ON THE ROAD TO THE EURO ZONE. CURRENCY RATE STABILIZATION: EXPERIENCES OF THE SELECTED EU CONTRIES

Sławomir I. BUKOWSKI

Quaderno n. 50 — Marzo 2008

QUADERNI DEL DIPARTIMENTO DI ECONOMIA, FINANZA E STATISTICA

Sławomir I. Bukowski[1]

**ON THE ROAD TO THE EURO ZONE.
CURRENCY RATE STABILIZATION: EXPERIENCES OF THE SELECTED EU
COUNTRIES**

ABSTRACT

The aim of this article is to show the threats connected with the exchange rate stabilization within the framework of ERM II and the analysis of the randomly selected EU countries – candidates for the Euro Zone. A two year stabilization of the exchange rate within the ERM II required prior to the Euro Zone accession is connected with numerous risks typical of a fixed rate with a hard band of fluctuations. There are two ways of exchange rate stabilization – a standard one as in the case of the Slovenian Tolar or a currency board (the case of the Baltic states). Neither of them is free of drawbacks. Against this background a question can be formulated: is the exchange rate stabilization indispensable for the Euro Zone accession at all? More and more arguments are raised against it. The most relevant ones refer to the criteria of price stability and fiscal stability. Stabilization of the exchange rate within the ERM II for two years in the situation of free capital flows may not be successful and there is a probability of the currency crisis in the country stabilizing the exchange rate.

JAL classification: F, F3, F36.

Keywords: monetary union, euro zone, euro, ERM II, system of exchange rate, fixed exchange rate, floating, currency board, impossible trinity, fiscal stabilization, stabilization of exchange rate, budget deficit, public debt, interest rate, current account, FDI, foreign portfolio investment, Samuelson- Balassa effect, inflation, speculation attack.

---

[1] Professor, Ph.D., D.Sc. (Econ.), Head of the Department of International Business and Finance, K. Pulaski Technical University of Radom, Poland

1. *Exchange rate systems and the factors determining their choice*

Theory and practice distinguish the following exchange rate systems:[2]
- flexible (floating) rate of exchange,
- fixed rate of exchange with a band of fluctuations including its variation – a currency board,
- indirect systems:
    - crawling peg,
    - adjustable peg,
    - managed floating.

Each of these systems has some advantages and disadvantages.

A floating rate of exchange is purely a market solution and thus it releases a central bank from the necessity of interventions in foreign currency. A floating rate of exchange has an in-built mechanism ensuring the balance of payments equilibrium. What is more, the floating system isolates economy from external monetary disturbances and, gradually and in a flexible way, it adjusts to structural changes in economy. It is also important that in a floating exchange rate system the probability of a currency crisis is decreased whereas economies which apply a fixed rate of exchange are exposed to this crisis.[3]

On the other hand, it must be borne in mind that despite the above mentioned features of a floating exchange rate, monetary and fiscal authorities of the country should apply a consistent stabilization policy aiming at ensuring the internal equilibrium. This exchange rate does not, however, protect economy against an import of disturbances of the extra-monetary type, e.g. a shift of the foreign demand to exports, changes in terms of trade or cost-related inflation connected with the rise of raw material prices in world markets.[4] It must be also emphasized that in the situation of a floating exchange rate fiscal policy is less effective in comparison with the system of a fixed exchange rate. Besides, its effectiveness depends on the degree of capital mobility. This is indicated by the analyses carried out according to the Fleming-Mundell model.[5] The scope of this stabilization policy depends on the flexibility of markets as well as prices and wages. This is the degree of market flexibility which determines the effectiveness of market adjustments in economy. The higher this effectiveness is, the lesser the scope of indispensable stabilization policy.

A drawback of a floating exchange rate is, among others, big uncertainty concerning financial market participants' behavior and a high exchange rate risk. The so-called managed floating is a pure attempt to eliminate the exchange rate system drawbacks. This type of exchange rate is regulated by the market mechanism. Yet the central bank has the right to intervene especially in the situation of different types of external economic shocks. Literature points to the danger of the exchange rate manipulation in the situation when the right of the central bank to intervene in exchange rate is decreed and the central bank is not autonomous enough to pursue the target which is price stability.[6]

A fixed (rigid) rate with a band of fluctuations (in other words, "the tunnel") allows for reduction of the exchange rate risk. Fiscal policy in the system of a fixed exchange rate is

---

[2] See [Lutkowski, 1998, pp. 51-52; Bożyk, Mijala, Puławski, 2002, pp. 233-238; Melvin, 2000, pp. 57-59].
[3] It refers mainly to the so-called II generation crises based on speculation attacks. See more: [Malecki, Sławiński, Piasecki, Żuławska, 2001, pp. 17-19].
[4] See more: [Lutkowski, 1998, pp. 52-66].
[5] See [Acocella, 2002, pp. 493-523; Caves, Frankel, Jones, 1998, pp. 586-633, Van Marrewijk, 2005, p. 58];
[6] See: [M. Friedman, 1968; Lutkowski, 1998, pp. 85-86].

more effective at a relatively ineffective monetary policy which again depends on the degree of capital mobility. In this system there is no automatic mechanism providing equilibrium to the balance of payments and monetary authorities must take care of foreign currency reserves, which are indispensable to accomplish exchange rate interventions aiming at the protection of the exchange rate. Nevertheless, a more significant problem related to the fixed exchange rate must be mentioned. This problem is called the impossible trinity concept (see Figure 1).

Figure 1: Impossible triangle
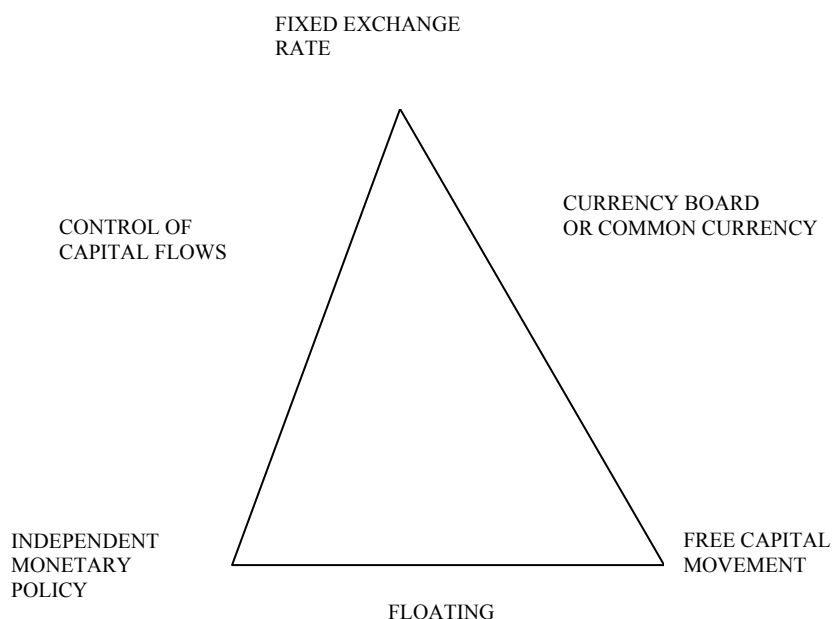
Source: author's own development based on Pentecost, 2001.

According to this concept it is impossible to have all three, namely: exchange rate stability, autonomous monetary policy and capital mobility (free capital flows) fulfilled at the same time. In the situation of a fixed exchange rate and full capital mobility, the pursuit of monetary policy independence can lead to the lack of the balance of payments equilibrium owing to the speculative capital flows. If the country has an autonomous monetary policy and the exchange rate is fixed, then, in order to protect the balance of payments, the country must control capital flows. An alternative solution is to resign from the fixed exchange rate and to apply the floating rate. Still another solution is to resign from the independent monetary policy and join a larger monetary area.[7]

A special case of a fixed exchange rate is the currency board. It consists in establishing a parity exchange rate (vis-a-vis another currency or gold) and ensuring at least 100% coverage of banknote and coin issue with the foreign currency or gold reserves being the parity basis of the currency board. In this way monetary policy is practically abolished. The market exchange rate fluctuations against the parity exchange rate are limited by the size of the domestic currency issue, which, in turn, depends on changes in foreign exchange reserves. In the orthodox version of the currency issuing office, the central bank does not neutralize the influence of the balance of payments on money supply, does not control foreign currencies, does not specify interest rates, neither does it specify obligatory reserves for commercial

---

[7] See more: [Mundell, 1961; Tavlas, 1993; Pentecost, 2001, pp. 25-27].

banks nor play the role of the last resort lender. Thus, commercial banks cannot expect financial support in the case of financial liquidity problems. In practice, currency boards are seldom orthodox and central banks retain part or the whole of the above mentioned rights. The currency board is usually used in small, open economies threatened by inflation which encounter problems with a consistent and credible monetary policy. Literature mentions the following advantages of the currency board system: stability of prices and interest rates, immunity to foreign currency speculation attacks, and high credibility in the eyes of investors. Despite its effectiveness in price and currency stabilization, this system has a number of drawbacks. They include, among others: restricted economic sovereignty of the country, limited possibilities of effective stabilization of economy with the help of monetary policy in the context of economic shocks.[8]

Therefore fulfillment of specific conditions on which effectiveness of adjustment systems depends is required. They include: fiscal stabilization and discipline, market flexibility and, in particular, that of the labor market, labor force mobility, flexibility of prices and wages and a developed banking system.

K. Lutkowski lists specific features of economy among the factors determining the choice of the currency exchange rate. He identifies them as: (1) size of economy and its share in the world's economy, (2) degree of flexibility of markets, prices and wages and the allocation function played by the price-wage mechanism, (3) significance of given economy as a financial centre, (4) degree of technical dynamics of economy and sustainability of foreign markets.[9]

Big economies having a large share in world's economy choose floating exchange rates rather. These economies have a large share of the inexchangeable goods (nontradables) sector and a relatively small share of trade turnover with abroad in GDP. This makes them immune to any disturbances related to changes in exchange rates. The situation is different with small economies. An exception here are small economies being important financial centres in world's economy, which is connected with large capital flows.[10] Similarly the fixed exchange rate systems are typical of innovative economies the growth of which is based on expanding exports. A floating exchange rate allows for solving the problem of excessive foreign exchange reserves increasing due to permanent export surpluses.

