

Real Exchange Rate In Bosnia & Herzegovina (B&H), The Required Adjustment In The Context Of Macroeconomic Stability And Accession To The EU

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1. EXECUTIVE SUMMARY

The currency board arrangement in B&H ensures that the currency of B&H, 'Konvertibilna Marka-KM', is at any moment exchangeable for the EURO at a predetermined and fixed ratio of 1.9558 KM to 1 Euro. The currency board arrangement as such ensures the stability of the local currency. However, the arrangement has been and is still the topic of a much debate. While one group of arguments stresses that giving the tool of monetary policy to B&H politicians would be dangerous, which is truly the case when financing growth through inflation has been proven to bring a dangerous inflation-devaluation spiral in many developing countries, including the ex-Yugoslavia in the past. For the proponents of this opinion B&H is also too small to have its own currency and benefits the most from having a strong adopted currency, and therefore the currency board provides a much desired exchange rate stability. On the opposite side is the group which argues that due to the fact that the currency board arrangement takes out of the Government's hands the monetary policy it costs the B&H real economy underperformance in terms of underemployment and economic growth. Presenting the currency board arrangement as an obstacle to the achievement of economic growth and higher employment is an oversimplification of the way that various economic variables interact and the way that economic balance (equilibrium) is achieved, both in the internal goods and labor markets and the external account of B&H.

In this paper we adopt a model which allows us to take account of the way that internal and external balance is reached and in this context analyze alternative policy options available to the government in solving current macroeconomic imbalances.

We also show using the framework of small open economy macroeconomic model that despite of the position that you might take with respect to the appropriateness of the current nominal exchange rate regime, the currency board arrangement is endangered if corrective actions are not immediately taken. Guarantees that the CBBH provides in promising to exchange KM to EURO at a fixed rate do not present a problem when the foreign currency reserves are sufficient. Exports earn foreign currency while imports deplete the foreign currency reserves in the country, foreign currency also enters the country through transfers, grants, remittances, or foreign capital flows into the country, but with the current trend of decrease in the later and the large current account deficit which stands at a 60% of GDP at the moment, the pressure on the currency board arrangement will increase, endangering its very existence. In this study we look at the problem that B&H is facing given the Currency Board (CB) arrangement in the context of the desired achievement of macroeconomic stability (as a necessary condition for EU accession) and economic growth. We evaluate the alternative policy actions that are available to the government and evaluate which policy option achieves these objectives in the best way using the standard small open economy framework which is built on a well-known Dornbusch's (1983) open economy model.

We evaluate two extreme options: (a) abandoning the currency board and (b) retaining the status quo. Both of these options, as we show by the outcomes of our econometric analysis using the adopted framework, fail to achieve desired objectives of currency stability coupled with macroeconomic stability, which is required by the criteria of an accession into the EU. We show that a third option, and an optimal policy option in the context of the adopted framework and the criteria of achieving both currency and macroeconomic stability, is the way of retaining the currency board arrangement coupled with structural changes in the labor market (making labor market more flexible and increasing the mobility of labor) and at the same time working on improving the investment climate, which will ensure that B&H becomes competitive enough to attract increased investment and in turn bring macroeconomic stability. We also show that these structural changes are necessary for achieving desired macroeconomic objectives even if the country chooses any other policy option if it is ever to achieve the long run internal and external balance and argue that short term fixes are therefore not available for B&H as may be true for any other economy. As such strong evidence is presented for the optimal policy option we urge for the relevant reforms to be done speedily in order to avoid much worse economic crisis if B&H does not perform the required actions in time. As situations in a number of countries that have experienced serious financial and currency crisis in recent history show, outcomes of such crises, if they occur, are devastating in terms of real economic losses. As we will show, under the present circumstances B&H has only one effective way in order to achieve the desired objective of macroeconomic and currency stability and avoid the crisis¹ from happening.

¹ The crisis here refers to the currency and financial crisis which can result in large real economic losses of lost employment and purchasing power that are likely result of speculative attack on the currency.

2. INTRODUCTION

European leaders have given January 2006 as a starting date for the negotiations with Bosnia and Herzegovina (B&H) on its accession to the EU. The path towards accession of B&H to the EU requires compliance with the number of clearly specified criteria² on economic performance. One group of criteria specifies the conditions to be fulfilled in order to join the monetary union and introduce the euro as its currency. These conditions are known as convergence criteria³ and entail, in brief: low inflation, a stable exchange rate, sound government finances and low interest rates. In addition, the country's central bank legislation must satisfy certain requirements.

B&H, with its current monetary arrangement of a currency board⁴ satisfies the requirement of the stable exchange rate. The reported inflation rate in the period 2001 to 2004 in B&H was significantly lower than in the Euro zone in 2002 (Central Bank of B&H, 2005: 22) and if continuing on this path B&H is likely to satisfy the accession requirement of low inflation. Even with respect to total external debt condition of it being less than 60 percent of the GDP, B&H with its reported total external debt in 2004 of 4,25 billion KM in relation to the GDP of KM 12,98 billions – a percentage rate of 32,74 - falls within this criteria. CBB&H also reports the government finances to be in surplus

²Please see Appendix B for the information on the Copenhagen Criteria.

³ Please see Appendix C for the detailed description of the convergence criteria.

⁴ The CBBH (Central Bank of Bosnia and Herzegovina) CBBH started its operations in August 1997. The CBBH conducts monetary policy through a currency board arrangement. The konvertibilna marka (convertible mark or BAM) – the national currency was introduced in 1998. The BAM is pegged to the euro, and the CBBH has dramatically increased its reserve holdings. This arrangement has enabled control over inflation, which is in the range of up to 1% and holding steady.

for the first two quarters of 2005. Nevertheless, the appropriateness of the policy of the currency board arrangement has been widely debated, especially with respect to its ability to solve the current macroeconomic imbalances in terms of high unemployment and large current account deficits.

The appropriateness of the exchange rate, under the real exchange rate misalignment approach, is determined by the criteria of whether the current level of the exchange rate is appropriate given the level of the exchange rate that is associated with the equilibrium situation⁵, which is defined in terms of the goods and labor market equilibrium and the

⁵ The nominal exchange rate (which is fixed under the currency board) is an important vehicle which adjusted for the relative price levels in the home country (B&H) and foreign countries, results in a real exchange rate, which is the important transmission mechanism in the economy, that adjusts on the way towards internal and external equilibrium. The real exchange rate, which is associated with the equilibrium, is called equilibrium real exchange rate and is determined by the real economic variables found in equilibrium. The direction of real economic variables required to achieve the sustainability carries the danger of the current real exchange rate (given by the fixed nominal exchange rate and the domestic and foreign price levels) being above the one required by the level required by the new conditions of real economic variables, which is called real exchange rate overvaluation. In this case the fixed nominal exchange rate can not act/ adjust (devalue) to bring the real exchange rate towards the equilibrium real exchange rate and in the absence of devaluation as a policy tool the adjustment of the real exchange rate has to happen through the adjustment in the relative prices (labor and goods) which due to the existence of current market rigidities prolongs the situation of RER misalignment, which results in serious real economic losses with dire social implications.

The currency board arrangement therefore raises an important question of the appropriateness of the current nominal exchange rate level, especially in the absence of the flexible structure of labor markets, which would enable the adjustment towards equilibrium real exchange rate via adjustment in prices of labor and other inputs in the situation of real exchange rate misalignment. By adopting the analytical framework of the small open economy model of Montiel (1999) in which the real exchange rate is an endogenous variable which adjusts on the way towards internal and external equilibrium, we use the observed real exchange rate and fundamental variables to calculate the Equilibrium Real Exchange Rate (ERER) using the single equation reduced form approach under the assumption of Real Exchange Rate (RER) eventually converging to ERER (Kaminsky, 1988).

The fundamental determinants of terms of trade, openness of the economy, relative productivity differential between the home country and the trading partners, share of investment in total consumption and trade balance are related to the real exchange rate to arrive at the cointegrating relationships. Under the assumptions of super-exogeneity of estimated parameters to the shifts under consideration, the parameters from the cointegrating equation are combined with the sustainable level of the fundamental determinants of ERER as defined by sustainability criteria, to arrive at the ERER level that defines a sustainable economy under this level of variables and comparing it to the current level of RER we see the level of adjustment in RER required in order to achieve the equilibrium. Given the estimated level of adjustment in RER that is required to achieve equilibrium we discuss the alternative policies and evaluate them in terms of adopted criteria.

In the small open economy models of Edwards (1989), Stein (1995) and Montiel (1999), which build on the well-known Dornbusch (1983) open economy model, the real exchange rate, which is represented by the relative price of traded to nontraded goods expressed in domestic currency, adjusts on the way towards equilibrium, to bring about internal balance (in terms of the goods and labor market) and external balance (in terms of sustainable current account deficits) (Kemme and Roy, 2002). This real exchange rate, which is associated with internal and external equilibrium, was termed as equilibrium real exchange rate (ERER) in the seminal work by Nurkse (1945).

The equilibrium real exchange rate is associated with the sustainable level of the fundamental economic variables that are found in equilibrium and change in these variables will cause the change in ERER. By attempting to determine this ERER given the desired change in fundamental economic variables as required by the requirement of macroeconomic stability quantify the real exchange rate adjustment required to bring economy towards equilibrium. The way that desired change in macroeconomic variables affects ERER

external balance being sustainable, which on the other hand is determined by the condition of the real economic variables found in equilibrium such as terms of trade, relative sectoral productivity between the traded and non traded sector of the economy, level of indebtedness, the current account deficit, the level of openness of the economy and proportion of investment in total consumption. (Atiqur Rahman and Abd. Basher, 2002) The exchange rate that is important in bringing this equilibrium, however, is the real exchange rate, which is the exchange rate adjusted for the relative price levels in the B&H economy and those of its trading partners (RER) which ultimately shows the level of competitiveness of B&H in relation to the world. It is this real exchange rate that is the single most important transmission mechanism in the economy, which adjusts on the way towards equilibrium. The theory argues that real exchange rate equilibrium is reached irrespective of the nominal monetary arrangement that the country adopts, however, the faster convergence of the real exchange rate towards equilibrium is observed in more flexible exchange rate arrangements, which is due to the fact that the nominal exchange rate can adjust faster to change in the fundamentals compared to the relative price levels

will also provide an important insight on desired policy actions which can move B&H towards faster achievement of internal and external equilibrium.

The nominal exchange rate regime is assumed to be irrelevant in ERER determination but the nominal exchange rate regime does determine the possible mechanisms of adjustment to the RER and the speed of convergence to the ERER, with flexible exchange rate mechanisms being associated with the faster convergence of RER towards the ERER. Under the fixed exchange rate regime the external disequilibria are not automatically corrected through the changes in RER that would happen by an adjustment to the nominal exchange rate and has to occur through the adjustment in the relative price levels. This is the reason that currency board arrangement requires sufficient flexibility of wages and prices to bring about adjustment of RER towards equilibrium (Lewis and Šević, 2001).

