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Determinants of Global and Intra-European Imbalances

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Determinants of Global and Intra-European Imbalances*

Abstract:

The paper discusses global current account imbalances in the context of an asymmetric world monetary system and asymmetric current account developments. It identifies the US and Germany as center countries with rising / high current account deficits (US) and surpluses (Germany). These are matched by current account surpluses of countries stabilizing their exchange rates against the dollar (dollar periphery) and current account deficits of countries stabilizing their exchange rate against the euro or members of the euro area (euro periphery). The paper finds that changes of world current account positions are closely linked to the monetary policy decision patterns both in the centers and peripheries. Whereas in the centers current account positions are affected by monetary policies, in the peripheries exchange rate stabilization cum sterilization matters. In specific, monetary expansion in the US as well as exchange rate stabilization and sterilization policies in the dollar periphery are found to have contributed to global imbalances.

Keywords: *Global Imbalances, Intra-European Imbalances, Asymmetric Monetary Policies, Foreign Reserve Accumulation, Sterilization, Granger Causality Tests, Panel Regressions.*

JEL: F31, F32.

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1. Introduction

During the recovery after the global financial and economic crisis, the controversial dispute about global imbalances has been revived (Feldstein 2008, Bernanke et al. 2011). The origins of the current account imbalances between East Asia and the US have been attributed to an East Asian saving glut (Bernanke 2005, Bernanke et al. 2011) combined with mercantilist trade strategies (Dooley, Folkerts-Landau and Garber 2003 and Bergsten 2010). In contrast, Chinn and Ito (2008) point to a US saving deficiency and expansionary US fiscal policies. McKinnon and Schnabl (2009) attribute the trade imbalance between the US and East Asia to expansionary US macroeconomic policies causing unintended periphery reserve accumulation. In this context in particular the role of international capital flows for global imbalances has received close attention (Lahiri and Morshed 2009, Gruber and Kamin 2009).

In Europe, the 2010/11 euro crisis triggered an extensive discussion about intra-European current account imbalances which have emerged between Germany and several European countries inside and outside the euro area. Whereas Sinn (2010) argues that the European deficit countries have to restrict private and public spending to cure the intra-European imbalances, the French minister Lagard sees the origins of the crisis in “excessive” German savings and export competitiveness. Berger and Nitsch (2010) argue that the current account imbalances within the euro area have been caused by the elimination of foreign exchange risk after the euro introduction.

Despite the intensive discussion about imbalances in the dollar and the euro blocs very few papers have aimed to trace the reasons for diametrically opposed current account trends in both regions (Herrmann and Winkler 2008). In the dollar bloc, the US as – what we call – center country has continued to run current account deficits whereas an increasing number of – what we call – periphery countries have run current account surpluses. In contrast in Europe, Germany – defined as a center country – has produced rising current account surpluses, which are matched by current account deficits of many other European countries. Whereas the current account posi-

tions of the European periphery countries are in line with Lucas' (1990) assumption that capital should flow from rich to poor countries where the marginal return to investment is higher, in the dollar periphery the capital is flowing uphill from the periphery to the center. The resulting asymmetry in world current accounts is illustrated in Figure 1.

Previous papers have focused on the role of fiscal policies for the global current account imbalances (Chinn and Ito 2008). We complement this analysis by following Aizenmann and Lee (2008) to scrutinize the role of reserve accumulation extended by the role of monetary policies in anchor and periphery countries to trace the origins of global imbalances. This approach shall us also provide an answer to the question of why the current accounts of Germany and its "periphery" have behaved antipodal to the US and the dollar periphery countries.

2. Transmission of Current Account Imbalances within an Asymmetric World Monetary System

We base our analysis on the fact that the world monetary system is asymmetric, with very few countries and currencies being in the center of the world monetary system and a large number of countries using these currencies for their international (and domestic) transactions. The present prominent role of the dollar as international money can be rooted in the post-war political and economic hegemony of the US under the Bretton Woods System (McKinnon 2010). It persists due to network externalities and economies of scale, which determine the currency habitat of emerging markets and developing countries with underdeveloped and fragile capital and goods markets.

Backed by the large size of US goods and financial markets – outside of Europe – the dollar is the dominant international means of payment, unit of account and store of value. Due to the substantial size of the European goods and financial markets, the euro has steadily gained importance within the EU and in countries linked to the European integration process (ECB 2010). An increasing number of countries bor-

dering the euro area have redirected their exchange rate strategies towards the euro and are increasingly holding euro denominated assets. Beyond the European Union the euro has gained a prominent role in the issuances of international debt securities, cross border loans and foreign exchange trading (Chinn and Frankel 2008 and ECB 2010).

Given the asymmetric use of national monies for international exchange a stylized pattern of the world monetary system has emerged. The US dollar is the dominant world currency with a large number of countries pegging their currencies more or less tightly to the dollar. The most important regions, which maintain common dollar pegs (as part of the informal dollar standard) are East Asia, the Middle East, (Latin) America and the Commonwealth of Independent States including Russia.¹ The euro is the second (regional) international currency with a flexible rate against the dollar. In the backyard of the euro area an increasing number of countries are pegging their currencies to the euro. This implies flexible exchange rates between the euro periphery and the dollar periphery. But why do the current accounts of the euro area periphery countries (as well as countries within the euro area) behave different to the current accounts of the dollar periphery countries? Europe and the informal dollar standard will be – in line with McKinnon and Schnabl (2009) and Hung and Gamber (2010) – discussed in turn based on the absorption approach to current accounts.

2.1 Current Account Transmission in Europe

The rise of current account imbalances in Europe started with the turn of the millennium (Figure 1). This roughly follows or coincides with the official introduction of the euro in January 1999 (Berger and Nitsch 2010), the burst of the new economy bubble in 2000 and low interest rate policies of the US Fed and the European Central Bank from 2001 up to 2005. The German current account balance which had turned

¹ The composition of the single country groups is listed in Table 1. The African countries partly peg to the euro and partly to the dollar. They are not included in the sample for parsimony reasons. Although Russia has adopted a currency basket containing both euro and dollar we list it as a member of the dollar periphery.

negative in the early 1990s due to a sudden rise of investment and consumption during the unification process turned positive far beyond the pre-unification level after the turn of the millennium.

To answer the question of why the German current account turned positive after 2000 we assume German attempts to regain international competitiveness after the unification boom as exogenous (Schnabl and Zemanek 2010). The unification had led to a hike in the public debt level (inter alia due to high costs of rebuilding the East German infrastructure etc.) and to a surge in unit labor costs (inter alia due to hiking social security expenditure because of sharply rising unemployment). Both factors were reflected in a negative current account balance. After the unification boom had ended in the mid 1990s, the German government made considerable attempts to consolidate public expenditure to comply with the stability and growth pact. The German industry sought to reduce unit labor costs to regain international competitiveness. Cutting wage costs in both the private and public sector was possible, because the hike in unemployment as well as wage pressure from Central and Eastern Europe had eroded the bargaining power of German trade unions.