On the other hand, low market, price and wage flexibility, and frequently their rigidity, encourage to choose a fixed exchange rate rather than a floating one. Economies of this type adjust with difficulty to any changes in foreign environment as well as in exchange rates.

2. *Fixed exchange rate – macroeconomic risks in the situation of international capital flows*

Implementation of a fixed exchange rate with a hard band of fluctuations may lead to specific costs and macroeconomic risks. Some of them were suggested above. Macroeconomic risks and costs of maintaining a fixed exchange rate include, among others: necessity to neutralize the influence of increasing foreign assets denominated in foreign currencies on internal prices (currency sterilization), cost and effectiveness of foreign exchange interventions, a

---

[8] See more: [A.M. Gulde, , M. Kähkönen, P. Keller,2000; Hanke, , pp. 203-222; Melvin , 2000, pp. 57-59; Pietrzak , 2001].
[9] See [Lutkowski, 1998, pp. 69-70], see also: [Mundell, 1961; Melvin, 2000, pp. 50-54].
[10] See [Lutkowski, 1998, p. 69].

phenomenon of "reserve escape"/outflow in the event of a balance of payments deficit, and speculation attacks.

The money issue policy in a country applying a fixed exchange rate is subordinated to the necessity of exchange rate stabilization, maintaining it within the band determined by the allowed fluctuation margin. This means the necessity to use costly foreign exchange interventions based on foreign currency sales and purchases. The size of monetary base is, to a large extent, determined by external factors resulting, first of all, from the monetary policy of the country whose currency is the main component of currency reserves of the country applying a fixed exchange rate.[11]

Neutralizing the influence of growing currency reserves on domestic prices (inflation impulse) requires periodical interventions of the central bank (currency sterilization) in the form of open market operations. In this case, currency sterilization does not solve the problem for ever but only relieves (mitigates) temporarily effects of growing reserves. Sterilization intervention requires a developed market of treasury bonds. It must be also taken into consideration that issuing and selling of treasury bonds is not unlimited.

In the case of reserve outflows caused by a balance of payments deficit, the country is forced to take foreign loans and credits stabilizing the balance of payments in order to ensure appropriate liquidity in settlements with abroad. This clearly limits the freedom of economic policy activities.[12]

Currency speculation is a serious threat connected with the application of a fixed exchange rate with a fixed band of fluctuations. Stability or instability of the exchange rate is determined by fiscal policy implemented by the government. Expansive fiscal policy leads to a budget deficit and increased public debt. Its other result are growing interest rates which attract foreign capital. Inflow of the speculative short-term foreign capital entails domestic currency appreciation. Currency appreciation has an adverse influence on export competitiveness but improves import profitability. Consequently, the current account deteriorates. A negative current account balance is covered by the inflow of foreign capital. If short-term investors find out that the existing currency reserves of a country are not sufficient to protect the currency exchange rate, then they start to get profits by selling domestic currency for foreign currency and withdraw from the market. If foreign currency reserves are really too low in relation to the negative balance of money turnover, then the only solution to the situation is to devaluate the currency or apply a floating exchange rate.

Effectiveness of economy stabilization mechanisms in the situation of a fixed exchange rate depends on the following institutional conditions:
- developed and regulated financial system,
- sufficient level of currency reserves,
- fiscal discipline,
- flexibility of markets, prices and wages.[13]

---

[11] See: [Acocella, 2002, pp. 504-506; Lutkowski, 1996, p. 70].
[12] See: [Acocella, 2002, pp. 504-506].
[13] See: [Wagner, 2001].

3. Exchange rate stabilization within the ERM II versus remaining convergence criteria

In conformity with the Maastricht Treaty each and every country of the European Union has the right and duty to participate in the Economic and Monetary Union (EMU). However, in order to join the EMU a given country must meet certain criteria indicating its readiness to participate in the single currency area, which the Union is. These are the above mentioned convergence criteria formulated in the Maastricht Treaty and then specified by the European Monetary Institute. They include:[14]

- price stability: the average annual inflation rate in the candidate country for the EMU cannot exceed the average annual inflation rate in 3 member countries with the lowest inflation by more than 1.5 points,
- fiscal stability: limiting the budget deficit (the top limit of the budget deficit to GDP ratio in a given country cannot be more than 3%); limiting the public debt (the global amount of internal debt cannot exceed 60% of the GDP value calculated on annual basis),
- long-term interest rate: the long-term interest rate on treasury bonds in a given country cannot exceed 2 percentage points of the average interest rates reported in 3 countries with the lowest inflation rates,
- exchange-rate stabilization: participation of the EMU candidate country's currency in the ERM II (Exchange Rate Mechanism II) within the standard band of fluctuations (+/- 15%) for the period of at least two years without devaluation against the currencies of the system member countries.[15]

The price stability criterion was adopted for several reasons. Firstly, there were fears (especially in Germany) that in future the European Monetary Union can face inflation. It was Germany which insisted on adoption of this criterion at the same time striving to have the future monetary policy in the Union run analogically to that of the Bundesbank. In this way the countries with low inflation wanted to safeguard themselves against the Union's central bank policy which was based on preferences of the countries with high inflation.

It is also worth mentioning that convergent low inflation rates in the EU countries encourage economic growth by reducing uncertainty in economic activities. Convergent inflation rates and maintaining them at a low level allows also for limiting the risk of social conflicts which destabilize economic life.

The fiscal stability criterion was based on similar reasons as the price stability criterion. In the past, majority of countries joining the EMU had some serious problems with budget deficits of structural character. Growing budget deficits and growing public debt led to crowding-out of private consumption and investment expenditures, which limited possibilities of economic growth in the long-run. It was also the reason for a high taxation burden for population and enterprises, which in turn, had an adverse effect on economic effectiveness and international competitiveness of economy. Introduction of this criterion, without doubt, contributed to accelerated reforms of public finance in individual countries.

However, it must be borne in mind that introduction of the reference values in the form of a 3% budget deficit to GDP ratio and a 60% public debt to GDP ratio was arbitrary and was not

---

[14] [The euro: explanatory notes by Directorate General II – Economic and Financial Affairs, 1998, p. 13-14].
[15] ERM II was set up by the decree of the European Council In June 1997 in Amsterdam. See: [The Euro and Economic Policy ..., 1999, p. 129-133].

substantiated by economic theory or practice. The said values were adopted under the influence of Germany. The point was to avoid higher interest rates resulting from excessive growth of a budget deficit and public debt in the whole territory of the Union, detrimental to the countries reporting lower interest rates at the moment the Union was created. In those days Germany was one of such countries.

The long-term interest rate criterion results from the conviction that this rate indicates sustainable economic effects in the sphere of price stability in particular member countries. Besides, reduced differences among interest rates allow avoidance of arbitration in financial markets, especially in the period when there are many currencies with a fixed exchange rate.

The exchange rate stability criterion means stabilization of exchange rates in the countries – candidates for the Economic and Monetary Union within the framework of the ERM II (Exchange Rate Mechanism II). The ERM II was set up by the decree of the European Council made in Amsterdam on 17 June 1997.

Participation in the ERM II is voluntary. The exchange rate mechanism is based on central exchange rates established against the Euro. The fluctuation margin in relation to the central exchange rate is +/- 15%. The national central bank of a country from outside the Economic and Monetary Union joining the ERM II concludes an agreement with the European Central Bank, which regulates operational procedures concerning introduction of central exchange rates. It is also assumed that the country does not apply any foreign currency related restrictions.

Stabilization of a given country's exchange rate within the framework of the ERM II for two years means that despite the lack of foreign currency-related restrictions the exchange rate undergoes minimal fluctuations around the central exchange rate. This proves the possibility of joining a single currency area. Replacement of such currency with a single currency is only a confirmation of the naturally existing state of affairs.

In the two-year period of the exchange rate stabilization in the candidate country for the European Monetary Union within the framework of the ERM II, all the above described risks related to the transition from a floating to a fixed exchange rate may occur. The narrower the acceptable band of fluctuations is, the stronger the possibility of their occurrence. At present it is +/- 15% but a possibility of narrowing it to +/- 2.5% is under discussion.

There is a significant relationship between exchange rate stability within the ERM II and the remaining convergence criteria, in particular fiscal stability conditions.

It must be emphasized that the EU member countries' exchange rates function within a uniform financial market and hence, in the situation of high capital mobility on the international scale. This entails significant consequences for economic policy. As the analysis of the Fleming-Mundell model indicates, in the situation of high capital mobility and a fixed exchange rate, fiscal policy- unlike monetary policy - has a favorable effect on GDP growth. In this case, expansive monetary policy leads to a large outflow of foreign currency reserves.

Price stability (low inflation) and exchange rate stability are significant factors deciding about success of an undertaking which is making the currency exchange rate against the Euro fixed. In order to ensure exchange rate stability, monetary authorities of a country should try to ensure a narrow band of fluctuations for domestic inflation against foreign inflation and a

narrow band of fluctuations for interest rates close to the interest rate parity. Otherwise, when the inflation rate fluctuates more than the average in the EMU countries, a strong pressure may occur toward currency depreciation. The latter can lead to the outflow of foreign capital and, consequently, an unbalanced balance of payments and loss of foreign currency reserves. On the other hand, significant upward fluctuation of interest rates from the currency parity will attract short-term speculation capital, thus leading towards currency appreciation. The exchange rate approaching the limits of the band outlined by the acceptable fluctuation margin is dangerous and encourages speculation attacks. Besides, it requires costly interventions in foreign currency..

