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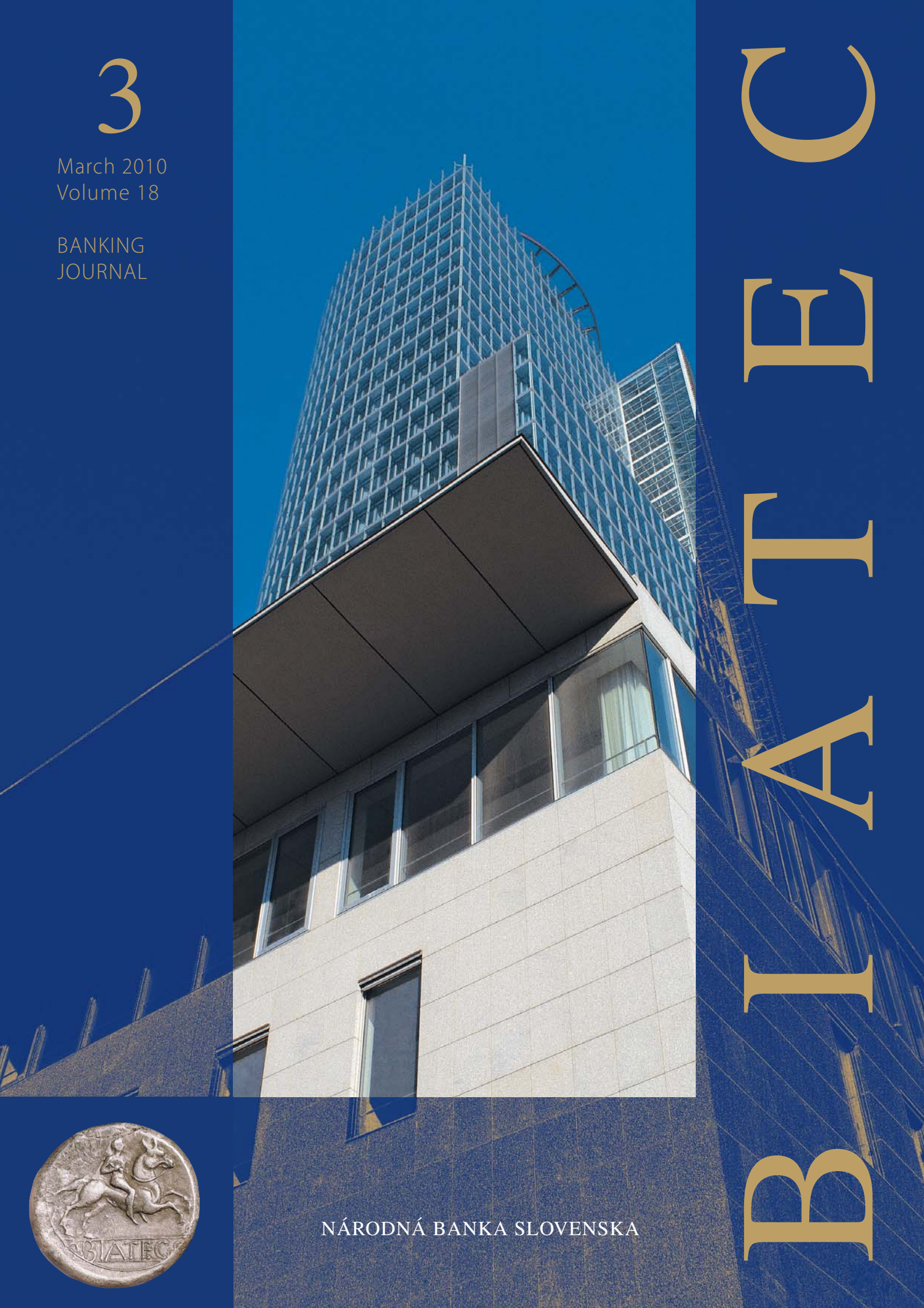


NÁRODNÁ BANKA SLOVENSKA

Monetary ups and downs

A new exhibition at the NBS building in Bratislava

The demise of the koruna currency has become an opportunity for many cultural and social acts. With several museums putting on exhibitions devoted to the koruna, the Museum of Coins and Medals, as the only specialized numismatic museum in Slovakia, could not remain on the sidelines. At the end of 2008, the museum held an exhibition in its numismatic room entitled "Currency Separations, Farewells, Reforms and Other Cataclysms in the 20th Century." After being extended and undergoing graphical changes, the exhibition was transferred to the NBS headquarters in Bratislava.

Photo: Igor Plávka

The exhibition presents currencies that were used in the territory of what is now Slovakia during the course of the 20th century – a period of revolutionary changes. To capture all the currency convulsions of the 20th century in one place is impossible. What this exhibition aims to do is to recall some of these events, to highlight their causes, consequences and significance, and to compare them in the broader context of time and geography.

In Europe, the First World War resulted in the breakup of large monarchies into smaller states. Some monarchies were replaced by aggressive dictatorships, often in dramatic circumstances. The restructuring of Central and Eastern Europe under the Treaty of Versaille led to efforts to revise this system. The result was the Second World War, which temporarily rewrote the map of Europe.

The Allied victory over Hitler brought about a partial restoration of the pre-war status in Central Europe, but not in Eastern Europe, where it reinforced the extensive territorial changes wrought by the Nazis and the Soviet Union before the war.

Furthermore, Europe was divided into two politically and economically antagonistic blocs, which, almost until the end of the century, teetered on the edge of a new global conflict.

All these events had a radical impact on the economies of individual states and also interfered notably in the property of individuals. Hardly anything was as sensitive to these events as were monetary systems and money.

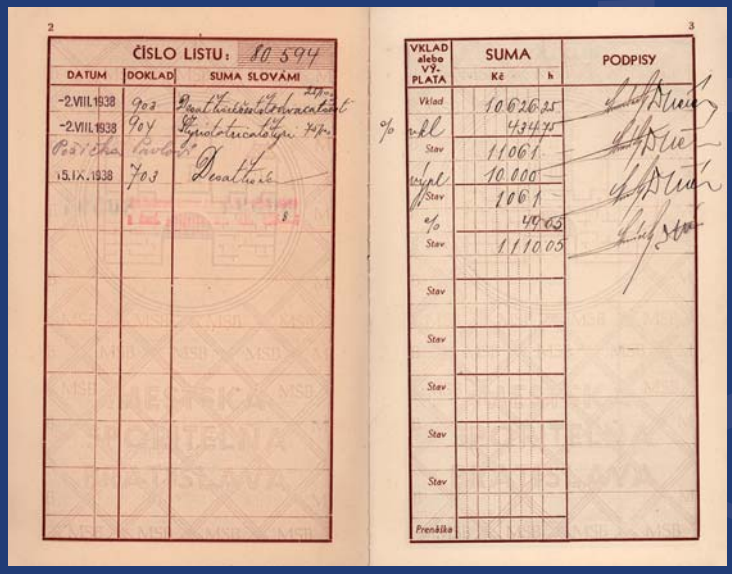
It cannot be said that similar changes would not have happened in earlier times. However, the frequency with which they came along in the 20th century and their destructiveness were exceptional. Almost every country, not just Slovakia, fell victim to them. The collapse of Austro-Hungary, the Second World War, the entry of communism in Central and Eastern Europe were events that affected all of us together. Therefore the currency reforms concerning our territory (currency separation in 1919; currency separation in 1939; currency reform in 1945, and currency reform in 1953) must be seen in a broader context. Some currency upheavals made almost no impression on people. Other changes, by contrast, affected the thinking of entire generations.

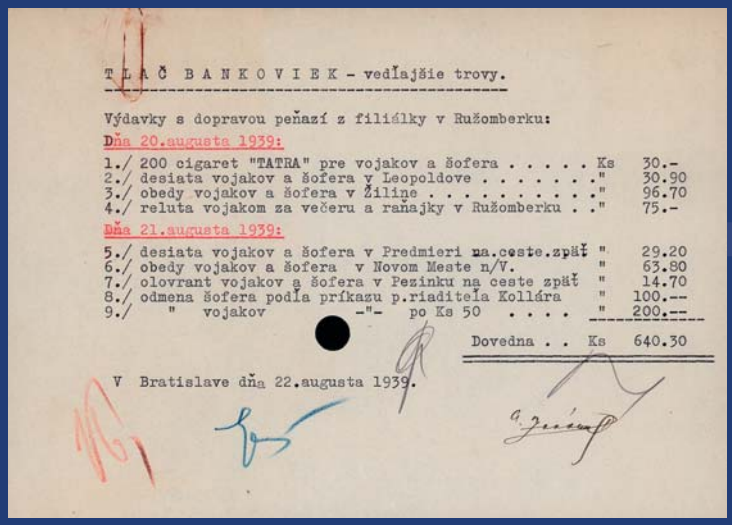
In Central and Eastern Europe currency systems have changed frequently and often suddenly – causing an immediate devaluation of currency in circulation and savings. This was typical especially in the period after the Second World War. Later, countries went about solving their currency difficulties through more gradual steps. Their situation was often worsened by dependence on a foreign power and its interventions, as well as by the instability of borders and the conflicts this led to.

Visitors viewing the 31 panels can familiarize themselves with the currency changes that affected this area in the 20th century. They can compare and follow, for example, how the different successor countries came to terms with the breakup of Austro-Hungary (by following an inflationary or deflationary monetary policy); how Soviet Russia formulated a new currency; hyperinflation in post-war Germany; the repercussions of the Molotov-Ribentrop Pact for the Baltic States, Poland and Romania; the breakup and reunification of Yugoslavia; and essential currency reforms to deal with the aftermath of WWII in Czechoslovakia, Austria, Hungary, Romania, and West and East Germany. The largest space is devoted to the 1953 currency reform, which the older generation of citizens will remember.

As well numerous examples of paper currency, the exhibition recalls the past through the use of period photographs, maps, conversion rates, archive documents, passbooks, share certificates, and so on. These items are on loan from the Museum of Coins and Medals in Kremnica, the archive of Národná banka Slovenska in Bratislava, and the private collection of the exhibition's principal organizer, Ing. Z. Šustek, CSc.

Martin Chmelík
NBS–MMM




TLAČ BANKOVIEK - vedľajšie trovy.

Výdavky s dopravou peňazí z filiálky v Ružomberku:

Dňa 20.augusta 1939:

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3./ obedy vojakov a šofera v Žiline . . . . . " 96.70
4./ reluta vojakom za večeru a raňajky v Ružomberku . . " 75.-

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9./ " vojakov -"- po Ks 50 . . . . " 200.--

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V Bratislave dňa 22.augusta 1939.

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Address:
NBS, Editorial Office BIATEC
Imricha Karvaša 1, 813 25 Bratislava
e-mail: biatec@nbs.sk

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Contents

Model use in central banks of selected European countries

Simona Štefanovičová[1], Juraj Zeman
Národná banka Slovenska

"Economics is a science of thinking in terms of models joined to the art of choosing models which are relevant to the contemporary world"[2].
John Maynard Keynes

This article deals with models used as a supporting tool of monetary policy formation. In the first part, it presents the main types of models and their general characteristics. The strengths and weaknesses of particular models are mentioned briefly. In the next part, it describes the main parts of the monetary-policy process and the role that the presented models play in this process. The article concludes with a short overview of the models used in central banks of selected European countries.

1 *Juraj Zeman was the tutor of Simona Štefanovičová, an undergraduate student who based the article on her eponymous dissertation.*
2 *John Maynard Keynes in a letter to Roy Harrod dated July 1938, taken from the book Economic models at the Bank of England, page 3.*
3 *Unofficially known as the Nobel Prize in Economics.*

Introduction

Central banks are confronted on a daily basis with a multitude of tasks, which they seek to address by making use of as much relevant information as possible. It is not easy to face the barrage of the information boom and to know how to select correctly the information that is of really key importance. One place to start is to transform the real world into the world of equations and modelling.

Macroeconomic modelling has in recent years started to play an important role also beyond the frontiers of theoretical research. The conclusions reached in this way have been put into practice, and they help not only to describe the current state of the economy, but also to make certain predictions in regard to its future development.

It must be noted, however, that monetary policies are not supposed to be based solely on model outputs. The economic crisis, affecting practically every economy in the world, has underlined the great importance of subjective estimates based on intuition. During the pre-crisis period, sound judgement and intuition receded into the background and excessive significance was placed in complicated models. Though the use of models can benefit monetary policies, it should always be remembered that models are intended to serve only as supplements to intuition and judgment.

A brief history of economic modelling

The Great Depression in the 1930s laid the ground for the development of macroeconomics. Economists started to address themselves to the causal relationships of the economic collapse and to the starting points that would help get the economy back to the pre-war level. Terms such as national income and economic statistics started being used ever more frequently.

The first publication dealing with macroeconomics was published as early as 1933 by the Norwegian economist Ragnar Frisch. No account of the development of macroeconomics would be complete without mentioning the great British economist John Maynard Keynes. Keynes was an advocate of government intervention in the economy, either through the setting of interest rates or by means of taxation. His theory was published for the first time in his 1936 book *The General Theory of Employment, Interest and Money*. Although the Keynesian theory came in for criticism – and not only from proponents of classical economics – the ideas of J. M. Keynes became the basis for the emergence of the neo-Keynesian movement that survives in the economy even today. In defending his theory against the classicists, he made the statement: "In the long run, we're all dead." His point was that the proponents of classical theory were focusing their attention on the medium-term and long-term horizon, in which the economy shows stability. For the Keynesians, however, it was the short-term horizon which was crucial and which provided the space for monetary and fiscal policy interventions.

Economists did not stop at purely theoretical activity. The study of macroeconomics and microeconomics logically resulted in the first attempts to design a model that would project reality into a web of equations and identities. The first macroeconomic models began to appear at the beginning of the 1950s.

The original large-scale national macroeconomic model was designed by the Dutch economist Jan Tinbergen. He, together with Ragnar Frisch, won the 1969 Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel[3] "for having developed and applied dynamic models for the analysis of economic processes".

Another leading name in the development of macroeconomic models was Lawrence Robert Klein, a US economist who constructed the first global macroeconometric model – the Wharton Econometric Forecasting Associates LINK project. The 1980 Sveriges Riksbank Prize in Economic Sciences was awarded to Klein "for the creation of econometric models and the application to the analysis of economic fluctuations and economic policies".

The 1960s began to see the use of macroeconomic models in central banks, especially in Western countries. Monetary policy-makers started to take account of model outputs in their decisions.

From the 1970s, elements of microeconomics started to be implemented in macroeconomic modelling, largely because the models that had been used up to then were based mainly on the historical correlation of variables and did not take into account the behaviour of particular agents (above all households).

Today in the new millennium, national banks make use of a broad range of models as a matter of course, especially when making forecasts, producing simulations of the economy's reaction to shocks, and examining alternative scenarios of monetary and fiscal policy. Banks use more types of models, and in the case of forecasts and simulations, some even combine the results of several types. Among the most frequently used are structural models, VAR models, and, coming to the fore in recent times, DSGE models.

Types of models used in central banks

Structural macroeconomic models

Structural macroeconomic models were among the first that started to be used as a supporting tool of monetary policies.

There are now several categories in this group. They are divided not only according to size (from models consisting of several equations up to one with more than 100 equations and identities), but also according to structure and the theory on which they are based (neoclassical, neo-Keynesian, or a combination thereof). Their further division stems from the form in which variables are entered in the model. For example, cyclical (gap) models focus on deviations of variables from their equilibrium trends, and they are countered by stock-flow models with variables expressed in volumes.