The resulting gloomy business sentiment in Germany stimulated precautionary savings of the private sector and put a drag on German fixed capital formation. In the second half of 1990s the rising surplus of saving above fixed capital investment was absorbed domestically by the new economy boom. After the burst of the new economy bubble in the year 2000 capital exports looked more attractive. The incentive to invest in Southern, Central and Eastern Europe as well as in the western European islands and the US was even larger, because decisive interest rate cuts by the US Fed and the ECB boosted economic activity and asset prices in these regions. In the US, UK and Ireland US Fed and ECB interest rate cuts had contributed to booming financial sector activity and rising prices in the (subprime) real estate markets (Hoffmann and Schnabl 2008). In Spain and Central and Eastern Europe surging real estate and stock prices created an incentive to invest German savings. In other euro area countries, the introduction of the euro seemed to have eliminated foreign exchange and default risk for investment in government bonds.

Figure 2 models the resulting current account transmission from Germany to the Central and Eastern European countries as well as for some euro area periphery countries. We assume German net saving behavior as exogenous because of a country specific adjustment process after the unification boom. The austerity in Germany following the unification boom led to an outward shift of the saving curve (from S_1 to S_2) (alternatively or simultaneously an inward shift of the investment curve) after the turn of the millennium. The resulting increase in the saving-investment gap was underpinned by the ECB interest rate cut following the burst of the new economy bubble (from i_1 and i_2).

Note that both events are linked by the burst of the new economy bubble, as prior to the year 2000 the dotcom euphoria tied savings in Germany. During the recession after the new economy boom foreign investment had become to look more attractive than domestic investment. The ECB interest rate cuts became possible because of low wage and low inflation in Germany as the largest euro area country and the global recession following the end of the new economy boom. Due to asymmetric economic sentiment in Germany and other regions in Europe, the ECB interest rate cuts did not stimulate German investment but in other regions of Europe.

The hike in German net capital exports (from CX_1 to CX_2) encouraged (discouraged) investment (saving) in the European periphery. The negative saving-investment gap in the European periphery increased to $I_2^* > S_2^*$.² Net capital imports increased from CM_1^* to CM_2^* and the current account deficits of – what we call – European periphery countries other than Germany rose from $-CM_1^*$ to $-CM_2^*$. Note that in Figure 3 we assume because of the consequences of unification shock and the large size of Germany, a unidirectional causality running from Germany to the smaller European “periphery” countries. The ECB interest rate policies are assumed to be transmitted independent from the exchange rate regime either via tightly fixed exchange rates (as for instance in the Baltic countries), discretionary exchange rate stabilization (as for

² The asterisk labels the periphery.

instance in the Romania), interest rate cuts to shield off speculative capital inflows or outright membership in the euro area.³

2.2. Current Account Transmission in the Dollar Bloc

On a global level the imbalances between the US and the countries pegging their currencies to the US dollar dramatically increased following the 1997/98 Asian crisis as shown in Figure 1. The context of the current account imbalances between the US and the countries pegging their currencies to the dollar is different to Europe in three main regards. First, in contrast to Europe where Germany as a center country is running a current account surplus, in the dollar bloc the US has a current account deficit since the early 1980s. A structural break towards a further hike in the US current account deficit was experienced following the Asian crisis, i.e. somewhat earlier than in Europe.

Second, whereas in Europe international trade, capital flows and macroeconomic decision making are subject to the European treaties and the *Acquis Communautaire*, on global levels no legally binding rules concerning macroeconomic policy coordination, exchange rate stabilization, trade barriers or capital controls exist. This allows the dollar periphery countries a higher degree of freedom in managing international capital

³ The capital inflows caused boom-and-burst cycles in the European periphery countries. During the global financial crisis (setting in 2007) and the euro crisis (setting in 2010) changing expectations concerning future profits net capital exports reversed German capital exports. This tightening of capital supply can be seen as the starting point of the crisis in Central and Eastern Europe and several euro area countries. The crisis was counteracted via three channels, which led to a monetary expansion in the euro area and thereby counteracted current account adjustment. First, the ECB decisively cut interest rates, thereby providing an incentive for private investors to continue capital exports. Second, private capital exports were substituted by public capital exports in form of rescue packages, for instance under the European Financial Stability Framework. Third, private purchases of government bonds were substituted by ECB purchases of government bonds of euro area crisis countries.

flows including non-market based interventions, as for instance capital controls and non-market based sterilization, which are not in line with the European treaties.

Figure 1 shows that two periods of widening current account imbalances between the US and its periphery can be identified: First after the Asian crisis up to the year 2000 and second after the burst of the new economy bubble in late 2000. These two breaks can be associated with changes in relative monetary policy stances between the US and East Asia. In response to the Asian crisis, the US Fed moderately cut interest rates to stabilize global financial markets (instead of sterilizing capital inflows). In contrast, the East Asian countries started tightening monetary policies and credit growth in order not to repeat pre-crisis policy mistakes when due to widely unsterilized exchange rate stabilization buoyant capital inflows were translated into excessive monetary expansion. While exchange rate stabilization continued (on a more discretionary basis) the monetary effects were neutralized based on sterilization policies (Löffler, Schnabl and Schobert 2011).

After the burst of the dotcom bubble and decisive interest rate cuts of the US Fed, the combination of expansionary monetary policy in the US and relative restrictive monetary policies in the East Asian countries was further enhanced, as speculative capital flows to East Asia (and therefore the scope of sterilization operations) grew. Because the loose US monetary policy also contributed to hiking oil and raw material prices, oil and raw material exporting countries felt forced to tighten monetary policy stances. For sterilization purposes they mainly used government deposits at the central bank and fast growing stabilization funds (Schnabl and Schobert 2009). As shown in Figure 1, the current account imbalances between the US and the countries pegging their currencies to the dollar further hiked after the year 2001, now being dubbed “global imbalances”.

Figure 3 models the emergence of global imbalances based on the assumption that monetary policy of the US as the largest economy with a prominent role of its currency within an asymmetric world monetary system is exogenous. We allow for feedback effects of exchange rate stabilization and sterilization in the periphery countries

on US interest rates. In contrast to the European setting it is assumed that capital is exported from the dollar periphery (CX_1^*) to the center (CM_1), where a negative saving-investment gap ($S_1 < I_1$) is closed by capital imports. The (accumulated) current account of the dollar periphery (CA_1^*) is positive, whereas the current account of the US ($-CA_1$) is negative. As in the case of Europe, the international capital market within the dollar bloc is assumed to be in equilibrium at $i_1 = i_1^*$.

The US central bank is assumed to cut interest rates exogenously. There are (inter alia) two possible reasons. First, a sudden price decline in stock or real estate markets seems to make interest rate cuts necessary to preserve financial stability and growth. Second, with the government pursuing an expansionary fiscal policy, the central bank cuts interest rates to neutralize Mundell-Fleming type crowding out effects (Freitag and Schnabl 2010). The interest rate cut by the Federal Reserve discourages private and public saving and encourages investment in the US, which implies a larger negative saving investment gap ($I_2 << S_2$) and a rising current account deficit ($-CA_2 < CA_1$). At the same time, however, private capital exports are stimulated, as long as interest rates are low and expected returns on investment in the periphery countries remain high. Rising US capital outflows would imply declining US net capital imports. The outcome would be a balance of payments disequilibrium because the capital imports (CM_2), which are necessary to cover the increasing US saving-investment gap ($I_2 < S_2$) are not matched by sufficient private capital exports by the US periphery (CX_2^*).