The price level in the economy of a country of a relatively low economic development level and being a candidate for the European Monetary Union is determined, among others, by two basic factors. They include the Samuelson-Balasa effect[16] and a pro-inflation effect of a budget deficit. These factors affect also the growth of interest rates.

The pro-inflation influence of the Samuelson-Balassa effect is revealed, first of all, in the economies which based their economic growth on liberalization of economic exchange with abroad (among others, the case of new EU members). In this type of economies productivity grows in the sector of exchangeable goods (tradables) leading to higher wages. By virtue of imitation (copying) (also due to the pressure of Trade Unions) the growth of salaries is transferred to the sector of non-exchangeable goods (non-tradables) where the pace of wage increase starts to be ahead of labor productivity. As a result, internal demand occurs, which is followed by a price rise. In the long run, productivity growth leads also to domestic currency appreciation.

A budget deficit and public debt resulting from it affect the price level as well as interest rates. Growth of a budget deficit stimulates inflation expectations. Moreover, the open market operations carried out in order to stabilize the exchange rate may influence the growth of monetary base when the central bank buys treasury bonds to prevent excessive currency appreciation.

A budget deficit and public debt influence also growth of interest rates and these, in turn, exert pressure on currency appreciation pushing the exchange rate towards the bottom limit of the acceptable band of fluctuations. It is worth mentioning that public debt is connected with the issue of treasury bonds which are an attractive investment instrument for banks. Through the portfolio crowding out effect it leads to maintaining high interest rates on bank credits and a large spread between the interest rate on budget credits and the one on bank deposits. Nevertheless, interest rates on deposits and interest rates on treasury bonds are usually above the interest rates abroad. High interest rates domestically in relation to foreign interest rates and attractiveness of treasury bonds for foreign investors attract first of all short-term capital.

A budget deficit is usually accompanied by a current account deficit. Maintaining a high budget deficit and a current account deficit is a negative signal for foreign investors and increases probability of their withdrawing capital from a given country. This, in turn, increases the risk of the currency crisis occurrence.

Therefore, it is important for a country joining the ERM II to have a stable situation in the area of public finances. The ERM II accession should be preceded by a deep reform of public

---

[16] See:[Balassa, 1964; Samuelson, 1964].

finance whose aim is to stop growth of a budget deficit and public debt and then to bring them to a low level measured by their share in GDP. Taking into account the convergence criteria, they should be fulfilled prior to the ERM II accession. Otherwise, the exchange rate will fluctuate dangerously and the threat of the whole undertaking's failure will grow. It must also be emphasized that it is not only the nominal convergence criteria that must be fulfilled. Fulfillment of the nominal convergence criteria should be a result of the real convergence processes.

Reforms and economy restructuring in a country aspiring to join the ERM II should rely, among others, on deregulation processes. What is meant here is the creation of conditions for flexible functioning of markets, including the labor market. Because in the situation of a flexible exchange rate (fixed against the Euro) and high capital mobility possibilities of applying economic policy are more limited than in the case of floating exchange rates (and even fixed ones but with a possibility of devaluation and revaluation), the main burden of adjustments in the two-year period of stabilization as well as later, after the domestic currency has been replaced by the Euro, will rest on flexible market mechanisms. It is of special importance should the demand-side or supply-side shocks occur during the period of the exchange rate stabilization against the Euro.

Another important issue is the domestic currency exchange rate at the moment it is fixed against the Euro in relation to the long-term balance of payment equilibrium. If the domestic currency exchange rate against the Euro is overvalued, then, it means that the current account balance deteriorates due to the decreased competitiveness of exports and outflow of foreign exchange reserves. Lower competitiveness of exports and a negative balance of the current account can be maintained for a longer period of time causing negative recessive effects for economy. What must be recalled here is the case of the former Democratic Republic of Germany where within the economic union with the Federal Republic of Germany the basic conversion rate of the East-German mark into West-German mark was adopted at the level 1:1. This meant that the East-German mark was appreciated by almost 450% in relation to the West-German mark. The effects of this move meant a slump in exports from the former Democratic Republic of Germany, numerous bankruptcies of enterprises and a long-term recession.[17]

4. Experiences of selected EU countries in stabilizing the exchange rate against Euro

Effects of exchange rate stabilization against the Euro within the ERM II as well as outside this mechanism in the case when the exchange rate is fixed against the Euro one-sidedly, can be examined on the basis of experiences of several EU member countries.

In Ireland the exchange rate stabilization process was started with the accession to the European Monetary System in 1979. In the period from 1979 to 1999, the Irish pound was devalued several times. The first devaluation took place in March 1983. Just before the accession to the European Monetary Union, at the end of 1998, the Irish pound was devalued again. It ensured higher competitiveness of Irish exports, which was one of the factors contributing to economic success of Ireland in the following years. It must be mentioned here that the fulfillment of the remaining convergence criteria by Ireland resulted, to a large extent, from deep liberal economic reforms which took place in the 1970s and 1980s.[18]

---

[17] See: [Bukowski, 2003, p. 73].
[18] See: [Keenan, 2003].

Also Danish experiences are interesting. In 1993, following the European Currency System (ESW), Denmark's Central Bank – Danmarks Nationalbank – started a one-sided policy of Danish krone stabilization. Denmark joined the ERM II agreement and the Danish government put itself under the obligation of running the economic policy in compliance with the requirements of the policy of a fixed exchange rate. The agreement adopted a narrower than acceptable in the ERM II band of exchange fluctuations: +/- 2.5%. Moreover, Danmarks Nationalbank started to apply interest rates reflecting the ones used by the European Central Bank, irrespective of the economic situation. The aim was to maintain a fixed exchange rate with a narrow band of fluctuations. In the situation when the depreciation rate of krone exceeds the daily fluctuations, the central bank raises interest rates quickly and significantly. These rates, however, are reduced gradually, in the delayed manner in relation to the currency inflow. In this way any speculation against krone is costly and unprofitable. The policy of Danmarks Nationalbank is credible for the foreign currency market participants, exporters and importers. They realize that the central bank is unconditionally ready to assist the exchange rate.[19] Besides, it is worth mentioning that markets, including labor market in Denmark, are relatively flexible in comparison to other EU countries. In the 1990s, deep structural reforms were implemented in Denmark which included, among others, the taxation system, social benefits system and labor market deregulation. The carried out reforms caused that inflation was reduced, unemployment dropped and nominal wages increased moderately.

Fiscal policy, like monetary one, was subordinated to the exchange rate and price stability. It was announced publicly that fiscal policy would be corrected if inflation departs from the definition of price stability given by the Central European Bank (0.2 percentage point growth of harmonized consumption price index).[20]

Slovenia joined the ERM II on 28 June 2004. The central exchange rate was determined at the level of 239.64 tolars for 1 Euro. The country in question fulfilled all the convergence criteria except price stability. The average inflation rate for the 12-month period preceding August 2004 amounted to 4.1% in relation to the reference value of 2.4%.

Table 1. Economic performance in Slovenia, interest rate and inflation in euro zone euro, period: 1999 – 2006

	1999	2000	2001	2002	2003	2004	2005	2006
SLOVENIA								
Short –term interest rate – interbanking market (%)	8.64	10.94	10.87	8.03	6.78	4.66	4.03	3.58
Rate of inflation HICP (%)	6.10	8.9	8.6	7.5	5.7	3.7	2.5	2.5
Real short –term interest rate – interbanking market (%)	2.39	1.87	2.09	0.49	1.02	0.93	1.49	1.05
Long –term interest rate (%)	-	-	-	-	-	2.49	3.81	3.90
Real long –term interest rate (%)	-	-	-	-	-	-1.17	1.28	1.37
Bank lending – annual change (%)	10.2	17.2	29.4	10.6	6.5	8.6	-3.0	-
Interest rate – bank deposits over 12 months.(%)	-	-	9.80	8.20	6.00	3.80	3.20	2.70
Real interest rate – bank deposits over 12 months.(%)	-	-	1.10	0.65	0.28	0.10	0.68	0.20
Interest rate – bank loans over12 months (%)	-	-	13.50	12.30	10.40	8.60	7.70	6.80
Real interest rate – bank loans over12 months (%)	-	-	4.51	4.47	4.45	4.73	5.07	4.20
Nominal currency rate (Tolar /EUR)	194.47	206.61	217.98	225.98	233.85	239.09	239.57	239.60
Real currency rate	183.29	174.22	170.19	169.21	177.24	192.26	201.54	196.65
Real effective currency rate	100	99.05	100.08	101.24	103.19	104.80	104.00	104.48

---

[19] See: [Jensen, 2001].
[20] See: [Jensen, 2001].

Current account balance/GDP (%)	-3.3	-2.8	0.2	1.1	-0.8	-2.7	-2.0	-2.5
Foreign debt/GDP (%)	-	-	46.8	54.3	59.5	64.2	71.4	84.5
Official reserves (mln EUR)	3134.1	3403.2	5042.3	6784.6	6878.7	6889.8	6896.7	-
Dynamics of official reserves	100	108.6	148.2	134.6	101.4	100.2	100.1	-
Offical reserves/GDP (%)	15.6	16.4	22.9	28.6	27.7	26.3	25.0	-
FDI flow/GDP (%)	0.9	1.1	1.4	4.0	3.8	2.1	1.6	1.0
Net FDI/GDP (%)	0.3	0.4	1.1	6.5	-0.5	0.8	-0.1	-1.0
Net portfolio investment/GDP (%)	1.6	0.8	0.3	-0.3	-0.9	-2.2	-4.5	-4.2
General government balance/ GDP (%)	-2.0	-3.8	-4.1	-2.5	-2.8	-2.3	-1.5	-1.4
Public debt/GDP (%)	24.9	27.4	28.4	29.1	28.6	28.9	28.4	27.8
Gross national savings/ GDP (%)	24.1	24	24.3	24.6	24.1	24.5	24.3	24.5
Investment /GDP (%)	24.4	23.7	20.7	18.7	18.2	18.1	18.2	19.9
Real GDP growth (%)	5.4	4.1	2.7	3.5	2.7	4.4	4.0	5.2
Euro zone								
Short –term interest rate – interbanking market	2.96	4.39	4.26	3.32	2.33	2.11	2.19	3.08
Rate of inflation HICP (%)	1.1	2.1	2.3	2.2	2.1	2.1	2.2	2.2
Real short –term interest rate – interbanking market (%)	1.84	2.24	1.92	1.10	0.23	0.01	-0.01	0.86

Source: Author's own development on the basis of the date from: [Eurostat-epp.eurostat.ec.europa.eu; Convergence Report, ECB, December 2006; Convergence Report, ECB, May 2006; European Economy, Spring 2007, Statistical Annex; Transition Report update 2007, EBRD, May 2007].