A general feature of these models is that they proceed from macroeconomic theory. Properties of the long-term horizon are derived from the supply side of economy, and short-term dynamics from the demand side.

A model is usually divided into blocs, e.g. demand, supply, price, monetary.

Agents acting in the economy include households, corporations, government and the central bank.

Advantages and disadvantages

Relationships in these models are either based on optimization (e.g. in case of corporations) or on identities from theory and on ad-hoc relationships (e.g. the relationship between consumption and disposable income). Criticism of the models is primarily levelled at their non-inclusion of microeconomic aspects, which enable more complex modelling of the behaviour and preferences of agents.

These types of models are very often backward-looking, i.e. the agents have only adaptive expectations. Forward-looking models, by contrast, allow the inclusion of such facts as expected inflation or expected interest rate.

These facts led to the development of structural models, one of the results of which was the emergence of DGSE modelling. This is based on traditional macroeconomic modelling, and complements it with insights from the field of general equilibrium theory and microeconomics.

Critics of such macroeconomic modelling came up with VAR models as an alternative to macroeconomic models. A relatively large number of central banks continue to use structural macroeconomic models in the formation of monetary policies (e.g. the ECB's model AWM, Austria's AQM, Slovakia's QPM). It should be noted, however, that central bank research staff often work on the development of the DGSE model (e.g. the Slovak DSGE), or they use auxiliary alternative models (the Austrian GDP factor model).

DSGE models

Macroeconomic modelling has recently been moving towards dynamic stochastic general equilibrium (DSGE) modelling**.** A specific feature of these models is that they proceed from microeconomic principles.

The foundations of DSGE modelling were laid in 1982 by the Norwegian economist Finn Kydland and his US colleague Edward Prescott in the paper *Time to build and aggregate fluctuations.* The two won the 2004 Sveriges Riksbank Prize in Economic Sciences "for their contributions to dynamic macroeconomics: the time consistency of economic policy and the driving forces behind business cycles". These economists came out not only with a reworking of Keynes' theory, but with a method for determining model parameters. Calibration was added to the estimation of parameters that had been used up to then.

As the name of the models indicate, they involve studies of how the economy is developing in time (*dynamic*). On one hand, the current influences of variables on future development are taken into account, and, on the other hand, the model incorporates expectations that play an important role in present-day decisions. The word *stochastic* conveys the element of randomness and the fact that the economy is exposed to shocks (e.g. to random technological changes, oil price fluctuations, etc.). The model assumes that there is a *steady state* in which the economy ex-

ists when it is not exposed to shocks. From the view of microeconomics, we understand that the DSGE model must be able to describe the economic environment formed by particular agents. This environment should be characterized by important economic aspects, such as:

- 1. preferences – each agent must possess defined objectives of optimization (utility function, profit function);
- 2. technologies – production capacities must be defined;
- 3. institutional basis – represents the institutional limitations under which the economic agents interact. For example, it is possible to state agents who take their decision with respect to budgetary limitations imposed exogenously.

Standard agents in this modelling are:

a. households
b. producers
c. central banks
d. government.

Advantages and disadvantages of DSGE models

DSGE models are built on microeconomic principles, and this fact implies the following:

1. the model is capable of identifying shocks that permanently affect the economy;
2. the model does not fall within the Lucas criticism[4];
3. the model optimizes through utility functions, thereby allowing it to address social prosperity derived from agents' preferences.

The model also allows the analysis of how changes in preferences, technology, institutions and governmental policy affect the equilibrium values and cyclical properties of key endogenous variables. Outputs, as well as model formulation, give space for the construction of so-called economic narratives. Equations represent the mathematical expression of relations according to economic theory, which is why the results we receive through them can be verified and interpreted at the theoretical level.

Besides advantages, the use of optimizing models has of course some disadvantages, too. The optimizing considerations of agents in the economy require simplification of the problem and the acceptance of strong assumptions, which could lead to certain risks being neglected. Because of the specification of relations among variables, optimization and restrictions, the model consists of a great number of equations and identities and becomes less transparent as a consequence. It is not unusual for models to contain more than a hundred equations and identities, and thus constructing them is a technically demanding process. To create and solve such a great number of equations requires personnel skills, together with a strong mathematical and economic apparatus and good-quality technical equipment.

Criticism of this type of model is heard also from opponents of equilibrium theory itself. In their view, the concept of equilibrium is impracticable for the economy, since the economy, being constantly supplied with energy, cannot represent a closed system. Accordingly, equilibrium in the proper sense of the word can never be achieved.

In view of the disadvantages of DSGE models, the preference at present is to use them mainly for analytical purposes and for learning how agents interact with each other. At the time we wrote our work[4], DSGE models were being used for forecasting purposes in only three countries in Europe – the United Kingdom (BEQM), Finland (AINO) and the Czech Republic (G3).

VAR models

Among the other models frequently used in econometrics are *vector autoregression (VAR) models*.

As early as 1969, VAR models were being analysed using Granger causality.

The first time that VAR was used to explain mutual interactions between economic variables was by Christopher A. Sims in *Macroeconomics and Reality* (1980). He thus created a counterbalance to macroeconomic models. Since then, the use of VAR models has expanded considerably into the field of economy modelling.

The structure of VAR models is straightforward, with the vector of variables explained through historical values. The solution of this model is more an issue of econometrics and time series.

Advantages and disadvantages of VAR Model

A strength of VAR models is that they do not require any strong theoretical fundamentals and assumptions. The VAR concept is not tied to theoretical conditions; all economic considerations are reflected solely in the selection of variables and number of lags. The model reveals correlations of the past variables, which is why it has great meaningfulness as far as their behaviour is concerned.

One advantage of the model is that all variables entered into it are treated as endogenous, which thereby obviates the modelling of exogenously considered variables.

The two main problems in constructing the model are, first, the selection of the optimal number of system variables, and, second, the lag length of the variables. The first problem is largely eliminated on the basis of findings from economic theories, and the second one through standard econometric criteria (Akaike information criterion, Schwartz information criterion). There are now also other methods for determining the correct number of time lags, see for example the work of Omar Ozcicek and W. Douglas McMillin.

The selection of a more than optimal number of lags (*overfitting*) can, according to Lütkenpohl, lead to the growth of so-called *mean square forecast errors*; the opposite problem (*underfitting*) results in auto-correlated errors in the model. At the same time, the inclusion of too many variables or time lags often leads to weakening of the model.[5]

4 *The Lucas criticism means the criticism of classical macroeconomic models that they do not take into account changes of relations in the event of changes in economic policies. 4 December 2009*
5 *Lütkepohl, H.: Introduction to Multiple Time Series Analysis. Springer – Verlag, Berlin, 1993.*

In addition to the already mentioned technical difficulties that stem from the very structure of the model, we encounter further difficulties in the course of modelling. Since the model is based on past interactions among variables, the forecast of the modelled variable behaviour is correct only provided that the past relations between variables are preserved in the present and also during the projection horizon. Since this is relatively strong assumption, the model is used only to forecast developments within the short-term horizon (e.g. monthly or quarterly forecasts) or in conjunction with other models (e.g. when comparing inflation development forecasts obtained by VAR and macroeconomic models – United Kingdom).

Further residues emerging in the model lack the attribute of mutual ortogonality. Consequently, the residue in one equation cannot be characterized as a shock to the variable being explained. In order to remove this shortcoming, it is necessary to finalize the system definition by means of other relations, primarily from economic theory. The model that emerges from the final combination is referred to as a structural VAR model.

Process of monetary policy formation

Central banks all over the world were in recent years focused on inflation targeting, meaning that they attempted to keep inflation at a desired level by means of monetary instruments – particularly the interest rate. In deciding on the interest rate level there are many factors to consider, for example, the expected economic development both at home and abroad, labour productivity, and so on. Thus models intended to offer possible predictions for the current and expected state of the economy are integrated into the decision-making process.

The forecasts of central banks are not, however, based only on model outputs. The whole process lasts for several days, even weeks, during which experts from the fields of modelling, theory and empirical studies join the discussion.

Responsibility for the direction of a country's monetary policy lies with the board of its central bank (in Sweden, for example, the Executive Board; in Slovakia, the Bank Board of NBS), which adopts decisions on basis of majority votes. With some central banks (e.g. the Swedish Riksbank), the views of individual board members are published subsequently, and in other cases (e.g. the European Central Bank) they are not .

Main stages of the decision making process

The publication of repo rates is preceded by a demanding process involving discussions at several levels[6].

The first stage of the process consists of a meeting to discuss the various risks to, and alternatives for, the economy's development. The meeting is attended not only by members of the body responsible for monetary policy, but also employees from the monetary policy department. At the end, a group of alternative scenarios is formulated and will be considered in the next stages.

Further meetings soon follow, and among the matters discussed are the international situation and its outlook, financial markets, and the current condition of the economy. New relevant information acquired since the previous meeting is analysed, deviations from the baseline scenario are monitored, and model outputs are presented. The meeting about financial market developments is important for determining the expected development of the repo rate, which serves as an input for the production of forecasts. Any changes in the markets that have occurred since the previous meeting are also taken into consideration. Since data describing the current state of the economy are not yet available at this time, model outputs are used for this purpose.

The next stage of the decision-making process is the forecasting of macroeconomic variables and production of detailed forecasts. Models created by the central bank are employed in this regard. First of all, a general-to-specific approach is taken, and then the output is checked the other way, i.e. specific-to-general. In this way, various alternatives for repo rate development can be taken into consideration.

The model outputs are presented at meetings organized by the bank board. The results obtained through the models, as well as any new information, are analysed, and their consistency is compared. The results obtained after incorporating the new information into models are also presented.

The next point of discussion is alternative scenarios and risks. After experts' opinions have been heard, the decision itself is taken. Once all the arguments have been considered, there is a discussion about how the economy will develop over the following period. Every member of the Board expresses a view on this and on the direction in which monetary policy should be moving. Finally, the majority view is adopted on the basis of a vote. The repo rate and monetary policy report are published the following day. If the central bank decides to disclose details of the voting, it will publish them around two weeks later.

Models used in the central banks of selected European countries

In conclusion, we provide a brief overview of models used by selected central banks in Europe in the formation of monetary policy, and a selection of their specific features. The following table lists the countries together with the names of the models, their type, and their main use. It should be noted that we have focused only on the principal models, and that while a central bank may have a whole arsenal of various models, these are used mostly for the production of shadow forecasts, or for validating outputs from the principal models. The selection of models is based on information given to us by the central banks' representatives.

6 The decision-making process is similar in all countries covered in our work. Our starting point is (2).

Table 1 Models used by central banks in the European Union

Country	Model name	Type	Use
ECB	AWM	structural	forecasts, analyses
	VAR models	VAR	forecasts, analyses
	DSGE models	DSGE	analyses
Slovakia	Structural model SR	structural	forecasts, analyses
Hungary	NEM	structural	forecasts, analyses
	PUSKAS	DSGE	analyses
	HI – FI	structural	inflation forecasts
Czech Republic	G3	DSGE	forecasts, analyses
Poland	NECMOD	structural	forecasts, analyses
	DSGE model	DSGE	analyses
Austria	AQM	structural	forecasts, analyses
	Static model	ARDL	GDP forecasts
	dynamic factor model	factor	GDP forecasts
Germany	MEMMOD	structural	forecasts, analyses
	DSGE models	DSGE	analyses
France	MASCOTTE	structural	forecasts, analyses
	OPTIM	VAR	GDP forecasts
UK	BEQM	DSGE	forecasts, analyses
	RAMSI	VAR	analyses
	DSGE model	DSGE	analyses
Finland	AINO	DSGE	forecasts, analyses
	EDGE	DSGE	analyses
Sweden	RAMSES	VAR	forecasts, analyses
Switzerland	DSGE – CH	DSGE	forecasts, analyses

As regards the description of specific features, we focused only on models that deviate significantly from the generally formulated model, and thus to a certain extent expand and improve its attributes.

In Hungary, the NEM model is characterized by its differentiation of capital and labour according to sector of use. In the private sector, capital or employment is the result of the optimizing behaviour of enterprises, whereas in public sector their use is given exogenously. This differentiation allows better adherence to the data. The model is also made specific by incorporating the integration variable into the equation for export volume. This is expressed by technological progress of labour, which is significant in describing the integration and convergence processes of the Hungarian economy.

The PUSKAS model incorporates the heterogeneity of households by differentiating between optimizing and non-optimizing households. Non-optimizing households spend everything they earn and their consumption in relation to number of hours worked is highly volatile. The model also covers retired persons, whose consumption does not depend on hours worked.

The behaviour of agents in the economy is influenced also by the adaptive mechanism of learning, whereby their decisions about expected inflation derive from historical differences between expected and real inflation values.

In the Czech Republic, the G3 model includes as agents dealers in foreign bonds and salary insurers. Households determine their optimal wage, although over the given period only one part of the household receives a signal for re-optimizing. If they do not receive the signal, the insurer pays them a contribution to wages. This ensures the homogenization of consumption, capital holdings and wages.

The general equation of capital accumulation is supposed to describe a specific feature of transitional economies, in which old capital is exchanged for new capital.

In Poland, the DSGE model is used to analyse the banking sector. Among the entities presented as agents are banks, differentiated into lending and saving. By incorporating the financial sector, the model makes it possible to monitor the transmission of shocks to which economies were exposed during the financial crisis. The model differentiates households into patient, impatient and small businesses. The first two differ from each other in the value of the discount factor. The small businesses act as producers of intermediate products, and therefore their volume is not the result of profit optimization, but rather utility maximization.

In Austria, the static model based on time series analysis serves for short-term forecasting of GDP.

Assisted by six indicators, the first stage involves modelling monthly GDP development, which is then used to forecast the quarterly development.

In Germany, the NEMMOD model was designed in response to the need for exogenous modelling of the external environment. It provides a model of nine countries – the G7 plus the Netherlands and Belgium. The model is composed of submodels for each of these countries and they are mutually interconnected through foreign trade.

In France, the MASCOTTE model is characterised by two differentiations. Capital is divided into capital for plant and capital for real estate, which in turn improves the modelling of investments and ensures that they receive better long-term attributes of the model. The second differentiation concerns imports, which are divided into imports of goods, energies and services in order to distinguish price trends.

In the United Kingdom, the BEQM model does not treat labour as a variable of utility maximization, but as a binary variable. Households have access to the financial market, where they can invest as well as borrow. In order to prevent nonstationarity of the model caused by high debt accumulation, households are exposed in each period to the probability of death.

The UK's DSGE model is used to examine the effect of Asian countries' exchange rate regime on the transmission of shocks from the USA to the EU. Households can trade in international financial markets. In order to achieve stationarity in this model, costs related to the holding of bonds are introduced. Enterprises, for their part, incur costs related to price fluctuations. Thus, in the context of optimization, prices do not adjust immediately to changes in demand and therefore price inflexibilities arise.

In Finland, the AINO model centres on the heterogeneity of households in terms of age. This is also why the model covers also pension funds. Households are divided into working and retired, which are distinguished by different discount factors and lower labour effectiveness. In each period, working households are subject to the probability of retirement, and retired persons to the probability of death.

The most interesting feature of DSGE – CH is the extension of the production factors with crude oil. This allows monitoring of the effect of oil prices on production, product prices, and overall inflation.