The balance of payments is cleared at the level $S_2 - I_2$ because of exchange rate stabilization cum sterilization policies in the countries at the dollar periphery. If exchange rate stabilization and foreign reserve accumulation – which remained prevalent in the dollar periphery countries independent from the official exchange rate regime after the Asian crisis – would remain unsterilized, the US interest rate level would be imported in the periphery countries and a disequilibrium as described above would emerge. Tensions would either force the US to realize smaller capital imports (i.e. forced saving on private and public US agents) or the periphery countries would be

forced to pursue tighter monetary policy stances. In effect, the latter is achieved through sterilization policies.

Sterilization of the monetary effects of foreign reserve accumulation can be either market-based or non-market based (Löffler, Schnabl and Schobert 2011). Market-based sterilization drives domestic interest rates upwards, which attracts new speculative capital inflows. As this is undesired within an environment of buoyant capital inflows the East Asian monetary authorities usually refrain to non-market based sterilization measures. They absorb liquidity from the domestic financial markets by coercion based on interest rates below markets rates, for instance via reserve requirements. This ensures that speculative capital inflows are discouraged (as market interest rates remain low), while domestic liquidity conditions are tightened. The downside is the fragmentation of financial (and goods) markets (see Schnabl 2010 for China).

In Figure 4 the non-market based sterilization policies are modeled by diverging interest rates between domestic and international capital markets. The official non-market based sterilization rate i_{2a}^* models the remuneration rate of sterilization instruments, which remains low at the international level to discourage additional capital inflows. The interest rate, which reflects the tightened liquidity conditions in the domestic market, is i_{2b}^* . The divergence of the non-market based sterilization rate i_{2a}^* and the interest rate i_{2b}^* reflecting tightened liquidity conditions models domestic capital market fragmentation and is usually underpinned by international capital controls.

International capital markets are fragmented as the de facto domestic interest rate level i_{2b}^* in the periphery country is delinked from the interest rate level in the center country $i_2 (= i_{2a}^*)$. On the international capital and goods markets an equilibrium between the current account and capital account positions is ensured as the foreign reserve accumulation of the periphery countries (ΔRes) shifts the capital export curve of the periphery outwards to CX_2^* . The additional capital supply of the periphery countries' monetary authorities keeps the interest level of the center country low at i_2 . The respective capital account balance CM_2 of the center is now financed by private

and public capital exports of the periphery countries ($CX_2^* = CX_1^* + \Delta \text{Res.}$) The saving-investment balance in the periphery corresponds to the distance between S_{2b}^* and I_{2b}^* . At the end of the adjustment process the increased saving-investment gap of the center ($I_2 > S_2$) corresponds to the increased saving-investment gap of the periphery $S_2^* > I_2^*$.

Although Figure 4 assumes that the adjustment process of global current accounts originates in the US as the country with the largest degree of freedom in monetary policy making it also models the bi-directional causality in current account positions. Exogenous changes in the US monetary policy stance trigger private capital flows to the periphery countries of the world dollar standard. The policy response in the periphery countries, i.e. exchange rate stabilization cum sterilization ensures sufficient capital flowing uphill from the periphery to the center and thereby the equilibrium in international financial and goods markets. As financial and current account surpluses/deficits have increased in one or the other direction, this international policy interaction is perceived as global imbalances.

The direction of causality of current account adjustment between the US and the dollar periphery can be assumed to be bi-directional as foreign US government bond purchases keep long-term US interest rates low thereby signaling low (or declining) consumer price inflation. Alternatively, low import prices from China keep US consumer prices low. This enables the central bank to keep short-term interest rates low. Second, the government is encouraged to increase spending and government debt, because the interest burden of rising public debt remains tolerable. Expansionary fiscal policies would force the central bank into further interest rate cuts to counteract Mundell-Fleming type crowding out effects via capital market interest rate increases and exchange rate appreciation. To this end, the question about the causality in global current accounts as discussed in section 1 remains pending. We address it empirically based on panel regressions and panel Granger tests.

3. Estimation Frameworks and Data

Our model for current account transmission is empirically tested in two ways. First, as periphery reserve accumulation and interest rates in the centers are acknowledged to play an important role for global current account balances we aim to disentangle the direction of causality between both variables. Second, we aim to identify the macroeconomic determinants of the world current account imbalances with a focus on monetary policies in center and periphery countries.

3.1 Estimation Frameworks

First, we perform a panel Granger causality test for monetary policies in the centers and reserve accumulation in the peripheries. The Granger test aims to provide evidence in favor of either Bernanke et al. (2011) or McKinnon and Schnabl (2009). Alternatively, bi-directional causality between center interest rates and periphery reserve accumulation may be revealed. Granger causality tests (Granger 1969) are a standard tool to analyze causality linkages in applied econometrics. More recently Granger causality tests have been applied to a panel context (Holtz-Eakin et al. 1988, Hurlin and Venet 2004). Arellano-Bond estimators are applied to cope with the inherent endogeneity problem (Arellano and Bond 1991). Because the standard errors of two-step estimators tend to be biased downwards, Blundell and Bond (1998) one-step estimation results are reported. The Hansen test of overidentifying restrictions checks for the validity of the applied GMM instruments. As instruments lagged values of both variables (A and B) are applied. The Granger causality is verified based on the Wald test. The null hypothesis of the Wald test assumes that the effect of the lagged variable A (explanatory variables) on variable B (dependent variable) is jointly zero. If the null hypothesis can be rejected Granger causality is assumed.

Second, we aim to jointly trace the impact of center and periphery macroeconomic policies on the current account positions. Our estimations focus on the role of monetary and exchange rate policies for the global imbalances as stressed above. As sug-

gested by Chinn and Ito (2008) we control for the impact of fiscal policies on net government savings. On the side of the periphery countries, the main policy variable is assumed to be the exchange rate as assumed by Dooley, Folkerts-Landau and Garber (2003). We use foreign reserve accumulation as a proxy for exchange rate stabilization. In addition – given nominal exchange rate stabilization – current account balances can be affected by sterilization operations for two reasons (Freitag and Schnabl 2010): First, non-market based sterilization depresses investment without stimulating saving. Second, as in the case of many raw material exporting countries, sterilization via government deposits at the central bank has a positive impact on government saving and a negative impact on private investment. For the second panel estimation we use a GMM estimator for the cross country panel (Arellano and Bond 1991, Blundell and Bond 1998).

3.2 Data

The sample contains the US and Germany as center countries and 91 periphery countries. The periphery sub-samples correspond to the six peripheries as identified in Table 1. The dollar periphery is subdivided into (Latin) America plus Canada (19 countries), East Asia (10 countries), the Middle East (14 countries), and the Commonwealth of Independent States (CIS) (12 countries). The periphery of Germany is subdivided into Emerging Europe (20 countries) and Industrialized Europe excluding Germany (16 countries).

The time period for all estimations and tests starts – if data are available - in 1981 and goes up to the year 2008. For the former socialist economies (CIS and Emerging Europe) the samples starts in 1994 when a wider set of data became available for most countries in the sample. Monthly and yearly data are applied for the estimations depending on the available data frequency. Yearly data are the highest frequency for which data are available for all macroeconomic variables including government deficits. Panel Granger causality tests are based on monthly data as interest rates and reserves are available in higher frequencies and more robust information can be gained based on the larger sample size.

