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**IS CROATIA READY FOR THE EMU?:
AN EX ANTE ANALYSIS OF NOMINAL AND REAL
CONVERGENCE**

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Abstract

The EU-enlargement and the advanced process of economic integration have brought attention to monetary integration and the conditions for its successful functioning. The main theoretical framework of the analysis – the OCA-theory – foresees three main requirements for that – mobility of production factors, fiscal solidarity and trade integration. Although not theoretically founded, the Maastricht criteria of price and exchange rate stability, balanced public finance and long-term interest rates should contribute to successful monetary integration in the EU which faces inter-regional differences in the level of development and the possibility of external shocks. The analysis of nominal convergence shows that Croatia approaches the reference values of the EU and achieves a high degree of macroeconomic stability. However, it lags behind the successful new EU-member states in respect of trade integration and production structure similarity which can be regarded as important indicators of the long-term advantages of monetary integration.

Key words: optimum currency area, exchange rate, trade integration, EMU, Croatia

INTRODUCTION

Dynamics and intensity of economic integration have brought attention to monetary integration¹ and the theoretical assumptions for its successful functioning. The central issue in this respect is the choice between fixed and floating exchange rate referring further to the economic policy priorities – macroeconomic stability vs. economic growth, i.e. more restrictive or loose economic policy. The main advantage of floating exchange rate is its effectiveness in restoring economic balance in case of external shocks. On the other hand, such an adjustment would be more costly, not to say impossible, with fixed exchange rate since output and employment recovery would follow only after a certain period of time. However, unlike floating exchange rates, fixed parities make business conditions more predictable and imply less risk for doing business internationally. Assuming inter-regional differences in the level of development within monetary integration and with reference to the economic policy trade-off between inflation and unemployment the common monetary policy would not have the same effect across regions. More developed regions would need restrictive monetary policy in order to 'cool down' the negative effect of growing economy on prices, leading possibly to recession and increasing unemployment in the less developed regions. More loose monetary policy would, however help them to reduce the development gap towards the advanced regions through more dynamic economic growth. Thus, the balanced economic growth in monetary union depends upon readiness of the developed regions to accept a certain degree of price instability (Mundell, 1961; McKinnon, 1963).

Regarding advanced relations of Croatia with the EU and the current accession negotiations the aim of the paper is to investigate Croatian readiness for monetary integration as one of the commitments of the full-fledged membership. Based on theoretical inferences about the possible impact of monetary integration on small open economies (SMOPEC) the analysis deals with both nominal and real criteria of convergence, thus referring to the conditions of macroeconomic stability and structural complementarity among the integrating countries. The purpose is to shed light on those aspects of economic reforms and economic policy which would need improvements in order to make monetary integration more advantageous for Croatia.

The first part of the paper refers to the relevant theoretical background which includes the optimum currency area theory and the 'endogeneity approach' to creation of a successful monetary union. This part also presents the main formal framework of monetary integration with the EU – the Maastricht criteria.

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¹ Currency areas are characterised by fixing exchange rate between different national currencies, while monetary unions include single currency. Real currency areas (e.g. bimetallism, the gold standard) incorporate automatic adjustments and convergence of interest rates supported by stabilizing market speculations. *Pseudo* currency areas (e.g. the Bretton-Woods system, European Monetary System – EMS) are based primarily on economic policy interventions and realize no automatic stabilization (Mundell, 1997).

In the second part, Croatia is analysed according to the four nominal convergence criteria, while the notion of real convergence is introduced in the third part and followed by the analysis of Croatia. The final part concludes.

1. CRITERIA FOR THE OPTIMUM CURRENCY AREA CREATION

1.1. Traditional approach to optimum currency area

Theory of optimum currency area (OCA) differentiates among three main criteria for successful monetary integration. The first one relates to the mobility of production factors and openness of factor markets which make free setting of prices possible, including flexible factor prices as a necessary condition for the efficient economic adjustment and realization of external balance. Under demand shock, resulting from demand shift from one region to another, mobile capital flows into the deficit region to restore domestic demand and external balance without need for exchange rate adjustment. The same effect can be realized through wage flexibility and labour migration from high- to low-unemployment region in case of supply shock hitting one region by fall in economic activities (Temprano/Arroyo, 2003). In order to make these adjustments effective and avoid exchange rate policy interventions institutional conditions have to be created to make production factors mobile within the monetary union. As far as capital is concerned financial market openness would imply liberalization of cross-border capital flows for both current and capital account transactions, particularly regarding the long-term capital flows (e.g. FDI). Unlike strong tendencies of capital market liberalization, labour market is generally still far from being fully liberalized².

The next relevant criterion for the OCA-formation is the degree of trade integration among the prospective members of the monetary union. The readiness for monetary integration depends in first instance on the country's economic openness. The more open the economy, the more prepared for fixed exchange rate or common currency, since changes in nominal exchange rate in open economies have no significant influence on real competitiveness. This is particularly the case with SMOPEC which face perfectly elastic foreign demand and are therefore unable to influence world prices, not even through adjustments in the exchange rate. Trade interdependence is a prerequisite for successful monetary integration since countries which trade more would have more advantages from stable and predictable exchange rates (Alesina/Barro, 2002). The advantages of trade integration are even greater if they realise similar trade and production structure.

² Cross-border capital mobility depends on financial market efficiency, legal conditions for investment, macroeconomic stability and the overall prospects for economic growth. Although these factors also influence labour mobility in broad terms it is considered that differences in cultural affinities, language, income, social welfare system and the housing market determine labour force migrations more directly.

Therefore, with specialization according to comparative advantage, based either on production efficiency or factor proportions, the existing differences in export and import flows and terms of trade can increase the risk of asymmetric shocks in the monetary union³. However, this problem disappears if countries have similar structure of trade flows (intra-industry trade), reducing thus the possibilities for asymmetric shocks⁴. Furthermore, economies having a more diversified production structure better respond to external shocks (Tavlas, 1993).

Finally, fiscal integration as a relevant instrument in creating an OCA, can help in eliminating asymmetric shocks through fiscal transfers from more developed regions to those which are hit by fall in economic activities.

1.2. 'Endogeneity view' of the optimum currency area

Previous analysis fails to observe the process of economic adjustment which follows after creation of a monetary union. According to the Lucas Critique, the 'endogeneity view' of the OCA-criteria points at dynamics of the adjustment process, referring to both economic policy measures and changes in economic structure of the integrating countries. Giving up monetary and exchange rate policy independence, calls for increasing wage and labour market flexibility and a functioning inter-regional fiscal transfer scheme⁵. Apart from that, many empirical studies (Frankel/Rose, 1997, 1998; Bayoumi/Eichengreen, 1997; Fidrmuc, 2004) proved that economic adjustment helps in creating a functioning monetary integration. Thanks to these conclusions it can be claimed that even countries which do not comply with the standard OCA-criteria prior to monetary integration can become part of a successful monetary union. Monetary integration can significantly contribute to rise in trade flows through fixing exchange rates and elimination of their unpredictable fluctuations. The effect of trade on synchronization of business cycles depends on the degree of industrial specialization induced by integration, clearly indicating the endogeneity character of the causality. The resulting changes in economic structures as a part of broader economic adjustment process, determine industrial specialization which is reflected in trade pattern. As long as the participating countries realize specialization within, instead of between sectors, increasing trade flows are

³ Even highly integrated economies in terms of trade can experience asymmetric shocks as long as they fail to realise the same degree of similarity in the output structure (see: Temprano-Arroyo, 2003).

⁴ On the importance of the structure of trade on the success of monetary integration, from the point of view of the endogenous approach to relation between trade and business cycle, see: Fidrmuc, 2004.

⁵ Optimum condition for a viable monetary union would be dynamic economic growth which eliminates the need for economic policy interventions (Mann-Quirici, 2005; Pomfret, 2005). However, historical analyses prove that, contrary to expectations, changes in industrial and employment structure as well as institutional conditions in the last half of century have not reduced wages sensitivity to the stage of business cycle (Allen, 1992).

dominated by intra-industry trade (IIT) what makes monetary union more homogeneous and thus more resistant to asymmetric shocks⁶.

1.3. Nominal criteria for monetary integration – the Maastricht criteria and the Stability and Growth Pact of the European Monetary Union

The process of monetary integration in the EU⁷ has foreseen the fulfilment of the nominal criteria prior to joining the Economic and Monetary Union (EMU) and the provisions of the Stability and Growth Pact (SGP) aimed primarily at achieving macroeconomic stability upon monetary integration. Despite some criticism that these are not theoretically founded (De Grauwe, 1996) and are lacking the economic adjustment mechanism (Feldstein, 2005), they should be seen as criteria which give an impetus for monetary integration which is in the case of the EU not a spontaneous, but a politically driven process.

