to Dollar was also one reason for low inflation in the USA. Many products made in the USA are made from raw materials and intermediate products imported from these countries. Due to pegging the imported price could be low and did not cause the increase of the final products price. So the US inflation did not rise.

In retrospect, it appears that easy credit and underestimation of risk were not confined to the mortgage and other market. Spreads between risky corporate debt (such as junk bonds issued to finance takeovers) and safe obligations like U.S. Treasury securities were very low by historical standards – investors were willing to take risks without demanding correspondingly high interest rates in return. With both stocks and traditional fixed-income markets producing low yields after 2001, pension funds and other institutional investors were driven by their actuarial needs and competition to seek out higher-yielding investments, creating a market for hedge funds and other investment managers using exotic and complex securities and strategies. Long-term rates did not rise much even after the Federal Reserve began raising the federal funds (overnight) rate in 2004, implying that the market anticipated a plentiful supply of credit to continue into the future. This perception may have encouraged the overuse of leverage, or borrowed money, to boost returns.

It is clear that many people did not take a mortgage loans with some incentives. Above mentioned examples show that government wanted poor people to have opportunity to live in their own real estate (flat, house and so on) and made a lot steps to enable it. Some of these steps have a long history[70]. It can be written, that (at least) after 1970, each government, both democrat as republican, supported mortgage loans to people with low income. The goal to give (almost) all people opportunity

[70] For instance: Fannie Mae was established in 1938 as part of Franklin Delano Roosevelt's New Deal in order to facilitate liquidity within the mortgage market.

to live in own real estate looks like very magnanimous however without other step can make more danger than utility. First people with low income have also higher probability not to pay the mortgage credits and principal even if they are also low. The people are more likely to lose their job or have other problems not allowing their payment.

As a lesson can be written that low credit must be accompanied with efforts to give the people skills, knowledge in order that people would be able to increase their income. However such effort costs more and is not connected with clear direct and quick success. Nobody can guarantee that development of skills, knowledge always leads to higher income. The support of low credit is easier and looks costless too. Again, it is possible write: the low credits are more visible. The theory of public choice offers simple explanation why governments (or better politics) make such steps – they believe the people who are by such steps supported, will elect politics as the authors of the steps. However without other steps simple policy can cause serious economic problems. The critical point theory says: if support oversteps some amount (critical point – it can be defined as the number of given loans, the total value of loans and the structure of loans and so on) the support become counterproductive, danger and harmful. It seems the critical point of mortgage loans in favor of people with low income was overstepped in year 2005 or 2006 and led to the present problems.

In the introduction of our chapter we cited Mankiw (2007): "When policymakers fail to consider how their policies affect incentives, they often end up with results, they did not intend." We think the policy supporting lending money to the people with low income in order to be able to buy real estate is good example of unintended results of incentives[71]. To the unintended results of the policy belongs that many debtors failed to pay their debts. The failures can be signed as one reason of present economic problems. As in case of central bank we see that the freedom and power of government to support some projects and goals can be danger. So again we would like to emphasize the necessity to discuss possible confine such freedom and power. We admit that we do not know solution yet[72]. We are also aware that opinion: "government power should be reduced and controlled" will be criticized as many people derive advantage from the power. But the process of reducing and controlling government power to give some people support without other steps continues the

[71] Such policy can be signed as a incentive.

[72] Finding a solution is not, however, the aim of the chapter.

general process of reducing or controlling government power. 300 years ago people in many states had much less opportunity and possibility to control government, to discuss his steps, bills and so on. Now a person can oppose government decision, can sue government or make other steps reducing the possibility of government to determine the rights, abilities and duties of the person. We think that control of government should be extended on the case when government makes bad policy and other examples. The task of economic or social theory is to find appropriate instrument for that. We repeat here: if government does not offer people bad incentives, people do not respond to such incentives.

8.4 Flexible Interest Rates, Rating Agencies and other Sakes

One of the reasons of the problems on the house and mortgage market can be defined as non-willingness of households to pay their loans. The theoretical literature[73] suggests that the likelihood of a household defaulting on its mortgage depends on both its willingness to keep up with loan repayments and its ability to do so. For instance, mortgagors may be willing to continue making mortgage payments but sudden drops in income or rises in mortgage payments could limit their ability to do so. This particularly happens when the mortgagor also has unsecured debts or low savings. Empirical studies[74] have found that a combination of measures of willingness and ability to pay is required to explain households' mortgage default rates. For willingness to pay, the level of undrawn housing equity has been found to be an important factor. The large fall in house prices since their peak[75] in October 2007 is likely to mean that some households find themselves with less unused housing equity to draw from to supplement shortfalls in labor income. Some households will find themselves in negative equity which might reduce their willingness to keep up with their payments.

Main objective to the saying that due to negative equity many households at the first half of 2000s were not able or willing pay their debts points at the fact that interest rates were very low at that time so the level of household debts could not be so high. As markets expect interest rates to remain low over the near future, the offsetting influence of

[73] See for instance Greenwald, Hatzius, Kashyap, Song Sing (2008).
[74] See for instance Jickling (2008).
[75] The peak occurred especially in the USA and in the UK.

interest rates on default rates should also be expected to persist for some time. This is a major difference between the current and the early 1990s recession. In those times very high interest rates added to the pressures on households. If the mortgages have variable interest rate, what was a case of the period after year 2000, households should now pay law interest. However we cannot forget that household must also pay off principal. Economic theory suggests that a number of macroeconomic variables are important drivers of mortgage arrears. Unemployment, housing equity, levels of debt and interest rates are all likely to influence the path of arrears. Other variables can offset the effect of low interest rates. If the current households' income is low and household equity due to decline of price is negative households can find difficult to pay off their debts even if the interest rates are also low. When we concentrate on the events of the first half of 2000s we cannot forget that after year of 2004 the interest rate increased, so many households had to pay for them high interests.

Before the price failing many borrowers refinanced their mortgages quickly, both because they could tap this new equity for other purposes and because the increased equity could improve their credit profile and allows them to borrow on better terms. As a result, mortgage products designed to be refinanced after a short period of time, such as so-called 2/28s, "interest only" adjustable rate mortgages (ARMs), ARMs with "teaser rates", and option ARMs[76] became increasingly popular in hot regional markets. Subprime borrowers were attracted to alternative mortgages to take advantage of growing equity's effect on their credit profile. Investors were attracted to alternative mortgages because they allowed larger purchases with less money down, often with little documentation (so-called low-doc or Alt-A mortgages)[77]. As long as house prices continued to rise, borrowers in hot markets easily refinanced their loans or sold their homes at a profit, and delinquency rates remained low. Noting low delinquency rates, more loans with lower underwriting standards began to be made. However the things change when a crisis

[76] A "2/28" is an adjustable-rate mortgage where the rate is fixed for the first two years, then adjusts for each of the next 28 years. "Interest only" ARMs have an introductory period where no principal is paid off. "Teaser rates" refer to ARMs with an introductory interest rate that is below market rates. "Option ARMs (adjustable rate mortgages)" offer homebuyers several payment options each month: interest, principal, both, or part of either.

[77] "Alt-A" most often refers to buyers who do not provide full documentation of income from traditional employment, but who would otherwise be considered prime borrowers.

comes and when people are not able to pay their liabilities. In such case lenders can afraid of future all their loans and can ask not only bad debtors but good debtors too to pay off their borrowing. If the credit rates are flexible the lenders can increase their value. But the increasing of credit rates and higher pressure for debtors to pay their debts can cause worsening of the problems.

We showed that government support to lend people with low income and wealth, generally speaking to people with higher probability not to pay off their debts. However the mortgage and other creditors were still private subjects. Their main goal should be to obtain a profit. If the debtors do not pay the creditors profit turns to negative (to lose). So creditors should take interest whether the debtors are able to pay off their debts. Why many creditors in the first half of 2000s did not care about debtors' situation? We think the main reason is due to securitization off debtors' assets and originating other investment products that seems to transfer the risk of failure to make payment on the other subjects. So first lenders were not interested on the long profit, their goal was simply give a credit and transfer the claim to another people.

The lenders behavior is quite understandable. However it can cause serious problems. As the solution is suggested interest lender on the long profit. It can be made quite simple: first lender (and second and other lenders if the claim is transferred several times) is still responsible for payment of the debts. So lenders are guarantees of the debts – if a debtor does not pay his debt, an assignee (a new owner of the claim) has rights ask the assigner (first and other lenders) to pay the debt instead of creditors.

Many of assignee bought the securitized asses due to their rating. Credit Rating Agencies (CRAs) lowered the perception of credit risk by giving AAA ratings to the senior tranches of structured financial products like CDOs, the same rating they gave to standard government and corporate bonds. The major underestimation by CRAs of the credit default risks of instruments collateralized by subprime mortgages resulted largely from flaws in their rating methodologies. The lack of sufficient historical data relating to the US sub-prime market, the underestimation of correlations in the defaults that would occur during a downturn and the inability to take into account the severe weakening of underwriting standards by certain originators have contributed to poor rating performances of structured products between 2004 and 2007. The CRAs are paid by originator (issuer) of securities and not by buyer, so they are in conflict of interests.

The issuer-pays model, as it has developed, has had particularly damaging effects in the area of structured finance. Since structured products are designed to take advantage of different investor risk appetites, they are structured for each tranche to achieve a particular rating. Conflicts of interests became more acute as the rating implications of different structures were discussed between the originator and the CRA. Issuers shopped around to ensure they could get an AAA rating for their products.

If CRAs are not responsible for their rating and bear no losses (damage), they can without hesitation give AAA or similar rating for products with high risk of failure. So CRA must be responsible for their rating. To the practical tasks belong to find schemes such responsibility – for instance[78]: if securities with AAA rating fail (the issuer is not able to pay his liabilities) CRA must pay the issuers liabilities. CRA could insurance against such risk. It can be discussed whether the insurance could not be obligatory and in such case about the amount of premium rate and other question. However these questions can be seen as a detail, main point is to enforce the principle of CRAs responsibility for their rating.

8.5 Securitization and New Financial Products

The above mentioned process means originating investment products responded to the needs of investors to find new yield investments by developing more and more innovative and complex instruments designed to offer improved yields, often combined with increased leverage. In particular, financial institutions converted their loans into mortgage or asset backed securities (ABS), subsequently turned into collateralized debt obligations (CDOs) often via off-balance special purpose vehicles (SPVs) and structured investment vehicles (SIVs), generating a dramatic expansion of leverage within the financial system as a whole. The issuance of US ABS, for example, quadrupled from $337 billion in 2000 to over $1,250 billion in 2006 and non-agency US mortgage-backed securities (MBS) rose from roughly $100 billion in 2000 to $773 billion in 2006.

If we concentrate on the mortgage market we have to admit securitization some advantages: securitization allowed mortgage lenders to bypass

[78] It is necessary to emphasize that our suggestion is really only basic suggestion and many exact rule of CRAs responsibility must be formulated in more precious way.

traditional banks. Securitization pools mortgages or other debts and sells them to investors in the form of bonds rather than leaving loans on lenders' balance sheets. The MBS market developed in part because long-term fixed rate mortgages held in banks' portfolio place banks at significant risk – if current interest rates for deposit rise, the banks' interest costs for deposit could exceed their (fixed) mortgage interest earnings. This was the problem behind the savings and loan crisis in the 1980s: inflation and rising interest rates required lenders to pay their depositors more than they were earning on their fixed-rate mortgage assets.

MBS were also popular with investors and banks because it allowed both to better diversify their portfolios. But because the MBS market was growing rapidly in size and sophistication, accurate pricing of its risk was difficult and could have been distorted by the housing boom. The growth of securitization meant that more loans could be originated by non-bank – securitization generally meant that non-banks needed to obtain financing only until a mortgage was sold on the secondary market, so deposits were not needed to finance mortgages. However many non-bank firms are not subject to examination by federal bank examiners and not subject to the underwriting guidance's issued by federal financial regulators.

A lot of papers[79] were written about potential danger of new investment products. We think the main problems lie in the fact that new products were heavily unregulated. There were no or insufficient limits on their amount, leverage and so on. For instance Commodity Futures Modernization Act accepted in year 2000 allowed financial derivates not to be subject of regulation. However financial subject under regulation (banks, investment funds, insurance companies and so on) could issue these products, buy then, speculate for their rise or bear and so on. To make the situation worse, the products did not have to be in balance sheets of their issuers and buyers. The uncertainty how much risk assets were issued how much such assets was bought by specific investors increased the interest rates. And the increase caused inability of many debtors to pay their debts. The financial market is based on trustworthiness. If creditors and debtors or other subject do not trust each other the number of loans decline, the interest (spread) rates increase, the condition for borrowing strengths and the number of borrowing failure rise.

[79] See for instance European Comission (EC 2009).

In principle the solution can be simple – all assets must be included in balance sheet. The leverage ratio must be, at least in case of some investors, reduced. It seems curious that the leverage instruments were used in the case of mortgage credit. The credits should be based on the long relationships, stable conditions, not too often changes. In such case the probability of payments is quite high. On the contrary, if the conditions of loan change too often and too much the probability of failure rise. The high leverage ratio is usually explained as the result of the market condition (see bellow). This relationship is logic but we offer also reverse causality: if the leverage ratio is high the yield product rate must be too volatile. Only if the volatility is high the investors' yield can be high too. However, as we just mentioned, such products should not be too volatile. So the regulation of leverage ratio in the case of some financial subjects or products seems to be good tools how to reduce possible crisis.

The situation on the US house and mortgage market has changed from the second half of year[80] 2007. We think that the problem cold not be so severe. A financial market needed adjustment however the adjustment did not need cause widespread disruptions. Lenders could easily tighten their standards, debt holders could re-price their securities to reflect an updated view of risk and take the balance-sheet losses, and reckless speculators could simply go out of business, all without interrupting the mainstream of credit flows that support the global economy. But instead of such an orderly adjustment, financial markets experienced what various observers have called a rout, a panic, a crash, a bubble, or a crunch.

Of course the question is (again) why it happened? At least in the beginning of the crisis there was a little evidence that problems can be so serious. We (again) see a lot of incentives leasing to the problems. The whole answer, however, must be, from our point of view, divided into several topics, some of them were already mentioned above:

[80] As the start point of the crisis is usually told August 2007 when investment bank Bear Sterns announced loss of two its major hedge funds were more than $1.5 billion. American Home Mortgage Investment Corp, another large lender, filed at that time for bankruptcy. For the first time in present crisis some financial firms were not able to borrow money. Central banks respond to the August 2007 problems and injecting funds into their banking systems to add liquidity. For instance On Thursday 9 August 2007 the Federal Reserve's Open Market Trading Desk (the "Desk") injected $24 billion into the U.S. banking system. On Friday 10 August 2007, the Desk was putting in a total of $38 billion Dollars.

First, the MBS held by the funds had been originally classified as very safe and low-risk by the bond rating agencies. The revelation that they had lost much of their value over a very short period raised doubts about the ratings of all similar bonds, and appeared to confirm what many believed: that during the boom, many market participants had significantly underestimated the risks of lending. The announcement suggested that other holders of subprime MBS might be experiencing similar, but as yet undisclosed, losses. Thus, traders and lenders became less willing to deal with any fund or financial institution known (or suspected) to be a holder of subprime MBS. Second, the interest rates on subprime MBS were not sufficient high to provide the kind of returns that hedge fund and other investors expect. Therefore, the risk investors (especially hedge funds) commonly use leverage (borrowed funds and derivative instruments) to boost returns. This means that losses in hedge funds are not only a problem for their investors (who by law must be wealthy individuals or financial institutions presumably able to bear risk and loss) but for their creditors and counterparties as well. For instance first US investment bank that came to the problems in present financial crisis[81] Bear Stearns had borrowed about $6 billion from other firms, including Merrill Lynch, Goldman Sachs, Bank of America, and Deutsche Bank). Since investments of hedge funds and other risk investors are unregulated or insufficient regulated and do not disclose their sources of funds, this created uncertainty about which firms were exposed to credit risk from the investors. To worsen the situation many derivatives markets, where these investors operate, are also unregulated, which means that the identities of a hedge fund's counterparties are not widely known. Thus, announcement of some investor about his problems led many to infer that other similar investors were likely facing same difficulties (which proved to be the case) and raised uncertainty about which associated brokers, lenders, and derivatives dealers might also face losses.

