ECONOMIC ANNALS, Volume LX, No. 205 / April – June 2015
UDC: 3.33 ISSN: 0013-3264

DOI:10.2298/EKA1505031G

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NET CAPITAL FLOWS TO AND THE REAL EXCHANGE RATE OF WESTERN BALKAN COUNTRIES

ABSTRACT: *This paper uses Granger causality tests to assess the linkages between changes in the real exchange rate and net capital inflows using the example of Western Balkan countries, which have suffered from low competitiveness and external imbalances for many years. The real exchange rate is a measure of a country's price competitiveness, and the paper uses two concepts: relative unit labour cost and relative inflation differential. The sample consists of six Western Balkan countries for the period 1996–2012, relative to the European Union (EU). The main finding is that changes in the net capital flows precede changes in relative unit labour costs and not vice versa. Also, there is evidence that net capital flows affect the inflation differential of countries, although to a less discernible extent. This suggests that the increasing divergence in the unit labour cost between the EU and Western Balkan countries up to the global financial crisis was at least partly the result of net capital inflows. The paper adds to the ongoing debate on improving cost competitiveness through wage restrictions as the main vehicle to avert the accumulation of current account imbalances. It shows the importance of changes in the exchange rate regime, reform of the interaction between the financial and the real sector, and financial supervision and structural change.*

KEY WORDS: *Capital flows, real exchange rate, Granger causality, Western Balkan countries*

JEL CLASSIFICATION: F41, F62

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1. INTRODUCTION

This study aims to identify the causality between cross-border capital flows and the real exchange rate, the usual indicator for competitiveness, using a panel of six Western Balkan countries. The question to be answered herein is what comes first: a loss in competitiveness or capital inflows? The literature offers theories and empirical studies, which implicitly assume either the one or the other direction of causality, with different policy conclusions. There are only a few studies in which the underlying assumption of causality is explicitly tested. This deficit is surprising, because the assumption of causality is of political relevance. If the causality chain starts with a loss in competitiveness, domestic policy reforms committed to re-balancing the domestic and external economy would focus on the labour market, wage-setting, social systems, and the fiscal system. If causality starts with cross-border capital flows, policies might also include reform of the exchange rate regime and various forms of capital import controls and financial supervision. An example motivating this research is the Euro Plus Pact, which was signed by 23 EU members in March 2011 and is a cornerstone of the EU's attempts at institutional reforms with the aim of avoiding financial and economic imbalances among the member countries (European Council 2011). The pact explicitly states that a loss in competitiveness of a couple of member countries is the source of their external deficits and excessive foreign debt and lists a number of policy measures which should be undertaken to reach its goals, including a review of wage-setting arrangements, indexation schemes, public sector wages, and structural reforms to enhance productivity. However, if the loss in competitiveness were the result of capital inflows under a regime of complete financial liberalization, as prevails in the EU and its monetary union, these reforms might fail. Therefore this paper adds to the general ongoing public policy debate about the meaning of price competitiveness and the effect of its improvement on the external balance, and will test basic assumptions on both sides of the debate

This study applies Granger causality tests to six Western Balkan countries (Albania, Bosnia and Herzegovina (BiH), Croatia, Macedonia, Montenegro, and Serbia). The country sample is motivated by a combination of several factors: (i) weak growth performance coupled with low external competitiveness and accumulated current account deficits, and (ii) not yet being EU members but accession or pre-accession candidates so that the official EU perspective on the countries' competitiveness and debt problems are relevant. While EU members have almost no substantial opportunity for controlling or subduing destabilizing capital inflows, Western Balkan countries, by contrast, do.

The remainder of the study is organized as follows: section 2 provides an overview of the messages the literature offers with respect to the nexus of competitiveness and cross-border capital flows. This overview suggests using empirical tests on the causality, and that would be a novel addition to the extant literature. Section 3 presents the data and discusses the properties of the time series. In section 4, Granger causality tests are performed, and section 5 concludes. The general result of the tests is a causality running from capital inflows to an appreciation of the real exchange rate.

2. MESSAGES FROM THE LITERATURE[1]

The fundamental logic of the balance of payments states that a deficit in the current account (trade balance) is *uno actu* counterbalanced by a surplus in the capital account if one abstracts from errors and omissions. The standard textbook model of an open economy assumes net exports to be a negative function of the real exchange rate, where the real exchange rate is defined as the price of domestic production relative to the price of foreign production measured in the same currency unit (Krugman and Obstfeld 2003, Ch. 16). The assumption is that both domestic demand and export demand depend negatively – and strongly – on the relative price of domestic and foreign commodities. Here the exchange rate regime is important: where the exchange rate regime is flexible, real appreciation is due to appreciation of the nominal exchange rate, which increases domestic prices in foreign currency. Where the exchange rate is fixed, real appreciation is due to a rise in inflation after the money supply increases. A relevant problem is that of the speed at which the current account adjusts after a change in the real exchange rate.