The Maastricht criteria of macroeconomic convergence include:

1. inflation – inflation rate (harmonised consumer price index) should not exceed that of the three best performing member countries of the EU by more than 1,5 percentage points;
2. government finance –consolidated general government deficit should not exceed 3% of the GDP and the government debt to GDP ratio should not go beyond 60%, both at the end of the previous fiscal year;
3. exchange rate – countries should participate in the Exchange Rate Mechanism II (ERM II) under the European Monetary System (EMS) without devaluations of the domestic currencies for two consecutive years prior to joining the EMU;
4. long-term interest rates – the nominal long-term interest rate (government bonds) should not be higher than that of the three best performing member countries (based on inflation) by more than 2 percentage points.

These criteria are primarily aimed at achieving low inflation and the control of the fiscal sector. This is strongly emphasised in the SGP which obliges the member countries to achieve a medium-to-long-term fiscal balance (*de facto* the second Maastricht criteria) and avoid negative effects of different national fiscal policies on the price stability. Further, balanced budget makes it possible for national policy makers to cope effectively with asymmetric shocks,

⁶ For empirical verification of the relevance of trade integration on the *ex post* effects of monetary integration see: Arnold/Verhoef, 2004; Boreiko, 2003 and Rose/Engel, 2002. For explanation of an alternative *ex post*-adjustment mechanism see: Corsetti/Penseti, 2002.

⁷ The three stages included: full capital flow liberalization, institution building (European Monetary Institute, European Central Bank) and introduction of the single currency (2002).

particularly under de-centralized fiscal system and without inter-regional fiscal transfers⁸. The SGP consists of fiscal monitoring and sanctions against member states which do not fulfil the criteria. If the fiscal conditions of an individual country do not comply with the rules of the SGP this leads to a series of measures ranging from recommendations for strengthening of a stabilization programme to penalties in form of non-interest bearing deposits or fines (amounting to 0,2% of the national GDP plus one-tenth of the amount by which the actual budget deficit went beyond 3% of GDP). The measures undertaken depend upon the degree of the fiscal imbalance, its time persistency and the degree of economic slowdown (more in: Arestis *et al.*, 2001). Some recent improvements of the SGP include: extension of the period during which a country should bring its fiscal position into balance (5 years) and changes in the way of the budget deficit calculation (exclusion of expenditures aimed at achieving the European goals or international solidarity). The analyses have shown that the Maastricht criteria and the SGP have contributed to macroeconomic stability, convergence of macroeconomic indicators and harmonization of growth dynamics across the EU. However, price stability is achieved at the cost of economic slowdown (Soukiazis/Castro, 2003).

Much criticism has been directed towards the theoretical and economic policy framework of the nominal criteria for monetary integration in the EU and in particular the SGP. The general one refers to the underlying monetarist approach according to which inflation is seen as a pure monetary phenomenon and low inflation as a prime economic policy objective. Although being an integral part of every economic stability programme, price stability could be seen as a second range priority in terms of the optimum policy mix and compared to sustainable economic growth or increasing employment. If the problem is viewed in this way, fiscal policy could, alternatively gain a more active role in promoting economic growth through creation of new production capacities, while at the same time contributing significantly to price stability through its influence on aggregate demand⁹ (Arestis *et al.*, 2001; Soukiazis/Castro, 2003). Further criticism refers to the unbalanced policy mix based on centralized monetary and de-centralized fiscal policy (Feldstein, 2005; Chari/Kehoe, 2004; Cooper/Kempf, 2000). The main argument in this respect is non-existence of the automatic mechanism which would limit the uncontrolled increase in public spending under conditions of wage rigidity, low mobility of labour force, highly regulated fiscal policy and the lack of national monetary and exchange rate policy. However, strong emphasis in the EU on price stability and the central bank credibility should prevent uncontrolled growth in public spending. On the other hand, the SGP is intended to provide fiscal prudence and prevent free-rider behaviour of national governments resulting possibly in strong pressure on monetary authority.

⁸ On the role of inter-regional fiscal transfers in coping with asymmetric real shocks in the historical process of the US-monetary integration see: Rockoff, 2000.

⁹ Another advantage of a more flexible fiscal policy would be achieving optimum effects over a longer period. The actual year-based limit for budget deficit is considered inappropriate regarding business cycles and the expected endogeneity effects of monetary integration (Feldstein, 2005).

2. CROATIAN CONVERGENCE TO THE EMU – THE MAASTRICHT CRITERIA

2.1. Price stability

In comparison with other countries of Central and East Europe (CEE), Croatia realized remarkable price stability throughout the 90s¹⁰. This general trend was not threatened even in 1998 when prices registered the strongest growth of 5,7% (consumer prices) and 10,7% (industrial producer prices), as they soon began to stabilise. However, despite that Croatia met the first criterion of Maastricht only in the period 2002-2004, while in the coming years Croatian inflation rate went beyond the reference value and the EU-average (table 1).

Table 1.

Inflation rate* in Croatia and transition countries (%)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Euro-area	1,6	1,1	1,1	2,1	2,3	2,2	2,1	2,1	2,2	2,2
EU 27	7,3	4,6	3,0	3,5	3,2	2,5	2,1	2,3	2,3	2,3
EU 25	2,6	2,1	1,6	2,4	2,5	2,1	1,9	2,1	2,2	2,2
EU 15	1,7	1,3	1,2	1,9	2,2	2,1	2,0	2,0	2,1	2,2
HR	-	5,7	4,0	4,6	3,8	1,7	1,8	2,1	3,3	3,2
POL	15,0	11,8	7,2	10,1	5,3	1,9	0,7	3,6	2,2	1,3
CZE	8,0	9,7	1,8	3,9	4,5	1,4	-0,1	2,6	1,6	2,1
SVK	6,0	6,7	10,4	12,2	7,2	3,5	8,4	7,5	2,8	4,3
SLO	8,3	7,9	6,1	8,9	8,6	7,5	5,7	3,7	2,5	2,5
HUN	18,5	14,2	10,0	10,0	9,1	5,2	4,7	6,8	3,5	4,0
BUL	-	18,7	2,6	10,3	7,4	5,8	2,3	6,1	6,0	7,4
ROM	154,8	59,1	45,8	45,7	34,5	22,5	15,3	11,9	9,1	6,6
ref. value	2,73	2,20	2,03	2,67	3,03	2,17	2,70	2,17	2,53	2,93

* Harmonized index of consumer prices for the EU-member states and index of consumer prices for Croatia.

Source: EUROSTAT – epp.eurostat.ec.europa.eu [accessed: 25. 07. 2007]; HNB – www.hnb.hr [accessed: 25. 07. 2007]

In respect of prices Croatia diverges from the general trend of other reform countries which managed to reduce their inflation, while Croatia faces a slight increase in the general price level in the last couple of years. In 2006 also Bulgaria, Romania, Slovakia and Hungary have inflation rate above the EU-reference value; among them Croatia is the best performer with the annual inflation rate exceeding the reference value by only 0,3 percentage points¹¹ (p.p.).

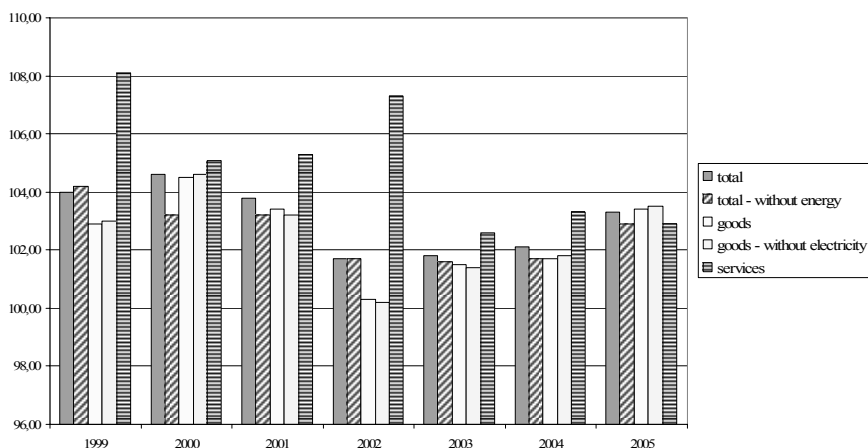
¹⁰ This is result of a successful antiinflation programme (October 1993) based on the ortodox and the heterodox policy measures which eliminated hyperinflation reaching almost 1.500% in 1993 (Anušić *et al.*, 1995).

¹¹ Forecasts for 2007 speak of further price stabilization in Croatia and an expected increase in prices of only 2,9% (EBRD, 2006).