The divergence between the RER and the ERER is due to the slow adjustment of nominal wages, capital stock and the level of net international indebtedness to their steady state equilibrium level; and/or due to the slow adjustment of the actual real exchange rate to permanent changes in policy and exogenous fundamentals that affect the equilibrium real exchange rate due to market rigidities and imperfections (Kaminsky, 1988); and/or other transitory influences on the underlying fundamentals⁵ affecting the economy (Edwards, 1989; Williamson, 1994). The prolonged deviation of RER from the equilibrium in terms of a real exchange rate overvaluation, can lead to the worsening of the trade balance, speculative attacks, increased foreign debt, fall in the rate of investment, productivity as well as overall growth (Gylfason, 2002). This approach makes the exchange rate policy relevant as nominal devaluation can bring fast adjustment of RER towards its long run equilibrium level. (Isard and Faruqee, 1998) It therefore follows that nominal devaluation can follow as a result of RER overvaluation and is seen as an equilibrating move since it brings the economy closer to its long run equilibrium. (Edwards, 1989) In the ideal situation countries with larger nominal exchange rate devaluations should have larger RER overvaluation.

due to market rigidities and bring the real exchange rate to a more depreciated level, which makes domestic goods cheaper relative to the foreign goods and should lead to the lowering of the current account deficit.

This adjustment of real exchange rate in the case of the fixed nominal exchange rate arrangement, like the currency board, has to happen through the adjustment in the price levels in B&H, which can take a long time and prolong the situations of real exchange rate misalignment. This is the reason that currency board arrangement requires sufficient flexibility of wages and prices to bring about adjustment of RER towards equilibrium (Lewis and Šević, 2001). Situations of real exchange rate misalignment can occur due to rigidities in the market which under the current labor market rigidities in B&H is likely to occur and is proven by the large grey economy proportion, with investors unwilling to comply with the current expensive labor law requirement. In a situation like this where real exchange rate misalignment is likely the real economy losses can be prolonged and devastating, which is also consistent with the B&H economic reality.

If the equilibrium real exchange rate calls for a more depreciated real exchange rate and the adjustment can not happen through the nominal exchange rate due to the fact that this rate is fixed and at the same time relative prices can not adjust due to labor market rigidities then a situation of the misalignment exists and presents a problem for the country as prolonged situations of misalignment have been associated with the ensuing currency and financial crises developing which also entails even bigger real economic losses of lost employment and purchasing power. (Edwards, 1989)

In order to enable us to analyze the B&H situation in the context of the appropriateness of the current real exchange rate level given the current real economic variables we adopt the small open economy model framework which is based on the Montiel's(1999) extension of the well-known Dornbusch's model. (please see Appendix A for a detailed description of the model). In this context we show that given the current situation of the real economic variables in B&H there is need for an adjustment in the real exchange rate as the smallest reduction in remittances and grants calls for a very large devaluation which at current rigidities in the labor and internal goods markets can not happen fast enough to prevent the crisis from developing and in order to maintain the external balance. In this situation where all of the evidence points of this danger, including the CBBH Chairman's statements⁶, and the latest World Bank report (2005) on B&H there are only limited choices available to B&H. We evaluate the

- 1) Status Quo
- 2) CB with the required structural adjustments (mainly reforms to bring more flexibility to labor market)
- 3) Abandoning the CB and opening the way for monetary policy.

The framework in which we evaluate these options is the outcome that each one of these policy options will have on macroeconomic stability (defined here as achievement of

⁶ In the words of the ex-Governor of the CBB&H Peter Nicholl (2001), the current conditions of fundamental variables in B&H, especially the external balance, present the challenge for maintainability of the currency board in the case that official capital flows be reduced as the achievement of the external balance in that case would be impossible unless the important structural changes occur to attract the foreign investment flows that would finance the current account deficit and keep the external balance. At the same time, the currency board arrangement carries with itself certain limitations with respect to the policies available to the Government in bringing economy towards internal (goods and labor market) and external (defined in terms of sustainability of the current account balances) equilibrium.

internal and external equilibrium), and stability of the currency - which are both requirements of EU accession criteria and all this being evaluated in the context of the likely trends in variables under the EU accession that affect the open economy macroeconomic model in which RER is the endogenous variable that adjusts on the way towards equilibrium. The way that the model assumes equilibrium happens is presented in an appendix A as our objective is evaluation of policy option performance in this framework rather than presentation of the theoretical and econometric tools used in our analysis. Nevertheless, these models are very well established and accepted in the literature in the field of international macroeconomics.

Our framework therefore includes the criteria which are at the core of the EU accession process and concrete application of B&H data in order to evaluate the alternative policies' effectiveness in achieving these objectives as well as certain episodic evidence and theoretical support for our argument which is based on the standard literature in the field of international macroeconomics.

We proceed to show that given the current situation of the real economic variables in B&H and the currency board arrangement, B&H has a problem of a likelihood of an economic crisis developing which could bring the economy to a more difficult situation than currently exists unless the necessary structural reforms are undertaken on time. This problem is exacerbated in the context of the desired movement in the real economic variables in the context of the B&H accession into the EU. We develop a framework of analysis in the following sections which allows us to evaluate the available policy options

in achieving the desired macroeconomic objectives in the context of the accession. The adopted framework and these well established criteria enable us to evaluate the alternative policy objectives and comment on which policy option is optimal in bringing B&H to these goals. Finally, we conclude and recommend the desired actions by the relevant parties based on our finding related to the identified optimal policy option.

3. PROBLEM DESCRIPTION

The biggest danger of the currency board arrangement, which guarantees the convertibility of the local KM to Euro at a fixed rate, is that this monetary arrangement rests on the ability of the country to sustain large enough foreign currency reserves to honor this promise. The large current account deficits of B&H are currently financed by grants, remittances and foreign capital inflows, however, in the long run in the absence of these inflows the currency board arrangement would come under tremendous pressure as its sustainability would come in question if exports as the only source of foreign exchange are not sufficient to cover the demands for the foreign currency likely leading to pressures to devalue the currency. The question therefore becomes whether B&H would be able to sustain the currency board arrangement long enough in order to successfully integrate into the EMU.

The current situation of the real economic variables in B&H, analyzed in the context of the role that the real exchange rate (which is simply the nominal exchange rate adjusted

for the price levels at home and abroad) has in bringing the internal and external equilibrium in the economy (which ultimately have to be achieved) indicates that in B&H the slightest reduction in the grants and remittances call for a very large real exchange rate devaluation. Given the fact that the real exchange rate adjustment can not occur through the nominal exchange rate devaluation as nominal rate is fixed as part of the current monetary arrangement, if the adjustment through the relative prices can not happen fast enough due to the market rigidities the situation is likely to result in currency and financial crisis and entail large real economic losses. (Edwards, 1989) Figure 1. shows the currently observed real exchange rate⁷ and the level that this real exchange rate has to be at if there is reduction in current account deficit by the amount of remittances only (ERER in Figure 1.), which still leaves the current account deficit at 30% of GDP in 2005 that is still considered very high.

This problem is only exacerbated if the desired level of the real economic variables, in this case in the context of the direction in which they will have to move as a result of the process of the B&H accession into the EU, is taken as their desirability criteria. The lowering of the level of the foreign indebtedness or the increased payments required to be made in way of the repayment of the foreign debt and decline in the current account balance to a sustainable level, which by certain authors is defined as below 5 percent of GDP (Atiqur Rahman and Abd. Basher, 2002) would require a much larger devaluation in the real exchange rate, therefore there exists an even worse situation of real exchange rate misalignment if we observe desired level of real economic variables in the context of the accession of B&H as a result of accession into the EU (see Figure 1. ERER-EU).

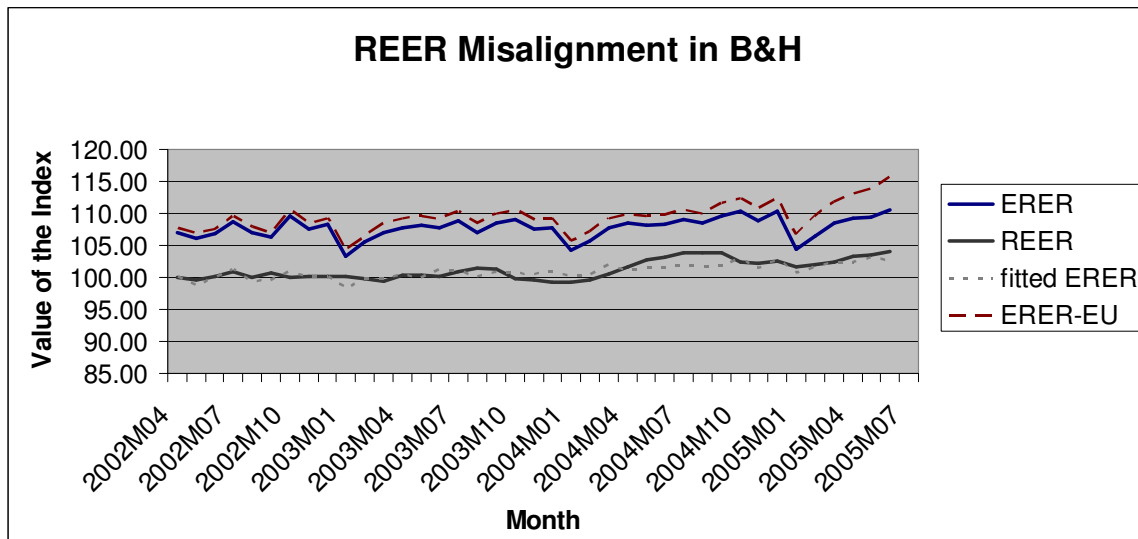
⁷ This is RER calculated by the CBBH which is defined in Appendix A in more details.

The level of misalignment of RER when we compare RER to the equilibrium level of real exchange rate when taking into consideration the required adjustments in the context of macroeconomic stability and accession to the EU (given by EREER-EU) indicate misalignment of 12 % in July 2005. We suspect that indicated level of the misalignment in both cases is much higher as we might not capture the true nature of the long run relationship between the fundamentals and EREER due to the limited length of the sample available for B& H and somewhat unique situation of continuous high current account deficits during the whole of the estimation period. It follows that the estimated sensitivity of real exchange rate to resource balance variable is underestimated and is likely to be much higher so that the current size of this relationship obscures the actual pressures that would exist in the absence of the capital flows that supported dibalances in resource balance variable during the length of the sample. We expect that the pressure on RER is much higher and that EREER is at much more depreciated level than we can capture with the existing data for B& H.

The real exchange rate adjustment has to eventually happen, as it has been shown by numerous crisis that have occurred as a result of the real exchange rate misalignment, the recent biggest one being the East Asian Economy crisis of 1997. In those countries the current account deficit, being at much lower level than in B&H, was unsustainable due to unsustainability of the volatile portfolio capital flows which financed these deficits. In the case of B&H the issue of unsustainability of the current account is not in question and results in such a drastic indication of the desired shift in the real exchange rate. Therefore, the required adjustment in RER is necessary and it has to happen through the

prices of labor and goods if pressure on CB arrangement is to be reduced and further real economic losses arising from RER misalignment are to be prevented.