When we recognize above described fact, it is not surprising that their result was credit crunch. Recognizing the situations on the market lenders were willing to lend money or to incest into securities only if the yields are, due to higher risk, high too. Suddenly some firms were able to borrow and investors were able to sell certain securities only at prohibitive rates and prices, if at all. The liquidity crunch was most extreme for

[81] To be exact: the credit was given to the hedge funds owned by Bear Stearns. However at the end the problems hit not only the funds but the owner. It is good example how the financial market is connected and possible negative results such connection.

firms and securities with links to subprime mortgages, but it also spread rapidly into seemingly unrelated areas. The main credit crunch occurred after the failure of Lehman Brother, but many financial subjects have problems to obtain money without prohibitive rates from the second half of 2007. Tightening credit availability contributed to a marked slowdown in lending growth in the major economies. In the United States lending began to fall. Lending also slowed sharply in the euro area, Japan and in the United Kingdom. Tighter credit conditions compounded the impact of the macroeconomic slowdown on indebted households. This reinforced and broadened an adverse feedback cycle between the real economy and financial system during the latter part of 2008 and the early months of 2009.

Third, in the USA housing problems was in 2007 and seen as a result different sakes and it was thought that common action or common solving is not necessary because different sakes need different solving. For instance, in some states in the Midwest and along the Gulf Coast, high delinquency and foreclosure rates reflected weak economies or the continued aftermath of the hurricanes. This was a traditional problem, in which the causality ran from the economy to housing. The other problem was found in states that were on the downside of housing bubbles, notably Arizona, California, Florida, and Nevada. In these areas, foreclosures reflected the steep declines in house prices and limited availability of credit for marginal buyers, which together put at risk subprime borrowers who had bought homes in 2004 to early 2007 in the expectation that rising home prices would give them equity with which to refinance out of a subprime adjustable rate loan.

Fourth, although there was not common opinion how serious housing and subprime problems is, the problems were widely anticipated at least till the second half of 2007. The housing and mortgage problems were underestimated but anticipated[82]. But subsequent spread of turmoil into many seemingly unrelated parts of the global financial system was not anticipated at all.

[82] As the start point of the crisis is usually told August 2007 when investment bank Bear Sterns announced loss of two its major hedge funds were more than $1.5 billion. American Home Mortgage Investment Corp, another large lender, filed at that time for bankruptcy. For the first time in present crisis some financial firms were not able to borrow money. Central banks respond to the August 2007 problems and injecting funds into their banking systems to add liquidity. For instance On Thursday 9 August 2007 the Federal Reserve's Open Market Trading Desk (the "Desk") injected $24 billion into the U.S. banking system. On Friday 10 August 2007, the Desk was putting in a total of $38 billion Dollars.

Generally speaking it is not surprising that problems of financial sector affected other sectors. However the dependence is mutual. If non-financial firms fare badly when financial firms are not doing well, one can easily imagine a reverse causality story. Non-financial firms are usually financed by financial firms. When non-financial firms suffer losses they are not able to pay their loans and financial firms have also problems. On the other hands, if financial firms are not able or willing to lend non-financial firms, financial firms have problems to manager their activities. The general mutual dependence can be seen in much concrete forms. For instance, an increase in liquidity constraint can be associated with an additional fall in the stock price. The reason is simple: increasing of the liquidity constraint worsen performance of a non-financial firms, so the amount of dividend per share will probably decline or, even, the probability of dividend paying will decline, so investors probably sells the share. So the problems on the mortgage and subprime sector should be anticipated to spread into other sectors. However almost nobody anticipates that the problems in some sectors are so serious a can so badly hit other sectors.

Again we can ask: why economic subject were not aware seriousness of the problem? A possible explanation says that many subjects did not understand principles of new financial products. There have been quite fundamental failures in the assessment of risk, both by financial firms and by those who regulated and supervised them. The extreme complexity of structured financial products, sometimes involving several layers of CDOs, made proper risk assessment challenging for even the most sophisticated in the market. Moreover, model-based risk assessments underestimated the exposure to common shocks and tail risks and thereby the overall risk exposure. Stress-testing too often was based on mild or even wrong assumptions. Clearly, almost nobody expected a total freezing of the inter-bank or commercial paper markets. Many subjects believed their risk model showing mitigating the risk, thank to new financial products. Diversification and securitization was thought as a miracle that able to remove risk or to restrict risk to negligible value.

This section can be concluded that human capital of many people was not sufficient to understand or to imagine the complicity of possible problems. As is written in the first section of our chapter the human behavior have both intended and unintended results. Nobody can know what happen if he makes some actions. The theory of games and other science show that contemporaneous actions of many people can cause that nobody better himself but everybody worsen himself. So problems

can occur not only in the case of irresponsible behavior but also in the case of rational behavior[83]. Rational man knows that even his rational action can cause irrational results. Rational man counts with possibility of irrational results and is prepared for it. From that point of view it seems that man do not behave rational. But the calculating all the possible results of human behavior is too costly. The results can occur only after long time and only with some probability. So although it does not seem to be rational, in fact it is rational not to think about all consequences human behavior. Of course when some negative consequence really occurs, many people are surprise and discuss why the event happened.

So we believe we cannot prevent all crises. What we can do is mitigating both the sakes as the results of the crisis. As is mentioned above, some new financial products should be more regulated. Using of the products should be connected with some conditions and duties. The people should not transfer a risk without guarantee. The significance of short run profit must not be overestimated to the prejudice of the long run profit. We should continue. However we would like to emphasize that all possible steps can only prevent some crisis or some stages of crisis. It is not possible to remove all crisis form our world. What is also necessary to say: some behavior that now seems to be irresponsible can be, in long run, accepted as responsible. So although we are convinced that before crisis many subjects behave irresponsible, some kind of irresponsible behavior is clear only later when crisis occur. Nobody can observe behavior of all people and that is why some irresponsible behavior can be hidden. Only in the case of problems (other) people start to ask what a subject did as the problems occurred.

As the logic consequence the fact emphasized in previous sentences we do not believe that government regulation can prevent all the crisis and we are not favor of enormous government regulation. Public choice theory explains the reason of government failure[84]. In our chapter is also showed that bad government steps enabled irresponsible behavior and led to the crisis. Other example will be given in the next (and last) section. So

[83] The theory of games shows many examples when situation of people can worsen. We remind here only "the bar problem" – a person want go to the bar if some number of people also go. If the number of other people who also go is too low or too high it is better for the person to stay at home. However the cost to get to know how many people visit the bar can be too high. So the person may stay at home although few other people go to the bar, or go to the bar although a lot of other people go to the bar. For details see for instance Carmichael (2005).

[84] For details see for instance Buchanan (1960).

we support the regulation but the regulation must be based not only on formal norms such as law but also on informal law such as good manners the informal business rules and so on.

8.6 Optimistic Macroeconomic Forecast

If we above told that the depth of crisis was underestimated we have also to mention that the spill-over form effect was in the beginning of crisis delayed. In the midst of the considerable pressures some important asset classes seemed little affected. Indeed, even relatively high-risk assets appeared to be immune to the initial signs of stress in the banking sector, mortgage market, and commercial paper market. Table 35 shows monthly total returns for a variety of asset classes starting in July 2007. While most assets classes had negative returns in July, the cumulative returns from July through October for all of the domestic variables, except the S&P financial, were positive. Only in November did clear signs of stress begin to appear.

	Jul 07	Aug 07	Sep 07	Oct 07	Nov 07	Dec 07	Jan 08
SaP 500	-3.1	1.5	3.7	1.6	-4.2	-0.7	-6.0
Sap Financials	-7.8	1.5	2.3	-1.8	-7.7	-5.4	-0.3
Nasdaq	-2.2	2.0	4.0	5.8	-6.9	-0.3	-9.9
Ryan Labs US Treasuries	1.8	2.3	-0.2	2.8	2.9	-0.6	3.7
Merill Lynch High Grade Corporate Bonds	0.6	1.0	0.5	0.7	1.4	0.3	2.2
Merill Lynch High Yield Bonds	-3.1	1.1	2.4	0.6	-2.0	0.3	-1.4
EMBI+	-0.9	1.6	2.4	2.6	-0.5	0.6	0.7
MSCI Europe (Local)	-3.5	-0.5	1.7	2.9	-3.8	-0.5	-11.4
MSCU EAFE (Local)	-3.2	-1.4	2.3	2.4	-4.1	-1.2	-10.9
MSCI EM (Local)	4.9	-0.9	8.4	9.0	-6.2	0.6	-12.4

Table 35 Monthly Total Returns on Various Asset Classes, July 2007 to January 2008 (%)
Source: Getter, Jickling, Labonte, Murphy (2007)

One reason for the delay seems macroeconomic condition. It is necessary to emphasize that macroeconomic condition in the period 2002 (or 2003)–2007 (beginning 2008) looked quite well. High savings in Asia contributed to low global long-term real interest rates. Cheap exports from China and elsewhere in Asia, along with growth in world trade, contributed to falls in inflation in a number of developed countries (see also above). Nominal short-term interest rates were reduced to very low levels. At the same time, economic conditions remained stable by historic standards, a period described by some as the "Great Moderation". Good economic conditions helped anchor expectations of continued stability. This, along with rising asset prices and low global real interest rates, boosted the demand for and supply of credit in a number of economies. Household and corporate borrowing rose rapidly. For instance[85] bank lending to households and non-financial companies in the United Kingdom increased from 19% of GDP in 1970 to almost 90% of GDP in 2006. We show two examples[86] of quite optimistic forecast in the second half of 2007, it means from the time when first exposures of crisis occurred and were quite visible.

For instance in World Economic Outlook from October 2007 (see IMF, 2007) is written: "The world economy has entered an uncertain and potentially difficult period. The financial turmoil of August and September threatens to derail what has been an excellent half-decade of global growth. The problems in credit markets have been severe, and while the first phase is now over, we are still waiting to see exactly how the consequences will play out. Still, the situation at present is one with threats rather than actual major negative outcomes on macroeconomic aggregates. At this point, we expect global growth to slow in 2008, but remain at a buoyant pace. Growth in the United States is expected to remain subdued. Following a weak start to 2007, the U.S. economy rebounded strongly in the second quarter, growing by 3.8 percent (annualized rate). Net exports and business investment provided a significant boost to growth, although private consumption growth slowed markedly in the face of rising gasoline prices, and residential investment continued to exert a significant drag on growth. Recent data, however, have painted a weaker picture of the U.S. economy going forward, reflecting

[85] For detail see Bank of England (2009).

[86] We can make more examples of macroeconomic underestimation of the crisis. For instance economic textbooks that were published in 2008 or even in 2009 (but the issue was written earlier) warn from possibility of US recession but believe that monetary and fiscal expansion overcome the recession.

in part the impact of the recent turmoil in financial markets. While personal consumption spending, employment, and nonresidential construction data have been solid, housing market indicators have been very weak, and consumer sentiment, the ISM business surveys, and durable goods orders all declined in the most recent readings. Against this background, the projection for U.S. growth in 2007 as a whole is unchanged at 1.9 percent, but has been lowered by 0.9 percentage point to 1.9 percent in 2008 Ongoing difficulties in the mortgage market are expected to extend the decline in residential investment, while house price declines are likely to encourage households to raise their saving rate out of current incomes and thereby dampen consumption spending. Exports, however, are expected to grow robustly, benefiting from the continued decline in the Dollar and solid growth in partner countries, and healthy corporate balance sheets should support business investment."

Although economic expectations were quite optimistic, since August 2007 the Federal Reserve has recognized deteriorating financial markets as a principal threat to the economic outlook. Despite soaring commodity prices and a falling Dollar, which would normally raise inflation fears, the Fed has eased monetary policy, reducing its target for the federal funds rate from 5.25% (the level that was established in June of 2006) to 2.25%. It has declared its willingness to provide liquidity to the financial system. In the process of reaching the lower interest rate target, the Fed, in its open market operations, buys securities from depository institutions, giving them new cash to lend. Lower rates themselves, of course, stimulate demand for credit, as more investment projects become potentially profitable once they can be funded at lower cost. In previous years, such actions appeared to be sufficient to prevent financial shocks from developing into crises. Neither the stock market crash of 1987 (where the stock market lost 23% of its value in one day), the near collapse of the Long-Term Capital Management hedge fund in 1998 (which threatened to paralyze the bond markets), the "dot-com" crash in 2000–2001 (which again erased trillions of Dollars in stock value), nor the September 2001 terrorist attacks (which closed markets and disrupted payment systems) was followed by the kind of prolonged financial stress observed in late 2007 and into 2008.

Economic theory tried to explain the events of year 2007 and 2008 by focusing on the pro-cyclical nature of leverage. The theory[87] assumes that firms prefer to maintain a more or less constant level of leverage, or ratio

[87] See for instance Greenlaw Hatzius, Kashyap and Song Shin (2009).

of total assets to capital. As the assets that make up a firm's capital base gain in value, the firm can support more assets on the balance sheet. Balance sheet expansion, in turn, involves asset purchases, boosting asset prices further. When prices are falling, however, the cycle works in reverse. As its capital loses value, the firm must shrink its balance sheet to maintain a given leverage ratio. As firms sell assets to reduce balance sheet exposure, asset prices are driven down. Because financial firms are typically highly leveraged, a balance sheet adjustment of any given size is multiplied. Some supporters of the theory assume that commercial banks have leverage ratios of about 10:1, meaning that a $1 billion capital loss requires a $10 billion reduction in their portfolio of assets, which consists primarily of loans. In other words, price shocks to a firm cause behavior that reinforces the movement of prices. Bernanke, Gertler, and Gilchrist[88] also seek a solution to the "longstanding puzzle" that large fluctuations in aggregate economic activity sometimes arise from what appear to be relatively small impulses. They describe a mechanism they call the "financial accelerator". They argue that the cost of external finance to a firm (its cost of borrowing) is inversely related to its net worth. A fall in asset prices reduces the collateral value of the firm's assets, which hinders or raises the cost of borrowing. By simultaneously increasing the need for external finance and restricting its availability, a negative shock causes the firm to reduce spending and production. As Bernanke, Gertler, and Gilchrist wrote: "To the extent that negative shocks to the economy reduce the net worth of borrowers..., the spending and production effects of the initial shock will be amplified."

8.7 Conclusions

It is possible to write that macroeconomic theory also underestimate the seriousness of the situation. It is not surprising: forecasting of the future is connected with mistake. The problem is, if other subjects trust the validity of the forecasts; do not think about possible untruth of the forecasts and not to prepare for possibility of untrue forecast. In such case people behave irresponsible. We know that nobody can order not to believe. However we think that is possible to order some subjects (as banks, investment funds and other financial subjects) to prepare for some possible bad situation. As a good example can be mentioned stress test for bank[89]. The preparation could include duty to make reserve for

[88] See Bernanke, Gertler, and Gilchrist (1996).

[89] The tests are based on the expectation of negative economic development.

possible worsening of the (both macro and micro) conditions, right to reduce the amount of credits and so on. We believe that the good mix of instrument can prevent or mitigate the seriousness of the crisis. Details are not the goal of our chapter.

Generally speaking we believe that macroeconomic environment belongs to main sakes of possible crisis. We discussed above the question of low interest rates, government pressure on the banks and other subject to give loans people with low income without other steps and so on. We think if macroeconomic environment will not offer such incentives, at least some kind of crisis do not occur or will be calm. One of the lesson of the current crisis is the economic forecast have to pay attention not only the main macroeconomic variables (such as GDP) but also have to concentrate on the microeconomic conditions. Forecasting should also offer more alternatives future development and emphasize uncertainty about future.