Conclusion

Given the important position that central banks have in the economy, their decisions must be based on information acquired from trustworthy sources. That is why models are used in the formation of monetary policy. The scope of their use is extensive, ranging from forecast outputs to the analysis of economic shocks. But although models remain firmly embedded in monetary-policy decision making, their use must be challenged with economic intuition and reality.

References:

1. Gavura, M., Reľovský, B.: A simple model of the transmission mechanism of Slovak economy, its structure, and properties. Biatec, 4/2005, pp. 12-19.
2. Hallsten, K., Tägtström, S.: The decision-making process – how the Executive Board of the Riksbank decides on the repo rate. Sveriges Riksbank, Economic Review 1/2009, pp. 66 – 86.
3. Kunst, R. M.: Vector autoregression, 2006.???????
4. Laforte, J. – P. Forecasting with DSGE models. Board of Governors of the Federal Reserve System.
5. Reľovský, B.: Macroeconomic modelling in central banks. Infostat, 11 pages.
6. Reľovský, B., Široká, J.: A structural model of the Slovak economy. Biatec, 7/2009, pp. 8-12.
7. Wieland, V.: DSGE Models for Monetary Policy: Promises and Pitfalls. Bank Indonesia and Bank for International Settlements Workshop, Keynote Lecture, 2008.
8. Zeman, J., Senaj, M.: DSGE Model – Slovakia. National Bank of Slovakia, Working Paper 3/2009, 2009.

Comparison of central bank measures taken in response to the financial crisis

Ing. Miroslava Kochanová
Národná banka Slovenska

The present article is a continuation of the article 'Comparison of Central Bank Measures Taken in Response to the Financial Crisis,' which was published in December 2009. The first part of the article was devoted to the common and individual measures of the European Central Bank and the Bank of England. The second part focuses on the responses of the Federal Reserve System and the Bank of Japan.

Federal Reserve System

The current operating target of the Federal Reserve System (Fed) is the overnight rate for unsecured deposits, at which the balances of deposit institutions held on current accounts with the Fed are traded, i.e. the Federal Funds rate (effective rate). The bank attempts to stabilise this rate close to its key interest rate called *Federal Funds target rate*. Through open-market operations, required minimum reserves, contractual clearing balances[1] and the discount rate, the Fed controls the supply of and demand for balances on the accounts of deposit institutions, and thus influences the key interest rate.

When the financial crisis arose in the autumn of 2007, the Fed responded by taking standard monetary-policy measures and introducing a wide range of non-standard instruments. In September 2007, the Fed started to ease its monetary policy: the key interest rate was reduced in ten steps, from 5.25% to a level close to zero within the 0.00–0.25% range (the term *'target rate'* was changed to *'target range'*).

Besides easing its monetary policy, the Fed also implemented new programmes, which markedly affected its balance sheet. The first group of instruments was associated with the traditional task of a central bank as the lender of last resort. Through these instruments, the Fed supplied banks and other deposit-taking or financial institutions with short-term liquidity. At international level, the Fed signed swap line agreements with 14 foreign central banks, which were subsequently supplied with US dollar liquidity in exchange for countervalues in their national currencies.

The second group of instruments includes the direct supply of liquidity to debtors and investors in the main markets. These programmes comprise the following facilities: *Commercial Paper Funding Facility* (CPFF), *Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility* (AMLF), *Money Market Investor Funding Facility* (MMAFF) and *Term Asset-Backed Security Loan Facility* (TALF).

Through these programmes, the Federal Reserve System started pumping much more money into the banking sector than in the period before the crisis. As a result, the Fed's balance sheet expanded to a significant extent. After being below USD 1,000 billion in June 2007, the balance total reached a historical high at the turn of 2008, i.e. USD 2,300 billion (more than twice the figure for June). The balance sheet expanded in terms of both volume and structure, because the new programmes created some new items, which were non-existent in June 2007. The extended range of instruments used as non-standard measures is described in the following analysis of the Fed's balance sheet.

Balance sheet of the Federal Reserve System

Liability side

Before the financial crisis, the largest liability-side item (accounting for almost 90%) was currency in circulation. It was followed by deposit received from thousands of deposit institutions (approximately 7,000), the US Treasury and other institutions having accounts with the Fed. The balance sheet expansion on the asset side, which was caused by various refinancing programmes launched in response to the ongoing financial crisis, was also reflected on the liability side, mainly in the item 'reserve accounts of deposit institutions.' Before August 2007, the daily average balance on accounts kept with at the Fed stood at approximately USD 12 billion. The intense refinancing of US banks through programmes caused a rapid increase in the volume of deposit account balances in the Fed, which is consistent with the currently used Fed Funds rate target, which is close to zero. In the middle of 2009, the volume of reserve account balances reached an average of USD 770 billion, which was 64 times more than the figure from the period before August 2007. The share of currency in total liabilities decreased to 45%,

1 *The Fed allows banks to hold contractual clearing balances on their accounts (in addition to the minimal reserves). A bank decides to maintain a clearing balance if the amount held at the end of the day under the minimum reserve requirement is insufficient for the coverage of other withdrawals (arising from unexpected debit transactions). Like the minimum reserves, such clearing balances are also remunerated, but the profit earned can only be used for the coverage of service charges within the Fed.*

while that of deposits in total liabilities increased to 35%.

Another item that markedly increased on the liability side was deposits held on the general account of the US Treasury. A new item was also created, i.e. a supplementary financial account for the US Treasury. This item was created on the basis of an agreement made between the Fed and the US Treasury establishing a *Supplementary Financing Program* (SFP) designed to assist the Fed in monetary policy implementation. Through the SFP, the Treasury issues short-term debt securities for sale to American banks. In this manner, the liquidity surplus in the banking sector resulting from the expansion of the Fed's refinancing facilities is reduced to some extent. This item accounts for approximately 10% of the Fed's liabilities.

Asset side

Open-market operations

The Fed's most frequently used monetary-policy instruments are open-market operations, including direct purchases and sales of securities and repo operations with primary dealers[2]. Their implementation is ensured by the Federal Reserve Bank of New York through the SOMA (*System Open Market Account*) portfolio. Securities purchased for the SOMA portfolio are normally held to maturity. Since the start of the financial crisis, the Fed has markedly expanded the refinancing of the banking sector through open-market operations, i.e. through the purchase of securities for portfolio. This expansion was mainly attributable to the *Mortgage-Backed Securities Purchase Program*, which was designed to reduce the costs and to increase the availability of loans for house purchases. Within the scope of these programmes, the Fed purchases direct Fannie Mae, Freddie Mac and Federal Home Loan liabilities from banks and mortgage-backed securities (MBS) guaranteed by Fannie Mae, Freddie Mac and Ginnie Mae. By the end of 2009, the Fed was supposed to purchase MBS in the amount of up to USD 1,250 billion.

According to economic analysts, America's real estate market – the main engine of the US economy – has been in recession over the last four years. The construction and sale of new houses have suffered a sharp decline since the end of 2005. However, the figures released indicate that the recession bottomed out in January 2009. The real estate market recession is also reflected in the volume of mortgage loans provided in the United States, which stagnated at the level of 2007 throughout the first quarter of 2009. This indicates that the number of families taking out mortgage loans has not increased for more than two years. The aforementioned MBS purchase programme has not yet produced a significant effect, but there are some signs of revival indicating that the real estate market is likely to start growing again.

In March 2009, the Fed announced its decision to start purchasing long-term government securities within the scope of the *Treasury Purchase Program* (TPP) in order to improve the situation in the lending market. The operating goal of this program differs from that of standard securities purchases, which are used during monetary policy implementation. The volume of the program is USD 300 billion and the purchases focus on 2 to 10-year securities. Eligible counterparties are the primary dealers.

Swap lines with other central banks

The Federal Reserve System cooperates with numerous foreign central banks in the area of liquidity supply on the basis of swap line agreements. There are two types of swap lines: swap line in US dollars and swap lines in foreign currencies.

In December 2007, the Fed signed an agreement on the supply of US dollars via swap lines established with the European Central Bank and the Swiss Central Bank to the local markets. Subsequently, the Fed made agreements with further central banks, namely the central banks of Australia, Brazil, Canada, Denmark, England, Korea, Mexico, New Zealand, Norway, Singapore, Sweden and Japan. The majority of these agreements had been effective until 1 February 2010. At the turn of 2008, the volume drawn by central banks from the Fed amounted to ca USD 600 billion. Since that time, however, the utilisation of this line has been in decline.

In order to enable the American banks to obtain other currencies in the US market, the Fed established reverse swap lines with the European Central Bank and the central banks of England, Japan and Switzerland.

Refinancing of deposit institutions

Another new asset-side item created in response to the financial turmoil is *Term Auction Credit*. It is a supplement to the standard *Discount Window* through which the eligible deposit institutions can obtain refinancing from the Fed. The *Term Auction Facility* (TAF) was created in December 2007 for the easing of financial market pressures through refinancing via auctions. Deposit institutions eligible for the discount window can also participate in TAF auctions. All loans are to be collateralised. The TAF programme currently provides funds with 28- and 84-day maturities in the maximum amount of USD 125 billion at interest rates set in auctions.

Refinancing of primary dealers

- *Primary Dealer Credit Facility* (PDCF): a facility created in March 2008 for the supply of overnight refinancing to primary dealers with the aim of improving the situation in the financial market. All loans provided within the scope of this facility are to be collateralised. This facility was used most intensely in October 2008. After the financial market pressures had eased, its utilisation fell considerably. It has not been used at all since May 2009.
- In March 2008, another facility was created, namely the *Term Securities Lending Facility*

2 *Primary dealers are selected banks and brokers actively trading with the Federal Reserve System in US government securities. There were 19 primary dealers in September 2008. In 2007, the average daily volume of transactions in US government securities stood at approximately USD 570 billion.*

(TSLF), which is designed to extend the scale of maturities for the *Securities Lending* (SL)[3] programme.

Other refinancing facilities

- *Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility* (AMLF): a facility created in September 2008 for the purpose of financing the purchases of highly liquid asset-backed commercial papers (ABCP) from money market mutual funds (MMMFs) by American deposit institutions. It is designed to supply funds to money market funds facing unexpected withdrawals and payments to investors. It also serves to provide liquidity to the ABCP market and to the money market in general.
- *Commercial Paper Funding Facility* (CPFF): a facility introduced in October 2008 with the aim of increasing the level of liquidity in the market for commercial papers. The Fed established a limited liability company for the purchase of unsecured and asset-backed three-month commercial papers directly from the eligible issuers.
- *Money Market Investor Funding Facility* (MMIFF): a facility created in October 2008 with the aim of providing liquidity to MMMFs for the coverage of withdrawals and payments to investors. It was used until October 2009. It was designed to provide loans secured by eligible assets from eligible investors (MMMFs). Eligible assets included deposit certificates and commercial papers denominated in US dollars with a residual maturity of maximum 90 days. The reason for the introduction of this programme was that MMMFs had problems in selling short-term securities and so obtaining liquidity for the coverage of withdrawals. Although the MMIFF was designed for the purchase of eligible assets worth up to USD 600 billion, this possibility has never been used.
- *Term Asset-Backed Securities Loan Facility* (TALF): a facility designed to provide loans to holders of eligible *asset-backed securities* (ABS) with a maturity of up to 5 years. This facility was created in November 2008 and was used until December 2009 for the provision of loans in the total amount of USD 200 billion. Its aim was to assist the financial market in satisfying the credit needs of households and enterprises through ABS issues, various collateralised consumer or corporate loans. Eligible collateral was ABS denominated in US dollars covered, for example, by student loans, car purchase loans or credit cards.

Support for specific institutions

In order to ease the financial market tension after the default of several major financial institutions in the United States, the Fed decided to help by accelerating the process of their acquisition. To facilitate the acquisition of Bear Stearns by JP Morgan Chase, the Federal Reserve Bank of New York created a credit line called Maiden Lane LLC.

To provide assistance to American International Group (AIG), the Fed created two new credit lines in November 2008: Maiden Lane II LLC and Maiden Lane III LLC. The first of them is used for the purchase of *residential mortgage-backed securities* from the branches of AIG. The second is used for the purchase of multisectoral collateralised debt obligations (CDOs).

Bank of Japan

The operating target of the Bank of Japan (BoJ) is to maintain the overnight rate for unsecured deposits at a stable level, close to the key interest rate. This target is being met through open-market operations, which include the direct purchase of Japanese government bonds (JGBs), the direct purchase of Treasury bills (TBs) and financial bills (FBs), refinancing operations against collateral on a pooling account, the purchase of Japanese government securities (JGSs) under a repurchase agreement, the purchase of commercial papers (CPs) under a repurchase agreement, liquidity-absorbing operations and a supplementary refinancing facility.

Despite the turbulence in the global financial market, the Japanese financial market had been relatively stable until the second half of 2008. Before that period, the BoJ had not intervened in the domestic financial market. After the collapse of Lehman Brothers in September 2008, however, the situation in Japan's financial market situation also deteriorated. The BoJ took several measures to ensure a sufficient level of liquidity in the banking sector at the turn of calendar and fiscal year (2008/2009). Before the end of 2008, the Bank eased its monetary policy and implemented numerous monetary-policy instruments and other financial measures to ensure adequate liquidity in the financial market and to stimulate corporate financing. These instruments first had no influence on the structure of the central bank's balance sheet; they only caused the existing items and the eligible collateral framework to expand.

Despite being at a very low level (around 0.5%), the Japanese central bank lowered its key interest rates in two steps (in October and December 2008) and thus modified its interest target for unsecured overnight deposits to 0.1%.

In order to maintain the stability of Japan's financial market at the turn of 2008/2009, the BoJ moved to provide more liquidity to the banking sector as early as October so that banks had time to create sufficient financial reserves. The BoJ increased the frequency and volume of repo operations in Japanese government bonds in the middle of October. At the end of 2008, the volume of such bonds purchased under a repurchase agreement stood at JPY 9,800 billion. At the end of the previous year, their volume reached only JPY 3,200 billion. Thus, the Bank had tripled this volume in order to maintain the stability of the financial market.

3 *This programme had existed before the crisis, but its utilisation increased under crisis conditions. Securities Lending consists in the 'lending' of US Treasury securities to primary dealers with a maturity of one day, by auction. Its purpose is to ensure smooth settlement for transactions where the collateral that is acceptable to the Fed is illiquid.*

In September 2008, the Japanese market also showed signs of uncertainty. Japanese banks had become risk averse in relation to their counterparties (mainly foreign financial institutions). Banks were also affected by a fall in money market liquidity as a result of increased corporate financing after the corporate credit market had suffered a sharp downturn in activity. Declines in volume were recorded in both the interbank money market and the market for commercial papers and corporate bonds. Interest rates in these markets reacted to this situation with a marked increase.

In an effort to improve the situation in these markets, the BoJ started using repo operations in commercial papers more actively and markedly increased the frequency of operations, from once a quarter to twice a week. The volume of operations was increased from JPY 300 billion to JPY 600 billion per operation. As a result, this item in the balance sheet had expanded by JPY 4,000 billion by the end of 2008, compared with the end of 2007.

Like the other major central banks, the BoJ signed a reciprocal swap agreement with the Fed on the supply of funds denominated in US dollars to domestic banks. By the end of 2008, the BoJ had drawn USD 123 billion under this agreement.

Despite the large volume of funds provided to the sector through expanded operations, the BoJ set the overnight rate for unsecured deposits close to the key interest rate. Excess funds were absorbed through sales of Treasury bills. At the end of 2008, the BoJ also introduced a new supplementary deposit facility, which consisted in the remuneration of excess reserves on the accounts of banks kept with the central bank.