In the period from July 2006 to June 2007 Croatia realized a little bit stronger price increase than the Euro-area. Total price increase during that period amounted to 2,83% (Euro-area: 2,02%) indicating that consumer prices in Croatia grew on average by 0,51% *à* month, while that of the Euro-area reached 0,36% monthly. Despite a somewhat faster growth of prices in the first half of 2006 (3-4% on annual basis), inflation generally kept its moderate character. The main reasons for a realised price increase are: increase in the world oil prices which contributed to raising both import and domestic prices, increasing prices of food and beverages as well as those of agricultural goods (strong seasonal component) and finally, increase in administered prices (e.g. water supply, utilities). However, nominal increase of domestic currency (HRK) towards the euro (EUR) followed by just a moderate increase in wages and rising productivity, prevented higher inflation. Basic inflation (without administered prices and seasonal prices of agricultural goods) realized a decrease from 3% (December 2005) to 2,7% (June 2006).

The prospects for price stability in Croatia and the price convergence to the EU-level are fairly good. Regarding the development level (measured by GDP) Croatia realizes a relatively high price level in comparison to other transition countries, which is, however lower than the EU-average. Thanks to that and the strong similarity of the price structure with that of the EU¹² no significant changes in the general price level are expected in the process of Croatia's accession to the EU (Nestić, 2004). Figure 1 shows that the above-average increase in prices of services significantly contributed to the overall price growth. However, the services sector influence on prices is getting weaker what points at the possible diminishing impact of the Balassa-Samulson effect (see: Mihaljek, 2003). However, this does not exhaust the expected influence of the services sector on increase in the general price level as some 'price adjustments' are still expected in education, culture and recreation and housing.

¹² Most of prices in Croatia are determined by market except for those of utilities (water supply, waste water management, transport – rail, maritime) and food (bread, milk), (EBRD, 2006).



Source: DZS – Statistički ljetopis Republike Hrvatske 2006., 2007

Figure 1. The composition of the price increase in Croatia (annual chain index)

According to the latest estimations, Croatian accession to the EU could cause an additional price increase amounting to 1,4%, mainly due to adjustments in the structure of service prices and the effects of tax harmonization with the EU. The estimated price adjustments of the youngest EU-member states – Bulgaria and Romania are greater and amount to 2,9% and 2%, respectively (EIZ, 2007). Thanks to the proclaimed commitment of Croatian government to entrepreneurship and the business climate development it is not realistic to expect increase in taxes or wages beyond the realized productivity growth as potential sources of inflation in medium-term.

2.2. Government finance

Public finance in Croatia registered recently marked improvements and after substantial and continuous decline throughout the observed period, consolidated general government deficit has reached the Maastricht level in 2006 (table 2). Accordingly, balanced increase in consolidated general government revenues (6,9%) and expenditures (6,6%) led to a mild decrease of their shares in GDP amounting to 45% and 43,9% in 2005, respectively. At the same time tax burden¹³ is reduced from 27,1% (2003) to 26,4% of GDP in 2005.

¹³ Tax revenues make app. 60% of total budget revenues, while the largest position on the expenditure side take social contributions and unemployment benefits making together almost 70% of total expenditures and 30% of GDP in 2005.

Table 2.

Consolidated general government in Croatia and transition countries (% GDP)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
EU 15	-2,5	-1,7	-0,8	0,5	-1,1	-2,2	-2,9	-2,7	-2,3	-1,6
HR	-	-	-7,1	-7,5	-6,8	-4,9	-6,2	-4,8	-4,0	-3,0
POL	-4,6	-4,3	-1,8	-1,5	-3,7	-3,2	-6,3	-5,7	-4,3	-3,9
CZE	-3,8	-5,0	-3,7	-3,7	-5,7	-6,8	-6,6	-2,9	-3,5	-2,9
SVK	-6,7	-4,8	-6,4	-11,8	-6,5	-7,7	-2,7	-2,4	-2,8	-3,4
SLO	-	-	-	-3,8	-4,1	-2,5	-2,8	-2,3	-1,5	-1,4
HUN	-5,9	-8,0	-5,5	-2,9	-3,4	-8,2	-7,2	-6,5	-7,8	-9,2
BUL	-	1,7	0,4	-0,5	1,9	0,1	-0,9	2,2	1,9	3,3
ROM	-	-3,2	-4,5	-4,6	-3,3	-2,0	-1,5	-1,5	-1,4	-1,9
ref. value (max.)	-3,0	-3,0	-3,0	-3,0	-3,0	-3,0	-3,0	-3,0	-3,0	-3,0

Source: EUROSTAT – epp.eurostat.ec.europa.eu [accessed: 30. 08. 2007]; HNB – www.hnb.hr [accessed: 29. 08. 2007];

Thanks to positive developments in government finance, Croatia experienced similar trend also in respect of public debt. Despite an increase of 52,6% in the period 2001-2006 and the average annual growth rate of 8,8%, expansion of public debt has practically come to a halt in 2006 when it registered a negligible annual increase of 1,1%. In 2006 it reaches 46,6% of GDP what shows that it meets the Maastricht criteria and is on the downward path (table 3).

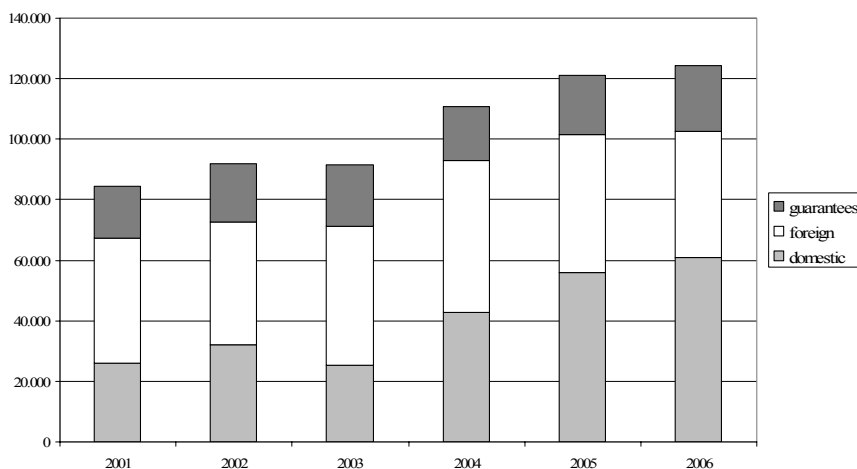
Table 3.

General government consolidated gross debt of Croatia and transition countries (% GDP)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
EU 15	71,0	68,9	67,9	64,1	63,1	61,5	63,1	63,3	64,4	63,3
HR	-	-	-	48,7	49,8	48,8	48,6	48,9	49,2	46,6
POL	44,0	39,1	40,3	36,8	36,7	39,8	47,1	45,7	47,1	47,8
CZE	12,2	12,9	13,4	18,2	26,3	28,5	30,1	30,7	30,4	30,4
SVK	33,1	34,0	47,2	49,9	49,2	43,3	42,4	41,5	34,5	30,7
SLO	-	23,6	24,9	27,4	28,4	29,1	28,6	28,9	28,4	27,8
HUN	64,2	61,9	61,2	55,4	52,2	54,0	58,0	59,4	61,7	66,0
BUL	105,1	79,6	79,3	73,6	66,2	54,0	45,9	37,9	29,2	22,8
ROM	16,5	17,8	24,2	22,7	-	23,8	21,5	18,8	15,8	12,4
ref. value (max.)	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0	60,0

Source: EUROSTAT – epp.eurostat.ec.europa.eu [accessed: 30. 08. 2007]; HNB – www.hnb.hr [accessed: 29. 08. 2007]

Similarly, the structure of public debt has gone through considerable change as its foreign component decreased from app. 60% (2001) to 40% (2006) reducing thus the currency risk and contributing to the domestic financial market development (figure 2). Thanks to the government strategy the share of public debt with fixed interest rate has increased by app. 12 p.p. in the period 2002-2006 (onto 65%); more than a half of public debt is denominated in EUR (54%), while the rest is denominated in HRK (33%) and other foreign currencies (13%).



Source: *Ministarstvo financija RH – Godišnje izvješće Ministarstva financija za 2005. godinu, 2006; Ministarstvo financija RH – Godišnje izvješće i strategija upravljanja javnim dugom, 2006*

Figure 2. Structure of Croatian general government debt including the non-debt positions of the government guarantees (mill. HRK)

Regarding the expected effects of Croatian accession to the EU¹⁴, as well as the close tightness of Croatian monetary and foreign exchange policy in preserving price stability, strong euroization of domestic economy and structurally caused external deficit, the realistic medium-term objective of Croatian government is to reduce negative public balance well below -3% of GDP (planned: -2,7% in 2007 and -0,5% in 2010). This should be achieved through structural and fiscal adjustments in public finance (management) followed by decrease in general government expenditures from 48% (2006) to 45,1% of GDP which is foreseen for 2009. Similarly, public debt is planned to reach 43,8% of GDP in 2009.