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9 The Influence of Official Development Assistance on Economical Development of the Selected Groups of Developing Countries around the World

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9.1 Introduction

Since the success of the Marshal Plan in the reconstruction of the Europe at the post-war period nobody doubts the significance of the development aid. This aid was the corner stone of the prosperity of the original member states of the European Union. Due to that many authors take in consideration the importance of the development assistance for underdeveloped nations and also the synergic effect on the overall economy. Another exceptionally successful example is Korea. However, the development aid has also some failures, it is necessary to mentioned the problem of former Democratic of Congo (originally Zaire) when due to the massive flow of foreign aid the personal income a possession of the head of the state has increased enormously.

There are many official definitions of the aid and also different kind of help. When we are talking about aid we also have to distinguish between official development assistance and official development finance as well as between the development aid, humanitarian aid, technical aid etc. World Bank (1998) defines the official development assistance as a subset of the official development finance and comprises grants plus concessional loans that have at least a 25 percent grant component. Another definition is by the World Health Organisation: *"Development aid or development cooperation (also development assistance, technical assistance, international aid, overseas aid or foreign aid) is aid given by governments and other agencies to support the economic, social and political development of developing countries. It is distinguished from humanitarian aid as being aimed at alleviating poverty in the long term, rather than alleviating suffering in the short term."*[90] For better understanding of the text

[90] W.H.O. glossary of terms, "Development Cooperation" Accessed 25 January 2008 (and still there in 2009!)

we are going to use the term aid instead of distinguishing between the development assistance and finance.

Ones of the very first authors who tried to deal with the impact of aid to economic growth were Harrod and Domar with the well known growth model based on savings and capital. Boone (1995) used the growth model in the connection of the public choice under alternative political regimes. His conclusion is rather alarming. His output shows that there is no connection between aid and economic development due to the not existing relation between poverty and capital shortage and the second reason is the unwillingness of the politicians to change the policies when they have guaranteed amount of aid.

Lensink and White (2001) oppose to the outcomes of the World Bank (1998) that the aid is more effective if the country has a good policy.

Probably one of the most important studies in the field of measurement of the development aid was done by Burnside and Dollar (1997 and 2000). They used the growth regression to show that the foreign aid has an insignificant effect in countries which have poor macroeconomic policies and on the other hand it leads to economic growth in countries which are capable of managing their macroeconomic policies well. Their model has been often used and also criticise by many authors though it is rather difficult to test this presumption on cross country data. Many authors have based their research on the above mentioned model. Ones of them are Hansen and Tarp (2000) whose have found out that it is the diversity of the developing countries in their natural endowments and cultural and socioeconomics characteristics which play one of the most important role in the output of the regression. Abegaz (2005) dealt with three different models of development aid and their application to African Sub-Saharan countries. His conclusion belongs between the straightforward ones. He stresses the importance of good governance and strong partnership between the donors and recipients. Another question is influence of the international organisations who are in same way responsible for development. Dreher, Sturm an Vreeland (2008) tried to find an answer on the question if World Bank decision can be influence by UN membership. They concluded that the World Bank does not fulfil its role to promote development and economic growth. They stressed the fact that these institutions are mostly driven by their major shareholders and due to that the tools being used are mostly just extended hand of the largest states. This output support the idea of Friedman (1958) who was strictly against the development aid because

of this idea the donors always use the aid to win allies. This idea was expand by Balla and Reinhardt (2008) who employ conflict as a measure of a donor's interests. Their findings show that they are some countries (such as Scandinavian countries) which try to protect neighbours instead of giving aid to the country of conflict.

Claessens, Cassiomn and Van Campenhout (2009) observe that most of the donors really care about the potential recipients as their results show that the biggest group of recipients belongs to the group of the lowest income level countries. This means that the poorer countries receive more aid. What is a problem in this tendency is the growing dependency on the aid. Many countries calculate with the aid but they cannot use it efficiently because mostly there does not exist long term aid agreements and due to that aid cannot be use for long term planning. Eifert and Gelb (2008) tried to find a solution for the unstable aid and how to deal with it. They have come with proposal based on performance-based allocation rule on a year-to year basis. Minoiu and Reddy (2009) divided the development aid into two main parts; development component which consists of growth-promoting expenditures and non-development component which includes other expenditure and they sought to find the effectiveness of the aid. They proved that some expenditure promote growth while the other have no impact on the economic development. Torsvik (2005) used Nash equilibrium and shown that cooperation between donor increase the effectiveness of the given aid.

The question is if received aid has just positive aspect or if we can find some negative evidence as well. One of them was introduced by Nyoni (1998) who modelled the influence of foreign aid on exchange rates in Tanzania. His results show that the currency of the receiving country can also depreciate under some conditions.

9.2 Aim and Methodology

The main aim of the chapter is to analyse the official development assistance (ODA). The chapter try to analyse the main development trends which have appeared in the last five decades. The main targets of the analysis are donors of the developing aid – DAC (development assistance committee) members – and on the other hand the main developing aid recipients – mainly the least developed countries. The chapter is going to find out how the official development assistance has influenced the main recipients' economies and in contrast also the ability of developed countries to provide developing aid. The chapter also analyses the

relationship between donors respectively recipient countries' GDP development and ODA value provided respectively received. The main idea is to find out if any relationship between ODA and GDP exists both in case of developed countries and developing countries.

For the purpose of our analyses we have decided to analyze the relationship between GDP and ODA. All data for the analyses were conducted in current and constant prices. The fundamental data come from OECD database and WDI database. We have used regression analysis as the basic analytical methods, elasticity analysis and basic and chain indices analysis. We also used linear regression analysis.

The correlation coefficient calculation was used for finding out mutual logical relationship.

The following relationships were defined based on confirmed mathematical and objectively logical relations between examined variables and agricultural productions. The basic mathematic-statistical methods (mainly the least square method and the multiple regression) were used for quantification.

Least square method is an approximation method. We search for such parameters of function f, where the sum of squares of calculated values variances is minimal from the measured values. The simplest type of dependency of two variables is linear measurement, which is represented by the equation of straight line in case of one independent and one dependent variable.

$$f(x) \equiv y = ax + b \tag{1}$$

where

y ... indicates dependent variable,
x ... indicates independent variable,
a ... is the gradient of line
b ... represents value of y when x is zero.

We can derive the following relationship for the calculation of parameters a and b.

$$a = \frac{n\sum_{i=1}^{n} x_i y_i - \left(\sum_{i=1}^{n} x_i\right)\left(\sum_{i=1}^{n} y_i\right)}{n\sum_{i=1}^{n} x_i^2 - \left(\sum_{i=1}^{n} x_i\right)^2} \tag{2}$$

and

$$b = \frac{\left(\sum_{i=1}^{n} x_i^2\right)\left(\sum_{i=1}^{n} y_i\right) - \left(\sum_{i=1}^{n} x_i\right)\left(\sum_{i=1}^{n} x_i y_i\right)}{n\sum_{i=1}^{n} x_i^2 - \left(\sum_{i=1}^{n} x_i\right)^2} \tag{3}$$

where:

n ... indicates the number of variable pairs which must be greater than calculated parameters, i.e. $n > 2$.[91]

Three-variable regression model is the second used method. To estimate the parameters of three-variable regression model ($Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i$). We first consider the method of ordinary least squares (OLS) and then briefly took in account the method of maximum likelihood.

The OLS procedure depends on choosing values of unknown parameters, that the residual sum of squares (RSS) is as small as possible. The most straightforward procedure to obtain the estimators that will minimize is to differentiate it with respect to the unknowns, set the resulting expressions to zero, and solve them simultaneously.

This procedure gives the following normal equations

$$\overline{Y} = \widehat{\beta}_1 + \widehat{\beta}_2 \overline{X}_2 + \widehat{\beta}_3 \overline{X}_3 \tag{4}$$

$$\sum Y_i X_{2t} = \widehat{\beta}_1 \sum X_{2i} + \widehat{\beta}_2 \sum X_{2i}^2 + \widehat{\beta}_3 \sum X_{2i} X_{3i} \tag{5}$$

$$\sum Y_i X_{3t} = \widehat{\beta}_1 \sum X_{3i} + \widehat{\beta}_2 \sum X_{2i} X_{3i} + \widehat{\beta}_3 \sum X_{3i}^2 \tag{6}$$

From equation (4) we see at once that

$$\widehat{\beta}_1 = \overline{Y} - \widehat{\beta}_2 \overline{X}_2 - \widehat{\beta}_3 \overline{X}_3 \tag{7}$$

which is the OLS estimator of the population intercept β_1. Following the convention of letting the lowercase letters denote deviations from sample mean values, one can derive the following formulas from the normal equations 4 to 6:

$$\widehat{\beta}_2 = \frac{\left(\sum y_i X_{2i}\right)\left(\sum X_{3i}^2\right) - \left(y_i x_{3i}\right)\left(\sum x_{2i} x_{3i}\right)}{\left(\sum x_{2i}^2\right)\left(\sum X_{3i}^2\right) - \left(\sum x_{2i} x_{3i}\right)^2} \tag{8}$$

[91] As defined by Červenka, 2007.

$$\widehat{\beta}_3 = \frac{\left(\sum y_i X_{3i}\right)\left(\sum X_{2i}^2\right) - \left(y_i x_{2i}\right)\left(\sum x_{2i} x_{3i}\right)}{\left(\sum x_{2i}^2\right)\left(\sum X_{3i}^2\right) - \left(\sum x_{2i} x_{3i}\right)^2} \tag{9}$$

which give the OLS estimators of the population partial regression coefficients β_2 and β_3, respectively. Having obtained the OLS estimators of the partial regression coefficients, we can derive the variances and standard errors of these estimators. We need the standard errors for two main purposes: to establish confidence intervals and to test statistical hypotheses. The relevant formula is as follows (equivalently for $\widehat{\beta}_2$):

$$se\left(\widehat{\beta}_3\right) = +\sqrt{var\left(\widehat{\beta}_3\right)} = +\sqrt{\frac{\sum x_{2i}^2}{\left(\sum x_{2i}^2\right)\left(\sum x_{3i}^2\right) - \left(x_{2i} x_{3i}\right)^2}\delta^2} \tag{10}$$

δ^2 is the homoscedastic variance of the population disturbances u_i.

$$\widehat{\delta}^2 = \frac{\sum e_i^2}{N-3} \tag{11}$$

The degrees of freedom are now $(N-3)$ because in estimating $\sum e_i^2$ we must first estimate β_{1-3}, which consume 3 df. (the argument is quite general)." (Gujarati, 1988)

The informative value of separate parameters and their demonstrability was subsequently tested through standard error in terms of the classical T-test (see for example Gujarati (1988), p. 212–217).

Quantitative characteristics of changes in agricultural exports due to a change in explanatory variables is done through the coefficients of elasticity (elasticity). This indicator expresses the endogenous variables change at one percentual change of predetermined variables. (Tvrdoň et al., 2004)

9.3 From Where to Whom and the Basic Data about Aid

Most development aid comes from the Western industrialized countries but some poorer countries also contribute aid. Aid may be bilateral: given from one country directly to another; or it may be multilateral: given by the donor country to an international organization such as the

World Bank or the United Nations Agencies (UNDP, UNICEF, UNAIDS, etc.) which then distributes it among the developing countries. The proportion is currently about 70% bilateral 30% multilateral. About 80 to 85 per cent of developmental aid comes from government sources. The remaining 15 to 20 per cent comes from private organizations such as "Non-governmental organizations" (NGOs) and other development charities (e.g. Oxfam). This is not counting remittances by individuals in developed countries to family members in developing countries.[92]

Official development assistance or official aid from the high-income members of the OECD are the main source of official external finance for developing countries, but official development assistance (ODA) is also disbursed by some important donor countries that are not members of OECD's Development Assistance Committee (DAC). DAC has three criteria for ODA: it is undertaken by the official sector; it promotes economic development or welfare as a main objective; and it is provided on concessional terms, with a grant element of at least 25 percent on loans (calculated at a 10-percent discount rate). Official development assistance comprises grants and loans, net of repayments, that meet the DAC definition of ODA and are made to countries and territories on of the DAC list of aid recipients. The new DAC list of recipients is organized on more objective needs-based criteria than its predecessors, and includes all low- and middle-income countries, except those that are members of the G8 or the EU (including countries with a firm date for EU admission). (Source OECD)[93]

In 2008, total net official development assistance (ODA) from members of the OECD's Development Assistance Committee (DAC) rose by 10.2% in real terms to USD 119.8 billion. This is the highest Dollar figure ever recorded. It represents 0.30% of members' combined gross national income. The largest donors in 2008, by volume, were the United States, Germany, the United Kingdom, France and Japan. Five countries exceeded the United Nations target of 0.7% of GNI: Denmark, Luxembourg, the Netherlands, Norway and Sweden. The largest volume increases came from the United States, the United Kingdom, Spain, Germany, Japan and Canada. In addition, significant increases

[92] OECD Stats. Portal ≫ Extracts ≫ Development ≫ Other ≫ DAC1 Official and Private Flows. Retrieved April 2009.

[93] http://www.oecd.org/document/35/0,3343,en_2649_34487_42458595_1_1_1_1,00.html

were recorded in Australia, Belgium, Greece, New Zealand and Portugal.[94]

During the last few decades the value of official development assistance, which is provided by developed countries (especially OECD members) to developing countries increased significantly. The following Figure 54 illustrates the official development assistance value development in period 1980–2007 which is provided by OECD countries.

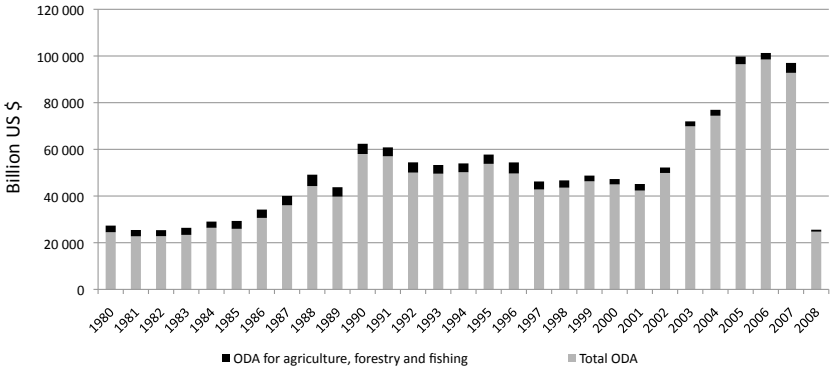

Figure 54 Official development assistance (ODA)
Source: OECD

During the last almost thirty years the value of official development assistance which is provided by OECD members increased by approximately 300%. While in the year 1980 the total value of ODA was about 25 billion USD, in 2007 it was almost 100 billion USD. Very interesting feature of ODA structure development is the fact that agriculture – one of the main parts of the developing countries' economy does not represent important part of ODA. As is perceptible from the Figure 55 the share of agricultural sector in total ODA is decreasing. While in the year 1980 the share of agriculture in total ODA value was more than 10%, nowadays it is less than 5%. The main target of current ODA assistance is the financing of the following activities: social infrastructure and services (about 41% of total ODA), economic infrastructure and services (13%), actions relating to debt (11%), humanitarian aid (8%), multisector/cross cutting (7%) and agriculture as a part of production sector (5%).