By the end of 2008, the reserve balances of banks in the BoJ had grown by approximately JPY 4,000 billion, from JPY 9,700 billion at end-2007 to JPY 13,800 billion at end-2008. The extended list of market operations used by the Japanese central bank in 2008 is illustrated in the overview below.

At the end of the year, the economic conditions worsened in Japan. Hence, the BoJ decided to extend the range of existing measures and to introduce new ones in support of corporate financing. These measures included:

Overview of central bank measures implemented since August 2007

	Key interest rate reduction	Liquidity supply via the interbank market	Direct asset purchases in the financial market
European Central Bank	from 4.25% in July 2008 to 1.0% at present (7 reductions)	• Refinancing operations with full allotment at a fixed rate • LTROs (increased in terms of volume and maturity) • Repo operations in USD and CHF • Expanded collateral framework	• Covered Bond Purchase programme
Federal Reserve System	from 5.25% in June 2006 to the 'target range': 0.00 – 0.25% at present (10 reductions)	• Term Auction Facility • Primary Dealer Credit Facility • Term Securities Lending Facility • Remuneration of excess reserves • Swap lines with central banks • Expanded collateral framework	• Asset-Backed Commercial Paper MMMF Liquidity Facility • Commercial Paper Funding Facility • Money Market Investor Funding Facility • Term Asset-Backed Securities Loan Facility • Direct purchases of MBs and bonds from government agencies • Direct purchases of government securities • Aid to individual banks in difficulty
Bank of England	from 5.75% in July 2007 to 0.50% at present (9 reductions)	• LTROs (increased in volume) • Discount Window Facility • Liquidity absorption through BoE treasury bills • Special Liquidity Scheme • Remuneration of excess reserves • Repo operations in USD • Expanded collateral framework	• Asset Purchase Facility for the purchase of government bonds, commercial papers and corporate bonds
Bank of Japan	from 0.50% in February 2007 to 0.10% at present (2 reductions)	• Supply of sufficient liquidity at the turn of the calendar and fiscal year • JGB purchases (increased volume) • Remuneration of excess reserves (Supplementary Deposit Facility) • Repo operations in USD • Expanded collateral framework	• Repo operations in commercial papers • Special funds-supplying operations • Direct purchases of commercial papers and corporate bonds • Direct purchases of shares held by financial institutions • Subordinated debt owed to banks

Source: ECB, Fed, BoE, BoJ.

- an increase in direct purchases of Japanese government bonds from JPY 14,400 billion per annum to JPY 16,800 billion per annum in December 2008 and a further extension of this facility to JPY 21,600 billion per annum in March 2009;
- outright purchases of commercial papers in the total amount of up to JPY 3,000 billion until the end of March 2009 and direct purchases of corporate bonds;
- new special refinancing operations for the support of corporate financing. Through these operations, funds were provided at a fixed rate (key interest rate) in unlimited amounts against collateral in the form of a corporate debt. The maturity of such operations was one month, but was later extended to three months. This programme was effective until the end of September 2009.

Conclusion

Affected by the financial crisis are not only financial institutions but also households and enterprises. Among other things, the crisis situation has led to so-called '*flight to safety*' flows, causing a downturn in equity markets and increased interest in risk-free government bonds; a marked increase in interest rate spreads indicating high credit risk and counterparty default risk in the money market; increased asset price volatility in the financial market; and worsened lending conditions for households and enterprises accompanied by a downturn in the issuance of short- and long-term debt securities and a rise in their prices.

The situation is gradually improving owing to the stabilising measures taken by governments and central banks. The economic indicators have not yet returned to the level of the period before the crisis, but the financial market indicators show signs of gradual improvement, which may give rise to an upturn in economic activity. For example, the spreads between deposit and swap rates have decreased considerably; they are now only slightly above the level of July 2007. Trading in the interbank market is concentrated in short-term maturities, but transactions in longer-term maturities were sporadic already before the crisis. The situation in the corporate bond market is gradually improving in the United States, as well as in Europe, which is indicated by the shrinking spreads between corporate and government bond yields. Issuing activity in America's corporate bond market virtually doubled in volume over the first half of 2009 (USD 550.6 billion) compared with the figure for the second half of 2008 (USD 258.2 billion). A noticeable increase was also recorded in bond issuance in the European corporate bond market (from USD 261.0 billion to USD 521.1 billion).[4]

At the beginning of March 2009, yields on bank bonds fell in the United States to the level of government bonds, which is a sign of renewed confidence in the banking system. At the same time, the degree of uncertainty dropped and the indicators of consumer and business confidence bottomed out. They are now slightly above the level of 50, which is a sign of expectations of economic revival. Investors tend to give preference to high-risk shares, instead of low-risk assets (government bonds). The increasing risk appetite of investors is mirrored in the strengthening equity markets (since February 2009) in the United States and Europe, as well as in the emerging markets.

Although some of the programmes implemented by central banks have not yet produced apparent effects, the improving conditions in the financial markets indicate that the process of recovery to sound functioning is already underway. The table summarises the measures taken by central banks in response to the crisis since August 2007.

4 *According to studies carried out by the Bank of Japan: Financial Market Report, August 2009.*

The effect of the euro changeover on price developments in Slovakia

Ján Haluška, Michal Olexa
INFOSTAT Bratislava

The Slovak economy grew at a slower pace in 2008, while the average annual inflation rate, by contrast, climbed slightly, from 2.8% in 2007 to 4.6% in 2008. In this context, it is legitimate to ask whether the development of consumer prices in Slovakia was influenced by preparations for the introduction of the euro, or by the euro changeover itself, and, if so, from when was it affected and to what extent? In this article, we examine the results of the analysis and estimation of how the euro changeover has affected price developments in Slovakia.

In the case of price statistics, it is very often quite difficult to estimate and quantify the effect that various factors and changes have on inflation, since there is usually a shortage of relevant information. The fact is that inflation development is ultimately the result of changes in consumer prices at the lowest, i.e. most detailed, level of disaggregation. This is caused by numerous different factors (common, specific, random, systemic, and others). During a given period, the effect of many of these factors may overlap with the potential impact stemming from the euro changeover, and thus may amplify, dilute or neutralize it.

In connection with the euro changeover in Slovakia (as of 1 January 2009), it is therefore difficult to give a clear answer to the question: Was the development of consumer prices affected by the preparations for the euro changeover, or by the euro changeover itself, and, if so, from when was it affected and to what extent?[1] That is to say, the effect of the euro changeover may have manifested itself either some time before the changeover, or not until some time afterwards. Consequently, it is necessary to analyse the development of prices in the consumer market over a longer period, not just the period of several months immediately before or after the euro changeover.

Thus we divided the analysis of consumer price developments into two stages: before the euro changeover (the *pre-changeover effect*) and after it (the *net-changeover effect and post-changeover effect*)[2]. Given that a key milestone in the pre-changeover period was the date of the fixing of the conversion rate (8 July 2008), our analysis of consumer price developments in 2008 is divided into shorter time intervals – the periods before and after the conversion rate was fixed, i.e. the first half of 2008 and the second half of 2008.

Methodological approach to the analysis of price developments before the euro changeover

Our analysis was made using mathematical-statistical methods applied to the development of time series of consumer price indexes (CPI), as well as time series of harmonized indexes of consumer prices (HICP), which were provided to us by the Statistical Office of the Slovak Republic (SO SR). The starting point of the analysis was two sets of monthly CPI time series at different levels of disaggregation. The first set contains monthly time series of the base price indexes of all consumer basket items, which runs to more than 700 and covers the period from January 2004 to December 2009. The second set contains 66 monthly time series of base indexes of consumer prices that are aggregated according to 12 groups under the classification of individual consumption by purpose (COICOP) and to 44 COICOP categories and which cover the period from November 2004 to December 2009. The set of selected monthly time series of the HICP for two economic groupings (the EU-27 and the Euro area 15 / Euro area 16), as well as for selected countries (including Slovakia), covering the period from November 2004 to December 2009, served as the starting point for comparing inflation developments in Slovakia and in the external environment.

Analysis of consumer price developments in the period 2005–2008

As Chart 1 shows, in a comparison of four indicators of consumer price developments, regulated prices recorded the most substantial changes over the period 2005–2008. Of particular note is the sharp slowdown in their year-on-year increase in 2007 (which caused a marked change in the price development structure), owing to the fact that regulated prices in 2007 rose by less than the rate of core inflation. In previous years, by contrast, the increase in regulated prices had usually been substantially higher than that of regulated prices.

The rise in inflation, under both the domestic and harmonized methodologies, has since the beginning of 2008 been one of the corollaries of developments in the Slovak economy. It reflected not only an increase in core inflation, but also a

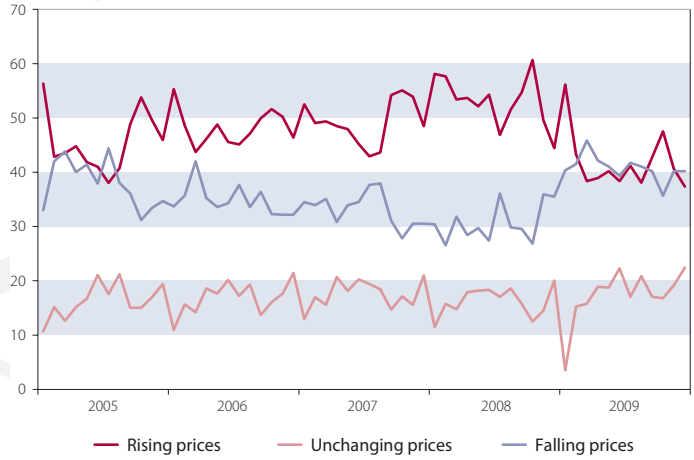
1 Related to this is also the response to the hypothetical question of how inflation would have developed if Slovakia had not been planning to adopt the euro.

2 The so-called net-changeover effect applies to price developments in the consumer market in January 2009, i.e. immediately after the euro introduction. This therefore indicates the immediate effect that the euro changeover had on consumer prices in terms of how they changed from December 2008 to January 2009.

Chart 1 Inflation (in %)

Key: CPI – consumer price index, HICP – time series of the harmonized index of consumer prices, CPI – CORE – core inflation, CPI – REG. – regulated prices.
Source: ŠÚ SR.

Chart 2 Consumer prices on a month-on-month basis (Shares in %)



Source: ŠÚ SR.

rise in regulated prices. The rise in core inflation was, however, largely caused by climbing food prices. The increase in overall inflation peaked in September, at 5.4%, from when it trended downwards – to 4.4% in December 2008, and even to 0.5% in December 2009.

The analysis of consumer price movements over the period 2005-2008 is based on time series of price indexes for consumer basket items, recalculated from base indexes into month-on-month indexes (expressed in %). In this way, each price index acquired a value for every month under review, which could be greater than 100 (where the price rises month-on-month), equal to 100 (where the price remains unchanged), or less than 100 (where the price falls). Each month, the set of consumer basket items may be classified into three groups on this basis, and the number of items in each group may be calculated as share of the total number of items[3]. Based on the trend developments of these three shares, it is possible to assess whether the structure of consumer prices so derived was more-or-less stable over time or underwent certain changes.

The results of this analysis of consumer price indexes are shown in Chart 2.

As regards the structure under review, the development of the consumer price basket can be described as relatively stable but only up to September 2007. Till then, however, the share of those consumer basket items that tend to rise in price from one month to another fluctuated mostly between 40% and 50% per cent, and sometimes (only for a short time) it exceeded 50%. By contrast, the share of those items that tend to fall in price from one month to another hovered between 30% and 40%. And finally, the share of items that remained basically unchanged on a month-on-month basis was the smallest and relatively most stable one, fluctuating between 10% and 20%.

From September 2007, the share of the rising-price consumer basket items began to increase more sharply, at the expense of the falling-price items. Their trend developments are mutually opposed, whereas the share of those items whose prices remained unchanged stayed relatively oscillating between 15% and 20%.

At the end of 2007, the share of rising-price items already stood at more than 50%, and then in January and February 2008 it began to approach 60%. Their share declined gradually from that point, and in July 2008, when the conversion rate was fixed, it even, temporarily, dipped below 50%. There followed a sharp rise, however, culminating in October 2008 when the share went above 60% and reached its highest level during the period under review. Immediately after this peak, in November and December 2008, the share recorded a sharp decline to around 50% and 45% in the respective months. Thus in December 2008, just prior to the euro changeover, the share fell even below its "long-term" average for the period 2005–2008 (around 49%).

For almost the whole of 2008, the share of rising-price items was around 4 percentage points (p.p.) above its "long-term" average, owing to the effect of several factors. It may be assumed that this was largely an effect of the already widely known acceleration in prices of food and non-alcoholic beverages[4] (which was not confined to Slovakia) and in regulated prices[5], as well as, to a certain extent, an effect of the approaching euro changeover. This view is supported by the exceptionally sharp increase in the share of rising-price consumer basket items that immediately followed the fixing of the conversion rate, i.e. from when Slovakia's adoption of the euro went from being an intention to a certainty.

As Chart 3 shows, the rise in food and non-alcoholic beverage prices was a truly significant factor in the increase in the share of rising-price items to above their "long-term" average in 2008, albeit not during the whole of the year but almost exclusively in the first six months. This is shown by the

3 Given the purpose of the analysis, it will be mainly the first group of price indexes that is the subject of review. An increase in this group's share of the consumer basket represents a potential inflationary risk.
4 The relatively rapid rise in food and non-alcoholic beverage prices in Slovakia persisted for ten months without interruption, from September 2007 to June 2008. In addition, food and non-alcoholic beverages account for the highest number of items in the consumer basket.
5 Regulated prices in 2008 increased by an average of 4.5%, or 2.8 p.p. more than they rose in 2007.

fact that the share of rising-price food and non-alcoholic beverages in the narrower basket of consumer items containing only food and non-alcoholic beverages increased sharply in the first half of 2008. Although this phenomenon does include an element of seasonality (it also appeared at the beginning of previous years), its development in the first half of 2008 showed an extreme fluctuation in addition to that. Looking from the other side, an extreme fluctuation may be identified also in the sharp decline in the share of rising-price food and non-alcoholic beverages, or the steep decline in the share of falling-price food and non-alcoholic beverages, in November and December 2008, i.e. just before the euro changeover.

That still leaves the question: What caused the share of rising-price items in the consumer basket to soar after the fixing of the conversion rate? A partial answer is supplied by Chart 3, according to which the cause was highly unlikely to have been food and non-alcoholic beverage prices (in aggregate). Although there are more potential "culprits" in the 11 other COICOP groups, the key one is "clothing and footwear", which accounts for the second-highest number of items in the consumer basket.