In those days, the tolar exchange rate was at the level close to central parity. [21] It is worth noting that the budget deficit stood at the level of 2% of GDP and public debt – at the level of 29.1% of GDP.[22] In the years 2005-2006, Slovenia fulfilled all the convergence criteria. The tolar exchange rate was relatively stable. Tolar's appreciation against the Euro was negligible. On 1 January 2007, the country joined the Euro zone (See: Table. 1).

In the whole period 1999-2006, real GDP growth in Slovenia was relatively high. It should be noted that the gross domestic savings and investment to GDP ratios were also quite high. The current account balance in the analyzed period was negative but its relation to GDP did not exceed 2.5% (except in 1999). In the analyzed period official reserves were growing and their ratio to GDP was quite high. Inflow of foreign investments into Slovenian economy was relatively small. In the last period (2004-2006) the balance of portfolio investments was negative. However, this did not entail any economic perturbations. Tolar's stability against the Euro resulted, first of all, from relatively restrictive fiscal and monetary policies which in the period 2004-2006 were subordinated mainly to currency stabilization.

Close coordination of fiscal and monetary policies played a significant role in macroeconomic stabilization in Slovenia, in particular, in exchange rate stabilization. Until 2004, Slovenia had had a managed floating system. In the period 1996-2001, the central bank of Slovenia implemented restrictive monetary policy aiming at price stability and real exchange rate stability (dual targeting). In this case price stability was adopted as inflation target for non-exchangeable goods (non-tradables) on the international scale. Monetary aggregates (M3) were used as indirect operational targets. In the period 2001-2006, the Central Bank of Slovenia based its monetary policy on the exchange rate as a nominal anchor.[23] The main target was exchange rate stability. Fiscal policy aimed at maintaining a low budget deficit. In the period 1999 – 2006 the budget expenditure to GDP ratio was reduced from 41.6 in 2000 to

---

[21] Zob. [Commission Report, 2004].
[22] Ibidem.
[23] See: [Capricolo, Lavrač, 2003; Neupauerovă, Vravec, 2007].

40.7% in 2006. At the same time, it was accompanied by an increased tax burden from 38.8% [24] of GDP in 2000 to 40.2% of GDP in 2006. This was mainly a result of higher VAT and excise tax rates.

In 1999 Hungary applied a fixed exchange rate against the Euro with a band of fluctuations initially +/- 2.5%, and from May 2001: +/- 15% At the same time the monetary policy based on the direct inflation target was applied. Widening of the fluctuation band was linked to the strong pressure on the forint appreciation. It was caused by several factors: higher interest rates attracting foreign capital, a relatively high budget deficit (9.2% in 2002), the Samuelson –Balassa effect. Forint appreciation lasted until January 2003. The, the central bank –NBH – started buying euros. At the same time, within two days, interest rates were reduced. It caused increased money supply and a threat to the inflation target in 2003. In June 2003, NBH devalued the forint. This, however, contributed to the increased pressure on forint depreciation. The reason why the forint fluctuated was the lack of coordination between the monetary and fiscal policies and sending negative signals to the financial market participants by the central bank – NBH. Financial market participants perceived the interest rate reduction and exchange rate intervention to protect the forint as a resignation from the inflation target attainment for the benefit of another target being the exchange rate. Forint devaluation caused that the central bank's policy was not very credible and was presented as a compromise between the government and the NBH. The government was said to accept the budget deficit reduction in exchange for the currency devaluation and reduced interest rates. This example shows what kind of problems with currency stabilization are caused by lack of fiscal stability and coordination of fiscal and monetary policies. [25]

Experiences of two new EU countries – Estonia and Lithuania, which joined the ERM II on 27 July 2004 – are equally interesting. A characteristic feature of the exchange rate systems of both countries is adoption of a currency board. The currency board system in both countries was not and is not of orthodox nature. It was assumed that Euro reserves will cover only the monetary base and central banks will be the final creditors. The origins of a currency board in both countries are similar. After they had achieved independence, they noted high inflation. At the same time both countries became highly open economies relatively quickly. Foreign currency-related restrictions were abolished and capital flows became liberalized. Estonia established a currency board in 1992 and pegged it to the Deutsche Mark. In 1999 both countries switched to the Euro as the reference currency. Lithuania introduced the system in 1994 and adopted the American dollar as the reference currency which was replaced by the Euro in 2002. The currency board experiment turned out to be extremely successful in reducing inflation and stabilizing economies in both countries. In 2004 both countries fulfilled the criteria of fiscal stability, price stability and long-term interest rates.

The ECB agreement concerning the ERM II accession says that these countries will keep their currency board systems while accepting additional obligations resulting from the ERM II membership. As Convergence Reports for the years 2004-2007 indicate, the currencies of both countries did not report deviations from central parities against the Euro. [26]

Bulgaria introduced the currency board system in 1997 adopting the German mark as the reference currency which was replaced in 1999 by the Euro. Introduction of the currency board system was also treated in this country as a remedy against inflation, as it was in Estonia and Lithuania. Also in the case of Bulgaria this system proved effective in economy

---

[24] See: [Public finance In EMU 2007, Statistical Annex]
[25] See: [Gabrisch, 2002; Tchorek, 2003, pp. 183-184].
[26] See more: [Convergence Report, ECB, 2004, 2006, 2007; Bogdanovičius, 2002; Sõrg, 2004].

stabilization. The aim of Bulgarian authorities is also to introduce the lev to the ERM II while maintaining the currency board system.

All three countries experienced problems only at the turn of 2005 and 2006.
In the years 1999-2006 Estonia, Lithuania and Bulgaria were characterized by high economic growth. The investment rate exceeded the gross domestic savings rate. This was reflected by the increased negative balance of current account and the foreign debt (especially in Estonia). Moreover, since 1999 all three countries have reported real currency appreciation and real effective exchange rate growth, which were reflected by lower competitiveness of exports. Real currency appreciation in the analyzed countries was mainly a result of the increased inflation rate and a large inflow of foreign capital in the form of foreign direct investments and EU funds (see Table 2).

In all three countries the EU funds which came in the years 2005-2005 accounted for 3.5% of GDP.[27] However, in 2006, Estonia indicated a drop in foreign direct investments. Both Estonia and Lithuania revealed a negative balance of foreign portfolio investments in 2005 and 2006 (see Table 2). It seems it was a reaction to negative real short-term interest rates which appeared in these countries in that period in the interbanking markets as well as in the case of bank deposits. However, in all three countries the interest rates on credits and loans were positive. Negative real interest rates in the interbanking market and on deposits resulted from significant inflation growth in the years 2004-2006 (especially, in Estonia and Bulgaria).

Table 2. Currency board and economic performance in Estonia, Lithuania, Bulgaria, interest rate and inflation in euro zone euro, period: 1999 – 2006

	1999	2000	2001	2002	2003	2004	2005	2006
ESTONIA								
Short –term interest rate – interbanking market (%)	7.81	5.68	5.31	3.88	2.92	2.50	2.38	3.16
Rate of inflation HICP (%)	3.10	3.90	5.60	3.60	1.40	3.00	4.10	4.40
Real short –term interest rate – interbanking market (%)	4.57	1.71	-0.27	0.27	1.50	-0.49	-1.65	-1.19
Long –term interest rate (%)	-	-	-	-	-	-	-	-
Real long –term interest rate (%)	-	-	-	-	-	-	-	-
Bank lending – annual change (%)	10.6	28.5	19.4	22.2	40.0	34.4	35.7	-
Interest rate – bank deposits over 12 months.(%)	-	-	4.50	3.70	2.40	2.10	2.30	3.60
Real interest rate – bank deposits over 12 months.(%)	-	-	-1.04	0.10	0.99	-0.87	-1.73	-0.77
Interest rate – bank loans over12 months (%)	-	-	10.1	6.6	5.1	6.2	9.2	7.7
Real interest rate – bank loans over12 months (%)	-	-	4.3	2.9	3.6	3.1	4.9	3.2
Nominal currency rate (kroon/EUR)	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65
Real currency rate*	15.34	15.11	14.23	14.82	16.19	14.84	13.75	13.20
Real effective currency rate	100.00	93.89	94.00	97.23	103.36	106.3	107.98	110.31
Current account balance/GDP (%)	-4.4	-5.3	-5.4	-9.8	-11.6	-12.5	-10.5	-13.9
Foreign debt/GDP (%)	-	-	53.0	64..4	73.6	86.0	86.7	86.2
Official reserves (mln EUR)	852.2	992.1	930.0	957.7	1098.3	1316.8	1647.2	-
Dynamics of official reserves	100	116.4	93.7	103.0	114.7	119.9	125.1	-
Official reserves/GDP (%)	16.3	16.3	13.4	12.3	12.6	13.7	14.7	-
FDI flow/GDP (%)	5.4	7.0	8.7	4.0	9.7	8.3	21.2	9.8
Net FDI/GDP (%)	3.9	5.9	5.5	2.2	8.1	6.0	16.8	3.5
Net portfolio investment/GDP (%)	0.2	1.5	-0.6	2	1.8	6.2	-15.8	-7.5
General government balance/ GDP (%)	-3.7	-0.2	-0.3	0.4	2.0	2.3	2.3	3.8
Public debt/GDP (%)	6.0	4.7	4.7	5.6	5.7	5.2	4.4	4.1

---

[27] See: [Accessing EU funds in the new member states: best practice from around Europe. Briefing paper, Economist Corporate Network, "The Economist, Vienna , March 2005].

