Current Account Adjustment and Exchange Rate Regimes

MSc Thesis in International Economics & Finance

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Abstract

There is a general belief by the majority of policymakers and academicians that the current account convergence is more rapid under more flexible exchange rate regimes, which is in line with what Friedman supported on his essay (1953). Recently, a small number of studies has attempted to evaluate whether Friedman's hypothesis is confirmed by the data. The aim of this dissertation is to examine whether exchange rate regimes affect the current account adjustment. The results are in favor with the common belief. Using a panel of different groups of countries, in a general first order autoregressive model (AR(1)), over the 1970-2016 period, we can observe that for the group of 189 countries (Full Sample), the OECD country members, the Lower Middle income countries and the High Income countries there is tendency for the current account to adjust faster under more flexible regimes, which is in line with Friedman's hypothesis. However, considering the Low income countries the current account adjustment is more rapid under more fixed regimes.

Chapter 1

Introduction

1.1 Dissertation Theme and Motivation

It is a fact that worldwide imbalances are something very usual in the history of economics. The relationship between the trade balance (and by extension on the current account balance) with the exchange rate regime is very important and very interesting too. An overvalued currency making the domestic goods and services more expensive and less competitive, decreasing exports and increasing imports as foreign goods and services are cheaper. This has as a result the increase of current account deficit (or a lower current account surplus). On the other hand, considering an undervalued currency, domestic goods and services are less expensive and more competitive in the international markets, increasing exports and decreasing imports as foreign goods and services are more expensive. Thus, the current account surplus increases (or the current account deficit decreases). These days, discussions on global imbalances are about the relationship between exchange rate flexibility and external adjustment. In the greatest time of Bretton Woods Monetary System and Agreement, Friedman (1953) supported that more flexible exchange rates would facilitate external adjustment, helping countries avoid damaging crises of the balance of payment by allowing markets to adjust, absorbing all the imbalances. Especially for deficit countries, the exchange rate would depreciate (i.e. loses value), to regain the lost competitiveness and decrease the deficit, when for economies with surplus, the exchange rate would appreciate (i.e. gains value), loosing competitiveness and decreasing the surplus. Considering, more fixed exchange rate regimes, for deficit countries the adjustment depends entirely on more rigid goods and factor prices, whereas for surplus countries the adjustment mechanism would not be compelling.

Until recently the empirical validity of Friedman's hypothesis has not been tested. In the last years there were several attempts that tried to examine whether Friedman's hypothesis is in line with the data or not, but formal evidence on the link between exchange rate regimes and external convergence is scant and surprisingly inconsistent. Chinn and Wei (2013), for example, find no clear evidence that the current account convergence is associated with the exchange rate regimes. On the other hand, Ghosh, Terrones and Zettelmeyer (2010), are in favor with Friedman's suggestion, referring to

results that a more flexible nominal exchange rate regime facilitates the external adjustment.

The aim of this dissertation is to draw these attempts and to reinvestigate the relationship in the data between exchange rate regimes and the current account convergence. Here, we have to notice that we care about the speed of current account convergence, we are not making the claim that there is relationship between a rapid current account adjustment and a higher welfare level. The relationship between welfare and exchange rate regime depends on whether the financial market is complete, and prices are flexible and whether exporters chiefly follow local currency pricing or producer currency pricing, among other things. So, the main purpose of this dissertation is to investigate in which exchange rate regime the current account adjustment is faster

By experimenting with a large number of statistical specifications, we find that for the following groups of countries Full sample, OECD sample, High Income countries and Lower Middle income countries, there is evidence in the data for the notion that countries on a more flexible exchange rate regime exhibit a faster adjustment of their current account balance, when we include control variables such as trade, capital flows openness, GDP per capita in PPP terms, inflation and real effective exchange rate. However, considering the Low income countries the current account convergence is faster under more rigid regimes.