[94] http://www.oecd.org/document/35/0,3343,en_2649_34447_42458595_1_1_1_1,00.html

The fall in resources devoted to agriculture has largely been caused by the sharp reduction in external assistance to agriculture. Total official development assistance (ODA) – combined bilateral and multilateral flows – increased sharply from US$ 43,949 million in 1997 to US$ 120,942 million in 2006 (all values in current US Dollars). ODA directly earmarked for expenditure in the agriculture sector also rose, albeit more slowly, from just over US $ 3,000 million to about US $ 4,000 million in 2006. However, as a proportion of total ODA, ODA for agriculture has continued to decline, falling from 7 percent in 1997 to less than 4 percent from 2002 onwards.[95]

In 2008, total net ODA from members of the OECD's DAC rose by 10.2% in real terms to USD 119.8 billion. This is the highest Dollar figure ever recorded. Bilateral development projects and programmes have been on a rising trend in recent years; however, they rose significantly by 12.5% in real terms in 2008 compared to 2007, indicating that donors are substantially scaling up their core aid programmes. In 2005, donors committed to increase their aid at the Gleneagles G8 and UN Millennium +5 Summits. The pledges, combined with other commitments, implied lifting aid from USD 80 billion in 2004 to USD 130 billion in 2010, at constant 2004 prices. While a few countries have slightly reduced their targets since 2005, the bulk of these commitments remain in force.[96] Overall, the current commitments imply an ODA level of USD 121 billion in 2010, expressed in 2004 Dollars, or an increase of USD 20 billion from the 2008 level.[97] The current global financial crisis is having a serious impact on all countries around the world and especially those countries which are icluded aminy so called "low income countries". World trade is experiencing its largest decline since 1929 and commodity prices, particularly for the exports of low income countries, are falling. Foreign direct investment and other private flows are on the decline, and remittances are expected to drop significantly in 2009. Budgets of many developing countries were hit hard by the rises in food and oil prices in the last two years. Many countries are not in a strong fiscal position to address the current financial crisis.[98]

[95] FAO, Commodity reports

[96] http://www.actionforglobalhealth.eu/news/record_oda_levels_still_short_of_targets

[97] http://www.reliefweb.int/rw/rwb.nsf/db900SID/PSLG-7QMJ6T?OpenDocument

[98] www.oecd.org/dac

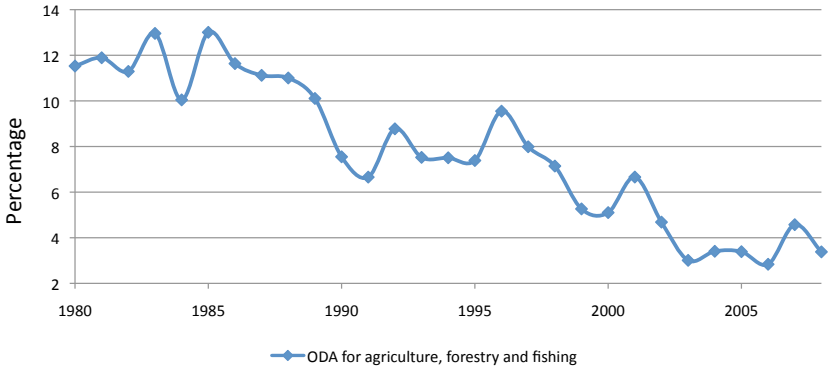

Figure 55 Proportion of total official development assistance allocated to agriculture
Source: OECD

ODA has played a positive countercyclical role during some previous financial crises. After the Mexican debt crisis in 1982, commercial lending was significantly reduced for about a decade, yet ODA rose slightly during this period, playing a strong role in maintaining flows to Latin America. However the global economic recession in the early 1990s produced large fiscal deficits in donor countries that led to deep cuts in ODA, which fell from 0.33% of gross national income in 1992 to 0.22% in 1997. Aid cuts at this point in time would place a dangerous additional burden on developing countries already faced with restricted sources of income and increased poverty, and perhaps undo some of the progress already made towards meeting the Millennium Development Goals.[99]

9.4 The Implications of ODA

During the last 50 years ODA has changed significantly its structure and value. It also changed its priorities. The following part of the chapter gives a brief overview about the development of ODA. If we take in consideration the current prices the value of ODA increased from 4,7 billion USD in 1960 to 120 billion USD at the end of 2008. It means that during 49 years the total value of ODA in the world increased by

[99] AID FOR TRADE AT A GLANCE 2009: MAINTAINING MOMENTUM – ©OECD/WTO 2009.

2461% and the average inter annual growth rate reached 7.5%. However, these numbers are misleading – they do not provide realistic information about current state and past development of ODA.

Due to that reason the analysis has been done in constant prices of the year 2007. During the last almost fifty years the value of ODA increased from approximately 36 billion USD to 114 billion USD. It means that the value of ODA increased by cca 214% and the average inter annual growth rate reached cca 2.7%. The OECD members have the main share in total ODA which is provided around the world – more than 95% of total net disbursements. But it must be emphasized that in reality about 70% of ODA is provided by only 7 countries (G7 members – USA, Japan, Germany, Italy, France, Canada and United Kingdom). Although their share in total ODA value is slowly decreasing, they are main pillars of current ODA system.

The following Table 36 gives brief information about ODA value development and changes which happened in period 1960–2008. Dominant role of G7 countries is quite visible and also we can see that more than 70% of total ODA value is realized through the bilateral agreements and just 30% is realized through multilateral agreements. Notwithstanding it must be emphasized that the role of multilateral activities on ODA is constantly increasing. While in 1960 the share of multilateral agreements in total ODA value was about 14%, nowadays it is almost one third. EU members together with USA, Japan, Canada, Australia and New Zealand are the most important donors. But while in 1960 the most important donors were USA (their share in total ODA was 40%) and France (more than 20%), the current situation is a little bit different. USA are still the most important donor country, but their share is about 22%. The share of France is 9%. The other important donors are United kingdom, Germany, Japan and the Netherlands. The following Table 37 offers information about the main development trends in ODA between the years 1960–2008. Data show that ODA is mostly connected with G7 and DAC member states. There are huge differences between values of ODA expressed in current prices and in constant prices. DAC countries, which are the most significant ODA donors around world, increased their value of ODA by more than 200%, in the same period G7 countries increased their value of ODA by about 130%. The share of G7 countries in total ODA value has been constantly decreasing vice versa with the share of other donors. The inter annual growth rate of ODA provided by G7 members is lower in comparison with other DAC members. Austria, Finland, Sweden, Switzerland, Norway, Italy, Denmark

Net Disbursement – Official development assistance	Value of ODA				Share in total ODA			
	Constant Prices (2007 USD millions		Current Prices (USD millions)		Current Prices (USD millions)		Constant Prices (2007 USD millions)	
	1960	2008	1960	2008	1960	2008	1960	2008
All donors	36 345	113 999	4 676	119 759	100.00%	100.00%	100.00%	100.00%
G7	34 015	77 763	4 460	80 815	95.40%	67.50%	93.60%	68.20%
All donors – bilateral ODA	31 217	81 241	4 094	85 187	87.60%	71.10%	85.90%	71.30%
G7 – bilateral ODA	29 506	55 726	3 932	57 769	84.10%	48.20%	81.20%	48.90%
All donors – multilateral ODA	5 129	32 758	582	34 572	12.40%	28.90%	14.10%	28.70%
G7 – multilateral ODA	4 509	22 037	528	23 046	11.30%	19.20%	12.40%	19.30%
Australia	531	3 038	59	3 166	1.30%	2.60%	1.50%	2.70%
Austria	1	1 555	2	1 681	0.00%	1.40%	0.00%	1.40%
Belgium	1 016	2 214	101	2 381	2.20%	2.00%	2.80%	1.90%
Canada	440	4 577	65	4 725	1.40%	3.90%	1.20%	4.00%
Denmark	74	2 570	5	2 800	0.10%	2.30%	0.20%	2.30%
Finland	18	1 047	2	1 139	0.00%	1.00%	0.00%	0.90%
France	8 028	10 168	823	10 957	17.60%	9.10%	22.10%	8.90%
Germany	2 616	12 994	224	13 910	4.80%	11.60%	7.20%	11.40%
Italy	986	4 059	77	4 444	1.60%	3.70%	2.70%	3.60%
Japan	1 368	8 310	105	9 362	2.20%	7.80%	3.80%	7.30%
Netherlands	519	6 522	35	6 993	0.80%	5.80%	1.40%	5.70%
New Zealand	86	355	9	346	0.10%	0.30%	0.00%	0.30%
Norway	73	3 638	5	3 967	0.10%	3.30%	0.20%	3.20%
Sweden	58	4 508	7	4 730	0.10%	3.90%	0.20%	4.00%
Switzerland	56	1 794	4	2 016	0.10%	1.70%	0.20%	1.60%
United Kingdom	4 862	12 217	407	11 409	8.70%	9.50%	13.40%	10.70%
United States	15 716	25 439	2 760	26 008	59.00%	21.70%	43.20%	22.30%

Table 36 The main donors and the value of ODA
Source: WDI, OECD, own processing

and Canada belong to the group of donors with increasing level of ODA. Mentioned countries significantly increased the ODA value. These countries with high level system of social solidarity dramatically increased their share in total DAC countries ODA value. On the other hand these countries, which are traditional cornerstones for ODA, have been losing their shares. However, it must be emphasized all DAC countries have been constantly increasing the value of ODA. Distribution is a very im-

	Current Prices (USD millions)		Constant Prices (2007 USD millions)	
	Absolute change 1960–2008 (%)	Average inter annual growth rate 1960–2008 (%)	Absolute change 1960–2008 (%)	Average inter annual growth rate 1960–2008 (%)
DAC Countries	2 461.3	7.5	213.7	2.7
G7	1 712.1	6.8	128.6	2.1
Australia	5 275.6	10.1	472.1	4.8
Austria	55 933.3	20.7	4 102.1	14.2
Belgium	2 259.4	8.7	117.8	2.9
Canada	7 183.9	11.1	940.5	6.5
Denmark	52 730.6	15.5	3 352.5	8.6
Finland	56 856.0	18.9	5 716.9	12.5
France	1 231.2	6.5	26.7	0.9
Germany	6 123.8	10.1	396.8	4.0
Italy	5 701.0	16.0	311.6	9.0
Japan	8 807.8	12.6	507.6	5.7
Netherlands	19 708.8	13.3	1 156.4	6.5
New Zealand	4 229.0	9.5	312.8	3.9
Norway	76 192.1	16.2	4 869.2	9.3
Sweden	70 494.6	16.8	7 667.8	11.1
Switzerland	57 493.7	17.7	3 075.9	10.2
United Kingdom	2 704.5	8.3	151.3	2.9
United States	842.4	6.6	61.9	2.7

Table 37 Change in ODA between the years 1960 and 2008
Source: WDI, OECD, own processing

portant phenomenon connected with ODA. In the last century major part of ODA was distributed on the base of bilateral agreements. Value of ODA which is distributed through the bilateral relationships increased by 160% and average inter annual growth rate of bilateral ODA value reached 2.4%. On the other hand the share of ODA value which is provided on multilateral base is increasing due to the growing role of globalization and internationalization. In comparison with the year 1960,

the current value of multilateral ODA increased by more than 500% and during the analyzed time period the average inter annual growth rate of multilateral ODA reached 6.4%. However, ODA real value has been growing much slower than if it is expressed in nominal values.

9.5 ODA Recipient

The main ODA recipients are developing countries around the World. While the value of ODA is constantly increasing, the share of ODA in total GDP value of developing countries has been decreasing. While in sixties the share of ODA in developing countries' GDP was more than 3%, in 2007 it was just 1.1%. Expressed in constant prices – ODA value for developing countries increased during analyzed time period by more than 200%. The most significant growth of ODA we can see in case of Oceania, Latin America and Africa.

(USD millions)	1960	1970	1980	1990	2000	2007	Absolute change (%)
Africa (CuP)	1 315	1 681	10 422	25 077	15 577	38 550	2 831.70
America (CuP)	222	1 026	2 242	5 233	4 850	6 842	2 983.10
Asia (CuP)	2 170	3 338	13 614	17 998	15 950	35 267	1 525.20
Developing Countries (CuP)	4 255	6 838	33 426	56 959	49 877	105 284	2 374.40
Developing Countries unspec. (CuP)	140	351	4 927	5 854	8 968	19 153	13 569.20
Europe (CuP)	385	179	1 198	1 424	3 716	4 175	985.60
Oceania (CuP)	23	264	1 023	1 373	816	1 296	5 478.60
Africa (CoP)	12 143	11 174	23 676	37 179	23 167	38 550	217.50
America (CoP)	1 612	5 680	5 061	7 680	6 702	6 842	324.40
Asia (CoP)	14 924	18 999	30 842	25 330	20 138	35 267	136.30
Developing Countries (CoP)	32 702	40 754	75 893	82 935	69 800	105 284	221.90
Developing Countries unspec. (CoP)	1 075	1 999	11 314	8 699	12 758	19 153	1 681.90
Europe (CoP)	2 736	1 179	2 663	1 961	5 814	4 175	52.60
Oceania (CoP)	213	1 723	2 336	2 086	1 221	1 296	508.40

Table 38 ODA Total – All Donors – Net disbursements
Note: CuP – current prices, CoP – Constant prices (2007 USD)
Source: WDI, OECD, own processing

The territorial structure of ODA has changed. While in 1960 more than 45% of total ODA was distributed among Asia countries, nowadays it is just 33%. While Far East and South and Central Asia have lost their shares in total ODA. The Middle East region share significantly

increased. There are no changes for Africa over the last fifty years. The only exception is North Africa that stopped to be the main target of distributed ODA. The position of Europe as one of the main donor is declining when comparing the decreasing share in total value of ODA. The same situation is evident in both Central and South America (Table 39). Huge differences in main development trend exist over the world.

Constant Prices (2007 USD millions)			Current Prices (USD millions)		
	1960	2007		1960	2007
Europe	8.37	3.97	Europe	9.04	3.97
Africa	37.13	36.62	Africa	30.90	36.62
North of Sahara	18.76	3.02	North of Sahara	16.86	3.02
South of Sahara	18.34	32.38	South of Sahara	14.02	32.38
America	4.93	6.50	America	5.22	6.50
North & Central America	1.81	3.30	North & Central America	1.88	3.30
South America	1.84	2.72	South America	2.31	2.72
Asia	45.63	33.50	Asia	51.00	33.50
Far East Asia	16.39	6.84	Far East Asia	19.50	6.84
South & Central Asia	22.64	12.24	South & Central Asia	24.82	12.24
Middle East	6.55	13.52	Middle East	6.64	13.52
Oceania	0.65	1.23	Oceania	0.55	1.23
Developing Countries unspec.	3.29	18.19	Developing Countries unspec.	3.29	18.19

Table 39 ODA Total – All Donors – Net disbursements in %
Source: WDI, OECD, own processing

While Asia and Africa are the main recipients of ODA and their inter annual growth rates of ODA received are about 3.04% respectively 3.16%, the other region except for Europe also significantly increased the value of ODA received. Their inter annual growth rates of ODA received are much higher in comparison with Africa and Asia. American inter annual growth rate reached in monitored time period the average value about 5.2% and Oceania inter annual growth rate reached the value about 7.4%

	Inter annual change (average value 1960–2007, %)	Absolute change 1960–2007 (%)
Africa	3.16	217.48
America	5.21	324.40
Asia	3.04	136.32
Developing countries	2.86	221.95
Europe	8.33	52.61
Oceania	7.39	508.38

Table 40 ODA development trends for group of countries (constant prices 2007, USD millions)
Source: WDI, OECD, own processing

(Table 40). The following Table 41 – informs us about the main recipients of ODA during the last 30 years. The structure of recipients has been changed. It is very hard to find the same countries among first 10 recipients in selected years. ODA value has been changing in case of all countries. Almost no country has fluent flow of ODA. Political, economic and social situation have been constantly changing. We are witness of the whole chain of changes which happened during the last few decades. Many of events are connected with the development of only selected part of the world. However, their impact on the other parts of the world is obvious. ODA must be able to react to all changes and it should be flexible. This is the reason why the ODA value flows changed year by year. In general ODA is distributed among the following activities: social infrastructure and service (e.g. education, health, water supply, sanitation etc.), economic infrastructure and services (e.g. transport, storage, communications, energy, etc.), production sector (e.g. agriculture, forestry, fishing, industry, mining, construction, etc.), multisector (e.g. environment protection etc.), commodity aid (e.g. budget support, food aid, commodity assessment, etc.), actions related to debt, humanitarian aid (e.g. emergency response, reconstruction relief and rehabilitation, disaster prevention, etc.) and so on.