Gross national savings/ GDP (%)	20.3	24.2	24.1	22.9	23.1	23.4	27.1	26.7
Investment /GDP (%)	24.7	26	26.7	29.8	31.7	31.4	30.6	34.1
Real GDP growth (%)	0.3	10.8	7.7	8.0	7.2	8.3	10.2	11.2
LITHUANIA								
Short –term interest rate – interbanking market (%)	13.89	8.64	5.93	3.74	2.84	2.68	2.43	3.11
Rate of inflation HICP (%)	1.50	1.10	1.60	0.30	-1.10	1.20	2.70	3.80
Real short –term interest rate – interbanking market (%)	12.21	7.46	4.26	3.43	3.98	1.46	-0.26	-0.66
Long –term interest rate (%)	-	-	-	5.97	5.22	4.43	3.73	4.0
Real long –term interest rate (%)	-	-	-	5.65	6.39	3.19	1.00	0.19
Bank lending – annual change (%)	9.70	-3.20	24.80	29.40	56.20	40.60	63.50	-
Interest rate – bank deposits over 12 months.(%)	-	-	0.80	0.30	0.20	0.20	0.30	0.30
Real interest rate – bank deposits over 12 months.(%)	-	-	-0.8	0.0	1.3	-1.0	-2.3	-3.4
Interest rate – bank loans over 12 months (%)	-	-	8.10	6.10	5.10	5.60	5.60	5.50
Real interest rate – bank loans over 12 months (%)	-	-	6.40	5.78	6.27	4.35	2.82	1.64
Nominal currency rate (LIT/EUR)	-	-	-	3.45	3.45	3.45	3.45	3.45
Real currency rate*	-	-	-	3.52	3.68	3.55	3.39	3.19
Real effective currency rate	100	98.15	93.14	97.52	100.66	101.67	105.3	106.8
Current account balance/GDP (%)	-11.0	-6.0	-4.7	-5.1	-6.8	-7.7	-7.2	-12.4
Foreign debt/GDP (%)	-	-	43.4	43.8	44.9	46.6	47.7	48.5
Official reserves (mln EUR)	1236.8	1459.9	1895.4	2314.3	2759.8	2638.1	325.9	-
Dynamics of official reserves	100.0	118.0	129.8	122.1	119.2	95.6	12.4	-
Official reserves/GDP (%)	12.1	11.8	14.0	15.4	16.8	14.6	1.6	-
FDI flow/GDP (%)	4.5	3.3	3.7	5.1	1.0	3.4	4.0	6.0
Net FDI/GDP (%)	4.4	3.3	3.6	5.0	0.8	2.3	2.6	5.1
Net portfolio investment/GDP (%)	4.7	2.3	2.2	0.1	1.5	0.9	-1.5	-0.8
General government balance/ GDP (%)	-2.8	-3.2	-2.1	-1.5	-1.3	-1.5	-0.5	-0.3
Public debt/GDP (%)	23.0	23.8	22.9	22.2	21.2	19.4	18.6	18.2
Gross national savings/ GDP (%)	11.9	14.2	16.1	17.1	16.9	16.4	18.4	17.5
Investment /GDP (%)	22	18.8	20.1	20.3	21.2	22.3	22.4	23.1
Real GDP growth (%)	-1.5	4.1	6.6	6.9	10.3	7.3	7.6	7.5
BULGARIA								
Short –term interest rate – interbanking market (%)	5.88	4.63	5.06	4.91	3.68	3.74	3.62	3.69
Rate of inflation HICP (%)	2.60	10.30	7.40	5.80	2.30	6.10	6.00	7.40
Real short –term interest rate – interbanking market (%)	3.20	-5.14	-2.18	-0.84	1.35	-2.22	-2.25	-3.45
Long –term interest rate (%)	-	:	:	8.26	6.42	5.25	3.8	4.01
Real long –term interest rate (%)	-	-	-	2.33	4.03	-0.80	-2.08	-3.16
Bank lending – annual change (%)	-	-	-	-	-	-	-	-
Interest rate – bank deposits over 12 months.(%)	-	-	2.90	2.80	2.90	3.00	3.00	-
Real interest rate – bank deposits over 12 months.(%)	-	-	-4.19	-2.84	0.59	-2.92	-2.83	-
Interest rate – bank loans over 12 months (%)	-	-	11.10	9.40	8.80	8.80	7.90	-
Real interest rate – bank loans over 12 months (%)	-	-	3.45	3.40	6.35	2.54	1.79	-
Nominal currency rate (LEV/EUR)	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96
Real currency rate*	1.93	1.68	1.69	1.70	1.94	1.55	1.51	1.31
Real effective currency rate	100.00	109.40	108.60	112.90	112.90	111.80	115.30	118.40
Current account balance/GDP (%)	-5.1	-5.5	-7.3	-5.6	-8.5	-5.8	-11.8	-15.80
Foreign debt/GDP (%)	-	-	78.1	72.7	67.4	71.6	69.4	82.3
Official reserves (mln EUR)	3206.8	3721.5	4082.6	4577.4	5405.2	6854.1	7368.5	-
Dynamics of official reserves	100	116.1	109.7	112.1	118.1	126.8	107.5	-
Official reserves/GDP (%)	26.4	27.2	26.8	27.5	30.4	34.5	33.7	
FDI flow/GDP (%)	5.9	7.9	5.1	3.9	10.5	13.7	15.7	16.4
Net FDI/GDP (%)	-	-	-	-	10.5	9.1	14.5	15.9
Net portfolio investment/GDP (%)	-	-	-	-	-1.1	-2	-5.9	0.4
General government balance/ GDP (%)	0.4	-0.5	1.9	0.1	-0.9	2.2	1.9	3.3
Public debt/GDP (%)	79.3	73.6	66.2	54	45.9	37.9	29.2	22.8
Gross national savings/ GDP (%)	13.1	12.7	14.6	16.7	15.8	17.2	16.2	16.2

Investment /GDP (%)	15.1	15.7	18.2	18.2	19.3	20.5	24.2	26.2
Real GDP growth (%)	2.3	5.4	4.1	4.5	5.0	6.6	6.2	6.1
EURO ZONE								
Short –term interest rate – interbanking market	2.96	4.39	4.26	3.32	2.33	2.11	2.19	3.08
Rate of inflation HICP (%)	1.1	2.1	2.3	2.2	2.1	2.1	2.2	2.2
Real short –term interest rate – interbanking market (%)	1.84	2.24	1.92	1.10	0.23	0.01	-0.01	0.8

Source: Author's own development on the basis of the data from: [Eurostat-epp.eurostat.ec.europa.eu; Convergence Report, ECB, December 2006; Convergence Report, ECB, May 2006; European Economy, Spring 2007, Statistical Annex; Transition Report update 2007, EBRD, May 2007].

In all three countries the main factor of inflation growth was high domestic and foreign demand for products from these countries, which is the main short-term stimulant of high economic growth. In the years 1999-2006, in Estonia the share of domestic demand in GDP changes was in the range from 8.5% to 16.6%, and the respective share for exports stood between 0.6% and 17.8%. In the years 1999-2006, in Lithuania the share of domestic demand in GDP changes was in the range from 2.5% to 12.9%, and that share for exports stood between 3.7% and 9%. In Bulgaria these ranges were: 9% – 12.3% and 4.9%-6.4%, respectively[28]. To some extent inflation growth resulted also from the Samuelson-Balassa effect.

Fiscal discipline characterized all three countries. In 2002, in Estonia there was a budget surplus. Bulgaria has reported a budget surplus since 2004. Lithuania reports budget deficit but it is low. All three countries are characterized by a low public debt to GDP ratio.

The basic problem of the analyzed countries connected with the Euro zone accession was inflation. In view of this statement it raises doubts if these countries will manage to fulfill the criterion of price stability when they lack the policy of interest rates, which is imposed by the currency board system. If we treat inflation as an occurrence accompanying high economic growth, then a drop in domestic and foreign demand and a slowdown in economic growth should bring about the effect of reduced inflation.

Furthermore, attention should be drawn to an increased risk of a possible financial crisis triggered off by external shocks. This danger is indicated by the following phenomena:: growing inflation and dropping real interest rates, growing current account deficit and foreign debt. On the other hand, the factors reducing this risk are clearly fiscal discipline, which is indicated by a low budget deficit to GDP ratio and a low public debt to GDP ratio as well as a tendency to increased official reserve levels and inflow of financial resources from the EU funds. The example of Argentina is frequently quoted as a country where the currency and financial crises appeared in the situation of the currency board system.[29] However, it must be borne in mind that this country noted high budget deficits and high public debt. These do not take place in the three examined countries. The foreign debt in the three countries in question refers to enterprises mainly, not to the state.[30]

Examples of Estonia, Lithuania and Bulgaria show the difficulties which a candidate country for the Euro zone may encounter in the situation of the currency board system and in the event of high economic growth and lack of possibility of controlling interest rates.

---

[28] Data based on: [European Economy, Statistical Annex, Spring 2007, p. 197, 200, 203].
[29] See: [Sławiński, 2007].
[30] See: Transition Report update 2007, EBRD, May 2007.

Poland has not defined the date of joining the ERM II and the Euro zone. The system of a floating exchange rate applied in Poland has proved to be a successful mechanism preventing currency crises, speculation attacks and providing foreign trade equilibrium.

In Poland the pace of economic growth is lower than in the Baltic states (see Tables 2 and 3). This results, among others from a lower rate of gross national savings and a lower rate of investments, which, to a large extent are the effects of the over-regulation of economy, a budget deficit and public debt, and a high tax burden (crowding-out effect). High public debt is the reason for a large spread, i.e. a difference between interest rates on credits and interest rates on deposits (see: Table 3).

