Thema:
Institutional Determinants of Balance of Payment Dynamics

Dissertation

Zur Erlangung des akademischen Grades
doctor rerum politicarum
[Dr. rer. pol.]

Vorgelegt dem
Rat der Wirtschaftswissenschaftlichen Fakultät der
Friedrich Schiller Universität Jena

Am 22.10.2014

Von: Dipl. Vw. Sebastian Voll
Geboren am 31.03.1983 in: Bad Salzungen

Gutachter:

1. Prof. Dr. Andreas Freytag, Friedrich Schiller Universität Jena
2. PD Dr. habil. Markus Pasche, Friedrich Schiller Universität Jena

Datum der Verteidigung: 10.02.2015

Sabrina, Annemarie und Konrad
für Vertrauen, Zeit und Geduld

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

ABS	Asset backed securities
AR( )	Autoregressive process of order ( )
bn.	Billion
BoP	Balance of Payments
CA	Current account
CpA	Capital account
ECB	European Central Bank
EFW	Economic Freedom of the World
ELA	Emergency Liquidity Assistance
EMS	Exchange Rate Mechanism
EMU	European Monetary Union
EMU2001	Members of the European Monetary Union as of January, 1st, 2001
ESCB	European System of Central Banks
ESM	European Stability Mechanism
EX	Exports
FA	Financial account
FDI	Foreign Direct Investment
FDIC	Federal Deposit Insurance Corporation
Fed	Federal Reserve
GDP	Gross Domestic Product
GIIPS	Greece, Ireland, Italy, Portugal, Spain
GMM	Generalized Method of Moments
GNS	Gross national savings
HLM	Harberger-Laursen-Metzler
ICRG	International Country Risk Guide
IM	Imports
IMF	International Monetary Fund
LLC	Limited Liability Company
LoLR	Lender of the last resort
MIGA	Multilateral Investment Guarantee Agency
mn.	Million
NCB	National Central Bank
ODA	Official development aid
OLS	Ordinary least squares
PrSav	Gross national private savings
TARP	Troubled Asset Relief Programme
TFP	Total Factor Productivity
U.S.	United States (of America)
USD	U.S. Dollar
WGI	World Bank Governance Indicators

GERMAN SUMMARY

Die vorliegende Dissertation widmet sich zwei Teilgebieten der internationalen Makroökonomik. Zum einen werden die Wirkungen von ökonomischen Institutionen auf die dynamische Entwicklung der Zahlungsbilanz und ihrer einzelnen Komponenten untersucht. Dieser Teil der Dissertation ist daher eher dem Bereich der ökonomischen Grundlagenforschung zuzurechnen. Zum anderen werden die Auswirkungen von Detailregelungen der Organisation föderaler Währungsunionen auf die Zahlungsströme der Mitglieder und den Zusammenhalt der Währungsunion betrachtet. Diese Betrachtung aus Sicht der angewandten Wirtschaftspolitik liefert grundlegende Erkenntnisse zur Funktion von föderal organisierten Währungsunionen. Kapitel 2 und 3 fokussieren auf die erste, Kapitel 5 auf die zweite Fragestellung. Kapitel 4 verbindet beide Themenblöcke am Beispiel einiger Mitgliedsländer der Europäischen Union.

Ausgangspunkt für die Untersuchungen in den Kapiteln 2 und 3 bildet eine Aussage der Modellfamilie intertemporaler Zahlungsbilanzmodelle: Für eine Ökonomie im wirtschaftlichen Entwicklungsprozess ist es optimal, die inländische (real-) Kapitalakkumulation durch ausländisches (Finanz-)Kapital zu finanzieren. Dadurch erhöhen sich im Zeitablauf Produktion, Exporte und Ersparnis, wodurch auch eine Rückzahlung der Kredite möglich ist. Aus dem Bereich der Neuen Institutionenökonomik und empirischen Tests ist weiterhin der Konsens entstanden, dass die Qualität ökonomischer Institutionen in einer Volkswirtschaft ebenso entscheidend für Wachstum und Wohlstand ist. Der Zusammenhang zwischen dynamischen Entwicklungen der Zahlungsbilanz und der Qualität ökonomischer Institutionen ist jedoch noch nicht erforscht. Kapitel 2 bietet daher einen Überblick über die theoretischen und empirischen Erkenntnisse, welche den Einfluss von Institutionen auf einzelne Komponenten der Zahlungsbilanz erklären. Aus der Gesamtschau und Einordnung dieser meist statischen Ergebnisse in die dynamische Beschreibung der Zahlungsbilanzkomponenten lässt sich der Einfluss der Qualität von ökonomischen Institutionen auf den Erfolg von Entwicklungsstrategien ableiten, welche auf ausländisches Kapital zum Erreichen eines höheren Wachstumspfades setzen.

Im Detail zeigt sich, dass bessere Institutionen heimische Investitionen anregen und dadurch Kapitalstock und Produktivität erhöhen. Dies gilt insbesondere für ausländisches Kapital, welches stark auf die Qualität der heimischen Institutionen reagiert. Bezüglich der Struktur des Auslandskapitals reagieren Direktinvestitionen stärker als Portfolioinvestitionen und Kredite. Da bei Ausländischen Direktinvestitionen positive externe Effekte auf die heimische

Wirtschaft vermutet werden, ist dies besonders interessant. Weiterhin hat die Verfügbarkeit von ausländischem Kapital Einfluss auf die Exportorientierung einer Volkswirtschaft und, wohl noch bedeutender, auch auf die Komplexität und den Wert der exportierten Güter.

Dies stellt die Verbindung zu Erkenntnissen aus der Handelsliteratur dar, nach denen Länder mit höherer Qualität einheimischer Institutionen Güter mit höherer Komplexität und höherem Wert exportieren. Weiterhin gibt es empirische Hinweise, dass die nationale Sparquote, sowohl des privaten Sektors als auch der gesamten Volkswirtschaft, positive von der Qualität und der Entwicklung der Institutionellen Faktoren eines Landes beeinflusst wird. Eine solche Studie wird in Kapitel 3 vorgestellt. Nimmt man alle diese empirischen Ergebnisse zusammen zeigt sich, dass Institutionen in den verschiedenen Phasen eines Schuldenzyklus unterschiedlich stark die Teilelemente der Zahlungsbilanz beeinflussen. Insgesamt scheinen gute Institutionen die Möglichkeit eines wohlstandssteigernden Schuldenzyklus zu begünstigen.

Der Zusammenhang von Institutionen und Finanzierung der heimischen Konsum- und Investitionsentscheidung durch ausländische Mittel wird am Beispiel einiger Mitglieder der Europäischen Union (EU) in Kapitel 4 aufgegriffen. Es zeigt sich, dass auch innerhalb der stark betroffenen Länder der EU die Schlussfolgerungen bezüglich Richtung, Volumen und Struktur des Auslandskapitals wie sie in Kapitel 2 gezogen worden, halten. Deutlich wird allerdings auch, dass für die Mitglieder der Europäischen Währungsunion die Leistungsbilanz und Kapitalbilanz nur unzureichend die Problematik von Kapitalflucht und dem unglücklichen Ende eines Schuldenzyklus abbilden. Ursache hierfür sind detaillierte Regelungen zur Behandlung von grenzüberschreitendem, elektronischem Zahlungsverkehr zwischen den einzelnen Nationalen Zentralbanken. Diese sind durch die sog. „TARGET2-Debatte“ mittlerweile bekannt. Wird dieses Problemfeld berücksichtigt, ergeben sich weitaus stärkere Schlussfolgerungen für die Mitglieder der Währungsunion, als für die betrachteten Nicht-Mitglieder.

Hauptthema des 5. Kapitels bildet der Vergleich zwischen Europäischer Währungsunion (EWU) und Federal Reserve System der USA bezüglich exakt dieser Detailregelungen im Umgang mit grenzüberschreitenden Zahlungsüberweisungen. Der in diesem Bereich von anderen Autoren festgestellte Unterschied zwischen beiden föderalen Währungsunionen besteht darin, dass in den USA nach dem Übergang von Einlagen zwischen den Reservebanken der einzelnen Distrikte auch geldpolitische Aktiva übergeben werden und so eine Kompensation für die erhöhten geldpolitischen Verbindlichkeiten in Distrikten mit

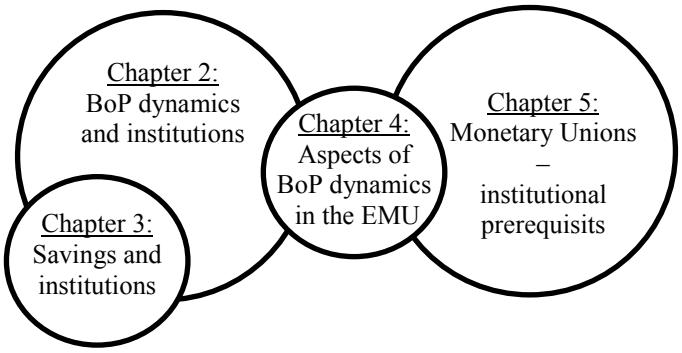
Nettozuflüssen an Einlagen besteht. In der Europäischen Währungsunion ist dies nicht der Fall, weshalb einige Autoren darin hohe Risiken für die Kernländer der Eurozone befürchten. In Kapitel 5 werden neben entscheidenden, aber wenig diskutierten Aspekten der TARGET2-Debatte und der Analyse weitergehender Änderungsvorschläge am „TARGET2 Mechanismus“ in der EWU die Grundzüge für die Ausgleichsregelungen im Federal Reserve System betrachtet und mit der Europäischen Währungsunion verglichen. Es zeigt sich, dass für die Beurteilung letztlich drei Fragen entscheidend sind, die grundsätzlich für das Design von Ausgleichsregelungen für Zahlungsüberweisungssalden in föderalen Währungsunionen herangezogen werden müssen. Können diese Grundfragen nicht positiv beantwortet werden, führt ein Ausgleichmechanismus für den grenzüberschreitenden Transfer von geldpolitischen Verbindlichkeiten zu einer Destabilisierung einer föderalen Währungsunion und deren wahrscheinlichem Auseinanderbrechen.

1 INTRODUCTION AND STRUCTURE OF THE THESIS

This thesis is dedicated to two major areas in international economics, which are loosely interrelated from a theoretical but strongly interrelated from an economic policy point of view: The dynamics of the Balance of Payments at the one hand and the functioning of a federally organized common currency area on the other. Inspiration for the first issue came from the fundamental question, whether countries in earlier stages of economic development can improve their welfare with foreign credit and whether economic institutions could have a role in this process. It is therefore a more basic topic in economic research, which seems to be easy from a theoretical side, but the empirical picture is all than clear and conclusive. My thoughts and reflections over the second issue of this thesis have been initiated by the public and scientific discussion over monetary imbalances in the Euro area since 2010 and the general question over its cohesion. Despite this more practical focus, the general findings from my analysis of the detailed organizational provisions for monetary unions with a federal character are of basic nature.

I have structured this thesis from a general-to-specific viewpoint and hope that the line of argumentation guides the interested reader from one chapter to the other. From a systematic perspective, the relation between the chapters could best be visualized by the following figure:

Figure 1: Systematic of chapters



In chapter 2 I follow the idea of Siebert (1989), who develops the model-dynamics for a cyclical movement of the current and the financial account of an economy during its transition from low capital stock to its optimal capital stock values, or easier, from a poor to a wealthy economy. In the line of research of the intertemporal approach to the balance of payments (see the seminal paper of Sachs, 1981, for the earliest model formulation), Siebert's paper is outstanding because he shows that such a cycle may evolve endogenously without active policy measures or breaks and jumps in foreign and domestic financing. However, in this and the later intertemporal models of the current account, institutions are part of the assumption on an efficient functioning of the market model economy. As we will see, the literature provides theoretical models which integrate the influence of economic institutions into the components of the current account, the financial account and the domestic investment decision. All these elements guide the dynamic movements of the Balance of Payments, but we are lacking a theoretical framework which is able to unify these single lines of arguments. Taking stock of these theoretical and empirical findings, we are able to tell how institutions might influence Balance of Payments dynamics, and get a hint which properties a unifying theoretical framework should be able to replicate.

Whereas my efforts in chapter 2 are focused on the overall picture of the influence of institutions on Balance of Payments dynamics as a whole, chapter 3 is dedicated to an empirical estimation of the influence of institutions on aggregate savings formation. This aspect has barely found any remarks in the literature at all, despite the fact that rising savings are one of the main ingredients for a successful maturing of an economy. They are also crucial for a completion of a debt cycle. Therefore, this chapter fills a niche in the empirical literature at the one hand and integrates very well into the findings of chapter 2 on the other.

The short chapter 4 is intended to connect the two preceding and the following chapter 5. At first, the relation of institutions, the current account deficits and the sudden stop of foreign financing is shown for selected economies in the European Monetary Union during 2008 to 2012. Second, the relevance of the detailed provisions of accounting within the European System of Central Banks as well as its federal setup for financing of current account deficits in South European crisis economies is highlighted, which is

now known as the “TARGET2 debate”. As I draw on sections from a publication with erroneous and in part naïve conclusions from my side back in 2010, I have changed the style of writing in this chapter and highlight the most important parts, corrections and improvements from my standpoint today.

In chapter 5, I focus on some neglected but nevertheless highly important aspects of this debate on TARGET2 balances. Especially, I follow the question whether these balances, arising from cross-border transfers of electronic money within the European Monetary Union, could be settled with a procedure comparable to the one that is used in the Federal Reserve System of the United States of America. This comparison of the detailed provisions in two federally organized monetary unions gives clear theoretical answers to some questions on this topic and hopefully adds some further insights to the necessary details on the optimal working of a common currency area. Conclusions round of the thesis.

As a cumulative dissertation, this thesis consists of (parts) of five single scientific papers, some published and some yet in working paper form. Chapter 2 is actually an unpublished working paper, chapter 3 has been published as Freytag and Voll, 2012. Parts of chapter 4 have been published in Draper et al, 2011 and chapter 5 consists in some parts of Burgold and Voll, 2012 and a working paper (Voll, 2012). For a clear overview which writings belong to which authors and co-authors, I added a supplementary table in Appendix D.

As Figure 1 shows and gets clear from the outline of the structure above, this thesis covers two and a half loosely connected topics. All chapters need other basic literature and fundamental economic ideas for an understanding of the issues. Therefore, and to make reading of the thesis fluent and relatively easy, I refrained from providing a single overview of the literature. I hope the interested reader will find my line of argumentation nevertheless convincing, inspiring and fun to read and the introductions to the single chapters guide the reader through the thesis itself.

2 INSTITUTIONAL DETERMINANTS OF BALANCE OF PAYMENTS DYNAMICS: A FIRST LITERATURE SURVEY

2.1 INTRODUCTION:

The wealth of nations is mainly determined by two factors: domestic institutions and participation in the international division of labor. Institutions reduce uncertainty over possible outcomes especially in situations with incomplete information and lack of control. They define standards for and help to enforce agreements of exchange. Therefore, they determine production- and transaction costs (North, 1991, p. 97f) which in turn influence patterns of the production process, division of labor and international exchange of goods, services and factors.

It has been observed empirically that poor institutions are associated with lower economic growth, for instance by Knack and Keefer (1995), lower total factor productivity (TFP), by Hall and Jones (1999), or lower per capita income, by Acemoglu et al. (2001), just to mention a few. With different instrumental variables, Hall and Jones (1999) and Acemoglu et al. (2001) can argue convincingly that causality goes from institutions to economic performance, despite feedback effects might also be at work (Acemoglu and Robinson, 2006; Bhalla, 2007).

Rodrik et al. (2004) argue in their seminal paper that the channel through which institutions cause economic development is through integration into the world economy. Integration into the world economy means basically two things: First, specialization in production of goods and services with a comparative advantage and in excess of domestic demand, with an exchange of the surplus against products with higher opportunity costs in domestic production. Second, it means integration of domestic into worldwide capital markets. It can be easily imagined that good institutions improve export performance and influence import prices and therefore demand. It is also not difficult to imagine that domestic institutions influence foreign capital inflows. The strong unbundling of the different stages in production with increased geographic dispersion of all suppliers in a global value chain has further leveraged the potential of foreign investment capital and trade since 25 years (Baldwin, 2013, p. 14ff). The relevance of institutions for international exchange has therefore important implications

on some of the results from the intertemporal model of the current account (of which the basic principles have been explained by von Böhm-Bawerk, 1914; for an overview on this model family, see Rogoff and Obstfeld, 1996) and especially the ability of a country to boost domestic capital formation with foreign credit and enter a beneficial "debt cycle" (Siebert, 1989). However, a consistent and unifying theoretical framework on these interrelated issues is still missing. This part of the thesis is an attempt to assess whether such a unifying framework makes sense from an empirical viewpoint, and which single aspects are crucial in describing the interrelation of institutions and Balance of Payments dynamics.

The relevance of capital formation, foreign investment and trade for the wealth of nations gives one major starting point for the empirical analysis: The Balance of Payments (BoP) of countries and its single accounts. Its principles and definitions follow the basic economic concepts established since decades, and are today defined and established for easier international comparisons in the Balance of Payments and international investment positions manual (IMF, 2009). The BoP consists of three main accounts: the current account (CA), the capital account (CpA) and the financial account (FA)[1]. The CA shows the flows of goods and services as well as income (primary and secondary) between residents and non-residents of an economy, whereas the CpA represents the recordings in non-financial, non-produced assets (e.g. land, contracts, licenses) and capital transfers (provision of resources without an exchange of economic value as direct return, e.g. debt forgiveness, nonlife insurance claims or investment grants). The sum of the CA and the CpA form the net lending ability or borrowing needs of an economy and find their counterpart in the financial account. The latter shows net acquisitions/disposals of financial assets and liabilities and gives information how the net lending is financed or into which types of assets the net borrowing is invested, e.g. equity, debt instruments or other types (e.g. bank loans, derivatives, reserves) or which is the nature of the investment (e.g. direct investment, portfolio or others). In its simplified form, these relations can be written as:

[1] Since the international revision of the SNA in 1998, the positions in the former CpA are now summarized under the term Financial Account with only minor changes. This is more precise, because the FA includes only transactions of financial capital and not real assets, which are captured either in the CA or the CpA now. But it is very unfortunate, as still a lot of publications use the old terminology, which easily leads to confusions.

CA balance + CpA balance = net lending/borrowing = FA balance

It is well known and easy to show within the System of National Accounts (SNA) that the sum of current and capital account balance equals the difference of gross national savings and gross fixed capital formation in an economy, thereby connecting the external relations of residents to domestic savings and investment transactions.

(CA + CpA balance) = FA balance = savings ./. investments

As CpA transactions can often be neglected from their relative volumes, the starting points for this literature review are the above cited three components: the CA balance, net lending/borrowing (the domestic savings-investment gap) and finally the size and structure of the FA.

The main questions I follow in this survey of the (empirical) literature are: Which influence does the domestic institutional setting have on the dynamic development of any of these BoP components. Are there common patterns observable and are we able to tell into which direction institutional developments drive the current or the financial account? For this, I have divided the paper into the four following parts. The chapters 2.2 to 2.4 focus on the interrelation of institutions with the current account, domestic net lending/borrowing and the financial account. Chapter 2.5 draws conclusions on the consistency of the findings and tries to provide a unifying framework.

As detailed descriptions of the empirical procedure, country samples, time periods and used variables is of minor importance for the overall empirical picture, but would consume much space and not be inspiring to read, I have decided to skip the details of most studies in the text. I included tables with such an overview over the single studies in Appendix A, tables A1 to A3.

2.2 THE CURRENT ACCOUNT – EX-IM, TRADE AND INSTITUTIONS

Economic exchanges across borders are often distorted, not only by tariffs or the like, but by high transaction costs often caused by a lack of contract enforcement. National courts might be unwilling, and international courts unable to prevent opportunistic behavior of the contracting parties (Rodrik, 2000, p. 179) which is a prerequisite to enforce agreements for exchange. Rodrik et al. (2004) argue that the channel through

which institutions cause growth is through integration into the world economy. From these arguments we can infer that institutions facilitating the enforcement of contracts in a country lead to higher integration into the world economy and would increase both exports and imports. The first question therefore is, does institutional quality have an influence on trade integration?

2.2.1 INSTITUTIONS AND TRADE: IMPORTS, EXPORTS, OR BOTH?

Jansen and Nordas' (2004) empirical results indicate that first, institutional quality is associated with higher integration into the world markets, but domestic and foreign institutions are both relevant. Second, trade policy in form of a reduction in bilateral tariffs has a larger impact on integration into the world economy if the institutional quality in the domestic country is better. Policy measures like tariff reductions or preferential treatment of certain country groups would thus only be one element to increase trade integration and welfare. It implies also that institutional differences would explain one of the puzzles in international economics – the "disproportionately high volume of trade among high-income countries" in comparison to high-low income countries' trade as predicted by models taking factor endowments into account only (Deardorff, 1998, p.16). Francois and Manchin (2013) confirm this hypothesis and find that trade flows between low income economies are only 26% of 'would be' trade flows if the average institutional level was comparable to the high income countries. Similar volumes of 'missing trade' can be observed for low-middle and middle-middle income countries. Trade between high and low income economies is only around 40% of the potential trade volumes if institutions are accounted for, according to their estimations. From these papers, we get an impression that current account transactions are indeed influenced by the institutional setting, but we don't get knowledge about the main direction of the influence: Are imports or exports more affected and could we expect an activation or passivation of the current account based on trade flows given strongly improved contract enforcement by better institutional quality?

The empirical findings of De Groot et al. (2004) show that exports are stronger influenced by the domestic institutional setting than are imports. Second, and much more interesting, is their result that countries with similar institutional levels trade more with each other, even if the authors control for the level of institutional quality. Their

dummy variable for institutional similarity between two countries is one, if the value of a governance indicator is within a fraction of the standard deviation of the whole sample. This seems at first as a very rough measure, as the same value of an indicator might still express very different details in the working of an institutional setting. I would expect that this particular result is largely driven by the trade patterns of developed countries, but the authors do not divide their sample into different incomes or differentiate their institutional similarity dummy by income groups.

The finding of a higher importance of exporter countries institutional quality is confirmed by nearly all empirical studies in this field: Francois and Manchin (2013), Jansen and Nordas, (2004), Ranjan and Lee (2007). The conclusion we have to draw is that, at least in bilateral trade, exports react stronger to the domestic institutional setting than do imports, which hints at an activating effect of domestic institutions at the current account. If we accept this result for now, the next question we have to turn towards is: What are the exact transmission channels for exports and imports?

Anderson and Marcouiller (2002) are the first who build a structural model of demand for imported goods where low institutional quality leads to a lack of contract enforcement resulting in a price markup for traded goods in the country with tenuous institutions. The big advantage of their structural model estimation is that it allows for different types of influence of insecure contract enforcement on the price markup: First, there is substitution within the group of traded goods, as imported goods from countries with common institutions such a cultural background, language or lower distance are expected to have a lower price markup. Behind this is the reasonable assumption that exporters are able to use existing institutions more effectively if the overall distance is lower. Second, there is a general equilibrium effect of substituting trade vs. non-traded goods and third, real income is reduced due to increasing prices lowering imports overall. As could be expected from their model setup, the quality of institutions has major influence on trade flows as imports from countries with low institutional quality are reduced. Second, not only imports from countries with poor institutions decrease, but the share of traded goods in total expenditure decreases, too, and more non-traded domestic services are consumed overall. With this channel, Anderson and Marcouiller replicate the effect of institutions on measured openness to trade. Additionally, their

model can add its part to the disproportionately high share of North-North trade. Overall, the paper of Anderson and Marcouiller gives us the clear theoretical and empirical answer how trade integration in general and particularly imports are influenced by lacking institutional quality in the exporting country.

2.2.2 Institutions and product complexity: How are exports affected?

Whereas Anderson and Marcouiller (2002) focus on imports, the majority of authors focuses on export performance: Berkowitz et al. (2006), Meon and Sekkat (2008), Nunn (2007), Levchenko (2007), Ranjan and Lee (2007) and Faruq (2011). All these authors argue that better institutions in the export country enhance international trade in complex products (either counted as manufactures vs. non-manufactures or complex (intermediate) goods or goods with quality as important characteristic) which have properties that are difficult to include into contracts completely. Their argument is that good legal institutions in the exporter's country reduce the incentive to breach the agreement by delivering a faulty good or incomplete shipment because contract enforcement is possible. In this regard, better institutions secure that the delivered good's properties are as expected by the importer. This is particularly important for complex products with many differing, not easily assessable characteristics, which is in line with North's (1990, p. 99f) argument that the more complex characteristics of transactions become, the higher is uncertainty of contract fulfillment and the more important institutions are. Furthermore, the importer's only chance to satisfy its claims is at the domestic courts of the exporter, as most often the bulk of their assets are hold in the domestic country. Better institutions reduce risk and the accompanying negotiation, monitoring and insurance costs and therefore overall transaction costs (Berkovitz et al., 2006, p. 364ff). Levchenko (2007) and Nunn (2007) argue further, that institutions might be themselves a source of comparative advantage apart from factor endowments as they help the specialization and division of labor within a country itself. Therefore, countries with good institutions have not only lower international transaction costs, but also lower production costs in complex products, facilitating trade integration through the export channel.

The overall empirical findings of this line of research are that countries with better institutions have higher exports and that, again, exporter country institutions have a

higher influence than importer country institutions. They also export goods which are more complex even if accounted for factor endowments, where complexity is measured by Rauch's (1999) classification of goods[2] either directly on bilateral trade flows or as aggregated index into final products with input-output tables (see Levchenko, 2007, for example). In contrast, Meon and Sekkat (2008) us a simpler approach and divide exports just into manufactures and non-manufactures. Whereas they can confirm that countries with better institutions for contract enforcement tend to export more manufactures, overall export volumes do not seem to be affected. The authors relate this to the high share of resource exporting countries in their sample. Apart from Meon and Sekkat's findings, the econometric results seem to be very robust overall, as they hold with different econometric methods, accounting for endogeneity, different country samples, bilateral trade data between USA and others or bilateral trade between a panel of countries and over different periods of time.

However, even if the theoretical models show strong rational for a relation of comparative advantage, export streams, reduced imports and institutions and the empirical tests of these models confirm a correlation of institutions and trade flows and patterns, uncovering a causal influence of an institutional improvement and developments in the trade flows is difficult. Nicolini and Paccagnini (2011) are the only to test the short term causal influence of contract enforcement on trade with a Granger type causality test. The simple Granger procedure first shows the expected results: institutional quality Granger causes trade flows. However, if cross-sectional heterogeneity is accounted for in the estimation procedure, the authors find no evidence in favor of causality from institutions to trade flows or vice versa. This might be caused by the choice of their institutional estimator: The authors do not use the widely applied rule of law or corruption indices, but two indices from the Freedomhouse Association on civil liberties and political rights. The relation of these indicators to contract enforcement and rule of law is weak at best, and I would not see their results as robust in this regard. On the other hand, studies using instrumental variable techniques (de Groot et al., 2004; Ranjan and Lee, 2007; Rodrik, 2004; Meon and Sekkat, 2008) argue

[2] Rauch (1999) classifies product complexity according to the way these goods are traded: trade on organized exchanges (reference priced commodities), reference priced (those goods whose reference prices are quoted only in trade publications) and differentiated goods. The latter are assumed to possess the most complex characteristics, and therefore are the most sensitive to lacking contract enforcement.

convincingly that the channel goes from institutions to higher export volumes via complex products.

I am tempted to guess that the difference in both findings lies in the well known imprecision of the institutional indicators and especially in the low within-country or short term variations of these indicators, which make it difficult for the econometric estimations to get causal influences from short term variations. As a preliminary conclusion, we could note that trade openness is higher in countries with better institutions, exports are more affected than imports and this goes through their effect on increases in complex exports.

2.2.3 Institutions and terms of trade improvement: Is there a connection?

The question is, if the export of more complex products has indirect effects on the current account. Prebisch (1950) and Singer (1950) argue that relying on exports of goods with low complexity, that is primary products or simple manufactures, leads to a deterioration of the terms of trade, a hypothesis which has been confirmed empirically especially for the period 1970-1990. This could itself lead to a passivation of the current account by reducing overall export volumes and increasing import volumes due to price effects. Furthermore, the well-known Harberger-Laursen-Metzler (HLM) (Harberger, 1950; Laursen and Metzler, 1950) effect states that terms of trade changes also affect domestic savings through an influence on real income (for one of the few empirical discussions of the HLM-effect and its direction, see for example Otto, 2003).

If better institutions increase exports of complex products, which should in turn improve terms of trade, the CA would be activated (as exports react stronger to institutional developments than do imports), but also national savings could increase due to the HLM-effect, leading to higher net lending/lower net borrowing and supporting the activation of the CA by the FA.

Empirical research on the connection between product sophistication on a detailed industry level and the terms of trade is relatively young field due to data limitations before 1990. However, the main consensus finding is that terms of trade have deteriorated between 1970's and 2000 on average for developing and emerging economies despite increasing complexity of their exports, albeit with large deviations

between countries, (Sarkar, Singer, 1991; Kaplinsky, 2006; Maizels 2000; Maizels, 2003; Saadin, 2013). The reason lies in what is discussed in the literature as 'fallacy of composition' (see Saadi, 2013, p. 635 for an overview), because many developing and emerging market economies have increased their exports in the same class of middle-complex goods, often as producers of intermediate goods or easily exchangeable contract manufacturers for final consumer goods, which has led to increasing world supply causing falling world market prices.

Therefore, an assessment of the indirect effects of better institutional quality and increasing exports of complex goods via the HLM-effect is not in general possible. It depends highly on the detailed export structure of the economy as well as the time preference rate and substitutions effects in the single economies as well.

2.2.4 SUMMING UP – DO BETTER INSTITUTIONS ACTIVATE THE CURRENT ACCOUNT?

To give a dissatisfactory but honest answer to this question: It depends. First, the literature is in broad agreement that improvements in institutional quality lead to better integration into the world economy, with causality in the long run going from institutions to trade. Second, the agreement is also about the fact that improvements in institutions have a larger effect on export volumes than on imports. The channel through which exports are more affected seems to be product upgrading, meaning the fact the better contract enforcement enables to export more complex products. For this, domestic institutions in the exporting country matter more than the institutions in the target country. Some authors even see the quality of institutions as the source for comparative advantage in production of complex goods. This speaks for larger increases of export volumes than for imports when institutions improve and therefore an activation of the current account.

On the other hand, for an activation of the current account to happen via the trade channel, the current account should determine the financial account (on this empirical relation, see section 2.3.1), which is against the assumptions of the by now standard model of the BoP, the intertemporal optimization approach. But this type of causality would not be necessary, if increases in exports of complex products lead to an improvement in the terms of trade and the HLM-effect holds. In such a case, real income would increase with better terms of trade which leads to increases in national

savings, narrowing the domestic savings-investment gap and leading to passivation in the financial account, which corresponds to an activation of the current account. This case seems to be very specific to each country, depending on the intensity of competition in the range of products a country is exporting (which influences the terms of trade) and the domestic circumstances influencing the savings-investment decisions. This aspect is part of the next section.

2.3 S-I: THE SAVINGS-INVESTMENT GAP AND THE CURRENT ACCOUNT

In the previous chapter, I surveyed articles which search for an influence of institutions on trade flows and on the current account. As a preliminary result, an activating effect is reasonable, as exports react stronger to institutional improvement than do imports. The question is now, if the empirical papers looking at the savings-investment relation find corresponding results. Corresponding in this case means: net lending should decrease, net borrowing increase with institutional upgrading, which needs a stronger reaction of national savings than gross fixed capital formation on the institutional development. Without revealing too much at the beginning, this seems unlikely.

2.3.1 REMARKS ONTO THE PRIMACY OF INTERTEMPORAL OPTIMIZATION VS. EXPORT DETERMINACY OF THE CURRENT ACCOUNT

I have to make two remarks at the beginning: First, the empirical papers using reduced form equations to look at the current account from the intertemporal perspective claim to explain the savings-investment gap, but utilize the current account balance as the dependent variable. This is reasonable from the perspective of the IMF's BoP manual and the whole framework of the system of national accounts. However, in this system, savings are calculated as a residual after many other variables are recorded first. From the intertemporal approach of the CA we know that the actual consumption and saving decision is the target variable, and residuals are exports- and imports which is exactly the other way round. In a perfect (model) economy, this would not matter. But if the "real world" decisions of the economic actors do not correspond bye and large to the ideas in the various versions of the intertemporal model (that is mainly forward looking intertemporal optimization under insecurity) and that exports are for example rather a driving force of national savings than the other way round, using the current account

balance (Ex-IM) as indicator for an optimizing net savings behavior (the savings-investment gap) of an economy is misleading.

The first point, that exports are rather a driving force of national savings follows from Maizels (1968) arguments for an alternative form of the savings function and has found some empirical validation especially for developing and emerging economies (see Kim, 1990; Sergi and Vit, 2004; Sinha, 1999, Wilbur and Hague, 1992).

The second point is, that for the CA balance to be an indicator of the (intended) savings-investment decisions of the economic actors in a country, the intertemporal model should hold as the main explanatory model of current account dynamics itself. However, the present value tests of the intertemporal model show usually a bad fit to current account movements (see for example Gosh, 1995; Bergin and Sheffrin, 2000; Nason and Rogers, 2006; Sheffrin and Whoo, 2002) which hints at the possible influence of other aspects than intertemporal optimization (for example Maizels hypothesis or omitted variables) in their econometric tests. A (non-linear) influence of institutions on the CA balance could be part of this omitted varibales.

The literature on causality tests between the current and the financial account differentiates this issue further. A common finding is that the FA drives the CA in emerging economies, whereas it is more often the opposite direction of causality in industrialized countries (see Yan and Yang, 2011, p. 30ff for an overview). If we analyze empirical studies using reduced form equations and the CA balance as dependent variable to explain the savings-investment gap, we have to keep this in mind.

2.3.2 Explanations for the savings-investment gap approximated by the current account balance

Panel studies researching the determinants of the current account from a savings-investment perspective have spurred since the seminal paper of Debelle and Faruqee (1996) (see Chinn, Prasad, 2003). However, most papers concentrate on the issues of financial development, financial reforms and free movement of capital and less on general economic institutions.

In policy advice and country case studies, taking account of institutional aspects influencing the savings-investment dynamics are common since the 1990s (see Dluhosch et al., 1996, pp. 141ff for example). However, the first to include the common institutional indices as explanatory variables in multi-country econometric studies have been Chinn and Ito in 2007. Like Gruber and Kamin (2008) later, they are interested in the determinants of global current account imbalances before 2007, despite I would say the interest lies more in the special case of US current account deficits and its 20 year old relation to the Asian economies. Whereas Gruber and Kamin (2008), de Santis and Lührmann (2009) and Kerdrain et al. (2011) argue that institutional quality should increase domestic investments itself and find supporting coefficients in their econometric tests, Chinn and Ito's (2007) hypothesis is that institutions enabling contract enforcement are just a binding constraint coming into effect only through financial market liberalization. Their variable capturing legal institutions has a significant and negative effect on the current account in developing and emerging economies, meaning increased net lending from the rest of the world. But there are interaction effects with the level of financial development and financial account openness: For emerging and developing countries, higher development of the domestic financial sector is associated with a passivation of the CA only for countries with legal quality in the highest 10%-percentile. In case of medium to low institutional quality, financial development leads to an activation of the CA.

Ca'Zorzi et al.'s (2012) interest lies also on the explanation of global imbalances prior to 2007 with a focus on the compatibility of the fundamental determinants of current account balances and their developments in the early 2000's. By applying model simulations over 14 dominant explanatory variables from the literature, they find that institutional quality is one of the consistent explanatory variables for the CA balance, albeit usually with low (negative) coefficients, stating that higher institutional quality is associated with smaller surplusses/larger deficits of the current account because of increased domestic investment (Ca'Zorzi et al, 2012, p. 1325ff).

Overall, the empirical literature on institutions and current account determinants from the savings-investment perspective hints at resulting CA deficits if institutional quality is relatively high. The most common argument given is that countries with higher rule

of law, lower corruption and market friendly regulation are attractive to domestic and foreign investments, increasing gross fixed capital formation, whereas high levels of corruption and lack of contract enforcement lead to capital flight.

2.3.3 INSTITUTIONAL INFLUENCES ON AGGREGATE SAVINGS FORMATION

I have looked at the empirical picture for the relationship of the current account balance and institutions from the savings-investment perspective in its aggregate. For a deeper understanding it is reasonable to research the institutional influence on its single components, namely the aggregate national savings at the one side and gross fixed capital formation – simply real investments – on the other. For savings and investments, a separation into private and public parts is necessary, as public saving/investment decisions are driven by political economy aspects different from the private actor's calculus.

Aizenman et al. (2007) find as a side-result of their empirical work on the relationship between foreign and domestic financing that volatility of aggregate national savings is lower the better domestic institutional quality is, which they explain to be the mechanism institutions influence long term growth by providing a stable basis for financing domestic investment. Concerning aggregate savings, there exist only three studies considering the influence of the general institutional setting on gross national and aggregate private savings formation. Chinn and Ito (2005, p.12 ff.) have a look on savings determinants in the working paper version of their 2007 published paper, unfortunately not for private but overall national savings. They find no individual influence of their used indices for legal quality, but an interaction effect with the openness of the financial account and institutional quality. Depending on the quality of institutions, an open financial account and development of the private financial sector reduces gross national savings in their estimates if institutional quality is within the 10% highest percentile, but increases national savings below. This holds for industrial as well as emerging economies and shows a non-linear, highly dependent relationship difficult to uncover in empirical studies

Swaleheen (2008) takes a look at the interrelation of corruption, national savings and capital flight and finds that corruption reduces gross national savings, but that gross domestic savings are unaffected. The explanation Swaleheen provides for this is that

corruption is associated with higher capital flight and therefore national and domestic savings are affected differently. These findings are consistent with the result of Chinn and Ito (2007) as mentioned above, where openness of the financial account and financial sector reform is associated with a gap between domestic savings and investments only if institutional quality is high.

Freytag and Voll (2013, see Chapter 3 below) show that better rule of law (as measured by the Economic Freedom of the World (EFW)-subindex) and the quality of governance (as measured by a subindex from the International Country Risk Guide, ICRG)) have a positive influence on aggregate national and aggregate private savings formation, even if the usual explanatories from the literature on aggregate savings formation (like demographics, per capita income, financial market development, etc.) are controlled for. They argue that the cause, especially in developing and emerging economies, is the influence of quality of institutions on perceived uncertainty over the general path and success of the economy as well as the individual income (Freytag, Voll, 2013, pp. 476ff, see section 3.2 below). This idea is supported by micro-econometric evidence from Shapiro and Wu (2011), who argue that the amount of individual savings depends not only on uncertainty and consumption smoothing, but also on individual fatalism in general and the expectation of individuals that saving can improve their future situation in particular. Especially in countries with relatively high poverty, inequality and low quality of institutions, such fatalist viewpoints might be common and prevent households and small business enterprises from savings formation.

To sum up the few papers researching the relationship on institutions and aggregate savings formation, I have to say that savings are less directly determined by the institutional surrounding than I would wish for clear conclusion. However, there are hints that aggregate savings are influenced positively with the quality of institutions in developing and emerging economies alone. When it comes to its interrelation with financial development and openness to world capital markets, countries with relatively good institutions seem to have lower national savings when their financial markets develop. The next step from now would be to take a closer look on the determinants of gross fixed capital formation (aggregate investment) and the influence the institutional setting might have on it.

2.3.4 INSTITUTIONAL INFLUENCES ON GROSS FIXED CAPITAL FORMATION, PUBLIC AND PRIVATE INVESTMENT AND ITS INTERRELATION

Besley (1995, p.905-906) summarizes the three main arguments, why the quality of institutions might have impacts on (private) investment. First, strong property rights protect from expropriation (Demsetz, 1967) and prohibitive taxes and makes therefore returns better calculable for investors. Second, such institutions are the basic ingredients for the functioning of capital markets and the enforcement of contracts, therefore the contractual barriers for carrying out investment projects are reduced. At third, institutions which enable contract enforcement facilitate economic transactions; they increase the benefits from individual trades and the corresponding returns.

The first author to take an empirical look at the influence of the institutional setting on investment was Mauro (1995). While controlling for the standard determinants of investments, he finds that a higher level of corruption lowers total investment in an economy, independent of the setting of "high bureaucratic efficiency" or "low bureaucratic efficiency". Mauro interprets this as a rejection of the idea that corruption speeds up inefficient governance systems ("greasing the wheels") and could be seen as a positive institution in specific cases. The general results of his study have been confirmed by a number of following studies. Dawson (1998) shows that total investment to GDP ratio is influence by economic institutional quality, but not by political institutions. Furthermore, he finds that a higher initial level as well as an improvement of economic institutions exerts a positive influence on aggregate investment.

In contrast to these studies, de Haan and Siermann (1998) do not find an influence of economic freedom on total aggregate investment; de Haan and Sturm (2000) confirm this previous with the same method and slightly increased sample size. In strong contrast to both studies are Dawson's (2003) findings. He shows granger causality running from improvement in economic freedom (EFW) to increases in gross fixed capital formation, but that rule of law and quality of bureaucracy are not the driving components, rather these are price stability, the size of government and freedom with

respect to goods and financial markets[3]. To conclude, it is very unfortunate that Dawson does not apply his estimation to private sector investment, but to total investment. It might well be that the results for private sector investment differ fundamentally from public sector investment or the mix of both, especially as in many emerging and developing economies the majority of investment is financed by the general government sector, which includes state owned enterprises.

Knack and Keefer (1995) find that institutional indices capturing aspects of rule of law, corruption and bureaucratic quality, are significant explanatories of real private investment, but variables capturing political instability, like political assassinations or coups d'état are not. Campos et al. (1999) argue that it is not corruption per se which counts, but its predictability and stability. Their research is motivated by the contradiction of high rates of corruption in many Asian economies and the parallel high rates of (private) investment. They first confirm that corruption reduces total and private investment, but that corruption which is predictable in its patterns has a less damaging influence. With predictable, the authors mean that the firms can be sure to reach a target by a certain amount of bribe or not, which can be constructed from the questionnaire of the World Development Report on corrupt practices (Campos et al., 1999, p. 1062). Aysan et al. (2008) look at private investment in Middle East and North Africa. They show that lacking political accountability seems to be a major driver of the very low private investment rate in MENA, especially in comparison to other developing regions.