However, the textbook statement does not yet explain why the nominal exchange rate appreciates or what speeds up domestic inflation.

In this causality regime, the capital account is the passive part of the balance of payments and adjusts to the financing needs of the domestic economy. Changes in the real exchange rate are autonomous in the sense that they are not influenced by changes in external capital flows. The triggers of real exchange rate changes might be changes in the domestic fiscal stance or monetary policy or in trade union power or labour market institutions that decouple wages and productivity

1 This section is an updated and slightly revised version of the review section in Gabrisch and Staehr (2014).

relative to trading partners, and without any discernible impetus from external capital flows.

In a regime with a flexible nominal exchange rate, a deficit in the current account would cause the nominal exchange rate to devalue and, if the Marshall-Lerner condition is fulfilled, equilibrate the current account sooner or later. The devaluation reduces the relative price of domestic goods against imported goods in foreign currency as well as the relative cost of labour. In the European monetary union, economies with higher domestic inflation or increasing labour costs are not able to adjust the real exchange rate through a nominal depreciation. Marin (2006) finds that outsourcing and offshoring of German firms improved their productivity relative to other countries.. Because German nominal wage increases did not compensate for the productivity increases, falling relative German unit labour costs are seen as the main cause of external imbalances in the European context. Wage restraint as in Germany is often taken as a means to rebalance the current account of other EU countries and to attain better output performance (Marzinotto 2011). Stockhammer (2011, p. 91) sums up this view: "…wage policy has a critical role in the rebalancing of European economies".

Many studies have tested the hypothesis of a link between relative price changes and current account developments, using datasets from both developed and developing economies, but without robust results. Rose (1991) finds that the hypothesis of a link between the real exchange rate and the trade balance gains little support in a sample of five OECD countries, and conjectures that the numerical import and export price elasticities are small. Bahmani-Oskooee and Kara (2003) estimate co-integration models for nine industrialised countries and reach the conclusion that there is no consistent finding: the reaction of trade flows to changes in import and export prices varies substantially across the countries. Boyd et al. (2008) use a sample of eight OECD countries and find that the real exchange rate has an effect on the trade balance in most of the sample countries, but the effect occurs after a substantial delay.

Other studies have investigated the problem in euro-area members before the outbreak of the global financial crisis; some focus on relative unit labour costs as a measure of the real exchange rate. The results are equally mixed and occasionally difficult to interpret. Zemanek et al. (2009) argue that a lack of international competitiveness can explain the large current account deficits observed in some euro-area countries. The empirical results, however, do not show strong support for this view, as changes in the unit labour cost appear to have little or no explanatory power in estimations of bilateral trade balances between individual

trading partners. Other variables, largely reflecting the macroeconomic stance, appear to be of greater importance. Fischer (2007) uses various concepts of real equilibrium exchange rates and finds that Germany gained competitiveness and several South European countries lost competitiveness between the introduction of the euro in January 1999 and the end of 2005. The author concludes that these developments to some extent reversed previously existing disparities. Dullien and Fritsche (2008) find that several South European countries experienced rapid increases in unit labour costs and, furthermore, that deviations from a long-term equilibrium level only closed very slowly. Jaumotte and Sodsriwiboon (2010) find that the real exchange rate in the South European euro-area members was substantially overvalued relative to its equilibrium value at the onset of the global financial crisis. Belke and Dreger (2011) investigate the relative importance of competiveness and income convergence for the current account in eleven euro-area countries and find an association between the real effective exchange rate and the current account, changing this association into the causality statement that "[i]f the relative real effective exchange rate appreciates, the current account will worsen".

However, Bachman (1992) finds that measures of competitiveness have very little explanatory power for the current account balance in the USA. Gros (2011) criticises the Euro Plus Pact, arguing that in reality the link between high or rising unit labour cost and current account deficit is weak, if it exists at all. He notes that Estonia, for example, has had rapidly increasing relative unit labour costs but also strong export growth over extended periods of time. As noted by Wyplosz (2011), the real appreciation of the euro is responsible for current account crises in South European countries, not unit labour cost differences. Storm and Naastepad (2014), estimating import and export functions and calculating gross output prices, find that relative unit labour cost has no explanatory power in the South European eurozone members. They argue that unit labour costs play a minor role in price determination compared to profit margins and the cost of imported intermediates. Similarly, Danninger and Joutz, 2007) find relative cost improvements to have accounted for less than 2% of German export growth.

In contrast to the previously discussed causality assumption, where the real sector plays a dominant role in the current account balance and the capital account adjusts, the financial sector is dominant in a region with financial liberalization and a single currency. Lending activities and the provision of liquidity determine domestic demand and cost of production. In such a framework the capital account is the active part of the balance of payments, and the current account adjusts. Capital inflows are autonomous, which means independent from the

domestic factors mentioned above. The problem of destabilizing capital flows is well known and lay behind the debates in Bretton Woods in 1944 about the usefulness of capital controls. Sixty-five years later, an UNCTAD report (2009) makes free capital flows between advanced and less advanced countries responsible for excessive creditor-debtor positions: countries with high inflation need a devaluation of their exchange rate to restore their competitiveness in goods markets. However, with free capital flows, currency markets would produce quite the opposite result. Higher interest rates in countries with relatively high inflation would attract short-term capital inflows (the famous currency carry trades), which entail an appreciation of the nominal and real exchange rates.