¹⁴ Estimated net-effects on Croatian budget are negative and amount to app. 1,1% of GDP (Cuculić et al., 2004; EIZ, 2007).

2.3. Exchange rate

Unlike the new member countries of the EU Croatia still does not fulfil the exchange rate criteria. As a non-member it takes no part in the ERM II which determines the main framework of convergence – exchange rate fluctuations within standard ($\pm 6\%$) or narrow ($\pm 2,25\%$) margins without pressure on exchange rate stability which also includes regular central bank interventions. Despite that, Croatia achieved a remarkable stability of its currency against EUR throughout the 90s and afterwards; it has a managed floating with the central bank interventions aimed at preserving long-term exchange rate and price stability. Among the new member countries half of them, though without the opt-out clause (like Denmark or the United Kingdom), still has not entered the ERM II (table 4).

Table 4.

Fulfilment of the exchange rate criteria for Croatia and transition countries, 2007

	exchange rate mechanism	entry into ERM II	target date for adoption of EUR	central rate <i>vis-à-vis</i> EUR	EUR foreign exchange reference rates (10. 08. 2007)
BUL	currency board based to EUR	not announced	not announced	-	1,9558
CZE	managed float to EUR	not announced	January 2010	-	28,044
EST	currency board in ERM II	June 2004	January 2011	15,6466	15,6466
CYP	ERM II	May 2005	January 2008	0,585274	0,5842
LAT	fixed peg in ERM II	May 2005	not announced	0,702804	0,6982
LIT	currency board in ERM II	June 2004	January 2010	3,4528	3,4528
HUN	fixed with band to EUR	not announced	January 2009	-	253,15
MAL	ERM II	May 2005	January 2008	0,4293	0,4293
POL	free float	not announced	not announced	-	3,7787
ROM	managed float to EUR	not announced	January 2014	-	3,2133
SVK	managed float in ERM II	November 2005	January 2009	38,455	33,53
SLO	euro-area managed float	June 2004	January 2007	239,64	-
HR	managed float to EUR	not announced	not announced	-	7,3057

Source: Commission of the European Communities – COM(2006) 671 final, 2006; EBRD - Transition Report, 2006; ECB - www.ecb.eu [accessed: 24. 08. 2007]

However, without participation in the ERM II Croatia realized the greatest stability of national currency *vis-à-vis* EUR (table 5). The average exchange rate has fluctuated within 10%-band in the period 1997-2005, while the fluctuation band for the exchange rate in purchasing power parity (PPP)

amounted to 16,4%. The maximum downward deviation of the annual exchange rate from the average value was 6,3% (1997) and the maximum upward pressure did not exceed app. 3,5% (2000). HRK has generally declined against EUR during the 90s, although it registered an appreciation *vis-à-vis* EUR in the period 1999-2002.

Table 5.

Nominal exchange rates of EUR in Croatia and transition countries

		1997	1998	1999	2000	2001	2002	2003	2004	2005	1997-2005 * (%)
HR	average	6,96	7,14	7,58	7,64	7,47	7,41	7,56	7,50	7,40	9,7
	PPP*	3,88	4,11	4,17	4,23	4,24	4,35	4,47	4,52	4,51	16,4
POL	average	3,71	3,92	4,23	4,01	3,67	3,86	4,40	4,53	4,03	23,6
	PPP	1,77	1,93	2,00	2,07	2,12	2,12	2,16	2,18	2,20	24,3
CZE	average	35,80	36,16	36,88	35,61	34,08	30,81	31,84	31,90	29,78	23,8
	PPP	14,89	16,27	16,29	16,34	16,76	16,58	16,99	17,03	16,77	14,4
SVK	average	38,01	39,60	44,12	42,59	43,31	42,70	41,49	40,05	38,59	16,1
	PPP	16,67	17,24	17,87	18,26	18,70	18,80	19,96	20,97	21,17	27,0
SLO	average	180,40	186,27	193,63	205,03	217,19	226,22	233,70	238,86	239,64	32,8
	PPP	130,88	137,39	142,35	147,57	156,42	167,32	176,31	174,64	175,05	34,7
HUN	average	210,93	240,98	252,80	260,04	256,68	242,97	253,51	251,68	248,05	23,3
	PPP	97,73	108,15	114,24	122,11	126,48	133,14	142,85	148,28	151,57	55,1
BUL	average	1,90	1,97	1,96	1,96	1,96	1,96	1,96	1,96	1,96	3,2
	PPP	0,48	0,59	0,59	0,61	0,64	0,68	0,68	0,71	0,72	49,7
ROM	average	0,81	1,00	1,63	2,00	2,60	3,13	3,76	4,05	3,62	401,0
	PPP	0,23	0,35	0,51	0,72	0,96	1,15	1,40	1,56	1,63	597,0

* Purchasing power parity.

Source: *WIW - Handbook of Statistics 2006, 2007 (according to: EUROSTAT); EUROSTAT – epp.eurostat.ec.europa.eu [accessed: 24. 08. 2007]; HNB – www.hnb.hr [accessed: 25. 08. 2007]*

A mild increase in the value of HRK can be observed from 2003 throughout the first quarter of 2007. Despite steady negative trade deficit the reasons for that can be found in growing credit activities of Croatian banks, increased foreign investment, increasing demand for government bonds issued in HRK, transactions on capital markets (large acquisition in pharmaceutical industry in 2006) and expectations of further increase in the value of HRK due to opening up of accession negotiations with the EU. However, HRK registered significant effective increase (against the currency basket consisting of EUR, USD, GBP, CHF and SIT) from 1999 to 2004 to the amount of app. 8,5 p.p.

Analysis of daily exchange rate reveals significant stability of HRK against EUR. The widest actual fluctuation band of daily exchange rates around the annual nominal exchange rate was realized in 1998 and 2001 (6-8,5%), while it dropped to 3-5% as of 2002 (table 6). Except for some years (1999, 2001) there are generally no significant differences between upper and lower fluctuation margins indicating the lack of any 'unbalanced' pressure on either devaluation or

too strong increase in the value of HRK. This is result of the central bank's efficient policy of currency stability (indirectly also price stability due to strong euroisation of the economy and inflationary expectations based on EUR) realised mostly through foreign exchange auctions.

Table 6.

Indicators of the EUR-exchange rate fluctuations in Croatia

	average nominal exchange rate	standard deviation (daily exchange rates from the average annual exchange rate)	exchange rate fluctuations (%)		
			band	downward pressure	upward pressure
1997	6,960	0,036	2,99	1,34	1,63
1998	7,138	0,138	6,46	3,09	3,26
1999	7,580	0,086	4,99	3,70	1,24
2000	7,635	0,078	3,10	1,71	1,37
2001	7,469	0,162	8,47	5,00	3,30
2002	7,407	0,060	3,69	1,33	2,34
2003	7,563	0,065	3,59	1,63	1,93
2004	7,495	0,109	5,19	2,16	2,97
2005	7,400	0,080	5,09	1,50	3,53
2006	7,323	0,051	2,68	1,16	1,49
2007*	7,366	0,018	1,13	0,49	0,64

* 01. 01. – 11. 04. 2007.

Source: HNB – www.hnb.hr [accessed: 25. 08. 2007]

In order to preserve exchange rate stability Croatian central bank has intervened on the euro-market. Usually it purchased the excessive amount of EUR resisting in that way a too strong depreciation of EUR. In doing so it used sufficiently large international reserves (both in terms of three-month imports and the net-amount of the exchange rate auction) which amount to almost 9,2 bill. EUR in the mid-2007 (table 7).

Table 7.

Indicators of international reserves of Croatian National Bank (HNB) and EUR-auctions

	international reserves (Mill. EUR)	international reserves/3-month imports	number of EUR-auctions	HNB net-purchase* of EUR	international reserves/net-purchase* EUR of HNB
1997	2.303,7	0,9	-	-	-
1998	2.400,2	1,0	-	-	-
1999	3.012,7	1,3	-	-	-
2000	3.783,2	1,4	7	240,60	15,7
2001	5.333,6	1,8	21	503,85	10,6
Nastavak tablice na sljedećoj stranici					

2002	5.651,3	1,6	16	220,45	25,6
2003	6.554,1	1,7	9	-353,80	-18,5
2004	6.436,2	1,6	11	370,20	17,4
2005	7.438,4	1,7	9	570,80	13,0
2006	8.725,3	1,8	14	1.172,03	7,4
2007	9.170,4**	0,9	2	139,90***	65,5***

* Negative sign indicates net-sale. ** June 2007. *** Until 24. 08. 2007.

Source: HNB – *Godišnje izvješće 2005., 2006*; HNB – www.hnb.hr; *WIIW – Handbook of Statistics 2006, 2007*

2.4. Long-term interest rates

Interest rates on long-term government bonds of transition countries have fluctuated in the period under observation, though with stronger mutual convergence towards the year 2004. Therefore, already in 2005 interest rates in the majority of the new EU members and Croatia registered levels below the reference value¹⁵ of 5,4% except in Hungary and Poland (table 8).