In B&H there are parties that argue that the macroeconomic balance can be reached by abandoning the currency peg. At the same time there is not enough urgency in taking any measures in reducing the existing imbalances by the Government. The alternative solutions for this situation can however be evaluated only in the context of how each solution performs on the adopted criteria of achieving the macroeconomic balance which is one of the most important accession criteria and this is the subject of the next section.



Note: Higher level of the RER index indicates more depreciated level, that is increase in index indicates RER depreciation. Misalignment is given by the gap between the REER and EREER. Higher level of the index indicates more depreciated level required by EREER compared to observed REER, indicating situation of RER overvaluation (misalignment).

Figure.1 Real Exchange Rate (RER) of B&H versus the Equilibrium Real Exchange Rate (ERER); Misalignment – B&H (given as the gap between real exchange rate and ERER) Two Step Engle-Granger (1987) Cointegration and Error Correction Mechanism

4. POLICY OPTIONS

In this section we evaluate the alternative policy options in the context of the adopted analytical framework of small open economy model of Montiel (1999) described in appendix A. The policy options evaluated are 1) the status quo, 2) the abandoning of the currency board arrangement and releasing the way for monetary policy⁸, 3) retaining the currency board arrangement while ensuring that adjustment in RER happens by creating more flexible labor market.

4.1. Maintaining the status quo

If the current situation is maintained without the necessary actions to correct for the imbalances, given the market rigidities and currency board arrangement, B&H risks severe economic crisis occurring. In Figure 1. we see that current situation of macroeconomic variables is associated with RER misalignment which could lead to a speculative attack on the currency (Mulino, 2002) Even the proponents of abandoning the currency peg would not like to see this happen through this situation as a currency crisis leads to horrendous economic losses in terms of lost employment (Gylfason, 2002). In terms of the framework adopted the status quo is not maintainable and the real economic costs that B&H is paying due to the current situation are a strong support that maintaining

⁸ The term *monetary policy* refers to the actions undertaken by a central bank, such as the Federal Reserve, to influence the availability and cost of money and credit as a means of helping to promote national economic goals.

the current situation is not an option. These losses are so large and obvious that do not require their quantification.

It is not our objective to be prophet of the impending crisis but we are afraid that there is not enough understanding of the seriousness of the situation in which B&H is currently. Nonetheless, recent statements of the CBBH governor speak of the presence of the voices that realize that the current situation is not sustainable without necessary structural reforms. In the words of the ex-Governor of the CBB&H Peter Nicholl (2001), the current conditions of fundamental variables in B&H, especially the external balance, threaten the maintainability of the currency board in the case that official capital flows be reduced. If this happens there is external imbalance and the currency board is threatened. The only solution for currency board to stay in place is to conduct important structural changes in order to attract foreign investment flows that finance the current account deficit and keep the external balance. So there is recognition of this problem that dates way back by the parties responsible for managing the currency board arrangement.

4.2. Abandoning the peg

There is quite often suggested the option of abandoning the currency peg, whose proponents often present it as the solution for the current macroeconomic imbalances (for example recent article in BH Dani, December 16, 2005), and might be wrongly understood by some that the currency board arrangement is to blame for the prolonged economic pains of the country. This option indeed has a positive effect in the ability of

the government to use the cost of money and credit as a means of helping to promote national economic goals, however in the context of the macroeconomic analysis which serves as our framework it fails to achieve the desired macroeconomic balance together with currency stability and even for the macroeconomic balance to be achieved it still can not work without the structural reforms being conducted.

We evaluate this option in the context of our adopted small open economy framework. In the context of the required macroeconomic adjustment the abandonment of the currency board arrangement allows for the nominal devaluation which can bring real exchange rate devaluation and allow the real exchange rate to adjust to the required level. This adjustment however, is only short lived in nature according to strong episodic evidence from a large number of developing countries (Edwards, 1989) and that is exactly the reason why the nominal exchange rate arrangement is considered irrelevant in the theory of long run equilibrium real exchange rate. The reason is that nominal devaluation usually leads to very fast adjustment in the price levels in the way of increased prices and inflation which leaves the real exchange rate unchanged in the long run. (That is RER remains at the same level in Figure 1. and does not move towards ERER, which is necessary in order to achieve internal and external equilibrium). The only way that nominal devaluation can contribute towards bringing economy closer to equilibrium is if it can bring fast adjustment in other real economic variables before the adjustment in the relative price level occurs. The experience of the large number of developing countries in the study conducted by Edwards (1989) however suggests that nominal devaluations were ineffective in bringing the economy closer to equilibrium in the long run; and to

make things even worse the nominal devaluation risks the dangerous phenomenon of inflation-devaluation spiral to develop which is difficult to brake and would bring much worse economic condition than B&H presently has. The solution risks giving only a short relief to the country and does not induce the real structural changes needed to occur on the way towards equilibrium. It is simply not good enough as it brings too little in the way of resolution and brings much higher risk of worsening the current macroeconomic picture.

4.3. Maintaining the currency board arrangement and performing the required structural adjustments

The adopted small open economy framework shows that adjustment in real economic variables, in addition to structural adjustments that allow the relative price level between B&H and its trading partners to move in favorable direction are the optimal way to bring the long run macroeconomic balance. Since the benefits of the currency board arrangement for the small open country like B&H are obvious in the way of the exchange rate stability, this policy option allows the country to fulfill this criteria of an EU accession and still achieve the objective of the macroeconomic stability. The evidence from Estonia, Lithuania and Bulgaria speaks in favor of this argument as currency board arrangement in these countries has provided both results of monetary stability and economic growth⁹ (EBRD, 2005).

⁹ Estonia has CB since 1992. It had inflation of less than 5% and 6-7% annual economic growth since 1999. Lithuania has CB since 1994; inflation less than 2% and growth 6-9% from 2000. Bulgaria has CB since 1997. Inflation less than 10% and 4-5% economic growth since 1999. (EBRD, 2005)

The required structural adjustments that are necessary for the macroeconomic adjustment to occur concern the actions that will ensure more flexible labor markets, the actions that will ensure enforcement of the rule of law in the area of the bankruptcy procedures and other legislation that protects foreign investors in B&H which will both lower the relative cost of doing business in B&H and make B&H more competitive, and by that encourage foreign investment and lead to higher employment and move the economy towards full employment. Despite the large unemployment in B&H, labor remains expensive in B&H due to large obligations that the employers have to pay in the way of pension and healthcare contributions (World Bank, 2005). This encourages the employers to function outside the system and if B&H is to become more competitive, the reform of the pension and healthcare system is a precondition to reaching a long run macroeconomic balance. The changes to these systems have been in the pipeline for a long time (World Bank, 2004) but there is no much discussion on this in the public arena.

On the other hand, the legislation on foreign investment is quite favorable¹⁰ allowing the same treatment of the foreign and local investors. However it is much to be desired in the

¹⁰ B&H have implemented wide – ranging reforms to open its economy to more foreign investments.

Most important initiatives are:

Liberal State Foreign Investment Policy Law: The law accords foreign investors the same rights as domestic investors. Investors are also protected from changes in laws regarding foreign investment. Should the government make changes, the investor may choose the most favorable set of rules to apply. The law prohibits expropriation and nationalization of assets, except under special circumstances and not without due compensation. The law treats foreign investors the same as domestic investors with respect to bidding on privatization.

Under the State investment law: a foreign enterprise has the same rights as a Bosnian enterprise or citizen. Consequently, foreign entities can establish and own business enterprises with the same rights as domestic entities. In the Federation a company is exempt from profit taxes for the first five years in proportion to the foreign stake in the total capital of the company if the foreign investment is at least 20% of equity. The entities are currently in the process of revising profits and income tax legislation.

B&H Foreign Investment Promotion Agency (FIPA): provides some assistance to foreign investors, but is constrained by limited staff and budgetary resources.

Source: 2005 Investment Climate for B&H, U.S. Department of State, www.state.gov

area of law enforcement¹¹ which are very important as a way of protecting the foreign investors. It is very important that B&H proceeds to ensure the enforcement of the rule of law in this area and ensure expediency of the legal system as this will ensure that B&H attracts sufficient funds that will finance its economic development. Increased productivity through the increase in investment and higher employment eventually cause the equilibrium real exchange rate to appreciate and therefore release the currency board from the current pressure. In Figure 1. EREER moves closer to the current RER, which is a movement towards the macroeconomic equilibrium in the context of our adopted framework.

The reforms that are required in the area of labor market and pension and healthcare systems are painful but unavoidable, and it would be very beneficial that this becomes the topic of larger public debate as only these structural changes will bring the desired results and they have to occur irrespective of the nominal monetary arrangement adopted. This has been shown by analyzing the episodic evidence from a large number of developing countries. (Edwards, 1989)

¹¹ Complex legal and regulatory framework: Under The Dayton Constitution, the establishment of governmental structures at the State and entity levels created multi-tiered legal and regulatory framework that is often duplicative and contradictory. Simplifying and streamlining this framework is essential to improving investment climate.

Non-transparent business procedures: The myriad of state, entity and municipal administrations creates a heavily bureaucratic system that lacks transparency. All three levels of government establish laws and regulations affecting businesses, creating redundant and inconsistent procedures that encourage corruption. Often it is impossible to know all of the laws or rules that might apply to certain business activities.

Weak judicial structures: B&H legal/judicial system provides no means for quick resolution of commercial disputes. While a legal framework for bankruptcy has recently been established, commercial courts are still in their infancy. The outlook of BH commercial court system is positive; it does not yet provide a speedy mechanism for the resolution of commercial disputes. The World Bank estimates an average of 330 days for the enforcement of commercial contracts.

Protection of Intellectual Property Rights: The B&H government does not adequately enforce intellectual property rights (IPR). Source: 2005 Investment Climate for B&H, U.S. Department of State, www.state.gov

In the absence of these adjustments being done in time, B&H risks the situation of currency crisis happening along the way, which is usually associated with the financial system crisis and tremendous losses in the living standards of its citizens. Thinking that this situation can contain itself until B&H is adopted into the Euro zone is far too optimistic as other macroeconomic criteria called for under the accession into the EU exert far too much pressure. In Figure 1. this is shown by EREU-EU being at even more depreciated level compared to the current RER. This pressure is too much to be contained unless the domestic politicians are betting that the political costs of the economic crisis in B&H are too large to risk for the international community so that they finance the current macroeconomic imbalances forever. The only question that remains for the international community in this case is whether it will prefer imposing continued burdens on those currently disadvantaged by B&H's economic circumstances, or impose losses on the parties responsible in the political arena who are costing society these pains by not taking desired policy actions.

5. CONCLUSION AND RECOMMENDATIONS

In this paper we have shown that Real Exchange Rate Misalignment exists in B&H when sustainable level of fundamentals is considered. Since RER is the single most important transmission mechanism that adjusts on the way towards achievement of equilibrium of goods and labor markets (termed as internal equilibrium) and external equilibrium (sustainable current account balances) the prolonged situation of RER misalignment

under the RER misalignment approach can result in serious misallocation of resources and real economic costs . We evaluate the policy options available to correct for this RER misalignment and show that maintaining status quo and abandoning of the currency board have high costs even without considering the desirability of the currency board arrangement from the point of satisfying an important condition of exchange rate stability as required by the convergence criteria. Even more importantly, both of these policy options fail to achieve macroeconomic balance, since they do not induce the required structural adjustments needed to achieve that balance.