The problem of destabilising capital flows has been studied in relation to the debt and financial crises of the 1980s and 1990s (Calvo et al. 1993, 1996; Kim 2000) and the recent global financial crisis in less advanced countries (Sen 2010, UNCTAD 2009), and in European transition countries (Lipschitz et al. 2006). More recent studies (Ca'Orzi et al. 2009, Bakardzieva et al. 2010, Combes et al. 2010, Gabrisch 2011, Pérez-Caldenty and Vernengo 2012) have focused on countries outside the EU with floating as well as fixed exchange rate regimes, and find that capital inflows destabilize the receiving economy. Calvo et al. (1993) show that episodes of substantial capital inflows in Latin American countries at different times resulted in real appreciations. The capital inflows occurred in countries with very diverse economic conditions, suggesting that the capital flows were in large part driven by events outside the region.

Calvo et al. (1996) find that real appreciation followed net capital inflows in both Asian and Latin American countries in the late 1980s and early 1990s. Rajapatirana (2003) uses data for the period 1985-2000 and reaches the same conclusion, but also finds that the real appreciation following net capital inflows was much larger in Latin American than in Asian countries, possibly because of the different composition of the capital flows. Combes et al. (2010) find for a panel of 42 developing countries clear evidence of a real appreciation after capital inflows, with the highest appreciation effect for portfolio investment: they recommend governments to consider more nominal exchange rate flexibility. Similarly, Bakardzhieva et al. (2010) find for a panel of emerging market economies, including Eastern European countries, that net total capital inflows led to an appreciation of the real effective exchange rate. The effects differed depending on the type of capital flow. For most types (portfolio investment, loans, foreign aid, remittances, and income transfers), a capital inflow led to a real appreciation, but this was generally not the case for capital stemming from foreign direct investment. Saborowski (2009) uses a broad sample of 84 countries

during the period 1990-2006 to investigate the effect of capital flows on the real exchange rate. The result is that capital inflows in the form of FDI generally lead to an appreciation of the real exchange rate.

The Dutch disease and the capital-augmented Balassa-Samuelson theorem are concepts to explain the effects of capital inflows on the real exchange rate in the neoclassical tradition, where neither the nominal exchange rate nor money is important. The Dutch disease (Corden and Neary 1982, Corden 1982, Lartey 2008) analyses the effects of a sudden availability of foreign resources (= capital inflow or foreign aid) on demand for domestic products; the price of tradable goods falls and the real exchange rate appreciates in terms of an increase in the relative price of non-tradable goods against the price of tradable goods. The capital-augmented Balassa-Samuelson theorem argues that foreign capital investment in the tradable goods sector would increase productivity and real wages there. The wage increase would spread to the non-tradable sector, and the relative price of non-tradable goods would increase (Sy and Tabarraei 2009). In some models, foreign investment is triggered by the higher marginal productivity of capital in the host country. Those models assume price arbitrage, efficient capital markets, and the re-distribution of a given amount of capital (savings), and describe how an initial imbalance will be balanced later, after the marginal productivities are equilibrated. Sinn (2010) explains the financial imbalances between European monetary union members due to the risk-free transfer of capital after the introduction of the common currency to the poor EU economies by abundant labour followed by an increase in wage costs over labour productivity, and by a decline in wage costs in the rich countries with abundant capital.

The neo-classical assumption that financial investment will be transformed into real investment and an increasing marginal product of labour will offset wage increases has been doubted by Holinski et al. (2012), who observed no measurable gains in productivity after the extensive flow of capital from North to South in Europe. The European Central Bank (ECB 2003) argue that the Balassa-Samuelson theorem is applicable to Greece, Portugal, Ireland, and Spain. Other empirical investigations could find no evidence for relevant Balassa-Samuelson effects explaining inflation differentials in the euro area in the pre-crisis period (Aucremanne and Collin (2004) with respect to equilibrium inflation rates in the euro area; Egert (2011) with a special focus on new EU member countries). Belke et al. (2009) apply a capital-augmented Balassa-Samuelson model to new EU member states with panel data for the period from 1993 to 2008. However, the tests fail to produce clear evidence for or against the hypothesis.