Table 8.

Long-term* government bond yields (%), annual average

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007**
EU 25	-	-	-	-	-	-	4,34	4,44	3,70	-	-
EU 15	6,26	4,93	4,73	5,43	5,00	4,92	4,23	4,27	3,59	4,05	4,69
Euro-area	5,99	4,71	4,66	5,44	5,03	4,91	4,14	4,12	3,42	3,83	4,31
HR	-	-	-	-	-	-	6,03	6,15	5,03	4,05	3,88
POL	-	-	-	-	10,68	7,36	5,78	6,90	5,22	5,23	5,22
CZE	-	-	-	6,72	6,31	4,88	4,12	4,75	3,51	3,78	4,00
SVK	-	-	-	8,34	8,04	6,94	4,99	5,03	3,52	4,41	4,35
SLO	-	-	-	-	-	-	6,40	4,68	3,81	3,85	4,43
HUN	-	-	-	-	7,95	7,09	6,82	8,19	6,60	7,12	6,77
BUL	-	10,10	10,05	7,38	6,70	8,26	6,42	5,25	3,80	4,01	-
ref. value	7,88	6,64	6,69	7,32	6,92	6,89	6,23	6,28	5,40	6,04	-

* All countries except Croatia: 10 years maturity. Croatia: five years maturity of the HRK-government bonds. **Euro-area: January-July, Croatia: January-March, Poland: January-May, other countries: January-June.

Source: EUROSTAT – epp.eurostat.ec.europa.eu [accessed: 04. 08. 2007]; HNB – www.hnb.hr [accessed: 05. 08. 2007]; IMF – *International Financial Statistics Yearbook 2006*; ECB – www.ecb.eu [accessed: 02. 08. 2007]

¹⁵ It is calculated as a simple average of the government bond interest rates of at least 10 years maturity of three member countries with the lowest inflation. However, in case of more countries with the same inflation rate, more than three average interest rates are taken into calculation.

Interest rates on five-year government bonds in Croatia are lower than the EU-reference value throughout the period for which the relevant data are available. Furthermore, interest rates on all individual government bond series (issued on domestic and international market¹⁶) are well below the reference value for the corresponding year (table 9).

Table 9.

Long-term Croatian government bonds

year	original maturity (years)	currency	nominal value (Mill.)	nominal interest rate* (%)
listed on the Zagreb Stock Exchange				
2002	10	EUR	500,00	6,875
2004	10	EUR	650,00	5,500
2004	15	EUR	200,00	5,375
2005	10	EUR	350,00	4,250
2005	10	HRK	5.500,00	5,250
issued on international markets				
1996	14	USD	857,80	6,1425
1996	10	USD	604,43	6,1425
2001	10	EUR	750,00	6,4000
2004	10	EUR	500,00	5,5638

* Depending on the borrowing conditions nominal interest rates are calculated on the basis of the USD 6-month LIBOR- and the 12-months EURIBOR-rates as well as the long term (10 years) interest rates on German federal bonds ('Federal Bunds').

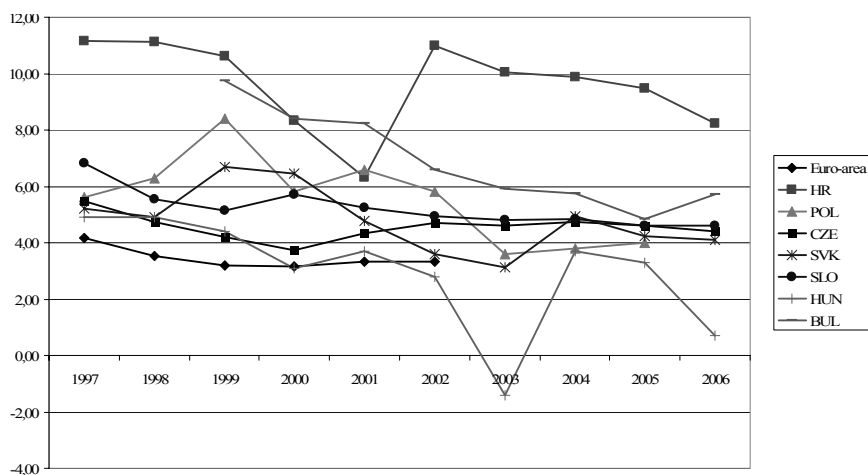
Source: HNB – www.hnb.hr [accessed: 05. 08. 2007]; Ministarstvo financija RH – *Godišnje izvješće Ministarstva financija za 2005. godinu, 2006*; ECB – www.ecb.eu [accessed: 06. 08. 2007]

Apart from the convergence of the government bond interest rates it can be generally said that structural and institutional reforms in the financial sector are still ahead of Croatia in order to achieve genuine financial market integration with the EU and sustainable long-term convergence of interest rates. Currently, lending rate in Croatia (2007) reach app. 10% and exceed those of other analysed transition countries or the Euro-area (4,64% in June 2007). This is, however still a favourable outcome of a decreasing trend of Croatian interest rates which started in mid-90s¹⁷. In February 2007 the average (short- and long-term) interest

¹⁶ By mid-2007 there are 11 government bonds, 4 municipal bonds, 1 bond of Hrvatska banka za obnovu i razvitak (HBOR) and 15 corporate bonds on the Zagreb Stock Exchange. Out of total (31 debt securities) app. one quarter has maturity of at least 10 years what includes all government bonds and one corporate bond.

¹⁷ In 1994 interest rates in Croatia amounted to app. 23% resulting from structural problems which included bad management and high business costs, underdevelopment and segmentation of financial markets, as well as inadequate financial instruments and weak legislation (Kraft, 2001).

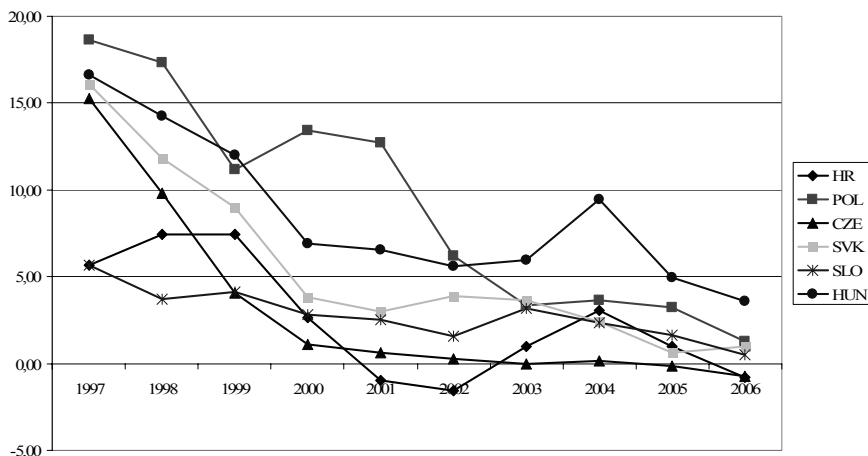
rate is lower by app. 1,2 p.p. compared to 2000. Hence, Croatia realizes the biggest difference between lending and deposit interest rates, while at the same time interest rate spread in the Euro-area amounts to 3,34 p.p. and that of the other transition countries varies between 4 and 6 p.p. (figure 3).



Source: IMF –International Financial Statistics Yearbook 2006; IMF – International Financial Statistics, May 2006

Figure 3. Interest rate spreads for Croatia, transition countries and the Euro-area (p. p.)

In respect of short-term interest rates Croatia realizes more similarities with the Euro-area or the EU 15 than in the case of long-term interest rates. Positive adjustments of short-term interest rates had begun in 1998 (when they amounted to app. 12%) and continued until 2003-2004 when they registered a slight increase on 3-5%; in 2006-2007 they have settled around 2-3%. These changes can be observed in figure 4 which depicts fluctuations of money market interest rate differentials of transition countries *vis-à-vis* the Euro-area. The highest positive differential achieves Hungary, while Croatia, Bulgaria and the Czech Republic have negative interest rate differential indicating thus lower interest rates than those in Euro-zone.



Source: EUROSTAT – epp.eurostat.ec.europa.eu [accessed: 04. 08. 2007]; IMF – *International Financial Statistics Yearbook 2006*; IMF – *International Financial Statistics, May 2006*

Figure 4. Short-term interest rate differentials vis-à-vis the Euro-area for Croatia and transition countries (p. p.)

An important condition for full and sustainable financial market integration with the EU is liberalization of financial transactions. Currently, apart from domestic currency convertibility for all transactions of the current account, Croatia allows long-term capital transactions which include incoming FDI, profit repatriation, unlimited inflow of deposits and borrowing from international markets (for business and government). Apart from restrictions in property acquisition for foreigners and limitations in buying domestic short-term debt securities, the majority of limitations still refer to capital outflows and mainly concern natural persons¹⁸.