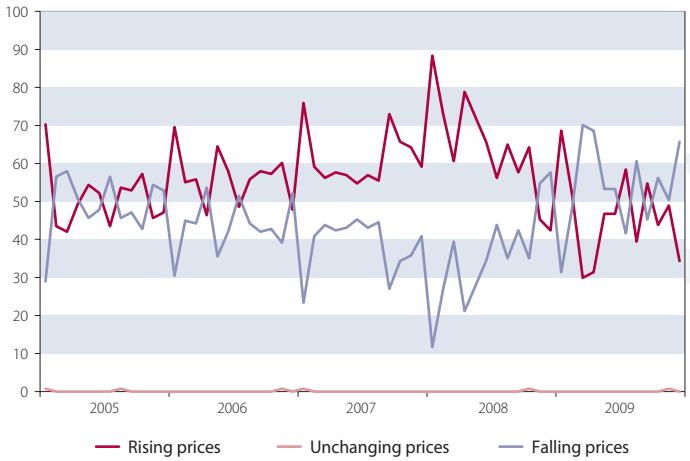
The rise in clothing and footwear prices was undoubtedly a significant factor in the fact that rising-price items as a share of the consumer basket rose after the conversion rate was fixed. In July 2008, i.e. the month in which the rate was fixed, the proportion of clothing and footwear items that went up in price was only 27%, about the same as in July 2007, but in August 2008 this figure increased to around 36% (compared with 28% in August 2007), and in September 2008 it soared to above 80% (63% in September 2007). Even where part of the share's increment was due to a seasonal effect, the rest of the rise may be attributed to an extreme upward fluctuation. At the same time, the decline in this share in December 2008 to 52%, can be seen as an extreme downward fluctuation.

Comparative analysis of consumer price developments in 2008

The next stage in the analysis of consumer price developments in 2008 is based on an examination of the attributes of the monthly time series of the base consumer price indexes, aggregated by COICOP groups (12 in total) and by COICOP categories (44 in total). The purpose here is to determine whether the price indexes show any signs of relatively sharper acceleration prior to the fixing of the conversion rate (i.e. in the first half of 2008) or afterwards (in the second half of 2008), with reference to the dynamics of these indexes during comparable periods of the previous three years. At the methodological level, the analysis was based on the well-established "three-sigma" rule, which in mathematical statistics relates to a normal distribution.

At the level of the aggregation of price indices according to COICOP groups, the three-sigma

Chart 3 Food and non-alcoholic beverage prices on a month-on--month basis (Shares in %)

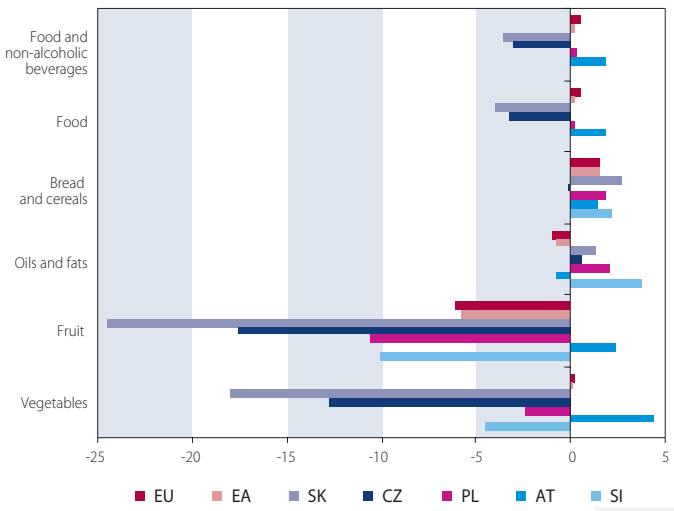


Source: ŠÚ SR.

Chart 4 Price changes (from June 2008 to December 2007; in %)

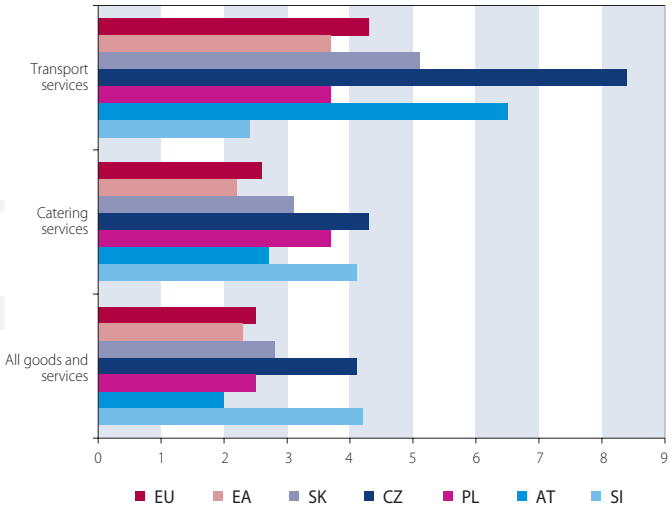
Source: ŠÚ SR.

Chart 5 Price changes (from December 2008 to June 2008; in %)



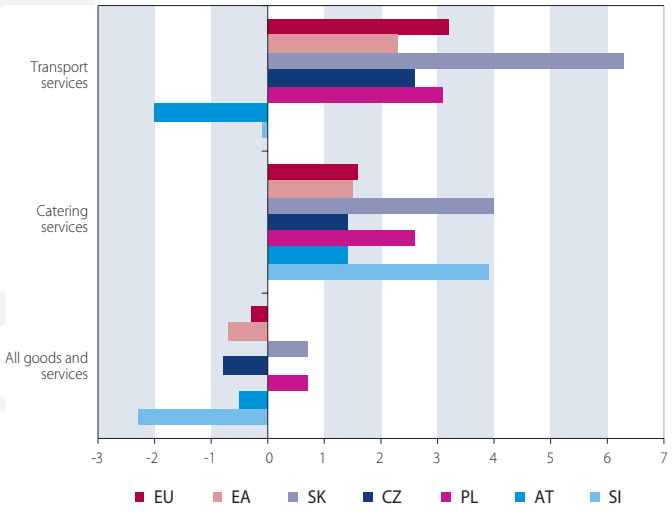
Source: ŠÚ SR.

Chart 6 Price changes (from June 2008 to December 2007; in %)



Source: ŠÚ SR.

Chart 7 Price changes (from December 2008 to June 2008; in %)



Source: ŠÚ SR.

6 *In the respective charts and table, they are denoted by the abbreviations eu, ea - euro area, cz, pl, at, and si. The comparison in this case is based on an analysis of monthly time series of the HICP in Slovakia (sk) and in the relevant countries.*

rule was used in identifying three groups, and three categories within those groups, which show signs of accelerating price rises from the beginning of 2008. Put another way, price developments in these three groups and three categories deviated from the tendency in line with the three-sigma rule, i.e. they were not normal. The groups in question were food and non-alcoholic beverages (01), transport (07) and restaurants and hotels (11), while the categories were food (011), transport services (073), and catering services (111).

In 2008, both before and after the fixing of the conversion rate, price inflation in several COICOP groups and categories recorded an acceleration in comparison with the same period in the previous three years, but this does not necessarily have to be a consequence of the preparations then being undertaken for the introduction of the euro. This is particularly true in the case of food and non-alcoholic beverages, since their prices inflation in Slovakia were already accelerating in September 2007. Furthermore, their prices were rising faster not only in Slovakia but also in the broader geographical vicinity.

As Charts 4 and 5 show, the acceleration of food and non-alcoholic beverage prices in the first half of 2008 may have been related to the euro changeover. It is clear in Chart 4 that prices of food and non-alcoholic beverages (01) rose in Slovakia in the first half of 2008 by far more than they did in the respective external environment (EU-27, Euro area 15, the Czech Republic, Poland, Austria and Slovenia[6]). This was caused by the relatively sharper increase in food prices (011) and in particular the prices of bread and cereals (0111), oils and fats (0115), fruit (0116) and vegetables (0117).

It is interesting to note that while food and non-alcoholic beverage prices in the second half of 2008 continued to rise in the external environment (except in the Czech Republic), albeit at a much slower pace than in the first six months, they recorded a relatively large decline in Slovakia and the Czech Republic (Chart 5). Their fall in Slovakia was largely attributable to prices in the category of food (011) and, within this category, especially to prices of fruit (0116) and vegetables (0117). At the same time, however, the prices of bread and cereals (0111) continued to rise, as did those of oils and fats (0115). In both cases, the increase was slower than in the first half of 2008.

As for transport services (073) and catering services (111), their prices in Slovakia and in the external environment during 2008 can be compared in Charts 6 and 7. Prices of transport services and catering services in Slovakia have one major feature in common, namely that that they rose substantially faster in the second half of 2008 than did the same prices in the external environment. It may therefore be asserted that the acceleration of prices in transport services and catering services in Slovakia in the second half of 2008 may to a certain extent have been caused by the approaching adoption of the euro in 2009.

Looking at the data in Table 1 and in Charts 6 and 7, a comparison can be made between the prices of all goods and services in total (i.e. the aggregate level of consumer prices measured by the HICP) in Slovakia and in the external environment. For the first half of 2008, the aggregate price level in Slovakia rose by more than in the EU-27, in the Euro area 15, in Austria, or in Poland, but by less than in the Czech Republic and Slovenia. Over the next six months of the year, the aggregate price level continued to rise in Slovakia, albeit far more slowly, and also in Poland (coincidentally at the same pace as in Slovakia), but everywhere else it fell.

The key fact, however, is that the full-year rise in the aggregate level of consumer prices in 2008 was higher in Slovakia than in any of the other compared countries or economic groupings. Considering that in the period from August 2007

Table 1 Prices of all goods and services in total (consumer prices measured by the HICP; in %)

All goods and services	August 2007 – June 2008		August 2007 – December 2007		December 2007 – June 2008		June 2008 – December 2008		December 2007 – December 2008	
	Overall change	Average change m/m	Overall change	Average change m/m	Overall change	Average change m/m	Overall change	Average change m/m	Overall change	Average change m/m
EÚ-27	4.4	0.43	1.8	0.45	2.5	0.42	-0.3	-0.05	2.2	0.18
EÚ-15	4.2	0.41	1.8	0.45	2.3	0.38	-0.7	-0.12	1.6	0.13
Slovakia	4.5	0.44	1.7	0.41	2.8	0.46	0.7	0.12	3.5	0.29
Czech rep.	6.0	0.58	1.8	0.45	4.1	0.67	-0.8	-0.13	3.3	0.27
Poland	4.6	0.45	2.0	0.50	2.5	0.42	0.7	0.12	3.3	0.27
Austria	4.1	0.40	2.0	0.50	2.0	0.33	-0.5	-0.09	1.5	0.12
Slovenia	6.8	0.66	2.5	0.62	4.2	0.68	-2.3	-0.39	1.8	0.15

Source: ŠÚ SR.

to December 2007, the rise in aggregate prices[7] was slowest one in Slovakia – even slower here than in the Euro area 15 – it may be concluded that the acceleration recorded in Slovakia in 2008 was probably not just related to the above-mentioned acceleration in regulated prices, but may to a certain extent also have stemmed from the expected introduction of the euro in 2009.

Estimation of the pre-changeover effect

The pre-changeover effect is estimated by comparing the HICP inflation rate in Slovakia and in the Euro area 15 – the grouping of countries that Slovakia was (at the time) preparing to join. According to the harmonized methodology, consumer prices in the Euro area 15 increased in 2008 by an average of 3.28%, or by 1.14 p.p. more than they did in 2007. In Slovakia, under the same methodology, consumer price inflation accelerated from 1.89% in 2007 to 3.93% in 2008, or by 2.04 p.p. In other words, the acceleration of consumer price inflation in Slovakia was, on average, 0.90 p.p. higher than in the Euro area 15. Since contribution of regulated prices accounted for 0.79 p.p.[8] of the acceleration in Slovakia's consumer price inflation in 2008, that leaves 0.11 p.p. attributable to the pre-changeover effect, i.e. the contribution of other factors (not further specified) to the increase in inflation. It can be assumed, however, that the major effect in this regard stemmed from the preparations then underway for the euro changeover. Indeed, we contend that the rise in Slovakia's inflation rate in 2008 was not to a statistically significant extent affected by demand-side factors, particularly considering that the increase in real wages at the macro level was (also) in 2008 slower than the increase in real labour productivity.

After excluding the effect of regulated price rises in 2008, the HICP inflation rate in Slovakia accelerated from 1.89% in 2007 to 3.14% in 2008, i.e. by 1.25 p.p. It is clear that if the Euro area 15's consumer price inflation was likewise calculated without including the effect of regulated price inflation (which, for a precise comparison, would of course be necessary), the acceleration of the average inflation rate in 2008 would be more than 0.11 percentage points greater in Slovakia (1.25 – 1.14 = 0.11) than in the Euro area 15. This estimate of 0.11 p.p. that we attribute to the effect of the euro changeover preparations must therefore be seen as a minimum value, or the estimate of the lower end of the effect in question[9].

Methodological approach to the analysis of price developments after the euro changeover

Analysis of consumer price developments in January 2009 and estimation of the net-changeover effect

A feature of aggregate consumer prices in Slovakia from 1993 to 2008 was that their highest month-on-month rise in a given year was usually recorded in January and in most cases it was well in excess of 1%. In January 2009, however, aggregate consumer prices recorded their lowest ever month-on-month rise for this month of the year, rising by just 0.4% in comparison with December 2008. This development was related to the slowdown in core inflation and in regulated price inflation[10].

In the broader context, this also reflects the impact of the global economic crisis, which has been a major drag on price inflation – both generally through demand-side factors, and also through supply-side factors, and in both Slovakia and the respective external environment. This is confirmed by the fact that, on one hand, HICP inflation in January 2009 in the EU-27, the Euro area 16 and Austria declined far more steeply month-on-month than it did in January 2008 (the respective changes being -0.6% against -0.2%, -0.8% against -0.4%, and -0.6% against -0.3%), and, on the other hand, HICP inflation in January 2009 in Slovakia, the Czech Republic and Poland recorded a considerably smaller month-on-month rise than in January 2008 (the respective changes being +0.3% against +1.2%, +1.4% against +3.3%, +0.4% against +0.5%), and in Slovenia it fell month-on-month (-0.3%) but rose slightly in January 2008 (+0.1%).

7 *Since the rise in food and non-alcoholic beverage prices began in Slovakia back in September 2007 and continued without interruption until June 2008, Table 1 includes, in addition to the overall change in consumer prices during the given period, the change they recorded up to the end of 2007 and, finally, their change in 2008. The overall change in the prices and their average change month-on-month are stated for each of the five periods.*

8 *Under the harmonized methodology, regulated prices in Slovakia in 2008 rose by an average of 4.91%, or 2.89 p.p. more than they did in 2007. Regulated price items as a share of the total number of items in the consumer basket represented 27.31% in 2008, which implies that regulated price inflation accounted for 0.79 p.p. of the increase in HICP inflation in 2008 (2.89 x 0.2731 = 0.79).*

9 *If EUROSTAT provided the necessary information about regulated price developments in the Euro area 15 in 2008, it would be possible to refine this estimate of the pre-changeover effect.*

10 *In January 2008, core inflation rose by 1.1% and regulated prices by 2.0%, but in January 2009 they increased, respectively, by only 0.3% or 0.5%.*

The slowdown in aggregate consumer price inflation in January 2009 tallies with the changes recorded in January 2009 (compared with January 2008) in the number of items of the three groups (rising-price, unchanging-price, falling-price) as a share of the total number of items in the consumer basket. These changes are shown again in Chart 2. Although the share of rising-price items increased in January to 56% (i.e. above its long-term average of 49% recorded over the period 2005– 2008), it was 2 p.p. lower compared with January 2008. At the same time, however, the number of falling-price items in the consumer basket rose substantially, from around 30% in January 2008 to around 40% in January 2009 (and thus also above its long-term average of 34% for 2005–2008). The increase in this share occurred predominantly at the expense of unchanging-price items, which fell from 11.5% in January 2008 to 3.5% in January 2009.