The long-run macroeconomic stability is only achieved through structural changes required to introduce flexibility to the labor market so that adjustment can happen through relative prices of labor and goods. Structural adjustment is a necessary condition even if the currency peg is abandoned and therefore the abandoning of the CB would not make these reforms avoidable but it does bring danger of monetary instability developing as the short term gain achieved by the nominal devaluation is much outweighed by loss of price stability, exchange rate stability and the potential of a dangerous inflation-devaluation spiral being set into motion if inflation is used to finance budget deficits. Therefore, the only viable option for B&H is increased labor mobility through pursuing of the reforms that are already developed under the World Bank umbrella together with maintaining of the CB arrangement. The passing of the required legislation to restructure the labor market and reduce the currently highly expensive cost of labor due to costs of high contributions for pension and disability and healthcare insurance should be the Government priority. At the same time enforcement of the laws that will ensure the rights

of the foreign investors and create an environment conducive to investment is another priority of the Government if B&H is to avoid the currency crisis and if it is to achieve the macroeconomic stability which is required as a condition for its much wished for accession to the EU.

Government needs to advocate the reform of labor market and enforce the rule of law with respect to bankruptcy and other legislation that will protect investors and create better investment climate as a way towards achieving better economic performance.

Our econometric model (applied in Appendix A.) was useful in the way that it has proven that given the current situation of Current Account balance and other fundamental determinants we see that there is RER misalignment in B&H, the magnitude of which is increased if we assume the likely direction of movement in variables as a result of B&H accession into the EU. To correct for this misalignment and achieve equilibrium, RER has to depreciate. The way to do this through nominal devaluation with inflation leaves RER same and achieves only short run benefits, leaving long term problems remaining. The status quo and associated prolonged RER misalignment cause a danger of speculative crisis, the cost of which, if it develops, is large in terms of real economic losses of lost employment.

The only way to take is therefore the structural adjustment that allows RER to depreciate through labor market adjustment and other changes that reduce the risks and costs of investment in B&H and therefore conditions for creating long term macroeconomic

sustainability while maintaining the CB arrangement. Policy has to be in this direction, and urgently. B&H has limited time to make this work and short term fixes will not work. Cassandras always speak of doom, but sometimes they are right. All the recent currency and financial crisis speak in favor of this argument.

We know that a currency crisis, when it happens, does not leave much room to contain the situation without causing serious real economic losses. For B&H to avoid the crisis, the long term solution is one that succeeds in maintaining the Currency Board to the moment of accession to the EU in combination with a public policy that will put priority on painful labor market reforms. These concrete steps that will make investment in B&H and B&H goods relatively more competitive are the optimal way to solve external balance and internal balance in the B&H economy.

Our argument for the reform of the labor market comes at a time when B&H has lost US\$108 million in World Bank funding due to slow reforms, one of which is the reform of the social sector (Second Social Sector Structural Adjustment Credit (SOSAC II)), which was supposed to reduce the currently high share of social sector spending within overall public spending and then move on to pension system reform. The World Bank (2004) report speaks in support of our argument, identifying labor market rigidities which reduce labor mobility as a cause of firms not being able to respond to market pressures by restricting layoffs and encouraging labor hoarding through a costly 'waitlist' system.

Three adjustment operations have already been undertaken that supported policy and program reforms in social protection and labor markets.

Technical assistance from the Netherlands and Japan helped to design and implement a new pension law and additional reforms. PFSACII deepened pension reforms with particularly strong measures. The SOSAC built on work initiated under PFSACII, focusing primarily on reducing labor market rigidities, including elimination of the waitlist system. SOSAC was accompanied by a Technical Assistance project (Social Sector Technical Assistance Credit, SOTAC) to support design of the follow-up adjustment operation to deepen reforms in labor markets and social assistance. The FY03 SITAP provides technical assistance for longer-term reform of pensions.

The Ministry of Finance and Treasury has on September 22, 2004 presented the implementation of labor market reform as one of the objectives of the Medium Term Development Strategy B&H (PRSP) for the period 2004-2007 and it was proudly presented as the first strategic document agreed to and approved by the B&H authorities without involvement of the international community.

Nevertheless, in March 2005 World Bank withdrew US\$108 million in additional technical assistance due to the slow process of reform in the projects that include the labor market reform and were prepared and initiated upon prior requests and agreement from B&H leaders. The solutions and the concrete steps required in labor market reforms are beyond the scope of this paper. Our recommendation stresses that the relevant BH

authorities realize the urgency of reform in this sector and speedier implementation of the existing reform programs that are being undertaken under the guidance by the World Bank and the other parties involved in this process.

Another important condition for the labor system reform to result in desired boost for macroeconomic performance is a boost of the investment climate in order to stimulate investors to invest and create productive jobs. (World Bank, 2005) Currently B&H has introduced a number of reforms¹² to open its economy to more foreign investments. However, there is much to be desired in the area of their implementation¹³ and expediency of the existing law enforcements. The Government has to move faster in this area too if it is to see the macroeconomic situation improve.

One problem that B&H is facing is the required speed of adjustment. There are no cheap and shortcut alternatives to achieving macroeconomic stability. There is a looming economic crisis if the painful reforms are not done in time, and we have seen that monetary tools alone can not provide long term solution. They may provide a short term fix, which however brings with itself even larger dangers for B&H in terms of possible loss of credibility of the Central Bank which could lead to an inflation/devaluation spiral to develop. The only solution is structural reform that will bring enough flexibility to the labor market and ensuring that the existing laws that were designed to promote the positive investment climate are enforced.

¹² See footnote number 10.

¹³ See footnote number 11.

The strong supporting evidence of numerous developing and accession countries into the EU clearly supports of the need for this to happen, but we have argued that given the currency misalignment, B&H has no time to waste. This is urgent and unavoidable as we have seen that alternative policy options will not spare us from this painful reform.

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7. APPENDIX A

The Analytical Framework: Single Equation Reduced Form General Equilibrium Approach To ERER Determination In Developing Countries

The ERER can be estimated from a single equation relating RER and fundamentals. The single equation relating ERER and fundamentals is a reduced form solution of an unspecified simultaneous equation system of the theoretical models of the likes of Edwards (1989), Stein (1995), and Montiel (1999). The approach rests on the argument that to the extent that the time horizon is long enough, one should expect fundamentals to eventually revert to their sustainable levels and be picked-up by time series-based methods. (Elbadawi and Soto, 1996) The approach also assumes that RER converges to ERER eventually, so that ERER, expressed as a linear function of fundamentals, can be obtained from the actual RER and fundamental variables. (Kaminsky, 1988).

7.1. The Theoretical Model of the Relationship between ERER and the Fundamentals

The single equation which expresses ERER as a linear function of fundamental variables is the steady state solution of some theoretical framework used to model the economy, given conditions of internal and external equilibrium. (Edwards (1989), Stein (1995), Montiel (1999))

The fundamental variables of trade policy, sectoral productivity differentials, share of spending on nontraded goods, external terms of trade and resource balance do not have readily available corresponding economic constructs in reality so that they have to be proxied. We explicitly define the constructs used to represent fundamental determinants of ERER in this text and justify their use based on the existing literature.

The analytical framework of the Montiel's model modified to accommodate features important for small developing countries (Baffes et al.1999) shows that the stock equilibrium concept of external balance in the theoretical model is consistent with a sequence of "flow" restrictions on the trade balance when countries are rationed in international financial markets¹⁴, which allows us to treat the trade surplus as one of fundamental determinants in the empirical estimation of ERER.

The ERER is therefore a vector of permanent values of its fundamental determinants. The fundamental determinants are obtained by solving the theoretical model for condition of internal and external equilibrium. Our theoretical model is based on Baffes et al. extension of Montiel (1999) to accommodate features of small open economies characteristic of B&H.

¹⁴ That is when they face an upward sloping supply curve of external loans. This assumption seems reasonable for small developing economies. See Baffes, et al. (1999: 411-412).

The equilibrium real exchange rate is therefore given by Equation 1:

$$e^* = e^*(g_N, g_T, b, \partial^*, \mu, \varphi, t)$$

Equation 1

The equilibrium exchange rate of a small open economy is therefore a function of government consumption on traded (g_T) and nontraded goods (g_N), trade surplus (b), differential productivity growth in traded sector relative to nontradable sector (μ), transaction costs associated with private spending (∂^*), stance of trade policy (φ) and the external terms of trade (t). Other factors that exert change in any of these variables influence e^* .

In B&H, commercial borrowing and private capital inflow is virtually absent until very recently. Hence external transfer becomes exogenous as basically it depends on long run aid disbursement and short run emergency lending by IMF. Hence, world interest rates and world inflation rates become irrelevant in determining real exchange rate. On the other hand debt service to export ratio has an important implication for real exchange rate. A permanent rise in the ratio will worsen the sustainability of the current account, and thus requires a depreciation of real exchange rate to restore balance.

The postulated effects of change in fundamental determinants of trade policy stance, external terms of trade, composition of government spending, sectoral productivity differentials and resource balance are consistent with the existing literature. The improvement in the external terms of trade, increase in productivity differential in favor of traded goods and increased government consumption of nontraded goods cause ERES appreciation. The relaxation of trade barriers and improvement of resource balance cause ERES depreciation.

The model is consistent with the role of short-run dynamics which arise from wage price stickiness, costs of labor mobility, gradual asset adjustment and other possible frictions not considered that cause real exchange rate dis-equilibrium and provide the role for nominal devaluation to bring adjustment towards ERES consistent with the RER misalignment approach to currency crisis.

The reduced form solution of ERES presented in Equation 1. is the basis of the single equation reduced form general equilibrium approach. Our empirical methodology developed in Section 3 is designed to capture this long-term relationship between ERES and the fundamental determinants using historical data on actually observed RER and fundamental determinants. Since fundamental determinants themselves required in this estimation do not have corresponding constructs in economic reality they are proxied. The constructs used to proxy fundamental determinants are derived from existing practices in the literature.

Empirical considerations require further compromise. First, it is not possible to construct a meaningful time series regarding productivity differential between traded and non-traded goods producing sectors because of data limitations. So we ignore the Balassa-

Samualson effect. Second data on government spending on tradables and non-tradables are not available as such. Government consumption mostly includes non-tradable items. Hence, we take the ratio of government consumption to total government spending to capture the effects of government spending of tradables and nontradables following the methodology of Atiqur Rahman and Abd. Basher (2002).

Unit prices of exports and imports were not available for B&H so we could not proceed meaningfully to construct the external terms of trade, and we ignored this effect. It is also very difficult to have a correct and comprehensive measure of trade policy over a long time series. Hence, like other studies in the present field, we proxy the trade policy by a measure of openness, i.e., the ratio of export plus import to GDP. An increase in this ratio is supposed to be associated with trade liberalization. Thus our list of fundamentals affecting equilibrium real exchange rate includes ratio of government consumption to total government spending, resource balance, openness, and debt service to export ratio.