Gwartney et al. (2006) use the aggregate EFW index as a measure of institutional quality and show the level of institutional quality as well as its improvement over 10-year periods are positively related to private investment rates (Gwartney et al, 2006, pp. 260-263). Interestingly, their results for the LDC-subset of their data have only slightly higher coefficients in comparison to other developing and emerging economies. I would tend to interpret this along the line that institutions matter strongly, but other aspects of the investment climate, like market size as measured by per capita income and infrastructure, become limiting factors. In a next step, the authors interact private investment and the EFW index to observe productivity effects of institutions on

[3] Note that that Freytag and Voll, 2013 (see Chapter 3) find exactly the other institutional variables to be significant in explaining savings formation. This hints at the complexity of the interrelation of specific institutions on the savings-investment gap and therefore the current account.

investment and find that the productivity of investments is influenced by the institutional setting, which might account for higher investment rates because of higher returns. Furthermore, Gwartney et al. show that public investment is less productive than private investment even in an environment of low institutional quality, but the difference is again dependent on the institutional quality. This study has touched a number of questions, and has especially interrelation of public and private investments given the overall institutional setting at the one side and causality of institutional quality to investment on the other, which I will present in the next section.

2.3.5 THE INTERRELATION OF PUBLIC AND PRIVATE INVESTMENT VOLUMES DEPENDING ON THE INSTITUTIONAL SETTING

From the point of view of this literature survey, my interest lies in the question if crowding-in or crowding out of private investment takes place due to public investment, and if this is dependent on institutional aspects. This could be expected to have an influence on total gross fixed investment and therefore the dynamic development of the savings-investment gap. From an economic development perspective, most scholars focus on the question if public and private investments are complements or substitutes and how this influences productivity, capital accumulation and economic growth.

Keefer and Knack (2007) document that public investment as a share of GDP as well as a fraction of total investment is higher in countries with bad institutional surrounding. Grigoli and Mills (2011) extend Keefer and Knack's (2007) work by panel estimations and find even an inverse relationship between public investment and institutional quality. Both pairs of authors suggest that governments in low-quality environments use public spending as a vehicle for rent-seeking and corruption. This leads to an overprovision of public investment spending in size and quantity of projects (Tanzi and Davoodi, 1997) as well as low efficiency of public investments in such an environment (Everhart, Sumlinski, 2001, p.14 ff). On the other hand, the authors note that increased public investment is used and as a compensation for the shortage of private investment in low institutional quality environments. As the questions whether public spending crowds out private investment is highly relevant, Everhart and Sumlinski (2001) show that the crowding-out effect of public investments is dominating in economies with low institutional quality, whereas in higher institutional environments it is the crowding-in effect. Daude's and Cavallo's (2011) finding support these results. First, higher public

investment lowers private investment in their sample, which means a crowding out of private by public investment spending. Second, private investment rises with better institutional quality as their institutional indicators have correct signs and are highly significant. Third, and most importantly, their interaction term of public investment and the institutional indices is positive and significant, saying that better institutional quality mitigates the crowding-out effect of public on private investments.

To conclude this section, private and public investments are both strongly influenced by the institutional setting, but with different signs and magnitudes. Private investment rises with better institutional quality, whereas low institutional quality enables politicians to gain rents by public investment projects, therefore public investment is higher in low than in high institutional surrounding. The probability that private investment is crowded in by public investment is higher, the better the institutional quality is.

For our topic of interest – the influence on net lending of the economy as a whole - we have to conclude that better institutional quality leads to higher gross fixed capital formation, because private investments rise in direct response to improvements of institutions and crowding out by public investments is reduced simultaneously. This over-compensates the lower public investment rates in better institutional countries. If savings remain constant, this corresponds to the idea of a debt cycle and of developing countries and welfare maximizing intertemporal optimization, which invest into their own capital stock by foreign credit in their process of catching up.

2.3.6 Conclusion: The influence of institutions on the savings-investment gap and the current account

The empirical results given in the literature hint at reduced net borrowing and increased net lending effect of improvements in institutional quality and therefore a deterioration of the current account balance from the savings-investment perspective. The main argument is in the increased attractiveness of countries with higher institutional quality towards private investment and private gross fixed capital formation, which leads to higher borrowing needs of the economy as a whole. The few papers studying the effect of institutional surrounding on aggregate national savings and aggregate private savings formation hint on the other side on a positive effect of institutional quality on savings

formation at the one hand. But as the domestic financial markets develops itself along the general institutional setting and offers larger possibilities for consumption smoothing and credit financing, aggregate (private) savings do not rise as fast and strong as aggregate investment. This result is confirmed by studies using the current account balance as an indicator of the savings-investment gap as well as from studies researching aggregate private capital formation. Furthermore, institutional quality seems to encourage crowding-in of private investment by public investment, rather than crowding out in case of lower institutional quality. The net effect of improvements in the institutional surrounding is positive for total investment, because public investment is not able to substitute the private investment volumes in less free and secure market economies.

2.4 THE FINANCIAL ACCOUNT AND INSTITUTIONS:

The findings of the previous chapter in mind, one question becomes obvious: If private investments increase with amended institutions as well as the savings-investment gap, the question is now which type of foreign capital is attracted and if this has repercussive effects on the current account (with respect to exports) and sustainability of the current account dynamics. There exists a broad line of literature capturing this particular topic by looking at the structure and dynamics of the financial account.

As in chapter 2.3 on the savings-investment gap, it is again necessary to recognize a different calculus of private and government market actors and the potential influence of institutions on the underlying capital flows. FDI and other equity-investment are mostly caused by private actors, whereas debt flows to developing and emerging economies contain often large parts of ODA (official development aid) or government backed guarantees and are therefore heavily influenced by political considerations (Alesina and Dollar, 1998). This is important to distinguish with respect to the quality of institutions, as I have argued in the previous chapter that private investment is negatively influenced by ailing institutional quality. By contrast, there are some hints in the empirical literature that official flows are unaffected by the institutional setting, for example it seems as if more corrupt regimes receive more ODA (Alesina and Weder, 1999).

2.4.1 INSTITUTIONS AND PRIVATE CAPITAL INFLOWS: IS THERE A RELATION?

Whereas Lothian (2006) documents that sound institutional structures are main determinants of overall capital flows from rich to poor countries, data availability for a differentiation of capital flows into private and official flows is often lacking or inconsistent. Alfaro et al. (2008) argue that equity flows are mostly private and use them therefore as an approximation of total private inflows. They show that the main explanatory of these capital flows is their variable capturing institutional quality. This holds even if controlled for financial market development, financial account openness and various other determinants of investment flows as well as endogeneity of actual institutional environment depending on settler mortality or colonial origins as proposed by Acemoglu et al. (2001). Faria and Mauro (2009) put their focus on the interrelation of the structure of foreign investment capital, the probability of economic crisis and institutional quality. For this, they analyze the composition of the (foreign) capital stock values. Better institutional quality is significant in explaining equity investment stocks, whereas the remaining liabilities (loans, bonds etc.) are significantly determined by low values of institutional quality. These results hold over a broad set of robustness tests like alternative estimators, endogeneity of institutions and change in the time period. Papaioannou (2009) shows corresponding results for international bank lending. According to his estimations, institutional quality dominates other pull-factors for international bank loans. Concerning FDI inflows, the literature on the role of corruption and institutions for FDI is overwhelming. Papers before 1995 find no effect of corruption on FDI, whereas papers looking at the period between 1990 up to the latest years find mostly that bad institutional quality reduces FDI inflows. I will try to present below the more elaborate results and studies to my best knowledge. Without revealing too much, we can say that in contrast to official flows, private capital inflows are influenced by the institutional setting as expected, but with different magnitudes.

2.4.2 INSTITUTIONS AND CAPITAL INFLOWS: WHICH TYPES SEEM TO BE MORE AFFECTED?

Albuquerqe (2003) argues that FDI has a lower risk of expropriation than other types of liabilities as much of the value of FDI is of an intangible nature (technology, brand names, organization and managerial skill) and thus difficult to expropriate. I would argue that this is only the smaller part of the reason, rather I would add that the case of

expropriation is more difficult for FDI, especially 'greenfield' FDI, than for bonds or loans. Borrowers of loans or bonds can simply stop payment of interest or redemption. For the investor to demand repayment, often the national courts have to be called, which can be easily influenced by domestic politicians or bureaucrats in countries with low institutional quality. In contrast, direct investment projects require case-specific actions to squeeze out the foreign proprietaries. Licenses have to be withdrawn, customers or suppliers have to be set under pressure, and violations of local laws have to be constructed artificially. From the viewpoint of corrupt practices as a characteristic and consequence in environments with low institutional quality, Wei (2001, p. 19) gives an argument which seems plausible from a general viewpoint: Direct investors can insure themselves against political risk by World Bank's Multilateral Investment Guarantee Agency (MIGA), a channel which is not available to bank loans and bonds. Furthermore, bilateral investor protection treaties have been signed between many industrial and developing countries for exactly the same reason, decreasing the risk of expropriation of FDI further.

I would add that for FDI projects to get operational, the investor has often build good contacts with governments and bureaucracies, local or regional, at the one hand, which insulates him in part from expropriation. This holds even more so in case of corruption, as the involved host country parties have the choice between a one-time income from expropriation and continuous income streams from bribes. From insurance theory, a deductible could reduce this problem from a foreign investor's point of view further, which seems to be confirmed by Smarzynska and Wei (2000), who find that direct investors switch more to joint ventures with local partners instead of fully owned greenfield investments in corrupt environments, which is confirmed by Du et al. (2012) for FDI in China, for example. Hausmann and Fernandez-Arias (2000) and Albuquerque (2003) confirm these arguments as they document no or a negative relationship between the share of FDI in total capital inflows and institutions and find no or a negative relationship with high institutional quality. However, especially in case of Hausmann and Fernandez-Arias this might be driven by their small sample and short time span. For a more elaborated critique, see Wei (2001, p. 23, footnote 11)

On the other hand, FDI usually bring much larger involvement of investors in comparison to portfolio investors or bank loans, as the former need to have regular and repeated contact to host country governments and bureaucracies (for establishment of business, different permits, acquisition of land sites or immobiles etc.). This places direct investors into higher sensitivity to corrupt practices, low quality of bureaucracy and weak political accountability, as they are more often affected. To my impression, the overwhelming part of the literature tends towards this position. Second, direct investments have to be seen as sunk costs to a large part and therefore ex post target of corruption, which increases the ex ante risk from the investor's viewpoint (Wei, 2001, p. 20). Benassy-Quere et al. (2007) and Li and Resnick (2003) provide evidence for this viewpoint as they document relatively large effects of different institutional indicators on FDI stocks. At last, Wei (2001, p. 20) hints at the probability of large international financial institutions to be bailed out in times of economic crisis, which reduces the risk of investments by loans and bonds further, whereas FDI projects can not expect a bailout. Given all these arguments and the high financial risk involved for the single investors, I would tend to the perspective that worse institutions and higher corruption lead to a lower share of FDI on total external liabilities (Faria and Mauro, 2004, p. 5; Wei, 2000a, p. 315ff)

Wei's publication series (Wei 2000, Wei 2000a, Wei 2001, Wei and Wu 2001) focusses on the basic question how corruption, as representing increased risk and bad institutional quality, affects FDI investments. Two main aspects are in the focus: First, does corruption reduce inward FDI? Second, does it change the composition of capital flows from relatively stable FDI towards more volatile and crisis-prone capital flows like loans or bonds (Wei, 2000, p. 303f)? At first, Wei (2000, 2001) finds that corruption is associated significantly with lower FDI stocks in the host countries. Second, international capital is tilted towards a higher loans/FDI ratio in countries with higher corruption if data for private bank lending is used as an indicator for loans. Wei and Wu (2000, p. 18f) add to the picture that the ratio of portfolio-type to FDI investment is also increasing with the incidence of corruption.

Garibaldi et al. (2002) have a regional focus on transition economies from Europe and the former Sowjet Union and find that for this sample, general governance indicators do

not seem to influence FDI flows but corruption does. On the other hand, governance quality affects the portfolio investment per capita significantly negative with relatively huge coefficients. These finding would fit the conjecture of the "greasing the wheels" hypothesis, as knowing how to play the corruption game insures against lacking rule of law (However, I have to note that their results might be driven by their choice of the estimation equation, as they use a dynamic specification with the lagged FDI/portfolio volume as one dependent variable. As the variation of the institutional indicators is relatively low within the country over time, using the lag-specification might bias results. This could only be justified if international investors would make their decision to invest in the next year dependent on last year's investments.

In their meta-analysis, Bloningen and Piger (2011) use Bayesian model selection techniques to detect the probability of certain explanatories to explain FDI stocks. Overall, they find only low probabilities for institutional determinants for explaining FDI volumes. However, this would not invalidate the findings of studies having the share of FDI to other liabilities as a dependent variable. Second, they reject a large number of potentially relevant determinants, like trade openness, business costs, credit market development and infrastructure as variables with low probability and leave the usual gravity variables and labor endowment as most strong predictors of FDI stock volumes. This seems to me as if their meta-technique is very restrictive and strongly supports variables with very general explanatory power for most aspects of international economic integration at the cost of explaining country-, time- or sector-specific characteristics.

Aizenman and Spiegel (2006) show that the ratio of FDI to gross fixed capital formation and to domestic private investment is higher in countries with better institutional quality and lower corruption. Morrissey and Udomkerdmongkol (2011) take a look at the interrelation of FDI, its dependence on domestic institutions and their interrelation with domestic private investment. For this, they simply divide the countries into groups of high vs. low domestic institutional quality depending on the sample mean. They confirm the finding of sensitivity of aggregate private investment and FDI towards institutional quality. More interesting, they show in a System GMM framework that first, FDI crowds out domestic private investment, which means that aggregate

investment rises by less than FDI, a result already well-established in the empirical literature (see Fontagne (1999), p. 10 for an overview). Second, crowding out is higher in high institutional quality regimes than in lower ones. This shows not only the complementary but also competitive relation between foreign and domestic investment. However, from our above paragraphs, we know that controlling for foreign loans or other liabilities might be necessary to get a convincing argument. With the above results in mind, we get directly to the next question relating the financial account to the current account: Does the availability of foreign finance and the composition of financial inflows have an influence on components of the current account?

2.4.3 FOREIGN CAPITAL AND EXPORT PERFORMANCE

The question whether foreign capital, and especially FDI, causes exports or export performance causes FDI and foreign capital inflows, is intensely debated since 30 years now (for an overview, see Greenaway and Kneller, 2007). The most likely answer is again that it depends on the specific micro-economic strategies and targets of firms as well as macroeconomic factors and endowments (see Fontagne, 1999, p. 13-18). Defever and Suedekum (2014) follow the arguments of Carlucci and Fally (2012) that the availability of foreign financing has strong impacts on the complexity of goods which are exported and provide actual evidence. They find that the export structure develops more towards higher complexity if foreign finance is available. Unfortunately, they do not distinguish between different types of finance that is between FDI, portfolio or other liabilities. Harding and Javorcik's (2012) target this issue. Their study has two remarkable results. First, they show that sectors strongly targeted by FDI have a higher growth in their unit value of exports than non-target sectors and this is not caused by increased overall investment in the particular sectors but by FDI. On the other hand, the authors do not find evidence that the increase in unit values is stronger in sectors producing complex goods versus simpler products according to Rauch's (1999) classification, but that final products show stronger increases in unit values than intermediates. Unfortunately, the authors do not control for institutional aspects in the host countries.

Concerning FDI, the question most interesting from our perspective is, if market seeking FDI are more probable or if more export-oriented, comparative advantage seeking FDI occur if the institutional quality is relatively good. Unfortunately, the literature barely touches this question. Hakkala et al. (2008) argue that corruption has different effects with regard to horizontal (market seeking) and vertical (comparative or cost advantage seeking) FDI. They find robust evidence in Swedish firm level data that vertical FDI targeting the local markets are significantly reduced in corrupt environments, whereas the relation of FDI targeted at costs advantages (to sales back to Sweden or the rest of the world) and corruption is not robust to different controls and estimation techniques. Ito (2013) does not control directly for institutional quality in his study on the determinants of export oriented FDI. However, he finds that trade costs significantly reduce export oriented FDI stocks. As lacking institutional quality increases trade costs (see section 2.2.1 above), this might be taken as indication that lailing institutional quality reduces export oriented FDI.

2.4.4 CONCLUSION: THE FINANCIAL ACCOUNT AND INSTITUTIONS

The empirical literature shows a strong effect of good institutional quality on capital inflows, which is not surprising given the risks faced by potential investors and informational asymmetry present especially in foreign investment projects. It also corresponds to results of Chapter 2.3 on the savings-investment gap, that poor institutional quality reduces domestic (private) investment overall. This finding holds for all types of private foreign investment, but with differing magnitudes. The connection from the composition of the financial account to the structure of the trade balance as part of the current account lies in the influence of foreign capital on the export value or the complexity of exported goods: Availability of foreign finance facilitates production of more complex goods and exports in general.

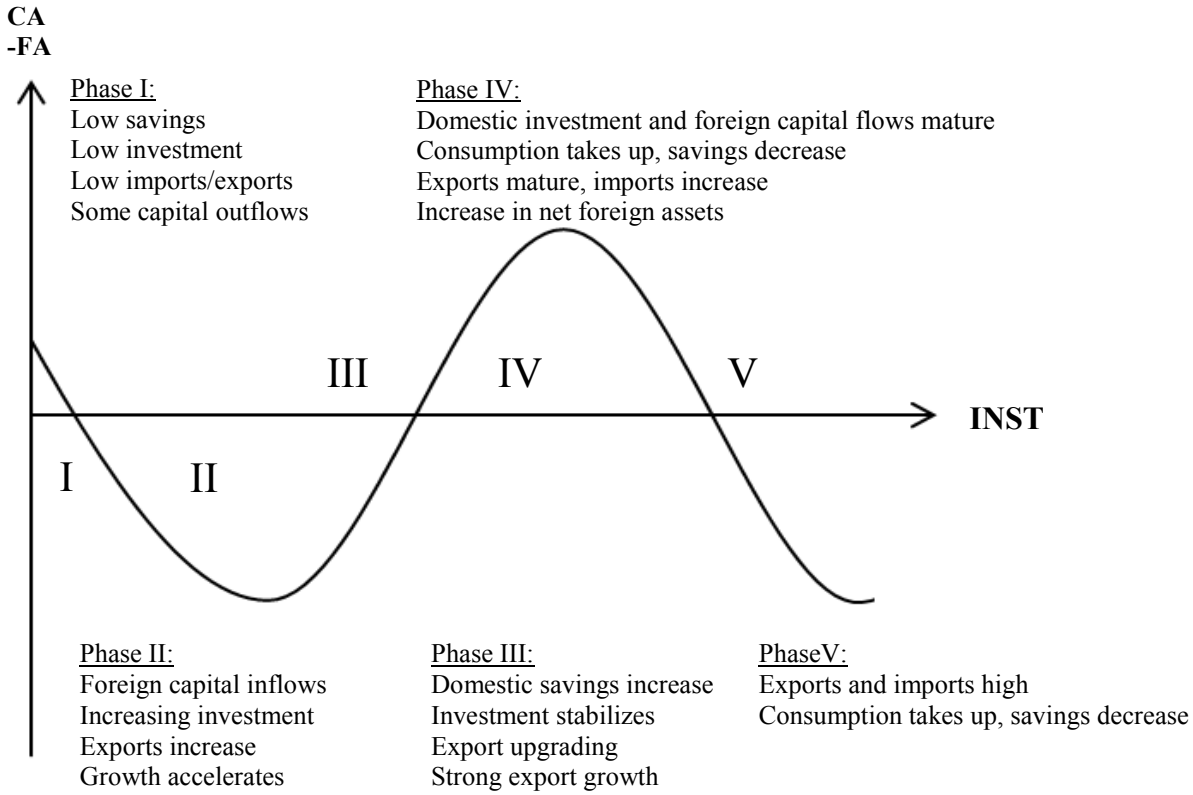
Concerning FDI, as the most discussed and often from domestic policy making most wanted type of foreign investment, the results are quite mixed. At the one hand, empirical findings show that overall FDI are deterred by ailing institutions, and foreign capital stocks tend more to non-equity types of liabilities. However, it is not clear if this comes from the fact the market-seeking FDI are stronger reduced by corruption and bad institutions than comparative advantage seeking FDI, reducing FDI stocks in many but

not all countries. The reason lies in the fact that the higher risk of FDI projects can to some extend be insured by MIGA or are otherwise protected under bilateral investment treaties. For a conclusive picture, more country-level evidence and panel-data evidence is needed, if the necessary data is hopefully available in some years.

2.5 BoP DYNAMICS AND INSTITUTIONAL DETERMINANTS – WHAT HAVE WE LEARNED?

The starting point and inspiration for this literature review was the conjecture of the intertemporal approach to the Balance of Payments, that it is optimal for countries with insufficient volumes of domestic savings to finance their capital accumulation by foreign capital, which helps to achieve higher growth rates and faster convergence to the long-term growth path. From an aggregate viewpoint, foreign credit can only be repaid by exports of goods and services. To produce these exports three preconditions have to be fulfilled: First, large parts of the foreign capital have to be invested. Second, the economy has to produce goods for which there is demand on the world market, which means in general using the countries comparative advantage to integrate into the world economy and don't use actual exports to finance actual imports only. Third, aggregate domestic savings have to increase to narrow the savings-investment gap, which also means to produce in excess of actual consumption. With this, I have described a cyclical movement of the CA and the CpA balance, which follows Sieberts' idea of a beneficial debt cycle. Other parts of the literature hint at the dominating role of institutions for the integration into the world economy – a necessary precondition for this debt cycle – and long term growth in general. Based on the literature I have reviewed in this paper, I would tend to the fact that better institutional quality facilitates the above described form of an ideal debt cycle. The quality of institutions seems to determine the success in transition to different stages of this dynamic development of the economy, which displays itself in the CA, the FA and the domestic savings-investment gap.

Figure 2: The influence of institutions on national debt cycle dynamics



Source: Following Kindleberger, 1963, p. 460 with own adaptions and additions

First and as expected, better institutions encourage aggregate investments, increasing production capital and productivity. This holds also for foreign private capital inflows, which seem to react strongly to the quality of domestic institutions. Relating to the structure of this external capital, the literature hints into the direction that FDI are more negatively affected by ailing institutional quality than are other types of liabilities. As FDI are supposed to created spillovers to the economy as a whole, in contrast to other types of financing, this is especially notable. On the other hand, the availability of foreign financing in general, be it direct equity or loans and bonds, has influences on the characteristics of export goods in an economy: the easier foreign finance is available, the higher the complexity of exported goods.

This gives us the connection to the findings in the trade literature, which concludes that countries with better domestic institutions export higher complex goods, which means export upgrading and a potential escape from the Prebish-Singer trap for developing and emerging economies. Finally, there are some findings in the empirical literature that national (private) savings are also positively influenced by improvements in the institutional setting. For the fulfillment of a beneficial debt cycle, this would be the last element, as rising domestic savings in excess of domestic investment are necessary to complete a beneficial debt cycle.

In Figure 2, I have tried to give an abstract picture on how institutional quality influences the BoP dynamics as I would summarize it from this literature review so far. Phase I stands for a low institutional quality, low income economy. Savings and aggregate investment are low, exports are focused on primary and other non-complex products. The domestic capital leaves the country due to high corruption and lacking investment opportunities, itself a consequence of ailing institutions, which causes a small CA surplus and FA deficit. Increasing quality in institutions marks the start of Phase II. Domestic investment rises and the country gets attractive for foreign capital. The foreign investors try to utilize the comparative advantage of the economy for exports, most likely in the low-wage, simple products sector, where exports start to increase. This contributes to income growth and enables domestic savings formation to rise. Together with increasing foreign capital inflows this leads to high investment and imports of capital goods. Strongly improved institutional quality increases the availability of foreign finance, FDI projects and production networks develop. As a consequence, the export structure starts to upgrade towards more complex products or products with higher unit export values during this Phase III. The transition to export surplus starts, as the rising incomes in the private sector enable higher aggregate private saving rates and household consumption remains still low. During Phase IV, continuous income growth changes the habits of the citizens and consumption adopts. Savings decrease, also because the development of the domestic capital markets is now facilitated by institutional quality. Both exports and imports are stable at high levels; integration in the world economy is strong. From the end of Phase IV on, further improvement of the institutional quality might have no conclusive effect. Some countries could run moderately high saving rates but very low investment, causing CA

surpluses like for example Germany, other EMU members or Canada etc. Other mature economies might have very low saving rates and moderate investment rates, causing a FA surplus like the USA. Further upgrading of the institutional environment is not decisive for the course of the BoP dynamics from there on. The influence of institutions on the BoP dynamics lies in the earlier stages of the economic development process.

3 INSTITUTIONS AND SAVINGS IN DEVELOPING AND EMERGING ECONOMIES

3.1 INTRODUCTION

In the long run, the domestic capital stock has to be financed by domestic savings. This is an important constraint, since economic development depends on investment in human and physical capital. As is shown by Feldstein and Horioka (1980) and is well established in the literature,[4] domestic savings and investment are highly correlated. In the short and medium runs, foreign borrowing can be used to finance the capital stock, but domestic savings have to rise in the long run to repay this debt.

The development literature has focused on the role of institutions in explaining economic growth in developing and emerging countries. In the last two decades, an intense debate on the influence of democratic and/or market-friendly institutions on economic growth has taken place.[5] Overall, the theoretical arguments are convincing, but empirical evidence is mixed. Most importantly, the channels through which institutions affect economic performance are still unclear. Our aim is to assess one of these channels, the link between institutions and savings, with a focus on developing and emerging economies. As the savings decision is directed at the future, it is reasonable to assume that it will be influenced by the institutional setting shaping a country's overall economic development.

Developing and emerging economies are of special interest for this particular topic, as savings rates there are often low or volatile, and the institutional setting is not as stable as in high-income countries. Furthermore, our focus on non-OECD countries enables us, at least in part, to circumvent the problem of parameter heterogeneity likely to be present in the empirical analysis (Eicher and Leukert, 2009). For this purpose, we created a unique database of about 60 countries covering almost three decades. This research is novel insofar as the literature on aggregate savings and its drivers concentrates on macroeconomic variables. These are quite well explored, whereas institutions have not been used to explain savings in a cross-country comparison.

---

4 See Apergis and Tsoumas (2009) for a detailed survey.

5 See Glaeser et al. (2004) for a short and critical overview.

On an aggregate national level, capital formation can be financed by foreign lending or domestic savings. Especially for developing and emerging economies in their early stages of economic development, foreign lending to build up the capital stock may be an optimal alternative to savings, according to the theory of the debt cycle (Siebert, 1989; Kindleberger, 1963). In reality, debt cycles have been completed very rarely; only a few examples exist, e.g., the United States from the late 19th century to the early 1970s. The empirical growth literature shows that foreign (and in particular public) debt affects growth negatively. However, Paldam and Freytag (2011) find some evidence that the ability of a government to transform foreign debt into higher growth rates depends on the institutional setting.

We can think of at least three channels through which institutions can affect growth: first, by encouraging investments; second, by supporting economic efficiency; and third, by determining savings. Institutions can play quite a different role in attracting (foreign) investments than in domestic savings formation. Experience with foreign (direct) investment suggests that good institutions help to attract such funds (and foster growth indirectly). Similarly, good institutions may support domestic wealth formation and investment by promoting own savings. However, the opposite may well be possible: poor institutional quality may require saving for precautionary reasons, leading to larger buffer-stocks, as individuals' expected incomes are exposed to considerable downside risk.[6] Therefore, instead of a positive correlation between institutions and savings, one may well expect a negative one. To tackle the issue in a structured form, we focus on two institutional questions: first, is there a general role for institutions in savings formation? Second, which roles do different institutions play in saving decisions? For this purpose, we distinguish between higher-order institutions, such as the democratic components of a constitution, and lower-order institutions, such as property rights and other aspects of the concept of 'economic freedom'.

The remainder of this chapter is organized as follows. Section 3.2 develops theoretical considerations with respect to the institutional drivers of savings and presents the main hypothesis. Section 3.3 briefly discusses the empirical literature on aggregate savings.

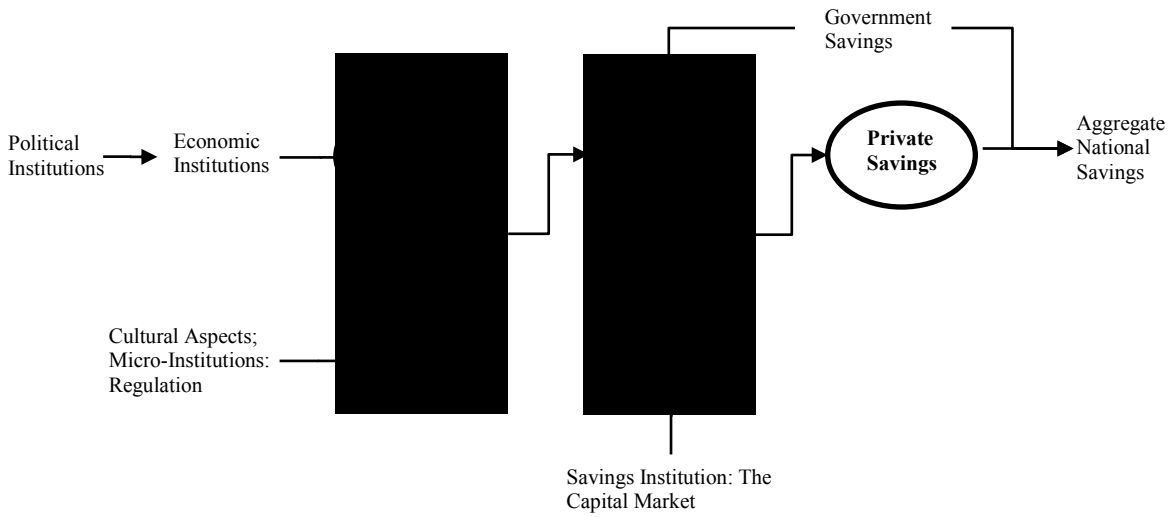
[6] Note that some buffer stock savings are held in form of goods like real estate, gems, gold or jewelry. These are not counted as savings in the Systems of National Accounts, but as consumption or investment.

Section 3.4 is devoted to a short description of the dataset and the estimation methods considered. In section3.5, our hypotheses are tested empirically using a comprehensive set of developing and transition countries over almost three decades. Conclusions round off the paper.

3.2 INSTITUTIONS AND SAVINGS: A THEORETICAL PRIMER

The key to understanding aggregate national savings is the individual savings decision. The drivers of private savings on the micro level, especially for private households or single individuals, have been well researched since Milton Friedman's (1957) seminal work. Friedman states that permanent components of income shape savings, which are ultimately aimed at consumption smoothing, whereas Modigliani and Brumberg (1954) focus on the consumption needs of households over the individual lifecycle. Zeldes (1989) and Deaton (1991) argue instead that a large part of savings is related to credit constraints if individuals face *uncertainty* and are *impatient*. Following this path, Carroll (1997) hints at the role of accumulated savings as a buffer-stock reserve.

Figure 3: Institutional factors influencing aggregate savings



Source: own contribution

From these microeconomic approaches, two elements influencing the savings decision can be extracted: *the ability to save* and *the willingness to save*. The ability to save is constrained by the overall state of development of an economy, e.g., the share of people near the poverty line or access to banks and other savings institutions.[7]

For our purpose, it seems more promising to analyze the factors influencing the *willingness to save,*[8] determined by *impatience* and *uncertainty*. As saving means consumption postponement, institutional factors influencing '*impatience*' become relevant. Figure 3 summarizes the potential transmission mechanism for institutions on aggregate savings. First, a regulatory framework that eases credit constraints may play a role.[9] Second, as savings are the residual of an individual's decision to consume, a consumer-oriented (liberal) regulatory environment can influence aggregate savings formation too. Another determinant of the willingness to save is *uncertainty*. Economic uncertainty can be reduced by governmental interventions into markets, e.g., through social security systems or administered prices. In this case, a small and market-friendly government sector would lead to more savings, everything else being equal. Note also that in this case, a 'big bad government' might lead to inefficiency and slower growth influencing savings in the opposite direction.

But perceived uncertainty is not related only to macroeconomic instability, i.e., risk of unemployment and income shocks. It is also related to 'latent' uncertainty *induced by the institutional setting.* Such a setting potentially allows a wide range of economic risks (like long-term economic stagnation, the repeal of economic reforms or privileges and, finally, expropriation and loss of social status) to evolve in the future for many individuals. Better institutional quality should therefore reduce perceived uncertainty and, thereby, buffer-stock savings. On the other hand, the aforementioned risks are existential because savings and their returns might not be appropriated at all when these latent risks finally emerge from 'bad institutions'. The opportunity costs of today's consumption decline in this case. From such a fatalist's viewpoint, saving is not an

---

7 This may partly explain why some studies find an effect of urbanization on savings, as there are more banking branches available in towns than in rural areas (Sen and Athukorala, 2003).

8 This is closely related to the 'time preference' concept, but as the latter has an exact definition with certain assumptions in microeconomics, we do not use this term here.

9 This includes also a well-functioning system of land property registration because of collateral requirements and is therefore related indirectly to public administration and rule of law.

option in a bad institutional environment, and better institutions might encourage savings.

We regard the rule of law and the quality of property rights as core institutions, influencing politically induced uncertainty. Additionally, corruption may have an influence on the de facto application of written law. For instance, it determines whether the rule of law applies to all economic agents and, if so, to what extent. To our knowledge, only one study by Swaleheen (2008) exists that incorporates these considerations, with a focus on corruption, into an analysis of aggregate savings formation.

Here an interesting distinction seems appropriate, namely, between 'higher-order' institutions and 'lower order' institutions. The former can be called political, the latter economic institutions. Higher-order institutions can influence economic welfare only indirectly through the adoption of a set of market friendly economic institutions. Lawson and Clark (2010) call this the 'Hayek-Friedman hypothesis', which states that politically free societies will either develop market-friendly institutions or have to restrict political freedoms over time.

Concerning our topic of interest – the savings decision – one can hardly argue that democratic participation is directly decisive with respect to the microeconomic interrelations of economic uncertainty and impatience. If a dictator adopts the rule of law for the economic sphere in his country and builds up credibility in this respect, we expect the same effects on savings there as for a more democratic environment. Whether economic freedom and political repression can stand together over a longer horizon is not the focus of our paper. In this context, lower-order institutions, like the rule of law and property rights, as well as the concept of economic freedom may be more relevant and thus more likely to be observed directly in empirical testing.

Having said this, we derive a core hypothesis about the role of institutions in savings formation: 'higher-order' institutions are not directly relevant for savings in developing countries and emerging economies, whereas 'lower-order' (economic) institutions have a direct impact on savings formation.

3.3 LITERATURE REVIEW: INSTITUTIONS, GROWTH AND SAVINGS DETERMINANTS

3.3.1 INSTITUTIONS AND GROWTH

For 20 years, the literature on empirical growth has discussed the role of institutions in the development process. Whereas theoretical arguments are convincing, the empirical debate is stuck (see the difference between Hall and Jones, 1999 and Glaeser et al., 2004, for example). Two results have emerged. First, market-friendly institutions are positively associated with economic performance (see de Haan et al,. 2006 for a survey). Second, other, more fundamental drivers exist for market-friendly institutions. One part of this literature (see Acemoglu et al., 2001; Glaeser et al., 2004, for example) tracks the quality of economic institutions back to deterministic climatic factors or early human capital endowments. As mentioned above, other authors argue that a 'hierarchy of institutions' exists (Williamson, 2000; Persson, 2004; Eicher and Leukert, 2009, amongst others), such that a set of political institutions favorable to a more democratic environment helps to develop a market-friendly institutional environment. From this viewpoint, a set of 'higher-order' (political) institutions determines the adoption of 'lower-order' (economic) institutions. In this study, we have adopted this distinction, too.

3.3.2 DRIVERS OF AGGREGATE SAVINGS: EMPIRICAL EVIDENCE

We take a brief look at the empirical literature on aggregate savings formation in a cross-country comparison. shows the expected determinants of savings as proposed by consumption theory and summarizes empirical findings from different macro-panel studies. These results form the basis for our control variables and our baseline model. We thereby ensure that our database is robust and reliable, and that our model is well specified.

Table 1: Empirical determinants of aggregate savings

category	variable	expected sign	empirical findings[a,b]
behavioral persistence	lagged savings	+	+ (1, 5, 6, 7)
income and growth	income level, actual	+	+ (1, 3) 0 (2)
	growth of income, actual	+/-	+ (1, 2, 3, 6, 7) 0 (5)
	productivity growth	+/-	+ (4)
	terms of trade, % change	+	+ (1, 4, 5, 7) 0 (2)
rates of return and macroeconomic un-certainty	inflation rates	-	+ (1) 0 (2, 4, 5, 6)
	real interest rates	-	- (1, 3, 4) 0 (5, 6, 7)
	political stability	+	0 (3)
	political assassinations	-	0 (3)
domestic borrowing constraints	broad money growth /private credit growth	-	- (1) 0 (7)
foreign borrowing constraints	current account balance	+	+ (3, 6)
development of financial sector	Broad Money/GDP or M2/GDP or private sector credit/GDP	-	0 (1) + (3) –(6, 7)
fiscal policy	public saving	-	- (1, 3, 4, 6) + (7)
	public sector surplus	-	- (2, 5)
	public consumption	-	- (2, 5)
social security system	social expenditures	-	- (3) 0 (6)
demographics	old age dependency ratio	-	- (1, 7), 0 (4)
	young age dependency ratio	-	- (1)
	dependency ratio	-	0 (2, 5, 6) – (3)
	urbanization	-	- (1, 3)
wealth and income distribution	income concentration	+	- (3)
	wealth/GDP	-	0 (2, 5)

a) (1) Loayza et al. (2000), Table 4, column 7; (2) Masson et al. (1998), Table 2, column 4; (3) Edwards, 1996, Table 2; (4) de Serres and Pelgrin (2003) Table 5, column 3; (5) Haque et al. (1999), Table 5 and Table 6, column 6; (6) Schroten and Stephan (2005) Table 3; (7) Terrones and Cardarelli (2005), Table 2.2, column 2;

b) Significant coefficients are indicated by a '+' or '-'; insignificant findings are indicated by a zero.

The dependence of savings on its past levels can be supported with two arguments. First, consumption and saving are shaped by habits and show considerable inertia (Alessi and Lusardi, 1997). Second, as a result of the intertemporal optimization calculus of rational individuals, consumption will be changed only after an economic shock or new information becomes available. Therefore, consumption can be modeled as an AR(1) process (Hall, 1978).

The influence of income and productivity growth on aggregate savings is somewhat ambiguous: on the one hand, and according to Modigliani's life cycle theory (Modigliani 1966, p. 167), faster income growth can lead to more aggregate savings. On the other hand, consumption may increase today if income growth in the future is anticipated correctly (Tobin, 1967). Intuitively, one can expect that savings rise with level of income too, as at very low levels of per capita income, satisfying basic consumption needs does not leave money available for savings. However, beyond a certain threshold, neither consumption theory nor macro-empirical evidence predicts a definite role for per capita income in aggregate savings formation.

Demographic factors are likely to influence gross national as well as aggregate private savings, as predicted by the life cycle model: if the old age dependency ratio rises, dissaving out of accumulated wealth is likely. The conventional view of the role of the youth-dependency ratio anticipates a negative sign: children are not productive workers and consumption expenditures rise in the child-rearing stages of the lifecycle (Higgins, 1998). Furthermore, strong family ties can be a substitute for precautionary savings in cases where capital market development is very poor, as seen in many developing countries (Gersovitz, 1991, p. 401f.).[10] Therefore, national savings are found to be lower in countries with larger youth dependency ratios.

Public consumption enters private savings in a direct way, since private national savings is the difference between national and general government savings. The central argument put forward for the theoretical influence of the public on private savings is that of 'Ricardian equivalence' (Barro, 1974). However, the opposite reaction of private consumption to public savings can be based on other common factors, i.e., business cycles. Note that a very weak reaction of aggregate private savings to public budget deficits nearly leads to the equivalent reaction of gross national savings to government savings, giving the government some influence in boosting savings in the short term.

[10] On the other hand, actual micro-evidence challenges this view: if lifetime income is dependent on investment in education, parents try to save money when the children are young and use these funds to finance higher education when their children enter adulthood (Chamon and Prasad 2010).

Concerning real rates of return, theoretical reasoning and empirical evidence are inconclusive. The real interest rate is also a function of inflation (in terms of the Fisher equation), with effects on national savings beyond the interest rate channel. As higher inflation rates are often correlated with greater price volatility, the inflation rate in general serves as a proxy of macroeconomic stability. Thus, inflation contributes to macroeconomic uncertainty, which should shift precautionary savings upwards.

The problem of credit constraints has also been tested on the macro level. If national capital markets are less developed, intermediation between lenders and borrowers is costly. In this case, consumption smoothing by lending is not possible for many citizens on an individual basis, and the precautionary savings motive drives national savings upwards (Edwards, 1995, p. 23). Quite the contrary, a developed domestic financial market may also provide incentives to save larger fractions of income, as it offers better risk-return profiles and reduces transaction costs for potential savers (Sen and Athukorala, 2003). As presented in section 2.3.3 above, Chinn and Ito (2005) find such a relation in low-institutional quality environments. Concerning integration into the global financial market, it is especially argued that fuller integration leads to lower national (private) savings, as foreign borrowing constraints are lifted. Usually, the current account balance is used as a proxy for worldwide capital market integration (Schmidt-Hebbel et al., 1992).[11]

[11] We do not use a measure of the current account balance, like some earlier empirical studies. It can easily be shown that in this case the actual savings rate is estimated by a fraction of its own value, as the current account balance nearly equals gross national savings – our dependent variable – minus gross capital formation. More importantly, the usual way of interpreting the current account balance as an international borrowing constraint is not correct, as this would mean, in a cardinal interpretation inherent in every linear estimation framework, that current account surpluses are a sign of strong borrowing constraints and only current account deficits are a sign of borrowing ability. Whereas the latter should hold on average, the first aspect clearly does not.