1.2 Review Literature

The majority of the empirical literature that tries to examine the link between exchange rate regimes and the convergence of the current account is relatively recent. We have to notice that, the theoretical joint analysis of exchange rate and current account balances goes a long way back in the bibliography, with Kouri (1976) and Dornbusch (1980). The benchmark hypothesis of the relationship between current account adjustment and exchange rate regimes is Friedman's suggestion (1953). Friedman (1953) claims that flexible exchange rates allow for a faster current account convergence. Chinn & Wei (2013) was the first empirical analysis that tried to examine the link between exchange rate regimes and current account adjustment. Chinn and Wei doubt the common belief that current account convergence is more rapid in a more flexible exchange rate regime. They use an annual data over the 1971-2005 period from more than 170 countries, and by the means of autoregressive analysis try to find out

whether the speed of current account adjustment depends on the exchange rate regime. They used a de facto rate regime classification based on Levy-Yeyati and Sturzenegger (2003) and Reinhart and Rogoff (2004). Controlling key variables, such as trade and financial openness, they do not find a straightforward evidence for the notion that a less fixed exchange rate regime accommodates the current account adjustment. Moreover, they supported that the real exchange rate is that one that affects the external convergence and not the nominal exchange rate regime. Additionally, to the previous results, they find that the nominal exchange rate flexibility does not linked with the speed of convergence in real exchange rates.

Ghosh, Terrones and Zettelmeyer (2010), showed in their paper that Friedman's suggestion does enjoy empirical support when it looked under different angle, based on cross-country evidence on the size of current account imbalances and the ratio of large current account reversals. Large current account reversals very rarely occur under less fixed regimes, and they involve much lower initial imbalances than current account reversals under intermediate and fixed regimes. This result is closely related to what Friedman seem to have had in his mind, when he argued that flexible exchange rates "tend to produce corrective movements before tensions can accumulate and crisis." In general, this paper concludes that large current account imbalances are more persistent under more rigid regimes whereas small current account imbalances are less persistent under more flexible regimes.

The methodology was followed by Chinn and Wei motivate Ghosh, Qureshi and Tsangarides (2014). They supported that the main reason, that existing studies do not find a straightforward link between exchange rate flexibility and external convergence, is because the existing studies use the aggregate exchange rate regime classification which do not differentiate the degree of exchange rate flexibility across various trading partners. This is the reason why in their analysis they use the bilateral exchange rate arrangements and trade flows across countries. Using bilateral trade data, they conclude that more flexible exchange rate regimes are associated with economically and statistically significantly more rapid external convergence.

Another important contribution to the question whether exchange rate variability affects the speed of current account adjustment was came from Clower and Ito's paper (2012). Their paper's results are in favor with Friedman's suggestion by showing that increasing the fixity of the exchange rate increases the probability of entering into local non-stationary episodes. For their analysis they use a Markov – switching specification

to identify temporary high – persistence episodes in the current account series, and then run a probit regression of the dummies corresponding to these cases on a set of potential determinants, which includes countries' exchange rate regimes. The main results of interest for our purposes is that among emerging and developing countries, countries with fixed exchange rate arrangement tend to enter into these non-stationary episodes, especially when experiencing negative balances.

Belger and Nitsch (2014) find in their paper that trade imbalances among euro area member countries have increased after the introduction of the common currency (euro). This increase went along with a higher degree of persistence, which appears to make the impact of shocks on external accounts more intense. These findings are in line with other papers which support that imbalances have a tendency to decrease among trade partners with higher degree of flexibility of the nominal exchange rate, and that bilateral trade surplus are decreasing in the real exchange rate, which will move slower in the absence of nominal exchange rate flexibility. Herrmann (2009) considers a more limited sample by using data only for emerging European countries. Instead of using a dummy variable approach to identify different exchange rate regimes, she chooses to rely on the degree of exchange rate volatility. She finds evidence that greater degree of exchange rate flexibility goes hand in hand with a significantly faster adjustment of the current account balance, which adds further support to the empirical validity of Friedman's hypothesis.

Fernando Eguren-Martin (2015), shows that recent papers which are against Friedman's hypothesis are not robust. Considering an alternative exchange rate regime classification, he found convincing evidence that current account persistence increases under more fixed exchange rate arrangements for non-industrial countries. Pancaro (2013) studies current account reversals in industrial countries across different exchange rate regimes. There are two major findings which have important implications for industrial economies with external imbalances: firstly, triggers of current account reversals differ between exchange rate regimes. Secondly, current account reversals in advanced economies do not have an independent effect on growth. This result holds not only for industrial economies in general but also for countries with fixed exchange rate regimes. Edwards (2004)[1] claimed that based on the empirical analysis that took place

[1] Sebastian Edwards (2014) also try to examine the relationship between sudden stops and current account reversals, to what extends the financial openness affect the probability of a country being subject to a current account reversal and if the openness play a role in determining the effect the of

in his paper that countries with more flexible exchange rate regimes are able to accommodate better shocks stemming from a reversal than countries with more rigid exchange rate regimes.