All data are from the IMF (WEO, IFS) or national central bank statistics. Yearly current account data, government deficits and foreign reserves are measured in percent of GDP. Yearly interest rates are included in levels. The proxy for sterilization is calculated as the gap between net foreign assets and currency in circulation as percent of GDP.⁴ Panel unit root tests reveal that there is no concern about stationarity in the data set. In monthly data the interest rates are also measured in levels. While foreign reserves measured as a percentage of GDP are stationary for yearly data, the same proxy is not stationary for monthly data. Therefore, monthly foreign reserves are proxied as the absolute first differences divided by GDP.⁵

4. Estimation Results

To test for current account transmission in the euro area and in the dollar area we perform Granger and panel GMM estimations for the world as a whole and single country groups. As China is of particular policy interest with respect to global imbalances, we report isolated results for China, albeit the sample size is very small and therefore the results have to be treated with caution.

Granger Tests

As stressed above the direction of causality between center interest rates and periphery reserve accumulation can go into one or the other direction. This may indicate a bi-directional, self-reinforcing relationship, which is tested based on a panel Granger causality framework.

The results for the Granger causality tests are reported in Table 2. For the estimations monthly data are used, which helps to increase the robustness of the results. Fur-

⁴ Concerning more information on the choice of this sterilization proxy see Schnabl and Schobert (2009).

⁵ Relative and absolute first differences are both used in the literature. We apply absolute first differences of foreign reserves as a percentage of GDP. Percent changes of foreign reserves decline when stocks of foreign reserves rise as it is the case in most countries since the turn of the millennium.

thermore, we assume in line with the tests above that monetary policy decisions are represented by interest rates in the center countries and by reserve accumulation in the peripheries. In the upper part of Table 2 the reserves in the peripheries were regressed on lagged reserves and lagged center interest rates. If adding lagged center interest rates to the autoregressive terms adds explanatory power to the regression, center interest rates Granger-cause periphery foreign reserves. The respective test statistics are represented by the Wald test for joint significance of the lagged interest rate variables. The US is used as a center country for the dollar peripheries; Germany is used as a center country for Emerging Europe and industrialized Europe excluding Germany.

For the US and the dollar peripheries (East Asia 10, Latin America, Middle East and CIS) the Granger test provides evidence only in favor of a panel Granger causality from US interest rates to periphery reserve accumulation for East Asia 10 at the common significance levels. For the Middle East and the CIS the Wald test is close to the ten percent significance level. With respect to Germany, center interest rates do not Granger cause reserve accumulation in Emerging Europe. For industrialized Europe, the Wald test is close to the common significance level.

In the lower part of Table 2 the results for causality from periphery reserves to center interest rates are reported. The Wald test indicates strong evidence in favor of causality from East Asian reserve accumulation to US interest rates. This implies a bidirectional causality for the US and East Asia: As the US keep interest rates low, the East Asian countries receive private capital inflows which trigger reserve accumulation, for instance to maintain competitiveness of exports (Dooley, Folkerts-Landau and Garber 2003) and to sustain the domestic value of foreign currency denominated reserves (McKinnon and Schnabl 2009). As periphery reserve accumulation is linked to substantial purchases of US government bonds and lower US import prices the interest rate level in the US is kept low (Bernanke 2005). Note, however, that such a bidirectional causation as suggested by the Granger test, does not allow for an assessment which side has initiated this circle of center interest rate cuts and periphery reserve accumulation, which seems to perpetuate global imbalances. For Europe, a self-

energizing bidirectional causality is found for industrialized Europe but not for Emerging Europe with respect to Germany.

Policy Transmission

Monetary policies in both centers and peripheries were identified in section 2 as crucial determinants of current account positions. Building upon the discussion above we test for the transmission of center and periphery macroeconomic policies on the overall current account positions. On the side of the center countries we use monetary and fiscal policies as determinants of the current accounts. On the side of the periphery countries reserve accumulation and sterilization policies are used as determinants of the current account. The results are reported in Table 3.

The upper part of Table 3 models macroeconomic policy transmission on current account positions treating the US as center. The strongest evidence in favor of an impact of macroeconomic policies on current account positions is found for the US and East Asia. US interest rates cuts are associated with rising current account surpluses of the East Asian countries (significant at the ten percent level). A declining US public deficit, for instance triggered by accelerating growth in the face of low interest rates, is linked to rising current account surpluses in East Asia. East Asian exchange rate stabilization as represented by reserve accumulation is accompanied by higher East Asian current account surpluses at a highly significant level. Sterilization policies, measured by the gap between foreign reserves and currency in circulation as percent of GDP, have a highly significant statistical impact on the East Asian current accounts. The transmission could be via saving and investment patterns: As non-market-based sterilization tightens investment and leaves saving unaffected the saving surplus and therefore the current account surpluses increase.⁶ This is widely in line with Figure 2.

From the point of view of the US, only US monetary policies are linked to the US current account position. As US interest rates fall, the current account balance deteri-

⁶ Schnabl (2010) discusses the impact of sterilization policies on the Chinese current account balance.

orates (positive coefficient, significant at the 5% level). Estimating China separately renders only the sterilization coefficient statistically significant. All in all, the results for East Asia and the US mostly support the finding of the panel Granger causality test, i.e. a bi-directional self-reinforcing causality originating in expansionary US monetary policies and real exchange rate stabilization in East Asia. Real exchange rate stabilization in East Asia results in the combination of nominal exchange rate stabilization as represented by reserve accumulation and sterilization policies, which keep the price level low.

For the other country groups with respect to the US, the evidence for the impact of center and periphery macroeconomic policies on current accounts is mixed. For (Latin) America, the current account positions seem to be driven by US monetary policies and periphery reserve accumulation. Periphery sterilization policies have the wrong sign. In the Middle East only sterilization policies, represented by general government surpluses and government deposits at the central bank, turn out highly significant. This is in line with the twin surpluses of the oil exporting countries and the low price elasticity of raw material exports. As sterilization slows down domestic consumption, investment and imports while public saving hikes, current account surpluses increase.

In the CIS, only US interest rates are significant at the common significance levels. For Emerging Europe, neither US macroeconomic policies nor sterilization patterns seem to have an impact on the current account positions. In contrast to East Asia and Latin America, reserve accumulation is linked to rising current account deficits. Finally, for the world as a whole both US monetary policies as well as periphery sterilization and exchange rate stabilization policies seem to have an impact on current accounts at the common significance levels.

In the lower part of Table 3 the estimation results with Germany as a center country are reported. In general there is strong indication for a negative correlation between German interest rates and the current account balances of the dollar peripheries, industrialized Europe and Germany itself (declining interest rates in Germany and the euro area are accompanied by improving current account positions). With respect to

Germany, Emerging Europe is of specific interest. In sharp contrast to the dollar periphery, declining interest rates in the Germany and the euro area are linked – in line with Figure 3 – to rising current account deficits in Emerging Europe (and US) at high significance levels. A declining government deficit in Germany (for instance in economic upswings) is accompanied by declining current account deficits in Emerging Europe. In contrast to East Asia sterilization policies in Emerging Europe have a no significant impact on the Emerging European current account balances, because the European treaties strongly restrain non-market based sterilization operations. Thus, the main reason for the divergence between East Asian and Emerging European current account balances are not different monetary policies of the centers or differing nominal exchange rate strategies but different attitudes with respect to sterilization and thereby real exchange rate stabilization.