3.4 ECONOMETRIC ISSUES

3.4.1 DATASET DESCRIPTION

Next, we briefly introduce the data and econometric techniques that we use to test our hypothesis. We created a database comprising a wide range of developing countries and emerging economies over the time span from 1980 to 2007.[12] Data for gross domestic product and real growth rates and productivity are from the Penn World Tables 7.0 from August 2011 (Heston et al. 2011). Data for gross national savings and government savings are from the World Bank database and the International Monetary Fund's (IMF) government finance statistics. As the dependent variable, we use gross national savings and gross national private savings in relation to GDP. The latter are calculated from a national accounts perspective as the difference between gross national savings and general government net lending ('public savings') in each year.[13]

3.4.2 ESTIMATION MODEL CHOICES

The underlying macroeconomic dataset makes the choice of a fixed effect panel data model reasonable. However, intertemporal consumption theory (Hall, 1978), macro-empirical evidence and first tests for the autocorrelation of residuals in a fixed effect framework suggest the inclusion of a lagged dependent variable.

In a fixed effect model, including the lagged dependent variable biases the coefficient estimates downwards (Nickell 1981). A second – and much more important – problem with fixed effect approaches is that variables with relatively less variation over time in comparison with their cross-sectional variation (see Table A 4 in the Appendix) are highly correlated with the unobserved country-specific (fixed) effect.[14] Therefore, country dummies in a pooled OLS or the within-transformation of a fixed effect (FE) model reduce the variation available to identify the coefficients of institutional variables remarkably.

Furthermore, in our macro-estimation framework, endogeneity problems and heteroscedasticity associated with country differences are present. These endogenous relations can bias the estimation results. The current standard method of first differencing and using a generalized method of moments estimator (GMM) tries to handle both problems of Nickell bias and endogeneity and is stated to be consistent with heteroscedasticity (Arellano and

[12] A list of countries is given in the appendix.

[13] A broad description of the other control variables including their sources and treatment can be found in the appendix; our institutional variables are described in section 5.

[14] Sobel and Coyne (2011) hint at this problem indirectly with their analysis of the time series properties of different institutional indicators.

Bond, 1991). The GMM approach relies on using lagged values of the explanatory variables as instruments to circumvent endogeneity between the explanatory variables themselves and the individual error term, as well as feedback effects from and to the explained variable. However, as in all instrumental variable estimations, possibly weak instruments might lead to less efficient estimates.

Our preferred method is the system GMM (Blundell and Bond, 1998) estimator instead of the differenced GMM (Arellano and Bover, 1995). The system GMM estimator not only improves the precision of the estimates but also reduces the small sample bias in comparison with the differenced GMM. For reasons of better small sample behavior explained in Bond (2002, p.150ff), we use the one-step system GMM estimator[15] with robust standard errors, as proposed by Windmeijer (2005).

In our estimation we assume that only the demographic variables, the oil balance, and the institutional indices are given exogenously[16] and enter the model with their original values, whereas all other variables are treated as endogenous. Of these variables, we use the second lags as instruments in the differences and the levels equations.[17] The lagged dependent variable is treated as predetermined.

To check the validity of these instruments, we perform Hansen's J-test[18] and the difference-in Hansen test for the exogeneity of selected instrument subsets. The Hansen test basically checks whether the residuals of the instrument variable estimation are uncorrelated with the instruments used under the null 'the instruments are exogenous', and therefore whether the exclusion of the instruments from the original regression is justified. Overall, the number of instruments increases quartically in t, and so does the number of moment conditions. As the Hansen test is weak, with the tendency never to reject the null if T is large, we reduce the number of utilized instruments by stacking the instrument matrix of the GDP growth rate, inflation rates, as well as government savings and domestic credit to the private sector, as proposed by Roodman (2006, p.22; 2009, p. 148). We further reduce the instrument count in our robustness checks by splitting the sample into different time periods. However, in our

15 We use the xtabond2 routine of Roodman (2006) for the STATA software package.

16 We relax the assumption of exogenous institutions in our robustness analysis; see our Table 5.

17 Note that, in their seminal paper, Loayza et al. (2000) treated all variables as predetermined, using not second but first lags as instruments, thereby improving the efficiency of their estimates considerably at the cost of coping with the endogeneity problem.

18 An alternative test would be the Sargan test. As this test is not robust to the presence of heteroscedasticity, it very often fails to reject the null of inappropriate instruments in our case. This may, for instance, also explain why this standard test is also not reported in Terrones and Cardelli (2005).

robustness analysis we also try to relax these assumptions and hence use the complete instrument set to get greater efficiency in coefficient estimation. Especially the latter results can be interpreted as an endorsement of our model specification.

In a first step, we run a simple regression on our savings variables as well as on most relevant control variables (demographics, GDP, real GDP growth, inflation, the oil trade balance). To detect outliers, we calculate Cook's Distance for every observation and exclude countries for which the distance measure exceeds 4/N at least once, as proposed in many textbooks. This drops five countries from our sample (Kuwait, Angola, Congo, Rwanda and Libya). Looking at the reasons for outlier behavior in these cases, we find war, civil war and natural disasters to be explanations. To ensure we get a reliable picture of savings behavior in one country – and not just a single snapshot – we also drop countries with fewer than 10 consecutive observations. Overall, this gives us a basic sample of 54 emerging and developing countries, with a total of 790 observations. Note that owing to fewer observations in some of the other control and institutional variables in the later regressions, the sample size is reduced for some regressions.

We do not include real per capita GDP in our regressions: as Table 5 shows, in itself it is insignificant as an explanatory variable. In addition, it makes other, theoretically and empirically well-founded variables insignificant. Finally, there is only a weak theoretical foundation in inter-temporal consumption optimization models as well as inconsistent macroeconomic evidence for the empirical salience of the level of income. Therefore, we return to this issue in our robustness checks at the end of the next section. We further abstain from including time dummy variables as, first, these are insignificant for all years and, second, they expand the instrument matrix in our system GMM framework considerably and render Hansen test statistics meaningless, because these never reject the null of instrument exogeneity.

3.5 RESULTS

3.5.1 BASELINE MODEL AND CORE HYPOTHESIS

In this section, we discuss the results of the estimations. We start with a baseline model, containing the controls suggested in the literature and test for different institutional indices thereafter. In section 3.6., we discuss the robustness of our results and summarize the main findings.

For our baseline models we chose a set of variables that in the empirical literature has been found to have substantial power in explaining aggregate savings. This includes the lagged savings rate, demographic factors (old age and youth dependency ratios), the actual growth rate, annual inflation, three-year average inflation, the ratio of private domestic credit to GDP (capturing the development of the credit market), government savings to GDP, and the oil trade balance (capturing the special influence of oil exporting or oil dependent economies as well as terms of trade effects due to energy price movements, to some extent). As we can infer fromTable 2, the FE estimation[19] often yields coefficient estimates and significance levels comparable to the system GMM models, but only in cases of variables with larger variations over time, and not for variables with high persistence. The latter (demographics, credit to the private sector) coefficients are biased due to multicollinearity and correlation with the country-specific fixed effect. As our institutional variables of interest also have high persistence (see Table A 4 in the Appendix), we abstain from further use of fixed effects estimations. Therefore, our preferred baseline specifications are those from the models (2) for gross national savings and (6) for our aggregate private savings measure (Table 2). The AR(1) and AR(2) tests point to the feasibility of using the system GMM. Moreover, the Hansen test does not reject the exogeneity of our chosen instrument set, as does the difference-in Hansen test for single variable instruments (see Table A5 in Appendix B). Overall, our control variables, in particular the lagged dependency ratios and growth, have expected signs and sizes, and match previous empirical findings.[20]

We can further see that more domestic credit to the private sector is associated with higher gross national and private savings ratios, which is somewhat counterintuitive to the credit-constraints argument. However, note that in emerging economies credit expansion in an immature credit market does not necessarily mean a lifting of borrowing constraints for

[19] We have also tested an FE version with year dummies. No year dummy has been significant. The change in coefficients is well within the range of the standard errors in the model without year dummies, so we excluded them for comparability with the system GMM estimations. Results are, of course, available upon request.

[20] See, for example, Loayza et al. (2000, p. 173, model no. 6) or Terrones and Cardelli (2005, Table 2.2).

private households, who might still be lacking collateral, but improves the financial situation of (private) companies. Therefore, an inflation-neutral expansion of credit to the private sector also means the enlargement of investment opportunities in usually underdeveloped credit markets and possibly gives rise to consumption postponement to finance prospectively profitable projects or purchases of expensive durable consumer goods. In our regression entering indexes of economic freedom as explanatory variables, we will return to this issue of credit constraints.

An interesting point relating to money and credit expansion is inflation, because its effects on savings remain unclear theoretically and empirically. In our sample, current inflation drives savings upwards, whereas (three-year) average inflation drives it downwards. This is in itself a new and interesting result that previous studies on this issue have not found. Whereas higher current inflation may hint at economic uncertainty and thus raise buffer-stock savings (Carroll, 1992, for example) or give economic agents surprisingly more money than planned for consumption (Deaton, 1977), higher inflation in the long run reduces purchasing power and the ability to save. Nevertheless, inflation rates are more significant for gross national savings rates than for private savings; we therefore should be careful with our interpretation. This brings us to a general problem in many of our following estimations, as our model performs relatively well with gross national savings but is somewhat less consistent for aggregate private savings. Overall, our baseline models are compatible with the literature and provide some further hints at the roles of other control variables.

Table 2: Baseline model estimations

dependent variable:	(1) GNS	(2) GNS	(3) GNS	(4) GNS	(5) PrSav	(6) PrSav	(7) PrSav	(8) PrSav
method	FE	sys-GMM	FE	sys-GMM	FE	sys-GMM	FE	sys-GMM
lagged dependent variable	**0.531*** **	**0.436*** **	**0.522*** **	**0.580*** **	**0.457*** **	**0.388*** **	**0.447*** **	**0.524*** **
	(0.0490)	(0.104)	(0.0527)	(0.133)	(0.0424)	(0.119)	(0.0466)	(0.132)
youth dependency	**-0.0987** **	**-0.161*** **	-0.0689	-0.199	**-0.107** **	**-0.166*** **	-0.0779	-0.194
	(0.0380)	(0.0566)	(0.0428)	(0.127)	(0.0456)	(0.0610)	(0.0483)	(0.139)
old age dependency	0.159	**-0.552*** **	-0.164	**-0.371** **	-0.0256	**-0.565** **	-0.337	-0.361*
	(0.307)	(0.194)	(0.410)	(0.181)	(0.345)	(0.220)	(0.520)	(0.196)
real GDP per capita, log			2.454	-2.942			2.399	-2.876
			(1.736)	(3.828)			(2.012)	(3.997)
real GDP growth	**0.0941*** **	**0.175** **	**0.0807*** **	**0.209** **	**0.0874*** **	0.132	**0.0747** **	0.152
	(0.0304)	(0.0849)	(0.0300)	(0.0853)	(0.0309)	(0.117)	(0.0314)	(0.119)
government savings (./.deficit)	**0.216*** **	0.193	**0.220*** **	0.129	**-0.514*** **	**-0.377** **	**-0.515*** **	-0.291
	(0.0604)	(0.119)	(0.0622)	(0.120)	(0.0637)	(0.168)	(0.0646)	(0.199)
oil/fuel trade balance	**0.339*** **	**0.255*** **	**0.339*** **	**0.308** **	**0.342*** **	**0.258*** **	**0.343*** **	**0.310** **
	(0.0517)	(0.0591)	(0.0507)	(0.123)	(0.0566)	(0.0598)	(0.0559)	(0.131)
domestic credit to the private sector, % of GDP	0.0132	**0.0501** **	-0.000125	**0.0546** **	**0.0354** **	**0.0616** **	0.0222	**0.0743** **
	(0.0169)	(0.0251)	(0.0168)	(0.0277)	(0.0171)	(0.0293)	(0.0188)	(0.0323)
inflation rate	**0.0967*** **	**0.143*** **	**0.100*** **	**0.125** **	**0.0581** **	0.0725	**0.0623*** **	0.0241
	(0.0259)	(0.0496)	(0.0253)	(0.0521)	(0.0225)	(0.0480)	(0.0224)	(0.0569)
3 year average inflation, excl. actual year	**-0.0619*** **	**-0.0880** **	**-0.0627*** **	-0.0816*	**-0.0488** **	-0.0419	**-0.0497** **	-0.0185
	(0.0209)	(0.0393)	(0.0212)	(0.0465)	(0.0228)	(0.0462)	(0.0231)	(0.0563)
observations	790	790	790	790	790	790	790	790
countries	54	54	54	54	54	54	54	54
R2-within	0.489		0.492		0.472		0.474	
R2-between	0.830		0.840		0.787		0.788	
R2-overall	0.777		0.775		0.699		0.702	
min. years	9	9	9	9	9	9	9	9
max. years	25	25	25	25	25	25	25	25
av. years	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63
AR(1)-test, probability		0.000970		0.000973		0.000269		0.000193
AR(2)-test, probability		0.867		0.940		0.874		0.656
Hansen-test statistic, prob		0.348		0.293		0.499		0.425
Sargan-test statistic, prob		0.125		0.000709		0.102		0.000172
number of instruments		41		43		41		43

1) constant not reported 2) bold values indicated 99% and 95% significance levels. 3) ***(**)(*) indicate 99% (95%)(90%) significance values. 4) Numbers in brackets are the corresponding t-values in case of the FE estimations and z-values in case of System GMM 5) FE: fixed effect model estimation, robust standard errors; Sys-GMM: system GMM estimation, panel specific heteroscedasticity adjusted standard errors

3.5.2 HIGHER-ORDER (POLITICAL) INSTITUTIONS

Here we consider the basic hypothesis and refer to 'higher-order' institutions. We claim that savings are not influenced by 'latent political uncertainty', that is, political institutions do not influence savings behavior directly. Various indices that try to capture the manifold dimensions of these ideas exist. We decided to utilize two sources, mainly for their longer-term availability over several countries and their general acceptance in the institutions and growth literature. For 'higher-order' political institutions, we chose the variable 'Constraints on the Chief Executive' from the PolityIV project (Marshall and Jaggers, 2002) and the 'imputed Freedom House – Polity2' measure of democracy, constructed by Hadenius and Teorell (2005). Both are taken from Teorell et al. (2011). Whereas the first variable captures the constraints imposed on the decisions of the highest executive branch and therefore captures checks and balances in a country, the latter also captures democratic participation. Hadenius and Teorell (2005) show that this measure outperforms its constituent parts. These are the Freedom House indices on press liberty and civil rights, as well as the revised, combined PolityIV variable, which indicates a more democratic or autocratic regime. We decided to use both of these variables, because they span two different dimensions of 'modern' types of political regimes and also because their correlation coefficient is relatively low, being only 0.29 (see Table A 6 in the Appendix)

As shown in **Table 3**, a direct effect of 'higher-order' institutions on aggregate savings formation cannot be supported by our dataset and estimation method. As suggested in the hypothesis, it seems plausible that political institutions are 'too far away' to influence the savings decision directly on a year-to-year basis. A change in political circumstances can have an effect on the economic institutions that influence micro behavior indirectly. This is in line with the first part of the 'hierarchy of institutions' hypothesis, which denies a direct effect on economic performance. In addition, including the lagged dependent savings variable hides a longer run relationship, as the variations in the political variables in the short term are not directly matched by corresponding variations in savings.

Table 3: Higher-order (political) institutions

dependent variable:	(9) GNS	(10) GNS	(11) PrSav	(12) PrSav
lagged dependent variable	**0.406*** **	**0.434*** **	**0.347*** **	**0.381*** **
	(0.105)	(0.104)	(0.124)	(0.122)
youth dependency	**-0.143** **	**-0.158*** **	**-0.151** **	**-0.164*** **
	(0.0597)	(0.0578)	(0.0646)	(0.0626)
old age dependency	**-0.538*** **	**-0.546*** **	**-0.566** **	**-0.560** **
	(0.198)	(0.194)	(0.225)	(0.224)
real GDP growth	**0.205** **	**0.179** **	0.185*	0.141
	(0.0843)	(0.0856)	(0.111)	(0.116)
government savings (./.deficit)	**0.206***	0.191	**-0.414** **	**-0.389** **
	(0.116)	(0.119)	(0.166)	(0.168)
oil/fuel trade balance	**0.271*** **	**0.257*** **	**0.280*** **	**0.262*** **
	(0.0609)	(0.0590)	(0.0676)	(0.0640)
domestic credit to the private sector, % of GDP	**0.0610** **	**0.0527** **	**0.0730** **	**0.0661** **
	(0.0257)	(0.0256)	(0.0302)	(0.0303)
inflation rate	**0.129** **	**0.142*** **	0.0653	0.0719
	(0.0503)	(0.0497)	(0.0502)	(0.0484)
3 year average inflation, excl. actual year	**-0.0826** **	**-0.0866** **	-0.0406	-0.0401
	(0.0393)	(0.0394)	(0.0450)	(0.0465)
constraints on chief executive	0.0922		0.102	
	(0.333)		(0.391)	
democratic participation		-0.00251		-0.0169
		(0.217)		(0.253)
observations	763	790	763	790
countries	52	54	52	54
min. years	9	9	9	9
av. years	14.67	14.63	14.67	14.63
AR(1)-test, probability	0.00137	0.000914	0.000668	0.000331
AR(2)-test, probability	0.832	0.855	0.964	0.918
Hansen-test statistic, prob	0.514	0.353	0.531	0.572
number of instruments	42	42	42	42

1) constant not reported 2) bold values indicated 99% and 95% significance levels. 3) ***(**)(*) indicate 99% (95%)(90%) significance values. 4) Numbers in brackets are the corresponding z-values

3.5.3 LOWER-ORDER INSTITUTIONS

The second part of the hypothesis states that 'lower-order' or economic institutions have an impact on savings. We chose three indicators to approximate this concept. The first is subgroup two from the Economic Freedom of the World index (EFW, Gwartney and Lawson, 2009). This index covers the issue of property rights (judicial independence, military interference in justice and politics, intellectual property rights). The second indicator is the quality of governance index from the International Country Risk Guide (, ICRG), which itself is a mixture of perceptions of corruption, the rule of law and the quality of bureaucracy. Finally, we use the rule of law index from the World Bank Governance Indicators (WGI, Kaufmann et al., 2009). The last two indices are taken from the Quality of Governance Database from April 2011 (Teorell et al., 2011). The three indices are highly correlated (around 0.8, see Table A 6 in the Appendix), as can be expected since they all claim to capture comparable aspects of governance. One problem in our estimations might be the indices' relatively high persistence over time, which might hinder the extraction of any significant effect given our large number of control variables. This can lead to identification problems and, finally, inflated standard errors, especially as our age dependency ratios and per capita GDP controls have comparable inertia and are correlated with our institutional variables. As can be seen inTable A 4 in the Appendix , especially the WGI of the rule of law has a very low ratio of within to between variation, whereas the EFW property rights and the ICRG indicator have an even larger within-variation relative to their means or the between variation, especially in comparison with our GDP or old age dependency variable.

For the rule of law and the protection of property rights to influence precautionary (aggregate) savings formation, they have to alter perceived *uncertainty*. On the one hand, a strong rule of law reduces 'latent' uncertainty about changes in the economy's fundamental principles. It may also lay the foundation for continuous economic growth, thereby reducing precautionary motives for accumulating buffer-stock savings. On the other hand, rule of law and stable property rights give incentives for wealth accumulation. Saving incentives are strengthened if the general path of the economy is somewhat certain. If there is a risk of expropriation by the government, a risk of general policy change or social unrest in the case of a growth breakdown, consumption today rises or saving materializes more in the form of purchases of durables. Therefore, the direction of the effect of these three indicators on savings is unclear ex ante.

Table 4: Lower-order (economic) institutions: Property Rights and Rule of Law

dependent variable:	(13) GNS	(14) GNS	(15) GNS	(16) PrSav	(17) PrSav	(18) PrSav
lagged dependent variable	**0.567***	**0.429***	0.297	**0.472***	**0.337***	0.285
	(0.0798)	(0.107)	(0.207)	(0.103)	(0.112)	(0.196)
youth dependency	**-0.108***	**-0.165***	**-0.272***	**-0.117****	**-0.173***	**-0.259***
	(0.0393)	(0.0504)	(0.0905)	(0.0518)	(0.0586)	(0.0981)
old age dependency	**-0.393***	**-0.617***	**-0.890***	**-0.433***	**-0.662***	**-0.870***
	(0.122)	(0.175)	(0.283)	(0.168)	(0.208)	(0.295)
real GDP growth	0.106*	**0.221****	0.108	0.0717	**0.237****	0.141
	(0.0630)	(0.0875)	(0.158)	(0.110)	(0.105)	(0.175)
government savings (./.deficit)	**0.214****	**0.208***	**0.595***	-0.256	**-0.399****	-0.146
	(0.0982)	(0.123)	(0.226)	(0.159)	(0.158)	(0.222)
oil/fuel trade balance	**0.232***	**0.257***	**0.286***	**0.250***	**0.276***	**0.293***
	(0.0495)	(0.0635)	(0.0811)	(0.0634)	(0.0687)	(0.0765)
domestic credit to the private sector, % of GDP	0.0176	0.0150	-0.00160	0.0349	0.0304	0.0135
	(0.0274)	(0.0319)	(0.0433)	(0.0321)	(0.0346)	(0.0449)
inflation rate	**0.172***	**0.160***	0.00825	0.0978	0.0672	-0.0250
	(0.0541)	(0.0530)	(0.142)	(0.0692)	(0.0488)	(0.149)
3 year average inflation, excl. actual year	**-0.116***	**-0.129****	-0.0385	-0.0748	-0.0670	-0.00323
	(0.0369)	(0.0543)	(0.0639)	(0.0456)	(0.0616)	(0.0785)
EFW: property rights quality	**0.964***			**1.063****		
	(0.355)			(0.479)		
country risk: quality of governance		**1.128***			**1.236***	
		(0.374)			(0.446)	
World Bank: rule of law			2.522*			2.385*
			(1.305)			(1.442)
observations	651	715	447	651	715	447
countries	43	49	54	43	49	54
min. years	9	7	5	9	7	5
max. years	25	24	9	25	24	9
av. years	15.14	14.59	8.278	15.14	14.59	8.278
AR(1)-test, probability	0.00256	0.00196	0.0180	0.000306	0.000450	0.0387
AR(2)-test, probability	0.0964	0.747	0.890	0.0472	0.748	0.883
Hansen-test statistic, prob	0.455	0.667	0.308	0.361	0.807	0.414
number of instruments	42	42	42	42	42	42

1) constant not reported 2) bold values indicated 99% and 95% significance levels. 3) ***(**)(*) indicate 99% (95%)(90%) significance values. 4) Numbers in brackets are the corresponding z-values 5) sys-GMM: System GMM estimation, panel specific heteroscedasticity adjusted standard errors

First, we find a significant and positive relationship between our property rights indicator (subgroup two of the EFW index) and gross national as well as private savings (see Table 4, models 13 and 16). Well defined and enforced property rights seem to drive savings upward, which would help developing countries and transition economies directly in financing capital formation. Unfortunately, again, the transmission channel is unclear, but strong property rights may encourage savings for later investments into (small and large) business projects, own houses or other consumer durables. In addition, we have used the WGI on the rule of law (Kaufmann et al. 2008), which we do not find to be significant in our model specifications. This can be attributed to little time-wise variation in (and very limited time span of) this indicator (see Table A 4 in the Appendix).

As another indicator of the rule of law and property rights protection, the ICRG index combines law and order, corruption, and bureaucracy into one aggregate measure. This variable is positive and significant, indicating that better governance is associated with larger gross national and private savings in our sample (see **Table 4**, models 15 and 17).

As corruption is part of the ICRG indicator, we cross-check the result for corruption with the World Bank governance indicator on the control of corruption and the Transparency International Corruption Perception Index (both from Teorell et al., 2011), and the results are not significant. Note that these indicators have very limited time coverage and comparability over time, which might influence the results. But overall, corruption does not seem to influence savings formation, which is in contrast to Swaheleen (2008). Thus, the results of the ICRG index may be driven by its property rights and judicial independence elements, as is confirmed by our solitary EFW indicator on property rights and the rule of law.

If we interpret the coefficients of the institutional variables in a cardinal and causal way, the long-run effect of a 10% rise in the EFW index on property rights or the ICRG country risk measure would increase the gross national savings rate by around 20% if all values are around the mean.[21] For our sample mean country, a 10% change of the EFW indicator for property rights (ICRG indicator) from 4.8 (4.9) to around 5.3 (5.4) is associated with an increase in the gross national savings rate from 21% of GDP to around 25.5% in the long run, everything else being equal. Note that the short-run coefficients for our lower-order institutions are surprisingly large from our point of view.

[21] The calculation of the long-run coefficients is based on a simple autoregressive distributed lag model with one lag of the dependent and zero lags of the additional variable. In this case, the long-run effect is simply the ratio of the estimated coefficient divided by one minus the coefficient of the lagged dependent variable.

3.5.4 ECONOMIC FREEDOM AS A SPECIAL FORM OF A 'LOWER-ORDER INSTITUTION'

We now take a closer look at the concept of economic freedom, a frequently used measure of institutional quality (Gwartney et al., 2013). In general, economic freedom is 'the right of property ownership, freedom of movement for labor, capital and goods; and […] absence of government coercion or constraint of economic liberty beyond the extent necessary for citizens to protect and maintain liberty itself' (Beach and Kane, 2008, p. 40f.). The guarantee of property rights is, in our view, a crucial element of economic freedom, which predominantly influences perceived economic uncertainty. Other elements of a free economic order may have an additional impact on uncertainty or impatience.

We select the following indicators covering these aspects: from a domestic policy perspective, we choose subgroup one, size of government, from the EFW index (Gwartney and Lawson, 2009) to capture market interventions through government enterprises, subsidies and taxes. As stated in section3.2, the effect of government interventions on savings is unclear a priori.

Concerning general domestic market regulation, we use subgroup five from the same source as an overall index of goods, credit and labor market regulations. One can argue that less regulation increases uncertainty for single actors and thus precautionary savings. Moreover, less-regulated markets might also provide better matches of demand and supply. As a result, individuals may become more impatient and prone to consume more currently, thus lowering savings. The last indicator for domestic market regulation is the financial reform index of Abiad et al. (2008). Here we would of course expect less regulation to be associated with lower private savings, which has been confirmed, for example, by Bandiera et al. (2000)[22].

Overall, our results are not unambiguous (see Table A 7 in the Appendix) First, we find negative and significant effects of the 'size of government' on national and aggregate private savings, which, in a causal interpretation, would mean that 'bigger governments' lead to more savings. But in the private savings regression, some control variables lose their explanatory power, so we do not stress this point further. For the overall regulation of goods, factor and financial markets, we do not find any significant effects. Finally, our separate indicator of financial market regulation, from the financial reform index, seems to drive down private savings, as expected. However, as most control variables change coefficients and significance levels, we skip this point too. To conclude, we do not find significant and robust effects of a

[22] Note that the results of Chinn and Ito (2005) hint at increasing savings for lower regulation, if institutional quality is low. I did not have knowledge on this empirical study when I formulated these hypothesis.

more liberal market order and other concepts of economic freedom on aggregate savings formation.

3.6 ROBUSTNESS

3.6.1 ALTERNATIVE AND ADDITIONAL CONTROL VARIABLES

When estimating our baseline model, we also test for several variables discussed in the empirical literature on aggregate savings formation. These include broad money to GDP, M2 or quasi-money to GDP and domestic credit supplied through the banking sector, the real exchange rate, net foreign aid flows, the fuel trade balance, population density and urban population proportion, real interest rates (all from the World Bank database), population growth rates, productivity growth, average GDP growth rates (all from Heston and Summers, 2011) and the net foreign asset position[23] (from Milesi-Ferretti and Lane, 2006) in its lagged values and first differences. All of these are inconsistent in their coefficient signs and barely and/or seldom significant over comparable model specifications. Therefore, we did not include them into our baseline models.

In our first robustness test, we relax all our restrictions on the instrument count, which is necessary to enable the Hansen tests for detecting possible non-exogeneity of the instruments. The restrictions mean that only the first or second lags of the variables are entered, which lowers the efficiency of the previous estimates. Information contained in further lags has been ignored so far. In **Table 5**we present the results for models dropping the stacking of the instrument matrix and using all available lags for our control variables as instruments. This increases the instrument count, as for every observation and year, a single instrument is used, which leads the Hansen test to fail in its ability to detect non-exogenous instruments. As we already know from our previous analysis and the accompanying tests, the chosen instrument set is generally exogenous. As can be seen from **Table 5** (models 25-28), the EFW index for the quality of property rights and the ICRG index for the quality of governance remain strongly significant without changing their signs. In addition, the coefficients of our control variables behave as expected. Moreover, the significance levels rise markedly owing to the improved efficiency of a larger instrument set. We regard this as an endorsement of our initial model's specification.

[23] See the extensive and very inspiring research project by Christiansen et al. (2009).

Table 5: Robustness 1: Enlarged instrument set; GDP as control variable

	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
dependent variable	GNS	GNS	PrSav	PrSav	GNS	GNS	PrSav	PrSav
lagged dependent	**0.811*** **	**0.804*** **	**0.797*** **	**0.785*** **	**0.812*** **	**0.805*** **	**0.796*** **	**0.785*** **
	(0.0317)	(0.0296)	(0.0354)	(0.0355)	(0.0315)	(0.0289)	(0.0363)	(0.0355)
youth dependency	**-0.0388*** **	**-0.0575*** **	**-0.0424*** **	**-0.0600*** **	**-0.0438*** **	**-0.0664*** **	**-0.0361** **	**-0.0587*** **
	(0.0140)	(0.0165)	(0.0145)	(0.0169)	(0.0160)	(0.0161)	(0.0177)	(0.0194)
old age dependency	**-0.161*** **	**-0.217*** **	**-0.179*** **	**-0.224*** **	**-0.155*** **	**-0.208*** **	**-0.185*** **	**-0.225*** **
	(0.0516)	(0.0648)	(0.0497)	(0.0667)	(0.0515)	(0.0646)	(0.0533)	(0.0698)
real GDP growth	**0.137*** **	**0.100*** **	**0.0817** **	**0.0702** **	**0.133*** **	**0.0937*** **	**0.0856** **	**0.0711** **
	(0.0352)	(0.0350)	(0.0389)	(0.0314)	(0.0349)	(0.0348)	(0.0388)	(0.0324)
government savings (./.deficit)	**0.153*** **	**0.151*** **	**-0.209*** **	**-0.230*** **	**0.162*** **	**0.166*** **	**-0.220*** **	**-0.232*** **
	(0.0548)	(0.0510)	(0.0790)	(0.0829)	(0.0542)	(0.0480)	(0.0744)	(0.0763)
oil/fuel trade balance	**0.127*** **	**0.114*** **	**0.133*** **	**0.128*** **	**0.133*** **	**0.124*** **	**0.126*** **	**0.126*** **
	(0.0237)	(0.0274)	(0.0310)	(0.0329)	(0.0244)	(0.0290)	(0.0332)	(0.0374)
domestic credit to the private sector, % of GDP	0.00861	0.00344	0.0146	0.0102	0.00904	0.00433	0.0140	0.0100
	(0.00809)	(0.00806)	(0.0113)	(0.0115)	(0.00813)	(0.00836)	(0.0116)	(0.0121)
inflation rate	**0.132*** **	**0.126*** **	**0.0860*** **	**0.0706*** **	**0.132*** **	**0.125*** **	**0.0867*** **	**0.0708*** **
	(0.0321)	(0.0321)	(0.0256)	(0.0256)	(0.0323)	(0.0321)	(0.0258)	(0.0256)
3 year average inflation, excl. actual year	**-0.102*** **	**-0.0993*** **	**-0.0668*** **	**-0.0655*** **	**-0.102*** **	**-0.0997*** **	**-0.0675*** **	**-0.0654*** **
	(0.0229)	(0.0216)	(0.0187)	(0.0180)	(0.0230)	(0.0214)	(0.0184)	(0.0179)
EFW: property rights quality	**0.362** **		**0.554*** **		**0.388** **		**0.521*** **	
	(0.164)		(0.189)		(0.158)		(0.162)	
country risk: quality of governance		**0.409*** **		**0.594*** **		**0.460*** **		**0.586*** **
		(0.145)		(0.170)		(0.134)		(0.141)
real GDP per capita, log					-0.200	-0.353	0.243	0.0512
					(0.290)	(0.282)	(0.388)	(0.400)
observations	651	715	651	715	651	715	651	715
countries	43	49	43	49	43	49	43	49
min. years	9	7	9	7	9	7	9	7
max. years	25	24	25	24	25	24	25	24
av. years	15.14	14.59	15.14	14.59	15.14	14.59	15.14	14.59
AR(1)-test, probability	0.000748	0.000777	4.29e-05	5.13e-05	0.000736	0.000793	4.13e-05	5.07e-05
AR(2)-test, probability	0.0557	0.897	0.0596	0.497	0.0576	0.866	0.0570	0.498
Hansen-test statistic, prob	1	1	1	1	1	1	1	1
number of instruments	651	715	651	715	651	715	651	715

1) constant not reported 2) bold values indicated 99% and 95% significance levels. 3) ***(**)(*) indicate 99% (95%)(90%) significance values. 4) Numbers in brackets are z-values in case of system GMM 5) Sys-GMM: System GMM estimation, panel specific heteroscedasticity adjusted standard errors

Including real GDP per capita as control variable is a general means of macroeconomic model testing. In our baseline models, doing so changes coefficients and significance levels substantially. This can be attributed to the problem of inefficient instruments. When real GDP per capita is entered into our model without restrictions on the instrument set, all control variables and our institutional variables behave as expected, but per capita GDP itself remains insignificant (see **Table 5**, models 29-32). Thus, excluding it from our initial model specification seems justified. Real GDP per capita itself is insignificant throughout all estimations. Additionally, the test on an AR(2)-process of the residuals fails to deny the non-existence of such behavior in four cases. Therefore, the system GMM method should not be applied to this model's specification at all. However, both the sign and significance levels are unchanged for the EFW measure of property rights regime and the overall quality of governance, so our results appear robust.

The most interesting aspect here is the change in coefficients for the lagged dependent variable and our institutional variables. First, the magnitude of the coefficient increases substantially, giving our model a much longer memory with heavier weight for past than for recent influences. This is fairly reasonable given the fact that we enter more lags as instruments. Second, the coefficients for our lower-order institutions fall by about 50%, hinting at a much smaller and more plausible short-term impact of institutional changes on the savings rate. Note, on the other hand, that the long-term multiplier for both variables stays at a factor of about two, as in our initial model specifications

We also include regional dummies as exogenous variables,[24] identifying sub-Saharan Africa, the Middle East and North Africa, Latin and South America as well as South-eastern Asia. These regional dummies capture climatic, geographic and cultural differences. Whereas different cultures may vary in impatience, climatic factors may influence income levels and growth directly. In model specifications with the reduced as well as the full instrument set, many of our independent variables, including the age dependency ratios and real GDP per capita, lose their explanatory power. The estimated coefficients on the regional dummies take values between -1.7 and -9.9 and are often significant, but the accompanying changes in the constant term hint at an interaction between both effects. The behavior of these regional coefficients is far too similar for a meaningful causal interpretation. This may be one reason why all macro-panel studies on the issue of aggregate savings formation have abstained from including such regional dummies.

[24] Results not reported; they are available upon request.

Only in specifications with the full instrument set do our two institutional variables (EFW subgroup two and the ICRG indicator) maintain their significances, signs and coefficient sizes. Whether this is an issue of over-instrumentalization or signifies true influences is unclear. When we enlarge our instrument set only slightly (keeping the stacking of the instrument matrix, but using two lags instead of one as instruments), most regional dummies retain their explanatory power, many control variables still miss it, and our two institutional variables measuring property rights exhibit weak statistical significance.

3.6.2 ALTERNATIVE TIMING AND MODELING

In the subsequent robustness check (see **Table 6**), we change the time periods of our sample. We divide the sample into two intervals: 1990 to 1999 and 2000 to 2007. Because of limited data availability, we drop our initial first period (1980-1989) which allows us to expand the instrument set slightly (two lags instead of one, but we stack the instrument matrix). As a result, some of the control variables lose their explanatory power in estimations with the restricted instrument set, which could result from more macroeconomic stability following the year 2000, and thus less variation in some of the macroeconomic variables. The results for our control variables improve somewhat when we allow for more lags as instruments. In most regressions, the coefficient on the ICRG indicator is significant and of the expected sign, whereas subgroup two of the EFW index exhibits more explanatory power in the private savings regression for the first (1990-1999) period. Against this background, we do not reject the conclusion that the impact of the rule of law and property rights on aggregate savings formation can be found over the two periods and seems to be time independent.

An alternative model specification for our institutional variables would be to treat them as endogenous rather than as exogenous variables. Under that assumption, the same idiosyncratic error can influence savings and the institutional variables simultaneously. By using the second lags of the institutions as instruments, this effect is overcome. One of the main arguments in the institutions and growth literature is that growth and institutional development have common determinants or, following the argument put forward by Bhalla (2008), growth produces a middle-income class that demands institutional quality. GDP and institutions may therefore be determined simultaneously. Thus, we include GDP per capita as a control variable this model specification. Our institutional variables enter with their second and later lags as instruments for the actual values. As can be inferred from **Table 7**, treating our two institutional indices as endogenous in this way does not change the overall results.

Table 6: Robustness 3: Different time periods: 1990-1999; 2000-2007

	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
	1990-1999				2000-2007			
dependent variable	GNS	GNS	PrSav	PrSav	GNS	GNS	PrSav	PrSav
lagged dependent	**0.540*** **	**0.653*** **	**0.392*** **	**0.524*** **	**0.276** **	0.221	**0.298** **	0.109
	(0.159)	(0.118)	(0.144)	(0.119)	(0.120)	(0.145)	(0.149)	(0.152)
youth dependency	-0.102*	-0.0889	-0.128*	-0.0995	**-0.276*** **	**-0.385*** **	**-0.244** **	**-0.435*** **
	(0.0592)	(0.0592)	(0.0755)	(0.0686)	(0.0991)	(0.119)	(0.100)	(0.131)
old age dependency	-0.305*	-0.276	**-0.469** **	-0.343	**-0.954*** **	**-1.262*** **	**-0.852*** **	**-1.410*** **
	(0.170)	(0.233)	(0.227)	(0.287)	(0.299)	(0.352)	(0.302)	(0.394)
real GDP growth	**0.241*** **	**0.215***	**0.206** **	0.152	0.130	**0.234*** **	0.0760	**0.256*** **
	(0.0899)	(0.111)	(0.0970)	(0.124)	(0.111)	(0.0861)	(0.114)	(0.0988)
government savings (./.deficit)	0.0656	-0.0452	**-0.569*** **	**-0.549*** **	**0.530*** **	**0.419** **	-0.190	**-0.397** **
	(0.173)	(0.208)	(0.124)	(0.164)	(0.144)	(0.181)	(0.165)	(0.183)
oil/fuel trade balance	**0.235** **	**0.189** **	**0.263** **	0.207*	**0.255*** **	**0.252*** **	**0.260*** **	**0.289*** **
	(0.105)	(0.0879)	(0.125)	(0.110)	(0.0831)	(0.0718)	(0.0863)	(0.0809)
domestic credit to the private sector, % of GDP	0.0397	0.0261	**0.0630** **	**0.0537** **	0.0116	-0.0796	0.0348	-0.0855
	(0.0257)	(0.0268)	(0.0249)	(0.0235)	(0.0525)	(0.0672)	(0.0540)	(0.0790)
inflation rate	**0.248*** **	**0.222*** **	**0.198*** **	0.0859*	0.0347	0.0573	-0.000516	-0.0155
	(0.0644)	(0.0391)	(0.0736)	(0.0520)	(0.125)	(0.132)	(0.116)	(0.114)
3 year average inflation, excl. actual year	**-0.128** **	**-0.141*** **	-0.0553	-0.0329	0.0370	-0.0690	0.0617	-0.0487
	(0.0507)	(0.0369)	(0.0665)	(0.0451)	(0.0919)	(0.0744)	(0.0970)	(0.0871)
EFW: property rights quality	**1.285*** **		**1.773*** **		**1.149** **		0.966*	
	(0.424)		(0.591)		(0.534)		(0.530)	
country risk: quality of governance		0.726*		**1.002** **		**2.130** **		**2.337** **
		(0.374)		(0.399)		(0.829)		(0.968)
observations	274	292	274	292	308	327	308	327
countries	43	49	43	49	47	49	47	49
min. years	1	1	1	1	4	5	4	5
max. years	9	9	9	9	7	7	7	7
av. years	6.372	5.959	6.372	5.959	6.553	6.673	6.553	6.673
AR(1)-test, probability	0.0575	0.00460	0.0410	0.00154	0.00971	0.00650	0.0149	0.0135
AR(2)-test, probability	0.0515	0.467	0.204	0.837	0.0566	0.877	0.151	0.963
Hansen-test statistic, prob	0.410	0.407	0.629	0.479	0.645	0.518	0.546	0.757
number of instruments	46	46	46	46	40	40	40	40

1) constant not reported 2) bold values indicated 99% and 95% significance levels. 3) ***(**)(*) indicate 99% (95%)(90%) significance values. 4) Numbers in brackets are the corresponding z-values in case of system GMM 5) Sys-GMM: System GMM estimation, panel specific heteroscedasticity adjusted standard errors

Table 7: Robustness 4: Treating institutions as endogenous

dependent variable	(42) GNS	(43) GNS	(44) PrSav	(45) PrSav
lagged dependent	**0.812*** **	**0.805*** **	**0.796*** **	**0.785*** **
	(0.0315)	(0.0289)	(0.0363)	(0.0355)
youth dependency	**-0.0438*** **	**-0.0664*** **	**-0.0361** **	**-0.0587*** **
	(0.0160)	(0.0161)	(0.0177)	(0.0194)
old age dependency	**-0.155*** **	**-0.208*** **	**-0.185*** **	**-0.225*** **
	(0.0515)	(0.0646)	(0.0533)	(0.0698)
real GDP per capita, log	-0.200	-0.353	0.243	0.0512
	(0.290)	(0.282)	(0.388)	(0.400)
real GDP growth	**0.133*** **	**0.0937*** **	**0.0856** **	**0.0711** **
	(0.0349)	(0.0348)	(0.0388)	(0.0324)
government savings (./.deficit)	**0.162*** **	**0.166*** **	**-0.220*** **	**-0.232*** **
	(0.0542)	(0.0480)	(0.0744)	(0.0763)
oil/fuel trade balance	**0.133*** **	**0.124*** **	**0.126*** **	**0.126*** **
	(0.0244)	(0.0290)	(0.0332)	(0.0374)
domestic credit to the private sector, % of GDP	0.00904	0.00433	0.0140	0.0100
	(0.00813)	(0.00836)	(0.0116)	(0.0121)
inflation rate	**0.132*** **	**0.125*** **	**0.0867*** **	**0.0708*** **
	(0.0323)	(0.0321)	(0.0258)	(0.0256)
3 year average inflation, excl. actual year	**-0.102*** **	**-0.0997*** **	**-0.0675*** **	**-0.0654*** **
	(0.0230)	(0.0214)	(0.0184)	(0.0179)
EFW: property rights quality	**0.388** **		**0.521*** **	
	(0.158)		(0.162)	
country risk: quality of governance		**0.460*** **		**0.785*** **
		(0.134)		(0.0355)
observations	651	715	651	715
countries	43	49	43	49
min. years	9	7	9	7
max. years	25	24	25	24
av. years	15.14	14.59	15.14	14.59
AR(1)-test, probability	0.000736	0.000793	4.13e-05	5.07e-05
AR(2)-test, probability	0.0576	0.866	0.0570	0.498
Hansen-test statistic, prob	1	1	1	1
number of instruments	651	715	651	715

1) constant not reported 2) bold values indicated 99% and 95% significance levels. 3) ***(**)(*) indicate 99% (95%)(90%) significance values. 4) Numbers in brackets are the corresponding z-values 5) System GMM estimation, panel specific heteroscedasticity adjusted standard errors

3.6.3 SUMMARY AND DISCUSSION OF RESULTS

In our baseline models from Table 2, we use control variables established in the microeconomics and macro-empirical literature on savings formation. The results are in line with existing empirical research, in that old and young age dependency ratios, past savings behavior, per capita GDP growth, oil abundance and size of the domestic financial market have the expected signs and are significant. A new and interesting peripheral aspect is the differential influence of average (anticipated) inflation versus actual contemporaneous inflation rates.