In the years 1999-2006, real interest rates were positive, which favored the inflow of foreign capital. The foreign capital inflow in the form of direct and portfolio investments as well as the EU funds have been one of the reasons (apart from the Samuelson-Balassa effect) for nominal and real appreciation of the zloty and increase in real effective exchange rates. In the years 1999-2006, the nominal exchange rate decreased by 7.8% whereas the real exchange-rate dropped by 10.91% (calculations on the basis of Table 3). It is worth mentioning that growth of the real effective exchange rate in Poland is lower than in the Baltic states and in Bulgaria.

A relatively high economic growth rate in the years 2003-2006, at too low a rate of national savings, nominal and real appreciation of the zloty led to maintaining a negative balance of the current account. However, the negative current account balance to GDP ratio in Poland is much lower than in the examined countries. In a similar way, a foreign debt to GDP ratio is lower in Poland than in Estonia and Bulgaria.

An argument in favor of the currency board system implementation in Poland, which is raised in literature, is the possibility of avoiding speculation attacks in the period of stabilizing the zloty in the ERM II as well as keeping a tight rein on inflation. The problem of speculation attacks in the situation of a fixed exchange rate and capital mobility is a very important one, as it was outlined at the beginning of this paper. With the principle of free capital flows binding in the European Union, the National Bank of Poland is deprived of the possibility of controlling capital flows.

Table 3. Economic performance in Poland, interest rate and inflation in euro zone euro, period: 1999 – 2006

	1999	2000	2001	2002	2003	2004	2005	2006
POLAND								
Short –term interest rate – interbanking market (%)	14.73	18.77	16.07	8.98	5.68	6.2	5.28	4.21
Rate of inflation HICP (%)	7.20	10.1	5.3	1.9	0.7	3.6	2.2	1.3
Real short –term interest rate – interbanking market (%)	7.02	7.87	10.23	6.95	4.95	2.51	3.01	2.87
Long –term interest rate (%)	9.53	11.79	10.68	7.32	5.78	6.92	5.23	5.26
Real long –term interest rate (%)	2.17	1.53	5.11	5.32	5.04	3.20	2.96	3.91
Bank lending – annual change (%)	26.7	17.0	7.4	4.2	7.1	3.1	15.1	-
Interest rate – bank deposits over 12 months.(%)	-	-	8.00	4.20	2.90	3.70	2.70	2.50
Real interest rate – bank deposits over 12 months.(%)	-	-	2.56	2.26	2.18	0.10	0.49	1.18
Interest rate – bank loans over 12 months (%)	-	-	16.80	11.60	9.60	10.30	8.60	7.80
Real interest rate – bank loans over12 months (%)	-	-	10.92	9.52	8.84	6.47	6.26	6.42
Nominal currency rate (PLN/EUR)	4.23	4.01	3.67	3.86	4.40	4.53	4.02	3.90
Real currency rate*	3.94	3.31	3.15	3.58	4.25	3.66	3.45	3.51
Real effective currency rate	100	106.5	124.91	113.94	96.19	91.5	103.32	107.75
Current account balance/GDP (%)	-7.4	-5.8	-2.8	-2.6	-2.1	-4.2	-1.7	-2.3

Foreign debt/GDP (%)	-	-	37.8	42.8	49.3	51.2	43.7	48.9
Official reserves (mln EUR)	27245.8	29559.2	30295.5	28444.2	27181.6	26930.1	35968.4	-
Dynamics of official reserves	100	108.5	102.5	93.9	95.6	99.1	133.6	-
Official reserves/GDP (%)	17.3	15.9	14.3	13.6	14.2	13.2	14.7	-
FDI flow/GDP (%)	4.3	5.5	3.0	2.1	2.2	4.9	3.2	4.1
Net FDI/GDP (%)	4.3	5.5	3.0	2.0	2.1	4.6	2.2	2.9
Net portfolio investment/GDP (%)	0.1	1.9	0.6	1.0	1.2	3.7	4.1	-0.8
General government balance/ GDP (%)	-1.8	-1.5	-3.7	-3.2	-6.3	-5.7	-4.3	-3.9
Public debt/GDP (%)	40.3	36.8	36.7	39.8	47.1	45.7	47.1	47.8
Gross national savings/ GDP (%)	20.3	19.2	18.1	16.2	16.9	16.5	17.3	18.4
Investment /GDP (%)	24.4	23.7	20.7	18.7	18.2	18.1	18.2	19.9
Real GDP growth (%)	4.5	4.3	1.2	1.4	3.9	5.3	3.6	6.1
EURO ZONE								
Short –term interest rate – interbanking market	2.96	4.39	4.26	3.32	2.33	2.11	2.19	3.08
Rate of inflation HICP (%)	1.1	2.1	2.3	2.2	2.1	2.1	2.2	2.2
Real short –term interest rate – interbanking market (%)	1.84	2.24	1.92	1.10	0.23	0.01	-0.01	0.86

Source: as in Table 1.

The example of Slovenia shows that stabilization of an exchange rate within the ERM II is possible. Denmark is another example here. However, it must be emphasized that these are the countries of small financial markets whose attractiveness for speculation capital is relatively small. As the analysis of the currency board system functioning in the Baltic states and Bulgaria indicates, the said system does not protect against inflation growth in the situation of high pace of economic growth and high inflow of foreign capital.

The following arguments are against implementation of the currency board system in Poland:
- high share of non-tradables which means a higher impact of the Samuelson-Balassa effect than in small countries causing higher real currency appreciation; on the other hand, as experiences of the examined countries indicate the currency board system does not protect against real currency appreciation and increase in real effective exchange rates (in the countries examined the real effective exchange rate was at a higher level than in Poland in the years 1999-2006)
- low market flexibility (over-regulation), including labor and wage markets, which means a long period of adjustment in economy, especially after the economic shocks have occurred,
- high budget deficit and public debt (higher than in the examined countries) and a tendency to low fiscal discipline in government's activities,
- inflation rate in Poland is at a relatively low level (lower than in the examined countries) thanks to the relatively effective monetary policy of the National Bank of Poland (hence, there is no reason to fight inflation with the help of the currency board, which as the examples of the examined countries proved is not fully possible),
- too high costs of keeping foreign currency reserves in the economy of the size of the Polish one.

Conclusions

Experiences of Estonia, Lithuania and Bulgaria connected with the currency board system do not encourage copying. As the carried out analysis indicates the system in question has numerous drawbacks and one can expect that they could be revealed more strongly in the Polish economy than in the analyzed countries as the former is much larger than the economies of the Baltic states or Bulgaria. Hence it seems that a much better solution for the countries planning to join the Euro zone is the standard solution of the type Denmark is

implementing or Slovenia implemented not so long ago. The key issue here is fulfillment of the fiscal stability criterion by a candidate country for the Euro zone. It requires a deep reform of public finances and not calculations. There is no possibility of effective stabilizing of the zloty to Euro exchange rate without fiscal stability. The reform is needed not only to benefit from joining the Euro zone but to create conditions for the long-term economic growth.

The new EU countries which are candidates for the Euro zone (including Poland) should stabilize their economies and implement deep reforms of institutional and structural character, which aim at raising market flexibility and international competitiveness of economy. To this end in-depth transformations of structural and institutional nature are indispensable. They include, among others:

- creation of institutional and structural conditions enabling efficient functioning of market mechanism and market adjustment processes (privatization, demonopolization and deregulation in order to ensure more economic freedom as well as flexibility of markets, prices and wages,a lesser tax burden for population and enterprises, creation of an effective system of economic law and its implementation;
- in-depth reform of public finance aiming at budget reduction on both revenue- and expenditure side, which would radically reduce the budget deficit and, in the long run, public debt; indispensable changes in the budget expenditure structure (increased expenditures on education, research, infrastructure, improved functioning of law while others are reduced), a lower tax burden for population and enterprises;
- introduction of mechanisms preventing future increases in the budget deficit and public debt;

In the period of the exchange rate stabilization within the ERM II, countries should run monetary policy targeted at price stability and exchange rate stability or subordinated to exchange rate stability which practically means price stability and stable interest rates. There is no evidence, however, that such policy will be effective in the case of medium-sized countries like Poland.

In this context a question can be formulated whether exchange rate stability is actually indispensable in order to join the Euro zone. More and more arguments are raised against this. The most relevant ones are those of a price stability and fiscal stability criterion. Exchange rate stability within the ERM II for two years may not be accomplished and then the exchange rate crisis is likely to occur in a given country. W. H. Buiter raised this issue. He is of the opinion that if the country being a candidate for the Euro zone completed the disinflation process and fulfilled the fiscal stability criterion, then the date of the Euro zone accession and the conversion rate can be determined.[31] It is a suggestion which is worth considering. Such a solution would not expose candidate countries to potential exchange rate crises. A similar opinion was expressed by A. Sławiński who pointed to the fact that at the above mentioned solution trade deficits of the candidate countries targeting at the Euro zone become only the indices of their economic situation and not a source of investors' fears or an increased risk of the exchange rate crisis occurrence.[32] Adoption of such a solution is particularly important for the new EU countries.

Bibliography

---

[31] See: [Buiter, 2004].
[32] See: [Sławiński, 2007].

Accessing EU funds in the new member states: best practice from around Europe. Briefing paper [2005], Economist Corporate Network, "The Economist", Vienna, March.

Acocella N.[2002], *Zasady polityki gospodarczej (Economic policy principles)*, Wydawnictwo Naukowe PWN, Warszawa.

Balassa B. [1964], *The Purchasing Power Parity Doctrine: A Reappraisal*, „Journal of Political Economy", Vol. 72.

Bienkowski W. [2000], *Konkurencyjność gospodarki polskiej w przededniu wejścia do Unii Europejskiej. Czy nasz rząd może być bardziej aktywny ? (Competitiveness of Polish economy prior to EU accession)* (in:) Latoszek E.,[ed.], *Unia Europejska wobec procesów integracyjnych: Wyzwania dla Polski (EU and integration processes: Challenges for Poland)*, WSHiFM, Dom Wydawniczy Elipsa, Warszawa.