The structure of banking sector in Croatia is mostly characterized by dominance of foreign-owned banks (91,2% of assets in 2005) which largely contributed to rising competitiveness and efficiency in the sector, leading to fall in lending rates and interest rate spreads. Banking in Croatia is characterized by four leading banks which own 41% of total assets, while six largest ones achieve an assets share of 64% and a market share of app. 80%¹⁹ (Ljubaj, 2005). Additionally, domestic banks mostly borrow from foreign capital markets because of insufficient domestic deposits and their inconvenient maturity structure (mainly short-term), as well as more stable and cheaper capital sources on international markets (Galac/Dukić, 2005); this indicates low efficiency of

¹⁸ Corporations can open account with the foreign bank only with special permission and the same regulation refers to transactions on foreign financial markets. These measures remain due to the fear of an unexpected capital outflow or speculative attack on domestic currency.

¹⁹ It is encouraging, however that the four leading banks have reduced their share which in 2000 amounted to app. 50% of total bank assets.

domestic capital markets in financial intermediation. The consolidation of banking sector in Croatia can also be seen through mergers on domestic market which resulted in decreasing number of banks (43 in 2000 and 34 in 2005). Further, Croatia has a low share of state-owned banks (3,4% of bank assets). In comparison with other transition countries Croatia has a high share of non-performing loans (7,2% of total loans), while together with Slovenia it takes the leading position regarding the credit expansion with the total value of loans granted to private sector of 55,6% of GDP²⁰ in 2005 (EBRD, 2006).

Development of Croatian non-banking sector is still unsatisfactory despite improved legal regulation²¹. Annual stock trading volume is still relatively low, due to which bonds make the greatest share of financial market instruments. Although the stock market capitalization in Croatia registered a marked increase in 2006 (50% of GDP in 2006 compared to 13,5% in 2000), there are still opportunities for its further growth in the future (table 10). The same also refers to bond market capitalization.

Table 10.

Financial markets indicators for Croatia and transition countries, 2005

	HR	CZE	HUN	POL	SVK	SLO
daily stock trading volume (Mill. EUR)	2,3	92,0	99,8	825,1	0,2	1,6
daily bond trading volume (Mill. EUR)	24,4	65,4	2,3	16,4	60,3	0,5
annual stock trading volume/GDP (%)	2,0	26,9	31,3	106,6	0,1	1,6
annual bond trading volume/GDP (%)	21,7	19,1	0,7	2,1	37,2	0,5
turnover velocity*	5,3	50,7	91,2	188,9	0,8	6,1
stock market capitalization (Mill. EUR)	10.954	45.745	27.586	110.083	4.067	6.699
bond market capitalization (Mill. EUR)	4.668	22.533	31.300	-	11.138	6.052
stock market capitalization/GDP (%)	38,6	53,1	34,3	56,4	12,3	25,8
bond market capitalization/GDP (%)	16,4	26,1	39,0	-	33,7	23,4
Eurobond issuance/GDP (%)	0,0	1,1	6,1	4,0	0,0	0,0

Monthly turnover on annual basis (multiplied by 100) as a stock market capitalization ratio.

Source: HNB – Godišnje izvješće 2005., 2006 (according to: Bloomberg.com); EBRD – Transition Report 2006, 2006

²⁰ At the end of 2006 49,2% of bank loans went to households, while 40,4% make corporate loans. The rest of loans is granted to government (7,5%), other financial institutions (2,1%), non-residents (0,6%) and non-profit insitutions (0,3%). Such a loan structure is more similar to advanced market economies and raises the issue of its medium-to-long term sustainability.

²¹ While banking legislation fully complies with the EU-norms (the highest EBRD-reform index: 4,0), the remaining financial sector activities are still insufficiently regulated without the necessary institutions, particularly in the field of securities markets (EBRD-reform index: 2,7), (EBRD, 2006).

3. SUSTAINABILITY OF MONETARY INTEGRATION – CROATIAN REAL CONVERGENCE TO THE EU

3.1. Trade openness and trade structure

Apart from nominal criteria the success of monetary integration depends also upon real convergence in respect of production factors mobility, degree of fiscal solidarity and the achieved level of trade integration. Generally, the readiness for monetary integration increases with increasing trade openness.

In economies strongly linked with international market, international prices can substantially influence domestic price structure and make exchange rate policy interventions less effective in achieving economic stability (McKinnon criterion). This especially refers to SMOPEC which face perfectly elastic foreign demand and realize a significant share of tradable goods in production and exports. Therefore, SMOPEC are considered to be more inclined to monetary integration. If they, further realize strong trade integration with a group of countries or regions, then introducing a single currency might be even more advantageous due to elimination of exchange rate risk and sometimes even inflation expectations (e.g. Croatia). Output and trade structure are relevant criteria of real convergence in determining the success of monetary integration. Countries with diversified production and export structure which, however display a certain degree of cross-country similarities are better candidates for monetary integration as asymmetric shocks are less likely to occur among them thus eliminating the need for costly stabilization policy (Kenen criterion). Those which do not fulfil these criteria can experience negative (uneven) impact of external shocks, asynchronous national business cycles and different responses to common monetary policy which, taken together, can considerably reduce medium- to long-term growth prospects for the entire monetary union and each member country (Angeloni *et al.*, 2005). This can be avoided if trade is predominantly of intra-industry type since countries which trade more within instead of between industries realize not only strong trade integration, but also high degree of complementary in trade structures which resemble similarities in the level of development and income.

Croatia achieves a fairly modest trade openness in 2005 (105,8% of GDP), since the only two worse positioned countries are Poland and Romania whose lower participation in international trade can be explained through their large domestic markets (table 11). Croatian trade openness registered constant expansion, although with slower pace in the second half of the 90s (1990: 45,2%, 1995: 85,7% and 2000: 99,4%).

Table 11.

Various indicators of trade integration of Croatia and transition countries, 2005

	trade openness* (%)	exports (%)		imports (%)		exports + imports (%)
		share of manufacturing in total exports**	KDI***	share of manufacturing in total imports**	KDI***	KDI***
HR	105,8	70,2	15,5	74,7	6,5	14,42
POL	74,4	83,1	6,5	79,4	4,5	16,16
CZE	141,2	90,4	13,6	82,6	5,1	12,12
SVK	158,1	85,8	10,7	76,2	3,7	29,79
SLO	129,5	92,9	10,7	78,0	6,9	33,41
HUN	136,9	89,4	24,5	83,6	14,3	30,64
BUL	137,9	70,6	24,2	68,0	11,0	11,81
ROM	76,5	81,8	18,4	77,4	5,7	18,42

* Share of exports and imports of goods and services in GDP.

** Share of goods of commodity classes 5-8 in 0-9 (SITC).

*** Krugman dissimilarity index. In the seventh column it is calculated on the basis of two pairs of data series: 1. extra-EU imports and Croatian total exports and 2. intra-EU imports and intra-EU exports for the analysed transition countries (members of the EU 27).

Source: *WIIW – Handbook of Statistics 2006, 2007; EUROSTAT – epp.eurostat.ec.europa.eu [accessed: 11. 09. 2007]*

However, rising Croatian trade integration with foreign markets is realized mostly through soaring imports which by 2005 exceeded its pre-transition value by 2,5 times and realized an annual average growth of 13,2% (reaching 18,6 bill. USD in 2005). Throughout the 90s exports was flat at the level of 3,5-4,5 bill. USD à year and registered more significant growth first in 2002; during 2000-2005 it realised annual growth of 25,5% on average and reached 8,8 bill. USD in 2005. According to these developments negative trade balance registered a steady growth and reached in 2005 a cumulative value of 61,8 bill. USD (equal to app. double Croatian GDP in 2005). Analogously, export-import ratio decreased to 47% in 2005 (2000: 56%).

As regards regional structure of Croatian trade, the greatest part (69,3% of exports and 73,8% of imports) is realised with developed countries among which the EU takes the prominent place²². Nevertheless, Croatian trade

²² The most important EU-trading partners are Italy, Germany, Slovenia and Austria which together make app. three quarters of Croatian total trade. The most important non-EU export markets for Croatia are Bosnia and Hercegovina, Serbia and Montenegro (2005), USA ad Libia where app. 25% of total exports is realised.

integration with the EU is lower than that of the new EU-member states, except for Bulgaria. As expected, Croatia trades more with the enlarged EU (app. 60%), than with the EU 15 (app. 50%), but contrary to experience of other countries it realised a decreasing trade integration with the EU what points at possible trade diversion resulting from non-participation in the integration process during the 90s (table 12).

Table 12.