We proceed with adding higher-order institutions relating to constitutional constraints on politics. As expected and proposed by the institutional growth literature, we cannot find a direct link between these political institutions and the actual savings rate. However, as higher-order institutions influence the adoption of a certain set of lower-order economic institutions, there may well be an indirect effect that we cannot detect given our modeling approach.

The institutions and growth literature also has found that economic freedom influences economic performance directly. Uncertainty and impatience theoretically may be affected by economic freedom, driving the savings rate in opposite directions, with an undetermined overall effect. Our findings from the models as given in Table A 7 in the Appendix could be interpreted as showing such inconsistent behavior.

But what is most important, we find that the quality of property rights and low country-specific risks of expropriation have a positive effect on savings, not only in the long run, but also in the short run. On average, we find a short-run multiplier for the hypothetical mean sample nation of between 0.4 and 1, meaning that a 10% rise on the scale measuring country-specific risk or economic freedom can lead to a 4% to 10 % increase in the national and the private savings ratio, respectively. The long-term multiplier as given by our system GMM method might even be twice as large. This effect is relatively stable over a number of model specifications, including the addition of other control variables like GDP and regional dummies (as proxies for climatic or cultural factors), a change in the instrument set, as well as treating these institutional variables as endogenous instead of as strictly exogenous.

However, one shortcoming may be our modeling choice. As saving rates strongly depend on some stationary as well as unstable factors, cross-sectional analyses of country averages or just long-term growth rates, as used in the institutions and growth literature, are meaningless.

This forces us to choose a dynamic panel data model, which, on the other hand, conceals long-term relationships because many control variables are persistent over time.

3.7 CONCLUSION

This chapter analyzes the drivers of savings in developing and transition countries. Human and physical capital accumulation – as well as an economy's institutional framework – drive long-term growth. Domestic savings are an important determinant of additions to the capital stock. The literature on institutions and growth argues that the institutional setting influences economic prospects through productivity growth and investment. In our view, institutions may additionally influence the formation of savings. This is a transmission channel for the impact of institutions on long-term growth, which has been neglected so far.

Microeconomic theory sees uncertainty and impatience as the main drivers of individual savings, which can explain the observed deviations of saving rates from the predictions of the lifecycle theory. The macro-empirical literature on domestic savings formation has not tested for these ideas, but focuses on the drivers of lifecycle savings and credit constraints. First, we argue that, from an individual's perspective, the general institutional setting of a country influences perceived or 'latent' uncertainty with respect to the overall political and economic environment. It is through this channel that the institutional setting of an economy influences aggregate savings. Second, we show for a set of developing and emerging economies that aggregate national and private savings indeed seem to be influenced by indicators of country-specific institutions.

We do not find direct effects on national and private savings formation associated with higher-order institutions imposing constitutional constraints on politics. This is in line with the theory of the 'hierarchy of institutions'. Furthermore, we do not find consistent evidence for some aspects of the concept of economic freedom. The reason may be that impatience and uncertainty are affected simultaneously, each having opposite effects on the savings rate.

We find evidence that property rights and the rule of law influence national and private savings formation. The effect of the quality of property rights is positive, significant and consistent throughout various robustness tests. Whereas it cannot be ruled out that stronger property rights reduce uncertainty and therefore should also reduce individual and aggregate savings, the opposite line of reasoning seems more plausible and is supported by our research: strong property rights and enforcement of the rule of law are essential for the long-term

development of an economy from an individual's perspective, making the accumulation of wealth appealing for private companies and individuals. This leads to higher national and aggregate private saving rates.

We hope that the discussion on this issue has just begun. The necessity of choosing a dynamic panel estimation method restricts us to a relatively small number of control variables and empirical models. This approach makes it difficult to detect the longer, but steadier, influence of institutional settings on many economic variables, including the savings ratio. Overall, our results seem plausible, as drivers of savings are manifold. However, a theoretical model that relates savings formation to institutions is lacking so far. Important empirical questions are also waiting to be answered. Does the macro-evidence also hold for micro-data on saving rates? Can the results be confirmed by other estimation approaches? Do household or business savings react more strongly to the institutional setting? The results of this paper are at least encouraging and will hopefully lead to more detailed research on these important questions.

4 ASPECTS OF CURRENT ACCOUNT DYNAMICS IN THE EURO AREA – THE ROLE OF THE FINANCIAL ACCOUNT, TARGET2 LIABILITIES AND INSTITUTIONS

4.1 INTRODUCTION

In mid-2009, I have started to write a minor part in a policy brief on institutional aspects of the current account deficit in South Africa and the danger of a sudden stop of foreign capital inflows in light of the global financial crisis. The paper has finally been published in March 2011 as Draper et al., 2011. The aim of the policy brief was to assess the situation of the South African economy. The authors decided for the content of one chapter to compare the situation of CA deficits in South Africa with the situation of countries in Europe which have been hit by the crisis and had huge CA deficits prior. From the point of knowledge we have on this topic by now, maybe the authors should have chosen other or additional countries and time periods for a good overall comparison. As the publication process went on, they had to update the figures and data up to mid-2010 and it became clear that some of the conclusions from 2009 came under pressure during the following year. Now, in 2014 and some additional research from my side later, I have to add several aspects to this small chapter and even withdraw from some conclusions of my first short analysis of the FA.

In end-2009, the development of the current accounts in Europe did hardly show any worrisome aspects and certainly no strong danger of a sudden stop or reversal by pure comparison of the aggregate data. Much of the reduction in foreign financing, as could be seen from the financial account and financial sector capital flows, could be attributed to the financial sector hording liquidity in response to the financial crisis that began to spread over the global economy in end of 2008. From the structure of the FA, some EU countries have been marked as “endangered” countries, facing potentially adverse effects of a sudden stop. The data update in 2010 showed more of these dangers, but data was still lacking to get a clear picture overall. Especially for the South-European economies, it was not until the seminal publication of Sinn and Wollmershäuser (2011)

that one could realize why the data was masking the type of sudden stop of foreign CA financing especially for the South-European countries one would have expected to see.

This publication is part of my research curriculum, and the content and conclusions serve as a good connection between chapters two and three of this thesis and the following larger chapter five. It gives insights into the interrelation of institutions, CA deficits, the structure of foreign financing and the role of detailed organizational provisions influencing the working of a monetary union. It stands furthermore for the first steps of my interest in the topic of CA deficits and the question of its influence factors.

Relating to the issue of institutional influences on Balance of Payments dynamics, we can learn two points: First, the pre-crisis boom of capital inflows in the selected European economies and especially the structure of investments fit very well into the results from the literature review on institutions and foreign investments from chapter 2, especially sections 2.3 and 2.4. Second, the necessary rebalancing of the economies after 2008 and the extent to which they had to cope with economic crisis and capital outflows shows significant influence of investors' perceptions of the institutional setting, like in Greece, Hungary, or Romania. It is furthermore an example of how the institutional environment shapes the potential to turn domestic investment with foreign credit into a successful export-upgrading strategy, helping to follow ideal debt-cycle dynamics like the Estonian case.

In the next sections, the parts already published in Draper et al. (2011, pp. 3-10) are critically analyzed and contrasted against today's perspective. The citations are given in italic letters followed by comments and corrections. All figures and data have been updated to actual values and do not show the values from mid-2009 and mid-2010.

4.2 CURRENT ACCOUNT REVERSALS AND SUDDEN STOPS IN THE EU

Concerning the level of the current account deficit in South Africa and the European economies with high CA deficits, Draper et al. had written:

"*As the comparison […] shows, the South African current account deficit is and has not been excessive by international standards. In contrast to the economic up-swing between 2002 and 2007, it rather seems quite modest. Both high income countries like Spain and Greece and fast developing ones like Bulgaria or Estonia have had much*

higher deficits on average and in peak since 2002. Therefore, the question of sustainability must be answered carefully."

Much of the following parts of the whole paper focused on the careful assessment of the South African case, but the authors made a short analysis of the potential problems of the EU countries, too. The space requirements for publication of course prevented a deep country analysis for every case, so they focused largely on the composition of the financial account and the utilization of this foreign capital to increase domestic consumption or investment, which is a standard part of the analysis of current account sustainability (IMF, 2009, p. 228). Despite the authors were hinting at potential problems, it was still a too optimistic and a bit naïve analysis from a today's perspective.

"To get a better impression of the sustainability of a current account deficit and the economic results, we briefly analyze the current and financial account composition of selected Eastern European countries and comment on their sustainability."

In what followed, Draper et al. did a short comparison on the level of the current account deficits of the nine EU economies and South Africa. They also noted the maximum and average CA deficits during 2001 to 2008 and classified the countries into two categories, whether they experienced a sudden stop of current account financing or not. In 2010, Draper et al. had based this assessment on the CA turning from deficit into surplus from one year to the next, which put Bulgaria, Estonia, Hungary, Latvia and Lithuania on the list of victims of sudden stop of foreign financing. But this criterion kept Greece, Italy and Spain off the list of countries with current account reversals.

Turning from high deficits directly into a CA surplus is a far too strict measure for a reversal of capital flows, and I would like to repeat this exercise now by using Edwards (2002) two criteria for CA reversals. Edwards (2002, p. 45) defines a reversal if either the CA deficit has decreased by 3% in one year or over a three year period. By using this categorization, all of the nine countries have experienced a sudden stop of external financing and capital flight (see Table 8). The smaller economies where most hit directly in 2008 and 2009 as a consequence of drying up of international liquidity and foreign financing, experiencing extreme reductions in their current account deficits of around 5-8% per year on average and excessive reversals of capital flows, but with

relatively short duration of only one or two years, despite high average and high maximum current account deficits preceding 2007. Greece and Spain as European Monetary Union (EMU) members had a longer period of deficit reduction with around 2% per year and for Italy, we can observe only a relatively moderate adjustment over 2 years which corresponds to its minor CA deficits between 2001 and 2007. The conclusion one could draw from this is, that EMU members are better insured against capital flight and current account reversals even if their deficits pre-2007 might have been comparable to other EU but non-EMU members.

Table 8: Current account deficits to GDP, sudden stop in selected EU economies

	average '01-'07	***2007***	***2008***	***2009***	***2010***	***2011***	***2012***	***2013***	reversal: 3% (start-end)	average reduction per year	max decline, year
Bulgary	-10.6	**-25.2**	-23.1	-8.9	-1.5	0.1	-0.8	1.9	'09-'10	5.4	7.4
Estonia	-11.4	**-15.9**	-9.2	2.7	2.8	1.8	-1.8	-1.1	'08-'09	8.2	11.9
Greece	-8.5	-14.6	**-14.9**	-11.2	-10.1	-9.9	-2.4	0.7	**'09-'13**	2.0	3.8
Hungary	-7.4	-7.3	-7.3	-0.2	0.2	0.4	0.8	3.1	'09	7.2	7.1
Italy	-0.7	-1.3	**-2.9**	-1.9	-3.4	-3.0	-0.3	1.0	'12-'13	1.1	0.9
Latvia	**-13.3**	-22.4	-13.2	8.6	2.9	-2.1	-2.5	-0.8	'09	**11.0**	**21.8**
Lithuania	-8.0	**-14.4**	-12.9	3.7	0.1	-3.7	-0.2	1.5	'09	**11.8**	**16.7**
Romania	-7.9	**-13.4**	-11.6	-4.2	-4.4	-4.5	-4.4	-1.1	'09	3.8	7.4
Spain	-6.0	**-10.0**	-9.6	-4.8	-4.5	-3.7	-1.2	0.8	**'09-'13**	2.2	4.8

Source: Eurostat, 2014; grey areas highlight the period of current account reversal according to Edwards (2002)

4.3 FOREIGN INVESTMENT, THE STRUCTURE OF THE FINANCIAL ACCOUNT AND INSTITUTIONS

Concerning the individual economic circumstances relating to the probability of strong and persistent CA problems, Draper et al. had written a short paragraph on the different countries, with a focus on the structure of the flows of foreign capital as given in the FA statistics:

"The surplus in the financial account of the South-Eastern European countries Bulgaria and Romania has been driven by FDI in exceptionally large parts. From 2008 on, tendencies of overheating could be observed in both countries: strong wage increases (European Commission, 2009, pp. 52 and 98) go hand in hand with declining shares of capital goods and rising shares of consumer goods in total imports, indicating a less sustainable utilization of the current account deficit. As a consequence, domestic

demand and thus imports plummeted during the economic downturn, lowering the current account deficit considerably. Regarding the financial account, net foreign investment shrank. Backed up by a well-capitalized banking system, strong foreign reserves and the commitment of foreign banks to keep their levels of exposure, neither country experienced strong capital outflows (EBRD, 2009), although a slight reversal in 2010 can be observed due to overall economic slowdown (EBRD, 2011)."

For Bulgaria, their analysis seems too optimistic. Despite the high share of FDI on total financial inflows was maintained and net FDI flows have been positive up to 2013, the European Commission (2014) finds that CA adjustment is structurally and not cyclical, caused by deleveraging of financial institutions (which can be seen from Figure 4 below with net negative flows of portfolio investment and loans) in accordance with considerable drop of investment in construction and manufacturing which has been exaggerated between 2004 and 2008. However, the main factors seen in the adjustment process are a case for structural economic policy, and less institutional aspects interesting from the first part of this thesis.

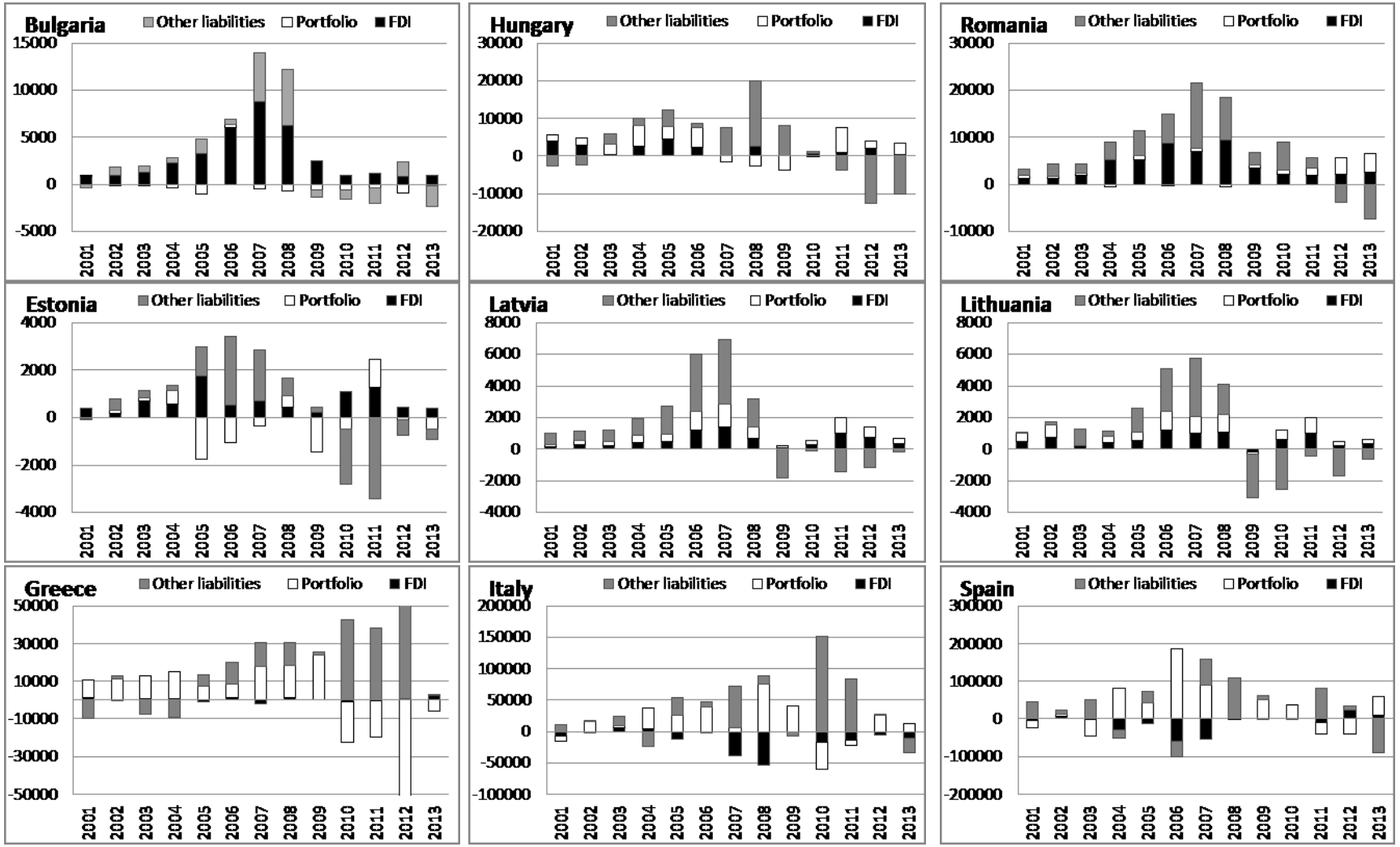
The point the authors overlooked in mid-2010 was the fact the Romania had applied for Balance of Payments assistance in 2009, of which the main credit lines have been disbursed between March 2010 and June 2011. They amount to 5 bn. Euro by the EU backed up by additional 15 bn. from IMF credit lines and other assistance programs. Because the data available in 2010 was only up to the 2nd quarter of 2010, the financial account did not show unexpected compositions of flows. Furthermore, Romania experienced a huge currency depreciation of about 30% in 2009 as a result of the sudden stop of capital inflows and capital flight. This realignment had moderating influences on the CA in the following years. Despite the European Commission (2013, p.25ff) hints at the role of quality of bureaucracy and public administration which is in need to improve, other institutional aspects are slowly improving or at least stable at a low level according to the Economic Freedom of the World indicators (EFW, Lawrence et al, 2013) and the World Bank Governance Indicators (WGI, Kaufmann et al. 2010). The low level of institutional quality speaks against the relatively high share of FDI on total financial inflows pre-2007, if we take the results from my survey in section 2.4 of this thesis into account, albeit one could argue that the main driver of FDI have been

low labor costs and the relatively stable institutional setting guaranteed by the membership in the EU.

"Looking at the Baltic countries, the picture is mixed. On the one hand, net portfolio investments were negative in most years, indicating that inhabitants of these countries invested in the rest of the world according to their risk-diversification strategies. On the other hand, there is a stable net inflow of FDI. Thus, we can not state that the capital surpluses have been highly speculative in general. During the financial turmoil, Latvia and later Lithuania experienced a reversal of short term capital inflows [as indicated by negative net other liabilities, usually bank loans]*, as non-residents withdraw their deposits at domestic banks* [and interbank-loans have been cancelled]. *Due to the well-capitalized banking sector, commitment of foreign banks and high foreign reserves, all three countries have been able to maintain their currency arrangements* [in contrast to Hungary and Romania]. *As very small open economies, domestic demand and investment is highly dependent on economic development in Europe and remains still weak (ERBD, 2009). Estonia has tried to avoid some problems of a small* [open] *economy by adopting the Euro in early 2011."*

For the Baltic countries, Draper et al.'s analysis from mid-2009 and 2010 still holds true in general. Interestingly, a regional study from the European Commission among central and east European countries highlights the significant influence of relatively low levels of corruption in attracting FDI for Estonia, especially in comparison to the two other small Baltic states (Grigonyte, 2010, p. 4ff). Furthermore, the European Commission hints at the fast restructuring of the Estonian economy, turning from CA deficits to surpluses by considerable export upgrading in the manufactures sector (Lamine, 2010, p. 4ff). This interpretation is again in line with the findings of chapter 2 of my literature survey and on the influence good institutions on foreign financing and on export upgrading and export performance.

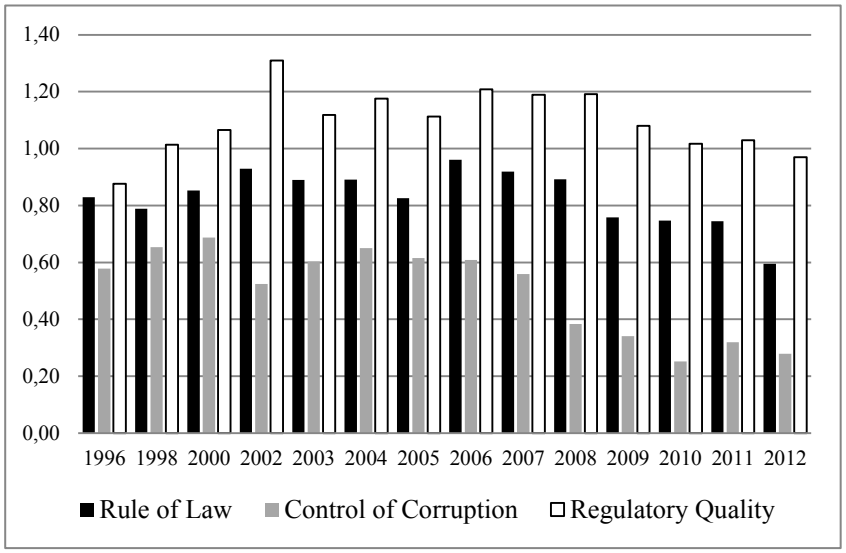
Figure 4: Structure of the financial account in selected EU economies



Hungary, the former showcase of an East-European transition economy, suffers from political distress and structural problems like high public deficits (IMF, 2009). From 2006 on, short-term oriented capital inflows dominated over FDI. […] *Hungary has become one of the early and most prominent victims of the financial crisis in Europe. Mass capital flight in early 2009 and strong exchange rate depreciation was the consequence of lost trust in the government's ability to cope with the financial crisis. Since then, the Hungarian currency has regained its pre-crisis level, but investor sentiments are still weak (ERBD, 2009 and 2011).*

It is especially Hungary which is a good case study for the arguments of an influence of institutional insecurity on foreign capital as given in section 2.4. Since 2007 and especially 2010, investor sentiment for Hungary has decreased because of insecurity over government interventions, not only into the market process, but also into the legal system (European Commission, 2014a, p. 43ff). The European Commission especially criticizes "[T]hat the loss in competitiveness has taken place mainly until 2009-2010 and that it was to a large extent driven by the deterioration in the policy-environment. [Investors] mention legal stability as well as the predictability of economic policy as primary weaknesses in the economic framework." (European Commission, 2014a, p. 48). For example, the WGI show a continuous weakening of rule of law, control of corruption and regulatory quality between 2007 and 2012, the last year actually available (Figure 5). The IMF (2014) and the European Central Bank (2014, p.190ff and p. 323ff) hint at the institutional aspects as potential risks for investment and growth. For example, the ECB recommends that "The government should actively seek to improve foreign investor sentiment by […]respecting the existing contracts between private parties […] and guarantee certainty in the implementation of private contracts" (European Central Bank, 2014, p. 194).

Figure 5: WGI of Hungary



Source: Kaufmann et al. (2010), data update September 2013

4.4 THE FINANCIAL ACCOUNT, TARGET2 LIABILITIES AND SUDDEN STOP OF FOREIGN FINANCING

Despite a detailed analysis of the Hungarian case, especially the interrelation of institutional quality and (foreign) private investment, would be interesting, it is more suiting for this essay to put the focus on Greece, Italy and Spain, as a focus on these countries serves as the connection to the following chapter 5. For these countries, Draper et al. had written in 2011:

"In contrast to the Baltic countries, the three South-European countries Greece, Italy and Spain have been more worrisome from the beginning, as their current account deficits were financed mainly by portfolio investments and came along with net FDI outflows in many years. […] As members of the European Monetary Union, the three countries have been saved from capital flight and exchange rate troubles until 2008"

From our knowledge today, there are some important elements in the above paragraph, relating to the earlier and later chapters of this thesis. First, Greece, Italy and Spain have relatively high shares of Portfolio (debt and equity) and loan financing and low shares of FDI, as can be seen from Figure 4. They are at the same time the countries with the highest corruption according to the CPI (Transparency International, 2013) within the group of countries with EMU membership in 2001 (EMU2001). They also have

significantly lower values in some institutional indices as given by the EFW 2007 index, that is their EFW rating is below one standard deviation from the mean of the EMU2001 group for rule of law, freedom to trade internationally and markets regulation, a picture which is confirmed if we use the WGI instead (Table 9). This is again (and surprisingly obvious) in accordance with the findings on the structure on the financial account from the literature survey above, stating that ailing institutions lead to lower FDI shares in financing and higher bond and especially loan financing (section 2.4.2).

Table 9: Institutional indicators for Greece, Italy and Spain, 2007

	EFW 2007, data update 2012 (0-7; higher is better)			WGI 2007, data update 2013 (-2.5 - +2.5, higher is better)		
	Rule of law	Trade	Regulation	Rule of law	Corruption	Regulation
Greece	6,72	7,61	5,86	0,84	0,25	0,90
Italy	5,96	7,90	6,50	0,44	0,31	0,92
Spain	6,96	7,73	7,10	1,13	0,99	1,21
EMU2001	8,17	8,18	6,92	1,41	1,46	1,42
s.d. EMU2001	1,13	0,38	0,58	0,48	0,72	0,34

EMU2001: average for the member states of the European Monetary Union as of 2001; s.d. standard deviation

Source: Kaufmann et al. (2010); Lawrence et al. (2013)

But from a today's perspective, Draper et al.'s interpretation in 2011 of the slow decrease of the current account deficit, which they interpreted as absence of large amounts of capital flight, was lacking the information regarding specific internal accounting regulations in the European System of Central Bank (ESCB), which is now known as part of the TARGET2[25] debate. The mechanism of TARGET2 and some implications are part of chapter 5 of this thesis. For now it is sufficient to note that TARGET2 balances are an indicator of excess money creation of a national central bank in the EMU and its subsequent transmission into other EMU member states in response to redemption of foreign capital or lack of foreign credit to finance imports. Taking account of TARGET2 liabilities, the assessment of a moderate reversal of foreign capital inflows and a steady adoption of the CA has to be examined anew.

[25] **T**rans-European **A**utomated **R**eal-time **G**ross Settlement **E**xpress **T**ransfer System.

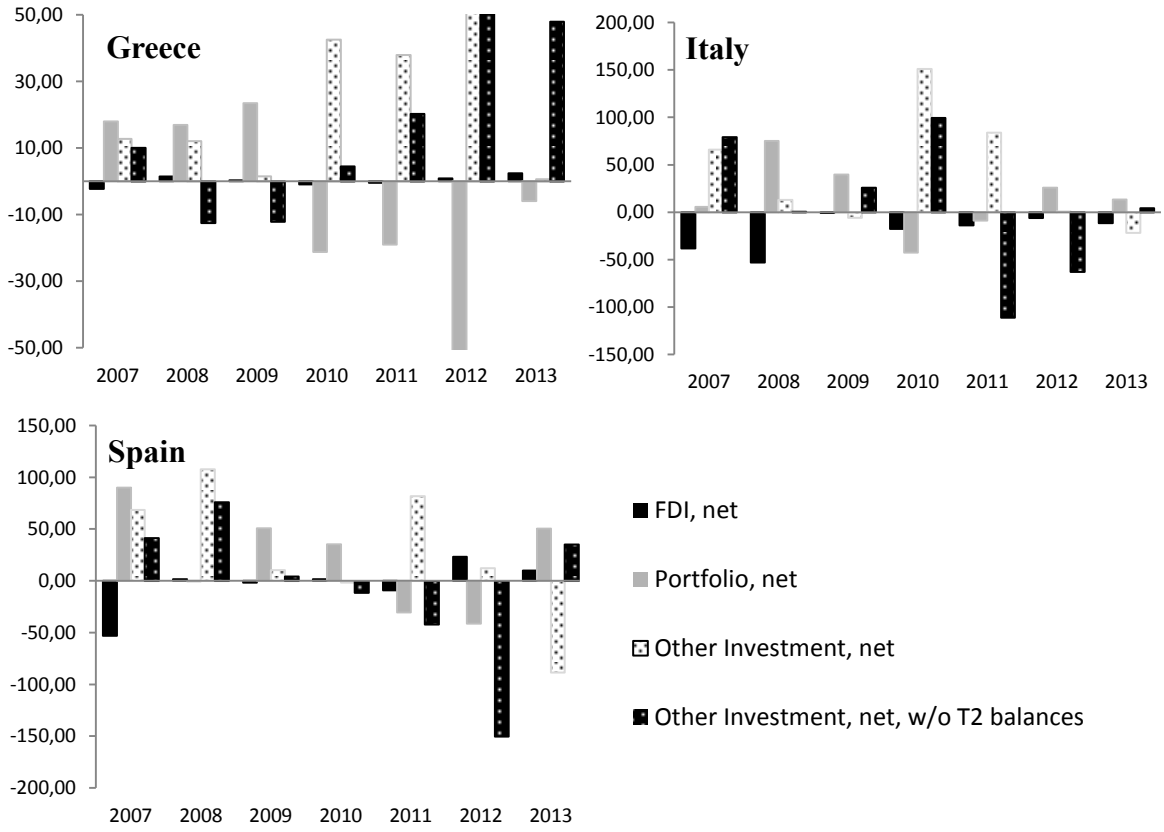
Table 10: Current account to GDP and sudden stop without TARGET2 liablities

	average '01-'07	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*reversal: 3% (start-end) average reduction /year*		*max decline/year*
Greece	-8.5	-7.2	-4.4	-5.2	7.0	-1.4	-2.4	'08-'12	7.5	12.2
Spain	-6.0	-3.9	-9.6	-4.2	-3.6	8.1	14.6	'09-'12	9.8	11.7
Italy	-0.7	0.3	-0.4	-0.8	-0.1	9.4	3.8	'10-'12	5.1	9.4

Source: Eurostat, 2014; grey areas highlight the period of current account reversal according to Edwards (2002)

For this, it is necessary to account for TARGET2 liabilities in the FA balance and the CA balance over a year for the three economies and to calculate the new values relative to nominal GDP. This gives us the "potential" CA balance values which are in accordance with the economies external budget constraint, if transfers of domestically created money into other EMU member states via TARGET2 would not have been possible (which is the case for non-EMU members). Applying Edwards (2002) method for identifying CA crises as above changes our judgment on the severity of the stop in foreign financing. As we see from Table 10 and the maximum decline in one year there, now all three countries show values of necessary CA adjustment of around 10%, which is dramatic given the size of the economies relative to the smaller Baltic and South-East European economies with same reductions. Second, the average values of reduction per year in comparison to the average pre-2007 are between 5% and 10%. Even using my first criterion in 2010 for a sudden stop, a change from CA deficits to surplus within one year, Greece would have experienced this harsh event in 2010 and Spain and Italy in 2011 in this contra-factual scenario (neglecting how realistic this could have been from the real economy's side).

Figure 6: Structure of financial account flows w/o TARGET2 liabilities, bn. of Euro.



Source: Eurostat, 2014

From a BoP perspective, TARGET2 balances are booked in the financial account under the item 'other investments, monetary authorities' and can therefore relatively easy be traced if one knows what to look for. The aggregate figures for FDI, portfolio investment and other types of investment, which I have presented in the 2011 paper and are repeated with actual data above in Figure 4, however hide this important point. If we account for the position of net assets/liabilities in the statistical item 'other investment, monetary autorities' of the FA, we get a better picture of the form of (private) capital flight that occurred in the three South-European countries between 2008 and 2012 which is shown in the graphs of Figure 6.

In these graphs, the grey dotted bar shows "other types of investment" (non-FDI and non-(equity and security types of)portfolio investments). Pre-2007, this position included mainly loans of banks and other financial institutions. The dark dotted bar shows 'other types of investment' if 'other types of investment, liabilities, monetary authorities' is subtracted. The difference between the two bars shows the amount of TARGET2 liabilities on "other types of investment" and gives a feeling for the extent to which flight of foreign capital out of the financial sector of these economies has been refinanced by TARGET2 and the national ECBs. For Greece, the year 2010 shows net FDI and portfolio capital flight and barely net other inflows (largely official transfers by the IMF and EU), which has been offset by TARGET2 liabilities. The private capital leaves the country if possible. The same holds for 2011. For 2012, the numbers are blurred by the massive aid programs and official debt restructuring, which is why the axis for Greece is cut at +/-50 bn. Euro. The true figures for 2012 in Greece correspond to portfolio capital flight in height of -77 bn. Euro, offset by around 110 bn. Euro of official assistance programs but only minor TARGET2 liabilities. For Spain, a superficial analysis of the financial account would show a change in the passive side of the FA, with private capital flight in FDI and portfolio investment but increased loans and other types beginning in 2011. If we account for TARGET2 liabilities, one can see that all types of private capital run away from the Spanish financial market, including loans and other investment types. The same holds for 2012 and we can easily tell the same story for Italy in 2011 to 2012 from the graphs.

Looking at the figures from Table 10 for the necessary current account adjustment and the replacement of private foreign capital by newly issued money, as shown in the structure of the FA, gives a good feeling for the extent to which the monetary union has first facilitated risky capital allocation pre-2007 (in comparison to the non EMU-members) and the stabilizing effect of the EMU onto the members economies in the short run after 2007. This might be the reason, why even Sinn and Wollmershäuser (2012) as the main proponents of critical arguments against the TARGET2 mechanism repeatedly stated that the TARGET2 mechanism as an emergency tool is unwanted, but "there are reasons to believe that the ECB policy was right in the short term because markets were dysfunctional…" (Sinn and Wollmershäuser, 2012, p. 477). One could discuss if the markets were dysfunctional, or if market actors were individually rational

with suboptimal welfare consequences, leading to a potential coordination failure. What gets clear is that knowledge on the detailed provisions of accounting between the national ECBs is relevant for an assessment of the severity of a CA crisis in the EMU. The following chapter 5 will touch this issue again and get deeper into the question how such detailed provisions could possibly be designed and which consequences this would have on the cohesion of the EMU.

5 TARGET2 BALANCES, REFORM AND THE COMPARISON WITH FED'S ISA

5.1 INTRODUCTION

The technical term „net claims within the Eurosystem", describing a balance sheet item of a central bank of the Euro area, has gained considerable attention in the public and the scientific community, starting with the first article by Sinn and Wollmershäuser (2011). These so called TARGET2 claims constitute net foreign assets of the German taxpayer which could be at risk in case of a breakup of the Euro area. In August 2012, these claims reached its maximum value, adding up to around 752 bn. Euro, with Spain being the largest (approximately 434 bn. Euro) and Italy the second (approximately 289 bn. Euro) largest debtor. Since 2012, this balance sheet item of the German Bundesbank is declining and has lost now (August 2014) 40% in comparison to its previous heights.

The underlying cause of the unprecedentedly high TARGET2 balances is the combination of low collateral requirements of the European Central Bank (ECB) monetary policy and capital flight from the so called GIIPS[26] countries. The evolving insecurity between the financial institutes in Europe and following breakdown of interbank financing in 2008 can be seen as trigger for the repatriation of funds back into the European Monetary Union (EMU) core countries[27]. But from 2010 on, TARGET2 balances show the underlying mistrust of financial market participants into the credibility of economic policy actions in the GIIPS, fear of government insolvency or even an exit from the EMU. At least in this part of the discussion, critics and defenders of the actual TARGET2 mechanism are sharing one opinion (see de Grauwe and Ji, 2013 vs. Sinn and Wollmershäuser, 2011, p.41). The disputes in the literature hint at the differing evaluation of the TARGET2 mechanism, either as a moderating element in the political and economic convergence or as a vehicle for maintaining the huge economic imbalances within the EMU.

---

[26] Greece, Italy, Ireland, Portgual, Spain

[27] In conjunction with Sinn and Wollmershäuser (2011, p.5), we define the core countries as the TARGET2-net claimants Germany, Finland, Luxembourg and The Netherlands, whereas the peripheral countries correspond to economies with (large) TARGET2 liabilities, mainly the GIIPS countries.

We will not take part in this line of the discussion, as it is full of value judgments, good economic arguments from both sides and high insecurity in the range of thinkable scenarios for the further development of the EMU. This part of the thesis will touch three main aspects. Section 5.2 summarizes the discussion on the issue of TARGET 2 and gives an introductory overview on the mechanics of TARGET2 balances, which are necessary to understand the following parts. It introduces also some aspects which seem to be relevant for a well-founded economic judgment. It is shown that TARGET2 debtor countries are not necessarily also the beneficiaries of the transactions that cause the excessive balances. Second, it is argued that TARGET2 liabilities are not to be seen as loans from a legal perspective. Lastly, it is reminded that the whole TARGET2 system can be circumvented by cash payments, which would enable the large financial institutions to elude possible cost increases induced by a reform of TARGET2. Section 5.4 goes into a detailed analysis of the risks associated with the claims against the ESCB, which the TARGET balances simply represent. From this detail it will become clear that TARGET2 balances are approximately one half of the potential losses in case of an exit of one member from the EMU.

Section 5.5 analyzes critically the known proposals for a reform of TARGET2 accounting mechanism. In general, various alternative compensatory mechanisms are thinkable. To our knowledge, the different modifications that have been discussed in the scientific community so far can be categorized into three groups:

1. Penalty interest rates including risk-premiums
2. Mandatory limits to potential losses
3. Pre-specified provisions for loss-sharing in the case of an exit from the EMU

It is shown that the proposals are not likely to reduce the balances without interrupting the cross-border payments. This contradicts the explicit provisions in Article 127 (2) TFEU specified objective of the Eurosystem as well as Article 63 (2) TFEU. They would also likely increase the possible doubts about the survival of the monetary union in times of economic crisis. In case of a strict and consistent implementation of one of the proposals, it is to be expected that a breakup of the monetary union will be enforced without a political coordination. As a predetermination of the distribution of future exit costs, the proposed TARGET2 modifications appear to us incomplete, because they do

not account for other positions of the central bank balance sheet. Since TARGET balances are only one part of the negotiations in the future relations between the then former EMU members, TARGET2 modifications constitute provisions for loss-allocation accruing from monetary policy. These can and will most likely be (over-) compensated by corresponding agreements in other areas of future cooperation in the wake of the breakup negotiations.

Section 5.6 takes up a detailed aspect, namely the assertion by Sinn and Wollmershäuser (2011, p. 48ff) that the United States Federal Reserve (Fed) system has something comparable like a well-functioning settlement mechanism for payment transfer balances, which the EMU just has to copy. The main question is, why it works in the US system and if it could work in the actual EMU framework. Overall, the analysis hints at three main questions which have to be answered for a positive assessment:

1. Is it ensured that there exists always a sufficiently large volume of assets eligible for settlement, be it in normal economic circumstances and times of turmoil as well?
2. Can the central banks get ownership of such assets in the course of their regular monetary policy operations?
3. Is it ensured that the financial sector does not have to rely on the national (regional) central banks as their lender of last resort (in times of systemic financial crisis) over an extended period of time?

We will show that the US system works relatively smoothly because the supposedly harsh restriction of Interdistrict Settlement Account (ISA) settlement is accompanied by many counterbalancing mechanisms, focusing on the impact of the central implementation of monetary policy, the management of the monetary assets in a single, common portfolio and the monetary policy focus of the Fed on federal bonds - as well as other side aspects - in comparison to the ESCB.

5.2 A SHORT SUMMARY OF THE LITERATURE

5.2.1 HOW THE DISCUSSION EVOLVED

In February 2011, Hans-Werner Sinn (2011a) described TARGET2 balances as "a kind of overdraft" whose limitation was not provided for because it has not been reckoned with such huge and persistent increases. In June, Sinn (2011b) spoke of TARGET2 claims as "sort of transfer" through which the ECB is practicing a hidden bailout. The balances showed that private loans from EMU core economies to the periphery countries are replaced through public loans. The peripheral countries financed their current account deficits in this way. For the NCBs of the core, and especially for the German taxpayer, this increased the liability risks for potential losses of their central bank (Sinn, Wollmershäuser, 2011, p. 33).