The quantification of the net-changeover effect was also based on analysing the time series attributes of the base indexes of consumer prices aggregated according to COICOP groups and to COICOP categories[11]. At the level of price index aggregation according to COICOP groups, the application of the "three-sigma" rule did not reveal any group that, in January 2009, showed signs of disproportionately accelerating price inflation compared with the years 2005 to 2008. Using the three-sigma rule, base price indexes in January 2009 were found to deviate significantly from the normal distribution only at the level of individual items of the consumer basket. However, the analysis carried out using the three-rule analysis excluded a priori those prices that rose from December 2008 to January 2008 as a result of administrative arrangements, i.e. regulated prices of cigarettes, housing-related prices and alcohol prices.

Despite this reduction, it was shown that a total of 17 consumer basket items recorded price developments in January 2009 that, under the three-sigma rule, could not be considered as normal in comparison with their price developments in the years 2005 to 2008. We believe that this could largely be seen as a consequence of the euro changeover.

The month-on-month changes in prices (rising or falling) of these 17 items of the consumer basket in January 2009 constituted the starting point for quantifying the net-changeover effect, i.e. the contribution of the euro changeover to aggregate price inflation in January 2009. This contribution is calculated as the sum of the euro changeover's contributions to price rises in 16 of the 17 individual consumer basket items, adjusted to exclude the effect of the drop in price of a criminal conviction certificate[12]. On the basis of this approach, and taking into account the weights of the 17 consumer basket items, we estimated the net-changeover effect to be 0.12 p.p.[13].

This estimate may be further adjusted to recognize that for each of the 16 items, the month-on-month price rise in January 2009 that was attributable to the euro changeover is not to be treated as disproportionate per se, but only to the extent that it exceeds the average month-on-month increase in the respective prices for the same month of the previous three years. Thus adjusted, the net-changeover effect represents the sum of the euro changeover's contributions to the above-average increase in the prices of the 16 consumer basket items (compared with their average for the first month of the previous three years) – reduced from 17 items so as to exclude the effect of the drop in price for a criminal conviction certificate in January 2009. After taking into account the weights of the 17 consumer basket items, the adjusted estimate of the net-changeover effect represented 0.08 p.p.

Analysis of consumer price developments from February to December 2009 and quantification of the post-changeover effect

The slowdown in aggregate consumer price inflation that was a feature of the Slovak economy in January 2009 intensified over subsequent months. In fact, consumer prices rose month-on-month in only four of the months from February to December (May, June, October, and November), they remained unchanged in three months (February, July and September), and they fell in four months (March, April, August and December). In the period from January to December 2009, the total consumer price level increased cumulatively only by 0.6%, an all-time low. In the years 1993 to 2008, the cumulative increase of total consumer price level for the January-December period was always higher than that, and the lowest level one was 3.3% (2007).

Given that a decline in inflation from the beginning of 2009 was recorded not only in Slovakia, but also in the external environment, this development may be seen as a corollary of the global economic crisis. This view is supported by HICP developments in Slovakia and the external environment (not including Poland and Slovenia).

The average HICP inflation rate for 2009 was lower than in 2008 almost everywhere, including in the EU-27 (1.3% against 2.0%), the Euro area 16 (0.8% against 1.5%), Austria (1.1% against 1.4%), the Czech Republic (0.6% against 3.2%) and Slovakia SR (0.0% against 3.5%), though it was slightly higher in Poland (3.8% against 3.4%) and Slovenia (2.1% against 1.8%). However, it is also clear from the comparison of these groups and countries that Slovakia recorded the lowest growth of consumer prices because HICP in Slovakia recorded zero cumulative increase (compared with December 2008).

The slowdown in aggregate consumer price inflation from the beginning of 2009 tallies with the tendencies recorded from February to December 2009 in the number of items of the three analysed groups as a share of the total number of items in the consumer basket. These tendencies are

11 *The main reason that the estimation of the net-changeover effect and post-changeover effect is, unlike the estimation of the pre--changeover effect, based on an analysis of CPI developments is that CPI developments can be adjusted to exclude the effect of regulated prices. Although regulated prices could, of course, be excluded also from the HICP inflation rate for Slovakia, to exclude them from the HICP inflation rate for the euro area would be highly difficult, if not impossible, since information on regulated prices in the euro area or EU is not available.*

12 *The month-on-month decline in the price of a criminal conviction certificate in January 2009 can be clearly attributed to the effect of the euro changeover, since it stemmed from the downward rounding of this price when converted from Slovak korunas according to the conversion rate.*

13 *This estimate corresponds to the lower end of the range (0.12-0.19 p.p.) which NBS published in mid-March 2009 as part of the estimation of the net-changeover effect [2].*

shown in Chart 2, which makes clear that there is an atypically large decline in the share of rising-price items and an accompanying atypically large rise in the share of falling price items. These tendencies may be described as atypical since the share of rising-price items from February to December 2009 remained relatively far below its average for the period 2005–2008 (around 49%), while the share of falling-price items over the same period stayed well above long-term average for those years (around 34%). More significant still, however, is that for February 2009 the share of rising-price items in the consumer basket was higher than that of falling price items, but from March 2009 the share of falling-price items was almost constantly (except in September and October) higher than the share of rising-price items. To a certain extent, this relates to tendencies in the number of items of the three analysed groups as relative shares of the two COICOP groups with the most number of items in the consumer basket – food and non-alcoholic beverages (Chart 3) and clothes and footwear.

As Chart 2 shows, the analysed price structure of consumer basket items which emerged in March 2009 and was maintained (except in September and October) until the end of 2009 is actually atypical and did not appear in any of the previous three years[14]. It is important to note that the rise in the share of falling-price items recorded from February to December 2009 occurred largely at the expense of a decline in the share of rising-price items. The share of unchanging-price items over the period February–December 2009 fluctuated close to its long-term average for the period 2005–2008 (around 17%).

The base indesex of time series of consumer prices from February to December 2009, aggregated according to COICOP groups and COICOP categories, were the starting point for estimation of the post-changeover effect. Considering the results of the analysis of consumer price developments over this period, it is no surprise that at the given levels of price index aggregation, the application of the three-sigma rules did not reveal any group or category that between February and December 2009 showed signs of disproportionately accelerating price inflation compared with the years 2005 to 2008. Nor were and such signs found at the level of individual items of the consumer basket, i.e. in the price developments of those 17 items that served as the basis for estimation of the net-changeover effect. It may be asserted that the euro changeover did not give rise to a post-changeover effect between February and December 2009. On the contrary, it kept the consumer prices of those items down and contributed to a decline in inflation.

Conclusion

The analysis results indicate that the euro changeover was very probably a factor behind the rise in inflation back in 2008 and then in January 2009, but that over the next eleven months it acted as a drag on consumer price growth and thus contributed to the fall in inflation.

As regards the pre-changeover effect, the comparative analysis of HICP developments in Slovakia and in the external environment demonstrates that the effect of the euro changeover on inflation growth in 2008 represented at least 0.11 p.p. This was above all due to faster rising prices of selected food types, transport services, and catering services. But whereas the price inflation of the selected food types contributed to the pre-changeover effect in the period before the fixing of the conversion rate, i.e. in the first half of 2008, the price inflation of transport services and catering services contributed to this effect in the period after the conversion rate was fixed, i.e. in the second half of 2008.

The net-changeover effect and post-changeover effect are estimated by analysing the attributes of price index developments for the individual items of our consumer basket. As for any net-changeover effect, the estimation results indicate that the immediate effect of the euro changeover on the increase in inflation recorded in January 2009 represented 0.12 p.p. This estimate corresponds to the lower end of the range (0.12–0.19 p.p) which NBS published in mid-March 2009 as part of its estimation of the net-changeover effect. The euro changeover did not give rise to a post-changeover effect between February and December 2009.

14 It previously occurred, temporarily, in July 2005, i.e. even before Slovakia joined the ERM II exchange rate mechanism.

References:
1. Haluška, J., Olexa, M.: Analýza a kvantifikácia zavedenia eura na cenový vývoj v SR; INFOSTAT, July 2009.
2. The impact of euro adoption on inflation in the Slovak Republic in January 2009; NBS, March 2009.

BRIC capital markets – progress and prospects

Ing. Peter Árendáš
University of Economics in Bratislava

BRIC is an acronym for the four most important members of the group of emerging market countries. This group, as defined by the IMF, comprises countries of medium-to-large income per capita which have carried out economic reforms and programmes and begun to act as significant players in the global economy. Brazil, Russia, India and China – the BRIC countries – all fall within this definition. Each of them has in their own way undergone important political and economic changes in recent decades, including rigorous consolidation of public finances at the turn of the century (Brazil), economic liberalization at the beginning of the 1990s (India), the creation of a market economy within the framework of a communist state (China), and, not least, the complete transition from a centrally planned economy to a market economy (Russia). And it must be stressed that the reforms implemented in each of the BRIC countries have turned out well, as evidenced by the impressive results of their economies in the past decade and the international respect and recognition that they have earned as a result.

Economic Growth of BRIC Countries

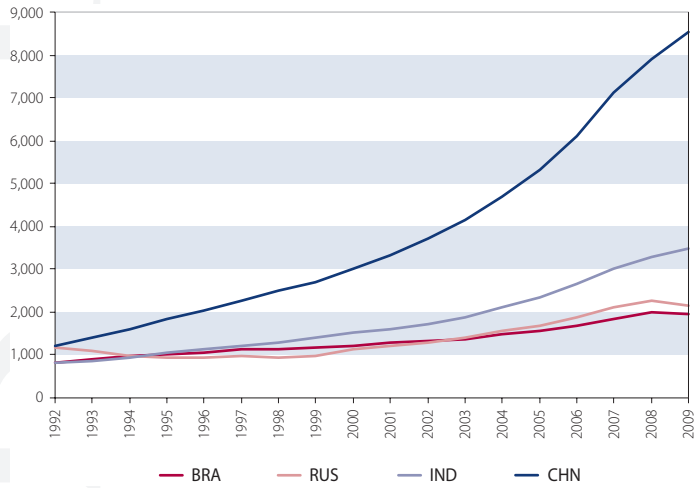
The development of GDP in BRIC countries may be seen as the principal indicator of their success. If we look at Chart 1, which in a much simplified comparison of the countries shows their GDP measured at purchasing power parity, we see all four countries experienced substantial economic expansion from 1992 to 2009. In Russia and Brazil, GDP doubled, and in India it rose by 3.5 times. As for China, it recorded a barely credible eightfold increase in GDP over those 17 years.

These numbers, interesting though they are, take on a new dimension if population is taken into consideration (Chart 2). By this simple operation, we see that although China and India grew more rapidly than Russia and Brazil, their standard of living is considerably lower owing to their huge populations. At the same time, domestic demand in China and India has been a strong driver of their economic growth, and its effect is even more evident amid the current global financial crisis, during which their growth, though somewhat reduced, has remained substantially positive. The fact that these countries have relatively low GDP per capita suggests that the role of domestic demand in their economic development should remain very significant in coming years, too.

For the Asian duo, a crucial factor is their continuously growing, already huge, domestic markets, but in the case of Russia and Brazil, it is necessary to focus on the absolutely key role played by commodities. Whereas India and China rely on their cheap workforce and growing domestic demand, the cornerstone of the Russian and Brazilian economies is the extraction and processing of raw materials for export.

In case of Russia the main export commodity is natural gas, where Russia is the world leader in its extraction and the same applies to its proven reserves. However, extraction and processing of crude oil, coal, iron, aluminium, nickel, gold and many other raw materials have an important position, too. Above that, Russia also became world leader in mining of diamonds in recent years. Exactly the bull market in commodities was one of the main causes of Russian recovery from the consequences of monetary crisis in 1998 and of forceful growth of economic power of the country in the past years. Very similar scenario unfolded also in Brazil, which has one great advantage over Russia in that it is not only an important world pro-

Chart 1 BRIC countries GDP in purchasing power parity (bln. USD)



Source: Processed by author according to IMF.

ducer of crude oil, iron ore, manganese, copper, gold, or platinum, but it is also one of the world's most important producers of agricultural commodities. It concerns first of all lucrative crops, like coffee, cocoa, but also, for instance, soy, citruses, corn and, of course, beef-cattle. Above that, Brazil is also a country with probably the greatest potential of bio energy. It is therefore more diversified in the field of commodities in comparison with Russia. Russia has on the other hand one huge advantage in that it directly neighbours China, with its gigantic hunger for commodities of all kinds. Above that, India is just around the corner.

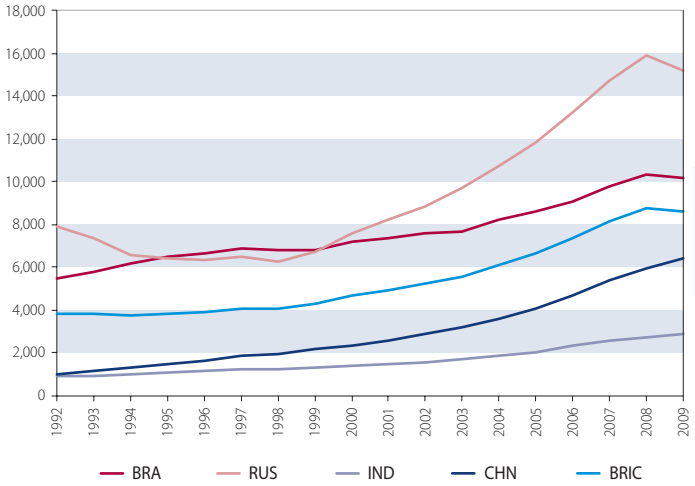
Basic Economic Parameters of BRIC Countries

Abrupt economic growth, of course, pushes the level of inflation upwards, which is what national banks seek dampening first of all by relatively high interest rates. Even in present-day period when central banks in developed economies retain interest rates on record-breaking low levels, average interest rate for the year 2009 is 3.4% in India, 5.3% in China, 10% in Brazil and in Russia even 11.4% (Chart 3).

From the chart it follows that most countries were able to keep inflation under control in recent years, thanks also to high interest rates. The only exception is Russia, which is not able to compress the rate of inflation under the level of 10% even under the conditions of crisis. Main reason can be found in the fact, that Russia imports great deal of mainly consumer goods first of all from the EU countries, whereas the Rouble significantly weakened against Euro after outbreak of the crisis, which caused increase of prices of almost all imported products. The situation in Russia went even so far, that the rate of inflation is greater than the rate of interest for the years 2008 and 2009.