This dissertation follows Chinn and Wei in using a simple and general framework to analyze current account dynamics, while is also relies on a *de – facto* exchange rate classification. However, we focus on an alternative source for the exchange rate regime classification and in different country samples.

1.3 Dissertation Overview

Chapter 2 starts with a briefly analysis about the difference between fixed and flexible exchange rate regimes and continuous with a representation of the history of exchange rate regimes the last 140 years in the world. In Chapter 3 we start to analyze the methodology which is used in order to identify the relationship between the current account adjustment under different exchange rate regimes. Additionally, we present all the data are used in statistical analysis.

Chapter 4 contains the models are used in this dissertation. It starts with the *Benchmark model*, which investigates the relationship between the current account adjustment under different exchange rate regimes without controlling variables. It continuous with the *Trade and capital flows openness model*, which investigates the relationship between current account convergence and exchange rate regimes including trade and capital flow openness as controlling variables. Afterwards, it takes place the *GDP per capita in PPP terms model*, at which we include the GDP per capita in PPP terms as controlling variable. Subsequently is presented the *Inflation model* at which is included the inflation as control variable in order to examine how the inflation affects the relationship between current account adjustment and exchange rate regimes. Following the inflation model, we have the *Real effective exchange rate model* at which is investigated how the value of a currency against a weighted average of several foreign currencies, i.e. the real effective exchange rate affects the relationship between current account adjustment and exchange rate regimes.

current account reversals on economic performance. Briefly, the results of the analysis is that sudden stops and current account reversals have been closely related. Furthermore, current account reversals have a negative effect on real growth and that financial openness does not appear to be related to the intensity with which reversals affect real economic performance.

In Chapter 5 we have three extension models, at first, we examine the relationship between current account adjustment and exchange rate regime considering countries with different central government debt. Secondly, we present a model in order to investigate how the reversion of real effective exchange rate is affected by the nature of the nominal exchange rate regime. Thirdly, we present a model in order to examine under which regime the response of real effective exchange rate is more intense. Chapter 6 contains a conclusion about the results. Following conclusion, it takes place the Bibliography, a country appendix, an exchange rate classification appendix and a data appendix.

Chapter 2

In this chapter we want to present some general information about exchange rate regimes.

2.1 Fixed Vs. Floating Exchange Rate

An exchange rate is the rate at which one currency can be exchanged for another. There are two ways the price of a currency can be determined against another. A fixed rate is a rate which is adopted by the central bank authority as the official exchange rate (hence the price of the currency is determined by the central bank based on the needs of the economy). The monetary authority intervenes by buying or selling domestic currency on the foreign exchange market, in order to prevent the excess supply or the excess demand of its own currency to affect the rate. The second way to price a currency is by letting the forces of the demand and the supply to determine the price of currency without interventions by monetary authority. In that case we have the floating exchange rate which is determined on the market of foreign currency. Exchange rate is very important variable to be left in the markets because affects all kinds of transactions, and this is the reason why in most cases the governments intervene to set the nominal exchange rate.

A pegged currency is closely related with stability and this is the reason why a government decide to fix its own currency. Especially developing nations which are characterized by low real income level and hence low investments, might choose a more fixed currency in order to gain stability and attract foreign investments. Under a fixed currency, foreign investors will always know the value of their investments, and daily fluctuations on the nominal exchange rate do not worry them. Additionally, a more fixed currency can also help the price level to decrease generating demand, because of greater confidence in the stability of the currency.

However, we must notice that fixed regimes can often lead to severe financial crises, since a peg is difficult to maintain in the long run period. Very important examples are the Mexican (1995), Asian (1997) and Russian (1997) financial crises: an attempt to maintain a high value of the local currency to the peg resulted in the currencies eventually becoming overvalued. Basically, this meant that the economies had not the amount of foreign reserves in order to satisfy the demand for foreign currency against

the domestic one. Under speculations and the fear of losing their money, investors and individuals hastened to convert their money into the foreign currency before the domestic currency lost its value, leading the foreign reserves in short supply. And as the supply of foreign reserves was very low, monetary authorities were not able any more to maintain the peg.