In response to the TARGET2 critiques, the German Bundesbank explained the increase in its monthly report of March 2011 in the balances with "tensions in the money market" and "problems in the banking sector in the Euro area" (Bundesbank, 2011, p. 35). TARGET2 balances are seen as an indicator for a "changed distribution of refinancing operations in the Euro area". She made particular note that TARGET2 balances are not independent risks and that losses from monetary policy operations are allocated on the basis of the capital key of the European System of Central Banks (ESCB), regardless at which National Central Bank (NCB) the losses occur. Willem Buiter et al. (2011), Karl Whelan (2011), Ulrich Bindseil (2011) and others argued vigorously against the evaluation of Sinn and Wollmershäuser (2011), particularly against the supposed function of financing of the current account, the relevance for losses in the Bundesbank balance sheet and the recommended reforms of the TARGET2 system.

5.2.2 WHY DO THE TARGET2 PROVISIONS DO NOT CONTAIN A SETTLEMENT MECHANISM BETWEEN INDIVIDUAL CENTRAL BANKS?

With the establishment of the ESCB and the introduction of the Euro as the common currency, the participating countries have committed to create an institution for the settlement of cross-border payments to ensure at all times within the EMU, that one currency unit in a region is equivalent to the same currency unit in a other member region. According to Garber (1998, pp. 8 ff) the design of TARGET[2] (automatic

cross-border payment transfers, daily clearing, but no settlement) represents the technical institution to ensure this principle and prevent speculative attacks within the Euro area (as in the case of the European Exchange Rate Mechanism (ERM) in 1992/93). It was specified in the agreements on the European Union that the ESCB decides centrally on the measures of monetary policy considering the whole currency area (European Union, 2012, Article 14.3) and the NCBs have to implement them without large discretion. The NCBs have no longer the right to interrupt or disturb otherwise cross- border payment flows with reference to their own monetary stability, as it was the case in the ERM.

Since the obligation to defend the fixed exchange rate with currency reserves and the legal basis to stop cross-border payments within the EMU are missing, it is not justified from an economic viewpoint to speculate onto a Euro area exit and the accompanied depreciation of the new currency. However, termination of EMU membership can be caused by political reasons. In the end, each state is sovereign within the Eurozone to undertake such a step, if its citizens find that the associated costs are less than the benefits of staying within the EMU. The advantage of the TARGET2 mechanism lies in the fact that economic actors are able to transfer their capital across borders in such a situation of political uncertainty, without that this capital movement itself accelerates or enforces an exit from the EMU. The latter would be the case with 'hard' settlement obligations for the TARGET2 balances. The possibility of free capital transfers under all economic circumstances can rather be seen as a prerequisite for economic integration in a monetary union without enforced political cohesion.

5.2.3 Probability of exit from and capital flight within the EMU

Implementing 'hard' settlement conditions for accrued balances in the cross-border payments system of the EMU basically mimics a system with fixed rates, where the obligation to intervene for stabilization rests unilaterally at the central bank whose jurisdiction has experienced net capital outflows (Burgold and Voll, 2012a, p.26). Depending on the design of the respective institutions and their credibility to maintain the underlying cross-border transactions, speculation against the membership of a country in this 'settlement-EMU' would be justified economically and politically, with both factors reinforcing each other. The economic rationale behind such capital flight

would follow currency crises models of Krugman (1979) or Flood and Garber (1984). Here, the prospect of an end of assets eligible for settlement forces market participants into rational speculation against EMU membership of a single nation. Political statements – like threats of exclusion or discussions about a unilateral declaration of exit from EMU - could be seen as trigger events to induce capital flight. These triggers could start the speculation on Eurozone breakup, despite the lack of fundamental economic factors, as for example, Obstfeld (1986) shows. The absence of any provision within the TARGET2 framework with respect to a settlement of payment balances ultimately prevents the – otherwise technically unavoidable - materialization of a balance of payments crisis like in the case of non-defendable fixed exchange rates.

5.2.4 ORDO-ECONOMIC REFLECTIONS ABOUT THE NECESSITY FOR SETTLEMENT OF PAYMENT SYSTEM BALANCES

Aside from the technical necessity of an absence of settlement obligations for cross-border payment flows in the EMU, it is still worthwhile to discuss this issue from a normative perspective. The starting point of such considerations could be an ordo-economic viewpoint, in particular the principle of competence and responsibility: As single economic actors have the right to make autonomous decisions, they must bear the resulting risks from their activities. Based on this, two conflicting lines of argument with respect to the emergence of TARGET2 balances can be developed.

From the first viewpoint, TARGET2 liabilities could be considered as a direct cause of the economic policies of the affected peripheral countries in the EMU. If we assume that the NCBs within the ESCB have sufficient autonomy in their monetary policy operations (e.g. through the Emergency Liquidity Assistance[28]), a compensation of TARGET2 balances is necessary. Kohler (2011) argues that otherwise the peripheral countries in the Eurosystem gain the same privileges as the reserve currency country in a system of fixed exchange rates. The need for a settlement of TARGET2 balances could withdraw this privilege again. Furthermore, a deferred implementation of necessary structural policy reforms to reduce real production costs and regain competitiveness in some of the peripheral countries could be interpreted as a strategic

[28] These ELA are possible from article 14.4 of the ESCB statutes, stating that such measures have to be undertaken at own accounts and can be rejected by a 2/3 majority of the ECB-council. On March, 21st, 2013, the ECB-council has made the continuance of the Cyprus ELA dependent on its application in a formal EU/IMF credit progamme, for example.

decision which aims to reduce the burden of adjustment for the country and impose it onto the other members of the EMU (Fahrholz, Wojcik, 2010). As the success of this strategy is unknown for the peripheral government as well as for private economic actors, exit from the EMU is still an alternative. Therefore, this gambling strategy can be seen as a catalyst of capital flight and thus for the TARGET2 balances, thereby increasing the costs for the core countries in case of a breakup of the EMU and thus improving the bargaining situation of the periphery further. By this way, deferring recommended reforms is a means to obtain funds through a fiscal transfer mechanism from the other Euro members. From both points of view - the autonomous monetary policy decisions and the strategic delay of reforms - the financial risks of the core members contained in TARGET2 balances increase. A settlement mechanism for TARGET2 balances with valuable assets could reduce these risks and could therefore be recommended.

From the opposite point of view, it could first be argued that peripheral countries do not have enough control over monetary policy instruments to reduce TARGET2 balances. Furthermore, these TARGET2 balances are induced by exogenous shocks (i.e. not backed by the economic fundamentals). The domestic economic policy is not able to influence this capital flight in the necessary scale in such a case. Second, the cash outflows from the peripheral countries which cause the TARGET2 imbalances have to be refinanced through the commonly agreed monetary policy instruments of the ESCB (e.g. low collateral requirements and low interest rates) to avoid strong deflationary developments. It is not justified to assign the responsibility for these measures to the peripheral countries alone, because they rest on majority decisions with the ECB council (Kooths, van Royne, 2012, p. 6 -13). From this perspective, excessive TARGET2 balances are not a result of misguided economic policies of single countries, but rooted in the fact the EMU is not an optimum currency area. TARGET2 balances are therefore a sign of insufficient resilience of the EMU towards asymmetric shocks. Actually, the ESCB tries to compensate for this failure by (ordo-economic questionable) monetary policy measures: very low interest rates and increased risk for the portfolio of central bank assets. Introducing a settlement mechanism for TARGET2 balances and assigning the burden for compensation to the periphery would not only increase the tensions in a highly imperfect currency area, but are also not justified from an ordo-

economic perspective. Independent of which of the above two lines of argumentation one is tempted to follow, proposals for a reform of TARGET2 accounting are worth to assess, if they are compatible with the necessities of a monetary union.

5.3 ESSENTIAL ASPECTS OF TARGET2 BALANCES

5.3.1 BASIC KNOWLEDGE

For the casual reader, the relevant hint for an understanding of the TARGET2 balances is the fact that money – book money as well as cash – is a liability from a central banks perspective. Therefore, it has to be backed by equally valued assets from a balance sheet perspective. If the money base rises within the jurisdiction of a central bank - either by money creation or by inflow of legal means of payment from other parts of the monetary union - this increase in liabilities must be backed by an equal increase in the central bank's assets as follows from the simple principle of double-entry accounting. Between the ESCB members, TARGET2 balances form the balance sheet item which equalizes changes in the money base and the asset side caused by cross-border transfers of electronic money between the economic subjects of Eurosystem member states.

TARGET2 balances are receivables (or liabilities, depending on their sign) of a national central bank in the Euro area against the entire Eurosystem. They are at first a purely technical result of the difference in incoming and outgoing cross-border payment flows between the financial institutes of the different Eurosystem member states. TARGET2 liabilities occur, if the economic subjects of one country transfer more funds into other countries of the Euro area than are received from there. In the opposite case, TARGET2 claims emerge. Figure 7 shows a simple example for the transfer of 100 Euro via TARGET2. If a French importer wants to make a payment to a German exporter, then its French commercial bank processes this payment via TARGET2. The deposits of the French commercial bank at her NCB (Banque de France) are then reduced by the amount transferred. The commercial bank of the German exporter is credited with the corresponding payment. Through this transaction, the Bundesbank inquires a balance sheet liability "deposit of a commercial bank" from the Banque de France and receives a TARGET2 claim as an offsetting entry on the asset side of its balance sheet. At the liabilities side of the Banque de France's balance sheet, the commercial banks' deposit is replaced with a TARGET2 liability instead.

Figure 7: Simplified example for emergence of TARGET2 balances

Simplified central bank balance sheets before a electronic money transfer via TARGET2

Banque de France			
Assets		Liabilities	
other assets	100	equity	100
loans to commercial banks	400	notes	200
		deposits by commercial banks	200
	500		500

Bundesbank			
Assets		Liabilities	
other assets	200	equity	200
loans to commercial banks	800	notes	400
		deposits by commercial banks	400
	1000		1000

Simplified central bank balance sheets after net transmission of 100 Euro from France to Germany via TARGET2

Banque de France			
Assets		Liabilities	
other assets	100	equity	100
loans to commercial banks	400	notes	200
		deposits by commercial banks	100
		TARGET2 liabilities	100
	500		500

Bundesbank			
Assets		Liabilities	
other assets	200	equity	200
loans to commercial banks	800	notes	400
TARGET2 claims	100	deposits by commercial banks	500
	1100		1100

A central bank creates (central bank) money by buying assets, including loans to commercial banks. Apart from other liabilities, the central bank's equity corresponds to the difference between its assets and the central bank money created (banknotes and central bank deposits). In the Eurosystem, this money-creation process is distributed across all national central banks with the result that the corresponding assets are also distributed over the 17 NCBs of the Eurozone.

If central bank deposits are now transferred across borders, a formal change of the debtor occurs. The claim of the commissioning commercial bank against its NCB in one country of the EMU changes into a claim of the receiving commercial bank against their NCB in another EMU member state. Without further accounting entries, the equity of the transferring NCB would increase, while that of the receiving NCB would decrease. To assure neutrality of electronic cross-border transactions with respect to the central bank's equity positions, TARGET2 claims and liabilities are necessary. The equity of the NCBs thus remains unaffected from the flow of central bank deposits within the Eurozone. If this was not the case, the net payments receiving countries such as Germany would have to recapitalize continually their NCB. The NCB's in the

peripheral countries could pay their governments correspondingly higher capital dividends.

5.3.2 MAIN BENEFICIARIES ARE NOT NECESSARILY THE PERIPHERY COUNTRIES

Accordingly, TARGET2 balances indicate whether the money base within the jurisdiction of a central bank has decreased (TARGET2 liabilities) or increased (TARGET2 claims), without active monetary policy operations of the national central bank. The steady increase of TARGET2 liabilities of some Euro member states simply shows that more payments from these countries have been made towards the rest of the monetary union than vice versa. It is important to note, first, that these balances are not caused by active transfers of central banks among themselves, but by action of independent, mostly private economic actors. Secondly, the balances are not bilateral in nature, but they are claims against the entire Eurosystem.

In the context of the current euro sovereign debt crisis, this is due to the fact that deposits are withdrawn because of the fear of bank failures, high taxation or forced conversion in case of an exit from the EMU. Another main driver of TARGET2 liabilities of the periphery are loans falling due, which are not extended but requested to redeem by the creditors in the core countries (Buiter et al., 2011, p. 5). This can easily be seen from the dynamics in the structure of the financial account of Greece, Spain and Italy in Figure 6, and we will come back to this special point of capital flight by the financial sector in section 5.6.3.

Without the EMU, comparable capital deductions would have provoked the devaluation of the crisis currencies, as could be seen with Hungary or Romania in 2009 in the European Union itself. This would have imposed large losses onto the former (predominantly private) creditors of the core countries. Depending on the currency of the individual credit contracts, either the nominal value of credit claims would have been reduced through devaluation, or the default risk of their borrowers would have increased because of an increase in the real debt burden due to depreciation. To conclude, the beneficiaries of the actual TARGET2 mechanism are primarily all economic actors which were able to withdraw their financial assets from the crisis countries without suffering devaluation losses. This includes wealthy investors in the periphery. But above all, the main beneficiaries are the foreign creditors in the former

capital exporting (core) countries that have financed investment and consumption and therefore the current account deficits in the periphery for years (Buiter et al., 2011, p. 4-6; Dullien and Schieritz, 2012).

Because of this fact it is unfortunate to speak of a financing of current account deficits by TARGET2, such as Sinn and Wollmershäuser (2011, pp. 34ff) do. It is of course true from the viewpoint of Balance of Payments accounting, but it mixes causes and consequences. Their statement implies that the current TARGET2 claims correspond to actual financing of consumption of the debtor countries. As long as the capital flows are, however, clearly crisis-driven (De Grauwe, Ji, 2012), the interpretation is more convincing that many years of mislead investments from actors in the core countries and other currency areas are withdrawn and the associated risks are passed on to the level of the whole monetary union.

5.3.3 TARGET2 CLAIMS AREN'T CREDITS

The common task of the Eurosystem, i.e. of the NCB's and ECB, is the management of the common currency in accordance with the provisions of Article 127 (1) and (2) TFEU. As far as the NCBs are required to conduct the monetary policy measures on behalf of the Eurosystem, they also manage the resulting assets and liabilities on its behalf. TARGET2 positions arise inevitably with the common task. From this point of view, TARGET2 balances do not represent individual credit relations between the NCBs, but are accounting positions in a framework of internal accounts. Provisions to limit increases in the single accounting positions would hinder the Eurosystem in fulfilling its treaty obligations.

The existence of the TARGET2 balances is caused by the design of the European Monetary Union, since the NCB are - regardless of the common task - organizationally and legally independent. If the Eurosystem had been built as a monolithic entity (without the legal autonomy of each NCB), these balances could not have been arising. With centrally conducted monetary policy and the NCBs in a role of simple subsidiaries, TARGET2 balances are not needed as balance sheet items. This supports the view that TARGET2 claims do not constitute credit from a legal perspective. Only in the external relationship - in transactions on the primary or secondary market - credit relationships arise for the NCBs or the ESCB. Further hints at the non-credit nature of

TARGET2 claims are given by the facts that there are no provisions for the due dates and that they are virtually non-interest bearing within the EMU (see section 5.4).

To interpret TARGET2 entries equivalent to an overdraft credit of the government is also not correct if we consider the legal acts which induce the payment transactions. In general, the contracting parties are private economic agents, who settle their voluntarily agreed business relations by money transfers via the TARGET2 system. Even if the payments are financed by credit lines of foreign investors, the NCB is not a contracting party in this business.

If we accept for this moment that TARGET2 claims is indeed credit by legal terms, the periphery countries could repay the debts by way of legal means of payments at any time, which is the Euro currency. But this is exactly the mechanism by which these claims have arisen, because the transfer of deposits leads to TARGET2 liabilities for the country from where the transaction is ordered. Paradoxically, "redemption" with legal tender can therefore only be held if a creditor, for example, currently the Bundesbank, transfers money to a debtor, for example, the Bank of Greece.

Other paradoxes arise when TARGET2 balances are added up with the national debt, which would be justified if TARGET2 liabilities are indeed loans taken as remarked in an early comment by Sinn (2011b): If, for example, the Greek government takes credit of 1 mn. Euro at the capital markets at home and buys goods or services in Germany, Greek government debt would increase by 2 mn. Euro. If, on the other hand, the Greek government buys domestic goods and services with credit from Germany in the same volume, Greek government debt would remain unchanged. Furthermore, this procedure would not be in accordance with the international conventions for calculation of the budget of the general government sector, in which central banks assets and liabilities are not included, for very good reasons. Note that including TARGET2 balances into the government financial accounting would also make the EMU core countries very happy, as TARGET2 claims would reduce the government debt there like it would increase the debt in the periphery. The conclusion of all the above cited arguments is that TARGET2 claims do not individually constitute credit claims and TARGET2 liabilities do not constitute debt. They have to be seen as accounting entities which arise with the orderly

conduct of the tasks of the ESCB and serve to prevent fluctuations in the equity position of the NCBs caused by large volumes of cash transfers.

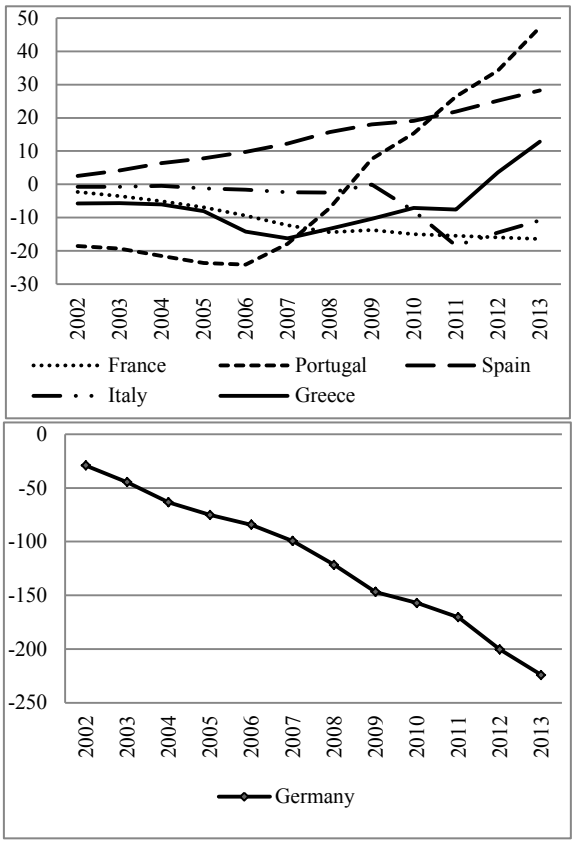
5.3.4 EVASION OF ELECTRONIC PAYMENT SYSTEMS VIA CASH

Rather than settling cross-border transfers via electronic money, payments can also be made in cash. The low importance of cash transactions for the trans-European trade is not least due to the fact that cashless payment works smoothly and with very low transaction costs in the whole EMU. In case of a significant interruption of the TARGET2 mechanism or a strong increase in transaction costs, an evasion to cash transports through cooperation of several major European banks would easily be possible.

The issue of banknotes and their transfer to another Euro member state gives rise to the same problem for the equity situation of the NCBs as the creation of central bank deposits and their transfer via TARGET2. Since the border crossing of bank notes is not controlled and full control would be very costly, the ESCB has set provisions for compensation of nationally different volumes in the issues of banknotes. From the monthly creation of notes in the Eurozone, 92% are accounted for in the liabilities side of the NCBs balance sheets according to their ESCB capital key. The remaining 8% are assigned as a liability to the ECB. An NCB which gives fewer notes into circulation than would correspond to its calculated share in the total provision of notes, gets credited the difference in the balance sheet item "claims related to the allocation of euro banknotes in the Eurosystem". NCBs which issue more notes than calculated out of their capital key receive corresponding liabilities. The development of this position for selected EMU member states can be seen in Figure 8 below[29].

[29] At January, 1st in 2004, 2007 and 2009 and on May, 1st, 2009, the capital keys and shares have been adopted. This explains some jumps in the graphs.

Figure 8: Intra-Eurosystem claims/liablities due to issuance of notes, Bn. of Euro. Source: NCBs



Although the balance sheet items corresponding to the issuance of bank notes originate for the same reasons as the TARGET2 positions and are treated alike (unsecured and are seemingly interest-bearing with the main refinancing rate), they did not play a role in the TARGET2 discussion[30]. An impairment of non-cash payments would certainly lead to an evasion to more cash payments. The supposed risks for the actual TARGET2-claimants would remain unchanged, only the accounting positions within each NCB would change.

The development of the Greek notes balance shows the fact that a banking crisis may reflect itself in the demand for and issuance of banknotes (Figure 8). A disproportionately large issuance of notes can be observed there since mid-2010, while the profiles of other Euro countries are unchanged.

[30] Whittaker (2011) as well as Bindseil and König (2011, p. 26) mention in one sentence each, that cash payments might be a substitute for electronic money transfers. However, they do not elaborate their arguments further.

Table 11: Intra-Eurosystem claims and liabilities, Bn. of Euro; Source: NCBs; TARGET2: Westermann, 2014

	end of Q4/2011			end of Q4/2013		
	Intra-Eurosystem claims/liabilities from TARGET2	*Intra-Eurosystem claims/liabilities from issuance of notes*	*sum*	*Intra-Eurosystem claims/liabilities from TARGET2*	*Intra-Eurosystem claims/liabilities from issuance of notes*	*sum*
Germany	463	-170	**293**	510	-224	**286**
France	-80	78	**-2**	-34	76	**42**
Portugal	-61	22	**-39**	-59	29	**-30**
Spain	-151	26	**-124**	-213	47	**-166**
Italy	-191	-8	**-199**	-229	12	**-217**
Greece	-105	-18	**-123**	-51	-10	**-61**
Ireland	-124	-15	**-139**	-55	-16	**-71**

Table 11 shows how the (net) intra-Eurosystem position (TARGET2 balance plus the balance of disproportionate issuance of notes) would change for some EMU members if Euro notes are considered. The German intra-Eurosystem claims are reduced by 30-40% as well as the Spanish Intra-Eurosystem liabilities, if we treat the adjustment items for notes issuance and TARGET2 similar. The French liabilities even convert into surplus by accounting for notes in 2014. To conclude this section, it is highly relevant to account for issuance of notes if one thinks of modifications to the TARGET2 mechanism. At the one hand, the volume of Germany's net intra-eurosystem position, and therefore the supposed balance sheet risk, changes if notes are considered. On the other hand, significant increases in the transaction costs for electronic cross border payments within the EMU as caused by the proposed modifications of the TARGET2 mechanism can be circumvented by the economic actors by using cash. This would only change the balance sheet positions, but not the potential balance sheet risk of the core countries.

5.4 DISTRIBUTION OF INCOME BETWEEN ENCBS AND TARGET2 RISK

5.4.1 DISTRIBUTION OF MONETARY INCOME AND LOSS SHARING

As already mentioned in, no range of maturity is specified for TARGET2 liabilities. Since a repayment is also not envisaged, there is in principle also no risk of default, as long as the counterparty (from perspective of the ESCB: the individual NCB) exists. But as a TARGET2 claim is an asset, it nevertheless represents an economic value. In the balance sheet of the NCB which has received net payment transactions, TARGET2 claims are claims against the ESCB to back up increased liabilities du to money creation

by the loans of other NCBs. The true risk of the Eurosystem and the TARGET2 balances lies in these loans, as pointed out by the Bundesbank (2011).

Losses arising from the conduct of common monetary policy will be shared by the individual NCBs according to their capital keys in the ESCB (European Union, 2012, Article 32). For the amount and distribution of losses it is irrelevant, whether the money created with a single asset now at risk has already left the country of origin through TARGET2 or not. If the loss concerns not an asset acquired in course of the common monetary policy, but for example for the purpose of emergency liquidity assistance (ELA), the risk falls solely on this single NCB, again regardless of whether the so created money has left the country or not (European Union, 2012, Article 14.4) . Therefore, TARGET2 claims bear no risk during the ongoing operations of the EMU. Only if a country decides to leave the common currency, losses can arise. For such a case the complete risk contained in the balance sheets of the NCBs can be easily calculated.

5.4.2 Potential ESCB balance sheet losses in case of a Eurozone breakup

Officially, there are no provisions on how to proceed in case of a breakup of the Eurozone with the balance sheet items of the ESCB. If we look at the Maastricht treaty, this is not surprising. The membership in the common currency area was seen as an essential part of EU membership, and permanent or infinite non-membership is seen as an exception. Consequently, Article 50 TFEU handles only the resign of membership in the European Union. Paragraph 2, sentence 2 provides that "the Union shall negotiate and conclude an agreement with that State, setting out the arrangements for its withdrawal, taking account of the framework for its future relationship with the Union". It is thus a question of the exit negotiations or agreements made thereafter, whether - and if so, how - the withdrawing NCB would have to pay the remaining EMU members a compensation for accrued losses.

If a country is to leave the euro, it will enact by law that as of now his new currency is legal tender, and all existing claims and liabilities by domestic borrowers and agreed upon under domestic law are legally enforceable only in the new currency. This legal view is rooted in the mutually accepted principle of international law known as "lex monetae". This means that a sovereign country is free to choose its own currency and

therefore to determine the legal tender for all contracts agreed under the national law as well as its exchange value towards other currencies (Clark et al., 2013, p. 8).[31]

Just before the exit from the common currency, the money base issued by the NCB is covered by four different balance sheet items. The value of issued Euro notes is accounted as in (1) a balance sheet item of notes allocated according to the capital key and (2) an item against the Eurosystem for volumes issued beyond, as shown in Figure 8 above. Furthermore, the NCB holds (3) Euro deposits of commercial banks and (4) the discussed TARGET2 liability for the net transfer of commercial bank deposits into the other Euro area countries. Only the third item, deposits of commercial banks, is primarily a matter of national sovereignty. Large losses may arise out of the other three balance sheet items for the remaining members of the EMU.

In addition to the intra-Eurosystem balances (TARGET2 plus disproportionate notes issuance), the remaining EMU members and the exiting NCB would have to agree on the treatment of the proportionally allocated Euro notes. Overall, the monetary losses are rather well quantifiable from the NCBs' balance sheets. Table 12 shows for different countries, how high these losses would have been, if the single country ceased EMU membership on January, 1st 2012 or January, 1st 2014. Had France then left the currency area, an agreement on 165 or 136 bn. Euro of liabilities of the France NCB would have been required. The exit of Germany, in contrast, would have left the EMU with considerable net gains. Note that in the total calculation of losses, in case of many countries the total value of both bank notes positions adds up to around 50% of the total risk for the remaining EMU. Therefore, ignoring notes in the discussion of risk emerging from TARGET2 balances and exit of single members is clearing misleading.

[31] However, there is a legal minority viewpoint challenging this view by stating that lex monetae holds only for a change in the national legal tender of which the country is the only sovereign. But as the Euro is a common currency and not the sovereign currency of a single nation, lex monetae does not hold if a member decides to leave the union (Clark et al., 2012, p. 8, FN 18).

Table 12: Potential balance sheet losses in case of an exit of a single member from the EMU. Source: NCBs

	Exit on January 1st, 2012				Exit on January 1st, 2014			
Exiting country	TARGET2 intra-Eurosystem position [1]	Intra-Eurosystem position from issuance of notes [2]	Allocated share of notes issued [3]	Maximum balance sheet loss for the remaining EMU members [1] + [2] + [3]	TARGET2 intra-Eurosystem position [1]	Intra-Eurosystem position from issuance of notes [2]	Allocated share of notes issued [3]	Maximum balance sheet loss for the remaining EMU members [1] + [2] + [3]
Germany	463	-170	214	**-79**	510	-224	230	**-56**
France	-80	78	163	**165**	-34	76	178	**136**
Portugal	-61	22	20	**59**	-59	29	22	**52**
Spain	-151	26	71	**196**	-213	47	57	**223**
Italy	-191	-8	141	**340**	-229	12	157	**374**
Greece	-105	-18	22	**145**	-51	-10	24	**85**
Ireland	-124	-15	13	**152**	-55	-16	14	**85**

5.5 DISCUSSION OF CHANGES IN THE TARGET2 MECHANISM

5.5.1 PURPOSE AND CATEGORIZATION OF RECOMMENDED CHANGES TO TARGET2

In order to reduce or avoid the above calculated losses from TARGET2 balances in advance, basically there are three mechanisms thinkable: (1) penalty interest rates including a risk-premium, (2) mandatory limits to potential losses, and (3) pre-specified provisions for loss-sharing in the event of exit of an EMU member state.

Penalty interests on intra-Eurosystem liabilities as proposed by Schlesinger (2011) follow the first mechanism. A binding loss limitation is introduced by the ideas for a cap on TARGET2 balances (Sinn, 2011c) or marketable debt rights as proposed by Fahrholz and Freytag (2012). Proposals for securitization with collateral or settlement of TARGET2 liabilities with valuable assets as proposed by Sinn and Wollmershäuser (2011) represent the idea of pre-specified determination of loss allocation. All potential variants have in common, that they try to shift the estimated costs of an exit unilaterally to the exiting economies. It is questionable whether all members of the EMU would decide in favor of such regulations.

5.5.2 INTEREST RATE PENALTY

Schlesinger (2011) suggests a limitation of the TARGET2 balances through a surcharge on the already accruing interest rate in height of the main refinancing facility. However, without changes in the actual calculation of monetary income, this would not be relevant. Interest income and expenses arising from intra-Euro-system liabilities are

treated as prepayments for the distribution of monetary income over all NCBs. The higher interest income of the TARGET2 claimants would therefore lead to a 1:1 reduction of their share of monetary income of the Eurosystem[32]. The level of the interest rate for the TARGET2 balances is completely irrelevant in the actual case.

To cause any effect, interest accruing on TARGET2 balances would have to be taken out of the calculation of the monetary income. The creditor NCBs could then receive a higher share of the monetary income of the ESCB and countries with TARGET2 liabilities see a corresponding reduction, which will potentially show up in their remittances to the treasury or even require recapitalization of the NCB by the government. The main counter-argument against interest payments is that TARGET2 balances would increase by the accumulated interest. The cause is that the NCBs with TARGET2 liabilities will transfer the interest in Euro via TARGET2 to NCBs with TARGET2 claims. Additional money flows out of the periphery and into the core economies – which is the cause for TARGET2 balances overall. Building up allowances for possible losses in case of an exit of countries from the Euro periphery is not possible in such a way. The collected "fund" itself consists of illiquid TARGET2 balances; their treatment in the event of a breakup is unclear. Therefore, we have to conclude that interest payments can not serve to mitigate the risk of TARGET2 claims.

If the interest payments should provide direct incentives for NCBs in the Euro periphery to reduce their TARGET2 liabilities, it remains unclear how they could do that if we disregard violations of the TFEU by interventions into the electronic cross-border transfer of the common currency. However, the penalty interest rates reduce the equity of the NCBs in the countries with net cash outflows. Would any government be obliged to refund its NCB to ensure a minimum volume in equity, TARGET2 interest rate payments would be a drain on the government budget and could strengthen the political interest to combat the root causes of capital flight. One might argue that this brings general incentives for an investor and market-friendly economic policy of a member state, but a fast response of TARGET2 balances to the "right" reforms seems to be unlikely.

---

[32] A more detailed explanation for the calculation of monetary income can be found in Burgold and Voll (2012), p. 24f.

5.5.3 CAPS FOR TARGET2 LIABILITIES

Beside the above analyzed mechanism of penalty interest rates for TARGET2 liabilities, all three other known proposals for a reform of the TARGET2 mechanism are special cases of a caps/ceilings for TARGET2 liabilities, as Sinn (2011c) demanded it in an early comment on TARGET2 imbalances. If these pre-defined regulations are not met anymore, like shortage of eligible assets as in the case of settlement or lacking debt rights, the payment transfers via TARGET2 has to be capped. Therefore it is reasonable to analyze the potential consequences in general.

From a macro-viewpoint, the advantage of ceilings for TARGET2 liabilities would be that capital flight could be contained or delayed in times of crisis , as a cap on TARGET2 balances works like capital controls and limited convertibility of a currency. The downsides are increased transaction costs and payment risk in cross border payments, which could significantly hamper EMU economic integration, convergence and growth. Aside from considerations on the working of the EMU, capping is difficult because TARGET2 is a gross payment system, i.e. the actual balances will only be available at the end of each working day. For a reasonable cap, however, information about the real-time balances would be required, to stop outgoing transactions within a second if necessary. TARGET2 would have to be converted into a net payment system. If the critical range of the cap is reached, outgoing payment transfers would then be executed only to the extent that equivalent ingoing payments are received.

Furthermore, regulations have to be found to prevent economic actors from exploiting the discrimination of payments to the order sequence, because early payments have a time advantage over later ones[33]. This gives incentives to transfer higher amounts than necessary to accounts in the core countries, which slows the settlement of later orders and puts the early payers at the same time in a position to offer payment services in the core countries themselves. As long as all market participants are convinced that remitting deposits from Germany to Greece is handled in five minutes, while it may conversely take several weeks, they also have the incentive to transfer and invest as much as possible in Germany, making the reaching of a cap more likely. Such a

[33] Note that TARGET2 is a real time payment transfer system. Payments are processed according to their order sequence and not collected and processed later but simultaneously.

mechanism would mimic the model setup used by Krugman (1979) and induced panic and capital flight itself.

But above all, the capping of TARGET2 balances should be accompanied by a capping of issuance of Euro banknotes. Otherwise, cross-border payments could be carried out in (unlimited) volumes with cash money. The risk for the core countries would migrate from the TARGET2 claims into the balance sheet item representing claims against the Eurosystem due to disproportionate notes issue in the periphery. The downside of a restriction of notes issuance is that cash is limited at the one hand, but could settle the intra-EMU transactions. This would cause deposits and cash as no longer being of equivalent value and result in price premiums on non-cash transactions and a hoarding of notes. This behavior is well know from currency arrangements based on bimetallism, where the more valuable coins (usually gold) have been hoarded and used for "important" transactions and the less common coins (usually silver) have been used for the simple daily transactions. Citizens in the former GDR know this from their usage of the Deutsche Mark.

In the cross-border economic transactions, problems would arise when companies from the periphery have indeed enough funds and deposits, but can not pay their liabilities in the core countries because the TARGET2 cap is reached. This would result in potential for serious legal conflict. The real value of different balances and bank notes in a crisis country would naturally radiate to other members of the monetary union. Exports from the crisis country would preferably be paid in cash, because it would entail substantial discounts or simply onto bank accounts in the core country. Electronic cross-border payments via TARGET2 would come to a halt or be considerably reduced, which corresponds to a disintegration of the financial market with the monetary union. Overall, the consequences show clearly that cross-border payments are significantly disturbed. This is clearly against the statutes of the ECB, (European Union, 2012, Article 3.1), stating that one of the four tasks is to enable the smooth functioning of intra-European payments.

5.5.4 TRADABLE DEBT- OR PAYMENT TRANSFER CERTIFICATES

Fahrholz and Freytag (2011) propose a market for tradable debt certificates for TARGET2 liabilities. For this purpose, a European agency has to be created which determines the annual amount of credit growth for the entire Euro area and allocates corresponding debt certificates among the Euro area members. Fahrholz and Freytag (2011, p.23) give the annual amount of credit growth as an example, but note that "Whether such a regulation would be technically feasible, politically desirable and legally allowed, is an open discussion". We will discuss these issues in short below. We see three basic institutional levels that could be target of debt certificates:

- The lending of each individual NCB should be limited with certificates to avoid disproportionate money and credit growth. Further liquidity demand of the corresponding domestic financial sector should then be satisfied over the intra-European (interbank) markets. This corresponds to limiting base money growth in the whole EMU by using nationally different limits. But this means that tradable certificates would not be needed. It shares furthermore all advantages and risks of a monetary strategy targeting the amount of money supply only. Note that in this case, regional liquidity crisis or a regional systemic financial sector crisis could not be supported by monetary policy measures, which means that the central bank could not perform one of its historical main functions as the lender of the last resort (Goodhart, 1988, p. 85ff).

- The lending of commercial banks is target of the debt certificates. To be different from the bidding process for central bank money as the basis for lending of commercial banks, the debt certificates would have to be allotted according to specific criteria. This allotment instead of the market oriented bidding process for central bank money corresponds to the idea of credit ceilings in monetary policy, of which France has made extensive use within its concept of "encadrement de credit" with ambivalent results during the 1980s. The German Bundesbank has rejected this idea in the 1972s (von Hagen, 1998, p. 450ff).

- Public sector borrowing could be addressed by these debt certificates, which seems to be the background of Fahrholz and Freytags' idea, as they refer to Casella (1999) who explicitly addresses certificates for government bonds as a way to reach the goals in the Maastricht treaties. If TARGET2 liabilities are indeed added to government

debt (despite the objections in section 5.3.3), they would of course be limited by the certificates, too. Besides this, buying foreign debt certificates means additional TARGET2 liabilities, as money has to be transferred into the TARGET2 claimant countries from the periphery. If a member state runs out of debt certificates, it results in the same consequences as reaching the transfer limit implemented by a cap on the TARGET2 balances. Furthermore, it is unlikely, that free market prices will emerge from inter-governmental exchanges of the debt certificates. Their transfer would be subject to various political intentions, so that the instrument of "tradable" debt certificates seems unnecessary.

Burgold and Voll (2012, pp. 117ff) argue that instead of a market for tradable debt certificates, a market for tradable transfer rights for the TARGET2 system could be an alternative. But depending on the detailed provisions, this could either have no effect on TARGET2 balances or an adverse effect if the willingness to pay is very high in countries with TARGET2 deficits. A credible implementation would further need a delay of intra-European payments or work like a cap if sufficient debt certificates are missing. It therefore shares all of the critiques for TARGET2 caps. Any form of debt certificates for TARGET2 balances would further be an organizational complex facility, significantly increasing the transaction costs in cross-border electronic payments within the EMU and would therefore work like an import tax between the members of the EMU.

5.5.5 TARGET2-SETTLEMENT WITH „EUROPEAN STANDARD BILLS"

The proposal of Sinn and Wollmershäuser (2011, pp. 48ff) for a settlement of TARGET2 balances with European Standard Bills (ESB) is the most widely conceived idea to solve the problem of TARGET2 imbalances. Sinn and Wollmershäuser state that their idea is a parallel to the settlement of Interdistrict Settlement Accounts (ISA) in the Federal Reserve System (Fed) of the USA. According to the authors, ESB are standardized, short-termed government bonds, ideally with first rank and secured with claims on parts of the national tax income or other real values (gold, real estate). The proximity to the "gold certificates" of the U.S. Treasury is obvious in the latter case (Federal Reserve Board, 2012, pp. 352f). ESB should be used for an annual settlement of TARGET2 balances to reduce them periodically. This would reduce the financial risk

for central banks with TARGET2 claims in the event of the dissolution of the current EMU. Furthermore, Sinn and Wollmershäuser (2011, p.48) argue that a NCB receives incentives to reduce the TARGET2 liabilities, as it has to buy the securities if necessary.

The first question is how a NCB with TARGET2 liabilities can get into possession of ESB and which effects does this have itself on the TARGET2 balances. If the NCB acquires ESB from foreign capital markets, the outgoing transfers of money from the periphery to the core accompanying these purchases would lead to additional TARGET2 liabilities. Therefore, the desired clearing is only possible by net exports of domestic ESB, which makes it necessary that the NCB in the periphery would have to buy domestic ESB at the domestic capital markets. A direct purchase at the primary market is in clear contradiction to the prohibition of monetary financing of governments (Art. 123 TFEU).

On the secondary market, NCBs could buy ESB from the domestic financial sector. ESB would be more attractive than other, unsecured government bonds because of its priority over other government debt, its collateral and the demand of the NCB leading to higher liquidity and thus price stability. In order to reach a sufficient volume of ESB for TARGET2 clearing, the NCB would have to offer much more favorable refinancing conditions. At last, the financial sector has the possibility to speculate against its own central bank and theoretically force the central bank to provide highly favorable refinancing conditions by (temporary) capital flight. In the same way, speculation against the continuance in the EMU, a stop of intra-European money transfers or a stop of TARGET2-settlement is possible (be it for political or economic reasons).

A more practical problem seems to be the most likely very low volume of ESB available for settlement in the whole EMU. ESB would then take the same role as Gold or the USD in the Bretton Woods System, from where the Gold and Dollar shortage are well known causes for Balance of Payments crisis during this period (Bordo, 1993). If we compare the volume of short-term financial obligations of the states (of which ESB could potentially only be a fraction) with their TARGET2 liabilities as done in Table 13, it can be seen that, except for Spain between 2008 and 2010, settlement of TARGET2 balances would have failed solely for the reason that the available volume of short-term government debt securities is too low. The Greek central bank for example

would have been able to settle only a maximum of 22% of the accrued TARGET2 liabilities in recent years, even if it had been in possession of 100% of short-term debt instruments of the Greek state[34]. If the amount to be settled is calculated as the daily average value of TARGET2 balances (like the ISA-calculation in the U.S.) the settlement volume would amount to about 17, 40 or 80 bn. Euro in 2008-2010, respectively. The total short-term government debt securities in these years amount to a volume of 6.5, 11 and 9 bn. Euro for the Greek government. In both cases – settlement of TARGET2 balances to a reference date or for average daily values over the last year - the settlement should have been stopped already at the first signs of the financial crisis.

Table 13: Short term government debt obligations relative to TARGET2 liabilities.

	2008	2009	2010	2011	2012
Greece	18.5%	22.2%	10.7%	14.2%	18.5%
Italy	.	.	.	68.5%	59.4%
Ireland	44.7%	43.3%	25.4%	35.2%	49.4%
Portugal	86.7%	87.1%	34.8%	18.2%	17.7%
Spain	**184.2%**	**250.6%**	**281.8%**	**117.7%**	75.2%

Sources: Bank of Greece (Central Government liabilities, short term securities) Irland and Spain: Eurostat (Series gov_dd_gdd, 1 to 5 years); Italy: Banca D'Italia (The Public Finances, various years: Public Borrowing Requirement, Table 4, Series S571730M) Portugal: Banco del Portugal (BP-statistics portal, series: general government gross debt, short term securities excl. financial derivatives); TARGET2 balances: Westermann, 2014: www.Eurocrisismonitor.com

Italy: 2008-2010 TARGET2 claims, therefore not reported

Second and apart from the problem of an insufficient total volume of available eligible assets, settlement through ESB could also lead to unwanted interactions with the fiscal policy sphere. First, this could lead to a higher amount of short-term securities, which would be necessary for the TARGET2 settlement only. It would increase the funding risk if a larger part of governmental debt is financed by short term instruments. In times of crisis and panic this fact alone could induce capital flight – away from the short term bonds of the 'risky periphery' countries towards the core countries of EMU and increase TARGET2 balances over this channel. Second, the additional demand of the NCB for ESB would work like a subsidy for short term government securities, making short term

[34] In contrast, the FOMC restricts the purchase of securities to 70% of a single tranche in total and reduces the sales volume already with a volume of 30% in holdings to small amounts in general to avoid too strong influences on the market price and available remaining maturities at the bond market. See Federal Reserve Bank of New York (2013, p. 6f).

funding more attractive toward the government than it should be from a markets perspective.