Bogdanovičius, A.[2002], *Lithuania's Experience Linking National Currency to Euro*, International Center for Economic Growth. European Center, Working Papers, Nr 20, Macroeconomic Studies, November.

Bożyk P., Misala J., Puławski M. [2002], *Międzynarodowe stosunki ekonomiczne (International economic relations)*, PWE, Warszawa.

Buiter W. H. [2004], An Attendant Godot? Financial Instability Risk for Countries Targeting Eurozone Membership, CEPR/ESI 8th Annual Conference: EMU Enlargement to the East and West, Hungarian National Bank, Budapets, 24-25 September, www. Mnb. Hu/Resource.aspx?Resource ID=mnbfile&resourcename=buiterfinal.

Bukowski S. [2003], *Teoretyczne podstawy i realizacja unii monetarnej krajów członkowskich Wspólnot Europejskich. Szanse i zagrożenia dla Polski (Theoretical foundations and implementation of the EMU. Chances and threats for Poland)*, Wydawnictwo Politechniki Radomskiej, Radom.

Bukowski S.[2003], *Zarys historii obszarów walutowych i unii monetarnych (Outline of the history of currency areas and monetary unions)*, „Ekonomista" nr 1, s. 93-103.

Bukowski S.I. [2007], Unia monetarna. Teoria i polityka *(Monetary Union. Theory and Policy)*, Difin, Warszawa.

Capricolo G., Lavrač V.[2003], *Monetary and Exchange Rate Policy in Slovenia*, Ezoneplus Working Paper No 17G: *Regional Input on Monetary and Fiscal Policies*, Supplement to Working Paper No 17, May.

Caves R. E., Frankel J. A., R., Jones W. [1998], *Handel i finanse międzynarodowe (Trade and international finance)*, PWE Warszawa.

Converegence Report, ECB, 2004, 2006, 2007

Convergence Report, ECB, December 2006.

Convergence Report, ECB, May 2006.

Corden W. M. [2003], *Economic Policy, Exchange Rates and the International System*, Oxford University Press, New York.

De Grauwe P.[2003], *Unia walutowa (Monetary Union)*, PWE, Warszawa.

European Economy, Spring 2007, Statistical Annex.

Eurostat-epp.eurostat.ec.europa.eu

Friedman M. [1968], *Rola polityki pieniężnej (The role of monetary policy)*, [in:] A. Szeworski (ed.) [1975], *Teoria i polityka stabilizacji koniunktury. Wybór tekstów*. PWE, Warszawa.

Gabrisch H. [2002], *Financial Fragility and Exchange Rate Arrangements of EU Candidate Countries*, International Center for Economic Growth. European Center, Working papers Nr 15, Macroeconomic Studies, November.

Gulde A-M., Kähkönen M., Keller P.[2000], *Pros and Cons of Currency Board Arrangements in the Lead-up to EU Accession and Participation in the Euro Zone*, [in:] Directorate General for Economic and Financial Affairs, European Commission [2000] Seminar on Currency

Boards in the Context of EU Accession. Brussels, 25 November 1999. Summary and Proceedings and papers, Enlargement Papers, Number 1, May.

Hanke S. H. [2002], *On Dollarization and Currency Boards: Error and Deception*, " Policy Reform", Vol. 5(4), pp. 203-222.

Jensen H. F. [2001], *Koszty i korzyści płynące z mechanizmu kursowego ERM II: Doświadczenia duński (ERM II costs and benefits. Danish experience)*, www.nbp.pl/konferencja/droga_do_euro/jensen_pl.pdf.

Keenan B.[2003], *The Irish Experience of Monetary Union, Action Center for Europe*, 07.05.03, www.actioncentreeurope.org.uk/publication/irishexperience/printable.html.

Koronowski A.[2003], *Czynniki destabilizacji rynków walutowych (Destabilization factors in currency markets)*, TWIGGER, Warszawa.

Krugman P. [1999], *Currencies and Crises*, The MIT Press, Cambridge, Massachussetts, London.

Krugman P.R., Obstfeld M.,[2000], *International Economics. Theory and Policy*, Fifth Edition, Addison-Wesley Publishing Company, New York.

Lutkowski K. [2001], *Globalizacja i dylematy polityki pieniężnej. W poszukiwaniu optymalnej strategii dla polski w drodze do euro (Globalization and dilemmas of monetary policy. In search of optimum strategy for Poland on the way to Euro)*, „Bank i Kredyt", nr 11-12, listopad-grudzień.

Lutkowski K. [2004], *Od złotego do euro. Źródła obaw i nadziei (From zloty to Euro. Fears and hopes)*, TWIGGER, Warszawa.

Lutkowski K.[1998], *Międzynarodowy system walutowy (International currency system)*, SGH Studia Finansowo-Bankowe Warszawa.

Lutkowski K.[2004], *Od złotego do euro. Źródła obaw i nadziei (From zloty to Euro. Fars and hopes)*, TWIGGER, Warszawa 2000.

Małecki W., Sławiński A., Piaseczki R., Żuławska U.[2001], *Kryzysy walutowe (Currency crises)*, Wydawnictwo naukowe PWN, Warszawa.

Marczewski K. [2002], *Zmiany kursu walutowego a ceny i reakcje przedsiębiorstw w handlu zagranicznym (Exchange rate changes and reaction of foreign trade enterprises)*, IKiCHZ, Warszawa.

Melvin M.[2000], *International Money and Finance*, Addison-Wesley, New York.

Misala J.(ed.) [2004], *Teoretyczne podstawy regionalnej integracji gospodarczej. Wybrane teksty (Theoretical basis of regional economic integration)*, Wydawnictwo Politechniki Radomskiej, Radom.

Mundell R. [1961], *A Theory of Optimum Currency Areas*, „The American Economic Review"Vol. 53, September.

Najlepszy E. [2000], *Zarządzanie finansami międzynarodowymi (International finance management)*, PWE Warszawa 2000.

Neupauerová M., Vravec J.[2007], *Monetary Strategies from the Perspective of Intermediate Objectives*, Panoeconomicus, Časpis Ekonomista Vojvodine UDC 336.7(437.6).

Orłowski L. T. [2001], *Monetary Convergence of the EU Candidates to the Euro: A Theoretical Framework and Policy Implications*, University of Bonn – Center for European Integration Studies (ZEI) Working Paper, No B25.

Orłowski W.[2004], *Optymalna ścieżka do euro (The optimum path to Euro)*, Wydawnictwo naukowe „Scholar", Warszawa.

Pentecost E.J. [2001], *The Political Economy of Transition to Monetary Union in Western Europe*, [in:] E. J. Pentencost, A. van Poeck [2001], *European Monetary Integration. Past, Present and Future*, Edward Elgar, Cheltenham, Northampton.

Pietrzak E. [2001], *Kiedy euro zastąpi złotego (When Euro replaces the zloty)*, „Bank i Kredyt" nr 11-12.

Pietrzak E.[1996], *Wymienialność złoteg (Convertibility of zloty)o*, Biblioteka Menedżera i Bankowca, Warszawa. Oręziak L. [2003], *Euro – nowy pieniądz (Euro –new Money)*, PWN Warszawa.

Public finance in EMU 2007, Statistical Annex, European Economy No 3, 2007.

Raport Komisji [2004]. *Raport o konwergencji z 2004 roku (Convergence Reports)* (przygotowany zgodnie z art. 122 ust. 2 Traktatu)[SEC(2004)1268], Komisja Wspólnot Europejskich, Bruksela, 20 października, COM (2004)690.

Samuelson P. [1964], *Theoretical Notes on Trade Problems*, "Review of economics and Statistics" Vol. 46.

Sławiński A.[2007], *Ryzyko utraty kontroli nad wysokością realnej stopy procentowej w systemie izby walutowej (The risk of losing cotrol over real interest rates in a currency-board system)*, „Ekonomista", Nr 2.

Sõrg M.[2004], *Estonia Monetary System: Reconstruction, performance, and Future Prospects,* Ernest-Moritz-Arndt-Universität Greifswald, Rechts- und Staatswissenschaftliche Fakultät, Wirtschaftswissenschaftliche Diskussionspapiere, Diskussionspapier 11/04, Dezember.

Tavlas C.G.SD.[1993], *The "New" Theory of Optimum Currency Areas*, "The World Economy", Vol. 16, No 6, November.

Tchorek G. [2003], *Polska polityka kursowa a przystąpienie do UW (Polish Exchange rate Policy in view of the EU accession)*, (in:) Nowak A.Z., Stepniak A.[2003], *Strefa euro – wyzwanie dla Polski (Euro zone – a challenge for Poland)*, Wydawnictwo Naukowe Wydziału Zarządzania Uniwersytetu Warszawskiego, Warszawa.

The Euro and Economic Policy. Legal and Political Texts Adopted by the Council of the European Union and the European Council [1999], General Secretariat of the Council of the European Union, January.

The euro: explanatory notes by Directorate General П – Economic and Financial Affrairs [1998], Euro Papers, Number 17, February.

Transition Report update 2007, EBRD, May 2007.

Van Merrewijk Ch. [2005], *Basic Exchange Rate Theories, Centra for International Economic Studies*, Discussion paper N0 0501, University of Adelaide, Adelaide Australia.

Wagner H. [2001], *Pitfalls in the European Enlargement Process – Challenges for Monetary Policy*, prepared for conference " *How to Pave the Road to E(M)U: The Monetary Side of the Enlargement process (and Fiscal Support)*, Eltville, 26/27 October.

Wagner H., *Pitfalls in the European Enlargement Process – Challenges for Monetary Policy, prepared for conference How to Pave the Road to EMU: The Monetary Side of the Enlargement Process (and Fiscal Support)*, Elville, 26/27October.