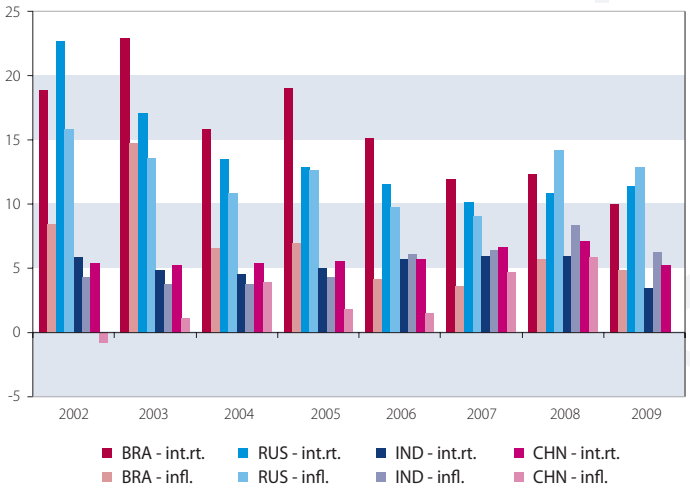
Strong economic growth and pro-export focus of the economies has reflected itself also in the balance of payments of the BRIC countries (Chart 4). It may be stated that neither of the countries has excessive deficit. But even in this case can the BRIC countries be divided into two groups. First (group) into which belong India and Brazil, has the remainder of balance of payments in relation to GDP very close to nil, moving in the range from -4 to +2% of GDP during the watched period. Contrary to this, Russia and China have huge surpluses. In case of Russia, culmination took place in 2000, when the surplus amounted to almost 18% of GDP. Since then, however, the stabilization of the level 5 to 10% succeeded, for the year 2009 even the balanced current account of balance of payments is expected due to global financial crisis. It can be expected, however, that after recovery of the global economy and repeated growth of prices and demand for commodities, the era of massive surpluses returns back. The situation is a little different in case of China, since according to IMF estimates, Chinese current account of balance of payments should not be massively affected by the crisis. It is caused mainly

Chart 2 BRIC countries GDP in per capita purchasing power parity (USD per capita)



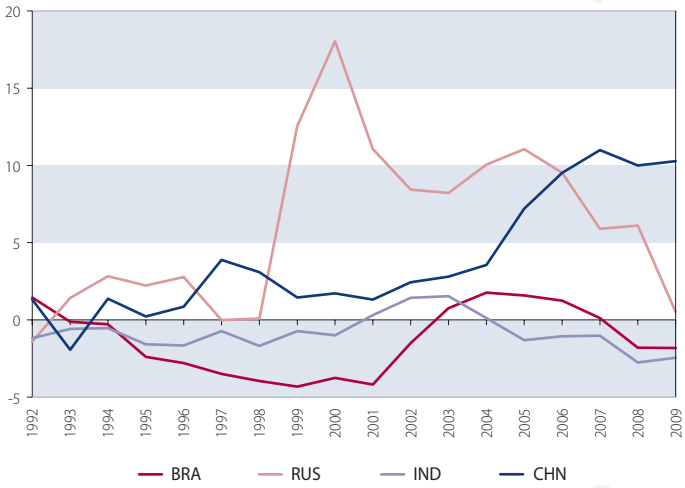
Source: Processed by author according to IMF.

Chart 3 BRIC countries interest rates and inflation



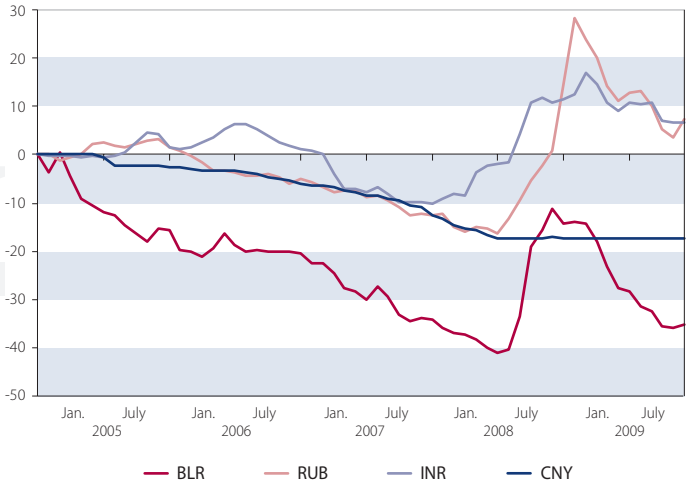
Source: Processed by author according to www.tradingeconomics.com.

Chart 4 Balance of payments current account balance (in % of GDP)



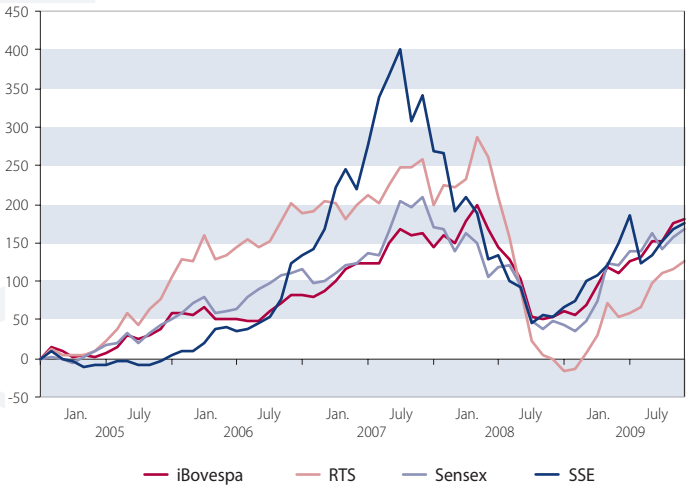
Source: Processed by author according to IMF.

Chart 5 BRIC countries currency exchange rates development against USD (in %)



Source: Processed by author according to ECB.

Chart 6 BRIC countries main stock indices development (in %)



Source: Processed by author according to www.yahoofinance.com.

by the fact that in spite of the crisis China keeps its economy up in good condition, moreover the price competitiveness of Chinese exports on foreign markets is kept on a very high level through distinctively undervalued Juan.

Fast growing economy in coordination with good condition of balance of payments current account and very interesting interest rates have caused, that in the long-term have the currencies of BRIC countries appreciated against main world currencies (Chart 5). China was the only exception up to July 2005. Chinese government kept the Juan closely fixed to American dollar. Foreign partners have for a long time blamed China for its artificial undervaluation of the Juan in an effort to favour exports. As late as in summer 2005 did the Chinese made one step forward and they began easing gradually the currency exchange rate, which they left gradually appreciate a little. However, it still remains heavily undervalued, and even the global financial crisis, during which the currencies of all BRIC countries with the exception of Chinese Juan weakened heavily, has not changed that. It is evident from the chart, that the turning point took place beginning of July 2008, when the rapid weakening of Rouble, Real and Rupee began. Approximately in March 2009 another trend change took place and thanks also to the weakening dollar have the currencies started to write off their losses against it. During all of this turbulent period of time has the exchange rate of Juan against USD remained practically without change.

Development of BRIC Countries Stock Markets

Very positive development of the economies of BRIC countries expressed itself in the development of their main stock indices. Economic expansion in coordination with relatively high interest rates and strengthening national currencies have lured great volume of foreign capital, which reflected itself also in penetrative up-move of stock markets. They strengthened in the course of three years by more than 200% (Chart 6).

The most violent development took place in China where bubble of gigantic size developed. Index SSE Composite has climbed from the level of 1013.60 points achieved on 23 May 2005 up to 5903.26 points on 12 October 2007, so almost by 500% in less than 29 months. The bubble was so inflated at that time that even the first messages about problems on American mortgage market in autumn 2007 caused its bursting. This bubble came into existence not only because of outstanding economic results of Chinese economy and positive outlook for future, but first of all due to excessive state interventions into the functioning of the markets, first of all in the form of massive resident restrictions of the capital movement out of the country and into the country as well. As a result, vast majority of Chinese do not have access to foreign stock markets, which is why they are forced to invest in China only. Given such a huge population there afterwards arises a remarkably high demand, which pushes the prices of domestic stocks to staggering heights. Just this factor, if not removed, will with highest probability cause origination of the bubbles in the Chinese stock market also in future.

The other three remaining countries of the BRIC group also recorded very rapid growth of stock markets but neither of them as rapid as China. Indian Sensex grew gradually from October 2004 up to January 2008 for more than 250%. At this level began the decline, initiated by the unfavourable news form the USA. The situation in Russia and Brazil was a little different, though. Similarly to the Russian RTS, the Brazilian iBovespa also culminated only several months later, towards the end of May 2008. It was caused by the fact that the economies of both countries depend markedly on the development of commodity markets. It becomes evident also on their stock markets, where the dominant role is played exactly by the

Table 1 BRIC Countries Outlook of the Public Finances Status

	Fiscal Deficit (in % of GDP)		Total Government Debt (in % of GDP)	
	2010	2014	2010	2014
Brazil	-0.8	-0.6	64.0	54.1
Russia	-5.0	-4.4	7.0	7.4
India	-8.7	-4.7	88.9	76.8
China	-3.6	-0.2	21.6	17.9

Source: Fiscal Implications of the Global Economic and Financial Crisis, IMF, 9 June 2009.

corporations from extracting and processing sectors. Just these pulled the RTS and iBovespa to new record-breaking heights, taking advantage of record-breaking prices of commodities. Decline of prices of commodities was launched at the beginning of summer 2008, thus just in time when abrupt downslide on Russian and Brazilian stock market took place as well.

The situation was particularly critical first of all in Russia in this period, which can be seen also on Chart 6. Within 5 months from June to October lost the RTS Index everything it gained in 32 months from October 2004 up to May 2008. From the historical maximum of 2487.92 points on 16 May 2008 it fell down to the level of around 550 points towards the end of October 2008, which represents decline of almost 80%. This was caused not only due to bad situation on global markets and fall of the prices of commodities, but also due to increased political risk. Causes (scandals) around the companies TNK-BP and Mečel were viewed with great resentment by foreign investors. Russian corporation TNK and British BP possessed common investments in Russia. Problem occurred the moment when TNK wanted to expand beyond the frontiers of Russia, which was what BP did not agree with, since it would thus in principle started competing with itself. This, of course aroused a row between both corporations, which overgrew up to deterioration of mutual relations between Russia and Great Britain. The steel giant Mečel, for a change, encountered problems because of its business practices. It was selling its production at dumping prices to its own daughter company with the seat in one of the tax havens, which sold it further at current market prices. Mečel thus evaded taxation from the state. The moment when Russian organs started to investigate the whole matter, investors began looking for features similar to notoriously known Jukos, which did not overly help the market sentiment, gloomy enough even before that. To all of this, armed conflict with Georgia was added in the middle of August. As a result sank the Russian stock index the deepest of all BRIC group.

From October 2008 we can witness gradual development synchronization of BRIC countries capital markets, which generally moved in lateral trend up to March 2009, followed by an abrupt rally. The SSE Composite, iBovespa and Sensex indices have appreciated for almost 80% from the beginning of the year 2009 up to the half of November. Russian RTS overtook its colleagues not only by steepness of its fall, but also by sharpness of its growth, when it strengthened within the same period for almost 130%.

Such an abrupt growth was caused first of all by massive "oversold" condition of majority of stock titles, caused by panic selloffs in the second half of the year 2008, but also by indications of recovery of the world economy and also by billions of dollars being pumped into the economies by the governments in an effort to reverse the unfavourable development, and from which the great part ended in capital markets. In case of Russia and Brazil, massive support came from commodity markets, where change of downward trend took place and prices of most commodities recovered significantly in comparison with the beginning of the year.

From among the stimulus packages of the BRIC countries, first fiddle was played by that of China. China earmarked Juan 4 trillion for the fight against crisis in it, which, in time of their approval at the end of 2008 and the beginning of 2009 amounted to more than 580 billions of USD. From this sum up to 45% was assigned to building and development of infrastructure and 25% for elimination of damages after earthquake. Just the Chinese package helped China markedly towards massive economic growth in spite of the crisis and it also positively influenced the prices of commodities, by which were Russian and Brazilian economies also indirectly supported.

Expectations of Future Development of BRIC Countries

In spite of the fact even the countries of BRIC group were not able to avoid the impacts of crisis, their future does by no means look pessimistically. It seems that notably Russia, Brazil and China represent an outstanding investment opportunity for the nearest decade.

The fact that the economies of these countries keep themselves in relatively good shape even despite the crisis is supported also by the outlook of the state of their public finances (Table 1). In spite of the fact, that in all of the four cases budgetary deficit is expected for the year 2010, their overall governmental debt is on the acceptable level in case of Brazil and in case of China and

mostly Russia, this indicator can be described as outstanding. Positively viewed may also be the outlook of gradual decreasing of deficit and debt. As can be seen, India lags even in these indicators considerably behind.

China declares even in these difficult times very high rates of economic growth, pulled mostly by domestic demand. Moreover, huge Chinese foreign exchange reserves and very good shape of public finances testify about undisputed economic strength. Also predominant majority of the huge stimulus package, whose value exceeded the sum of half a trillion American dollars, was wisely assigned to investments in the infrastructure. After recovery of developed economies, further improvement of Chinese economic results can be expected, which projects itself legitimately into the growth of Chinese stock markets. Huge Chinese markets and growing purchasing power of Chinese population represents huge potential for the future. It will be important, however, how Chinese government copes with the most burning problems. The main problem being the ever growing, even now dangerously high social inequality, where there is a small group of wealthy managers, and relatively narrow, even though ever growing middle class on one side, and on the other side very poor, predominantly rural population. Another very unpleasant problem is protection of the environment, corruption, excessive bureaucracy and often unnecessary state interventions into the economy. Worth mentioning is also alarming demographic development, where the state policy of radical birth rate reduction resulted in commencement of ageing of the Chinese population, and above that, the gender structure of the population was markedly disrupted. In connection with Chinese stock market intensive regulation from the state is to be mentioned, which concerns above all resident restrictions. Shares of Chinese corporations are divided into five categories (A-shares, B-shares, H-shares, N-shares, Red Chip shares), with different rate of accessibility for the domestic and foreign investors. For example, N-shares are shares of Chinese corporations quoted at New York Stock Exchange, which means they are freely accessible also to foreign investors. Contrary to this, only Chinese citizens and foreign institutional investors with special permission have access to the group of shares .These restrictions together with the fact that the Chinese population has only limited access to the investment on foreign capital markets lead to the emergence of price deformations and bubbles. It seems though, that Chinese government is aware of this problem and that is why it worked out a strategy of capital market development for the years 2008 up to 2020, main objectives of which consist above others in liberalization of the capital market, in making it more effective, and in its gradual opening in an effort to prop up competitiveness within the global financial system.

In case of Russia and Brazil the main reason for optimism lies in their position in the world of commodities. Both countries belong to their most important world producers. And because the growth of prices of almost all commodities is practically inevitable from middle as well as long-term perspective, Russia as well as Brazil can look forward to high revenues. Also looking forward to interesting revenues can as well investors on capital markets of these countries, which are narrowly tied to the development on the commodities markets. Similar to the case of China it will be important, how will both countries cope with imminent challenges. It concerns first of all diversification of the economy, in order to reduce the excessive dependence on commodities. First signs of this endeavour are already there to be seen in both countries. While Brazil tries to diversify primarily through the development of tourism and services, Russia concentrates itself to the development of the sector of nanotechnologies. It is already today the world leader in this sector, and in the nearest years it plans to "pump in" another more than USD 10.5 billion into it. This should help the sector to the yearly production valued at around USD 30 billion up to the year 2015. Grounding of two sovereign funds can also be described as a reasonable step. While the Stabilization Fund of the Russian Federation is supposed to serve as a support for budgetary expenditure in case the price of crude oil sinks under USD 27 a barrel, the National Wealth Fund is designed to support the pension system and building of the infrastructure. The very capital market in Russia has problems mostly with political risk, which is perceived very sensitively by the foreign investors and they often react by massive capital drain. Brazil, on the contrary, must strive to solve above all social problems and criminality, which is a problem mainly of the great cities, as well as ecological problems, which are connected first of all with excessive cutting of rain forests.