5. Conclusion

In the recovery after the global crisis – as represented by the revived conflict about the Chinese dollar peg – global imbalances can be expected to strengthen again. Our paper aimed to trace the origins and transmission channels of asymmetric global imbalances based on the assumption that the world can be subdivided into two center and many periphery countries. We have shown that there is no mono-causal, unidirectional explanation to global imbalances. Instead, global imbalances are seen as the outcome of monetary and exchange rate policy interaction of center and periphery countries under different institutional frameworks.

In the US, low interest rates are argued to have contributed to the current account deficit as saving declined and investment rose. In the dollar periphery, in particular in East Asia the combination of nominal **and** real exchange rate stabilization can be seen as the reason for current account surpluses. In this context, the periphery countries may have few degrees of freedom concerning both exchange rate stabilization and sterilization, because goods and capital markets are underdeveloped and shallow. Without nominal exchange rate stabilization and sterilization these countries – in particular China – would be victims to (even stronger) inflation and overheating as it was

the case in Emerging Europe prior to the recent crisis and as in East Asia prior to the Asian crisis.

To this end, as partially reflected in the econometric exercises, the imbalances within the dollar bloc are the outcome of a mutual self-reinforcing process. This does not solve the question of if the center or the periphery have triggered the vicious cycle of interest rate cuts and reserve accumulation. One could argue, however, that only the center countries have the necessary structural characteristics to give momentum to such a process. Nevertheless, we have shown that the current account imbalances have become a two-sided issue, which can only be cured by combined efforts. While the United States has to return to tighter monetary policies, the dollar periphery countries including China have to curtail sterilization operations and strengthen domestic demand.

With respect to Germany and the smaller European countries the econometric exercise did not yield sufficient evidence to answer the question of why many European countries have continued to run current account deficits while Germany has moved into current account surpluses. Yet the theoretical analysis implies that the exogenous shock of the German unification is likely to play an important role up to the present in combination with the inability of European periphery countries to sterilize capital inflows. If this is the case the intra-European imbalances have to be addressed by fiscal and mainly wage policies rather than nominal exchange rate adjustment.

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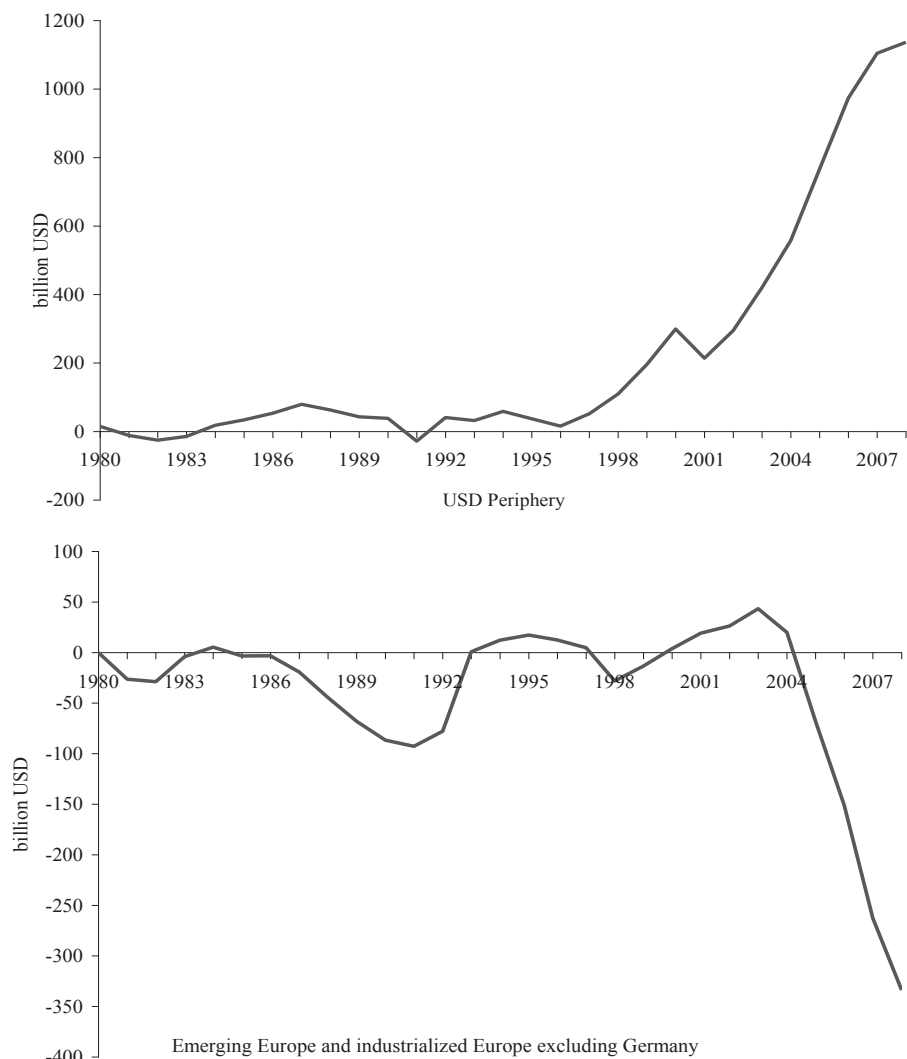
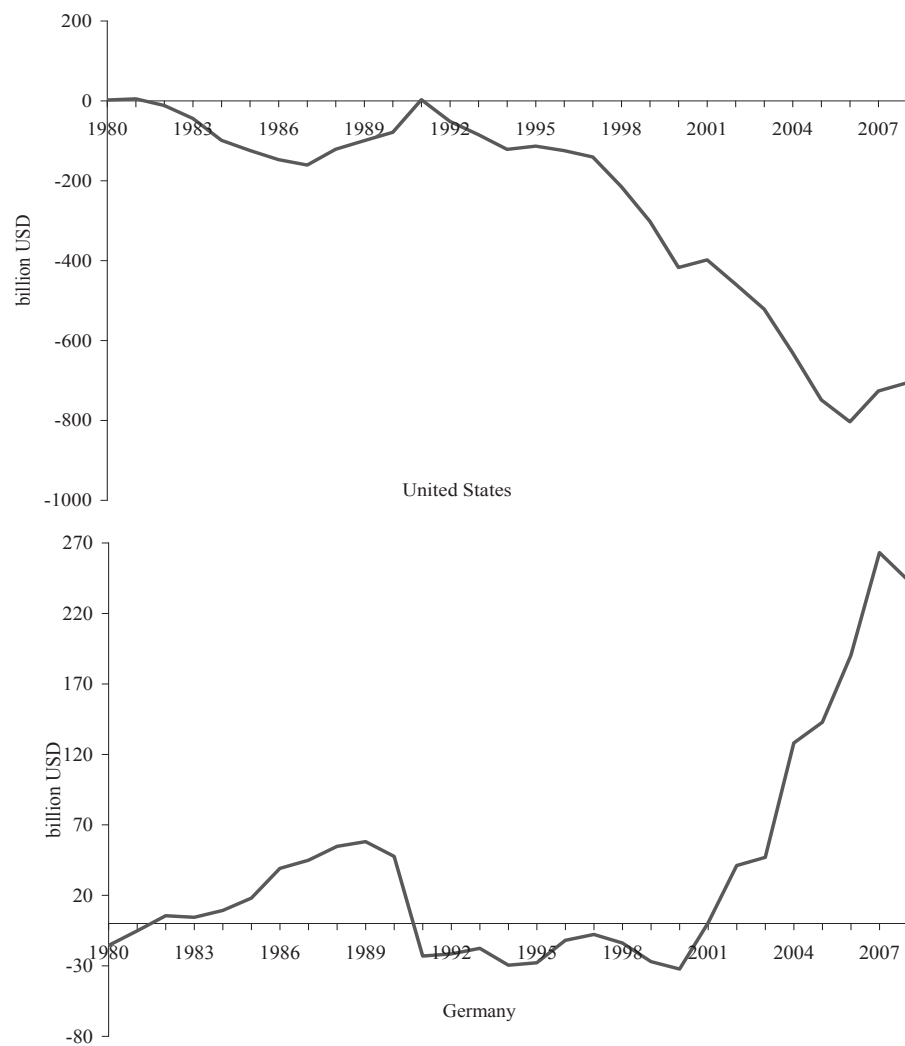
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Figure 1: Asymmetric Global Current Accounts



Source: IFS 2010.