It is a fact that economies which have a fixed exchange rate regime are linked with very weak financial system and regulating institutions. Hence economies by adopting, a pegged regime have the ability to increase the level of stability in that unstable environments. On the other hand, countries with strong financial system and in general a very stable environment can maintain a more flexible regime. Furthermore, we have to notice that when a country depreciates its currency has to make some economic reforms in order strengthen its financial institutions.

2.2 A brief history of Exchange rates

From 1876 to 1913, the exchange rate system was dependent on the respective currency's comparative convertibility to an ounce of gold. However, the fact that the gold standard was suspended during the World War I, made the way which the exchange rate was determined to be accessed again. Following the suspension of the gold standard in 1914 was the collapse of the exchange rate market. In the early 1920s, it took place an attempt by some countries to revive the gold standard to get the old exchange system back into practice, but the fact that United States were hit by the Great Depression in 1929, make all plans about the revision of the gold standard to be abandoned.

After the World War II the policymakers all around the world were dominated by two preoccupations: first, to find the most appropriate methods to accommodate the reconstruction of European economies (at which the effects of World War II were devastating) and, second, to prevent a return the competitive devaluations and protectionism that had characterized the 1930s. The British and US governments established the International Monetary Fund (IMF), which was intended to police a system of fixed exchange rates known universally as the Bretton Woods system. The Bretton Woods system worked on a principle known as the Gold Exchange Standard.

Under this arrangement the USA operated a fully-fledged Gold Standard – in other words, it pledged to keep the dollar price of gold fixed irrevocably (at the price of $35 per ounce), by standing ready to exchange gold for US currency on demand via the so-called Gold Window. The USA anchored the system as a whole, by virtue of the fixed dollar price of gold. Other countries then had to accommodate themselves by changing their exchange rates when required.

The Bretton Woods system was last till 1971. By 1970, the existing exchange rate system was already under threat, and the system finally broke down on 15 August 1971 when President Nixon announced the closing of the Gold Window. The fact that the supply of the US dollar had exceeded its demand led in, the Smithsonian Agreement to be signed. The Smithsonian Agreement had as a result for the first time in exchange rate history, the market forces of supply and demand to determine the exchange rate. The Smithsonian Agreement did not last for a long time. By 1973, the extensively traded currencies were permitted to fluctuate. In a floating currency system, a currency's value can vary in keeping with the conditions of the foreign exchange market.

Over the 1979 – 1993 period we have the European Monetary System, at which the member countries of EU (except for UK) fixed the values of their currencies against each other in a so-called parity grid. The EMS disintegrated in two stages. The first crisis resulted in the departure of the UK and Italy on 16 September 1992. The final agony came a year later, when the French authorities gave up the battle to prevent the franc falling below its floor against the DM. The main conclusion after the collapse of the EMS, was that, in a world of free capital movements fixed exchange rate regimes doomed to failure.

Rather than adopting a floating exchange rate regime, EU policymakers found the opportunity to make a deal about a full monetary union with a single currency for all member countries. The details were finalized at the Maastricht Conference of December 1991, which set a start date of 1 January 1999 for the translation into the new currency of all wholescale dealing. This union is known as European Monetary Union and stands until today.

Chapter 3

In this section we explain our econometric specifications and the definitions and sources of the key variables.

3.1 Methodology

We want to examine the relationship between the current account adjustment and exchange rate regimes. In order to do this, we follow Chinn and Wei (2013), and we estimate the current account persistence, using a simple first order auto-regressive AR (1) model:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \eta_{it} \quad (1)$$

Where CA_{it} is the current account in GDP ratio in country i and year t.[2] The closer the autoregressive coefficient ρ_1 is to one the slower the adjustment in response to shocks, i.e. the current account is more persistent (and the speed of convergence is lower). Hence, if Friedman's hypothesis held we would expect that floating exchange rate regimes to display a lower autoregressive coefficient, since that would imply less persistence of the current account.

The equation (1) does not provide any information about whether exchange rate regimes affect the current account convergence. Hence, for the purpose of examining whether the persistence of the current account is affected by the exchange rate regime, equation (1) can be augmented with interacting binary dummy variables for each regime. Thus, we can estimate the differential effects in a single regression. In this case our model can be represented in general as:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_{0j} \sum_{j}^{k} regime_{jit} + \theta_{1j} \sum_{j}^{k} (CA_{it-1} \times regime_{jit}) + \eta_{it} \quad (2)$$

Where the variable *regime* describes dummy variable corresponding to any of the exchange rate regime categories used based on Ilzetzki, Ethan, Carmen M. Reinhart

[2] We check for higher-order autoregressive terms and find that an AR (1) is sufficient for the annual data.

and Kenneth S. Rogoff (2017) classification. (We allow for both country fixed effects and year fixed effects[3], which does not alter the basic conclusion of the paper.)