At third, the decentralized implementation of monetary policy in the ESCB (as will be described in section 5.6.2 as an important prerequisite for the smooth working in the Fed ISA settlement) could hinder a smooth settlement through ESB. Since the domestic central banks do not automatically get ownership of ESB with their undertaking of the regular monetary policy operations, ESB would have to be bought from the domestic financial sector. This means, that the NCB has to undertake open market operations which are not justified by monetary policy considerations in the first case and might therefore interfere with the objectives of monetary policy in general. As it shows, the idea that TARGET2 balances could be settled by ESB is therefore deceptive.

Even if we assume that TARGET2 balances have been settled at one date by ESB, the TARGET2 liabilities would yet arise automatically and in the same amount again at maturity of the ESB: the repayment involves the transfer of Euro-deposits from the periphery to the core via the TARGET2 system, which is the mechanism how TARGET2 claims and liabilities emerge. Since the ESB are intended to have a short duration, redemption of the maturing ESB will be necessary in relatively frequent periods.

The clearing of the risky and illiquid TARGET2 claims converts the latter for a limited time into supposedly more liquid and less risky government bonds (ESB). The correctness of this thought is based on the assumption that access to the collateral securing the bonds is enforceable. However, it is a strong assumption that promised tax increases to the benefit of foreign nations (the holders of the ESB after TARGET2 clearing) could be enforced even against the will of the current government of the debtor country. From this perspective, ESB are not necessarily less risky and more valuable than TARGET2 claims for the Eurozone core members.

Even with real assets as collateral, like gold, silver or real estate, the payment obligations caused by ESB could be converted into the new national currency in case of an exit of the periphery country from the Euro area (as long as the new government can refer to the lex monetae). Since the NCB is virtually unlimited solvent in its new

currency, recourse to the collateral could be avoided. The main "success" of the ESB solution from the viewpoint of the actual TARGET2 claimants would therefore be, that a predetermination of the distribution of losses from the balance sheet item “balances from intra-European transactions” is implemented. The losses would then fall in full volume onto the exiting country and would not be allocated via the capital key onto all ESCB members. However, this could be achieved by means of an intergovernmental agreement without creating a new assets class, without the necessity for a clearing mechanism for TARGET2 balances and without the problems occurring while the periphery NCBs try to purchase ESBs.

5.6 PRINCIPLES OF ISA-SETTLEMENT OF THE US FEDERAL RESERVE SYSTEM

Sinn and Wollmershäuser (2011, p. 28) get their idea for settlement of TARGET2 with ESB from the example of ISA settlement in the U.S. Particularly, they write that “[…] If such a system were introduced in the Eurozone, the NCBs of the GIIPS would no longer have an interest in overexerting their money-printing presses […]. As in the US, no Target balances would be piling up.” According to our above argumentation, such settlement should not work smoothly, not even in the U.S. The main questions are therefore, why it works in the U.S. system (relatively well), what the detailed institutional provisions of ISA settlement are, how the way of conducting monetary policy influences the settlement process and which are the differences that prevent an adoption of such settlement in the EMU actually. I try to answer these questions below.

5.6.1 SETTLEMENT OF INTERDISTRICT SETTLEMENT ACCOUNT BALANCES

The system settling the transfer of book money for economic agents between different Fed districts in the U.S., is the system of Interdistrict Settlement Accounts (ISA). The incoming and outgoing transfers are recorded in these accounts for each ‘district-Fed[35]’ and balanced at the end of the day. In April of each year, the average daily ISA balance of each district-Fed is determined and settled against the corresponding share of the common open-market portfolio (SOMA portfolio: System of Open Market Accounts).

[35] With this term, we denote the 12 single Federal Reserve Banks of the Federal Reserve System of the USA.

Figure 9shows a simplified example of the functioning of the settlement of the ISA balances in the U.S.

Figure 9: Example for ISA settlement according to paragraph 40.40 (S.136ff) of the Federal Reserve Accounting Handbook (Federal Reserve Board, 2013)

assumptions

- average gold coverage of cash in the Fed-system is 10%

- the average daily value of the ISA account for FED1 is '-20'

Simplified balance sheet of FED1 before settlement

District-FED 1

Assets		*Liabilities*	
other assets	10	notes	100
gold-certificates	1	deposits of commercial banks	800
loans to commercial banks	0	ISA	100
SOMA share	989		
	1000		1000

Step 1:

Caculation of average daily ISA account balance against the volume of gold certificates

result:

Shortage of gold certificates as coverage for notes in circulation

District-FED 1

Assets		*Liabilities*	
other assets	10	notes	100
gold-certificates	-19	deposits of commercial banks	800
loans to commercial banks	0	ISA	80
SOMA share	989		
	980		980

Step 2:

Increase in the amount of gold certificates and offsetting by reduction of the SOMA shares

Result:

ISA balances are in fact compensated with SOMA shares, not gold certificates

District-FED 1

Assets		*Liabilities*	
other assets	10	notes	100
gold-certificates	10	deposits of commercial banks	800
loans to commercial banks	0	ISA	80
SOMA share	960		
	980		980

Negative balances are settled by, first, balancing the average daily ISA account against the amount of U.S. treasury gold certificates. At this first step, a - preliminary - settlement of the balance with gold takes place. At the second step, the gold certificate account is increased (with funds from the other district-Feds) to the extent that the amount of Federal Reserve Notes with gold certificates equals the average in the entire Fed-system. Counterintuitively, the district-Fed in question receives now a gold inflow by ISA settlement, if gold coverage of banknotes is insufficient compared to the other districts. In the third step, this inflow of gold certificates is offset by a reduction in the districts share of the SOMA portfolio. If the stock of outstanding notes did not change in a Fed district over the curse of a settlement period, the ISA balances are ultimately

settled exclusively by the shares in the SOMA portfolio, without any change in the stock of gold certificates (Federal Reserve Board, 2013, pp. 136ff).

By settling the average daily ISA balances once a year, imbalances are not equalized completely at the settlement date. Rather the increase of the balances is attenuated. The unsettled overhang is carried forward as a fixed amount to the settlement in the next year. Then it enters completely into the settlement calculation, such that smoothing of an ISA balance occurs in fact over two years.

However, the described settlement procedure is legally not binding, but is at the discretion of the Federal Reserve Board. Section 16(4) of the Federal Reserve Act provides that "The Board of Governors [...] shall make and promulgate from time to time regulations governing the transfer of funds and charges...among Federal Reserve Banks." Therefore, the Federal Reserve Board is able to suspend the settlement for individual district-Feds, if after compensation, their solvency or ability to provide payment services would be at risk. Subsequently, the provisions governing ISA compensation have been circumvented by voluntary loans among the Reserve Banks or by forced loans based on Article 11(b) of the Federal reserve Act, for example in the years 1917-1921 and 1933 (Federal Reserve Bank of Dallas, 1921, p.6; Hackley, 1973, p. 164ff). Eichengreen et al. (2014) show further, that this mutual assistance between the single Fed districts was common in case of liquidity needs, involving transfers of large volumes in gold certificates between the single district-Feds. This sharing of reserves has been essential in maintaining the cohesion of the Fed system between 1913 and 1960, with the largest assistance happening between 1945 and 1960 and not during the turbulent 1920s or the Great depression. In 1975, (daily) compensation by means of gold certificates on the Gold Settlement Fund (the predecessor of the ISA) was changed into the current practice of yearly SOMA settlement. In reaction to the latest financial crisis, the ISA compensation was suspended from 2008 to 2010 (Koning, 2012).

These measures show that the ISA settlement procedure has been constantly developed in the U.S., especially when it came to financial crises in individual districts or across the U.S. as a whole. It indicates that the purpose of settling ISA balances by means of the SOMA portfolio is aimed at the allocation of profits and losses arising from monetary policy operations proportional to the money in circulation within each district

(Federal Reserve Board, 2013, p 136) rather than their purpose as a precautionary arrangement for the breakup of the Dollar currency area, as it is the background in the discussion about settling the European TARGET2 balances.

5.6.2 Elements of US monetary policy arrangements influencing ISA-settlement

5.6.2.1 Settlement with all assets used for monetary policy purposes

In addition to the possibility of suspending the settlement procedure if required, many balancing mechanisms and regulations exist within the U.S. system to prevent a possible insolvency or stop of dollar payments by single district Feds as a consequence of settlement. A leading role is played by the centrally conducted monetary policy in the United States. The U.S. prime interest rate (Federal Funds Rate) is usually controlled through outright transactions of securities by the New York Fed on behalf of the Federal Open Market Committee. The corresponding securities are held in the System of Open Market Accounts (SOMA) portfolio, which is also managed by the New York Fed on behalf of all district-Feds (Federal Reserve Board, 2013, p. 128). As argued in the previous section, the SOMA shares are used for the calculation of the profit and loss distribution to the individual district-Feds. At the same time, the shares also serve as assets for the compensation of ISA balances. That is to say that settlement of Dollar transactions between the different Fed districts is undertaken by means of all assets used in the regular monetary policy operations. With the example of the ISA balances of the Richmond Fed in 2008, the relevance of this point for the function of ISA settlement can be illustrated: The volume of the Richmond Fed's shares at the SOMA portfolio amounted to USD 210 bn. at the end of 2008, ISA liabilities were approximately USD 164 bn. (Federal Reserve Bank of Richmond, 2010) and the corresponding average daily balances to be settled in April 2009 amounted to approximately[36] USD 33 bn. (Federal Reserve Bank of St. Louis, 2013, series D5WAISAL). To that extent, even this historically high compensation would have had no impact on the effective functioning of settlement. But if only a fraction of assets used for monetary purposes is accepted as eligible, for example the gold certificates which were used as before 1975, the stock of USD 875 mn. in gold certificates of the Richmond Fed would have been much too little.

[36] The average daily values have been calculated from a weekly basis, as daily values are not publicly available.

In the Fed-system (almost) the entire volume of the assets used for monetary policy operations is available for the settlement of interdistrict payment balances through the usage of the SOMA portfolio. This is also a mandatory precondition for the credibility of such a compensation mechanism and its compatibility with maintaining the interdistrict payment flow. A too low volume of generally available eligible assets could result in a suspension of the settlement even in normal economic conditions, with corresponding effects on the suspected disciplining effect for money creation of a single Fed district. Incidentally, it was this limitation of the volume of gold certificates as eligible assets which led to the introduction of the current practice of yearly settlement with SOMA shares in the U.S. in 1975 (Federal Open Market Committee, 1975, p. 40ff). Thus, the definition of the type of eligible assets plays an outstanding role in the smooth functioning of any settlement mechanism.

What are the differences between the Dollar area and the Euro area, which prevent a successful adoption of the ISA-settlement by the ESCB? In the Eurosystem, the common money creation is undertaken primarily through loans of the single NCBs to eligible counterparties residential in their country. In return, the counterparties have to deposit certain assets as collateral[37] (European Central Bank, 2011, p. 15ff). Thus, the claims from these loans represent the majority of assets in the NCBs balance sheets. Because individual loans are not comparable or tradable with each other and their value is at risk in the case of an exit from the EMU (because of devaluation and default), these credit claims can not be seen as more secure than the existing TARGET2 claims in the event of a break-up of the current Euro area. This makes a settlement of TARGET2 balances by means of the assets actually used for monetary policy purposes difficult and is an important aspect which prevents the adoption of the ISA settlement procedure in the EMU.

Necessary for the credibility and the viability of any "European ISA settlement mechanism" is that all (or at least a large part of) the claims and assets that get into the ownership of the ESCB through the monetary policy operations can be used for settlement of the payment balances, as it is the case in the USA since 1975. The actual

[37] Further minimum requirements exist depending on the kind of monetary policy instrument. They are uniform across the EMU (European Central Bank, 2011, p.15)

design of monetary policy instruments in the Euro area does not guarantee this important fact.

5.6.2.2 Federal character of underlying assets, term structure and rollover of US-debt

If money is created in the Fed-System, usually U.S.-treasury securities are being purchased outright[38]. This has the advantage that the settlement medium in the U.S. has a federal character and is therefore not linked to the risks of national (regional) economic development and financial stability. Furthermore, it is traditional and regular policy of the Fed to prolong expiring U.S. treasury securities from the SOMA portfolio and replace them with new ones, if not otherwise need for influencing the Federal Funds Rate (Federal Reserve Bank of New York, 2009, p.8). This prevents the emergence of (temporary) ISA balances when the securities fall due. Would the bonds in the SOMA yet be repaid, there would still no systematically negative ISA balances occur – which is in contrast to the situation in the Euro area and lies in the fact that the SOMA portfolio contains mainly assets from the federal level, whereas in the Euro area each NCB has a regional asset portfolio from the loans given to the national counterparties.

The underlying mechanism can be understood easily: If a European NCB buys securities from other EMU member states (private or government) for settlement of TARGET2 balances, this central bank would incur an additional TARGET2 liability as a result of the necessary payment flow in this transaction. This TARGET2 liability would again have to be settled. Therefore, a central bank would have to buy domestic securities at the domestic capital market and hand them over to the other national central banks to prevent a TARGET2 liability to emerge at first hand. But when these securities fall due, the interest and principal payments will cause payment flows out of the country with the (settled) TARGET2-liability and into the country with the former and now settled TARGET2-claims, causing the TARGET2 balances to reemerge. The advantage in the use of federal bonds like in the U.S. or "real" values, such as gold and real estate in the balancing procedure, lies thus in its neutrality with respect to the origin of payment transfer balances itself. The interest and principal payments of U.S. treasury

[38] During the subprime crisis, the Fed has also given large volumes of loans against collateral to different financial institutions, which have expired during the year 2012. Since 2008, the Fed holds also securities of the government sponsored enterprises, which had maturities below 5 years in 2013 and will not be revolved.

securities are financed through taxes collected from all districts in the U.S., therefore the repayment of treasury securities causes net ISA-liabilities for all Fed-districts (but the New York, where the SOMA is located) according to their share in national tax revenue but not one large liability for one particular Fed district.

Additionally, the current instruments of monetary policy in the ESCB (European Union 2012b, Annex I, Chap. 1.3) are too short in their duration to allow consistent TARGET2 settlement in the Euro area. The Main Refinancing Operations and the Long-Term Refinancing Operations of the ESCB have a regular term of one week and three months, respectively[39]. If the assets backing these refinancing facilities (claims against the counterparties) are used for settlement of TARGET2 balances, the balances would reemerge each week with the end of the refinancing operations. Suitable eligible assets which do not systematically cause TARGET2 balances itself to reemerge with their maturity would therefore be commodities, real estate or "real" Euro Bonds by means of debt instruments of the European Union as a whole, funded by the (still to be granted) right of taxation for the European Union. Euro Bonds would have the advantage, that at maturity, money from taxes from all EU countries would be transferred to the holders of Euro Bonds without debiting individual countries systematically with new TARGET2 liabilities (especially the ones with former negative, but now settled TARGET2 balances). Alternatively, any kind of security is conceivable, which can be prolonged or has very long time to maturity, like eternal bonds, for example. None of these assets is currently part of the monetary policy instruments of the ESCB. As a conclusion, we have to say that not only the total available volume of assets eligible for settlement of TARGET2 balances is crucial for a time consistent settlement procedure, but also the maturity and the national (or inter-regional)character of the assets in use.

[39] The duration of the Long-term Refinancing Operations of the ECB has been extended for up to 36 months during the height of the sovereign debt crisis in 2012, but the ECB has returned to its usual duration.

5.6.2.3 *Benefits of centrally conducted monetary policy for the stock of eligible assets at single district-Feds and the emergence of ISA balances*

The central implementation of monetary policy in the U.S. ensures that each district-Fed gets automatically into ownership of a certain volume of eligible assets used for ISA-settlement. Through the purchase of government bonds and other marketable assets by the Fed system, each district-Fed is allocated (daily) a volume proportionate to their previous share of the SOMA, independent of the fact that the created money flows to the financial institutions in their own district or not (Federal Reserve Board, 2013, pp. 133ff). So as long as monetary policy in the U.S. does not reduce the money supply and thereby the volume of the SOMA portfolio, each district-Fed obtains an amount of eligible assets for ISA-settlement approximately equivalent to their proportion of total central bank money during the last year.

At the logical second of money creation (before these funds are eventually transferred into other districts), each district-Fed would be allocated a share of the additional value in the SOMA. ISA liabilities arise always and automatically for each single district-Fed as the balance sheet counterpart to the allocation of SOMA shares in the course of money creation (with the exemption of the New York Fed, which has an ISA-claim, Federal Reserve Board, 2013, p. 136). Because the SOMA and the eligible counterparties (allowed to take part in the monetary operation of the Fed-system) are each located in the Fed district of New York, the transfer of newly created money to another account of any bank in another Fed-district, the other Fed district's ISA account is credited with the corresponding value. But their overall (net) ISA balance is lower because of the earlier net liabilities from the SOMA assignment in the first step. The sum of the increase in the SOMA volume and the ISA claims arising from the transfer of the newly created money corresponds to the new liabilities resulting from the creation of money in the accounts of the particular district-Fed. An illustration with a simple example is given in Appendix A.

The logic behind this bookkeeping is simple: As the financial institutions in a district re-finance their business with the sale of eligible assets to the Fed-system (through the eligible counterparties), this decreases the aggregate assets of all financial institutions in the district. The commercial banks in a district are shareholders of their district-Fed (Federal Reserve Act, Section 9). From a consolidated perspective, the district would

lose financial wealth if its financial institutes sell assets to the Fed-System to refinance their business, because their district-Fed gets only allocated a fraction of this newly created money in form of higher volumes in the SOMA[40]. These are equal to the calculated SOMA share at the beginning of the actual settlement period and do therefore not take account of additional money created with the assets of this districts' financial sector. Between two ISA-settlement dates, the missing wealth of the district is compensated by ISA-claims. The ISA claims therefore serve as a balancing item for the loss of assets eligible for monetary policy operations from the perspective of the consolidated financial sector of each district. As a result, the financial wealth of the consolidated financial sector in the district remains ultimately unaffected from the act of money creation.

As long as the newly created money stays within a single district, the remaining districts have net ISA liabilities towards the former. In April of the following year, the remaining district-Feds have to transfer a portion of their SOMA-share so that the central bank money circulating within the district with ISA claims and the shares in the SOMA approximately match again. Before compensation in April, there is now a situation in which this district-Fed has less "real" assets from the SOMA portfolio than in a decentralized organization of monetary policy. This is exactly the same situation as the ESCB system with unsettled TARGET2 balances. That is to say, as long as money creation by regular monetary policy operations is higher for one Fed district than in the other districts of the Fed-System (and this money stays inside this district), the money base there is backed with proportionally less marketable assets than it is the case in the ESCB. In both systems of central banking, it does not matter in normal circumstances.

Contrary to the description of Sinn and Wollmershäuser (2011, p.49) the single district-Fed can not and must not purchase eligible assets from the financial institutions in their district or the capital market in general to achieve ISA compensation if the district-Fed is too low on SOMA-shares for settlement. Independent from the provisions in the Federal Reserve Act, this would obviously be in contrast to the common monetary policy objectives of the Federal Reserve System. First, it would undermine the position

[40] Note that the deposits received in exchange for the eligible securities are an asset for commercial banks and liability for the district-Fed, which cancels out each other from the consolidated perspective of the financial wealth of the district.

of the FOMC as monopolistic supplier of central bank money and second, drive the price and therefore the interest rates for assets used for monetary purposes into different directions or out of the interest rate boundaries targeted by the FOMC. The lack of autonomy in the acquisition of eligible assets for every single district-Fed can risk the smooth functioning of ISA-settlement at the one hand. On the other, this corresponds with the FOMC as monopolistic supplier of central bank money and the lack of influence on the ISA-balances itself.

The above described practice of money creation is in strong contrast to the process in the Euro area. Although the rules and guidelines of monetary policy are determined centrally, implementation and conduct is done on the national level by the respective NCBs themselves (European Union, 2012, Article 12.1 and 14.3). Thus, assets which get into ownership of the ESCB in course of monetary policy operations are booked only in the balance sheet of the NCB in which the creation of money takes place. The balance sheets of other central banks in the Eurosystem are, in contrast to the Fed system, not affected. An automatic inflow of general eligible assets for settlement with corresponding offsetting entries in the form of TARGET2 liabilities does not take place.

The consequences of this agreement on the conduct of monetary policy in the Euro area in case of a 'European ISA settlement mechanism' must be viewed in the context of the current monetary policy instruments : First, most assets backing the created central bank money are not usable for TARGET2-settlement, as described in section 5.6.2.2 above. Second, because of the decentralized implementation of monetary policy in the Euro area each, NCB would have to purchase the specific assets eligible for TARGET2-settlement, and consequently compete for those assets with other NCBs (in case of "federal" assets) and the private capital market. This would lead to deviations from the provisions of the common monetary policy, i.e. offering of better refinancing conditions for those assets relative to other assets or relative to the neighboring central banks. This is also contrary to the goal of unification of monetary policy in the Euro area. Therefore, it is an essential condition for a successful TARGET2 settlement mechanism that NCBs can use the assets acquired under the conduct of the common monetary policy to settle TARGET2 balances and without requiring them to purchase on their own expense.

5.6.2.4 Risk-pooling through SOMA participation and adjustment of the capital shares

The aim of recommendations for a TARGET2 settlement mechanism is to use safe assets as settlement means. This should limit the potential losses for the countries with TARGET2-claims in case of a breakup of the Eurozone. The example of the ISA compensation in the U.S., however shows that the general assessment of SOMA securities as 'secure collateral' and equalization of this aspect with 'overall less risk' is not convincing. At first, there is insurance for the purely hypothetical case of a district-Fed leaving the Dollar area, as the assets in the SOMA portfolio tend to be federal in nature. Therefore, SOMA losses from devaluation for the remaining Fed-districts do not exist. But in return, the district-Feds with (settled) ISA-claims get allocated a higher share of potential losses out of monetary policy operations in normal economic circumstances, because gains and losses are allocated in relation to the SOMA shares. As the SOMA shares rise for the districts with ISA claims, their potential balance sheet risk does also rise[41] (see section 5.6.2.3). With the monetary policy measures of the Fed in reaction to the financial crisis of 2008-2010, additional asset classes were purchased for the SOMA portfolio to stabilize the financial markets. These assets were mostly of low value from the markets perspective, so that at this point one can not necessarily assume these were 'secure' assets by any means (Federal Reserve Bank of New York, 2009). This could also explain why the ISA settlement was exposed from 2008 to 2010: First, district-Feds with high ISA-liabilities could conserve on their SOMA shares and their asset side of the balance sheet. But second, they would have had to bear larger parts of the potential losses from the crisis measures undertaken collectively by the whole Fed system, because their SOMA share remained higher than it would otherwise have been. The logic is straightforward: Especially the financial institutes located in the districts with ISA-liabilities have profited from the crisis programs and second, potential losses appeared to be high at least from the short run perspective of ever falling market values for asset backed securities and mortgages.

[41] Note that, in contrast to the ESCB, the commercial banks of each district are the shareholders of the District-Fed. However, their shares are capitalized with a fixed 6% interest rate per year. In the ESCB, the shareholders of the single national central banks participate directly on the gains and losses of their central bank in full heights.

Applied to the case of the EMU, this means that Germany, with a share of the money supply in the Eurozone from currently about 35 percent (Bundesbank, 2012; European Central Bank, 2013B) would also get allocated a higher share of potential gains and losses than today, if a settlement mechanism similar to the ISA system of the Fed exists. The capital share of Germany in the ESCB is currently at about 18 percent, so that the Bundesbank gets a lower share of profits or losses allocated (18%) than corresponds to its share on the overall money base (35%, as its share of the liabilities side of the ESCB). As a consequence, the current TARGET2-system reduces potential gains and losses for the Bundesbank whenever Germany holds a larger share of European money supply than would be 'entitled' by is capital key in the ESCB. In the actual situation, the most part of money creation takes place in the Euro-periphery and is backed with risky assets, the Bundesbank and therefore the German taxpayer is better off without an 'ISA-like' TARGET2-settlement - under the condition that EMU will remain in their current form. This aspect is usually overlooked in the discussion for risks emerging from TARGET2 balances.

5.6.3 EQUILIBRATING FORCES FOR ISA-BALANCES APART FROM THE US MONETARY POLICY

5.6.3.1 There is no exit-risk for single Fed-districts

As was argued in section 5.2.3, the existence of a settlement mechanism for payment transfer balances could increase the risks of individual Euro members for an exit from the currency area from the perspective of capital market. This exit-risk does simply not exist for a single Fed district because of too high ISA balances. Firstly, several U.S. states would have to decide over an exit (which is also the exit from the United States, which means political secession), as most Fed districts are responsible for several U.S. states. On the other hand, the primary task of the Fed-system is to secure the flow of Dollar payments between all districts free of discounts. This task precedes the provisions from the Federal Reserve Act concerning the settlement of payment balances (Federal Reserve Act, Art.16 (3)). Therefore, there is no rational for holders of Dollar funds in one district to reallocate their money wealth through capital flight to other Fed districts in fear of exit, interruption of interdistrict payments or devaluation. In contrast, the exit of a country from the EMU can not be excluded in general and depends highly on the set of policy options negotiated over by Eurozone governments. The possibility

of massive capital flight in response to the uncertainty over the results of this political process is a very rational and likely act. Any mechanism for the settlement of TARGET2 payment transfer balances must take this difference to the Fed-system into account.

The European government debt crisis has shown that massive capital flight due to uncertainty of the political outcome has very strong destabilizing forces from an economic and political viewpoint. The reallocation of Euro funds from the periphery to the core during 2010 to 2013 came from three groups: First from investors within the Euro area, which did not extend their credit lines after 2010 (whether for their own liquidity needs or by adjusting the risk assessment). Cecchetti et al. (2012, p. 8) estimate this amount for German commercial banks alone to about 282 bn. Euros[42]. The second group comprises non-EMU financial institutions that have shifted their funds from the GIIPS to Germany and the core to counteract potential devaluation losses in case of an exit of one of the crisis countries from the Euro area. For British banks alone for example, figures show more than 100 bn. Euro in 2012 in reduced credit (Ceccheti et al., 2012, pp. 10f). The third group includes citizens and companies of the GIIPS countries themselves, who wanted to bring their liquid assets into safety.

The capital flight from the GIIPS countries that started already in 2007 was initially re-financed by the ECB's crisis measures (especially the extended duration for the Long Term Refinancing Operations beginning in 2008). The Greek and Irish national central banks additionally backed their financial institutions with credit through the Emergency Liquidity Assistance (ELA) beginning in 2011. The main reason was, that in the wake of the sovereign debt crisis the financial institutions in both countries did not have enough securities eligible as collateral in the main refinancing operations of the ECB (European Central Bank, 2012), or they have been accepted as collateral only at very large discounts[43] (European Central Bank, 2013a, Annex I) which limited the overall available volume of refinancing too much. Therefore, the NCBs provided - formally on

[42] In reduced credit lines to debtors in the GIIPS, which also includes depreciations for expected losses in general.

[43] For example, AAA reated bonds with remaining maturities are accepted with a discount of 0.5% on their value as collateral, whereas BBB-rated bonds of the same maturity are accepted with 6% discount. Discounts are rising sharply with remaining maturity, so that bonds with 10 years residual time to maturity have 5 to 13% discount, depending on their rating.

their own account and risk - funding via the means of ELA to different conditions. As the NCBs now took the role of the lender of last resort, these loans prevented the collapse of government finances and national financial systems. They allowed on the other hand the increasing capital flight. As the financial institutes and the NCBs never lost their ability to repay their debt in Euros, the fears about an exit from the Euro area were motivated by political reasons. The simple introduction of a European 'ISA-settlement mechanism' without establishing other balancing forces will provide additional economic arguments for capital flight instead by limiting liquidity of the financial sector and thus destabilize the cohesion of the monetary union artificially in times of financial turmoil.

5.6.3.2 The Fed-system as lender of last resort

The facility of Emergency Liquidity Assistance in the EMU has a parallel in the Fed system. Each district-Fed has the legal right and the tools to fulfill the role of the lender of last resort for the state banks in its district and provide additional liquidity beyond the centralized monetary policy in the United States (Federal Reserve Act, Articles 10A and 10B). [44] However, this is subject to very precisely specified constraints. These limitations ultimately prevent a district-Fed to provide emergency liquidity for commercial banks in their district over an extended period (over 120 days a year). Therefore, it will effectively prevent that the role as lender of last resort of one district-Fed can lead to sustained high ISA balances at the one hand and make settlement of ISA balances impossible. Consequently, the Fed system does not leave the responsibility for emergency liquidity provision and stabilization of the financial institutes in the hands of the single Fed-districts, if the liquidity crisis hits more than a single institute within. As the Subprime-crisis has shown, the Fed-system takes the role of lender of last resort as a whole, even if the provided liquidity measures particularly benefit some financial institutions in a few Fed districts. At the same time, the U.S. federal government and the national Federal Deposit Insurance Corporation (FDIC, a nationwide, privately funded

[44] Federal Reserve Act, Sec. 10A and 10B specify the requirements and constraints. Conditions for such loans are either a joint liability of several banks in the district in case of collective loans or that the head of the bank certifies the bank is viable in general. Such credit is provided only over short term (max. of 60 to 120 days) and against collateral with maturity below 4 weeks. Another case is that the institution is critically undercapitalized and insolvent, in which case the federal deposit insurance (FDIC) will be involved. Furthermore, the federal level gets involved in case of such emergency loans and potential losses in form of extensive reports to the Congress, too.

deposit insurance) supported rescue operations and took over market price and solvency risks in this process (Federal Reserve Bank of New York, 2009, pp. 15f, pp. 23-27).

This relieved the district-Feds from their responsibility to provide emergency liquidity for the financial institutes in their districts. For example, even if the Fed district Richmond provided 75 bn. USD in emergency loans in 2008 and the New York Fed 300 bn. USD, both district-Feds could reduce their involvement in the following year to about 1.1 bn. (Richmond) and 77 bn. USD (New York), because the crisis measures of the Fed-system took over theses these risks.

These now centrally conducted measures had a direct impact on the ISA balances: The purchase of agency debt and agency mortgage-backed securities through the open market policy of the Fed system[45] , for example, led directly to ISA-claims of the District of Richmond at the Fed-system. Where the emergency loans from the Richmond Fed in the amount of approximately U.S. $ 75 bn. have led to ISA-liabilities in the amount of about 160 bn. USD in 2008, the outright purchases of these securities for the SOMA (total height 160 bn. USD on bonds, 980 bn. of Agency MBS) have been associated with ISA-claims of the Richmond District to the Fed-system of USD 111 billion in 2009 (Federal Reserve Bank of New York , 2008, 2009; Federal Reserve Bank of Richmond, 2008, 2009). In the same manner one can explain the development of ISA-claims of the district New York against the Fed-system, since all major investment and commercial banks in the U.S. are located there. These have benefited significantly from the general liquidity measures of the Federal Reserve System as well as of institutions specific measures (the Maiden Laine LLC's etc).[46]

If we transfer these considerations on the assignment of the crisis measures in the Fed system and the impact of central money creation on the ISA balances (as described in section 5.6.2 above) onto the Eurosystem, it must be concluded that the interaction of central liquidity provision and central conduct of monetary policy has had a

---

45 Securities of Fannie Mae, Freddy Mac, Ginnie Mae and the Federal Home Loan Banks as well as ABS on their loans portfolio.

46 A financial crisis comparable to the Eurozone debt crisis in case of the regional structure is the savings and loan crisis in the U.S. beginning in the mid 1980's and lasting to the early 1990's. This case shows, that financial aid from federal levels was a logic and natural step even as most of the mortgages financing institutions have been active on the regional level only. For a detailed analysis of the regional drivers of the crisis and the inter-regional payment flows see Warf and Cox, 1996.

significantly dampening effect on the ISA-balances. By contrast, the assignment of financial stability as a national task and the decentralized implementation of monetary policy in Europe have to be seen as drivers of TARGET2 balances already from the purely technical point of bookkeeping, leaving insecurity over national actions and abilities to bail out the banking sector aside. It is therefore hard to imagine that a TARGET2 settlement mechanism could be feasible without that the ESCB as a whole would have to adopt the role of lender of last resort even in case of regional financial crisis.

A targeted purchase of bonds and loan portfolios from vulnerable financial institutions or on markets by the whole ESCB itself or by all NCBs in concerted action according to their capital key, similar to the central measures of the Fed-system, would have had a significantly dampening effect on the TARGET2 balances in the early stages of the European sovereign debt crises. This applies to the purely technical bookkeeping perspective (loans and liquidity supply from ESCB would form the opposite flow of funds to the TARGET2 liabilities caused by capital flight) as well as a clear signal to the financial markets, that the lender of last resort function will be fulfilled and a break-up of the Euro area would not take place. Ultimately, the announcement of the Outright Monetary Transactions in August 2012 can be seen as a voluntary assignment of crises policy to the level of the ESCB as a whole. As a result, the TARGET2 balances began to decline (see the development of the TARGET2 balances on a monthly level, for example Westermann, 2014). It can be concluded that within a monetary union it is not possible to leave the responsibility for liquidity provision in case of severe regional financial crisis in hands of the NCBs, if at the same time a settlement mechanism for the payment transfer balances is wished. The perfect integration of payment systems promotes capital flight, making settlement impossible. If a TARGET2 settlement should be introduced similar to the ISA settlement in the U.S., the European crisis policy should also be willing to relocate substantial liquidity and solvency risks on the inter-regional level as in the U.S., with corresponding effects on the risk positions of the individual NCBs, as has been discussed in more detail in section 5.6.2.4.

5.6.3.3 Financial market integration and ISA-balances in the US

Whereas a single financial market is still a target in the Eurozone, it is a fact in the U.S. If the banks of one Fed district are undercapitalized or near insolvency, they are potential targets for mergers or acquisitions for institutes from other Fed districts, which can take over the whole institute, or parts thereof. Necessary liquidity is provided by this (either already in advance of a possible insolvency of the single institution or subsequently in the management of the nationwide FDIC[47]) and at least parts of the potential losses and risks are shared. The mergers guarantee continuation in credit supply, guarantees and covers the deposits and other debts of the troubled institutions. Most importantly, the district-Fed has not to take the role as LoLR and emergency liquidity provider (Koning, 2013), which could otherwise drive ISA liabilities.

During the U.S. subprime crisis, the number and volume of district-wide bank acquisitions in comparison to prior years have significantly increased (Adams, 2012, p.30). In Europe in contrast, the opposite development could be observed since 2007 (Council of Economic Advisors, 2012, pp. 153f). The already comparatively weaker integrated European financial market has further defragmented. First, the assets of the financial institutions became increasingly focused on their home countries (Allen et al., 2011, p.24). Second, despite increased mergers activity, no cross-border bank mergers could be observed. The main reasons are different corporate cultures, market conditions and still large differences in the legal framework of the different countries. This increases the transaction and integration costs in the event of a takeover by other banks and therefore makes mergers and acquisitions more costly and less likely in the EMU than in the U.S. (Buch, 2000; Buch and de Long, 2001).

A major step towards less costly cross-border acquisitions of illiquid financial institutions could be the EU-Commission's proposals for financial market regulation and the so called ‘banking union’. An essential part of this are so-called ‘resolution plans’ (European Commission, 2012, Sect. 5), which contain among other elements pre-specified plans for a separation into a ‘should-be-healthy’, or solvent, part of an institute and illiquid or insolvent parts which should be liquidated. The healthy parts of an

[47] Federal Deposit Insurance Corporation. Founded in 1993 with the Glass-Steagall Act, it is a privately financed, nationwide deposit insurance at the one and but is also responsible for management and resolution of financial institutions in insolvency or in danger of insolvency.

institution are potentially rewarding takeover targets for other financial institutions. Due to the obligation to prepare the resolution plans and the involvement of the regulatory authorities in this process, the informational disadvantage of potential buyers with respect to associated risks could be significantly reduced and the willingness for acquisitions increased. Furthermore, there are plans for a common fund to finance the resolution of unviable parts of distressed financial institutions if the national resources are insufficient (European Commission, 2012, Article 97). Both factors can relieve the NCBs of the Euro area from their LoLR and are therefore likely to prevent the rise of large TARGET2 imbalances in the future in case of turbulence in the national financial sectors.

5.6.3.4 Further aspects

Outside the sphere of monetary policy, there exist many equilibrating institutions and regulations in the USA which attenuate the accumulation of excessive ISA-imbalances. First, the ESCB is still nationally organized, so that each national central bank processes the inter-European payment flows for its jurisdiction. In the U.S., in general one Fed district comprises several states. This relaxes the connection between ISA balances and regional business and economic crises, the debt of the individual U.S. states and regional capital flight. In its trivial form, this argument was used several times even in the discussion about the risks of TARGET2 balances (see, e.g. Neumann, 2011, p.27) and has been discussed as an independent idea for reforms of the TARGET2 mechanism itself (Burda, 2013).

In addition to pure accounting effects from such consolidation of different economic areas and the consequences on TARGET2 balances of merging regions with potentially different business cycles, the expectations of market participants about an exit of a large European Central Bank district would be low. Would national jurisdictions and European Central Bank districts be separated, and therefore fiscal policy and monetary policy be unbundled even more than today, the subjective probability of an exit of a whole central banking district comprising a number of member countries will be greatly reduced. Capital flight out of this district would be less severe, TARGET2-liablities would rise less and their settlement would not be impossible from the beginning. This will have again recursive effects on the expected probability of an exit.

At second, a strong equilibrating force for ISA balances in the U.S. exists in form of the fiscal transfers from the federal level and other autonomous flows of funds in the USA. These are opposed to possible capital outflows from a district and reduce its (net) ISA liabilities. Transfers from the federal level for the benefit of the individual federal states amounted to approximately USD 607 bn. in 2011, or about 4% of U.S. GDP. In addition, there are regular payments for federal agencies such as the FBI, Armed Forces, Border Patrol etc., so that we can assume an autonomous redistribution from the federal level amounting to approximately 16 % of U.S. GDP without interest payments (Congressional Budget Office, 2013)[48]. Some of these payments can be seen as automatic stabilizers in terms of business cycle policy, and they will not disappear out of a Fed district in case of a regional crisis immediately and reduce the emergence of ISA-liabilities. Compared to the U.S., the autonomous cash flows within the EU due to redistribution from the federal budget are much lower. They amounted in 2012 to about 147 bn Euro or approximately 1.1 % of total EU output of about 12.9 bn. Euro. The equilibrating effect from such transfers onto TARGET2 balances will therefore be much lower than it is the case in the U.S..

At third, a key point in the resolution of the subprime crisis was the readiness of the U.S. government to support the financial markets with federal funds. The transfer of such direct federal aid ultimately reduces emergence of ISA liabilities outside the New York Fed district. The most significant examples are the nationalization of the two government sponsored enterprises Fannie Mae and Freddie Mac as well as the conduct of the Troubled Asset Relief Program (TARP). While the two companies were provided each with USD 100 bn. (a cost estimate is not yet possible), the loans contained in the TARP portfolio are about 431 billion USD, with an estimated actual cost of about 24 bn. (Congressional Budget Office, 2012, Table 1). A similar instrument in EMU since 2012 is the possibility of the European Stability Mechanism (ESM) to lend to countries to recapitalize domestic financial institutions (European Union, 2012, Article 15). First, this relieves the NCBs from an extension of their role as a LoLR (and the danger to refinance so called zombie-banks). Second, it directly reduces TARGET2 liabilities: If the ESM issues bonds in Frankfurt (Germany) or other EMU core countries and the corresponding funds are subsequently transferred to the periphery, Germany incurs

[48] The biggest share have grants for the health system, income support and education.

(gross) TARGET2-liabilities, whereas the receiving countries get (gross) TARGET2 claims. If the ESM issues the bonds in the periphery itself, private capital would flow in and reduce TARGET2 balances again.

5.7 CONCLUSION

Before we come to this chapters' conclusion, a short brush up of the main results of this part of the thesis is appropriate. We have seen that TARGET2 liabilities arise in an EMU member state, if foreign and domestic capital leaves the country and the NCB takes its role as a lender of last resort. TARGET2 balances emerge in this case automatically and within the orderly functioning of the monetary union. They can even be seen as the stabilizing element, enabling cohesion of the EMU. However, TARGET2 balances are one part of the monetary risk arising if one country decides to leave the Eurozone. But it is too narrow to focus only on TARGET2 balances, as the additional risk from bank notes in circulation can increase or even decrease the costs by 30-50%, depending on the exiting country. Taking account of cross-border cash payments is also necessary, if we look at the proposals for a reform of the TARGET2 mechanism. No proposal is actually able to mitigate the risks from TARGET2 balances without interrupting the cross-border payment flows, which is against the treaties of the EU. Interestingly, the Fed system of the USA seems to provide an example of an easily working compensation mechanism for the risk coming from interdistrict payment transactions. The simple answer, why this system is working relatively smoothly is: The US system is higher centralized with respect to its monetary policy operations, the financial market is much more integrated, financial stability is a matter of federal and not regional economic policy and federal transfers to the regional levels have much higher dimensions in the US than the EMU. Last but not least, the Fed-system takes its settlement procedure not as a binding constraint, if liquidity needs endanger cohesion of the Fed system. This is not a political decision, but a historical practice since the foundation of the Fed system in 1913. For the successful implementation of a settlement mechanism for cross-border payment flows within a monetary union, three basic questions are ultimately decisive.

1. Is it ensured that there exists always a sufficiently large volume of assets eligible for settlement, be it in normal economic circumstances and times of turmoil as well?
2. Can the central banks get ownership of such assets in the course of their regular monetary policy operations?
3. Is it ensured that the financial sector does not have to rely on the national (regional) central banks as their lender of last resort (in times of systemic financial crisis) over an extended period of time?