A non-neoclassical approach builds on the relationship between the credit cycle and effective demand. Minsky (1982, 117-162) explains the boom-bust cycle of financial and real capital investment by the typical features of the financial institutions and their interplay with the business sector. Communale and Hessel (2014) argue that the financial cycle is driven by credit and house prices. An asset price boom improves the credit conditions of the banking sector and lifts credit constraints on domestic demand. Net capital inflows contribute to better credit conditions, and changes in price competitiveness are at best a by-product of demand movements. The interplay between net capital inflows, the improvement in credit and asset (house) prices, and domestic demand and prices can be understood with the two-price approach of Keynes (1936), which is akin to Tobin's q-value of a firm (Tobin 1969): the asset price boom raises also the demand for real capital and its price followed by higher 'replacement cost' in the investment goods sector at given technology and productivity. Bhaduri (2011) presents another Keynesian perspective, arguing that capital gains following an asset price boom lead to higher consumption by the rich, depress the savings rate, and induce more imports.

Seemingly, the introduction of the euro has strengthened the link between credit booms and current account deficits in this region of the European Union. Actually, the euro introduction has led to the build-up of euphoric expectations in the Minskyan sense: speculative capital inflows to South European economies with formerly high interest rates and exchange rate risks caused an increase in unit (labour) cost. This strand of the literature argues in contrast to the standard model: financial liberalization (or 'financialization') fosters domestic demand and unit labour costs adjust (Gabrisch 2011; Storm and Naastepad 2014; and also Detzer and Hein, without year). The Nyberg Report (2011) for Ireland and Poncela (2012) for Spain find evidence of a link between asset price boom, credit boom, and rising unit labour cost. Communale and Hessel (2014) applied panel error-correction models to the analysis of fluctuations in domestic demand at the frequency of the financial cycle for 17 euro countries, and conclude that differences in domestic demand are more important for the trade balance than price competitiveness. Similar studies on non-EU European countries, here the Western Balkan countries, to our knowledge are not available, although these countries liberalized their balance of payments and financial sectors and present a potential case for the study of the linkages in question.

In sum, the literature offers two contrasting sets of theoretical explanations, with mixed evidence for both. The heterogeneity of applied empirical methods and country samples might be responsible for the mixed evidence. However, only a

few studies test the causality assumption of the theories. Morande (1988) tests with small VAR models and monthly data 1977-1983 for Chile whether a real appreciation occurred before or after capital inflows. The result is unambiguous: the direction of causality runs from the capital account to the real exchange rate, and not vice versa. Gabrisch and Staehr (2014) obtain similar results when they test for causality in 27 EU countries between 1995 and 2015 with Granger causality and VARs. Distinct from Morande (1988), they use the relative unit labour costs as the indicator of the real exchange rate. Their study likely belongs to the few that accentuate the relevance of cross-border capital flows – the competitiveness nexus of the European governance reform debate.

3. DIAGONOSTICS AND ESTIMATION STRATEGY

This paper performs Granger causality tests with data for a panel that includes countries[2] with a floating exchange rate (Albania, Serbia), an exchange rate goal (Croatia and Macedonia), a fixed exchange rate in the currency board version (Bosnia and Herzegovina), and the euro as official currency (Montenegro).[3] Panel techniques have the advantage of more observations; they also allow mitigating the threats of heteroskedasticity and omitted variable biases in regressions. The latter is important with respect to possibly relevant institutional variables, which the models do not consider due to the lack of appropriate time series data.

A test on Granger causality is carried out in two steps: initially, a dependent variable Y_t is regressed on lagged values $(t\text{-}\tau)$ of the dependent variable and an independent variable X in order to find the coefficients of the lagged variables. The second step repeats the procedure with the restriction that the lagged variables $X = 0$. The aim is to test the null hypothesis that these variables are not significantly different from zero. The probability (p-) value of the test (Wald test) must < 0.1 to reject the null of no Granger causality. If $p > 0.1$, the null hypothesis can be rejected, and $X_{t-\tau}$ series do not Granger cause Y_t, even when the coefficients in the initial regression were sufficiently significant. However, this does not automatically mean that the alternative hypothesis holds, according to which $Y_{t-\tau}$ Granger causes X_t. Therefore, the Wald test must be repeated with changed dependent and independent variables. The test could end with the result of a two-sided statistical causality due to feedbacks between the variables. Further, the

2 The West Balkan region includes Kosovo and Slovenia. Kosovo has been excluded due to the lack of data for real exchange rates, and Slovenia for its EU membership since 2004.

3 Of course, without being a member of the euro system. An overview on the classification of de-facto exchange rate systems can be found in International Monetary Fund, 2013.

signs of the lagged variables decide whether the identified statistical causality meets one of the assumed theoretical assumptions or not. By contrast, the size of the coefficient and also its significance are, albeit not completely, less important.

Panel estimations apply fixed effects and the Generalized Method of Moments (GMM) methodology. Fixed effects capture omitted and unknown variables. The redundant fixed effects test decides which specification – cross-section or period effects, or both – produces the most efficient results. All estimation results are controlled for group-wise heteroskedasticity (test of variance equality) and serial correlation (Breusch-Godfrey LM test). However, in panel OLS estimations with fixed effects, the presence of the lagged dependent variable may lead to biased estimates. To assess this issue, additional models are estimated using the System GMM methodology developed by Arellano and Bover (1991) and Blundell and Bond (1998). All econometric tests were performed with the EView8-software programme.