"Black sheep" from among the BRIC countries represents India. It does not fall too much behind China as far as population is concerned, but the standard of living is considerably lower, which is witnessed also by per capita GDP, which is lower for more than 50%. Moreover, the social situation in India is much more acute in comparison with China. Contrary to Russia and Brazil, India can not prop upon commodities. Quite on the contrary, it is to a considerable degree dependent on their import. Problematic seems to be also the state of public finances, where for the year 2010 a deficit of 8.7% of GDP and overall government debt at the level of 88.9% of GDP are expected. Corruption and alarmingly bad hygienic and ecological situation is also one big problem. Copious bureaucracy does not help the country either. Also Indian market as such is strongly disintegrated among particular federative states and territories. Last but not least real threat is the security situation, as India has tense relations with neighbouring countries, Pakistan in particular, and it lives under constant threat of terrorist attacks.

References:

1. Kotlebová, J., Chovancová, B: Medzinárodné finančné centrá, zmeny v globálnej fnančnej architektúre, Iura Edition, Bratislava, 2010.
2. Fiscal implication of the Global Economic and Financial Crisis., IMF, 9 July 2009.
3. http://www.imf.org.
4. http://www.yahoofinance.com.
5. http://tradingeconomics.com.
6. http://www.oecd.org.
7. http://www.worldbank.org.

New challenges for e-money in the euro area

Miloslav Hoschek

A new EC Directive and developments in mobile payments will further boost the electronic money industry, writes

Rules and regulation of e-money

The European Parliament and Council's Directive 2009/110/EC, issued on 16 September 2009, has established a clearer and technologically neutral definition of electronic money. The revised Directive (which updates directives 2005/06/EC and 2006/48/EC and repeals 2000/46/EC) was introduced in response to the emergence of prepaid electronic money payment products. Member states are required to adopt laws and regulations in accordance with the Directive by the end of April 2011.

As defined by the European Commission, electronic money is „an electronic surrogate of cash (coins and banknotes), which is stored on an electronic device. It enables cashless payments of smaller amounts in diverse environments such as points of sale or through mobile or internet communication."

The Directive resolves several open issues and areas regarding electronic money in the euro area. The definition opens up the possibility of new technological and product innovations in the market. It applies to situations where the payment service provider issues and prepaid stored value in exchange for funds used for third party payment purposes. The directive also defines rules and terms such as „electronic money institution",„ e-money issuer: and „means of payment by electronic money".

Electronic money institutions

With regard to the prudential supervision of electronic money institutions, the Directive states that the purpose of surveillance is to ensure a level playing field for all providers of payment services. The legal entity licensed to issue electronic money is called an electronic money institution. These institutions distribute electronic money, including the sale of resale of electronic money to the public. Under the new Directive, electronic money institutions are no longer considered as credit institutions (as they were previously). Instead, electronic money institutions are defined as institutions involved non-cash payments that are authorised to issue electronic money in accordance with national law.

The Directive considers the operational and financial risks that electronic money institutions face in carrying out the business activities related to the issuance of electronic money. For example, electronic money institutions are not permitted to lend funds raised or held for the purpose of issuing electronic money. Nor can they use credit or interest rate instruments.

Means of payment

The means of payment for electronic money are defined as those that store electronic money for electronic devices. They allow access to authorised holders or the stored electronic money. Electronic money products allow authorised holders to access funds through electronic or other technical devices called remote access payment instruments. Such devices include bank or credit cards and electronic banking applications. Electronic money payment instruments also include electronic wallets (e-money stored on smart cards) and software wallets (electronic money stored on other electronic devices).

The Directive states that (if it is not possible to recharge) the maximum amount to be stored electronically in the electronic money device will be not more than € 250, or if it is possible to recharge, a limit of € 2500 is imposed on the total amount transacted in a calendar year. As regards national payment transactions, member states or their competent authorities may increase the amount of € 250 to a ceiling of € 500.

Single European cash area

The Brussels-led single European cash are (Seca) addresses the migration of cash payments to credit and debit cards and electronic payment instruments. UK-based PSE Consulting estimates that every day coins or banknotes are used in four out of five retail purchases. It is estimated that countries in the euro area spend around € 50-70 billion per day in cash payments. Seca is a cornerstone of the single euro payments area (Seca) initiative. However, electronic money in the euro area may go beyond the initial initiatives of the European Payments Council and its Seca committee.

Successful projects

Innopay's study of mobile payments, published in November 2009, provides examples of dozens of successful mobile payments projects in euro area. For example, in Warsaw, a mobile wallet project operates on public transport. This is a joint project of Poland's Bank Handlowy, mobile operator

Polkomtel and mPay, a company specialising in mobile payments. The services provided allow users to pay for travel tickets directly from their bank accounts at Bank Handlowy. Users can buy tickets via their mobile phones.

In Slovakia, a mobile payment service enables payments to be made for public transport, tickets, CDs, DVDs, parking fees and internet connection fees. The service is a collaboration between Blue Orange (a subsidiary of multinational group Jet Multimedia), T-mobile, Orange, T-Com, Telefonica-O2.

In Czech Republic, mobile customers can use Web tokens, that provide access to the paid sections or toll information in the internet environment, such as access to archival articles, photos, videos, ads, additional services at various sites, downloading files and the like. The system is based on the transmission of unique access codes by SMS. The advantage of Web services is a token whereby the application code can be adjusted according to specific needs of the service or product.

Also in Czech Republic, a near field communication (NFC) – based project launched in 2009. The project ran in two phases in the city of Plzeň, where residents is selected shops, clubs and urban transport use only a mobile phone to make payment.The mobile wallet enables users to see which purchases they have made, their travel history on the public transport network, the balance of their wallet and also the last four transactions made. By simply attaching a mobile phone to a payment terminal, the transaction is immediately transferred. The terminal, which is designated by the public transport system, immediately displays the current balance of the electronic wallet. As on the public transport system, users can also pay using the NFC technology in shops and in restaurants. In these cases, the phone is attached to a payment terminal and within a few seconds the customer can make the transaction. To use any of these services, the user must have a phone that supports NFC technology. NFC is a high-frequency communication technology that can exchange data between devices within a distance of 10 centimeters.

In Romania, the Dutch banking group ING has teamed up with MasterCard and IT companies (Logica Netherlands and Finland's Venyon) for a pilot project of mobile micro-payment based on a new standard for phones supporting NFC. The project combines an interface, and smart card reader in one device. Around 500 participants in the project have the opportunity to pay up to € 20.66 via their phones at contactless terminals that have been installed at around 40 outlets.

Conclusion

Electronic money is an emerging area in the euro zone and linked to this is an emerging industry of mobile payment systems that involves mobile operators, phone manufactures, retailers, financial institutions and manufactures of ancillary equipment. At the same time, regulatory initiatives have paved the way for the further uptake of electronic money.

Silver collector coin

World Cultural Heritage Wooden churches in the Slovak part of the Carpathian Mountain Area

Ing. Dagmar Flaché

In March, Národná banka Slovenska issued the first collector coin under its issuance plan for 2010. In doing so, it is presenting further of the Slovak cultural heritage sites that are included in the UNESCO's World Heritage List, in this case wooden churches in the Slovak part of the Carpathian Mountain Area.

Coin produced on the basis of a design by Mgr. art. Patrik Kovačovský

This cultural heritage site was included on the UNESCO list in 2008 and includes eight churches built between the 16th and 18th centuries. They are among the most precious examples of historical architecture in Slovakia, representing a unique symbiosis of Christianity and folk architecture and offering a fine illustration of the co-existence of three Christian denominations. The Roman Catholic churches are located in Hervartov and Tvrdošín, the Greek Catholic churches in Bodružal, Ladomirová and Ruská Bystrá, and the Protestant churches in Kežmarok, Leštiny and Hronsek. The folk builders who constructed them applied above all an intimate knowledge of wood, including its properties and potential. What these churches have in common is a prevailing timber structure with a less prominent column structure. Their typological variety reflects denominational differences, the effect of period styles, and regional peculiarities. The valuable interior decoration of the churches is preserved.

In March 2009, Národná banka Slovenska announced an anonymous public competition for the production of the coin design. A total of fourteen designs were entered by fourteen authors, and in June 2009 they were assessed by the NBS Governor's Committee for the Assessment of Designs for Slovak Euro Coins. Its expert advisors were Ing. arch. Viera Dvořáková, head of the Department of Cultural Heritage Site, Archaeology and World Heritage at the Monuments Board of the Slovak Republic and Ing. Miloš Dudáš, CSc., head of the Regional Monuments Board in Žilina.

The Committee awarded first prize to Karol Ličko and recommended his design for production of the coin. The Committee appreciated the fact that the design referenced all three of the respective Christian denominations – Roman Catholic, Greek Catholic and Protestant. It noted the balanced composition of both sides and the suitably fine font that complemented it. On the obverse side, the designer depicted the churches in Hronsek, Ladomírová and Hervartov. For the reverse side, he selected the Tsar door of the Ladomírová iconostas, set against outlines of the framed structure of the church in Hronsek. At the apex of the reverse-side composition is a universal motif for all three denominations – the eye of God.

First prize: Karol Ličko

Second prize: Vojtech Pohanka (academic sculptor)

Third prize: Pavel Károly

Although the expert committee put forward this design, the NBS Governor exercised his right under the terms of the competition to decide differently from its recommendation. On the basis of the NBS Bank Board's Authorization, he approved the design that came third in the competition as the one to be used for the coin. Entered by Mgr. art. Patrik Kovačovský, this design, too, depicts the churches of the three denominations. The obverse side shows the churches in Bodružal, Hronsek and Tvrdošín, and the reverse side the churches in Ruská Bystrá and Hervartov. Linking the composition on both sides is the motif of a road running between the individual churches. The Bank Board has decided that the coin will be included in the international project "Joint Issues of Europe", which in 2010 will focus on the subject of European architecture. For this reason, the obverse design is supplemented with the project's logo – the European star together with the euro symbol.

The second prize was awarded to academic sculptor Vojtech Pohanka. The Committee appreciated the design's high quality, particularly the reverse-side's compositional grouping of churches in Hronsek, Hervartov and Bodružal. A drawback of the obverse design is that it depicts the Madonna and Child from the church in Jalová, which is not included in the World Heritage List. The third prize was shared by a design from Pavol Károly. In this case, the Committee praised the inventive reverse-side design of a cross-sectioned tree trunk; its wood structure is highlighted, and around its edge are motifs of the eight churches included in the World Heritage List. The obverse side depicts the Hronsek belfry along with a tree trunk cross-section.

The silver collector coin, measuring 34 mm in diameter and weighing 18 g, was minted at the Kremnica Mint from silver with a purity of 900/1000. Deeply engraved on the edge is the inscription: "WORLD HERITAGE – PATRIMOINE MONDIAL". Within the limited number of 30 000 of the coins will be minted, including 9 900 pieces in brilliant uncirculated quality and 17 325 proof coins have been minted.

Photo: Ing. Štefan Fröhlich

JANA KOTLEBOVÁ – BOŽENA CHOVANCOVÁ

MEDZINÁRODNÉ FINANČNÉ CENTRÁ – ZMENY V GLOBÁLNEJ FINANČNEJ ARCHITEKTÚRE (INTERNATIONAL FINANCIAL CENTRES – CHANGES IN THE GLOBAL FINANCIAL ARCHITECTURE)

Published by Iura Edition, spol. s r.o.; Bratislava, 2010, 484 pages

"International Financial Centres – Changes in Global Financial Architecture" is a monograph published by Iura Edition and written by two highly regarded professionals – doc. Ing. Jana Kotlebová, PhD. and prof. Ing. Božena Chovancová, PhD. Kotlebová, who wrote most of the book, is an expert in monetary policy and international financial centres, while Chovancová is an expert in financial markets and collective investment. This first edition of the book is a product of the research project VEGA 1/0542/09: "Prospects for Slovakia amid the global imbalance".

The current global crisis has indicated several problems in the functioning of international financial relations and has brought about a change in the global financial architecture. Although modern trends such as globalization, liberalization, integration and internationalization are accompanied by positive effects, they also deepen the global imbalance in the world economy. As the crisis has spread from the financial sector to real economy, and as the problems of environment pollution become ever more pressing, the repercussions of the crisis are being felt also in the social sphere – there is even talk of a "crisis of confidence". These circumstances are having a great effect on the shaping and development of international financial centres.

The aim of this monograph is to identify factors which historically have influenced the formation and functioning of international financial centres, and also, on the basis of experience, to analyse the positive and negative aspects of this process that could play a key role in their future development.

Chapter One, entitled "The International Monetary System – its Functions and Significance in the Formation of International Financial Centres", briefly describes the development of international monetary system, defines it, lists its individual functions and deals with different stages of its development.

Chapter Two, "International Financial Centres", analyses the factors behind the formation of international financial centres, the importance of these centres in international financial relations, and the tasks that they perform. International banking – as a key element in the shaping of international financial centres – forms an important part of this chapter.

Radical changes in conditions have brought about the various reforms that multinational international financial institutions are now undergoing (Chapter Three). The Millennium Development Goals of the World Bank and the IMF define the most significant world problems that are currently affected by the global financial crisis.

Chapter Four, "Economic Integration in Europe", looks at the current membership situation of the EU and euro area and the potential for their enlargement, as well as at the European Central Bank and single monetary policy of the euro area – both in the present context and in the period before the outbreak of the current global crisis.

Chapter Five, "Economic Integration in Africa", briefly describes the history of monetary cooperation in Africa and deals with the major regional groups on this continent.

Chapter Six, "Economic Integration in Asia and Latin America", describes programmes and regional groups in different areas of Asia that are focused on developing mutual trade and on enhancing economic cooperation, both within Asia and with the Pacific area.

Countries' main priorities for the future are listed in Chapter Seven: "The Changing Global Financial Architecture". A bipolar world is being transformed into a multi-polar one in which emerging economies have an increasingly important role.

Financial crises, their types, models and frequency of occurrence, and the IMF's task in preventing, dealing with and the removing consequences of financial crises are covered in Chapter Eight "Crisis – Typology, Causes, Consequences, History and Present Day." This chapter offers the reader an overview of the historically most important crises, and ends by describing the causes and manifestations of the current global financial crisis and measures for eliminating its consequences.

Chapter Nine, "Development Tendencies in World Capital Markets", highlights changes that occurred in financial markets in the second half of the 20th century. It deals with bond and loan markets, stock markets in different countries, and collective investment, as well as with new tendencies in this area and alternative forms of investment.

Shifts in the distribution of economic powers in different countries of the world and the significant position of emerging and developing economies that offer new possibilities to developed countries form the subject matter of Chapter Ten: "New World Economy Leaders".

Chapter Eleven, "Offshore Financial Centres", examines the basis and forms of offshore centres as well as reasons that they are used. It highlights the importance of cooperation in the fight against organized crime at the international level and also the importance of cooperation between national authorities in order to ensure global world economy growth.

This book represents a step up in quality for this kind of literature. Compared with textbooks on this subject produced by well-known economics universities in Europe, it has both an excellent theoretical level and a clear style.

I appreciate the comprehensive treatment of the subject, which covers the latest theoretical knowledge in the field and applies that theory to different countries of the world. This monograph identifies factors which have influenced the formation and functioning of international financial centres and analyzes both positive and negative aspects of this process. Taking the basic elements of their mechanism, it establishes a clear system and shows the importance of the economic integration process, the spread of globalization, and the increasing economic sensitivity of countries.

This book will prove useful for students and postgraduate students of both economics universities and other universities, and for anyone who has an interest in this subject.

Review by:
Ing. Viera Malacká, PhD.
University of Economics in Bratislava

B I A T E C