The proxies for the fundamentals were:

- Trade policy stance is captured by construct of openness measured as ratio of trade volume measure (imports plus exports) to GDP.
- Debt is the ratio of debt service to exports expressed as percentage.
- Government consumption is simply the ratio of government consumption expenditure to total government expenditure.
- And finally resource balance is given by the difference between exports of goods and nonfactor services and imports of goods and nonfactor services. These proxies are henceforward referred to as fundamentals.

The next section proceeds to develop the empirical methodology designed to capture the long term relationship between EREER and fundamentals with an objective of measuring EREER. To measure unobservable EREER from observable variables of RER and fundamentals we rely on features of the theory of EREER, which postulates that RER diverges from EREER only due to short run dynamics so that RER eventually converges to EREER enabling us to estimate EREER using actual RER and fundamentals (Kaminsky, 1988).

7.2. The Empirical Model Of EREER Estimation

The linear relationship between EREER and fundamentals, which is central to single equation reduced form general equilibrium approach, has been adopted to represent either linear relationship between simple transformations of EREER and fundamentals such as logarithms (Elbadawi and Soto (1996), Baffes, Elbadawi and O'Connell (1999), Atiqur Rahman and Abdul Basher (2002), Xiaopu (2002)) or it has been taken to hold at levels

of variables (Lim and Stein (1995), Rajan and Siregar (2002)). The empirical applications that adopt the assumption of linearity under simple transformations often result in mixing of variables that are transformed (i.e. logarithmic transformations of variables) and variables that are taken at levels due to certain fundamentals having some negative observations¹⁵ (Edwards (1989), Tzanninis (1999)). To avoid this problem we follow those studies that assume that linearity of relationship holds at levels, and our empirical analysis therefore studies the relationship between the levels of variables of RER and fundamentals.

Assuming that the relationship between equilibrium real exchange rate and the fundamentals is linear in levels, enables us to express the model of equilibrium real exchange rate by Equation 2:

$$e_t^* = bF_t^* \tag{Equation 2}$$

where, e_t^* is the equilibrium real exchange rate, F_t^* is the vector of permanent or sustainable values of fundamentals, and b is the vector of long run parameters of interest. (Elbadawi and Soto (1996), Kemme and Roy (2002))

To estimate long parameters, b , we need empirical model that is consistent with Equation 2. but relates observable variables.

Since ERER is an unobservable variable, estimation of b in Equation 2 from observable variables depends on two important features of the equilibrium real exchange rate theory: (a) Equation 2 comes from steady state relationship between actual values of real exchange rate and fundamentals so that we can estimate b by relating actual RER and fundamentals, and (b) the steady state is dynamically stable, that is, that the economy eventually converges to equilibrium given any instabilities. The shocks that cause the exchange rate to diverge from its (possibly new) equilibrium in the short run should produce eventual convergence to the relationship in Equation 2 in the absence of new shocks. (Baffes, Elbadawi and O’Connell (1999)).

Translated into stochastic terms the first feature of the theory means that the disturbance term w_t in Equation 3 is a mean-zero stationary random variable.

$$e_t^* = bF_t^* + w_t \tag{Equation 3}$$

where b is the cointegrating vector and w_t is an uncorrelated random disturbance.

The second feature of the equilibrium is captured by general error correction model¹⁶ given by Equation 4 below. (Elbadawi and Soto (1996), Atiqur Rahman and Abdul Basher (2002))

¹⁵ The most common example is the resource balance variable which has negative values and is not logarithmically transformed.

¹⁶ This equation is just re-parameterization of the unrestricted p th order autoregressive distributed lag (ADL) representation of $\ln e_t$. (see Montiel 1999: 417)

$$de_t = a(e_{t-1} - b'F_{t-1}) + \sum_{(j=1,p)} \mu_j de_{t-j} + \sum_{(j=0,p)} \gamma_j' dF_{t-j} + v_t \quad \text{Equation 4}$$

where F_t is the vector of fundamentals and v_t is an independent and identically distributed, mean-zero, stationary random variable. Assuming that all variables are either stationary or I(1) in levels Equation 4 implies Equation 3 and for $-2 < a < 0$ the corresponding ERES is stable.

Here changes in the exchange rate are a function of the difference between the last period exchange rate and the predicted long run value of $b'F_{t-1}$, plus short term period to period adjustments to both the previous period exchange rate and the current and previous period vector of macro fundamentals, n periods in the past. a , b' , n_j and y_j' are parameters to be estimated and v_t is an error term. The equilibrium exchange rate is then the predicted value from this equation based on a given vector of macroeconomic fundamentals, F_{tp} , assumed to be sustainable long run equilibrium values. (Kempe and Roy, 2002)

Equation 4 embodies the central insight of the single equation approach: that the ERES can be identified econometrically as that unobservable function of the fundamentals towards which the actual RER gravitates over time (Kaminsky (1988), Elbadawi (1994), Elbadawi and Soto (1994, 1996). Our econometric work in this paper takes the form of versions of equation (4).

7.2.1. Two Step Engle-Granger (1987) Cointegration and Error Correction Mechanism

Engle and Granger (1987) demonstrated an equivalence between cointegration and error correction for nonstationary variables. In the nonstationary case, therefore, Equation 3, which implies cointegration, also implies that the real exchange rate has a reduced-form error correction representation- that is one that is similar to Equation 4 but with contemporaneous values of the fundamentals excluded. It is this reduced form error correction equation that is estimated in the second step of the Engle-Granger (1987) method in Equation 5. The error correction mechanism allows that short run disequilibrium be treated as “equilibrium error” and used to tie short-term behavior of RER to its long-run value. Therefore, in the second step, lagged residuals from the static regression in Equation 3 can be used in place of the equilibrium error on the right-hand side of a reduced form error correction equation below (Gujarati, 1995:724)

$$de_t = a + bdF_t + cu_{t-1} + z_t \quad \text{Equation 5}$$

where d denotes first difference; u_{t-1} is the one-period lagged value of the residual from regression (Equation 3), the empirical estimate of the equilibrium error term; and z is the error term with usual properties.

The alternative way to obtain parameters b in case of $I(1)$ variables is to obtain it directly from general error correction mechanism in Equation 4 but since general error correction mechanism above requires that the short term parameters and long term parameters are estimated simultaneously, studies which are faced with small samples, including ours, follow the empirical methodology to estimation of cointegration and error correction mechanism provided by the two-step Engle-Granger (1987) procedure.¹⁷ (Atiqur Rahman and Abd. Basher, 2002)

7.3. Calculating ERES

After long run parameters b of Equation 3 are estimated using appropriate econometric tools given unit root properties of the data series estimation of sustainable fundamentals F^* is next step in measurement of ERES. The sustainable fundamentals are then combined with b to arrive at ERES, that is $ERES=bF^*$.

We capture the effect of sustainability of the net capital flows and other fundamentals on ERES in B&H in this step. The estimation of the value of sustainable fundamentals involves some methodological issues. Time series based (or data based) permanent values of fundamentals are by nature of construction of cointegration methodology unable to detect substantial misalignment (Baffes, Elbadawi and O'Connell, 1999:443) We follow the methodology of Baffes, et. al. (1999) in using counterfactual estimate of net sustainable capital flows assuming that estimated long-run parameters of cointegrating equation are invariant to class of distributional shifts under consideration¹⁸ since we consider the net capital flows to be the fastest changing variable influencing ERES.

Compared to the time-series based estimates or ex post approaches which rely on data-generating processes of the fundamentals, counterfactual estimates are ex ante modeling of the fundamentals which are motivated by positive and normative reasons. Positive

¹⁷ The results of the estimation using econometric specification of adjusted ECM proposed by Stein (1995) are only used to check the consistency of the long run parameters b obtained using the two step Engle-Granger (1987) procedure. The results of this technique take second place to those obtained using Engle-Granger (1987) procedure due to assumptions involved in the econometric specifications. The main concern being the introduction of proxy for change in fundamentals through some market measure.

¹⁸ Estimating misalignment using sustainable value of fundamentals is done using time paths for the fundamentals that are not used in estimating long run parameters. This does not pose a problem under super-exogeneity assumption, which holds when the vector of long run parameters in equation $e=bF$ is relevant for assessing the effect of alternative paths for the fundamentals. This assumption is along the weak exogeneity assumption key ingredient of the single equation methodology.

This however requires super-strong exogeneity to hold which requires invariance of the parameters of interest to the class of distributional shifts under consideration. The invariance property is taken as a maintained hypothesis rather than being tested as it is sensitive to the particular class of interventions under study.

Single equation approach can provide fully efficient estimation and inference based on conditional estimation on fundamentals when these fundamentals are weakly exogenous. This condition holds when the parameters that describe relationship of ERES to fundamentals can be directly recovered from the distribution of the real exchange rate conditional on the fundamentals (and the past) and there are no cross-equation restrictions linking the parameters of this conditional model with those of the marginal model for the fundamentals. In this case marginal distribution of fundamentals holds no information to estimating the parameters of interest. Baffes et.al. (1999:421) This assumption is implied in estimation of ERES (e^*) from single equation $e=bF$.

reason for counterfactual estimates is to avoid difficulties faced by the time series decomposition method or moving average in distinguishing persistent but unsustainable changes in the fundamentals from genuinely sustainable changes. Normative reasons lie in answering what would happen if fundamentals were to change. Both of these reasons motivate construction of a path for fundamentals in question which is in line with a plausible notion of sustainability. (Baffes, Elbadawi and O’Connell, 1999)

Since we are interested to test changes in equilibrium real exchange rate if net capital inflows were to change the counterfactual estimation of sustainable level of the capital flows determine the resource balance variable used to calculate EREER. We do this by excluding part of the “unsustainable” net capital inflows used to finance resource balance following the argument by Williamson and Mahar (1998), we differentiate between private direct investment, which tends to be long-term in nature, and liquid private portfolio investment, remittances and grants by excluding 50% of former and 100% of the later from net capital inflows to arrive at the “sustainable” resource balance.

The other fundamental determinants of EREER should also be in their permanent state in equilibrium. In the case of exogenous variables and those that adjust very slowly the time series based estimates of their sustainable values are used.

Time series estimates of sustainable values of fundamentals are obtained using moving average technique along the methodology of Edwards (1994) and Baffes et al. (1999) which use moving averages to estimate permanent values of fundamentals used in EREER calculation. Moving averages technique is appropriate for both nonstationary and stationary variables and avoids presumptions of permanent component and judgmental nature involved in its estimation¹⁹ in series which may be misidentified as nonstationary due to our small sample. At the same time moving average technique allows us to recognize that even stationary variables may have long-lasting movements. If current value of the variable is far from its unconditional mean using moving averages allows the EREER to move in response to current values of the fundamentals even if they are ultimately temporary (Baffes et al., 1999:444).

ERER calculation as “sustainable” RER, which is the fitted RER in which the fundamentals have been replaced by their sustainable values²⁰, enables us to calculate the RER misalignment for B&H.