The variables in Granger causality tests include the current account balance and two concepts of the real exchange rate. The interpretation of signs in regressions is based on the following principle: notwithstanding which of the two competing causality assumptions discussed above holds, one of the lagged (independent) X-variables should always obtain a negative sign. If it has a positive sign it is 'incorrect', in the sense that an increase in the real exchange rate (an appreciation) causes the current account to be positive (net capital outflow) or to improve (higher net capital outflow or less capital inflow), and vice versa. This result would be consistent with neither of the causality hypotheses. Of course, with various lags some coefficients might be positive and others negative. In that case, the significance of the coefficient gains relevance.

4. DATE AND TIME SERIES PROPERTIES

As mentioned, some of the empirical literature tries to split capital inflows into various components. However, a country can receive FDI inflows and have a balanced current account. Therefore, tests abstract from the channels through which specific capital inflows affect the real exchange rate and use the net capital flow. The variable for the net capital flow is the current account, as it is standard in the empirical literature (Reinhart und Reinhart 2009). The sum of the current account, the financial account, and of changes in official reserves is zero (in the absence of errors and omissions). The argument to fade out changes in official reserves points to the administrative, non-private character of decisions on changes (Reinhart und Reinhart (2009.

Table 1: Descriptive statistics of CA, GRULC, and GRCPI, 1996 - 2012

		Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability	Obs.
Current account balance in % of GDP	Albania	-9.225	-9.200	-2.500	-15.600	4.149	-0.140	1.913	0.841	0.657	16
	BiH	-11.40	-10.000	-5.700	-19.100	4.605	-0.368	1.652	1.375	0.503	14
	Croatia	-5.013	-5.350	0.100	-10.600	2.989	0.082	2.287	0.357	0.836	16
	Macedonia	-5.388	-5.450	-0.400	-12.800	3.487	-0.439	2.283	0.858	0.651	16
	Montenegro	-22.217	-18.150	-6.800	-49.800	12.920	-0.818	2.828	1.354	0.508	12
	Serbia	-8.421	-8.300	2.200	-21.600	6.376	-0.402	2.822	0.395	0.821	14
GRULC	Albania	4.021	3.997	49.738	-14.087	14.193	2.050	7.955	27.581	0.000	16
	BiH	4.055	2.500	29.977	-9.924	9.384	1.540	5.787	9.347	0.009	13
	Croatia	1.061	1.840	8.916	-5.252	4.239	-0.119	2.075	0.609	0.738	16
	Macedonia	5.132	-0.718	77.750	-12.856	20.506	2.981	11.250	69.08	0.000	16
	Montenegro	8.639	5.226	43.776	-9.078	16.96	1.322	3.470	3.605	0.165	12
	Serbia	10.23	2.882	90.269	-23.323	28.779	1.684	5.714	10.14	0.006	13
GRCPI	Albania	2.963	0.721	18.508	-5.822	6.509	1.044	3.351	2.986	0.225	16
	BiH	1.786	0.578	14.117	-1.370	3.999	2.084	7.077	21.251	0.000	15
	Croatia	0.694	0.428	4.884	-3.036	2.322	0.095	2.228	0.421	0.810	16
	Macedonia	-0.349	-0.387	4.338	-9.227	3.181	-1.168	5.305	6.733	0.035	15
	Montenegro	3.867	1.622	19.137	-1.547	6.192	1.651	4.390	6.416	0.040	12
	Serbia	0.989	0.551	37.526	-52.156	19.673	-1.129	5.903	7.328	0.026	13

Source: WIIW database, online; access: December 2013; WIIW work sheets, unpublished.

The data includes annual data for the current account and the real exchange rate for the period 1997-2012. Current account data, in percentages of the gross domestic product (variable CA), has been downloaded for all six countries from the WIIW[4] database. A CA > 0 reports a positive current account balance or a capital outflow. Competitiveness is measured in two versions: variable GRULC (Growth rate of Relative Unit Labour Cost) is the nominal exchange rate against the euro, corrected with the change in unit labour cost relative to the 12-country euro area. The use of this measure of competitiveness addresses the European discussion in the context of the Euro Plus Pact and monetary union reforms. The second measure has a more 'global' relevance: the variable GRCPI is the nominal exchange rate adjusted by the consumer price inflation differential. The inflation differential is calculated from national inflation rates and the EU inflation rate. Because the euro is the official currency in Montenegro, the calculation of the real exchange rate is reduced to the inflation differential. An increase in GRULC or GRCPI (= > 0) signifies a worsening of competitiveness relative to the EA12 or EU, while a lowering of the relative unit labour cost, GRULC (GRCPI) < 0, signifies an improvement in competitiveness relative to the EA or EU, respectively. GRULC and GRCPI data were taken from unpublished WIIW calculations of the countries' competitiveness indicators (below, "WIIW work sheets"). WIIW calculates unit labour costs from nominal wages and macroeconomic productivity: rate of change of the gross domestic product minus rate of change of employment. Gabrisch and Staehr (2014) used standardized Eurostat data of nominal compensation and productivity per employee; however, those data are not available for WB countries. The inflation differential relates to the entire EU.