For different kind of economic, humanitarian and social activities donor countries around the world has been spending more than 100 billion USD a year. Only between the years 1971 and 2007 the value of ODA received by individual sectors increased more than 12 times (expressed in current

1977		1997		2007	
Egypt	2343.99	China	2053.55	Iraq	9176.31
India	988.81	Egypt	1984.77	Afghanistan	3951.08
Syria	823.37	India	1645.09	Tanzania	2810.84
Israel	797.4	Bangladesh	1010.63	Viet Nam	2496.73
Bangladesh	783.57	Viet Nam	998.25	Ethiopia	2422.48
Pakistan	585.52	Mozambique	948.11	Pakistan	2212.42
Morocco	566.24	Tanzania	943.71	Sudan	2104.19
Indonesia	512.92	Bosnia-Herzegovina	861.45	Nigeria	1947.46
Yemen	403.37	Madagascar	833.06	Cameroon	1904.61
Jordan	368.29	Uganda	812.97	Palestinian Adm.	1875.80

Table 41 Main recepients of the ODA (total current prices, USA millions)
Source: WDI, OECD, own processing

prices). The average inter annual growth rate of ODA is about 8% per year. The one half of total ODA is allocated to sectors connected with social infrastructure and development of economic activities. Second half of the sum is determined for humanitarian activities, protection of living environment, administration costs, supports of NGO'S etc.

The majority of provided ODA is connected with programmes for social infrastructure and services development. In 2007 more then 35% of total ODA was allocated into the above mentioned activities. Just for economic infrastructure development was allocated more than 11% of total ODA. The support of production sectors represents about 5% of total ODA. Multisector activities represent about 6% of total ODA value. For the purpose of commodity aid only 4% of total ODA value is provided.

Table 42 gives us information about the structure of ODA provided. There are individual activities which are connected with ODA distribution and development of ODA value which was allocated into different programs since 1971. During the last three decades the most progressive development was recorded in case of financing of those activities which are connected with debt control (year by year the average inter annual

growth rate was more than 40%), environmental protection and other actions connected with multisectoral development. This is also connected with high value of inter annual growth rate (on average 38.6%).

High level of ODA inter annual growth rate was also recorded in case of those developing activities connected with health, water supply and sanitation and humanitarian aid. The average inter annual growth rate of developing assistance, in case of the other developing activities supported by ODA, fluctuated between 5–15% a year.

It must be emphasized that more than 65% of total ODA is intended for those projects which are connected with individual countries' infrastructure development. The share of ODA which was projected for above mentioned purposes is constantly increasing, while in 1970 it was just only 44% of total ODA, nowadays the share is much higher. Compare to that the humanitarian and anti-crisis activities represented in 2007 only about 20% of total ODA value. The share of money used for these activities has been decreasing. (In 1970 the share of ODA for humanitarian and anti-crisis was about 37%.)

During the last more than three decades the trends and priorities of ODA distribution has significantly changed. While the programs for humanitarian aid and anti-crisis activities recorded the average inter annual growth rate of ODA only about 20%, those activities which are connected with economic and social infrastructure development recorded the average inter annual growth rate about 40%. It means that donor countries changed their attitude to developing priorities and they stopped to support those activities which are not connected with the future growth rate of individual countries economic and social potential. But not all money which are planned for ODA are in fact used for developing activities. Administrative costs represented about 5% of total ODA value and in 2007 it was about 5 billion USD. The detailed information about the structure of ODA distribution are contained in the following Table 42.

The following Table 43 and Table 44 contain information about ODA distribution among the following four groups of countries which are the main target of ODA (the least developing countries – LDCs, low middle income countries – LMICs, upper middle income countries – UMICs and more advanced developing countries and territories – MADCTs).

More than 1,758 billion USD was distributed among the all developing countries around the world (in constant prices of the year 2007 it was 3,181 billion USD) during the last 47 years. During the same time pe-

Current Prices (USD millions)	1971	1981	1991	2001	2005	2007	Absolute change 1971–2007 (%)	Inter annual change 1971–2007 (%)
SOCIAL INFRASTRUCTURE, SERVICES	2 249	5 575	11 215	13 707	29 494	37 599	1 571.9	9.3
- Education	1 888	2 596	4 947	3 672	5 689	8 430	346.5	6.1
- Health	65	1 336	1 424	1 706	3 448	4 339	6 594.4	25.2
- Water Supply & Sanitation	107	636	1 835	1 973	4 466	4 360	3 970.5	19.3
- Government & Civil Society	85	312	1 380	2 949	9 218	11 565	13 436.0	20.2
- Other Social Infrastructure & Services	103	695	1 232	2 291	3 497	3 253	3 051.8	14.8
ECONOMIC INFRASTRUCTURE, SERVICES	542	3 716	12 157	6 293	10 458	11 794	2 074.4	11.9
- Transport & Storage	193	1 730	4 950	3 660	5 017	3 862	1 896.4	14.5
- Communications	104	362	1 158	208	342	274	163.7	13.8
- Energy	245	1 623	5 063	1 590	3 238	3 834	1 465.5	15.7
PRODUCTION SECTORS	670	6 030	6 188	3 701	5 140	5 626	739.4	10.2
- Agriculture, Forestry, Fishing	283	2 741	3 798	2 820	3 270	4 245	1 399.2	11.5
- Industry, Mining, Construction	387	1 406	1 885	606	1 379	812	109.8	8.3
MULTISECTOR/CROSS-CUTTING	34	627	1 524	3 000	5 974	6 546	19 106.4	38.6
TOTAL SECTOR ALLOCABLE	3 496	15 947	31 084	26 700	51 067	61 564	1 661.2	9.2
COMMODITY AID/GENERAL PROG. ASS.	1 937	2 268	9 349	2 907	2 575	4 211	117.4	10.6
- Dev. Food Aid/Food Security Ass.	1 409	568	1 781	1 242	890	1 081	-23.3	14.7
ACTION RELATING TO DEBT	763	662	7 303	4 156	25 997	9 761	1 179.8	42.6
HUMANITARIAN AID	128	330	2 700	1 932	7 973	6 996	5 364.3	20.8
ADMINISTRATIVE COSTS OF DONORS			1 582	2 754	3 872	4 884	530.9	13.8
SUPPORT TO NGOs			700	1 448	1 252	2 140	200.7	14.0
UNALLOCATED/UNSPECIFIED	1 725	3 536	4 325	1 366	1 742	1 265	-26.7	11.0
TOTAL ODA (all donors)	7 723	32 381	60 877	51 909	107 671	105 284	1 263.2	8.2

Table 42 The structure of ODA distribution
Source: OECD, own processing

(in million USD)		1960	1970	1980	1990	2000	2004	2007	Absolute change 1960-2007	Inter annual change 1960-2007
G7 (CoP)	LDCs	2246	3195	7567	10134	7220	11983	13135	484.80%	4.90%
All Donors (CoP)	LDCs	3291	5548	19638	24465	18633	29011	32470	886.50%	5.60%
G7 (CoP)	LMICs	8556	7114	8094	14980	10549	12918	14517	69.70%	3.20%
All Donors (CoP)	LMICs	9122	11182	20953	26616	20710	22509	25956	184.60%	3.70%
G7(CoP)	Other LICs	8653	9537	3262	4800	4369	5104	6890	-20.40%	2.70%
All Donors (CoP)	Other LICs	8619	12442	12630	10576	10340	12018	15468	79.50%	3.00%
G7 (CoP)	UMICs	2267	1870	2468	2989	1057	1297	1891	-16.60%	2.90%
All Donors (CoP)	UMICs	1939	3037	4657	4984	2614	2922	4099	111.40%	3.90%
G7 (CoP)	MADCTs	3528	2806	3373	3112	34	2		-100.00%	-9.40%
All Donors (CoP)	MADCTs	3510	3214	4159	3634	209	65		-98.10%	-3.30%
G7 (CuP)	LDCs	261	494	3353	6991	5306	10600	13135	4934.10%	10.30%
All Donors (CuP)	LDCs	369	843	8601	16518	12618	25215	32470	8711.30%	11.10%
G7(CuP)	LMICs	1070	1238	3643	10956	9139	11982	14517	1256.10%	8.10%
All Donors (CuP)	LMICs	1116	1866	9296	18751	15371	20112	25956	2226.50%	8.80%
G7(CuP)	Other LICs	1245	1774	1422	3330	3878	4666	6890	453.40%	7.00%
All Donors (CuP)	Other LICs	1240	2205	5535	7147	7842	10632	15468	1147.40%	7.40%
G7 (CuP)	UMICs	325	326	1111	2196	783	1188	1891	481.20%	8.90%
All Donors (CuP)	UMICs	288	513	2067	3537	1726	2566	4099	1323.40%	8.70%
G7 (CuP)	MADCTs	513	474	1536	2118	20	1		-99.70%	xx
All Donors (CuP)	MADCTs	509	531	1881	2460	131	57		-88.70%	xx

Table 43 ODA distribution between chosen groups of countries (Net disbursements)

Note: CuP – current prices, CoP – Constant prices (2007 USD)
Source: WDI, OECD, own processing

(%)	1960	1970	1980	1990	2000	2004	2007
LDCs	10.1	13.6	25.9	29.5	26.7	32.3	30.8
LMICs	27.9	27.4	27.6	32.1	29.7	25.1	24.7
Other LICs	26.4	30.5	16.6	12.8	14.8	13.4	14.7
UMICs	5.9	7.5	6.1	6.0	3.7	3.3	3.9
MADCTs	10.7	7.9	5.5	4.4	0.3	0.1	X
Developing Countries (USD millions)	32,702.2	40,753.8	75,892.6	82,934.6	69,799.9	89,679.9	105,284.0

Table 44 ODA Total Net disbursements All donors (Constant Prices (2007 USD millions)
Source: WDI, OECD, own processing

riod developed countries increased their GDP by 400% and developing countries increased their GDP even by 680%.

At the beginning of the sixties the low middle income countries and low income countries were the main target of the ODA (together about 70% of total ODA value). Nowadays countries which are included in the list of the least developed countries are the main target of ODA. During the last five decades the significant changed in ODA value distribution was also recorded in case of the upper middle income countries and more advanced developing countries and territories. The share of ODA projected for upper middle income countries decreased from 7% to 5% and in the case of more advanced developing countries and territories we witnessed even decrease from 13% in 1960 to almost zero percent in the beginning of 21st century.

During the last five decades the priorities of ODA distribution changed. Donor countries decided to support especially those developing countries with high pro-growth potential (low middle income countries) and those countries which have to face the humanitarian and economy collapse (the least developed countries). These countries became the main target of ODA while the other countries lost their importance (but it does not mean that developed countries do not care about these territories. Although the other countries are not the main target of ODA, they have possibility to growth especially through the permanent pro-

cess of internationalization and globalization and through the process of liberalization of world trade and etc.).

The majority of ODA has been distributed by G7 countries. These countries are the main engine of ODA. In sixties they share in total ODA distributed around the world was almost 90%, nowadays it is about 50%. While in the beginning of the sixties G7 countries supported especially low and low middle income countries, nowadays they are supporting especially the least developed and low middle income countries.

During the above mentioned period the least developed countries have witnessed the most significant growth of received ODA (almost 900%). The other groups of countries recorded the inter annual growth about 3–4% except for those countries which are included between more advanced developing countries and territories. These territories recorded negative growth rate −3.3% per year and the current value of ODA received is almost zero.

9.6 The Analysis of the Relationship Between GDP and ODA Assistance

We have to analyze the development of ODA from two different points of view. Firstly, we have to mention the impact of ODA on individual countries economy (GDP) – in case of countries receiving ODA. Secondly, the relationship between ODA value and donor's economies development (development of donor countries' GDP) must to be taken in consideration.

Nowadays ODA value distributed around the World represents more than 100 billion USD. The above mentioned money is distributed among individual parts of the World and group of countries. The provided ODA has different impact on individual groups of ODA recipients states. Table 45 offers information about the relationship between the growth of ODA and GDP growth of individual groups of countries and territories.

We can confirm the general relationship between ODA value received and developing countries GDP. The result of processed regression and elasticity analyses is the following. The results of our analyses show that if ODA value change by 1%, developing countries GDP should change by 0.25%. During the monitored time period the most progressive relationship between ODA and GDP is possible to find out in the case of the least developed countries.

	Elasticity (1% change in ODA causes ?? change in GDP, 1960–2007)	R	R^2	α=0.01	α=0.5
America	X	0.78	0.54	positive	positive
Europe	X	0.55	0.3	positive	positive
Asia	X	0.53	0.28	positive	positive
Africa	X	0.85	**0.72**	positive	positive
Oceania	X	0.3	0.1	negative	positive
LICs (low income countries)	0,013	0.86	**0.74**	positive	positive
LMICs (low middle income countries)	0,05	0.74	0.55	positive	positive
UMICs (upper middle income countries)	0,013	0.123	0.015	negative	negative
LDCs (least developed countries)	0.27	0.49	0.24	positive	positive
Developing countries	**0.25**	0.88	**0.78**	positive	positive

Table 45 Relationship between ODA and GDP growth
Source: WDI, OECD, own calculations

From statistical point of view the relationship between ODA received and GDP was recorded in case of Africa and low income countries. These two subjects (recipients of ODA) represent the areas which are the main targets of international ODA. The value of ODA has influenced their economy growth. On the other hand there are some region (e.g. Asia, Oceania) and groups of countries (LMICs, UMICs) which economies are not really dependant on ODA received. Although these economies are target of ODA, their economies are not dependant on ODA and ODA is not the engine of their economy growth.

The following Table 46 provides information about the relationship between ODA value provided and GDP development from donor countries point of view. The value of ODA provided around the world depends on GDP. If the value of GDP around the world increases about 1% the value of ODA should growth by 1.74%. This relationship was also proved through the statistical analyses of the relationship between ODA and GDP value development.