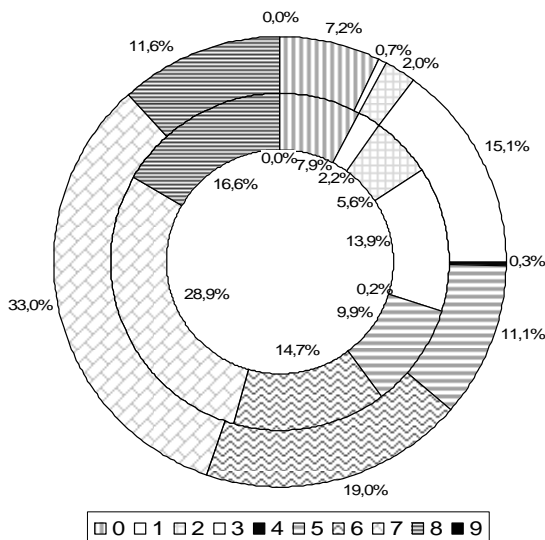
Trade integration of Croatia and transition countries with the EU

		HR 1990*	HR 1995	HR 2000	HR 2005	BUL	CZE	HUN	POL	SVK	SLO	ROM
exports	EU 25	61,3	74,5	69,3	61,9	56,6	84,1	76,4	77,2	85,4	67,9	67,6
	EU 15	59,9	57,6	54,4	48,0	51,6	66,0	65,5	65,0	57,8	59,2	59,4
imports	EU 25	59,8	78,5	70,1	65,5	49,6	71,0	68,2	65,6	71,1	80,9	62,2
	EU 15	54,9	62,1	55,4	50,6	43,9	57,7	58,1	59,6	46,2	71,8	52,0

* EU 25 does not include Slovenia, the Czech Republic and Slovakia.

Source: WIIW – Handbook of Statistics 2006, 2007; WIIW – Handbook of Statistics Countries in Transition 2003, 2004

Regarding the sector structure a dominant share in Croatian trade is realized by machinery and transport equipment (class 7 of SITC) and various manufactured goods (classes 6, 8), (figure 5).



Source: DZS – Statistički ljetopis Republike Hrvatske 2006., 2007; DZS – Statistički ljetopis Republike Hrvatske 2005., 2006

Figure 5. Croatian export (outer circle) and import (inner circle) structure, (SITC), 2005

Despite the high share of manufactured goods in export and import flows, Croatia generally achieves a relatively low share of manufacturing in total trade, since manufacturing makes close to or even exceeds 80% of total trade in the advanced transition countries (table 11). The similarity analysis²³ sheds, however a slightly different light on the relative position of Croatian exports and imports. According to it, 15,5% of Croatian exports differs in structure (0-9 SITC) from the average of the analysed transition countries with the greatest gap in machinery and transport equipment (class 7) and manufactured goods classified by material (class 6) to the amount of 9,14 p.p. and 6,15 p.p., respectively. Mineral fuels (class 3) realise an above average share in exports (6,65 p.p.). Import flows, however show lower degree of dissimilarity which ranges from 3,7% (Slovakia) to 14,3% (Hungary). According to this indicator Croatia is similar to Slovenia, yet better positioned than Bulgaria and Hungary. The analysis of the similarity of extra-EU (27) imports and Croatian exports on the one hand and intra-EU (27) imports and exports for new member countries shows, namely that Croatia is better positioned than Hungary, Bulgaria and Romania and could presumably better react to external shocks than these countries. The dissimilarity of Croatian exports and the EU 27-imports from outside the single market amounts to app. 20%, while this difference climbs to almost one third of export and import flows in the case of the worst positioned countries (table 11). The strongest harmony of trade flows with the EU 27 achieves Slovenia (just below 90%) closely followed by Slovakia, Poland and the Czech Republic.

3.2. Intra-industry trade and similarities in production structure

Successful countries of CEE have experienced a significant increase in IIT during the 90s – while at the beginning of transition the share of IIT ranged between 20% (Romania) and 40% (Hungary, ex-Czechoslovakia), it increased by 10-25 p.p. by the mid 90s and continued to do so, however at a slower pace, towards the end of the 90s. Despite the differences in the IIT-dynamics across countries it can generally be said that structural adjustments in advanced transition countries have contributed to real convergence and increasing trade

²³ This analysis is based on the methodology proposed by Krugman (1993) and known as the Krugman dissimilarity index which is in this case adjusted to obtain a relative measure (Angeloni *et al.*, 2005) as follows:

$$DIST_{i-r} = \frac{\sum_j |S_{ij} - S_{rj}|}{200} \cdot 100 \quad i, j = 1, 2, \dots, n.$$

In this version, numerator represents the sum of the absolute differences in the shares (S) of the analysed variable i and the share of the reference variable r (e.g. average) over a group of activities j . The result is given in percentage, while the original Krugman index assumes values within 0-2. In both version lower value of index indicates greater similarity between analysed variables (e.g. trade or output structure).

integration with the developed countries of the EU²⁴. The most successful countries of CEE realize nowadays IIT comparable to that of Italy, Denmark, Spain and Austria and exceeding that of geographically peripheral countries of the EU (Greece, Finland, Ireland, Portugal), (table 13).

Table 13.

Intra-industry trade of the EU-countries and countries of South East Europe (%), 1998

	FRA	GER	GBR	BEL	NDL	AUT	ESP	ITA	DEN	SWE	POR	IRL	FIN	GRE
IIT	79,5	77,0	75,2	74,6	72,3	68	65,9	61,4	60,8	57,3	50,5	45,7	44,5	26,4
	CZE	SLO	HUN	SVK	POL	BUL	EST	ROM	LIT	LAT	ALB	SMT	MAC	BIH
IIT	66,0	58,1	57,3	44,7	44,4	34,0	30,0	29,2	26,3	22,6	33,1	31,8	25,5	24,5

Source: *Fidrmuc, 2001;Astrov, 2001*

The forthcoming analysis of Croatian IIT²⁵ is based on the standard methodology developed by Grubel and Lloyd (1971, 1975) and takes reference to relevant contributions to improvements in case of trade imbalance and statistical aggregation (see: Derado, 2007). Taking account of the previous empirical studies (e.g. Blanes/Martin, 2000; Behr, 1998; Gabrisch, 1995), in this part Croatian IIT with all countries, EU 15 and CEEC 7 (before joining the EU) is analysed. The research is carried out on the 3- and 1-digit level of statistical aggregation (SITC), as well as on the level of total trade and refers to the most dynamic period of transition – the 90s – in which marked changes in trade and output structure have occurred. Except complete trade flows (0-9 SITC) special reference is given to manufacturing (5-8 SITC).

As shown in table 14 Croatia has a relatively low level of IIT, i.e. it still keeps having prevailing specialization between instead of within industries what further reduces prospects for closer trade integration as an important prerequisite for successful participation in a monetary union. Although Croatia, having reached 44% of IIT, compares well with Poland and Slovakia and is even better than all the countries of South East Europe (including Bulgaria and Romania), it actually goes through a decrease in the share of similar trade flows, particularly towards the end of the 90s (table 14).

²⁴ However, apart from successful trade integration and efficient re-orientation of the transition countries' trade towards the EU (Hoekman/Djankov, 1997), some authors point out slow convergence of their output structures to the EU-specialization pattern (Angeloni *et al.*, 2005).

²⁵ Based on data series for exports and imports in 1990, 1995 and 2001 obtained from the Central Statistical Bureau of the Republic of Croatia (Državni zavod za statistiku).

Table 14.
Croatian intra-industry trade: all countries and selected country groups (%)

		all countries	EU 15	CEEC 7*	ex-YU**
1990	0-9 SITC	38,4	38,2	17,5	-
	5-8 SITC	45,3	40,4	25,3	-
1995	0-9 SITC	46,3	38,6	41,7	53,2
	5-8 SITC	53,4	45,1	46,5	60,2
2001	0-9 SITC	44,1	39,6	36,0	47,3
	5-8 SITC	46,6	40,0	34,4	55,7

* Bulgaria, the Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia.

** Bosnia and Hercegovina, Macedonia, Serbia and Montenegro, Slovenia.

Source: author, according to: DZS – export and import data series for 1990, 1995, 2001

Mostly due to the modest business and trade integration with the developed countries before the 90s and similarly to other transition countries, Croatia experienced a significant increase in IIT in the first years of transition reforms. However, unlike more successful countries which continued to experience a growing IIT afterwards, Croatia realized a fall in 'trade overlap' with all analysed country groups and CEEC 7 in particular. This can be explained through more successful re-orientation of the advanced transition countries' trade towards more competitive EU-markets, induced by economic integration (trade liberalization) and dynamic economic restructuring. Regarding the unfavourable conditions in trade with CEEC 7, as well as the steady state of Croatian IIT with the EU prior to the last two enlargements (2004, 2007) it can be further assumed that in the following years Croatia has reduced the share of IIT with EU 27. The assumed trade diversion in this case strengthens the dominant specialization pattern according to factor proportions thus reducing capacities for monetary integration in the future, even from the point of view of the endogeneity approach.