The properties of time series and cross-sections are relevant to the choice and specification of the variables. Table 1 reports the descriptive statistics of CA, GRULC, and GRCPI for the period 1997–2012. The number of observations informs about the different starting year for each individual country. Mean and medium values exhibit negative CA values throughout the panel, and even negative maximum values; except for Croatia, which shows a small positive value. The standard deviation is elevated for Montenegro with only 12 observations. In addition, the standard deviation is different between the two measures of the real exchange rate caused by extreme outliers in some country series: extremely high maximum and minimum values for GRCPI in the case of Serbia at the beginning of the series (37% in 2000 and -52% in 2001). With respect to possible shortcomings in the data generation process, these outliers should be eliminated in order to raise the efficiency of the estimations. Also, the null that there is no

4 Vienna Institute for International Economic Studies.

deviation between a normal and the actual distribution can be rejected in four out of the six cases for GRULC and GRCPI, while CA is normally distributed. Seemingly, the problem lies in the kurtosis, and could be softened by elimination of those outliers if this did not reduce too much the already small number of observations.

Testing panel stationarity is of particular relevance. Table 2 reports the results of tests for common and country-specific unit roots. All variables are panel stationary except CA, which is a borderline case as the PP-Fisher test is around the 10% level of significance only. The estimations that follow include CA and ΔCA. However, the rejection of a unit root for the first difference of the current account suggests preferring it in the interpretation of estimation results.

Table 2: Results of panel unit root tests 1996–2013 (p values in brackets)

	Levin, Lin & Chu[a]	**Im, Pesaran and Shin**[b]	**ADF-Fisher**[b]	**PP-Fisher**[b]
GRULC	-8,619 [0,000]	-6,268 [0,000]	84,870 [0,000]	101,486 [0,000]
GRCPI	-14,036 [0,000]	-11,987 [0,000]	153,491 [0,000]	166,945 [0,000]
CA	-3,433 [0,003]	-2,013 [0,022]	44,130 [0,027]	38,111 [0,096]
ΔCA	-10,438 [0,000]	-7,700 [0,000]	110,612 [0,000]	156,397 [0,000]

[a] Test assumes a common unit root for all countries [b] Test allows for country specific unit roots.

Legend: GRULC = rate of change of relative unit labour costs in euro currency; GRCPI = rate of change of the inflation differential in euro currency; CA = current account; ΔCA = first difference of CA; both in % of the gross domestic product.

Note: The null hypothesis is for all cases that the variable has a unit root. Tests allow for country-specific intersection points; p values are in brackets.

Source: WIIW database, online; access: December 2013; WIIW work sheets, unpublished.

5. TEST RESULTS

Fixed effects regressions were run until four lags. The tables report results with two lags due to comparison with GMM estimations, where more than two lags produce a number of instruments that is higher than the number of observations.[5]

5 Remember the only small panel size.

All regressions include a constant, which is not shown in the tables either; fixed effects are also not shown.

The interpretation of signs in regressions is based on the following principle: notwithstanding which of the two competing causality assumption discussed above holds, one of the lagged (independent) X-variables should always obtain a negative sign. If it is a positive sign it is 'incorrect', in the sense that an increase in GRULC causes the current account to be positive (net capital outflow) or to improve (higher net capital outflow or less capital inflow) – and vice versa. This result would be consistent with neither the one causality hypothesis nor the other. Of course, with four lags some coefficients might be positive, others negative. In that case the significance of the coefficient gains relevance.

Table 3 presents results of tests for the variables CA and ΔCA, and GRULC, comparing fixed effects (FE) models with GMM models. Estimations with a fixed effects regressor do not show any interpretable result. However, estimations with four lags (not shown) reveal that the current account and its change Granger-cause GRULC. Additional GMM models are estimated in order to remove biases in FE estimations. The dependent variable and the independent variables are instrumented with one lag for all specification variables. With the aim of removing the cross-section fixed effect, differences and orthogonal deviations are applied as transformation methods. In regressions with difference transformation, the AB-1-step serves for GMM weights, and the Arellano-Bond serial correlation test is applied. In estimations with orthogonal transformation, for GMM weights the White period (AB-n-step) is selected.