	Elasticity (1% change in GDP value means ?? change in ODA, constant prices, 1960–2007)	R	R^2	α = 0.01
World	1.74	0.92	0.86	positive
DAC Countries	1.62	0.91	0.84	positive
G7	0.71	0.82	**0.66**	positive
Australia	1.99	0.86	0.75	positive
Austria	3.97	0.82	**0.67**	positive
Belgium	0.25	0.8	**0.63**	positive
Canada	1.71	0.8	**0.62**	positive
Denmark	0.34	0.97	0.95	positive
Finland	4.71	0.88	0.76	positive
France	1.19	0.63	**0.40**	positive
Germany	1.61	0.85	0.73	positive
Ireland	2.05	0.96	0.92	positive
Italy	5.84	0.72	**0.52**	positive
Japan	-0.11	0.93	0.87	positive
Luxembourg	1.38	0.97	0.94	positive
Netherlands	-0.46	0.95	0.91	positive
New Zealand	-4.32	0.81	**0.66**	positive
Norway	16.51	0.97	0.95	positive
Portugal	2.45	0.85	**0.72**	positive
Spain	4.04	0.93	0.87	positive
Sweden	3.19	0.95	0.9	positive
Switzerland	0.73	0.97	0.94	positive
United Kingdom	0.21	0.73	**0.53**	positive
United States	-2.25	0.11	**0.013**	negative

Table 46 Relationship between ODA and GDP – donor countries
Source: WDI, OECD, own calculations

Elasticity (1% change in GDP value means? change in ODA, constant prices, 1971–2007)	High income (%)	World (%)	Developing countries (%)
SOCIAL INFRASTRUCTURE, SERVICES	6.25	3.61	2.19
- Education	4.10	2.29	1.35
- Health	13.29	7.43	4.70
- Water Supply & Sanitation	9.21	5.53	3.13
- Government & Civil Society	10.55	9.40	6.70
- Other Social Infrastructure & Services	13.95	7.08	4.01
ECONOMIC INFRASTRUCTURE, SERVICES	6.71	4.86	2.55
- Transport & Storage	4.26	4.27	2.99
- Communications	14.05	10.84	5.46
- Energy	12.36	7.25	3.29
PRODUCTION SECTORS	4.46	2.75	1.72
- Agriculture, Forestry, Fishing	5.44	3.06	2.07
- Industry, Mining, Construction	3.66	2.44	1.28
MULTISECTOR/CROSS-CUTTING	8.58	7.64	6.88
ADMINISTRATIVE COSTS OF DONORS	2.65	2.26	1.81
COMMODITY AID/ GENERAL PROG. ASS.	23.32	10.22	4.40
- Dev. Food Aid/Food Security Ass.	25.45	9.03	3.21
ACTION RELATING TO DEBT	18.85	12.47	11.11
HUMANITARIAN AID	16.38	9.73	5.95
SUPPORT TO NGOs	5.96	4.93	3.25
UNALLOCATED/UNSPECIFIED	0.77	1.85	1.87

Table 47 Relationship between GDP value development and development of ODA value
Source: WDI, OECD, own calculations

Compare to that the DAC countries, which represent the most important donors of ODA, positive relationship between GDP value development and provided ODA value. Positive relationship was proved in case of the following countries (Australia, Denmark, Finland, Germany, Ireland, Japan, Luxemburg, the Netherlands, Norway, Spain, Sweden, and Switzerland). In case of other countries the relationship was not proved. The important result is the fact that in case of the main ODA donors (USA, United Kingdom, France, Italy) and some other donors (Canada, Belgium, Austria, New Zealand and Portugal) the relationship between their GDP and ODA provided was not proved.

In case of these countries the ODA value does not depend on individual countries economy performance, but probably value of ODA provided depends on some other factors (social, political, strategic etc.). While the majority of the analysed countries have positive relationship between GDP growth and the growth of ODA, there are some countries with even the negative value of growth rate (USA, New Zealand, the Netherlands, Japan). The mentioned results demonstrate that the final value of ODA depends not just on donor countries' GDP value development, but also on some other factors (especially in case of the most important donors).

The Table 47 provides information about the which is distributed among individual sectors of developing assistance. It presents information how the growth of economy has been influencing the growth of ODA distributed into individual sectors in case of high income and developing countries and also the world average. The most progressive relationship is possible to find in case of the following activities: debts assistance, commodity aid, humanitarian aid, food aid, environmental protection programs and activities connected with development in the following areas – communications, government and civil society, healthy and energy.

The process of financing of the mentioned activities is the most sensitive on GDP value development. In case of other activities the growth of GDP is not connected with so high percentage value growth. The positive relationship between ODA value provided and donor countries GDP value, was proved in case of the following activities financing: social infrastructure and services (especially – education, health, water supply and sanitation), multisetor and cross cutting (especially – environmental protection), administration and humanitarian aid. The mentioned activities really depend on GDP values (in fact – the financing of these activities is connected with free sources in donor countries budgets), while the others are independent to the GDP value development.

	R	R^2	α=0.01
SOCIAL INFRASTRUCTURE, SERVICES	0.91	0.84	positive
- Education	0.87	0.76	positive
- Health	0.89	0.79	positive
- Water Supply & Sanitation	0.90	0.82	positive
- Government & Civil Society	0.80	0.64	positive
- Other Social Infrastructure & Services	0.96	0.92	positive
ECONOMIC INFRASTRUCTURE, SERVICES	0.80	0.64	positive
- Transport & Storage	0.77	0.6	positive
- Communications	0.066	0.0044	positive
- Energy	0.66	0.45	positive
PRODUCTION SECTORS	0.25	0.065	negative
- Agriculture, Forestry, Fishing	0.49	0.24	positive
- Industry, Mining, Construction	0.05	0.0025	negative
MULTISECTOR/CROSS-CUTTING	0.94	0.87	positive
ADMINISTRATIVE COSTS OF DONORS	0.96	0.93	positive
COMMODITY AID/GENERAL PROG. ASS.	0.13	0.018	negative
- Dev. Food Aid/Food Security Ass.	0.19	0.037	negative
ACTION RELATING TO DEBT	0.71	0.5	positive
HUMANITARIAN AID	0.86	0.75	positive
SUPPORT TO NGOs	0.65	0.42	positive
UNALLOCATED/UNSPECIFIED	0.40	0.15	positive

Table 48 Relationship between ODA and donor's GDP
Source: WDI, OECD, own calculations

	R	R^2	α=0.01
SOCIAL INFRASTRUCTURE, SERVICES	0.96	0.92	positive
- Education	0.87	0.76	positive
- Health	0.93	0.87	positive
- Water Supply & Sanitation	0.89	0.8	positive
- Government & Civil Society	0.89	0.79	positive
- Other Social Infrastructure & Services	0.96	0.92	positive
ECONOMIC INFRASTRUCTURE, SERVICES	0.75	0.56	positive
- Transport & Storage	0.69	0.48	positive
- Communications	0.034	0.0012	negative
- Energy	0.62	0.39	positive
PRODUCTION SECTORS	0.195	0.038	negative
- Agriculture, Forestry, Fishing	0.41	0.17	negative
- Industry, Mining, Construction	0.016	0.0002	negative
MULTISECTOR/CROSS-CUTTING	0.96	0.93	positive
ADMINISTRATIVE COSTS OF DONORS	0.98	0.96	positive
COMMODITY AID/GENERAL PROG. ASS.	0.048	0.002	negative
- Dev. Food Aid/Food Security Ass.	0.24	0.0588	negative
ACTION RELATING TO DEBT	0.75	0.57	positive
HUMANITARIAN AID	0.91	0.83	positive
SUPPORT TO NGOs	0.71	0.51	positive
UNALLOCATED/UNSPECIFIED	0.39	0.15	negative

Table 49 Impact of ODA received on developing countries' GDP
Source: WDI, OECD, own calculations

Between sectors which are not dependant on GDP development in donor countries belong those sectors which are connected with the long term development of supported economies (economy infrastructure and services, production sectors, commodity aid, debt assistance and the support of NGO's). The mentioned activities are objects of long term developing assistance and they represent the main key – through which it is possible to solve the problem of developing countries. The financing of above mentioned activities is connected with the reconstruction of developing countries economies.

The relationship between ODA provided and donors' GDP was proved. Relationship was also proved in case of such activities as social infrastructure development, environmental protection and humanitarian aid – these activities are strongly related with GDP growth. On the other hand such activities like economic infrastructure development, production sectors support, commodity and food aid do not depend on GDP growth.

The last Table 49 provides information about the impact of ODA received on developing countries' GDP. The mentioned tables provide data about the distribution of ODA among individual developing activities. The positive relationship was proved in case of social infrastructure and services activities, economic infrastructure and services, multisector activities and humanitarian aid. On the contrary the negative relationship was recorded in the case of production sectors, communications and commodity aid. GDP development is connected especially with financing of those activities connected with creation of convenient environment for developing of economic activities.

9.7 The Influence of Current Financial Crisis on Ability of Donors to Provide Development Assistance and the Impact of Development Assistance Slowdown on Developing Countries Economy

The analyses proved that direct relationship between ODA value provided and growth of individual donor countries economy exists. It was also proved that there direct relationship between received ODA value and GDP development in recipient countries exist. The results of above mentioned analyses are the following: If world and main donor countries GDP change by 1%, the value of ODA provided will change by

about 1.7%. If provided ODA value change by 1%, the GDP value in developing countries will change by 0.25%.

The current financial crisis makes situation worse in the case of majority of countries. The gap between developed and developing countries will be growing. The current level of ODA is unable to improve economic situation of all developing countries. The majority of developing countries economies will have to face problems connected with world economy slowdown.

However, the impact of ODA slowdown will be possible to experience in those areas connected with developing assistance distribution (not all part of individual developing countries economy are targets of ODA). The amount of current ODA provided to developing countries does not have any ambition to improve or to stabilize developing countries economy. The current level is just able to help those sectors and especially the most vulnerable people.

The following Figures 56–59, illustrate that the general trends of received ODA value and GDP development are both increasing. Decline in ODA value received is not connected with decline in GDP value. Decline of ODA value is accompanied by certain decline in growth rate of individual groups of developing countries GDP. Graphs also illustrate that ODA value development (received and provided) is not really closely related with GDP development in developed and developing countries. Common development trend exist but we can see that decline of provided ODA value is not accompanied by decline of developing or developed countries GDP. Therefore, we can say that slowdown of decline of ODA value provided does not affect GDP development (from recipients countries point of view) so much and on the other hand we can say that slowdown of world GDP will has only minimal impact on provided ODA value (from donors point of view).

Distributed ODA can just help to solve the most critical situation and it can also help to improve the quality of life of those people who are targets of ODA distribution. The most vulnerable groups are low income countries and the least developed countries. In case of the former the high level of dependency between ODA received and GDP development exists. In case of the later the relationship between ODA and GDP was not proved. However, due to the situation of these countries, which are target of high share of humanitarian assistance, if the value of ODA decline, we can expect deterioration of living conditions of their inhabitants. In case of other groups (upper middle income and low middle

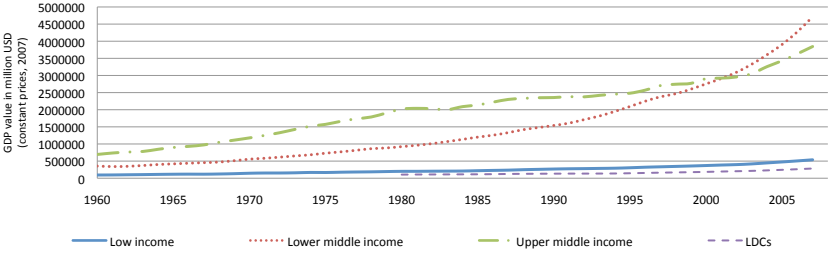

Figure 56 Selected groups of countries GDP development
Source: WDI, OECD, own processing

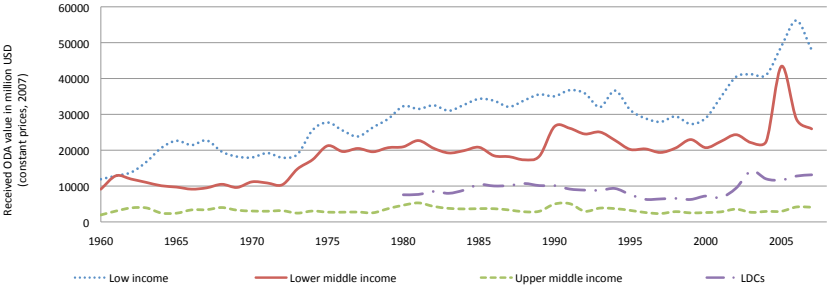

Figure 57 Received ODA value development
Source: WDI, OECD, own processing

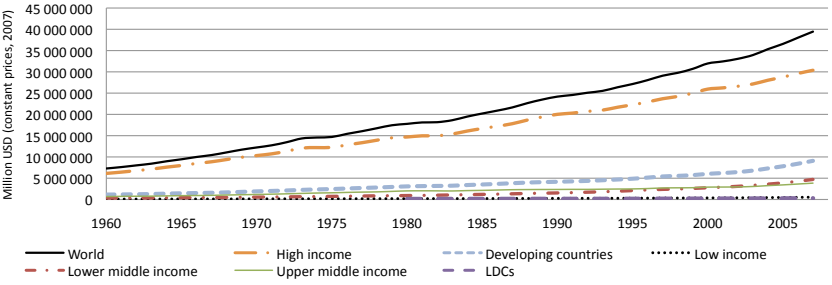

Figure 58 GDP value development in 1960–2007
Source: WDI, OECD, own processing

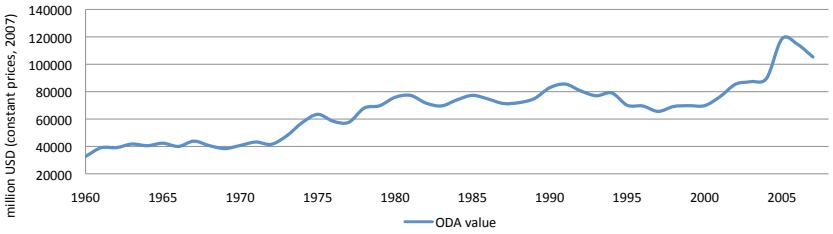

Figure 59 ODA value – Net disbursement (1960–2007)
Source: WDI, OECD, own processing

income countries) of developing countries the direct relationship between ODA value and GDP was not confirmed and on the base of our results we can say that provided ODA is not significant stimuli for economy growth.

The current crisis has been affecting certain donors' decision about ODA value provided. In case of the majority of the donors the final decision about ODA value provided is connected with their economies performance. The analysis proved that in case of fifteen from the most important ODA donors the relationship between GDP value development and ODA value provided has exist. Only in case of seven donors the relationship was not proved. However, these countries belong to the most important world economy engines and they represent the main ODA pillars.

We can say that the global economy decline will probably affect donor countries' altruism. Their main priority will be stabilization of their own economies and resuscitation of their (GDP) growth. Some countries which are the main engines of world economy and main policy makers will be independent in their ODA policy, but those countries (especially small developed countries) which were affected by the crisis and which do not have sufficient internal sources, will probably freeze their ODA. The own ODA value decline will not significantly affect individual developing economies growth, but it is possible to expect that some target groups of people in developing countries will be in much worse situation than they were before the crisis appeared.

9.8 Conclusions

At the end of our chapter we can say that development assistance which is provided by developed countries represents certain kind of stimuli for developing countries development. The value of ODA which is distributed around the world represents more than 100 billion USD and during the last almost five decades the value of ODA increased by more than 200%. Targets of ODA are especially developing countries with low level of economy growth. The main targets of ODA are countries situated in Africa and Asia. The positive relationship between ODA value received and GDP value was proved especially in case of African countries and also for the group of low income countries. The main donors are countries with high share in world economy. The most important donors are G 7 members. The analyses which was conducted proved that the value of ODA provided is closely related with GDP development of donor countries. The majority of donors make a decision about ODA provided on the base of GDP development, but it must be emphasized that some donors whose decision making process connected with ODA value provided is not dependant on their GDP development (USA, France, Italy, UK) also exist.

The total value of ODA is distributed between many developing activities and while some of them are closely related with donor countries' GDP growth, some of them are quite independent. The same can be said about the influence of ODA received on recipients countries' GDP.

Developing aid is not automatically connected with GDP growth, many developing countries has almost no relationship between ODA received and GDP performance. The effect of ODA on GDP development usually depends on structure of developing activities financed. Pro-growth activities are usually those which are connected with social infrastructure and services development, environmental protection and other multisector activities and economic infrastructure and services development.

It is very difficult to make some prediction about the future development of ODA value now. Current crisis has been influencing the world economy. It has been influencing the ability of donors to provide ODA and on the other hand crisis has been also increasing demand of developing countries for additional ODA. We proved that positive relationship between ODA provided and GDP development of main donor exist. It is possible to say that current crisis has affected the willingness of donors to pay additional money, while on the other hand some developing countries are more and more dependant on developing assistance. Developing

assistance will be probably still growing, but the inter annual growth rate of ODA will be lower in comparison with last decades. It is also possible to expect that donor countries will change their priorities – in case of ODA allocation process and also they will be more strict in case of ODA distribution. Developing countries demand for ODA will not be satisfied for sure and it is possible to expect the growing competition between individual developing countries to receive additional sources for their economy development.