Given the equilibrium real exchange rate the misalignment can be calculated as:

$$m_t = e_t^* - e_t \tag{Equation 6}$$

¹⁹ Nonstationary series have both transitory and permanent components, with the permanent component corresponding to the underlying stochastic trend. In the case of nonstationary variables sustainable values of the variables are assumed to correspond to the permanent component. This permanent component is estimated by Beveridge-Nelson method which views fundamentals as ARIMA(p,1,q) process. Autoregressive and moving average parts generate stationary fluctuations about an underlying random walk (Beveridge and Nelson, 1981). Movements generated by unit-root are permanent and are extracted as an estimate of the sustainable component of the respective fundamental variable.

²⁰ The equilibrium real exchange rate is then the predicted value from cointegrating equation ($e_t = bF_t$) based on a given vector of macroeconomic fundamentals, F_t^* , assumed to be sustainable long run equilibrium values, $e_t^* = bF_t^*$.

Once the misalignment is calculated we have determined whether the currency is overvalued or undervalued at present and may make statements about the RER misalignment in B&H prior to 2005. (Atiqur Rahman and Abdul Basher (2002), Xiaopu (2002)).

7.4. Empirical Analysis: Estimation Of ERES Misalignment In B&H

In this section we estimate the misalignment of the real exchange rates in B&H at the end of 2004 using the reduced form single equation methodology linking the real exchange rate to a set of fundamental variables (Edwards (1989), Razin and Collins (1997)).

We begin by defining and documenting the sources of data in section 7.4.1. Section 7.4.2 reports results of the time series properties of the data. Section 7.4.3 tests the existence of cointegrating relationship between the fundamentals and data. Section 7.4.4 proceeds to estimate the long run parameters b of the ERES vector ($e_t^* = b \cdot F_t$) using the appropriate econometric tools given the time series properties of the data. Section 7.4.5 calculates the ERES given the sustainable values of fundamentals, where counterfactual estimate of sustainable resource balance given sustainable net capital flows and time series estimates of slower adjusting fundamentals is combined with the estimated parameters b . Section 7.4.6 calculates the degree of RER misalignment as the difference between the ERES estimated in section 7.4.5 and the actual RER.

7.4.1. Definition and Measurement of the Variables

The variables found in the reduced form single equation are the actual real exchange rate (e_t) and the fundamental determinants of the equilibrium real exchange rate (F_t), which include the terms of trade, sectoral productivity differential, openness of the economy, the resource balance to GDP ratio and the investment share.

Real exchange Rate, e (RES)

On theoretical grounds defining the real exchange rate as the relative price of tradable to nontradable goods is preferable. We however experiment with the measure of trade weighted multilateral index of relative price to the general price index as a proxy for real exchange rate, following the literature. (Edwards (1989), Stein (1995), Baffes et. al. (1999)).

We use the multilateral trade weighted index as a measure of RES. The real exchange rate provides the implied measure of external competitiveness of a country relative to another country. In evaluating competitiveness it is necessary to use or construct a broad multilateral index of the real exchange rate, which provides a measure of the degree of

competitiveness of a country relative to a group of its trading partners. (Edwards, 1989:88)

We use the Central Bank of Bosnia and Herzegovina (CBBH) construct of the multilateral index of the real exchange rate which is consistent with the methodology of Edwards (1989: 88) which is represented by Equation 7 below to measure the competitiveness of B&H against her largest trading partners:

$$\text{multilateral RER}_{jt} = (\sum_{(i=1..k)} a_i E_{it} P_{it}^*) / P_{jt} \quad \text{Equation 7}$$

In the above equation the multilateral RER_{jt} is the index of the multilateral real exchange rate in period t for country j ; E_{it} is an index of the nominal exchange rate between country i and country j in period t ; $i=1..k$ refers to the k partner countries used in the construction of the multilateral RER index; a_i is the weight corresponding to partner i in the computation of multilateral RER_{jt} ; P_{it}^* is the price index of partner i in period t ; and P_{jt} is the price index of the home country in period t . An increase in the value of this index of multilateral RER reflects real depreciation, whereas a decline implies a real appreciation of the domestic currency.

In the construction of the multilateral RER indexes the following procedure was followed: 1) The weights used (a_i) were trade weights constructed using data from the CBB&H on the largest trading partners of B&H; 2) The countries chosen were the 9 largest trading partners with whom B&H is achieving the total foreign trade exchange in the amount of about 80 percent those being: Austria, France, Italy, and Germany (from EU), Croatia, Serbia and Monte Negro, Slovenia, Switzerland and Hungary over the period 1998-2005; 3) in all cases the nominal exchange rate (E_{ij}) were implied cross exchange rates between these countries and their trading partners.

The constructed multilateral RER indexes is deflated using the index of retail prices (CPI), published by IFS; except for B&H and Serbia where the data on the retail prices index published for B&H by the CBBH is used, and for Serbia it is National Bank of Serbia.

Openness or OPEN is defined as the ratio of imports (IMP) and exports (EXP) to GDP (GDP) all in current prices: $\text{OPEN} = (\text{IMP} + \text{EXP}) / \text{GDP}$.²¹

²¹ We also experiment with the following variables: OPEN2 is the ratio of the value of imports at current prices (IMPKP) plus exports at constant prices (EXPKP) to GDP at constant prices (GDPKP). $\text{OPEN2} = (\text{IMPKP} + \text{EXPKP}) / \text{GDPKP}$. OPEN3 is the ratio of imports at constant prices to domestic absorption at constant prices: $\text{OPEN3} = \text{IMPKP} / (\text{GDPKP} - (\text{EXPKP} - \text{IMPKP}))$.

Resource balance to GDP Ratio (RESGDP). The value of exports at constant prices (EXPKP) minus the value of imports at constant prices (IMPKP), divided by the GDP at constant prices (GDPKP). Thus $RESGDP = (EXPKP - IMPKP) / GDPKP$.

DEBT is the ratio of debt service to export expressed in percentage.

GOVCON is simply the ratio of government consumption expenditure to total government expenditure.

The data were obtained from two sources: 1) CBB&H, 2) the IMF, International Financial Statistics; 3) the World Bank Development Indicators (WDI), published by the World Bank.

7.4.2. Time Series Properties Of Data Series

Table 1 present the results of the standard Augmented Dickey-Fuller (ADF) (1979) statistics and the Philipps-Perron (PP) test (1988), which are used to assess the unit root properties of the data. The MacKinnon critical values (1991) are reported alongside of the results of the ADF and the PP tests.

Table 1: Tests for Stationarity

	ADF	PP	Decision
RER	-1.11	-1.12	I(1)
RESGDP	-4.32	-4.21	I(0)
OPEN	-4.44	-4.33	I(0)
GOVCON	-1.94	-1.95	I(1)
DEBT	-1.86	-2.42	I(1)

Notes: test assumption includes constant in test equation

For the Augmented Dickey-Fuller statistics (ADF), the MacKinnon critical values are: 1%=-3.61, 5%=-2.94, 10%=-2.60. Critical values for the PP test are: 1%=-3.61, 5%=-2.93, 10%=-2.60. Sample period is 2002:4 to 2005 :7.

The test value of the critical values performed on the variables indicate that the test value is greater in absolute terms than the critical value when the data series are considered stationary. When the test value is less than the critical value the test is performed on the first difference of the data series. If the test value exceeds the critical value then the first difference of the data series is stationary, so that the data series at that level are considered to possess unit root (I(1)).

The results obtained from the standard ADF and the PP test suggest that some of the variables under consideration exhibit unit root properties, that is they are integrated of order one and their first differences are stationary.

7.4.3. Test of Cointegration

Since the relevant data series used in the empirical analysis are nonstationary (integrated of order one) it follows that a cointegrating regression can potentially be formed if the series are found to be cointegrated. Table 2 contains the Johansen (1998) test for the number of cointegrating vectors for B&H.

The Johansen (1988) cointegration imposes a restriction on the reduced form or VAR representation of the joint distribution of the real exchange rate and its fundamentals. (Baffes, Elbadawi and O’Connell, 1999) We use a lag length of one for the underlying VAR system; this is very restrictive even for annual data, but a longer length leaves us with very few degrees of freedom. The null hypothesis for these tests is that the number of cointegrating vectors relating n nonstationary variables is less than or equal to r (where $r < n$). Comparing the estimated likelihood ratios in column 2 to the asymptotic critical values in column 3, we see (row 1) that the hypothesis of no cointegration ($r=0$) can be rejected in favor of at most one cointegrating vector. In row 2, the hypothesis of one cointegrating vector cannot be rejected in favor of more than one. The asymptotic tests therefore indicate one cointegrating vector for B&H at the 1 % confidence interval. (see Table 2). The Johansen maximum-likelihood procedure which tests for the number of cointegrating vectors in Table 2, shows that we have 1 cointegrating vector for B&H.

Table 2: B&H- Johansen maximum likelihood procedure for testing the number of cointegrating vectors

The variable set is (RER, RESGDP, OPEN, DEBT, GOVCON)

Null (1)	Likelihood Ratio (2)	Max. eig. Stat. [99% crit] (3)	Max. eig. Stat . [99% crit] (4)
R=0	0.7499	101.145	88.80
R<=1	0.4713	49.85	63.87
R<=2	0.2961	26.27	42.91
R<=3	0.2210	13.28	25.87

Sample period is 2002:4 to 2005 :7.

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

7.4.4. Estimation of Cointegrating Relationship Between RER and Fundamentals

The existence of cointegration between the variables of RER and the fundamentals suggests that the econometric techniques of Cointegration and Error Correction Mechanism, are appropriate for estimating the relationship between RER and its fundamental determinants.

We estimate the cointegrating parameters, b , in using the two step Engle-Granger (1987) cointegration and error correction methodology (1987).

4.4.4.1 Two-Step Engle-Granger (1987) Cointegration And Error Correction Mechanism Estimation Results

In this section we present the empirical estimation results for the two-step Engle-Granger (1987) Cointegration and Error Correction Mechanism. We first estimate the long run cointegrating relationship by estimating Equation 2 using the OLS technique by relating actual real exchange rate (e) to actual values of fundamentals (F). The results of this estimation are provided in Table 3 for B&H.

$$e_t^* = bF_t^* + w_t \quad \text{Equation 3}$$

The explicit form of Equation 3 tested is Equation 8:

$$\text{RER} = c(1) + c(2) * \text{RESGDP} + c(3) * \text{DEBT} + c(4) * \text{GOVCON} + c(5) * \text{OPEN} + w_t \quad \text{Equation 8}$$

Cointegration implies that the residuals of Equation 3, w_t are stationary, and this restriction provides a test for cointegration²². Table 4 provides results of this Engle-Granger (1987) two-step procedure test for cointegration. There is strong evidence of cointegration in each case, as indicated by the unit-root test applied to the estimated residuals: in each case the calculated values reject nonstationarity in favor of stationarity at standard levels²³.

²² Baffes, Elbadawi and O'Connell (1999) note that estimates of b from the static regression are super-consistent, approaching the true parameters at a rate proportional to the sample size rather than the square root of the sample size; and they remain so even in the absence of weak exogeneity.