Table 3: Panel data Granger causality tests with CA, ΔCA, and GRULC[a] as dependent variables

	CA		ΔCA		GRULC			
Indep. Variables[b]	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
CA(-1)	0.844***	0.081	---	---	0.844***	1.719	---	---
CA(-2)	-0.288**	-0.193	---	---	-0.288**	0.184	---	---
ΔCA(-1)	---	---	0.074	-0.523***	---	---	0.107	-1.306**
ΔCA(-2)	---	---	-0.018	-0.393***	---	---	-0.541	-0.384**
GRULC(-1)	0.005	-0.145	-0.018	-0.172	0.005	-0.331	0.169	0.052
GRULC(-2)	0.010	-0.022	0.015	-0.027	0.010	-0.137	-0.112	-0.207***
Wald F	0.069	0.611	0.198	0.683	0.069	3.084**	1.200	3.773***
Period F	2.783***	---	2.955***	---	2.783***	---	2.800***	---
Cross-section F	3.015**	---	0.304	---	3.015**	---	0.592	---
Variance equality test (value)[c]	0.986	0.525	1.075	3.706**	0.986	1.299	0.585	2.571
AB m stat., AR1 (AR2)	---	-2.632*** (0.872)	---	-2.973*** (0.145)	---	2.150** (-1.138)	---	---
Estimation[d]	FE	GMM[d]	FE	GMM[d]	FE	GMM[d]	FE	GMM[d]
Observations	73	61	69	57	73	62	70	58

Significance levels: *** 10 %, ** 5 %, * 10 %.

[a] CA = current account balance (=net capital flows) ; ΔCA = first difference of CA; GRULC = relative rate of change of unit labour cost. – [b] Lags in brackets. – [c] Levene test results are shown only, because they signal more inequality than Bartlett and Brown-Forsythe tests. - [d] FE = fixed effects; GMM = Generalized Method of Moments; estimations include differences with Arellano-Bond 1-step weights in models 1.2, 1.4, and 2.2 and orthogonal transformation with White period (AB 1-step) weights in model 2.4, and one period lagged variable instruments.

The estimation results of models 1.2 and 1.4 confirm the FE estimation results, and GRULC does not Granger-cause CA or ΔCA. However, GMM estimations in the second part of Table 3 allow us to draw conclusions as to causality: the Wald tests for models 2.2 and 2.4 suggest that the null of no Granger causality cannot be rejected at the 5% and 1% levels; hence, CA or ΔCA do Granger-cause GRULC, and not vice versa. Yet in model 2.2 the signs of the lagged CA-variables are positive, signaling that an increase in relative unit labour costs is coupled with a surplus in the current account, a result that runs against the assumptions discussed in the literature review. Also, the lagged CA-variables are insignificant. However, model 2.4 presents better results: both lagged ΔCA-variables receive the 'correct' (negative) sign. The basic outcomes of estimations do not change when outliers in GRULC are taken from the data set. Additional tests controlled for biased results:

Arellano-Bond serial correlation tests in models 1.2, 1.4, and 2.2 show that the first order statistic is statistically significant, whereas the second order statistic is not, which is what one would expect if the model error terms are serial uncorrelated in levels. GMM Model 2.4 works with orthogonal transformation, which does not allow AB serial correlation tests.[6] However, LM tests (Breusch-Godfrey) do not reject the hypothesis of no serial correlation in individual country regressions in this model as well as in most other models, except for Croatia and Serbia in model 1.4, where weak significance of the F statistics could be revealed. Bartlett, Levine, and Brown-Forsythe tests for group-wise heteroskedasticity (equality of variances) do not reject the null of no group-wise heteroskedasticity in models 2.1 through 2.4. Group-wise heteroskedasticity appears in model 1.4 only (only Levene test results are shown). Looking at all the results, we may assume that the history of relative unit labour costs (appreciation of the real exchange rate) and of the loss in competitiveness can be better explained when an increase in net capital inflows (or a decline in net capital exports) is considered.

Table 4 shows results for additional tests with changes in the inflation differential GRCPI, which is another concept of the real exchange rate and a broader measure of price competitiveness than unit labour cost. One extreme and implausible inflation outlier (-52% in 2001) was eliminated from the Serbian data. Statistical causality is identified in FE models 3.1, 3.3, and the GMM model 4.4. In the FE models 3.1 and 3.3, the Wald test signals that a change in the inflation differential has a weak impact on the current account balance. However, the lagged GRCPI variables show the 'wrong' sign: an increase in the inflation differential (hence, a real appreciation) is coupled with a positive current account (3.1) or its improvement (3.3), hence, with (more) net capital outflows! No conclusion can be drawn from GMM models 3.2 and 3.4. The Wald tests reject statistical causality, although the GRCPI variables have negative signs. Regressions 4.1–4.4 model the GRCPI as the dependent variable. Statistical causality is revealed for model 4.4 only, running from a change in the current account to the inflation differential. However, the two lagged ΔCA-variables have opposite signs, and the combined impact is negative, but weak. The Arellano-Bond test reveals serial correlation in three GMM specifications, but not in the decisive model 4.4. The Levene test finds group-wise heteroskedasticity in models 3.4, 4.3, and 4.4, while the other two tests do not. Hence, there is some evidence of robustness in estimations. Net capital inflows deteriorate cost, but the evidence is weaker than in case of changes in unit labour cost.