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10 Evaluation of the Development of Unemployment Rates with regard to the Real GDP Growth Rate

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10.1 Introduction

Unemployment as one of the accompanying phenomena of functioning the market economy has become a serious economic, social and political problem even in modern economics. Therefore, governments try to reduce already often high unemployment by specific tools of macroeconomic policy based on economic theories. Particularly the policy of employment is an important tool balancing the imbalance on the labour market. Its task is to achieve dynamic balance between labour offer and labour demand and to ensure the productive use of labour sources. However, it is necessary to emphasize that governments do not affect the labour market directly on the level of enterprises but they try to create such conditions the labour market to operate better. It refers particularly to the improvement of services associated with labour market, offering sufficient information and surveys on vacancies, the use of public costs within regional policy, governmental retraining programmes and the creation of public job opportunities. Further it refers to legislative measures, tax, wage and social policy including pension policy and other forms of employment policy. Thus, employment policy can only support or modify the development on the labour market but it cannot modify it in principle.

As a matter of fact, practical macroeconomic policy including employment policy based on theoretical findings of various trends in economic theories does not bring necessary results in the field of reducing the unemployment to a tolerable level. Actually it appears that it is generally little effective. The problem can also consist in a fact that governments of countries with unused production factors deal particularly with problems of unemployment while they ought to shift the main stress to measures of macroeconomic policy maximizing the production and supporting free market. Naturally, civilization progress is also of great importance. It

reduced the need of human labour and thus, it lowered the rate of employment. The trend will continue certainly also in the future. However, rich countries achieving the high level of productivity can rather afford to keep part of population unemployed (thanks to direct support) than artificially create co-called full employment.

10.2 Material and Methods

The chapter is aimed at assessing the relationship between the unemployment growth rate and the real GDP growth rate in the Czech Republic. It tries to verify the existence of correlation of inter-quarter unemployment increments regarding to the real GDP growth rate. The analysis is realized by means of quantitative methods especially regression and correlation analysis including testing the statistical significance.

Used factual material comes from the sources of Eurostat and respects international rules for measuring unemployment respecting the methodology of International Labour Organization (ILO). The rate of unemployment is measured as the proportion of unemployed persons in total active population. The reference period for following analysis was set on the period 2000–2009 (the 2nd quarter). The use of statistical methods was described by Aczel (1989) or Mason, Lind (1990). The factual data processing comes from the methodology published by Hindls et al. (2003), Seger et al. (1998), Dirschedl, Osteermann (2001).

Minařík (1996, p. 97) states, that the statistical dependence of two characteristics (numeric figures) can be expressed as their functional relation by a formula, table or graph. We recognize these types of statistical dependence: fix, functional alias deterministic dependence and free, statistic alias stochastic dependence. The stochastic dependence makes itself felt like more or less significant repeatable tendency, which realizes in different form on different place and in different time. It is characteristic for its variability of individual causes and makes itself felt under a row of noteless, variously reacting factors. The stochastic dependence is referred to as a correlation dependency. For this dependency, we distinguish from dependent and independent variable. The correlation analysis of two variables is called pair or simple analysis.

The main graphical data presentation tool for examining the dependence between two variables is a point diagram, where we mark particular cases as points in a reference frame with coordinates, which are the values of particular dependent and independent variables.

The equation for a linear model is: $y = b_0 + b_1 x$

The equation for a quadratic model is: $y = b_0 + b_1 x + b_2 x^2$

The equation for a cubic model is: $y = b_0 + b_1 x + b_2 x_2 + b_3 x^3$

The equations for a bisector or second-degree parabola are the same as trend determination in temporal series. The calculation of parameters b_0 and b_1 comes from a system of normal equations.

In this chapter, particular characteristics are calculated of tightness of the dependency of variables. Conjugate regression lines show the same values of the tightness dependency characteristics, the correlation coefficient $r_{yx} = r_{xy}$, determination coefficient $r_{yx}^2 = r_{xy}^2$ (at the first place in this index is stated variable thought to be dependent). Correlation coefficient can also be defined as a geometrical mean of regression coefficient values b_{yx}, b_{xy} for the conjugate regression equations (bisectors). Correlation coefficient can vary between −1 to +1 $(-1 \leq r_{yx} \geq 1)$ whereas according to its absolute value the tightness dependency is assessed and the number sign shows the dependency "direction trend":

a) The more closely the value of $|r_{yx}|$ approximates the value 1, the tighter is the dependence (observed values y_i are more closely gathered in the correlation field around regression line), whilst the more closely to value 0, the weaker (looser) is the dependency b) The "+" sign of correlation coefficient describes a linear upward-sloping dependency, the "−" sign indicates a linear downward-sloping dependency.

The correlation index I_{yx} is a dependency tightness characteristics for any type of regression function (for simple as well as multiple dependencies of variables). Its second power is determination index I_{yx}^2. Determination index multiplied by 100 presents the explanation percentage of the calculated regression function – how the changes of dependent variable Y are explained by the changes of independent variable(s).

Statistical software Unistat 5.11 for Windows and Microsoft Excel has been used for the calculation of following results.

10.3 Results

This chapter is focused on relationships between changes in the unemployment rate and real GDP growth. This includes a statistical approval or disproval of correlation of chosen characteristics based on data from the Czech Republic. The reference period for this analysis is 2000–2009

(the 1st quarter 2000 to the 2nd quarter 2009). For purposes of the following analysis, particular inter-quarter additions of unemployment rate were determined. The methods of regression and correlation analysis were used to determine the parameters of a regression function. These methods are described in the methodological part of this chapter. For the analysis purposes, linear, quadratic and cubic functions were used, which led to nearly similar results. Parameters of a regression function in the given reference period are stated in Table 50. The correlation indices were tested on the significance level $\alpha = 0.05$ and $\alpha = 0.01$. In the Czech Republic, a negative correlation was proved between the rate of unemployment (its inter-quarter increments) and the real GDP growth rate (also inter-quarter) and all tested correlation indices I_{yt} may be marked as statistically important.

The existence of correlation between the development of GDP and the long-term unemployment in the Czech Republic hasn't been proved in another analysis carried out by Palát (2009). This analysis leads to a supposed conclusion, that a long-term unemployment is a very specific problem that is not to be given into direct connection to the real GDP growth development. But the results of that analysis in the Czech Republic also affirm, that the correlation hasn't been found between other examined groups of indicators (real GDP growth and short-term unemployment rate increments as well as between the real GDP growth and the total unemployment rate increments). This analysis based on annual data (reference period 1998–2006) brought similar results also in Hungary or Austria.

Using yearly data Palát (2009) had examined the existence of correlation between these characteristics also for EU-25 countries, especially for old member countries (EU-15), where the free market economy has longer tradition than in the Czech Republic or other post-communist countries, which had to go through a long period of economic transformation. This analysis made for old member countries really lead to different results. The negative correlation was proven between the increments of all observed unemployment rates (long-term, short-term and total) and the real GDP growth. Short-term unemployment rate has been calculated as a difference between long-term unemployment rate and total unemployment rate. All tested correlation indices I_{yt} were statistically important on the significance level $\alpha = 0.05$.

This means that growing values of the real GDP growth indicator lead to higher negative increments of all unemployment rates. Results for the

Model	Model parameters				I_{yt}
	b_0	b_1	b_2	b_3	
1	0.1410791859	-0.250350607	X	X	0.6457401903^{++}
2	0.0491055493	-0.2100614246	0.0393144898	X	0.6756837190^{++}
3	0.0148123478	-0.1012835479	0.0073562935	-0.0195548382	0.6818091641^{++}

Table 50 Regression function parameters for the inter-quarter increments of unemployment rate with regard to the real GDP growth
Note: Correlation index: I_{yt}, significance level: $^{+}\alpha = 0.05$; $^{++}\alpha = 0.01$

whole European Union, which were also included in the analysis, brought (regarding to the correlation of observed indicators) nearly similar results to the results of EU-15 countries.

10.4 Discussion

Precedent analysis (Palát, 2009) has also proven the existence of correlation between long-term unemployment and total unemployment in the Czech Republic. Long-term unemployment has its specific causes, but changes in conjunction with the development of unemployment total. This could come up to the hysteresis concept and points out to the existence of hysteretic factors participating on the Czech unemployment formation. On grounds of performed analysis, it is not possible to quantify the significance of hysteresis or other explanations standing behind the raise of unemployment (or its natural rate) but some particular unemployment causes can be mentioned in next few paragraphs.

Let me start with the structurally-institutional causes. Structural causes were emphasized by Němec (2004). It is often used to explain the raise of unemployment in the member countries of EU, which started already in the 70s during oil crisis and culminated in the 90s. The particular factors include strong position of unions, social network and the unemployment compensation system regarding amounts and the time of compensation payments. Some studies impeach the crucial importance of amounts as

well as the time of unemployment compensation payments for the development of unemployment stressing out a very weak dependency between these two indicators (e.g. Pissarides, 1999). The causes of the raise of unemployment in the Czech Republic as well as in other post-communist countries of Central Europe can be surely found also in described structural and institutional changes on the labour market, which was not able to adapt oneself flexibly to the fast-changing conditions. But the amount as well as the time of unemployment compensation payments can't answer itself for the raise of unemployment in its width. By the time, long-term unemployment became a significant problem in many European countries and that's why I'd like to mention some explanation of unemployment coming out of the hysteresis theory.

Let's go over to the next explanation of unemployment causes on the basis of so-called hysteresis of unemployment. The hypothesis of hysteresis assumes the existence of dependency between the actual unemployment rate and its natural rate. The results of empirical studies (e.g. Blanchard, 2006) indicate that natural rate of unemployment (eventually NAIRU) has been increasing steadily in the countries of the European Union and flowed along with the development of actual unemployment rates. The model insider-outsider (Lindbeck, Snower, 1988) is one of the hysteretic approaches used for explaining presents the raise of natural rate of unemployment. Based on this model, we can assume that the causes of steadily high unemployment in long term are connected to the strong position of insiders, which do not make it possible to enter the labour market for unemployed outsiders, which keep loosing their qualification as well as their willingness to work and by the time become absolutely unemployable. Further such like factors cold present the height of recruitment costs, training costs etc.

When we deal with the causes of unemployment there can be found both structural and institutional causes as well as unemployment hysteresis. The impacts of hysteresis are significant and can result in lower economic performance of the member countries of the European Union. Hysteretic factors can be also observed in the Czech Republic, where the long-term unemployment during a long period remained at unpleasantly high values, even in times when the total unemployment had been on decrease.

10.5 Conclusions

Although the existence of negative correlation between the increments of the inter-quarter unemployment rate and the real GDP growth rate

has been proven in the Czech Republic and in older studies using annual data also in EU-15 and EU-25, there are member countries where the existence correlation hadn't been proven statistically (e.g. Hungary). This could be caused by relatively specific economic development in the post-communist countries during a long period of transformation and restructuring when processes that were usual in free-market economies had been pushed into the background by other causes and circumstances. This situation can be explained by specific structural and institutional changes which had occurred during this period and which has had a significant impacts for output and unemployment. But the correlation hasn't been confirmed for some of the old member countries of the European Union indeed, e.g. Austria. That's why these results are to be taken into consideration also with regard to other circumstances not pointed out in this short analysis. To conclude let me put a question why the unemployment situation in the Czech Republic and other member countries of the European Union has been so different from the situation in another advanced free market economies worldwide, e.g. United States? The explanations could be rather found in different attitudes and behaviour of unemployed persons than in models mentioned in the discussion. These attitudes are definitely influenced by the existence of a nationally-cultural surrounding and social background. And also these factors are to be taken into consideration when assessing the development of unemployment with regard to economic output or the efficiency of taken measures regarding the diminution of the number of unemployed people in each country.

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IV.
In Lieu of Conclusion

11 The Information in the Economic Discourse and Analysis (Some thoughts about the role and uses of information)

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11.1 Introduction

The discussion in this chapter aims at the inquiry about the role and the importance of the broadly conceived information issues in the process of the economic analysis, modeling and the economic discourse – which includes forecasting – in general.

The role and the impact of information are often addressed by both the economic analysis and indeed, in a general discourse pertaining the economic issues. In some sense, it can be argued that the information is the key to the economic thinking.

Historically, the issues related to the acquisition and processing of information were in the core of the plan vs. market arguments. The line of classicist thinkers – from Adam Smith via Friedrich von Hayek to Milton Friedman (to name just few) argued that the superiority of the market economy performance lies in the interplay of motivation and the ability to effectively use the disperse information.

And, indeed, the issue of information (both the collection and processing) together with the closely related issues of motivation were the keys for the understanding of economic underperformance of planned economies (or economies with strong centralized decision making features), both practically and theoretically, as witnessed by the works of economists advocating "economic reforms" of planned economies, from Oscar Lange, Ota Sik and reformers of 1960's to "perestroika" advocates in 1980's.

In the current economic thinking the issue of information and the resulting behavior (i.e. the motivation) forms the starting point of the analysis. The rational expectations hypothesis (the cornerstone of the mainstream macroeconomics) is defined as expectations based on the all information

– including the "relevant" economic model – available when the expectations are formed. Behavioral economics then stresses the process of discovery – i.e. the need and costs to obtain the "required" information.

Analysis in this chapter will endeavor to investigate the situations where the information even if available is uncertain, often contradictory and subject to often unpredictable revisions. In those circumstances the individual rationality (the concept which goes beyond the costs of acquiring information – it permits for the situation where the reliability of information is impossible to evaluate ex ante) implies the "rule of thumb" behavior, where the expectations formation and hence the resulting behavior are determined in the way which resembles a simple program, inevitably heavily weighted by the past knowledge and experience.

The functioning of the economic system is heavily impacted when individual rationality implies programmatic behavior. This permits a wedge between the individual and systemic rationality which then implies an incipient systemic instability. But such an instability makes the evaluation of the available information yet more difficult, increasing the likelihood of the "black swan" event – even if the predictability of such an event (and hence the ability to adjust the individual behavior ex ante) effectively declines. Economies become more unstable.

11.2 Information and Economic Discourse

Economic discourse takes place on several different planes. These are indeed related, but nevertheless distinct, with differing sophistication and intellectual level, different methodologies and differing audiences. Those differences are then reflected in different ways through which the information is defined, interpreted and used (or misused).

On the level of a "scientific" economic analysis the main vehicle today is the so called "DSGE" (Dynamic Stochastic General Equilibrium) model. In its commonly used versions, The DSGE model is the contemporary amalgamation of two "axiomatic" ideas – the rational expectations hypothesis (REH) and the "real business cycle" hypothesis (RBC).

The use of the REH provides for the expectational and behavioral consistency between the decision-making processes of individual agents and results of the model as generated by these processes. As Lucas (2002) stressed, such consistency is both the key for calling the agents behavior rational and for the stability of the model results over time.

In this context it should be stressed that the concept of rationality as employed by REH is the one which excludes the divergence between the individual assumptions, expectations and behavior and the results generated by a model. The argument is that any behavior which would imply a systemic divergence between individual expectations (and hence resulting actions and behavior) and systemic results would create and exploitable arbitrage opportunities which at least some optimizing agents would be able to utilize. By doing so they would then change the results for everybody and eventually bring the modeled economy back to the behavioral and expectational consistency.

In general, REH (and the general DSGE modeling concept) does not exclude the possibility of a short term deviations between the expected and the actual, model consistent observations, expectations and behavioral patterns. However, as far as those lead to the profitable arbitrage opportunities, these are quickly exploited. Expectations and behavioral patterns are re-aligned to be again model consistent and the equilibrium path is restored.

In a dynamic sense, the path of a DSGE model is the "dynamic equilibrium" (after all, this gives this class of models its name), with possible short term oscillations.

The second axiomatic idea in the specification of the DSGE models is the concept of the "real business cycle" (RBC), (Kydland and Presscott, 1982). RBC hypothesis attributes the cyclical dynamics observable in real economies to the arrival (over time) of various innovations – both positive and negative. These innovations change the set of available outcomes for an economy, may influence individual preferences and, as a consequence, alter expectations and behavioral dynamics.