Figure 2: Market-Based Current Account Transmission in the Euro Area

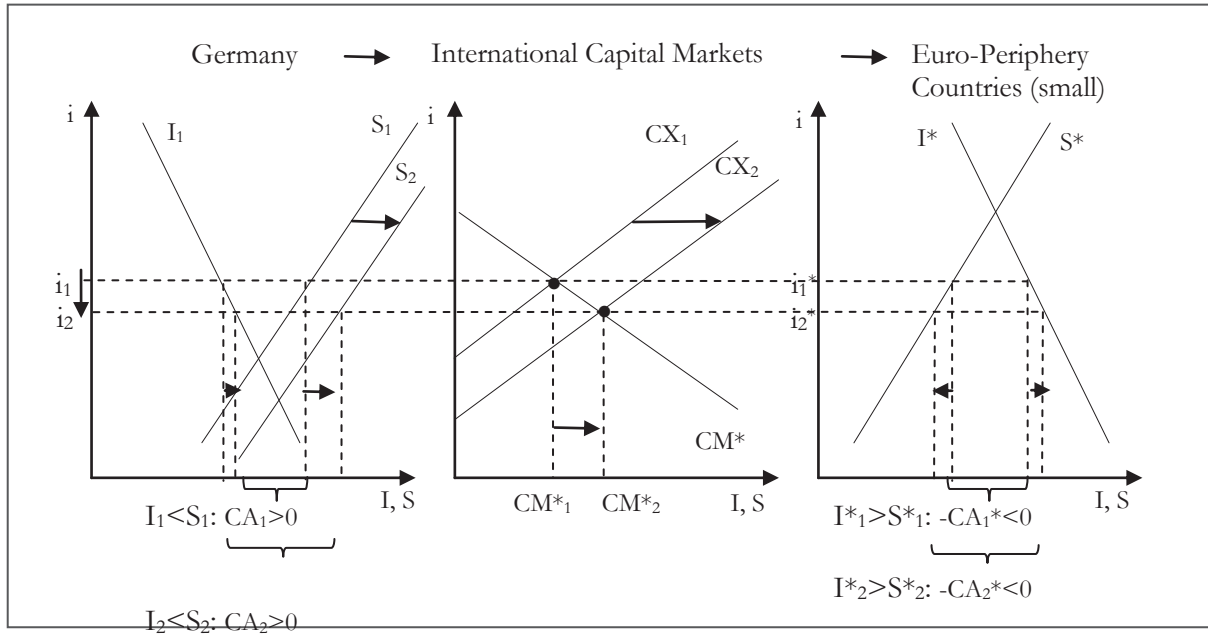


Figure 3: Non-Market Based Current Account Transmission in the Dollar Bloc

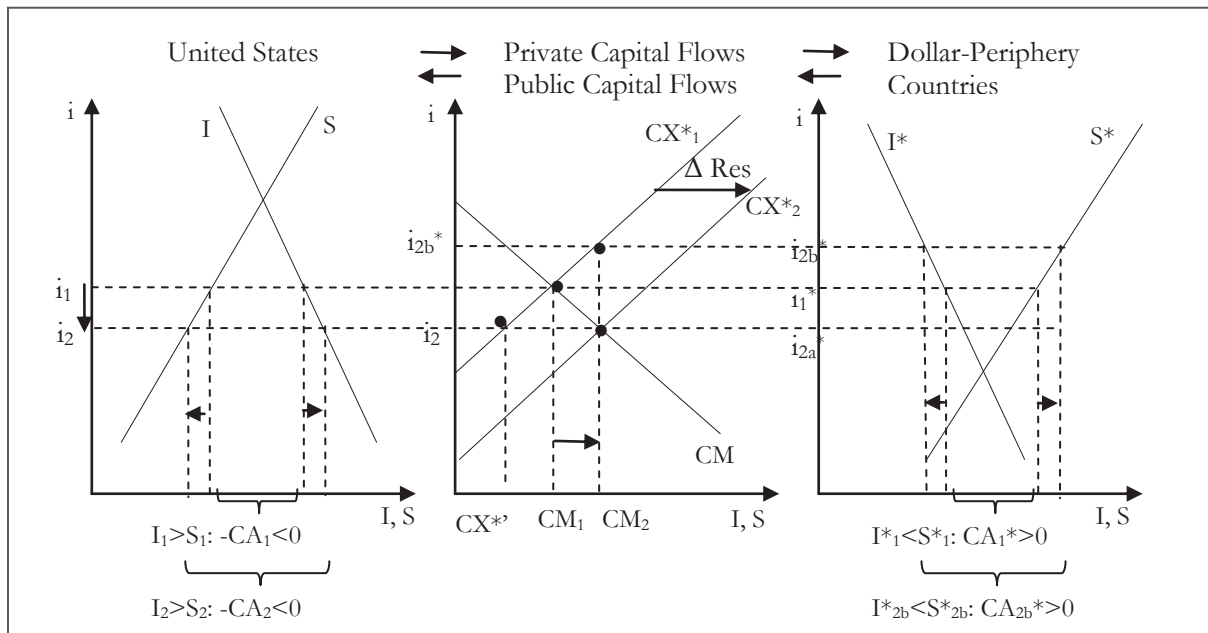
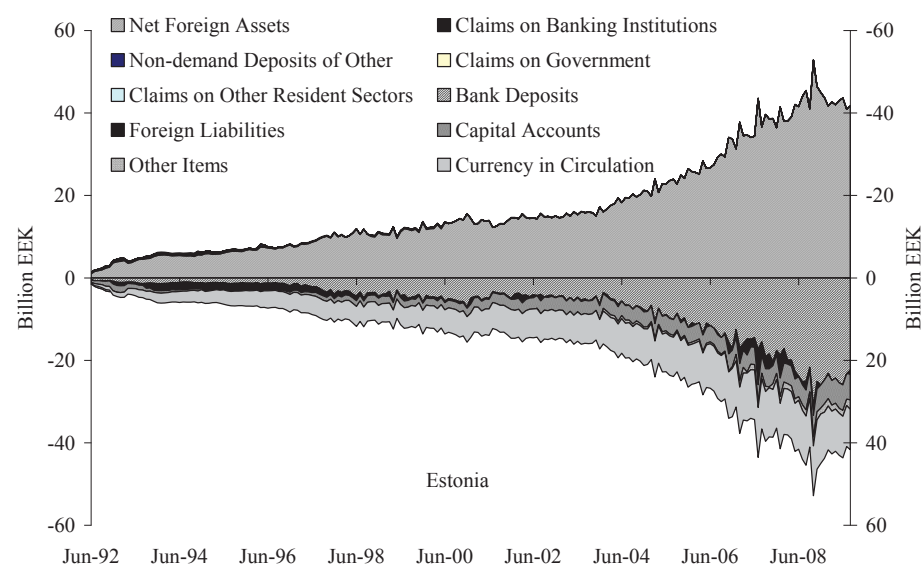
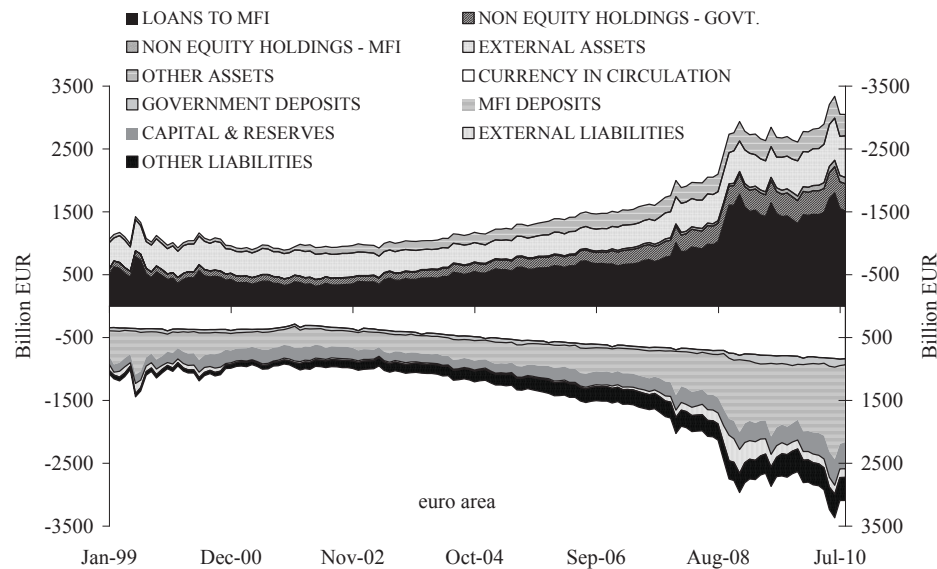
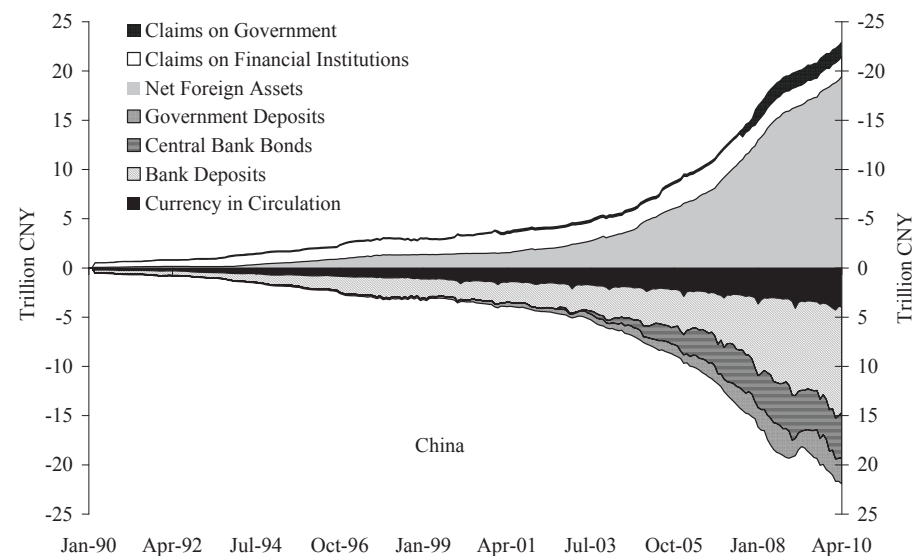
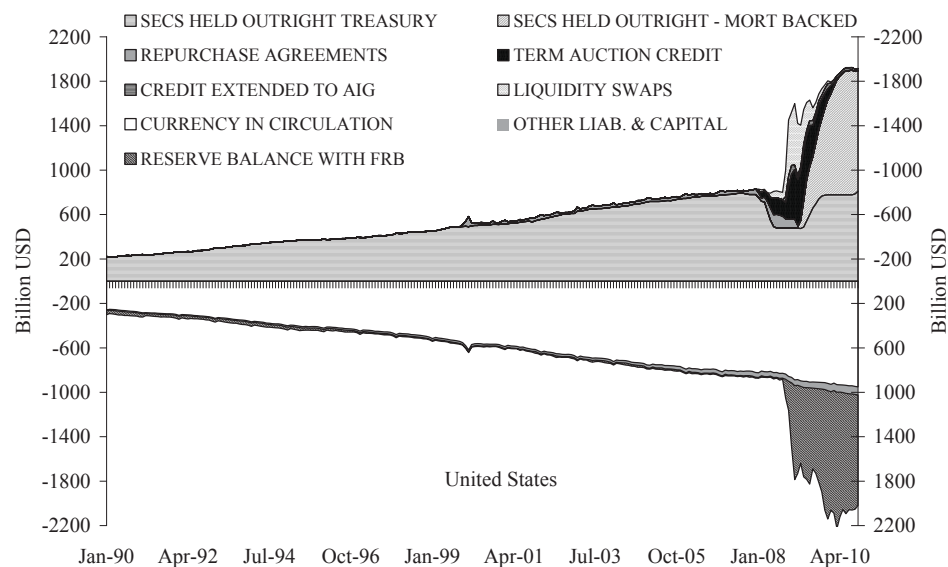


Figure 4: Central Bank Balance Sheets



Source: IFS 2010.

Table 1: Country Groups

| Region | Countries |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Latin) America (\$) | Argentina, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela |
| East Asia 10 (\$) | China, Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, Thailand |
| Middle East (\$) | Algeria, Bahrain, Egypt, Iran, Israel, Jordan, Kuwait, Lebanon, Libya, Oman, Saudi Arabia, Syria, United Arab Emirates, Yemen |
| CIS (\$) | Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan |
| Emerging Europe (€) | Albania, Bosnia, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Iceland, Latvia, Lithuania, Macedonia, Malta, Morocco, Poland, Romania, Slovak Republic, Slovenia, Tunisia, Turkey |
| Industrialized Europe excl. Germany (€) | Austria, Belgium, Denmark, Finland, France, Greece, Italy, Ireland, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom |

Table 2: Panel Granger Causality Test for the Center Interest Rates and Periphery Foreign Reserves (Jan 1981 – Dec 2008)

| Dependent Variable: Reserves of Periphery Countries | | | | | | |
|------------------------------------------------------------|------------------------|------------------------|------------------------|---------------------|------------------------|-----------------------|
| | East Asia-10 | Latin America | Middle East | CIS | Emerging Europe | Ind. Eur. excl.GER |
| Interest Rates(-1) | -0.1658** (0.0767) | -0.1265 (0.08073) | 0.3585** (0.1722) | -0.4350 (0.5065) | -0.1412 (0.1683) | 0.5127* (0.3136) |
| Interest Rates(-2) | 0.0754 (0.0753) | 0.0008 (0.0682) | -0.3345** (0.1721) | 0.5611 (0.5733) | 0.0883 (0.1500) | -0.6135* (0.3462) |
| Reserves(-1) | -0.9402*** (0.0083) | -0.2541* (0.1756) | -0.9144*** (0.3080) | -0.2401 (0.2270) | -0.2509** (0.1106) | 0.3114*** (0.1328) |
| Reserves(-2) | -0.8101*** (0.0358) | -0.5550*** (0.1202) | -0.0621 (0.0681) | 0.0701 (0.0582) | -0.0018*** (0.0005) | -0.0310** (0.0144) |
| Number of obs. | 2889 | 5531 | 3444 | 1188 | 2480 | 4832 |
| Wald-Test (p-level) | 0.008 | 0.9366 | 0.114 | 0.140 | 0.457 | 0.1073 |
| Hansen-Test (p-level) | 0.288 | 0.276 | 0.243 | 0.215 | 0.340 | 0.405 |

| Dependent Variable: Interest Rates of Center Countries | | | | | | |
|---------------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|
| | East Asia-10 | Latin America | Middle East | CIS | Emerging Europe | Ind. Eur. excl.GER |
| Interest Rates(-1) | 1.3607*** (0.0009) | 1.3438*** (0.0060) | 1.2519*** (0.0424) | 1.7957*** (0.0749) | 1.0826*** (0.0525) | 1.3580*** (0.0150) |
| Interest Rates(-2) | -0.2992*** (0.0007) | -0.3592*** (0.0057) | -0.2461*** (0.0395) | -0.7830*** (0.0832) | -0.0255 (0.0397) | -0.3310*** (0.0160) |
| Reserves(-1) | -0.0023*** (0.0002) | 0.0101 (0.0407) | 0.1688 (0.1257) | 0.0669 (0.0563) | 0.2737 (0.3150) | 0.0216** (0.0113) |
| Reserves(-2) | -0.0008*** (0.0002) | -0.0122 (0.0220) | 0.0046 (0.0101) | -0.0069 (0.0154) | 0.0016 (0.0021) | -0.0026** (0.0011) |
| Number of obs. | 2889 | 5535 | 3455 | 1190 | 2484 | 4842 |
| Wald-Test (p-level) | 0.000 | 0.7802 | 0.248 | 0.430 | 0.647 | 0.073 |
| Hansen-Test (p-level) | 0.109 | 0.211 | 0.148 | 0.193 | 0.243 | 0.136 |

Standard errors in parentheses. ***, **, * denotes significance at 1%, 5% and 10% level. Estimates for constant terms are not reported. The Arellano-Bond one-step estimator was applied. East Asia-10 encompasses China, Hong Kong, Indonesia, Japan, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand. The US is used as a center country for the dollar peripheries; Germany is used as a center country for Emerging Europe and Industrialized Europe excluding Germany.

Table 3: Transmission of Center and Periphery Macro Policies to Current Accounts (1981-2008)

| Regression on current accounts: | World | East Asia-10 | (Latin) America | Middle East | CIS | Emerging Europe | Ind. Eur. ex. GER | United States | Germany | China |
|--------------------------------------------------------------|----------------------|---------------------|----------------------|---------------------|----------------------|----------------------|-----------------------|-----------------------|------------------------|---------------------|
| Constant (α) | -0.016 (0.012) | -0.011 (0.029) | -0.029** (0.013) | 0.020 (0.042) | 0.241** (0.110) | 0.046 (0.042) | 0.033*** (0.007) | -0.061*** (0.047) | 0.087 (0.082) | -0.014 (0.020) |
| US interest rate (β_1) | -0.002* (0.001) | -0.003** (0.001) | -0.002** (0.001) | -0.0002 (0.003) | -0.034*** (0.011) | -0.004 (0.004) | -0.003*** (0.0006) | 0.028** (0.001) | -0.003 (0.003) | 0.002 (0.001) |
| US Deficit (β_2) | 0.310** (0.134) | 0.359* (0.190) | -0.007 (0.152) | 0.851 (0.573) | 1.148 (0.756) | 0.205 (0.232) | 0.317*** (0.108) | -0.142 (0.237) | -0.094 (0.521) | 0.272 (0.224) |
| Sterilization in Periphery (β_3) | 0.087*** (0.029) | 0.072*** (0.023) | -0.137*** (0.051) | 0.1675** (0.083) | -0.209 (0.201) | -0.025 (0.096) | - | -0.370+ (0.349) | 0.939**++ (0.481) | 0.235*** (0.045) |
| Periphery Reserves (β_4) | 0.121*** (0.036) | 0.250*** (0.054) | 0.128** (0.051) | 0.145 (0.091) | 0.278 (0.250) | -0.413*** (0.107) | 0.275*** (0.069) | 0.097+ (0.296) | -0.558++ (0.428) | 0.096 (0.056) |
| Adj. R-squared | 0.347 | 0.637 | 0.603 | 0.202 | 0.135 | 0.317 | 0.566 | 0.700 | 0.429 | 0.747 |
| Constant (α) | -0.007 (0.010) | -0.004 (0.021) | -0.011 (0.010) | 0.061 (0.038) | 0.008 (0.081) | -0.066*** (0.025) | 0.010 (0.006) | -0.054*** (0.014) | 0.144*** (0.031) | -0.040 (0.033) |
| EMU/German interest rate (β_2) | -0.004*** (0.001) | -0.005** (0.002) | -0.005*** (0.001) | -0.009* (0.005) | -0.008 (0.013) | 0.010*** (0.003) | -0.005*** (0.0009) | 0.004*** (0.001) | -0.011*** (0.003) | -0.006 (0.007) |
| German Deficit (β_2) | 0.520 (0.327) | 0.984** (0.449) | 0.256 (0.376) | 0.645 (1.480) | 1.844* (1.156) | -0.726** (0.306) | -0.339 (0.270) | -0.165 (0.242) | -0.299 (0.651) | 0.440 (1.368) |
| Sterilization in Periphery (β_3) | 0.081*** (0.029) | 0.075*** (0.023) | -0.138*** (0.050) | 0.145* (0.082) | -0.263 (0.198) | -0.012 (0.083) | - | -0.309***+ (0.013) | 0.131***++ (0.256) | 0.147 (0.111) |
| Periphery Reserves (β_4) | 0.112*** (0.034) | 0.252*** (0.045) | 0.104 (0.047) | 0.108 (0.092) | 0.163 (0.206) | -0.231** (0.096) | 0.306*** (0.070) | 0.045+ (0.113) | -0.931***++ (0.217) | 0.237 (0.207) |
| Adj. R-squared | 0.354 | 0.641 | 0.617 | 0.215 | 0.210 | 0.418 | 0.545 | 0.874 | 0.478 | 0.636 |
| Observations | 1754 | 214 | 526 | 346 | 143 | 276 | 442 | 28 | 28 | 28 |
| Countries | 76 | 8 | 19 | 13 | 10 | 19 | 16 | 1 | 1 | 1 |

Two-step Arellano-Bond estimators with country fixed effects are applied. Standard errors in parentheses. ***, **, * denotes significance at 1%, 5% and 10% level. J-Statistics for all estimates < 0.001, $\chi^2(1)$, p-value > 0.99. Aggregates of the CIS and Emerging Europe are based on data from 1994 to 2008.

+: Dollar Periphery, ++: Emerging Europe and industrialized Europe excluding Germany.