²³ Note that the critical values for this test are more demanding than when testing for a unit root in a single variable, since the OLS estimation tends to induce stationarity in the residual. (Gujarati, 1995)

Finally, we examine the short-term dynamics of real exchange rate, e , by estimating an error correction model of Equation 9 where residuals from static regression (w_t) in Equation 3, are used in place of the equilibrium error on the right hand side of the error correction equation to tie short-term behavior of RER (e) to its long-run value.

$$de_t = a + b\Delta F_t + c w_{t-1} + z_t$$

Equation 9

where d denotes first difference; w_{t-1} is the one-period lagged value of the residual from Equation 3, the empirical estimate of the equilibrium error term; and z is the error term with usual properties.

The explicit form of Equation 9 tested is Equation 10:

$$dRER = c(1) + c(2)*dRESGDP + c(3)*dDEBT + c(4)*dGOVCON + c(5)*dOPEN + c(6)*w_{(t-1)} + z_t$$

Equation 10

Table 5 provides results of estimation of Equation 10 for B&H.

We find that the short run effects are generally in the same direction as the long run effects. A crucial parameter in estimation of short-term dynamics is the coefficient of the ERROR (w in Equation 10.) in the second step of the Error Correction Procedure, which measures the speed of adjustment of the RER to its equilibrium level. Importantly, the error term is less than one in absolute terms and statistically significant, hence the equilibrium real exchange rate is stable (Lim and Stein, 1995).

Table 3: Step One Engle-Granger (1987) Cointegration and Error Correction Procedure-Long Run Parameter Estimates : B&H

Variable	Coefficient	t-stat	2-tail significance
Coefficient	98.05	20.86	0.0000
OPEN	10.42	1.50	0.1595
RESGDP	0.12	1.43	0.1416
DEBT	-0.11	-0.47	0.6356
GOVCON	0.01467	0.56	0.5787

Dependent variable: RER

Notes: Adjusted R-Square= 0.5167 ; Durbin-Watson=1.134 ADF (e-bF): UROOT(N,0)=-3.733; ADF critical value 1%=-3.6155; Sample period is 2002:4 to 2005 :7.

Table 4 Results On Engle-Granger (1987) Two Step Procedure For Testing Cointegration

Unit root test of the residuals from the long run relations

Long run equation (4.1)	ADF Test Statistics	Order of Integration
B&H	-3.6155	I(0)

MacKinnon (1991) critical values for rejection of null of no cointegration are -3.62 and -2.94 at 5% and 10% levels respectively.

Table 5 Short Run Dynamics: B&H
(Two-Step Engle–Granger (1987) Cointegration and Error Correction Mechanism)

Variable	Coefficient	t-stat	2-tail significance
Coefficient	0.0780	0.7535	0.4567
ERROR(-1)	-0.2478	0.1166	0.0414
DOPEN	4.4516	1.3768	0.1781
DGOVCON	0.0160	0.3323	0.7418
DRESGDP	0.0426	1.1264	0.2683
DDEBT	0.0748	0.4810	0.6337

Notes: Dependent variable: DRER; Adjusted R-Square=0.056; Durbin-Watson= 1.7096; Sample period is 2002:4 to 2005 :7

Our test statistics of Adjusted R^2 (AR^2) for the Two-Step ECM model indicate higher value of AR^2 for the long-run parameter estimation in step one of the two step ECM model (0.51) compared to that of the second step of Two-Step ECM (0.05), which is consistent with applications of the model to Burkina Faso and Cote D’Ivoire by Baffes et.al. (1999) and China by Xiaopu (2002).

The important factor in considering the volatility of the model is to observe for serial correlation diagnostic since low Durbin-Watson statistic (DW) values accompanied by high R^2 alert to the potential problem of spurious regression²⁴. (Gujarati, 1995: 724) The relatively higher AR^2 values found in step one of Engle-Granger (1987) Cointegration and Error Correction Mechanism (two-step ECM) model are also accompanied by DW test statistic values of less than two as we observe DW to be 1.13. These results are similar to those found in Baffes et al. (1999) where the same empirical methodology produces results of DW in the range of 1.14 to 1.16, whereas others like Atiqur Rahman and Abdul Basher (2002) study for Bangladesh, IMF (1999a) application for Malaysia, Rajan and Siregar (2002) application to Singapore and Edwards (1989) do not report the DW diagnostics test statistic while using similar time series fundamental determinants of ERER and empirical model of two-step ECM.

²⁴ Granger and Newbold, quoted by Gujarati (1995:724) have suggested: an $R^2 > d$ (Durbin Watson statistic) is a good rule of thumb to suspect that the estimated regression suffers from spurious regression.

7.4.5. Calculating ERES

Once the long run parameters b in Equation 3 relating RER and the fundamentals are estimated, the next step in the calculation of ERES is the estimation of sustainable fundamentals F^* so that ERES (e^*) is given by $e^*=bF^*$.

Since our objective is to test changes in ERES given the net sustainable capital flows, the resource balance variable is calculated by determining sustainable levels of capital flows. The sustainable resource balance is given as actual resource balance from which 100 percent of FPI and grants are assumed to phase away gradually following the methodology of Williamson and Mahar (1998), which considers liquid portfolio investments as volatile and unsustainable. We also take the permanent values of, openness and government consumption in total government expenditure by smoothing the time series by using 3 year moving averages.

The already high openness of the BiH economy is considered to be at the desired level and slow changing compared to resource balance so that we use moving average of actual values of this fundamental. The import content of investment already reflected in high value of openness variable observed leaves conclusion that trade policy is already very open and moving average of actual openness variable is used for B&H. These variables are considered as slower changing so that their permanent values are obtained as moving average of data series.

We assume that foreign capital inflows are unsustainable in the long run following the methodology of Williamson (1994) and calculate the sustainable resource balance as that level of resource balance without the foreign portfolio capital flows, and remittances, which still leaves the negative resource balance variable in 2005 at 30 % of GDP which is still considered very high, especially in the view of the arguments that anything above 5% is considered unsustainable (Atiqur Rahman and Abd. Basher, 2002).

The ERES is then obtained as a fitted value of the estimated long run cointegrating equation using the sustainable values of fundamentals. This ERES is referred to as “sustainable” ERES and is reported in column three of Table 6 for B&H for the two step Engle-Granger (1987) Cointegration and Error Correction Mechanism.

In view of the requirements of the accession of B& H into the EU, we consider that the most pressure comes from the direction of change necessary for the debt service to export ratio and the resource balance variable. We therefore construct ERES-EU using the estimated long-run parameters from cointegrating equation and resource balance where this variable converges to more sustainable levels as proposed by Atiqur Rahman and Abd. Basher (2002). Following the suggestion made by Klein (1994) we assumed that sustainable debt service to export ratio is at most 20% but slowly increasing in view of the higher repayment obligations.

7.4.6. Calculating The Degree of Misalignment

The degree of misalignment can be calculated as percentage difference between the real exchange rate and the equilibrium value of the RER. We measure misalignment as the difference between EREER estimated using sustainable values of fundamentals and the actual RER. “Sustainable” RER is the fitted RER in which the fundamentals have been replaced by their sustainable values. The “fitted RER” is the one estimated from the cointegrating regression using actual values of fundamentals. Presentation of “fitted RER” helps us illustrate that calculation of sustainable values of net capital flows is a necessary step for a meaningful estimation of EREER as temporary responses to unsustainable fundamentals should not be taken as an indicator of long run overvaluation or under-valuation. This question can be answered only by looking at how sustainable those movements itself are. (Avallone and Rault, 1999)

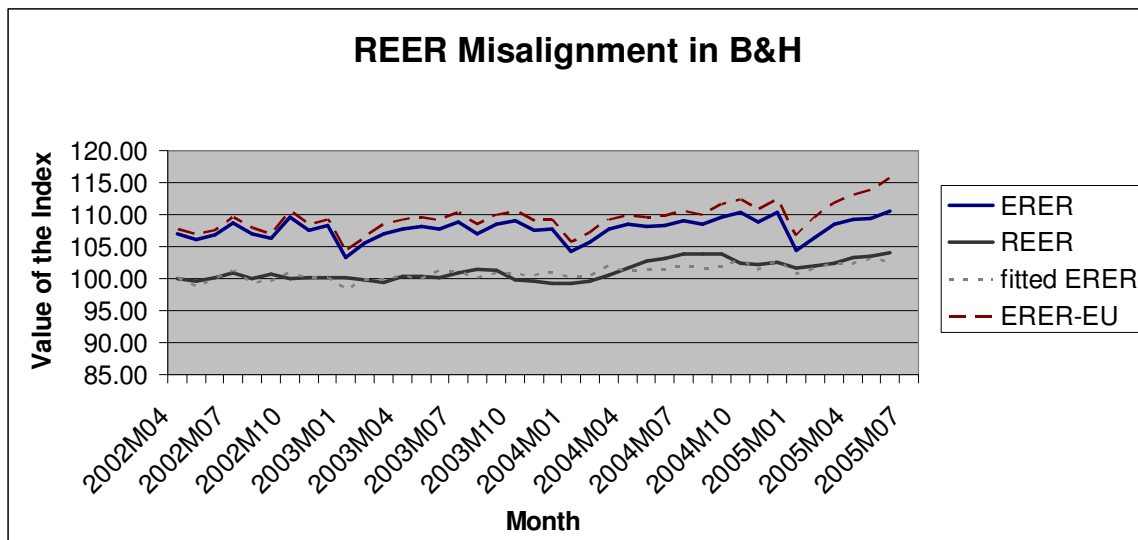
Table 6 reports the observed RER, sustainable EREER as well as fitted RER for B&H, obtained from the cointegrating equation estimated. The last column of Table 6, shows the gap between the observed and equilibrium real exchange rates using the “sustainable” simulations for the equilibrium rate. The gap between these two series provides a measure of the real exchange rate misalignment. Since our RER is measured as index where 100=1 the difference between RER and EREER is equal to percent overvaluation/undervaluation.