Innovations can be both positive, increasing the utilization of existing resources and negative, when the resource utilization declines. Positive innovations are mostly improvements in the nature of existing technologies (which includes the firm level of organization etc.) Negative innovations are mostly attributed to regulations and other politically motivated government actions.

The cyclical behavior arises from adjustments of expectations, behavioral patterns and decision-making to the newly arriving information, either on the technology and productivity side (including the availability of new products) or on the side of rising regulatory restrictions etc. But what is important to note is that as long as the "rational expectations" – i.e. individual expectations and resulting decision-making and behavioral

patterns compatible with the macroeconomic results – remain (even in a stochastic sense), the equilibrium path is preserved. (For an interesting discussion along this path, see Ohanian, 2009.)

It should be obvious that, especially by assuming a sophisticated contemporary economy, the informational requirements of a DSGE type of a model are enormous. An agent in this model has to be able to continuously absorb the flow of information about the current and future (expected) price structure and the relevant stochastic properties, firmly anchored in the evolving structures of an economy, both technologically and preferentially. (And this does not include the practical need for information regarding the current and future steps of government, on both fiscal and monetary sides. But, indeed, these may be essentially unpredictable and may be considered random shocks. However, the relative size and frequency of these shocks should then constitute a problem on its own.)

Another characteristics of an actual economy which should complicate the matters informationally are questions about the degree of homogeneity (or a differentiation) between the economic agents, on both consumption and production sides. The DSGE type of models sidestep this issue by assuming a "representative individual" (or a representative agent). That certainly simplifies the analytical complexity, especially when expectation formations, comprehensions of economic structures and hence decision-making and behavioral patterns are concerned. However, such an assumption by definition eliminates both the possible differences in preferences and hence expectations and thus decision-making and behavioral patterns and the impact of interactions and informational exchanges between individual agents. (Ormerod, 1998)

At the "age of bubbles" one would assume that inter-individual interactions should play a role in the economic analysis and modeling. However, one should point out that the notion of a representative agent is not just a convenient analytical simplification which makes DSGE models manageable and, practically speaking, amenable to the empirical testing. The essence of REH is the compatibility between the individual expectations and the macroeconomic results. If the uniqueness of the latter is presumed (the concept of "equilibrium") and if all agents are assumed to have the same general behavioral motivations (captured by the assumptions of the utility and profit maximizations), then indeed their expectations and general behavioral patterns should be logically

the same (in a stochastic sense). Hence the (basically operational) concept of the "representative agent".

But, indeed, for many the basically equilibrium oriented conclusions of the DSGE models and their at best a limited ability to address many observed economic phenomena (bubbles, rising cyclical instability, protracted disequilibria both perceived and actual) provide a motivation to search for alternative answers.

The rise of "behavioral economics" (sometimes in a guise of "behavioral finance") and recently their more sophisticated offspring, the "imperfect knowledge economics" (IKE) is one of those answers. (See, Shleifer (2000), Frydman etc. (2007), Phelps (1990) and others.)

The essence of this "behavioral" approach is the assumption that individuals can be irrational in their expectations and behavioral patterns (in a sense of incompatibility with the macroeconomic results). This possibility then practically eliminates the concept of a "representative agent". But then the diversity of agents introduces the possibility of interactions between agents and hence the kinds of expectations and a (group) behavior facilitating protracted divergencies from equilibrium. And, finally, both of these assumptions can make a disequilibrium the most common state of the economy, practically the only one which agents (and governments) observe, experience and expect. That makes the identification of the DSGE type of result (based on REH) difficult. This then reinforces the incipient instability, facilitates slow adjustments to changing conditions, generates a bubble phenomena and, indeed, may account for rapid changes in individual expectations, behavioral patterns and decision-making paradigms. Rapid shifts in economic dynamics then become distinct possibilities.

The basic objection from the current mainstream (i.e. school of thoughts based on the DSGE modeling paradigms) to the "behavioral" and IKE types of approaches concern the "irrationality" assumptions. And, indeed, it is very powerful. After all, why should individuals persist in forming expectations and following behavioral patterns which are not only at odds with macroeconomic results, but which generate prolonged suboptimal results for one group of individuals and provide arbitrage opportunities and superior profits for others?

Some answers to this puzzle was provided by experiments of Kahneman and Tversky (KT, 1979). They demonstrated that the standard expected utility maximization concept generally used to analyze and describe the

individual behavior may be "over-rational" in a sense that many individuals, for personal psychological reasons, are more concerned and worried about the possibility of the negative outcomes (losses) of their decisions than about the prospective of gains. This then leads to a behavior where stochastic opportunities of gains (which, however, imply some probability of loss) are ignored in favor of behavior which minimizes the probability of a loss. The macroeconomic results of such a behavior are impossible to specify in general (i.e. without specifying details of individual behavior), but it certainly can result in protracted disequilibria and/or bubbles.

Moreover, the individual behavior (i.e. the perception of a risk of losses) may change over time (perhaps by observing results of others in the same macroeconomy) which not only invalidates the important "representative agent" element of DSGE models, but it can generate a protracted disequilibria and an unstable macro dynamics.

The problem with behavioral models incorporating the Kahneman-Tversky explanation of irrationality is that they cannot be (at least not yet) empiricized on a macro scale. After all, KT results came and were replicated only in laboratory and classroom environments, which certainly casts shadows over their broader applicability.

The concept of "rationality" is in the center of economists' discourse. But the rationality, and hence expectations and behavior, are closely related to, and, indeed, crucially dependent upon, the availability and a flow of information. This certainly was not neglected in the economic analysis.

In their 1981 article, Stiglitz and Weiss stressed than the most of information relevant for forming of expectations and the economic behavior is not free. A simple costs-benefits calculation then may induce some actors to choose to follow the choices of the ones they believe to be informed if this is less costly than obtaining the information itself. This indeed lengthen the "information chain", inevitably resulting in some information loss and hence in a possibility of expectation formations which are not "fully rational" and may lead to suboptimal decisions and hence to protracted disequilibria. And, indeed, to a degree in which information about the most of economic phenomena is stochastic, an impact of a slight initial random error by the informed agents (i.e. by those who expended resources to obtain the information), albeit quickly corrected, will be magnified by the behavior of "followers".

(Of course, this possibility, albeit probably very relevant in the world of the technologically induced business cycles, is irrelevant in the world of "representative agent" DSGE type of analysis.)

In general, information must be obtained, evaluated, processes and applied – i.e. utilized in forming expectations and devising (presumably optimizing) behavioral patterns. Both DSGE and behavioral/IKE approaches assume that received information is either "unique" or characterized by a well defined and known stochastic distribution. Such an information can indeed be evaluated and processed into expectations which are subsequently converted into behavioral patterns. The difference between the two approaches is that DSGE assumes an optimizing systemic rationality, whereas behavioralists/IKE allow for some degree of irrationality in processing of information and resultant behavioral patterns stemming from the psychological make-ups of individual agents. In addition, whereas DSGE models generally remain silent about the nature of processes through which information is acquired, behavioralists institute the processes of an "information search". The latter then implies the possibility of a Stiglitz-Weiss dynamics.

However, the neither approach analyzes the nature of the information flow itself, especially the issues of reliability, interpretability and usability of the available information. To address (in an introductory manner) those issues and the possible implication is the subject of the following part.

11.3 The Nature of Information in Economic Discourse

The advent of "information revolution" – that is the widespread availability of Internet and the enormous increase of information processing abilities via an explosion of computing power available to each individual – profoundly changed the circumstances under which economic agents form expectations which determine their behavioral patterns and hence the nature of an overall economic dynamics.

Internet makes a huge amount of economic information available to any interested individual either free of charge or at effectively negligible costs. And the large increase in the computing power makes it possible to process this information in an extremely short time, facilitating (theoretically) an expectation formation which closely correspond (again, theoretically) to the economic dynamics as conveyed by received information.

The problem is that in the real world the available information is often incomplete and subject to variety of interpretations. These are often contradictory both as observations and as far as expected consequences are concerned, subject to errors and large revisions and are often distorted by those who make information available. Moreover, the information available includes not only data (subjected, indeed, to all influences just mentioned), but the processed information – by individual analysts, consultants, media and indeed, the government – as well. And the objectivity of this processed information is often unknown, independently on whether the distortions and misinterpretations are intentional or just the consequences of difficulties and uncertainties mentioned above.

Information available (effectively to each individual) is getting increasingly "dispersed" as far as its veracity, relevance and usability are concerned. And even if this reality is generally know to all economic agents, the problem is that uncertainty regarding the meaning and implications of individual "bites" of information received is Hurwitzian – that is no probability profiles and statistical distribution can be, by and large, attached to the arriving information ex ante.

In these circumstance, to process "all information available at a period t" to form expectations about the period $t + 1$ may well be, and often probably is, beyond the cognitive abilities of the most, if not all, of economic agents. (Increased computing, i.e. information processing, power, certainly helps here, but it is practically powerless in confronting information contradictions and Hurwiczian uncertainty.)

In the discussion below, this situation will be termed "informational overabundance". One may envisage two classes of responses to this increasingly common phenomenon.

One possibility is to choose a subset of the all available information which an individual considers "more relevant or reliable" and form expectations on the basis of this subset. (The choice can be made on the basis of a historical performance, preferred economic model or even the personal trust as far as "expert opinions" are concerned.) The resulting expectations and the behavioral patterns will be then compared with reality and subsequently adjusted if required.

In a long term stable economy this could be considered an asymptotic version of REH. Expectations are formed on the basis of "all available information". (Some available information is indeed ignored, but the choice of which information to use and which to ignore is the organic part of the expectation formation process.) On the basis of observed

results the expectation formation process is then adjusted accordingly and the results coincide with predictions of REH eventually.

However, during the path toward the REH equilibrium individual choices and hence expectations may differ. This will, indeed, make some choice to appear irrational (in a sense of not leading to modelwise optimal results). But it should be pointed out that in the environment of "informational overabundance and Hurwiczian uncertainty" the individual choices remain individually rational and REH equilibrium is only obtained as a result of an iterative process. The length of this process is generally ex ante unknowable, and indeed, there will be a diversity of agents during the move toward REH equilibrium. (It follows that a "representative agent" is the asymptotic equilibrium phenomenon as well.)

However, the likelihood that even an asymptotic REH equilibrium will be approached is low as long as RBC hypothesis remains the part of the DSGE model. Structural changes which form the backbone of RBC hypothesis will increase the information dispersal (or information entropy) and hence, ceteris paribus, will perpetuate the diversity of "relevant information set" choices and hence the expectation formation and behavioral patterns of individual agents. That, indeed, will replicate the appearances of irrationality and suboptimal decisions (arbitrage opportunities) in observed economic results and dynamics.

The second possible response to the overabundance of information, uncertain and often contradictory, is the shift from optimizing to what could be called programmatic (or algorithmic) behavior. (The similar idea was introduces in 1982 by Herb Simon, who used the term "satisficing".)

If the flow of information exceeds individual's cognitive abilities and/or his information processing capabilities, this behavior does provide some sort of solution. The basic idea is that an individual identifies (ex ante) economic variables he wants to pay attention to and then he answers to observed or predicted changes in preconceived manner. That is, the individual does not "optimize" by forming expectations and adjusting his behavioral patterns accordingly, but responds to actual and/or perceived and predicted change in chosen economic variables an a manner which he expects to make him better off. In essence he forms and applies the program saying: if A, B, C etc. happen and you expect that taking action D will improve your wellbeing (however defined), take action D. Else, take action E (or F, G, H, depending on the actual realization of

observed variables), The latter choices, indeed, may (and will) include no action at all.

In reality these programs may be very simple (like buying the Microsoft shares on the dip and selling them if a price increase exceeds a certain percentage, during the dot-com boom) or very sophisticated, like HFT (high frequency trading) programs today. And, indeed, they extend beyond the realm of finance – like an increase in consumption and reduction in savings if the value of individual's assets increases over and above some predetermined value.

Programmatic behavior – which, it is important to repeat, is the individual's response to the "informational overabundance", will, indeed, generate prolonged disequilibria, know colloquially as "bubbles". And it may be assumed that the knowledge of "successful" programs will spread and those programs will be replicated across population, especially given the increasing ability of the computing and information processing power. That implies that a growing share of population will act in the same way, exacerbating of whatever economic impact the initial program sought to exploit.

However, some modern research in areas outside economics indicates that programmatic behavior itself could be the source of not only bubbles, but systemic instability and unpredictability as well. Steven Wolfram (2002) demonstrated that the extensive replication (in a sense of consecutive applications) of even a very simple program can generate results which appear to be results of a random process – or a set of results where parts appear to be organized and parts random. Apparent randomness, combined with the lack of awareness regarding the nature of the process (program) which generated the apparently random patterns makes the evolution of such a program generated system essentially incomprehensible and unpredictable to outside observer.

From the information view, observed seemingly random pattern and observationally unpredictable genesis of a wolframite system generates an observational appearance of a system progressing in time via seemingly endless series of random shocks. This is so even if the system is generated by a simple, well defined program. Moreover, in Wolfram's examples such a system emanates signals (information regarding its state and evolution) which eventually become pure noise, making any induction about generating processes (programs) impossible.

Economic systems may not be "wolframite" but we cannot exclude the possibility that an increased incidence of programmatic behavior will

generate a system which appears increasingly random and unpredictable, giving the rise to the increasing "information overabundance" (in a sense defined above), which then reinforces programmatic behavior.

That then reinforces the appearance of systemic randomness and unpredictability, making the formation of "rational expectations" in a sense of REH practically impossible, even if the individual behavior (i.e. the programmatic responses) are the rational response to the observable environment.

The problem with such a system then may be that its observational randomness and unpredictable evolution can hide weak structural spots. Those remain essentially hidden in perceived random structure and may be benign. However, it is possible that some action – the programmatic response to some system evolution, but appearing random to an outside observer – may trigger cascading structural failure. But again, the apparent randomness of the system and unpredictability of its evolution make it impossible to indentify ex ante both the areas of "structural weaknesses" and their reaction to some programmatic behavior, often appearing as a type of random shock. Moreover, such a random shock can be observed before as being harmless – mostly because it did not impact an area of (ex ante unidentifiable) structural weakness. (This possible mechanism is an application of what is known as "sandpile game" – see Buchanan, 2001.)

11.4 Conclusions

The discussion above indicated that that the "overabundance of information" (as described in the previous discussion) may overwhelm cognitive and processing capabilities of economic agents. That limits the ability to form expectations along the lines of REH.

The individual rationality (i.e. the effort to cope with the informationally overwhelming and often uninterpretable environment) then introduces programmatic approach and behavior. But this often appears systemically "irrational", especially when REH and DSGE approach to economic analysis are the main points of reference.

But the programmatic behavior tends to make systems dynamics to appear increasingly random and unpredictable, with the potential to form the areas of an ex ante unindentified systemic weaknesses which may result in a sudden and unpredicted difficulties and performance deteriorations.

Policy responses to this development remain at this point of time unclear. A stabilization of markets – both real and financial – may reduce the degree of uncertainty and unpredictability of information. This could result in individual behavior becoming less programmatic and more optimizing – i.e. getting close to REH logic and hence closer to equilibria and stability.

However, by stabilizing markets and hence the flow of economic information, such policy would reduce both the risk taking and the incentives to creatively and dynamically exploit the emerging opportunities. The result then could be the nightmare of slow growth or stagnation, with a persistently high unemployment and periodic bouts of debilitating and cancerous inflation. Such a cure, indeed, has a potential to be much worse over medium to long term than instabilities and risks it seeks to redress.

Well, whereas there may be no optimal policy response, the best solution appears to be an accommodation to a new reality. The future may be more unstable and less predictable, but it has a potential to become more dynamic. But only time will tell.

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