A more detailed analysis across main classes of trading goods reveals similar level in IIT between the EU and total trade. However, Croatia achieves lower IIT with the EU in each class of commodities except for mineral fuels (class 3) and other commodities (class 9) which together make less than 15% of Croatian trade volume in 2005, (table 15). Furthermore, in trade with food and live animals (class 0), raw materials (class 2) and animal and vegetable oils and fats (class 4) there can be observed further deterioration of the gap between the EU and all countries. However, there is no large difference in IIT between trade with the EU and other countries in manufactured goods (5-8 SITC), except for trade in chemicals.

Table 15.

Croatian intra-industry trade, with all countries and the EU (% , p.p.), 1990-2001

SITC		0	1	2	3	4	5	6	7	8	9
all countries (%)	1990	42,10	52,36	21,93	13,37	22,44	45,24	49,32	39,48	51,70	83,42
	1995	48,35	60,40	39,32	13,14	52,69	46,99	60,53	41,09	66,95	1,06
	2001	52,91	43,29	45,60	22,55	55,83	47,40	48,82	37,29	63,39	40,70
EU 15 (%)	1990	36,38	33,79	24,43	29,08	6,79	26,98	48,71	31,58	54,61	82,29
	1995	30,31	50,28	23,06	9,82	10,24	25,88	50,99	32,49	63,74	0,67
	2001	27,48	32,93	21,94	63,52	18,03	28,45	43,56	33,83	54,62	78,63
difference (p.p.)	1990	-5,70	-18,60	2,50	15,70	-15,70	-18,30	-0,60	-7,90	2,90	-1,10
	1995	-18,00	-10,10	-16,30	-3,30	-42,50	-21,10	-9,50	-8,60	-3,20	-0,40
	2001	-25,40	-10,40	-23,70	41,00	-37,80	-19,00	-5,30	-3,50	-8,80	37,90

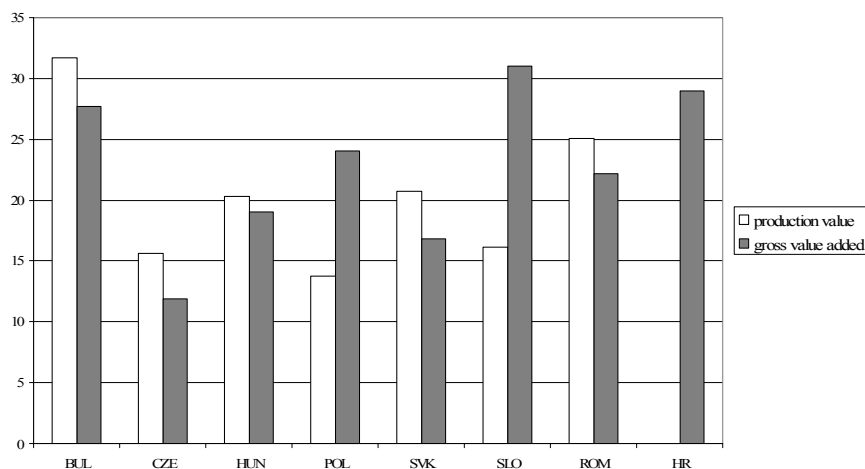
Source: author, according to: DZS – export and import data series for 1990, 1995, 2001

Generally, analysis of IIT across industries (3-digit SITC) points at decreasing 'trade overlap' in goods of higher level of finalization as well as of more complex products, while the realised level of IIT is still stabile in goods such as machinery and transport equipment and those of metal industry which are produced mainly on the basis of standard technology. A relatively high level of IIT in low knowledge-intensive products reveals weaker possibilities for business cooperation between domestic and foreign producers, i.e. weaker basis for further trade integration. Weak industrial structure of IIT where sometimes just a few products of the whole industry are traded on intra-industry basis proves an *ad hoc* character of trade and an accidental specialization pattern. That points at undefined technological and industrial structure of Croatian industry and trade without which it is hard to find a *niche* and stabile position on international market, including also making advantage of economic integration.

Production structure and structure of the gross value added, based on the calculation of the Krugman dissimilarity index, are depicted in figure 6. The slightest difference in the output structure in comparison to the EU is achieved by Poland (13,8%), the Czech Republic (15,6%) and Slovenia (16,1%) which compare well to Austria and Italy and are even better ranked than Scandinavian and Baltic countries. Bulgaria and Romania display pronounced dissimilarity in output structure amounting to 25% and 33%, respectively. The structure of gross value added (across industries) shows, however somewhat different results according to which Poland and Slovenia take the bottom positions with the index values ranging between 25% and 30%. Croatia belongs to the same group of transition countries with the dissimilarity index of 29% taking in that way the back seat position also when compared to all EU-member countries; the only ones with higher dissimilarity in the structure of gross value added in comparison to the EU-average are Luxembourg (37,5%), Cyprus (39%), Lithuania (40,1%), Latvia (40,2%) and Ireland (44,4%).

Figure 6.

Krugman dissimilarity index of transition countries with the EU* (NACE, DA-DN), (%), 2004



* EU 26 due to the non-availability of the statistical data for Malta.

Source: author, according to: EUROSTAT – epp.eurostat.ec.europa.eu [accessed: 12. 09. 2007]

When both criteria of structure similarity (output and gross value added) are taken together, it becomes obvious that only the Czech Republic, Slovakia and, to a slightly lesser extent, Hungary realise the highest production similarity in to the structure of the EU as a whole what makes them prospective candidates for the monetary union.

CONCLUDING REMARKS

By giving up monetary sovereignty, joining a monetary union is a challenging process the main benefits of which are elimination of the exchange rate risk, price stability and reduction in transaction costs, capital market development and sometimes even improvements in the monetary policy credibility. These advantages prove to be especially important in case of small open economies which are usually highly integrated into international market and are unable to influence their real competitiveness through prices, nor through adjustments in the nominal exchange rate. However, monetary integration denies the opportunity to react to external shocks through exchange rate policy and calls for new economic policy measures in achieving macroeconomic stability.

As far as Croatian readiness for the monetary integration with the EU is concerned, it fulfils the most of the Maastricht criteria and achieves stabile prices

with positive long-term outlook (even with the expected adjustments in the price structure upon EU-accession) and stable exchange rate, though not formally within the ERM II. Long-term interest rates are strongly converging to the EU-level and government deficit just reaches the reference value. The last will probably need the greatest efforts in order to be reduced to the level sustainable even after accession to the EU. In respect of real convergence, Croatia proves to be less successful compared to most of the new EU-member states. A relatively low trade openness and shrinking trade integration with the EU, followed by low share in IIT and prevailing specialisation according to factor proportions, make Croatian trade structure less similar to that of the EU. This is followed by low similarity in the production structure and the composition of gross value added. Regarding the above said, and at least five to six years before joining the ERM II at earliest, Croatia should strongly concentrate on improving structural reforms and adjusting economic policy measures in order to increase real convergence to the EU and achieve a more dynamic economic growth. Apart from structural reforms these should include a variety of horizontal measures aimed at improving international competitiveness through increasing value added in manufacturing, transfer of technology, business network creation with the EU-producers, increasing knowledge intensity in the production and improving business and investment climate, in particular through FDI.

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**JE LI HRVATSKA SPREMNA ZA EMU?: EX ANTE
ANALIZA NOMINALNOG I REALNOG Približavanja*****Sažetak***

Proširenje EU i uspješni proces ekonomske integracije ukazali su na monetarnu integraciju i uvjete za njeno uspješnije djelovanje. Glavni teorijski okvir analize – OVP (Optimalno Valutno Područje) -teorija – predviđa tri važna uvjeta za to – mobilnost proizvodnih faktora, fiskalna solidarnost i trgovinska integracija. Iako nije teorijski utemeljeno, Maastricht kriterij cijene i stabilnost deviznog tečaja, uravnoteženo javno financiranje te dugoročne kamatne stope trebale bi doprinijeti uspješnoj monetarnoj integraciji u EU koja se suočava s među regionalnim razlikama na razini razvoja i vjerojatnosti vanjskih udara. Analiza nominalnog približavanja pokazuje da se Hrvatska približava referentnim vrijednostima EU i da postiže visoki stupanj makroekonomske stabilnosti. Ipak zaostaje za uspješnim novim zemljama-članicama EU u pogledu trgovinske integracije i sličnosti proizvodne strukture, koje su veoma važni pokazatelji dugoročnih prednosti monetarne integracije.

Ključne riječi: optimalno valutno područje, devizni tečaj, trgovinska integracija, EMU, Hrvatska

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