Table 6: Observed and Equilibrium RER Indexes for B&H 2002:4 to 2005:6 (2002:4=100) (Two Step Engle-Granger (1987) Cointegration And Error Correction Mechanism)

Column	1	2	3	4	5	6
Period	Observed	Fitted	“Sustainable ”	Misalignment (%)	“Sustainable” EU	Misalignment EU (%)
2002M04	100.00	100.11	106.95	6.95	107.83	7.83
2002M05	99.70	98.81	106.13	6.46	107.02	7.35
2002M06	100.19	100.03	106.78	6.59	107.67	7.47
2002M07	100.84	101.30	108.74	7.84	109.62	8.71
2002M08	100.03	99.42	107.02	7.00	107.91	7.88
2002M09	100.71	99.68	106.23	5.48	107.11	6.35
2002M10	99.98	100.95	109.58	9.61	110.47	10.50
2002M11	100.18	100.23	107.64	7.45	108.52	8.32
2002M12	100.11	100.24	108.29	8.17	109.18	9.05
2003M01	100.26	98.26	103.30	3.03	104.17	3.90
2003M02	99.82	99.84	105.55	5.73	106.42	6.61
2003M03	99.40	99.84	107.05	7.69	108.54	9.19
2003M04	100.30	100.55	107.69	7.37	109.18	8.85
2003M05	100.36	100.03	108.08	7.70	109.58	9.19
2003M06	100.19	101.26	107.74	7.53	109.22	9.01
2003M07	101.01	101.17	108.90	7.81	110.39	9.29
2003M08	101.43	100.24	107.10	5.59	108.58	7.05
2003M09	101.25	100.92	108.52	7.18	110.00	8.65
2003M10	99.88	100.68	109.02	9.14	110.52	10.64
2003M11	99.70	100.53	107.53	7.85	109.01	9.33
2003M12	99.27	100.88	107.81	8.61	109.29	10.10
2004M01	99.21	100.24	104.28	5.11	105.74	6.58
2004M02	99.55	100.64	105.82	6.30	107.29	7.78
2004M03	100.47	101.97	107.82	7.32	109.30	8.79
2004M04	101.65	101.10	108.57	6.80	110.06	8.27
2004M05	102.74	101.48	108.14	5.26	109.63	6.70
2004M06	103.13	101.53	108.41	5.12	109.90	6.56
2004M07	103.83	102.02	109.11	5.09	110.60	6.52
2004M08	103.82	101.75	108.45	4.46	109.93	5.89
2004M09	103.85	101.81	109.65	5.58	111.74	7.60
2004M10	102.48	102.91	110.30	7.63	112.39	9.67
2004M11	102.30	101.50	108.82	6.37	110.91	8.41
2004M12	102.58	102.86	110.29	7.52	112.39	9.55
2005M01	101.58	100.66	104.53	2.90	106.59	4.94
2005M02	102.08	101.68	106.40	4.23	109.68	7.44
2005M03	102.38	102.41	108.55	6.02	111.84	9.24
2005M04	103.34	102.48	109.21	5.69	113.12	9.46
2005M05	103.58	103.16	109.36	5.58	113.86	9.92
2005M06	104.02	102.80	110.60	6.32	115.72	11.24

Note: The observed RER is the one used in the econometric analysis. The fitted RER is the one estimated from the cointegration regression. The “sustainable” RER is the fitted RER in which the fundamentals have been replaced by their sustainable counterparts. The RESGDP sustainable is equal to actual RESGDP adjusted for the change in RESGDP required in case of capital flows outflows comprising 100 percent of foreign portfolio inflows and transfers. The OPEN, GOVCON and DEBT sustainable are given by 3 year moving averages. Misalignment is defined as $100(\text{sustainable RER}-\text{observed RER})/\text{observed RER}$. The “sustainable” EU is the fitted RER in which the fundamentals have been replaced by their sustainable counterparts so that resource balance (RESGDP) converges to more sustainable levels as proposed by Atiqur Rahman and Abd. Basher (2002) of 5% of GDP. Following the suggestion made by Klein (1994) we assumed that sustainable debt service to export ratio is at most 20% but slowly increasing from the current levels in view of the higher repayment obligations.

Figure 1 presents graphically the percent misalignment for B&H for each year from 1998:1 to 2004:7 based on the results of the Two Step Engle-Granger (1987) Procedure. Since our RER is measured as index where $100=1$, the difference between RER and ERER is equal to percent overvaluation/undervaluation, with the positive sign representing overvaluation and the negative sign indicating undervaluation of RER.



Note: Misalignment is given by the gap between the RER and ERER. Higher level of the index indicates more depreciated level required by ERER compared to observed RER, indicating situation of RER overvaluation (misalignment).

Figure.2 Misalignment – B&H (as the gap between real exchange rate and ERER) Two Step Engle-Granger (1987) Cointegration and Error Correction Mechanism

7.4.7. Conclusion

Recognizing the endogeneity of the equilibrium real exchange rate and adopting a mild and testable assumption that the distance between the actual and the equilibrium real exchange rate is a stationary random variable, justifies the use of the cointegration method for estimating the long-run relationship between the real exchange rate and its fundamentals. Since the methodology adopted assumes that the economy was in internal and external equilibrium on average over the sample period, it implies that the average degree of misalignment in the sample will tend, by construction, to be small, if depending on only the time series estimates of sustainable value of fundamental variable of resource balance.

To observe the impact of change in sustainable value of net capital flows on EREER we performed counterfactual simulations for this fundamental. We find that in B&H, the real exchange rate was overvalued by 6 percent in July 2005 using the Two Step Engle Granger Methodology. In our counterfactual estimation for B&H, the smaller trade deficit associated with the smaller current account deficit produces a depreciation of the equilibrium rate and therefore tends to increase the estimated degree of misalignment. This is evident in higher sustainable RER (ERER), or more depreciated value of sustainable RER compared to the fitted RER value calculated using the actual resource balance variable.

The level of misalignment of RER when we compare RER to the equilibrium level of real exchange rate when taking into consideration the required adjustments in the context of macroeconomic stability and accession to the EU (given by EREER-EU) indicate misalignment of 12 % in July 2005. We suspect that indicated level of the misalignment in both cases is much higher as we might not capture the true nature of the long run relationship between the fundamentals and EREER due to the limited length of the sample available for B& H and somewhat unique situation of continuous high current account deficits during the whole of the estimation period. It follows that the estimated sensitivity of real exchange rate to resource balance variable is underestimated and is likely to be much higher so that the current size of this relationship obscures the actual pressures that would exist in the absence of the capital flows that supported dibalances in resource balance variable during the length of the sample. We expect that the pressure on RER is much higher and that EREER is at much more depreciated level than we can capture with the existing data for B& H.

8. APPENDIX B: The Copenhagen Criteria

In June 1993, the European Council at Copenhagen laid down the foundations of the current enlargement process by declaring that "the associated countries in Central and Eastern Europe that so desire shall become members of the European Union" and by defining the membership conditions, the so-called Copenhagen criteria. Under the Copenhagen criteria, membership requires that the candidate country ensures:

- "stability of institutions guaranteeing democracy, the rule of law, human rights and the respect for and protection of minorities": the political criteria.

Since the entry into force of the Treaty of Amsterdam in May 1999, these requirements have been enshrined as constitutional principles in the Treaty on European Union, and have been emphasized in the Charter of Fundamental Rights of the European Union, that was proclaimed at the Nice European Council in December 2000.

- "the existence of a functioning market economy as well as the capacity to cope with competitive pressure and market forces within the Union": the economic criteria.

These criteria are consistent with the principles for economic policies as enshrined in the EC Treaty by the Maastricht Treaty that entered into force on 1 November 1993.

- "ability to take on the obligations of membership, including adherence to the aims of political, economic and monetary union". This criterion refers to the implementation of the Union's legislation, known as the *acquis communautaire*. For that reason, it is referred to thereafter as the *acquis* criterion. Subsequent European Councils, in particular the Madrid European Council in 1995, have highlighted the importance, not only of incorporating the *acquis* into national legislation, but also of ensuring its effective application through appropriate administrative and judicial structures.

Since its 1997 Opinions on the applications for membership by the countries of Central and Eastern Europe, the Commission has evaluated annually in its Regular Reports, extended also to Cyprus, Malta and Turkey, the progress made by the candidate countries towards meeting the Copenhagen criteria. The Commission developed, in the context of Agenda 2000, a methodology for that purpose.

Under this methodology, the Regular Reports assess progress in terms of legislation and measures actually adopted or implemented. This approach ensures equal treatment for all candidates and permits an objective assessment of the situation in each country. Progress towards meeting each criterion is assessed against a detailed standard checklist, which allows account to be taken of the same aspects for each country and which ensures the transparency of the exercise. The Reports draw on, and are cross-checked with, numerous

sources, starting from information provided by the candidate countries themselves, and many other sources including reports from the European Parliament, evaluations from Member States, or the work of international organizations and non-governmental organizations. This year's Reports also contain some forward-looking elements.

In order to evaluate the extent to which candidates meet the political criteria, the Commission not only provides a description of their various institutions (Parliament, Executive, and Judiciary), but examines how the various rights and freedoms are exercised in practice. With regard to human rights, the Commission analyses the way in which the candidate countries respect and implement the provisions of the major human rights conventions, including in particular the European Convention for the Protection of Human Rights and Fundamental Freedoms. As regards respect for minority rights and the protection of minorities, the Commission devotes particular attention to the implementation of the various principles laid down in the Council of Europe Framework Convention for the Protection of National Minorities. Measures undertaken by the countries in order to fight against corruption are also examined.

The economic criteria consist of two elements: the existence of a functioning market economy, and the capacity to withstand competitive pressure and market forces within the Union. These two elements are assessed through a number of sub-criteria which have been defined in Agenda 2000. The existence of a functioning market economy requires that prices, as well as trade, are liberalised and that an enforceable legal system, including property rights, is in place. Macroeconomic stability and consensus about economic policy enhance the performance of a market economy. A well-developed financial sector and the absence of any significant barriers to market entry and exit improve the efficiency of the economy. The capacity to withstand competitive pressure and market forces within the Union requires the existence of a market economy and a stable macroeconomic framework. It also requires a sufficient amount of human and physical capital, including infrastructure. It depends on the extent to which government policy and legislation influence competitiveness, on the degree of trade integration a country achieves with the Union and on the proportion of small firms.

The ability to take on the obligations of membership requires the adoption, implementation and enforcement of the *acquis*. In its Reports, the Commission analyses, for each of the twenty-nine chapters of the *acquis*, the extent to which the necessary legislative measures have been taken to enable implementation of the *acquis* in that chapter, and what remains to be done in this regard. Furthermore, the Commission assesses to what extent each candidate country has established administrative structures required to implement the *acquis*.

This year's Regular Reports take a broader perspective than in previous years. In addition to assessing progress made by each candidate, they also evaluate to what extent the candidates will fulfill the Copenhagen criteria by accession, taking into account the envisaged timeframe for enlargement defined by the European Council.

This requires a careful examination of the progress achieved by each country over the past years, of their track record in implementing the commitments made in the negotiations and of whether the countries sufficiently fulfill the Copenhagen criteria. These latter aspects are particularly important when assessing the ability to take on the obligations of membership. The implementation already now by a given candidate country of a critical mass of the acquis in the various chapters, and a positive track record over the past years, are necessary conditions for concluding that this country will be able to apply the acquis upon accession. Information available to the Commission on the relevant ongoing preparations, in particular in the context of the monitoring process, is also taken into account.

The Regular Reports identify the candidate countries which will meet the Copenhagen criteria within the envisaged accession timeframe. They are the basis upon which the Commission recommends the conclusion of the negotiations with these countries.

9. APPENDIX C: The Convergence Criteria

The convergence criteria are the following:

1) Stable prices

Inflation must not be more than 1.5 percentage points higher than the average in the three member countries with best price stability, i.e. lowest inflation.

2) Stable exchange rate

The national currency must have been stable relative to other EU currencies for a period of two years prior to entry into the monetary union.

3) Sound government finances

Public debt must not exceed 60 per cent of GDP and the central government budget deficit must not be greater than 3 per cent of GDP.

4) Low interest rates

The 5-year bond rate must not be more than 2 percentage points higher than in the three member countries where inflation is lowest.

5) Legislation

A country's national legislation, including the legislation on its central bank, must be compatible with the Treaty and with the Statute of the European System of Central Banks (the ESCB Statute).