These basic questions are supplemented by considerations on general factors influencing the emergence of excessive payment transfer balances. The analysis of the institutional arrangements in the Federal Reserve System shows that here, on the one hand, all assets used in monetary policy operations of the Fed-system can also be used to settle potential ISA imbalances. This greatly reduces the problem of a too low volume of eligible assets limiting the ability to settle transfer balances. Secondly, any district-Fed automatically acquires ownership of these eligible assets in the wake of the monetary policy operations and does not have to purchase them independently for settlement purposes only. Third, in the United States exist the necessary institutional conditions to relieve the individual district-Feds from the role as lender of last resort for their regional financial institutions. These are the provisions in the Federal Reserve Act, the Federal State Deposit Insurance and the single financial market in the USA. Furthermore, a far-reaching willingness to provide emergency liquidity at the federal level and to take over essential solvency risks - from both sides of the entire Federal Reserve System and the Federal Government - have continued to reduce the ISA balances in the U.S. fast during 2008 to 2010. To sum up, all three basic questions formulated in the above paragraph are answered positively in case of settlement of the ISA balances within the Fed-system.

In the European case, the introduction of the ESM (European Union, 2012a) and the discussed reforms in the area of financial market regulation (especially the so called ‘banking union’, see European Commission, 2012), can help to relieve the national central banks from their role of emergency liquidity provider in times of regional financial crisis. Therefore, the answer for the third basic question tends to be positive

for the introduction of a TARGET2 settlement mechanism in the future. However, the concept of decentralized conduct of monetary policy measures, undertaken through secured loans to eligible commercial banks, makes the introduction of a settlement mechanism almost impossible. The monetary assets can hardly be used to settle TARGET2 balances, as they are not standardized, comparable or easy tradable. A possible remedy could be at this point, to enforce a greater centralization of monetary policy similar to the Fed System - in one district, by a common open market portfolio. First, a common open-market portfolio ensures that all assets related to monetary policy operations could be used for settlement of TARGET2 balances, because not individual assets, but shares of this portfolio could be used for settlement. Second, the single national central banks will receive these eligible assets regularly through the monetary policy operations without a need for own initiative. On the other hand, however, this would require far-reaching steps in the transformation of monetary policy instruments and limit the national central banks remaining autonomy. The introduction of a settlement mechanism within the TARGET2 system therefore requires far more innovations than copying the Fed's settlement procedure for ISA balances. By contrast, a modification of the most fundamental parts of the ESCB would be required for a smooth functioning of TARGET2 settlement even in times of economic turmoil.

6 Conclusion for the Thesis

This dissertation intends to add understanding to two fields in international economics: First, it seeks to provide a deeper insight into the influence of economic institutions on the dynamics of the Balance of Payments. Second, it highlights important prerequisites for the necessary detailed provisions regarding organization of federal monetary unions.

In chapters 2 and 3, I survey the literature and partially provide own evidence on the influence of institutions on components of the Balance of Payments as well as the domestic savings-investment decision. Therefore, the argumentation and findings are more of a basic research character. First, better institutions encourage aggregate investments, increasing domestic capital and output. Second, foreign private capital inflows seem to react strongly to the quality of institutions in the target country, with FDI reacting more sensitive than portfolio investment into shares and securities or bank loans. Foreign financing in general and FDI in particular seem to have remarkable effects on export performance, especially in boosting the complexity and value of exported goods. Third, the trade literature concludes that countries with better domestic institutions are more integrated into the world economy and export goods with higher complexity. Finally, there are some findings in the empirical literature that national (private) savings are also positively influenced by improvements in the institutional setting, a finding which is supported by the research presented in chapter 3. All these elements in the literature can, if interpreted in a dynamic way rather than a static one, be seen as fitting into the idea of a beneficial debt cycle. The quality of domestic institutions is from this viewpoint one element in determining the success of a development strategy relying on foreign financing and trade integration for sustained long term growth and successful economic transformation.

However, large questions remain to be answered. Surveying the literature with mostly static models and squeezing them into a dynamic one – however plausible this interpretation may be – is not finally conclusive. It would be nice to have a unified dynamic model within the accepted model family of intertemporal models on the Balance of Payments that can take account of the differential influence of institutions on trade, savings, domestic and foreign investment. Furthermore, my empirical results on institutions and aggregate savings formation need additional theoretical research and

empirical validation for a broader acceptance as general conclusion. Both aspects require hard work in the future and I hope that the reader will follow these developments with some questions from this thesis in mind in the next years.

In chapter 5, my main focus was on the working of detailed provisions concerning cross-border transfers of money in a currency union. This issue came up with the discussion on TARGET2 balances and has found increased attention in the scientific and public community. Arguments and findings are therefore more important for discussion or application in applied economic policy. The first conclusion is that payment transfer balances arise inevitably in a federally organized monetary union, as the examples of the EMU and the Fed system both show. The normative necessity for a settlement of such balances can be discussed. The main argument in this thesis is, that for a smooth functioning of a monetary union, not only provisions for a settlement of such balances must be found. Rather the whole process of money creation, allocation of assets eligible for settlement and the role of central banks as LoLR must be carefully recognized and implemented in accordance with such a settlement regime. Only if some crucially questions can be answered positively, a federal monetary union with settlement and compensation for regionally disproportional money creation can be designed.

In this more applied field of research, direct research questions following from the above findings are few. However, the whole problem of designing a common monetary union is rich on questions how certain provisions – like a common interest rate, decentral implementation of monetary policy, regulations for acceptance of collateral according to the needs of only some financial regions – influence the incentives of economic actors to the better or the worse in the EMU. Monetary policy in the EMU will certainly develop and change in these areas. I hope that the reader will follow these developments with large interest and some questions from this thesis in mind.

ACKNOWLEDGEMENTS

Chapter 3 has been published as an article in Public Choice, Vol.157 (3-4), pp. 475-509. Before publication, valuable comments came from the participants of the ESSA Meeting in Stellenbosch, September 2011 and the Martin Paldam workshop in Aarhus, September 2012. Especially to be named are Christian Bjørnskov, Co-Pierre Georg and William Shughart. Chapter 5 has profited from general remarks of Peter Burgold, Christian Fahrholz (University of Jena) and John Wood (Wake Forest Universtiy) as well as Thomas Lubik (Federal Reserve Bank of Richmond) and JP Koning for comments and hints on the details of the ISA-system and U.S. monetary policy. All remaining errors rely solely on the author.

APPENDICES

APPENDIX A: SUPPLEMENTARY LITERATURE OVERVIEW FOR CHAPTER 2

Table A 1: Literature overview on exports, imports and institutions

Study	Main findings: better institutions…	Method	Period	Country Sample	Institutional Indicator
Anderson Marcoullier (2002)	- increase domestic imports	OLS on bilateral trade	1997	58 developing and industrial	GCR
Berkowitz et al. (2006)	- domestic institutions influence imports and exports - but exporting country institutions matter more for bilateral trade flows - exporter institutions have a positive effect on imports of complex goods - international institutions can act as substitute for domestic institutions if imports are concerned	pooled OLS on bilat. Trade flows according to goods classifications	1982-1992	55 developing and industrial	ICRG
de Groot et al. (2004)	- influence bilateral trade positively, exports as well as imports - exports stronger affected - even if accounted for common language, colonial origins, common border etc. - but countries with similar institutional levels trade more with each other	OLS on bilateral trade	1998	100 developing and industrial	WGI: Kaufmann et al, 2002
Faruq (2011)	- countries with better institutions have higher export prices, even within the same industry as low institutional quality countries	OLS, 2SLS	1996	US import data at industry levels on 58 countries	IEF: Heritage, World Bank Doing Business; TI: CPI, WGI
Francois and Manchin (2013)	- would increase bilateral trade flows of low-low and low-middle income countries, effect larger in low-high income trade' -importer and exporter country institutional quality influences trade; export matter slightly more'	FE Panel	1990-2003	94, developing and industrial	EFW, TI:CPI, WGI (2005)
Jansen and Nordas (2004)	- lead to higher trade openness'	OLS on bilateral trade	2002	144, developing and industrial	WGI: Kaufmann et al, 2002

	- tariff reform has higher effect if good institutions'				
Levchenko (2007)	- exporter country institutions matter for complexity of exports	OLS	1998	U.S. import data on 116 countries and 389 industries	WGI (1996-2000 average)
Meon and Sekkat (2008)	- increase exports of manufactures - and non-manufactures are larger in countries with low quality institutions	2SLS on exports	1990-2000	60 developing and industrial	WGI: 1999
Nicolini and Paccagnini (2011)	- no Granger-causality of institutions on bilateral trade if regional heterogeneity is accounted for	Maximum Likelihood	1976-2004	bilateral trade on 197 countries	FH: Political rights and civil liberties
Nunn (2007)	- lead to specilization of countries on complex products which need complex intermediaries - are therefore a source of comparative advantage	OLS, 2SLS, propensity score matching on output and exports in 28 different industries		70-146 developing and industrial countries, output and exports in 28 different industries	WGI (2000), EFW, WBdBI
Ranjan and Lee (2007)	- importer and exporter country institutions matter - for trade in complex goods, exporter country's institutions are more relevant in explaining trade flows	ML Tobit treshold model for bilateral trade	1997	79-83 developing and industrial	EFI (1992); WGI, ICRG (1992)
Rodrik et al. (2004)	- lead to higher growth - through higher integration into the world economy	2SLS	1995	79-137 developing and emerging economies	WGI: Kaufmann et al, 2002

2SLS: 2 stages least squares; 3SLS: 3 stages least squares; OLS: ordinary least squares; ML: maximum likelihood; FE: fixed effects; RE: random effects; HP: Hodrick-Prescott filter for cyclical data; Poisson qMLE with FE: Poisson quasi-maximum likelihood with fixed effects

BI: Business Intelligence (The Economists' Business Intelligence Unit) EFI: Economic Freedom Index (Heritage Foundation, see Holmes et al, 1998); EFW: Economic Freedom of the World (Fraser Institute, see Gwartney and Lawson, 2009, 2013 and other years); FH: Freedom House (Freedom House Organization, various years); GCR: Global Competitivesness Report (World Economic Forum, various years); ICRG: International Country Risk Guide (PRS Group, New York); IP: Institutional Project Database (Bertolier et al. 2003) Polity IV: Polity IV Project (Marshall, Jaggers, 2000); TI:CPI : Transparency International, Corruption Perception Index (various years) WBdBI: World Bank Doing Business indicator; WGI: World Bank Governance Indicators (Kaufmann et al, various co-authors, various years)

Table A 2: Literature overview on savings, investments and institutions

Study	Main findings: better institutions…	Method	Period	Country Sample	Source of institutional Indicators
Aizenman et al. (2007)	- are associated with higher stability domestic savings	OLS	1981-2004	37-49 developing and emerging	ICRG (2004)
Aysan et al. (2008)	- political institutions itself not significant - but have impact on private investment over human capital formation - rule of law affects private investment directly	3SLS	1970-2002	60 developing and emerging	ICRG; Freedom House
Campos et al. (1999)	- paradox of countries with high investment rates and high corruption values can be explained - if accounted for predictability of corruption - if corruption is unpredictable, investment is negatively affected	OLS	1981-93	67 developing and industrial	self constructed; World Development Report 1997
Ca'Zorzi et al. (2012)	- institutional indicators are consistent in explaining CA balances, with low coefficients, usually negative and significant	Meta-Study	various	various	various
Chinn and Ito (2005)	- high institutional quality regimes expirience decreasing savings rates if financial sector deepens - low institutional quality regimes expierience increases in savings, if financial sector develops	5-year averages (FE), yearly, HP-filtered data	1971('84)-2004	89 developing and industrial	ICRG
Chinn and Ito (2007)	- no influence on CA in industrial countries - associated with CA deficits in developing and emerging economies - but interaction with financial deepening	5-year averages (FE), yearly, HP-filtered data	1971('84)-2004	89 developing and industrial	ICRG
Dawson (1998)	- economic freedom is associated with higher investment - but political/civil liberties are not	OLS, FE, 5 year averages	1975-1990		Gastil; EFW (1996)
Dawson (2003)	- are associated with higher levels of investment - but no sigificant results for property rights as subgroup	Granger Causality test	1970-2000	83 developing and industrial	EFW (2001)

de Haan and Siermann (1998)	- no siginficant relationship between indicators of economic freedom and investment	extreme bound analysis, total average over years	1975-1993	78 developing and industrial	EFW(1996), Scully and Slotje (1991)
de Haan and Sturm (2000)	- no siginficant relationship between indicators of economic freedom and investment	extreme bound analysis, total average over years	1975-1990	78 developing and industrial	EFW (1996)
de Santis and Lührmann (2009)	- are associated with CA deficits/lower CA surplus	RE, FE	1970-2003	72-13 developing and industrial	FH: Civil Liberties
Everhart and Sumlinksi (2001)	- corrpution has negative effect on quality of public infrastructure - in corrupt environments, public investment crowds out private investment to a larger degree	RE, pooled OLS	1970-1999	100 developing and emerging	ICRG
Grigoli and Mills (2011)	- public investment is larger in countries with ailing institutions - economies with ailing institutions have more volatile public investments - better institutional quality is associated with better quality in infrastructure	System GMM	1984-2008		ICRG, DPI
Gruber and Kamin (2008)	- are associated with lower CA surplus/higher deficits	OLS, 5-year averages	1980-2004	84 developing and industrial countries	WGI (2005)
Gwartney et al. (2006)	- affect investment positively, in LDCs as well as in economies - affect productivity of investment positively - private investment is more productive than public investment - improvements in economic freedom increase investment over the longer term - causality runs from improvements in EFW to investment and growth - but not from growth to EFW	2SLS	1980-2000	94 developing and industrial	EFW (2006)
Keefer and Knack (1995)	- significantly associated with higher real private investment rates for economic freedom indicators - but indicators of political institutions and stability are not	OLS on total average	1974-89	97 developing and industrial	ICRG(1982), BERI(1971)
Keefer and Knack (2007)	- public investment is larger in countries with ailing institutions - this holds if public investment is measured as fraction of national income or of total investment	OLS, 2SLS	1974-1998	51-114 developing and industrial	ICRG, DPI
Kerdrain et al. (2011)	- more market liberal order on product markets is associated with passivization of CA	FE, FE Vector Decomposition	1993-2008	30 - 117 developing and industrial	

Mauro (1995)	- higher levels of corruption lower total investment - independent of efficiency of bureaucracy	OLS, average over all years available	1960-85	30-68 developing and industrial	BI
Swaleheen (2008)	- countries with higher corruption have lower gross national savings	System GMM	1994-2004	53-100 developing and industrial	TI: CPI
Tanzi and Davoodi (1997)	- corruption increases amount and size of public investment projects - corrupt practices are associated with poor quality of public infrastructure	OLS	1980-1995	42-95 developing and industrial	BI: 1980-1993; ICRG: 1982-1995

2SLS: 2 stages least squares; 3SLS: 3 stages least squares; OLS: ordinary least squares; ML: maximum likelihood; FE: fixed effects; RE: random effects; HP: Hodrick-Prescott filter for cyclical data; Poisson qMLE with FE: Poisson quasi-maximum likelihood with fixed effects

BI: Business Intelligence (The Economists' Business Intelligence Unit) EFI: Economic Freedom Index (Heritage Foundation, see Holmes et al, 1998); EFW: Economic Freedom of the World (Fraser Institute, see Gwartney and Lawson, 2009, 2013 and other years); FH: Freedom House (Freedom House Organization, various years); GCR: Global Competitivesness Report (World Economic Forum, various years); ICRG: International Country Risk Guide (PRS Group, New York); IP: Institutional Project Database (Bertolier et al. 2003) Polity IV: Polity IV Project (Marshall, Jaggers, 2000); TI:CPI : Transparency International, Corruption Perception Index (various years) WBdBI: World Bank Doing Business indicator; WGI: World Bank Governance Indicators (Kaufmann et al, various co-authors, various years)

Table A 3: Literature overview on the financial account and institutions

Study	Main findings: better institutions…	Method	Period	Country Sample	Source of institutional Indicators
Albuquerqe (2003)	- if country credit rating is used as control, institutional variables are not significant in explaining FDI flows	OLS	1975-1997	not reported	ICRG
Alfaro et al. (2008)	- are associated with higher foreign capital inflows	OLS	1970-2000	56-81 developing and industrial	ICRG (2001)
Benassy-Quere et al. (2007)	- ailing institutions reduce FDI - institutional distance between countries decreases FDI - the authors find relatively large coefficients for institutions, indicating that they are one of the main drivers	Poisson qMLE with IV	1985-2000, 5 year averages	not reported	IP; EFW
Faria and Mauro (2009)	- equity-type investment as share of foreign capital stock are higher in countries with better institutional quality - the share of loans in foreign capital stock is higher in countries with low institutional quality	OLS, 2SLS	1996-2004	94 developing and industrial	WGI (2006)
Garibaldi et al. (2002)	- property rights are the only significant explantory variable for portfolio investment flows - FDI react to better institutions and other controls	OLS	1991-1999	25 transition economies	WDR 1997
Hausmann and Fernandez-Ariaz (2000)	- countries with lower quality in institutions hafve lower inflows in foreign capital - but the share of FDI is higher - natural resources abundance is one driving explanation for this	descriptive	1997	not reported	WGI (1996)
Li and Resnick (2003)	- political institutions can not explain FDI flows alone - rather property rights protection exerts a strong influence on FDI inclows	OLS with PCSE	1982-1995	53 developing	PolityIV
Morrissey and Udomkerdmongkol (2011)	- total private investment is higher in better institutional quality - FDI is higher in better institutional quality - FDI crowds out domestic private investment, this effect is greater with better institutions	System GMM	1996-2009	46 developing	WGI (2010)

Pappaioannou (2009)	- institutional quality is main explanatory of international bank lending	FE , OLS, 2SLS	1984-2002, anual and quarterly	40-150 developing and industrial	ICRG (2001)
Wei (2000)	- corruption affects volume and structure of capital imports - corruption lowers capital imports - c. reduces the share of FDI - increases the share of loans	OLS, RE, 2SLS	1994-1996, total average	country pairs, 13 lending, 85 borrowing countries	GCR, WDR, TI: CPI
Wei (2000a)	- FDI stocks are lower in host countries with higher corruption	OLS, FE, 2SLS, Tobit	1993	country pairs, 12 lending ant 45 borrowing countries	BI, ICRG, TI:CPI
Wei (2001)	- FDI flows are lower into countries with higher corruption	OLS, 2SLS	1994-1996, total average	13-15 lending, 53-85 borrowing; overall: 103 max.	GCR, WDR
	- but loans are higher into countries with higher corruption				
Wei and Wu (2000)	-results above are confirmed - but the authors have additionally controlled for policies targeted at attracting FDI in the host economies - high corruption is associated with higher loan-to-FDI ratio - higher corruption is associated with higher portfolio-to-FDI ratio	OLS, RE, 2SLS	1994-1996, total average	13-15 lending, 53-85 borrowing; overall: 103 max.	GCR, WDR

2SLS: 2 stages least squares; 3SLS: 3 stages least squares; OLS: ordinary least squares; ML: maximum likelihood; FE: fixed effects; RE: random effects; HP: Hodrick-Prescott filter for cyclical data; Poisson qMLE with FE: Poisson quasi-maximum likelihood with fixed effects

BI: Business Intelligence (The Economists' Business Intelligence Unit) EFI: Economic Freedom Index (Heritage Foundation, see Holmes et al, 1998); EFW: Economic Freedom of the World (Fraser Institute, see Gwartney and Lawson, 2009, 2013 and other years); FH: Freedom House (Freedom House Organization, various years); GCR: Global Competitivesness Report (World Economic Forum, various years); ICRG: International Country Risk Guide (PRS Group, New York); IP: Institutional Project Database (Bertolier et al. 2003) Polity IV: Polity IV Project (Marshall, Jaggers, 2000); TI:CPI : Transparency International, Corruption Perception Index (various years) WBdBI: World Bank Doing Business indicator; WGI: World Bank Governance Indicators (Kaufmann et al, various co-authors, various years)

APPENDIX B: SUPPLEMENTARY TABLES AND MATERIAL FOR CHAPTER 3

Gross national savings to GDP: taken from the IMF World Economic Outlook 2012 database.

Government savings (deficits): we use the ratio of general government net lending to GDP from the IMF World Economic Outlook database as a proxy for governmental budget deficits. We dropped 14 observations, for which deficits exceeded -25% of GDP, as extreme outliers.

Private savings: gross national savings minus government savings. We dropped one case wherein private savings exceeded 150% of GDP as an inconsistent or extreme outlier.

Actual inflation: consumer price inflation taken from the World Development Indicators. We truncated inflation values above 50% (which is the defined border for hyperinflation) and set all values above 50% to this. That truncation was applied to 325 of 4512 observations in the basic dataset.

Three-year average inflation: inflation average over the last three years before the year under consideration.

Real interest rates: taken from the World Bank Database and truncated to -10% to 50%, which replaced 190 values below -10% and 34 over 50% out of 3534 observations.

Real GDP per capita, log: the log of the variable 'rgdpch', taken from the PWT 7.0. This is the real GDP, chain-linked series in PPP prices with 2005 as the base year.

Real GDP growth: the variable 'grgdpch' taken from the PWT 7.0, which is the real growth rate of the 'rgdpch' series.

Domestic credit to the private sector to GDP (also: broad money to GDP, M2 and quasi-money to GDP, credit supplied by the banking sector to GDP): taken from the World Bank database. Values of zero were treated as missing observations.

Old age (youth) dependency ratio: ratio of people over 65 (below 15) years to working age people between 15 and 65. Data are from the World Bank database.

Population: population in millions was taken from PWT 7.0. Countries with populations of less than one million people were dropped to avoid problems due to large capital account-based transactions in so-called tax havens such as the Bahamas.

Oil trade balance: the ratio of volume of oil exports minus oil imports to GDP, taken from the World Economic Outlook database 2011. In one country, imports were counted as a negative entry in the dataset, which we corrected.

EFW-indices: the interpolated chain-linked versions taken from Gwartney and Lawson (2009). As the institutional data are available only in five-year intervals from 1970 to 2000 and annually thereafter, we do linear interpolations between two data points where necessary for our yearly estimations. Such a procedure has been applied previously by, for instance, de Soysa and Neumayer (2005). As institutions develop slowly over time, a linear estimation comes close to capturing the gradual development inherent in the evolution of institutional quality. Furthermore, as the indices are constructed from different sources, including surveys, the normal measurement error and errors caused by linear interpolation are two sides of the same coin, leading us to the conclusion that our error can be tolerated given the long time span and wide country coverage of our sample.

IMF capital account openness: we use the Chinn and Ito (2008) index based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) in its 2012 version.

Trade openness: the ratio of imports plus exports to GDP in 2005 constant prices, the variable openk taken from the Penn World Tables 7.0.

Freedom House – PolityIV: the 'imputed revised combined polity2' score from Hadenius and Teorell (2005) is a combination of the Freedom House civil liberty and political rights as well as the p_polity2 score of the PolityIV project. Overall, this index tries to capture the degree of democratic participation in a country. It ranges from 0 to 10, with higher values indicating more democracy.

PolityIV: chief executive constraints: measure of the power of the highest executive body in a country and the system of checks and balances against it. The measure takes

values between one and seven, equal to one if the chief executive has unlimited power and seven if his/her power is balanced by the controls available to other political actors.

ICRG: quality of governance: is the aggregate indicator from the International Country Risk Guide of the Political Risk Group, which we have taken from Teorell et al. (2011).

List of countries in our baseline models:

Albania, Argentina, Bangladesh, Belarus, Benin, Bolivia, Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Chile, China, Colombia, Cote d'Ivoire, Ecuador, El Salvador, Estonia, Ethiopia, Gabon, Ghana, India, Jamaica, Jordan, Kenya, Latvia, Macedonia, Malaysia, Mexico, Moldova, Mongolia, Mozambique, Namibia, Niger, Pakistan, Panama, Papua New Guinea, Paraguay, Philippines, Poland, Russian Federation, Singapore, Sri Lanka, Sudan, Swaziland, Syrian Arab Republic, Tanzania, Thailand, Togo, Tunisia, Uganda, Ukraine, Venezuela, Vietnam.

Table A 4: Descriptive statistics

variable		mean	std. dev.	min	max	observations	
gross national savings rate	overall	21.2	10.5	-6.5	52.4	N	904
	between		8.99	4.18	45.6	n	56
	within		4.78	-0.9	42.5	T-bar	16.1
private savings rate	overall	23.4	9.22	-8.4	52.7	N	904
	between		7.65	9.25	42.6	n	56
	within		4.76	-0.4	52.8	T-bar	16.1
government savings (./. deficit)	overall	-2.2	4.42	-22.	18.7	N	904
	between		2.97	-7.7	9.84	n	56
	within		3.15	-21.	13.9	T-bar	16.1
real GDP per capita, ppp, 2005 prices	overall	7.91	1.09	5.77	10.7	N	904
	between		1.08	5.96	10.4	n	56
	within		0.17	6.93	9.01	T-bar	16.1
oil trade balance	overall	-0.9	7.61	-19.	49.2	N	904
	between		7.79	-10.	37.9	n	56
	within		2.55	-14.	12.1	T-bar	16.1
young age dependency ratio	overall	63.5	21.7	17.4	106.	N	904
	between		22.4	21.6	100.	n	56
	within		5.92	43.5	84.9	T-bar	16.1
old age dependency ratio	overall	8.57	4.39	4.16	25.1	N	904
	between		4.99	4.24	23.9	n	56
	within		0.50	6.22	10.5	T-bar	16.1
domestic credit to the private sector, % of GDP	overall	32.9	32.2	1.54	168.	N	889
	between		31.9	4.22	149.	n	56
	within		9.56	-16.	79.7	T-bar	15.8
growth rate of real GDP per capita	overall	2.65	5.48	-23.	37.6	N	904
	between		2.46	-1.4	8.74	n	56
	within		4.94	-21.	35.5	T-bar	16.1

variable		mean	std. dev.	min	max	observations	
inflation rate, current	overall	10.7	11.6	-23.	50	N	866
	between		7.92	1.54	34.0	n	54
	within		8.57	-18.	48.9	T-bar	16.0
3 year average inflation rate, excluding actual year	overall	11.9	12.3	-11.	50	N	852
	between		9.58	1.63	42.4	n	54
	within		8.18	-13.	45.8	T-bar	15.7
PolityIV: constraints on chief executive	overall	4.54	1.92	1	7	N	848
	between		1.76	1.18	7	n	54
	within		0.84	1.08	7.74	T-bar	15.7
Freedom House/ PolityIV: imputed score	overall	5.67	2.76	0.25	10	N	861
	between		2.58	0.51	9.57	n	54
	within		1.13	0.64	9.93	T-bar	15.9
EFW: property rights	overall	4.83	1.50	1.43	8.63	N	730
	between		1.37	2.77	8.35	n	48
	within		0.63	0.59	6.66	T-bar	15.2
international country risk guide: quality of governance	overall	4.89	1.46	0.55	9.16	N	768
	between		1.20	2.52	8.52	n	49
	within		0.83	1.92	7.34	T-bar	15.6
EFW: size of government	overall	6.53	1.37	2.62	10	N	732
	between		1.22	4.20	9.21	n	48
	within		0.68	4.11	8.97	T-bar	15.2
EFW: overall markets regulation	overall	5.60	1.22	1.49	8.78	N	734
	between		1.17	1.94	8.44	n	48
	within		0.47	4.24	7.93	T-bar	15.2
financial reform index	overall	0.56	0.26	0	1	N	562
	between		0.21	0.14	0.97	n	39
	within		0.14	0.16	0.96	T	14.4
World Bank governance indicator: rule of law	overall	-0.3	0.66	-1.6	1.79	N	462
	between		0.64	-1.4	1.63	n	54
	within		0.16	-0.8	0.94	T	8.55

Table A 5: Difference-in Hansen-test statistics

H0: instrument subset is exogenous				
table No.	model No.	explanatory	instrument subset (selection)	probability, that > Chi2
3	2	gross national savings	GMM instrument set for levels	0.627
			GMM for LDV gross national savings (lag 1)	0.262
			GMM for real GDP growth, government savings (lag 2)	0.301
			GMM: inflation rate (lag 2)	0.936
			GMM: 3-year average inflation (lag 2)	0.712
			GMM: domestic credit to the private sector to GDP (lag 2)	0.412
			exogenous variables: old age/youth dependency, oil trade balance	0.128
	4		GMM: real GDP per capita(lag 2)	0.203
	6	private savings	GMM instrument set for levels	0.653
			GMM for LDV gross national savings (lag 1)	0.454
			GMM for real GDP growth, government savings (lag 2)	0.239
			GMM: inflation rate (lag 2)	0.403
			GMM: 3-year average inflation (lag 2)	0.195
			GMM: domestic credit to the private sector to GDP (lag 2)	0.787
			exogenous variables: old age/youth dependency, oil trade balance	0.827
	8		GMM: real GDP per capita (lag 2)	0.263
4	9	gross national savings	exogenous variable: constraints on the chief executive	0.737
	10		exogenous variable: democratic participation	0.524
	11	private savings	exogenous variable: constraints on the chief executive	0.202
	12		exogenous variable: democratic participation	0.027
5	13	gross national savings	exogenous variable: EFW: property rights quality	0.265
	14		exogenous variable: country risk: quality of governance	0.606
	15		exogenous variable: World Bank governance indicators: rule of law	0.123
	16	private savings	exogenous variable: EFW: property rights quality	0.862
	17		exogenous variable: country risk: quality of governance	0.182
	18		exogenous variable: World Bank governance indicators: rule of law	0.189
6	19	gross national savings	exogenous variable: EFW: size of government	0.393
	20		exogenous variable: EFW: overall markets regulation	0.003
	21		exogenous variable: financial reform index	0.013
	22	private savings	exogenous variable: EFW: size of government	0.05
	23		exogenous variable: EFW: overall markets regulation	0.209
	24		exogenous variable: financial reform index	0.102

Table A 6: Correlation matrix of explanatory variables

	gross national savings rate	private savings rate	government savings (./. deficit)	real GDP per capita, log	oil/fuel trade balance	youth dependency	old age dependency	domestic credit to the private sector, % of GDP	real GDP, growth	inflation rate	3 year average inflation, excl. actual year	PolityIV: constraints on chief executive	Freedom House/PolityIV imputed democracy score	EFW: property rights quality	country risk: quality of governance	EFW: size of government	EFW: domestic market regulation	financial reform index
gross national savings rate	1																	
private savings rate	0.885	1																
government savings (./. deficit)	0.436	-0.03	1															
real GDP per capita, log	0.400	0.233	0.411	1														
oil/fuel trade balance	0.200	0.127	0.185	0.223	1													
youth dependency	-0.49	-0.43	-0.22	-0.73	-0.16	1												
old age dependency	0.107	0.080	0.076	0.545	0.019	-0.73	1											
domestic credit to the private sector, % of GDP	0.673	0.584	0.318	0.413	-0.11	-0.38	0.020	1										
real GDP, growth	0.349	0.280	0.207	0.121	0.012	-0.34	0.301	0.147	1									
inflation rate	-0.14	-0.13	-0.05	-0.11	0.300	0.159	-0.05	-0.39	-0.10	1								
3 year average inflation, excl. actual year	-0.23	-0.23	-0.04	-0.08	0.302	0.140	-0.03	-0.43	-0.13	0.700	1							
PolityIV: constraints on chief executive	0.093	0.121	-0.03	0.177	-0.02	-0.16	0.141	0.074	0.078	0.045	0.034	1						
Freedom House/PolityIV imputed democracy score	-0.25	-0.22	-0.10	0.385	0.013	-0.30	0.352	-0.20	-0.04	0.006	0.026	0.282	1					
EFW: property rights quality	0.442	0.354	0.264	0.410	-0.24	-0.40	0.249	0.557	0.229	-0.26	-0.24	0.059	-0.09	1				
country risk: quality of governance	0.429	0.353	0.241	0.458	-0.08	-0.33	0.189	0.509	0.124	-0.21	-0.18	0.109	0.004	0.755	1			
EFW: size of government	-0.06	-0.19	0.247	0.188	-0.08	0.023	-0.07	-0.07	-0.16	-0.15	-0.17	-0.03	0.351	-0.17	-0.09	1		
EFW: domestic market regulation	0.270	0.148	0.296	0.511	-0.24	-0.30	0.177	0.385	0.118	-0.33	-0.36	0.074	0.254	0.48	0.432	0.292	1	
financial reform index	0.028	-0.12	0.298	0.605	0.056	-0.32	0.355	0.122	0.025	-0.25	-0.22	0.057	0.427	0.229	0.282	0.304	0.491	1

Table A 7: Other aspects of economic freedom: Freedom of choice on markets

dependent variable:	(19) GNS	(20) GNS	(21) GNS	(22) PrSav	(23) PrSav	(24) PrSav
lagged dependent variable	**0.596*** **	**0.583*** **	**0.606*** **	**0.488*** **	**0.485*** **	**0.503*** **
	(0.0757)	(0.0757)	(0.133)	(0.117)	(0.115)	(0.130)
youth dependency	**-0.122*** **	**-0.110*** **	-0.0740	**-0.137** **	**-0.120** **	**-0.114***
	(0.0430)	(0.0414)	(0.0578)	(0.0581)	(0.0536)	(0.0689)
old age dependency	**-0.386*** **	**-0.356*** **	-0.172	**-0.437** **	**-0.396** **	-0.237
	(0.137)	(0.130)	(0.168)	(0.190)	(0.176)	(0.213)
real GDP growth	0.0649	0.0478	**0.244** **	0.0229	0.00192	0.129
	(0.0608)	(0.0656)	(0.120)	(0.109)	(0.109)	(0.164)
government savings (./.deficit)	**0.274*** **	**0.252** **	0.0354	-0.154	-0.200	-0.257
	(0.0983)	(0.107)	(0.129)	(0.160)	(0.177)	(0.223)
oil/fuel trade balance	**0.183*** **	**0.201*** **	**0.220** **	**0.196*** **	**0.217*** **	0.164
	(0.0519)	(0.0448)	(0.0950)	(0.0655)	(0.0606)	(0.119)
domestic credit to the private sector, % of GDP	0.0275	0.0288	**0.0415** **	0.0479	0.0474	0.0431
	(0.0229)	(0.0230)	(0.0195)	(0.0321)	(0.0308)	(0.0284)
inflation rate	**0.181*** **	**0.182*** **	0.0929	0.0905	0.105	0.0705
	(0.0550)	(0.0566)	(0.0609)	(0.0678)	(0.0709)	(0.0616)
3 year average inflation, excl. actual year	**-0.114*** **	**-0.104** **	**-0.107** **	-0.0437	-0.0607	**-0.122** **
	(0.0438)	(0.0416)	(0.0516)	(0.0549)	(0.0536)	(0.0487)
EFW: size of government	**-0.619** **			**-0.793** **		
	(0.264)			(0.375)		
EFW: overall markets regulation		0.417			0.479	
		(0.448)			(0.611)	
financial reform index			-2.061			**-3.983*** **
			(1.476)			(1.465)
observations	652	625	654	475	781	652
countries	43	43	43	37	54	43
min. years	8	6	9	7	9	8
max. years	25	25	25	23	25	25
av. years	15.16	14.53	15.21	12.84	14.46	15.16
AR(1)-test, probability	0.00363	0.00419	0.00285	0.00769	0.000535	0.000970
AR(2)-test, probability	0.158	0.280	0.170	0.807	0.803	0.0747
Hansen-test statistic, prob	0.279	0.303	0.294	0.242	0.544	0.452
number of instruments	42	42	42	42	42	42

1) constant not reported 2) bold values indicated 99% and 95% significance levels. 3) ***(**)(*) indicate 99% (95%)(90%) significance values. 4) Numbers in brackets are the corresponding z-values 5) sys-GMM: System GMM estimation, panel specific heteroscedasticity adjusted standard errors

APPENDIX C: SIMPLE EXAMPLES FOR THE INFLUENCE OF FED MONETARY POLICY ON ISA SETTLEMENT

Figure 10: Example of the relation of open market operations, ISA balances and SOMA shares on ISA settlement procedure

Fed system: volume of SOMA portfolio: 1000 USD; 3 Fed-districts with shares: 50-30-20% each; 1:1 coverage of gold and notes;
District-FED1 holds and manages the SOMA on behalf of the FED-system (corresponding to the New York Fed)

District-FED 1

Assets		Liabilities	
other assets	30	notes	100
gold certificates	100	deposits of com.b's	530
loans to com.banks	0	ISA	0
SOMA	500		
	630		630

District-FED 2

Assets		Liabilities	
other assets	20	notes	50
gold certificates	50	deposits of com.b's	320
loans to com.banks	0	ISA	0
SOMA	300		
	370		370

District-FED 3

Assets		Liabilities	
other assets	10	notes	20
gold certificates	20	deposits of com.b's	210
loans to com.banks	0	ISA	0
SOMA	200		
	230		230

01. September: Commercial bank in District 2 sells assets to the FED-system in their open market operations in volume of 200 USD.
Fed-System: volume of SOMA now 1200 USD; distribution is still 50-30-20 between the districts; FED2 gets credited 60 USD in SOMA, for example

District-FED 1

Assets		Liabilities	
other assets	30	notes	100
gold certificates	100	deposits of com.b's	530
loans to com.banks	0	ISA	100
SOMA	600		
	730		730

District-FED 2

Assets		Liabilities	
other assets	20	notes	50
gold certificates	50	deposits of com.b's	320
loans to com.banks	0	ISA	60
SOMA	360		
	430		430

District-FED 3

Assets		Liabilities	
other assets	10	notes	20
gold certificates	20	deposits of com.b's	210
loans to com.banks	0	ISA	40
SOMA	240		
	270		270

In the same second, the commercial bank from district 1 gets credited this amount as a deposit in her account at District-FED2.
This leads to ISA claims in height of 140 USD for FED2, which are shared between FED1 and FED3 as their relation in the SOMA (50:20)

District-FED 1

Assets		Liabilities	
other assets	30	notes	100
gold certificates	100	deposits of com.b's	530
loans to com.banks	0	ISA	100
SOMA	600		
	730		730

District-FED 2

Assets		Liabilities	
other assets	20	notes	50
gold certificates	50	deposits of com.b's	520
loans to com.banks	0	ISA	0
ISA	140		
SOMA	360		
	570		570

District-FED 3

Assets		Liabilities	
other assets	10	notes	20
gold certificates	20	deposits of com.b's	210
loans to com.banks	0	ISA	40
SOMA	240		
	270		270

01. October: Commercial banks from District 3 pay credit lines in District 1 in volume of 150USD; com.b's there deposit this at their District FED1
FED3 incurs additional ISA liabilities of 150 USD, FED1 incours claims, leading to net ISA claims of 50 USD

District-FED 1

Assets		Liabilities	
other assets	30	notes	100
gold certificates	100	deposits of com.b's	680
loans to com.banks	0	ISA	0
ISA	50		
SOMA	600		
	780		780

District-FED 2

Assets		Liabilities	
other assets	20	notes	50
gold certificates	50	deposits of com.b's	520
loans to com.banks	0	ISA	0
ISA	140		
SOMA	360		
	570		570

District-FED 3

Assets		Liabilities	
other assets	10	notes	20
gold certificates	20	deposits of com.b's	60
loans to com.banks	0	ISA	190
SOMA	240		
	270		270

In April of the following year, settlement is conducted:

FED 1: 1 month ISA -100; 3 months ISA +50 = 4.17
FED 2: 4 month ISA-balance of +140 = 46.67
FED 3: 1 month ISA -40, 3 months ISA -190 = -50.83

District-FED 1

Assets		Liabilities	
other assets	30	notes	100
gold certificates	100	deposits of com.b's	680
loans to com.banks	0	ISA	0
ISA	45.83		
SOMA	604.2		
	780		780

District-FED 2

Assets		Liabilities	
other assets	20	notes	50
gold certificates	50	deposits of com.b's	520
loans to com.banks	0	ISA	0
ISA	93.3		
SOMA	406.7		
	570		570

District-FED 3

Assets		Liabilities	
other assets	10	notes	20
gold certificates	20	deposits of com.b's	60
loans to com.banks	0	ISA	139.2
SOMA	189.2		
	219.2		219.2

Figure 11: District-Fed as LoLR and ISA-settlement failure

Our simplified FED-system at the end of settlement in April as above:

District-FED 1

Aktiva		Passiva	
other assets	30	notes	100
gold-certificates	100	deposits of com.b's	680
loans to com.b's	0	ISA	0
ISA	45.83		
SOMA	604.17		
	780		780

District-FED 2

Aktiva		Passiva	
other assets	20	notes	50
gold-certificates	50	deposits of com.b's	520
loans to com.b's	0	ISA	0
ISA	93.33		
SOMA	406.67		
	570		570

District-FED 3

Aktiva		Passiva	
other assets	10	notes	20
gold-certificates	20	deposits of com.b's	60
loans to com.b's	0	ISA	139.17
SOMA	189.17		
	219.17		219.17

Commercial banks in District 3 need refinancing at September, 1st;
For example in volume of 150 USD to pay credit lines from the financial sector in District 1 and 2 (with shares 50:50)
Deposits and ISA-claims increase in Districts 1 and 2, decrease in District 3

District-FED 1

Aktiva		Passiva	
other assets	30	notes	100
gold-certificates	100	deposits of com.b's	755
loans to com.b's	0	ISA	0
ISA	120.83		
SOMA	604.17		
	855		855

District-FED 2

Aktiva		Passiva	
other assets	20	notes	50
gold-certificates	50	deposits of com.b's	595
loans to com.b's	0	ISA	0
ISA	168.33		
SOMA	406.67		
	645		645

District-FED 3

Aktiva		Passiva	
other assets	10	notes	20
gold-certificates	20	deposits of com.b's	60
loans to com.b's	150	ISA	289.17
SOMA	189.17		
	369.17		369.17

Settlement of ISA in April of the following year:

FED-1: 9*45.83+4*120.83	74.6
FED-2: 9*93.33+4*168.33	126
FED-3: 9*139.17+4*289.17	201

District-FED 1

Aktiva		Passiva	
other assets	30	notes	100
gold-certificates	100	deposits of com.b's	755
loans to com.b's	0	ISA	0
ISA	46.18		
SOMA	678.82		
	855		855

District-FED 2

Aktiva		Passiva	
other assets	20	notes	50
gold-certificates	50	deposits of com.b's	595
loans to com.b's	0	ISA	0
ISA	42.23		
SOMA	532.77		
	645		645

District-FED 3

Aktiva		Passiva	
other assets	10	notes	20
gold-certificates	20	deposits of com.b's	60
loans to com.b's	150	ISA	88.40
SOMA	-11.60		
	168.40		168.40

--> Settlement is not possible, SOMA volume of FED3 is too low.