Afterwards, we want to control for other structural variables that might also affect the rate of current account reversion. We augment the equation (2) with level and interaction effects, hence are model can be represented as:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_{0j} \sum_{j}^{k} regime_{jit} + \theta_{1j} \sum_{j}^{k} (CA_{it-1} \times regime_{jit}) + control_{it} + \eta_{it} \quad (3)$$

where the list of *control* includes different measures of economic openness, including trade and financial openness, and other variables such as GDP per capita in PPP terms, Inflation and Real Effective Exchange Rate. All variables that were mentioned above will be described in greater detail below.

(All the models will be implemented by Stata which is general-purpose statistical software package.)

3.2 Database Description

Current account balance, Trade Openness, Inflation consumer prices, GDP per capita, PPP and Real effective exchange rate index are from World Bank's *World Development Indicators. Current account balance* is the sum of net exports of goods and services, net primary income, and net secondary income. *Trade openness* is the sum of exports and imports of goods and services measured as a share of gross domestic product. *Inflation, consumer prices* is the inflation as measured by the consumer price index reflects the annual percentage change, in the cost to the average consumer of acquiring a basket of goods and services, that may be fixed or changed at specified intervals, such as yearly. *GDP per capita (PPP)* is the total economic output produced by all residents converted to international dollars using the purchasing power parity. *Real effective exchange rate* is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. For Capital account openness, we use the Chinn and Ito (2006) financial openness index. This measure is the first principal component of four

[3] The fixed effects for both country and year allows each year in each country to have a separate intercept. In other words, it allows fully flexible yearly time trends for each country.

categories of restrictions on external transactions, including dual foreign exchange rates, restrictions on current account transactions, restrictions on capital account transactions, and finally the surrender of export proceeds.

The fine de facto[4] exchange rate regime variables come from one source: Ilzetzki, Ethan, Carmen M. Reinhart and Kenneth S. Rogoff (2017) measure. The Ilzetzki, Reinhart, and Rogoff (2017) ranges from 1-15, for more to less fixity exchange rate. We stratify the series into three categories. The first category is fixed (from no separate legal tender or currency union to de facto peg), the second category is intermediate (from pre-announced crawling peg de facto moving band narrower than or equal to +/-1% to pre-announced crawling band that is wider than or equal to +/-2%) and the third category is for floating exchange rate regime (de facto crawling band that is narrower than or equal to +/-5% to freely floating)[5].