6 AB tests on residuals in regressions with differences reject the null of serial correlation, but the Wald F turns out to be insignificant. In general, regressions with orthogonal transformation support the result of difference weights.

Table 4: Panel data Granger causality tests with CA, ΔCA, and GRCPI[a] as dependent variables

	CA		ΔCA		GRCPI			
Independent variables[b]	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4
CA(-1)	0.834***	-0.136	---	---	0.081	1.448	---	---
CA(-2)	0.138**	-0.028	---	---	-0.082	0.058	---	---
ΔCA(-1)	---	---	0.087	-0.865***	---	---	-0.012	-0.245
ΔCA(-2)	---	---	0.065	-0.559***	---	---	0.156*	0.091
GRCPI(-1)	0.076	-1.774	0.087**	-2.204*	-0.041	0.046	-0.138**	-0.461**
GRCPI(-2)	0.130**	-0.297	0.067	-0.392	0.037	0.009	-0.012	-0.185**
Wald F	2.609*	1.125	2.504*	1.968	0.540	0.006	1.677	3.432**
Period F	3.829***	---	3.613***	---	1.921**	---	2.543**	---
Cross-section F	4.339***	---	0.396	---	1.132	---	1.025	---
Variance equality test (value)[c]	0.305	1.736	0.049	2.941**	0.681	1.087	2.447*	2.249*
AB test, AR1 (AR2), m stat.	---	0.455 (-0.930)	---	-0.482 (-1.370)	---	0.255 (-0.068)	---	-1.914* (-1.514)
Estimation[d]	FE	GMM	FE	GMM	FE	GMM	FE	GMM
Observations	74	62	70	58	75	63	71	59

Significance levels: *** 10 %, ** 5 %, * 10 %.

[a] CA = current account balance (= net capital flows); ΔCA = first difference of CA; GRCPI = change of the inflation differential (CPI). – [b] Lags in brackets. - [c] Levene test results are shown only, because they signal more inequality than Bartlett and Brown-Forsythe tests. - [d] FE = fixed effects; GMM = Generalized Method of Moments; estimations include differences with Arellano-Bond 1-step weights in models, and one period lagged variable instruments.

6. CONCLUSIONS

The main objective of this study was to identify the causality between the development of the real exchange rate and cross-border net capital flows for six Western Balkan countries. The results of the analysis indicate that the causality runs from net capital inflows to an appreciation of the real exchange rate, which induces a negative current account or its deterioration. The economics behind these results seem simple: 1) labour cost is only one component of gross output prices, and not necessarily the most important, and 2) net capital inflows may affect domestic demand, and indirectly, as a by-product, the domestic inflation rate and workers' higher nominal wage demands. Some caveats concerning

the validity of the results: while Gabrisch and Staehr (2014) also applied vector autoregressive (VAR) models with impulse-response functions, this study is restricted to Granger causality tests, not least due to the small sample size. VAR models allow a deeper investigation of the interactions between the variables over time. In particular, the reaction of the variables to shocks can be computed using different assumptions for the temporal relation between the variables, including no lag between the change in one variable and the resulting change in the other variable. VAR techniques remain for further research with a richer data set. Another reservation relates to possible estimation biases caused by a heteroskedastic database. Overcoming this requires larger time series, which are not yet available.

The policy conclusion drawn from the results does not ignore the role of wage formation in the real sector and monetary policy, but reveals the importance of the exchange rate regime, the linkages between the financial and the real sector, and, possibly, other components of price competitiveness such as the cost of intermediate imports and the profit margins. In addition, it shows the importance of the non-price components of export success like quality and commodity composition. The results of the study confirm a similar study by Gabrisch and Staehr (2014) for a panel of 27 EU countries, which, however, have restricted options with respect to the exchange rate regime and tough controls of capital inflows into the financial sector. Those restrictions apply to WB countries with the euro as the official currency (Montenegro and Kosovo) and to Bosnia and Hercegovina with its currency board. In countries with their own currency, reforms of the financial sector and macroprudential controls of capital inflows such as specific taxes still belong to the toolkit. Governments of Albania, Croatia, Macedonia, and Serbia, should consider more flexibility of their exchange rate regime. However, public policy in all countries ought to commit to supporting structural change: industries in commodity markets in which the nexus between costs and demand is weak should find a beneficial environment: this is behind the German export and trade surplus miracle.

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Acknowledgements

The author would like to thank Michael Karsten Staehr (Tallin), Herbert S. Buscher (Berlin) and an anonymous reviewer for useful comments. I am co-authoring with Karsten Staehr a related paper on the EU. The following paper roots in a public policy advice project on competitiveness issues in the West Balkans. The views expressed are solely those of the author.

Received: January 25, 2015
Accepted: May 07, 2015