APPENDIX D: OVERVIEW ON PUBLICATIONS INCLUDED IN THE THESIS

This dissertation includes, in full length or reworked and translated parts of, the following publications:

1. Voll, S. (2014) Institutional determinants of Balance of Payments dynamics: A first literature survey. Unpublished working paper, University of Jena.
2. Freytag, A. and Voll, S. (2012) Institutions and savings in developing and emerging economies. Public Choice, Vol. 157(3-4), pp. 475-509
3. Draper, P., Freytag, A. and Voll, S. (2011) Global financial crisis, protectionism and current account deficit: South Africa on the brink? World Economics, Vol. 12(2), pp. 129-152.
4. Burgold, P. and Voll, S. (2012) Begrenzung von TARGET2-Risiken – ein kritischer Überblick. Perspektiven der Wirtschaftspolitik, Vol.13, S.103-121.
5. Voll, S. (2012) ISA vs. TARGET2 - Ein Vergleich der Voraussetzungen für den effektiven Ausgleich von Zahlungsüberweisungssalden, Working Papers on Global Financial Markets No. 51, University of Jena

Of publications No. 1) and 5), sole contributing author is Sebastian Voll. Publications No. 2) and 4) are joint work of the mentioned authors. Sebastian Voll's contribution to publication 4) is solely section II of the cited paper, of which parts have been used for this thesis. For details, see the table below.

Thesis chapter/section	**Published as**	**Contributing author(s) for the parts in the thesis (contributions as shares in %)**
Chapter 2	Unpublished working paper	Sebastian Voll
Section 3.1, 3.2, 3.7	Freytag, A. and Voll, S. (2012) Institutions and savings in developing and emerging economies. Public Choice, Vol. 157(3-4), pp. 475-509	Andreas Freytag, Sebastian Voll (50-50)
Sections 3.3 - 3.6	Freytag, A. and Voll, S. (2012) Institutions and savings in developing and emerging economies. Public Choice,. Vol. 157(3-4), pp. 475-509	Sebastian Voll
Chapter 4	Draper, P., Freytag, A. and Voll, S. (2011) Global financial crisis, protectionism and current account deficit: South Africa on the brink? World Economics, Vol. 12(2), pp. 129-152.	Sebastian Voll

Section 5.2.1	Burgold, P. and Voll, S. (2012) Begrenzung von TARGET2-Risiken – ein kritischer Überblick. Perspektiven der Wirtschaftspolitik, Vol.13, S.103-121.	Peter Burgold , Sebastian Voll (90-10)
Sections 5.2.2 - 5.2.4	Voll, S. (2012) ISA vs. TARGET2 - Ein Vergleich der Voraussetzungen für den effektiven Ausgleich von Zahlungsüberweisungssalden, Working Papers on Global Financial Markets No. 51, University of Jena	Sebastian Voll
Section 5.3	Burgold, P. and Voll, S. (2012) Begrenzung von TARGET2-Risiken – ein kritischer Überblick. Perspektiven der Wirtschaftspolitik, Vol.13, S.103-121.	Peter Burgold, Sebastian Voll (60-40)
Section 5.4.1	Burgold, P. and Voll, S. (2012) Begrenzung von TARGET2-Risiken – ein kritischer Überblick. Perspektiven der Wirtschaftspolitik, Vol.13, S.103-121.	Peter Burgold, Sebastian Voll (90-10)
Section 5.4.2	Burgold, P. and Voll, S. (2012) Begrenzung von TARGET2-Risiken – ein kritischer Überblick. Perspektiven der Wirtschaftspolitik, Vol.13, S.103-121.	Peter Burgold, Sebastian Voll (60-40)
Section 5.5.1-5.5.4	Burgold, P. and Voll, S. (2012) Begrenzung von TARGET2-Risiken – ein kritischer Überblick. Perspektiven der Wirtschaftspolitik, Vol.13, S.103-121.	Peter Burgold, Sebastian Voll (50-50)
Section 5.5.5	Burgold, P. and Voll, S. (2012) Begrenzung von TARGET2-Risiken – ein kritischer Überblick. Perspektiven der Wirtschaftspolitik, Vol.13, S.103-121. Voll, S. (2012) ISA vs. TARGET2 - Ein Vergleich der Voraussetzungen für den effektiven Ausgleich von Zahlungsüberweisungssalden, Working Papers on Global Financial Markets No. 51, University of Jena	Peter Burgold, Sebastian Voll (20-80)
Sections 6.6-6.7	Voll, S. (2012) ISA vs. TARGET2 - Ein Vergleich der Voraussetzungen für den effektiven Ausgleich von Zahlungsüberweisungssalden, Working Papers on Global Financial Markets No. 51, University of Jena	Sebastian Voll

REFERENCES

Abiad, A., Detragiache, E. and Tressel, T. (2008) A new database of financial reforms. IMF Working Paper No WP/08/266, International Monetary Fund, Washington D.C.

Acemoglu, D. and Robinson, J. (2006) The economic origins of democracy and dictatorship. Harvard University Press, Harvard, MA.

Acemoglu, D., Johnson, S. and Robinson, J. (2001) The colonial origins of comparative development: An empirical investigation. American Economic Review Vol. 91, pp. 1369–1401.

Adams, R. (2012) Consolidation and merger activity in the United States banking industriy from 2000 throughout 2010. Finance and Economics Discussion Paper FedS 2012-51, Federal Reserve Board, Washington D.C.

Aizenman, J.; Pinto, B. and Radziwill, A. (2007) Sources for financing domestic capital – is foreign saving a viable option for developing countries? Journal of International Money and Finance, Vol. 26(5), pp. 682-702.

Albuquerque, R. (2003) The composition of international capital flows: risk sharing through foreign direct investment. Journal of International Economics Vol.1(2), pp. 353–383.

Alesina, A. and Dollar, D. (1998) Who gives foreign aid to whom and why? NBER Working Paper No. 6612, National Bureau of Economic Research, Washington D.C.

Alesina, A. and Weder, B. (1999) Do corrupt regimes receive less foreign aid? NBER Working Paper No. 7108, National Bureau of Economic Research, Washington D.C.

Alessi, R.and Lusardi, A. (1997). Consumption, saving and habit formation. Economic Letters, 55, 103-108.

Alfaro, L.; Salemli-Ozcan, K. and Volosovych, V. (2008) Why doesn t capital flow from rich countries to the poor. Review of Economics and Statistics. Vol. 90(2), pp. 347-368.

Alfaro, L.; Salemli-Ozcan, K. and Volosovych, V. (2011) Sovereigns, upstream capital flows and global imbalances. Tinbergen Institute Discussion Paper TI 2011 126/2, Tinbergen Institute, Amsterdam.

Allen, F., Beck, T., Carletti, E., Lane, P., Schoenmaker, D. and Wagner, W. (2011) Cross-border banking in Europe: implications for financial stability and macroeconomic policy. Centre for Economic Policy Research, London.

Allen, W. and Moessner, R. (2012) The liquidity consequences of the Euro area sovereign debt crisis. BIS working paper no. 390. Bank for International Settlement, Basel.

Anderson, J. and Marcoullier, D. (2002) Insecurity and the pattern of trade: an empirical investigation. The Review of Economics and Statistics, Vol. 84(2), pp. 342-352.

Apergis, N. and Tsoumas, Ch. (2009) A survey of the Feldstein-Horioka puzzle: What has been done and where we stand. Research in Economics, Vol. 63, pp. 64-76.

Arellano, M. and Bond, S. (1991) Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Review of Economic Studies, Vol. 58, pp. 277-297.

Arellano, M. and Bover, O. (1995) Another look at the instrumental variables estimation of error component models. Journal of Econometrics, Vol. 68, pp. 29-51.

Aysan, A.; Ersoy, Z. and Veganzones-Varoudakis, M.-A. (2008) What types of perceived governance indicators matter the most for private investment in Middle East and North Africa. CERDI Etudes et Documents 2008.2. Centre d'études et des recherches sur le dévelopment international, University of Auvergne, France.

Baldwin, R. (2013) Changing features of global value chains. In: Elms, D. and Low, P. (Eds.): Global value chains in a changing world. World Trade Organization, Geneva.

Bandiera, O., Caprio, G., Honohan P. and Schiantarelli, F. (2000) Does financial reform raise or reduce saving? The Review of Economics and Statistics, Vol. 82(2), pp. 239-263.

Barro, R. J. (1974). Are government bonds net wealth? Journal of Political Economy, Vol. 82, pp. 1095-1117.

Beach, W.and Kane, T. (2008). Measuring the 10 economic freedoms. In: Heritage Foundation (Ed.). 2008 Index of Economic Freedom report. Washington D.C. Chapter 4.

Beck, T.; Clarke, G.; Groff, A.; Keefer, P. and Walsh, P. (2001) New tools in comparative political economy: The database of political institutions. World Bank Economic Review, Vol. 15(1), pp. 165–176.

Benassy-Quere, A., Coupet, M. and Mayer, T. (2007) Institutional determinants of foreign direct investment. The World Development, Vol. 30(5), pp. 764-782.

Berkowitz, D., Moenius, J. and Pistor, K. (2006) trade, law, and product complexity. Review of Economics and Statistics, Vol. 88 (2), pp. 363- 373.

Berthelier, P., Desdoigts, A. and Aoudia, J. (2003) Presentation and Analysis of an Original Database of the Institutional Characteristics of Developing, in Transition and Developed Countries' (Mimeo, University of Bourgogne).

Besley, T. (1995) Property rights and investment incentives: Evidence from Ghana. Journal of Political Economy, Vol. 103(5), pp. 903-937.

Bhalla, S. (2007) Second among equals: The middle class kingdoms of China and India. Mimeo, Oxus Research and Investment, New Dheli. Available at http://www.oxusinvestments .com/files/pdf/NE20090106.pdf

Bijlsma, M. and Lukkezen, J. (2012) TARGET2 of the ECB vs. Interdistrict Settlement Account of the Federal Reserve, Blog entry on www.eurointelligence.com., 15. March 2012.

Bindseil, U. and König, J. (2011) The economics of TARGET2 balances. SFB 649 Discussion Paper 2011-035, Economic Risk, Humboldt-University, Berlin.

Bloningen, B. and Piger, J. (2011) Determinants of Foreign Direct Investment. NBER Working Paper No. 16704. National Bureau of Economic Research, Washington D.C.

Blundell, R.and Bond, S. (1998) Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, Vol. 87, pp. 115-143.

Bond, S. R. (2002) Dynamic panel data models: a guide to micro data methods and practice. Portuguese Economic Journal. Vol. 1(2), pp. 141-162.

Bordo, M. (1993) The Gold standard, Bretton Woods and other historical exchange rate regimes. A historical appraisal. NBER Working Paper No. 4310, National Bureau of Economic Research, Washington D.C.

Buch, C. (2000) Information or regulation. What is driving the international activities of commercial banks? Kiel Working Paper 1011, Institut für Weltwirtschaft, Kiel.

Buch, C. and de Long, G. (2004) Cross border bank mergers: what lures the rare animal? Journal of Banking & Finance, Vol. 28(9), S. 2077-2102.

Buiter, Willem, Ebrahim Rahbari und Jürgen Michels (2011): The implications of intra-Euro area imbalances in credit flows. CEPR Policy Insight No. 57, August 2011. Centre for Economic Policy Research, Brussels.

Bundesbank (2011) Die Entwicklung des TARGET2-Saldos der Bundesbank in: Monatsbericht März 2011, pp. 34-35.

Bundesbank (2013) Monthly Financial Statement, August 2013. Bundesbank, Frankfurt am Main.

Burda, M. (2013) Der nächste Schritt für die EZB wird der Schwierigste sein. Blogbeitrag on www.Ökonomenstimme.org/a/551 vom 25. Of June 2013

Burgold, P. and Voll, S. (2012a) Mythos TARGET2 – Ein Zahlungsverkehrssystem in der Kritik. Working Papers on Global Financial Markets No. 29. University of Jena.

Burgold, P. and Voll, S. (2012) Begrenzung von TARGET2-Risiken – ein kritischer Überblick. Perspektiven der Wirtschaftspolitik, Vol.13, S.103-121.

Ca'Zorzi, M., Chudik, A. and Dieppe, A. (2012) Thousands of models, one story: Current account imbalances in the global economy. Journal of International Money and Finance, Vol. 31, pp. 1319-1338.

Campos, J., Lien, D. and Pradhan, S. (1999) The impact of corruption on investment: Pre-dictability matters. World Development, Vol. 27(6), pp. 1059–1067.

Carluccio, J. and Fally, T. (2012) Global sourcing under incomplete capital markets. Review of Economics and Statistics Vol. 94, pp. 740-763

Carroll, C. D. (1992) The buffer-stock theory of saving: Some macroeconomic evidence, Brookings Papers on Economic Activity, 1992(2), pp. 61–156.

Carroll, C. D. (1997) Buffer-stock saving and the life cycle/permanent income hypothesis. The Quarterly Journal of Economics, Vol. 112(1), pp. 1-54.

Casella, A. (1999) Tradable deficit permits: Efficient implementation of the Stability Pact in the European Monetary Union. NBER Working Paper No. 7278, National Bureau of Economic Research, Washington D.C.

Cavallo, E. and Daude, C. (2011) Public investment in developing countries: A blessing or a course? Journal of Comparative Economics, Vol. 39(1), pp. 65-81.

Cecchetti, S.; McCauley, R. and McGuire, P. (2012) Interpreting TARGET2 balances. BIS working paper no. 393. Bank for International Settlement, Basel.

Chinn, M. and Ito, H. (2005) Current account balances, financial development and institutions: Essaying the world "saving glut." NBER Working Paper No. 11761, National Bureau of Economic Research, Massachusetts, M.A.

Chinn, M. and Ito, H. (2007) Current account balances, financial development and institutions: Essaying the world "saving glut." Journal of International Money and Finance, Vol. 26, pp. 546-569.

Chinn, M. and Prasad, E. (2003) Medium-term determinants of current accounts in industrial and developing countries: an empirical exploration. Journal of International Economics, Vol. 59, pp. 47-76.

Chinn, M. D. and Ito, H. (2008). A new measure of financial openness. Journal of Comparative Policy Analysis, 10(3),: 309-322.

Clark, C., Dhonncha, M., Godden, R., Loosveld, S., Phillips, L. and Voisin, M. (2012) Eurozone bulletin: Updating contingency plans. Linklaters Eurozone Bulletin, June 2012. Linklaters, London.

Congressional Budget Office (2012) Report on the Troubled Asset Relief Programme – October 2012. Congress of the United States. Washington D.C.

Congressional Budget Office (2013) Federal grants to state and local governments. Congress of the United States. Washington D.C.

Dawson, J. (1998) Institutions, investment and growth: New cross-country and panel data evidence. Economic Inquiry, Vol. 36, pp. 603-619.

Dawson, J. (2003) Causality in the freedom-growth relations. European Journal of Political Economy, Vol. 19, pp. 479-495.

de Grauwe, P. and Ji, Y. (2012) TARGET2 as a scapegoat for German errors. www.Voxeu.org , Center for Economic Policy Research, London.

de Grauwe, P. and Ji, Y. (2012) What Germany should fear most is its own fear. CEPS working Paper No. 368, September 2012. Center for European Policy Studies, Brüssel.

de Groot, H., Linders, P., Rietveld, P. and Subramanian, U. (2004) The institutional determinants of bilateral trade patterns. Kyklos, Vol. (57), pp. 103-123.

de Haan, J. and Siermann, C. (1998). Further evidence on the relationship between economic freedom and economic growth. Public Choice, Vol. 95(2), pp. 363–380.

de Haan, J. and Sturm, J.-E. (2000). On the relationship between economic freedom and economic growth. European Journal of Political Economy, Vol. 16(2), pp. 215–241.

de Haan, J., Lundström, S. and Sturm, J.-E. (2006). Market-oriented institutions and policies and economic growth: A critical survey. Journal of Economic Surveys, 20(2), 157-191.

de Santis, R. and Lührmann, M. (2009) On the determinants of external imbalances and net international portfolio flows. A global perspective. Journal of International Money and Finance.Vol. 28(5), pp. 880-901.

de Serres, A. and Pelgrin, F. (2003) The decline in private saving rates in the 1990s in OECD countries: How much can be explained by non-wealth determinants? OECD Economic Studies, Vol. 36(1).

de Soysa, I.and Neumayer, E. (2005) False prophet or genuine savior? Assessing the effects of economic openness on sustainable development, 1980-99. International Organization, Vol. 59, pp. 731-772.

Deardorff, A. (1998) Determinants of bilateral trade: Does gravity work in a neoclassical world? In: Frenkel, J. (Ed.) The regionalization of the world economy. National Bureau of Economic Research, Cambridge, MA.

Deaton, A. (1977) Involuntary saving through unanticipated inflation. The American Economic Review, Vol. 67(5), pp. 899-910.

Deaton, A. (1991) Saving and liquidity constraints. Econometrica, Vol. 59(5), pp. 1221-1248.

Debelle, G. and Faruqee, H. (1996) What determines the current account? A cross-section and panel approach. IMF Working Paper WP/96/58. International Monetary Fund, Washington D.C.

Defever, F. and Suedekum, J. (2014) Financial liberalization and the relationship-specificity of exports. Economics Letters, Vol. 122(3), pp. 375-379.

Demsetz, H. (1967) Towards a theory of property rights. American Economic Review, Papers and Proceedings, Vol. 57(1), pp. 347-359.

Dluhosch, B., Freytag, A. and Krüger, M. (1996) International competitiveness and the balance of payments: Do current account deficits and surpluses matter? Edward Elgar, Cheltenham.

Draper, P., Freytag, A. and Voll, S. (2011) Global financial crisis, protectionism and current account deficit: South Africa on the brink? World Economics, Vol. 12(2), pp. 129-152.

Du, J., Lu, Y. and Tao, Z. (2012) Institutions and FDI location choice: The role of cultural distances. Journal of Asian Economics, Vol. 23(3), pp. 210-233.

Dullien, S. and Schieritz, M. (2012) German savers should applaud the growing TARGET2 balances. Blog entry on www.VoxEU.org from May, 7th 2012, Center for Economic Policy Research, Brussels.

EBRD (2009) Transition report 2009 – recovery and reform. European Bank for Reconstruction and Development, London.

EBRD (2011) Transition report 2011 – crisis and transition: The people's perspective. European Bank for Reconstruction and Development, London.

Edwards, S. (1996) Why are Latin American savings rates so low? An international comparative analysis. Journal of Development Economics, Vol. 51(1), pp. 5-44.

Edwards, S. (2002) Does the current account matter? In: Edwards, S. and Frankel, J. (Eds.) Preventing currency crisis in emerging markets. National Bureau of Economic Research, Washington, D.C.

Eichengreen, B., Mehl, A., Chițu, L. and Richardson, G. (2014) Mutual assistance between Federal Reserve Banks, 1913-1960 as prolegomena to the TARGET2 debate. NBER Working Paper No. 20267. National Bureau of Economic Research, Washington D.C.

Eicher, T.and Leukert, A. (2009) Institutions and economic performance: endogeneity and parameter heterogeneity. Journal of Money, Credit and Banking, Vol. 41(1), pp. 197-219.

European Central Bank (2011) Implementation of Monetary Policy in the Euro Area. European Central Bank, Frankfurt am Main.

European Central Bank (2012) Collateral eligibility of bonds issued or guaranteed by the Greek government. Press release, 20. Juli 2012. European Central Bank. Frankfurt am Main.

European Central Bank (2013a) Decision of the European Central Bank from 26th of September 2013 on additional measures relating to Eurosystem refinancing operations and eligibility of collateral. European Central Bank, Frankfurt am Main.

European Central Bank (2014) Convergence Report. European Central Bank, Frankfurt am Main.

European Commission (2009) Economic forecast – spring 2009. The European Commission, Brussels.

European Commission (2012) Proposal for a directive of the European Parliament and of the Council establishing a framework for the recovery and resolution of credit

institutions and investment firms and amending Council Directives 77/91/EEC and 82/891/EC, Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC and 2011/35/EC and Regulation (EU) No 1093/2010. Com(2012)/288/3. European Commission, Brüssel.

European Commission (2013) Romania: Balance of Payments assistance programme 2013-2015. Occasional Paper 165. European Commission, Brussels.

European Commission (2014) Macroeconomic imbalances. Bulgaria 2014. Occasional Paper 273. European Commission, Brussels.

European Commission (2014a) Macroeconomic imbalances. Hungary 2014. Occasional Paper 280. European Commission, Brussels.

European Union (2012) Protokoll Nr. 4 über die Satzung des Europäischen Systems der Zentralbanken and der Europäischen Zentralbank. Amtsblatt der Europäischen Union, C326/230 vom 26.10.2012.

European Union (2012a) Treaty on the establishment of a European Stability Mechanism. T/ESM 2012.

European Union (2012b) Leitlinien der Europäischen Zentralbank vom 20. September 2011 über geldpolitische Instrumente and Verfahren des Eurosystems. Amtsblatt der Europäischen Union, vom 14.12.2011. EZB/2011/14.

Fahrholz, C. and Freytag, A. (2011) Realwirtschaftliche Aspekte der gegenwärtigen Krise im Eurosystem: Ursachen, Wirkungen und Reformansätze Whither the TARGET2 System?, in Applied Economics Quarterly, Konjunkturpolitik, Vol. 57 (1), pp.15-25.

Fahrholz, C. and Wojcik, C. (2010) The Bail-Out! Positive political economics of Greek-type crisis in the EMU. CESifo Working Paper No. 3178. CESifo-Gruppe, München.

Faria, A. and Mauro, P. (2009) Institutions and the external capital structure of countries. Journal of Money and Finance, Vol. 28(2), pp. 367-391.

Faruq, H. (2011) How institutions affect export quality. Economic Systems, Vol. 35, pp. 586-606.

Federal Open Market Committee (1975) Minutes of the Meeting of the Federal Open Market Committee of 14th and 15th of April, 1975. Board of Governors of the Federal Reserve System. New York.

Federal Reserve Bank of Dallas (1921) 7th Annual Report of 31st Dezember 1921. Federal Reserve Bank of Dallas, Dallas.

Federal Reserve Bank of New York (2008) Annual Report. Consolidated Financial Statements. New York.

Federal Reserve Bank of New York (2009) Domestic open market operations during 2008. Report presented to the Federal Open Market Committee. Federal Reserve Bank of New York.

Federal Reserve Bank of New York (2009a) Annual Report. Consolidated Financial Statements. New York.

Federal Reserve Bank of New York (2013) Domestic open market operations during 2012. Report presented to the Federal Open Market Committee. Federal Reserve Bank of New York.

Federal Reserve Bank of Richmond (2008) Report of Independent Auditors: Financial Statements. Richmond.

Federal Reserve Bank of Richmond (2009) Report of Independent Auditors: Financial Statements. Richmond.

Federal Reserve Bank of St. Louis (2013) Federal Reserve Economic Data. http://research.stlouisfed.org/fred2

Federal Reserve Board (2012) 99th Annual Report 2012. Board of Governors of the Federal Reserve System. New York, 2012.

Federal Reserve Board (2013) Financial accounting manual for Federal Reserve Banks. Board of Governors of the Federal Reserve System. New York, 2013.

Feldstein, M. and Horioka, Ch. (1980) Domestic savings and international capital flows, Economic Journal, Vol. 90, pp. 314-329.

Flood, R. and Garber, P. (1984) Collapsing Exchange Rate Regimes: Some Linear Examples. Journal of International Economics, Vol.17, pp. 1-14.

Francois, J. and Manchin, M. (2013) Institutions, Infrastructure and Trade. World Development, Vol. 46, pp. 165-175.

Freytag, A.and Paldam, M. (2011). Comparing good and bad borrowing in developing countries - a study of twin cases. GFinM Working Paper 31-2012, University of Jena, Germany.

Freytag, A. and Voll, S. (2013) Institutions and savings in developing and emerging economies. Public Choice, Vol. 157(3-4), pp. 475-509.

Friedman, M. (1957). A theory of the consumption function. Princeton University Press.

Garber, P. (1998) Notes on the Role of TARGET in a Stage III crisis. NBER working paper series No. 6619. National Bureau of Economic Research, Cambridge, MA.

Garibaldi, P., Mora, N., Sahay, R. and Zettelmeyer, J. (2002) What moves capital to transition economies? IMF Working Paper No. WP/02/64, International Monetary Fund, Washington D.C.

Gersovitz, M. (1991) Saving and development. In: Chenery, H. and Srinivasan, T.N. (1991) Handbook of development economics, 381-424. North-Holland, Amsterdam.

Glaeser, E. L., Porta R., Lopez-de-Silanes, F. and Shleifer A. (2004) Do institutions cause growth? Journal of Economic Growth, 9, 271-303.

Goodhart, C. (1988) The evolution of central banks. MIT Press, Cambridge, MA.

Greenaway, D. and Kneller, R. (2007) Firm heterogeneity, exporting and foreign direct investment. The Economic Journal, Vol. 117, pp. 134-161.

Grigoli, F. and Mills, Z. (2011) Do high and volatile levels of public investment suggest misconduct? Policy Research Working Paper WPS 5735, The World Bank, Washington.

Grigonyte, D. (2010) FDI and structural reforms in the Baltic States. ECOFIN Country Focus, Vol. 7(5), pp. 1-8.

Gruber, J. and Kamin, S. (2008) Do differences in financial development can explain the pattern of global current account imbalances? International Finance Discussion Paper Series, No. 923. Board of Governors of the Federal Reserve System, New York.

Gwartney, J. and Lawson, R. (2009) Economic freedom of the World. 2009 annual report. The Fraser Institute, Vancouver, Canada.

Gwartney, J., Lawson, R. and Hall, J. (2013) Economic freedom of the world 2013 annual report. The Fraser Institute, Vancouver.

Gwartney, J., Holcombe, R. and Lawson, R. (2006) Institutions and the impact of investment on growth. Kyklos, Vol. 59(2), pp. 255-273.

Hackley, H. (1973) Lending Functions of the Federal Reserve Banks: A History. Board of Governors of the Federal Reserve System. New York. Available at http://fraser.stlouisfed.org/docs/publications/books/lendfunct_hackley1973o.pdf

Hadenius, A. and Teorell, J. (2005) Assessing alternative indices of democracy. Committee on Concepts and Methods Working Paper No. 6. Committee on Concepts and Methods, Mexico City.

Hakkala, K., Norbäck, P. and Svaleryd, H. (2005) Asymmetric effects of corruption on FDI: Evidence from Swedish multinational firms. Working Paper No. 641, The Research Institute of Industrial Economics, Stockholm.

Hall, R. (1978) Stochastic implications of the life cycle-permanent income hypothesis. Journal of Political Economy, Vol. 86(6), pp. 971-987.

Hall, R. and Jones, C. (1999) Why do some countries produce so much more output per worker than others? The Quarterly Journal of Economics, Vol. 114(1), pp. 83-119.

Haque, N., Pesaran, M. and Sharma, S. (1999). Neglected heterogeneity and dynamics in cross-country savings regressions. IMF Working Paper No.99/128. International Monetary Fund, Washington D.C.

Harberger, A. (1950) Currency depreciation, income and the balance of trade. Journal of Political Economy Vol. 58, pp. 47–60.

Hausmann, R. and Fernandez-Arias, E. (2000) Foreign Direct Investment: Good cholesterol? Research Department Working Paper 416, Inter-American Development Bank, Washington D.C.

Heston, A., Summers, R.and Aten, B. (2011) Penn World Table Version 7.0, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, June 2011.

Higgins, M. (1998) Demography, national savings and international capital flows. International Economic Review, Vol. 39(2), pp. 343-369.

Holmes, K., Johnson, B. and, Kirkpatrick, M. (1998) 1998 Index of Economic Freedom. Heritage FoundationrWall Street Journal, Washington, DC.

IMF (2009) Balance of Payments and international investment position manual. 6th edition. International Monetary Fund, Washington D.C.

IMF (2014) Hungary. IMF country report No. 14/155. International Monetary Fund, Washington D.C.

Jansen, M. and Nordas, H. (2004) Institutions, trade policy and trade flows. Staff Working Paper ERDS-2004-02. World Trade Organization, Geneva.

Kaplinsky, R. (2006) Revisiting the revisited terms of trade. Will China make a difference? World Development, Vol.34(6), pp. 981-995.

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2010) The worldwide governance indicators : A summary of methodology, data and analytical issues. World Bank

Policy Research Working Paper No. 5430. The World Bank, Washington D.C. Data update September 2013.

Keefer, P. and Knack, S. (2007) Boondoggles, rent-seeking and political checks and balances: public investment under unaccountable governments. Review of Economics and Statistics, Vol. 89(3), pp. 566–572.

Kerdrain, C., Koske, I. and Wanner, I. (2011) Current account imbalances: Can structural reforms help to reduce them? OECD Journal: Economic Studies, Vol. 2011, pp. 31-74.

Kim, K. (1990) Exports and savings in developing countries. Journal of Economics, Vol. 16, pp. 175-178.

Kindleberger, C. P. (1963) International Economics, 3rd edition, Richard D. Irwin Inc., Homewood, Illinois.

Knack, S. and Keefer, P. (1995) Institutions and economic performance: Cross-country tests using alternative institutional indicators. MPRA paper No. 23118. Munich University Library.Munich.

Kohler, W. (2011) Zahlungsbilanzkrisen in der Währungsunion. Griechenland in der Rolle des Reservewährungslandes? Ifo Schnelldienst Vol.64(16), S. 12-19.

Koning, J.P. (2012) The idiots guide to the federal reserve interdistrict settlement account. Blog entry, Moneyness – www.jpkoning.blogspot.com 5. February 2012.

Koning, J.P. (2013) Without proper balancing forces, Hans-Werner Sinn's "European ISA" will be destabilizing. Blog entry, Moneyness – www.jpkoning.blogspot.com

Kooths, S. and van Royne, B. (2012) Nationale Geldschöpfung im Euroraum. Kieler Diskussionsbeiträge No.508/509. Institut für Weltwirtschaft, Kiel.

Krugman, P. (1979) A Model of Balance of Payments Crisis. Journal of Money Credit and Banking Vol.11, S.311-325.

Lamine, B. (2010) Estonia: Towards a swift current account rebalancing. ECOFIN Country Focus, Vol. 8(6), pp. 1-7.

Laursen, S. and Metzler, L. (1950) Flexible exchange rates and the theory of employment. Review of Economics and Statistics, Vol. 32, pp. 281–299.

Lawson, R.and Clark, J. (2010) Examining the Hayek-Friedman hypothesis on econonomic and political freedom. Journal of Economic Behavior and Organization, Vol. 74(3), pp. 230-239.

Levchenko, A. (2007) Institutional quality and international trade. Review of Economic Studies, Vol. 74, pp. 791-819.

Li, Q. and Resnick, A. (2003) Reversal of fortunes: Democratic institutions and foreign direct investment into developing countries. International Organization, Vol. 50(1), pp. 175-211.

Loayza, N., Schmidt-Hebbel, K.and Servén, L. (2000) What drives private saving across the world? The Review of Economics and Statistics, Vol. 82(2), pp. 165-181.

Lothian, J. (2006) Institutions, capital flows and financial integration. Journal of Money and Finance, Vol. 25(3), pp. 358-369.

Lubik, Thomas A. und Karl Rhodes (2012) TARGET2: Symptom, not cause of Eurozone woes. Economic Brief EB12-08, The Federal Reserve Bank of Richmond.

Maizels, A. (1968) Exports and economic growth of developing countries. Cambridge University Press. Cambridge, MA.

Marshall, M. and Jaggers, K. (2002) Polity IV Project: Political regime characteristics and transitions, 1800-2002: Dataset users' manual. Maryland: University of Maryland.

Masson, P. R, Bayoumi, T. and Samiei, H. (1998) International evidence on the determinants of private saving. The World Bank Economic Review, Vol. 12(3), pp. 483-501.

Mauro, P. (1995) Corruption and growth. The Quarterly Journal of Economics. Vol. 110(3), pp. 681-712.

Meon, P.-G. and Sekkat, K. (2008) Institutional quality and trade. Economic Inquiry. Vol. 46(2), pp. 227-240.

Milesi-Ferretti, G. M.and Lane, P. R. (2006) The external wealth of nations mark II: revised and extended estimates of foreign assets and liabilities, 1970-2004. IMF Working Papers 06/69, International Monetary Fund.

Modigliani, F. (1966) The life cycle hypothesis of saving, the demand for wealth and the supply of capital. Social Research, Vol. 33(2).

Modigliani, F.and Brumberg, R. (1954) Utility analysis and the consumption function: An interpretation of cross-section data in Kurihara, K. (ed.) Post-Keynesian economics. Rutgers University Press.

Morrissey, O. and Udomkerdmongkol, M. (2011) Governance, foreign direct investment and private investment in developing countries. World Development, Vol. 40(3), pp. 437-445

Neumann, M. (2011) Refinanzierung der Banken treibt TARGET Verschuldung. Ifo Schnelldienst, Vol. 64(16), S. 25-28.

Nickell, S. (1981) Biases in dynamic models with fixed effects. Econometrica, Vol. 49, pp. 1417-1426.

Nicolini, M. and Paccagnini, A. (2011) Does trade foster institutions? Review of Economics and Institutions, Vol. 2(1), pp. 1-20.

North, D. (1991) Institutions. Journal of Economic Perspectives, Vol. 5(1), pp. 97-112.

Nunn, N. (2007) Relationship-specifity, incomplete contracts, and the pattern of trade. The Quarterly Journal of Economics, Vol. 122(2), pp. 569-600.

Obstfeld, M. (1989) Rational and self-fulfilling balance of payments crisis. American Economic Review, Vol.76(1), S. 72-81.

Obstfeld, M. and Rogoff, K. (1996) The intertemporal approach to the current account. NBER Working Paper No. 4893. National Bureau of Economic Research, Washington, D.C.

Papaioannou, E. (2009) What drives international financial flows? Politics, institutions and other determinants. Journal of Development Economics, Vol. 88(2), pp. 269-281.

Persson, T. (2004) Consequences of constitutions. Journal of the European Economic Association, 2, 139-161.

Prebisch, R. (1950) The Economic Development of Latin America and its Principal Problems. Economic Bulletin for Latin America, Vol. 7(1), 1-22.

Ranjan, P. and Lee, J. (2007) Contract enforcement and international trade. Economics & Politics, Vol. 19(2), pp. 191-218.

Rauch, J. (1999) Networks vs. markets in international trade. Journal of International Economics, Vol. 48, pp. 7-35.

Rodrik, D. (2000) How far will international economic integration go? Journal of Economic Perspectives, Vol. 14(1), pp. 177-186.

Rodrik, D., Subramanian, A. and Trebbi, F. (2004) Institutions rule: the primacy of institutions over geography and integration in economic development. Journal of Economic Growth, Vol. 9, pp. 131-165.

Roodman, D. (2006) How to do xtabond2: An introduction to "difference" and "system" GMM in Stata. Center for Global Development Working Paper No. 103, Washington D.C.

Council of Economic Advisors (2012) Jahresgutachten 2012/2013: Stabile Architektur für Europa – Handlungsbedarf im Inland. Council of Economic Advisors zur Begutachtung der gesamtwirtschaftlichen Entwicklung. Wiesbaden, 2012.

Sachs, J. (1981) The current account in the macroeconomic adjustment process. Scandinavian Journal of Economics Vol. 84, pp. 147-159

Sarkar, P. and Singer, H. (1991) Manufactured exports of developing countries and their terms of trade since 1965. World Development, Vol. 19(4), pp. 330-400.

Schlesinger, H. (2011) Die Zahlungsbilanz sagt es uns. ifo-Schnelldienst 2011, Vol. 64 (16), S. 9-11.

Schmidt-Hebbel, K., Webb, S., and Corsetti, G. (1992) Household saving in developing countries: First cross-country evidence. The World Bank Economic Review, Vol. 6(3), pp. 529-547.

Schrooten, M. and Stephan, S. (2005) Private savings and transition. Dynamic panel data evidence from accession countries. Economics of Transition, Vol. 13(2), pp. 287-309.

Scully, G. and Slottje, D. (1991) Ranking economic liberty across countries. Public Choice, Vol. 69(1), pp. 121–152.

Sen, K. and Athukorala, P. (2003) The determinants of private saving in India. World Development, Vol. 32(3), pp. 491-503.

Sergi, B. and Vit, K. (2004) How to rationalize the export-saving paradigm. Prague Economic Papers Vol. 2, pp. 115-120.

Siebert, H. (1989) The half and the full debt cycle. Weltwirtschaftliches Archiv, Vol. 125, pp. 217–229.

Singer, H. (1950) U.S. Foreign Investment in Underdeveloped Areas: The Distribution of Gains Between Investing and Borrowing Countries. American Economic Review, Papers and Proceedings, Vol. 40, pp. 473-485.

Sinha, D. (1999) Do exports promote savings in Africa? MPRA-paper No. 18058, Munich University Library, Munich.

Sinn, H.-W. (2011) The ECB 's stealth bailout. Blogbeitrag auf www.VoxEu.org vom 01. Juni 2011. http://www.voxeu.org/index.php?q=node/6599.

Sinn, H.-W.(2011a) Neue Abgründe. Wirtschaftswoche Nr. 8, 21. February 2011, p. 35.

Sinn, H.-W. (2011b) The ECB's stealth bailout. www.voxeu.org, 1. June 2011.

Sinn, H.-W. (2011c) The ECB's secret bailout strategy, Blog Entry on www.project-syndicate.org from April 29th, 2011. http://www.projectsyndicate.org/ commentary/sinn37/ English.

Sinn, H.-W. and Wollmershäuser, T. (2012) Target loans, current account balances and capital flows: the ECB's rescue facility. International Journal of Tax and Public Finance, Vol. 19(4), pp. 468-508.

Sinn, H.W. and Wollmershäuser, T. (2011) Target-Kredite, Leistungsbilanzsalden und Kapitalverkehr: Der Rettungsschirm der EZB. Ifo Working Paper No. 105, Ifo-Institute, Munich.

Smarzynska, B. and Wei, S. (2000) Corruption and the composition of FDI – firm level evidence. NBER Working Paper 7969. National Bureau of Economic Research, Washington D.C.

Sobel, R. and Coyne, S. (2011) Time-series properties of country institutional measures. Journal of Law and Economics, Vol. 54(1), pp. 111-134.

Swaleheen, M. (2008) Corruption and savings in a panel of countries. Journal of Macroeconomics, Vol. 30, pp. 1285-1301.

Tanzi, V. and Davoodi, H. (1997) Corruption, public investment, and growth. IMF Working Paper WP/37/139. International Monetary Fund, Washington D.C.

Teorell, J. Samanni, M. Holmberg, S. and Rothstein, B. (2011) The Quality of Government Dataset, version 6Apr11. University of Gothenburg: The Quality of Government Institute, http://www.qog.pol.gu.se.

Terrones, M.and Cardarelli, R. (2005) Global imbalances: A saving and investment perspective. World Economic Outlook 2005, chapter II, 91-124. International Monetary Fund, Washington, D.C.

Tobin, J. (1967) Life cycle saving and balanced growth. In Fellner, W. (Ed.) Ten economic studies in the tradition of Irving Fisher: 231-256, Chapter 9. John Wiley: New York.

Transparency International (2013) Corruptions perception index 2013. Transparency International, Berlin.

Voll, S. (2012) ISA vs. TARGET2 - Ein Vergleich der Voraussetzungen für den effektiven Ausgleich von Zahlungsüberweisungssalden, Working Papers on Global Financial Markets No. 51, University of Jena

von Böhm-Bawerk, E. (1914) Unsere passive Handelsbilanz. In: Weiss, F. (Ed.): Gesammelte Schriften von Eugen von Böhm-Bawerk, Sauer und Auvermann, 1968. Frankfurt am Mai, S. 499-515.

von Hagen, J. (1998) Geldpolitik auf neuen Wegen. In: Deutsche Bundesbank (Ed.) Fünfzig Jahre Deutsche Mark. Notenbank und Währung in Deutschland seit 1948. C.H. Beck, Munich.

Warf, B. and Cox, J. (1996) Spatial dimensions of the savings and loan crisis. Growth and Change, Vol.27(2), S. 135-155.

Wei, S. (2000) How taxing is corruption on international investors? Review of Economics and Statistics Vol. 82(1), pp. 1–11.

Wei, S. (2000a) Local corruption and global capital flows. Brookings Papers on Economic Activity 2, 303–354.

Wei, S. (2001) Domestic crony capitalism and international fickle capital: is there a connection? International Finance 4 (1),15–45.

Wei, S. and Wu, Y. (2002) Negative alchemy? Composition of capital flows, and currency crises. NBER Working Paper No. 8187, National Bureau of Economic Research, Washington D.C.

Westermann, F. (2014) TARGET2 balances. www.Eurocrisismonitor.com, University of Osnabrück.

Whelan, K. (2011) Professor Sinn Misses the Target. www.voxeu.org, 9. June 2011.

Whittaker, J. (2011) Eurosystem debts, Greece, and the role of banknotes, Monetary Research, Lancaster University Management School, 14. November 2011.

Wilburgh, W. and Hague, M. (1992) An investigation of the export expansion hypothesis. Journal of Development Studies, Vol. 28(2), pp. 297-313.

Williamson, O. (2000). The New Institutional Economics: Taking stock, looking ahead. Journal of Economic Literature, Vol. 28(3), pp. 595-613.

Windmeijer, F. (2005) A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics, Vol. 126, pp. 25-51.

Yan, H. and Yang, C. (2012) Are there different linkages between foreign capital inflows and the current account between industrial countries and emerging markets? Empirical Economics, Vol. 43, pp. 25-54.

Zeldes, Stephen (1989) Consumption and liquidity constraints. An empirical investigation. Journal of Political Economy, Vol. 97(2), pp. 305-346.