Williamson J. [2000], *Exchange Rate Regimes for Emerging Markets. Reviving the Intermediate Option,* Policy Analyses in International Economics 60, Institute for International Economics, September.

Wojtyna A.[2004], *Szkice o polityce pieniężne (Sketches on monetary policy)*, PWE, Warszawa.

Zabielski K.[1994], *Finanse międzynarodowe (International finance)*, PWN Warszawa.

QUADERNI DEL DIPARTIMENTO DI ECONOMIA, FINANZA E STATISTICA
Università degli Studi di Perugia

1	Gennaio 2005	Giuseppe CALZONI Valentina BACCHETTINI	Il concetto di competitività tra approccio classico e teorie evolutive. Caratteristiche e aspetti della sua determinazione
2	Marzo 2005	Fabrizio LUCIANI Marilena MIRONIUC	Ambiental policies in Romania. Tendencies and perspectives
3	Aprile 2005	Mirella DAMIANI	Costi di agenzia e diritti di proprietà: una premessa al problema del governo societario
4	Aprile 2005	Mirella DAMIANI	Proprietà, accesso e controllo: nuovi sviluppi nella teoria dell'impresa ed implicazioni di corporate governance
5	Aprile 2005	Marcello SIGNORELLI	Employment and policies in Europe: a regional perspective
6	Maggio 2005	Cristiano PERUGINI Paolo POLINORI Marcello SIGNORELLI	An empirical analysis of employment and growth dynamics in the italian and polish regions
7	Maggio 2005	Cristiano PERUGINI Marcello SIGNORELLI	Employment differences, convergences and similarities in italian provinces
8	Maggio 2005	Marcello SIGNORELLI	Growth and employment: comparative performance, convergences and co-movements
9	Maggio 2005	Flavio ANGELINI Stefano HERZEL	Implied volatilities of caps: a gaussian approach
10	Giugno 2005	Slawomir BUKOWSKI	EMU – Fiscal challenges: conclusions for the new EU members
11	Giugno 2005	Luca PIERONI Matteo RICCIARELLI	Modelling dynamic storage function in commodity markets: theory and evidence
12	Giugno 2005	Luca PIERONI Fabrizio POMPEI	Innovations and labour market institutions: an empirical analysis of the Italian case in the middle 90's
13	Giugno 2005	David ARISTEI Luca PIERONI	Estimating the role of government expenditure in long-run consumption
14	Giugno 2005	Luca PIERONI Fabrizio POMPEI	Investimenti diretti esteri e innovazione in Umbria
15	Giugno 2005	Carlo Andrea BOLLINO Paolo POLINORI	Il valore aggiunto su scala comunale: la Regione Umbria 2001-2003
16	Giugno 2005	Carlo Andrea BOLLINO Paolo POLINORI	Gli incentivi agli investimenti: un'analisi dell'efficienza industriale su scala geografica regionale e sub regionale

17	Giugno 2005	Antonella FINIZIA Riccardo MAGNANI Federico PERALI Paolo POLINORI Cristina SALVIONI	Construction and simulation of the general economic equilibrium model Meg-Ismea for the italian economy
18	Agosto 2005	Elżbieta KOMOSA	Problems of financing small and medium-sized enterprises. Selected methods of financing innovative ventures
19	Settembre 2005	Barbara MROCZKOWSKA	Regional policy of supporting small and medium-sized businesses
20	Ottobre 2005	Luca SCRUCCA	Clustering multivariate spatial data based on local measures of spatial autocorrelation
21	Febbraio 2006	Marco BOCCACCIO	Crisi del welfare e nuove proposte: il caso dell'unconditional basic income
22	Settembre 2006	Mirko ABBRITTI Andrea BOITANI Mirella DAMIANI	Unemployment, inflation and monetary policy in a dynamic New Keynesian model with hiring costs
23	Settembre 2006	Luca SCRUCCA	Subset selection in dimension reduction methods
24	Ottobre 2006	Sławomir I. BUKOWSKI	The Maastricht convergence criteria and economic growth in the EMU
25	Ottobre 2006	Jan L. BEDNARCZYK	The concept of neutral inflation and its application to the EU economic growth analyses
26	Dicembre 2006	Fabrizio LUCIANI	Sinossi dell'approccio teorico alle problematiche ambientali in campo agricolo e naturalistico; il progetto di ricerca nazionale F.I.S.R. – M.I.C.E.N.A.
27	Dicembre 2006	Elvira LUSSANA	Mediterraneo: una storia incompleta
28	Marzo 2007	Luca PIERONI Fabrizio POMPEI	Evaluating innovation and labour market relationships: the case of Italy
29	Marzo 2007	David ARISTEI Luca PIERONI	A double-hurdle approach to modelling tobacco consumption in Italy
30	Aprile 2007	David ARISTEI Federico PERALI Luca PIERONI	Cohort, age and time effects in alcohol consumption by Italian households: a double-hurdle approach
31	Luglio 2007	Roberto BASILE	Productivity polarization across regions in Europe
32	Luglio 2007	Roberto BASILE Davide CASTELLANI Antonello ZANFEI	Location choices of multinational firms in Europe: the role of EU cohesion policy
33	Agosto 2007	Flavio ANGELINI Stefano HERZEL	Measuring the error of dynamic hedging: a Laplace transform approach

34	Agosto 2007	Stefano HERZEL Cătălin STĂRICĂ Thomas NORD	The IGARCH effect: consequences on volatility forecasting and option trading
35	Agosto 2007	Flavio ANGELINI Stefano HERZEL	Explicit formulas for the minimal variance hedging strategy in a martingale case
36	Agosto 2007	Giovanni BIGAZZI	The role of agriculture in the development of the people's Republic of China
37	Settembre 2007	Enrico MARELLI Marcello SIGNORELLI	Institutional change, regional features and aggregate performance in eight EU's transition countries
38	Ottobre 2007	Paolo NATICCHIONI Andrea RICCI Emiliano RUSTICHELLI	Wage structure, inequality and skill-biased change: is Italy an outlier?
39	Novembre 2007	The International Study Group on Exports and Productivity	Exports and productivity. Comparable evidence for 14 countries
40	Dicembre 2007	Gaetano MARTINO Paolo POLINORI	Contracting food safety strategies in hybrid governance structures
41	Dicembre 2007	Floro Ernesto CAROLEO Francesco PASTORE	The youth experience gap: explaining differences across EU countries
42	Gennaio 2008	Melisso BOSCHI Luca PIERONI	Aluminium market and the macroeconomy
43	Febbraio 2008	Flavio ANGELINI Marco NICOLOSI	Hedging error in Lévy models with a fast Fourier Transform approach
44	Febbraio 2008	Luca PIERONI Giorgio d'AGOSTINO Marco LORUSSO	Can we declare military Keynesianism dead?
45	Febbraio 2008	Pierluigi GRASSELLI Cristina MONTESI Paola IANNONE	Mediterranean models of Welfare towards families and women
46	Marzo 2008	Mirella DAMIANI Fabrizio POMPEI	Mergers, acquisitions and technological regimes: the European experience over the period 2002-2005
47	Marzo 2008	Bruno BRACALENTE Cristiano PERUGINI	The Components of Regional Disparities in Europe
48	Marzo 2008	Cristiano PERUGINI Fabrizio POMPEI Marcello SIGNORELLI	FDI, R&D and Human Capital in Central and Eastern European Countries
49	Marzo 2008	Cristiano PERUGINI	Employment and Unemployment in the Italian Provinces
50	Marzo 2008	Sławomir I. BUKOWSKI	On the road to the euro zone. Currency rate stabilization: experiences of the selected EU countries

I QUADERNI DEL DIPARTIMENTO DI ECONOMIA
Università degli Studi di Perugia

1	Dicembre 2002	Luca PIERONI:	Further evidence of dynamic demand systems in three european countries
2	Dicembre 2002	Luca PIERONI Paolo POLINORI:	Il valore economico del paesaggio: un'indagine microeconomica
3	Dicembre 2002	Luca PIERONI Paolo POLINORI:	A note on internal rate of return
4	Marzo 2004	Sara BIAGINI:	A new class of strategies and application to utility maximization for unbounded processes
5	Aprile 2004	Cristiano PERUGINI:	La dipendenza dell'agricoltura italiana dal sostegno pubblico: un'analisi a livello regionale
6	Maggio 2004	Mirella DAMIANI:	Nuova macroeconomia keynesiana e quasi razionalità
7	Maggio 2004	Mauro VISAGGIO:	Dimensione e persistenza degli aggiustamenti fiscali in presenza di debito pubblico elevato
8	Maggio 2004	Mauro VISAGGIO:	Does the growth stability pact provide an adequate and consistent fiscal rule?
9	Giugno 2004	Elisabetta CROCI ANGELINI Francesco FARINA:	Redistribution and labour market institutions in OECD countries
10	Giugno 2004	Marco BOCCACCIO:	Tra regolamentazione settoriale e antitrust: il caso delle telecomunicazioni
11	Giugno 2004	Cristiano PERUGINI Marcello SIGNORELLI:	Labour market performance in central european countries
12	Luglio 2004	Cristiano PERUGINI Marcello SIGNORELLI:	Labour market structure in the italian provinces: a cluster analysis
13	Luglio 2004	Cristiano PERUGINI Marcello SIGNORELLI:	I flussi in entrata nei mercati del lavoro umbri: un'analisi di cluster
14	Ottobre 2004	Cristiano PERUGINI:	Una valutazione a livello microeconomico del sostegno pubblico di breve periodo all'agricoltura. Il caso dell'Umbria attraverso i dati RICA-INEA
15	Novembre 2004	Gaetano MARTINO Cristiano PERUGINI	Economic inequality and rural systems: empirical evidence and interpretative attempts
16	Dicembre 2004	Federico PERALI Paolo POLINORI Cristina SALVIONI Nicola TOMMASI Marcella VERONESI	Bilancio ambientale delle imprese agricole italiane: stima dell'inquinamento effettivo