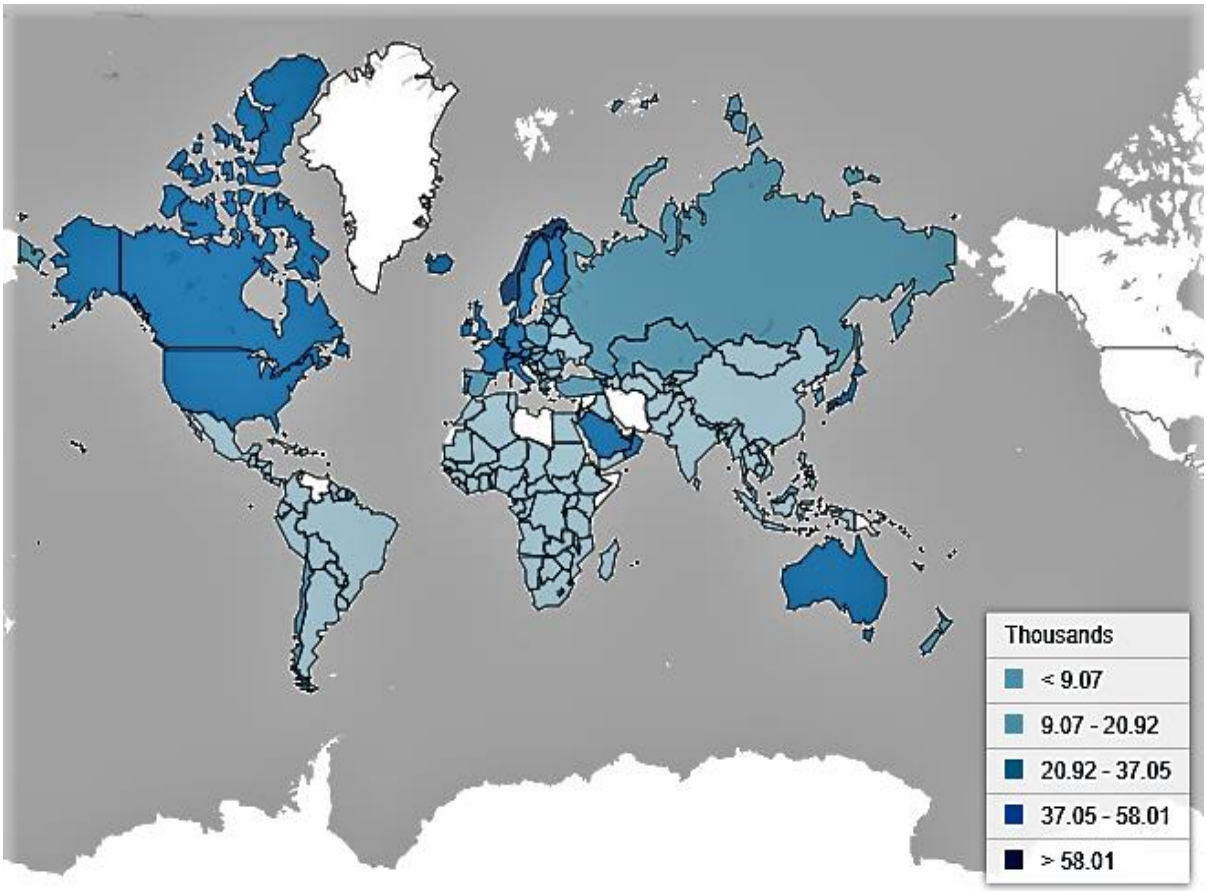
Our analysis is taken place over 1970-2016 period under different group of countries. The *Full Sample* at which we have 189 countries (including developed, developing and emerging countries). The *OECD sample* (OECD[6] - Organization for Economic Co-operation and Development at which we can observe countries many of the world's most advanced countries, but also emerging countries like Mexico, Chile and Turkey). Furthermore, we distinguish countries depending on Gross National Income per capita (GNI per capita). GNI per capita is the sum of all goods which are produced by all resident within a year. Based on this criterion we end up with *High Income countries sample* (includes countries in which 2015 GNI per capita was $12.476 or more), *Lower Middle Income countries sample* (includes countries in which 2015 GNI per capita was between $1.026 and $4.035) and *Low Income countries sample* (includes countries in which 2015 GNI per capita was $1.025 or less).

[4]The de facto exchange rate regime can be defined as what a countries government actually does in regard to its exchange rate system despite what it claims. On the other hand, the de jure index can be defined as what a countries government 'claims' to do and in regard with the bipolar view

[5] This means we have omitted the ''freely falling'' regime observations (category 14), following Graciela Kaminsky's observation that such episodes are fundamentally distinct from freely floating. Additionally, we have omitted the 15th observations as data is missing.

[6] OECD is an international organization of those developed countries support the principles of representative democracy and the free market economy.

Figure 1 - GNI per capita, PPP (current international $) 2015 (Source: World development indicator)



Chapter 4

Statistical Analysis and Results

In this section we represent analytically the statistical analysis we use to check the relationship between exchange rate regime and current account adjustment.

4.1 Benchmark Model

In this model we want to estimate the differential effects of each exchange rate regime up to current account balance, in a single regression using dummies for each regime without controlling variables. For the purposes of this analysis, in the benchmark model we use the equation (2) as mentioned in section 3.2. The dependent variable of the model is the current account. As explanatory variables we use the lagged current account, the flexible and the intermediate regimes in the form of dummy variables. Additionally, in order to be able to examine the effect of each regime up to current account we use as independent variables the interaction terms of flexible and intermediate regimes with the lagged current account. Thus, the benchmark model has the following form:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_0 Intermediate_{it} + \theta_1 Flexible_{it} + \\ +\theta_3(CA_{it-1} \times Intermediate_{it}) + \theta_4(CA_{it-1} \times Flexible_{it}) + \eta_{it}$$

Using the regression output (Table 1) we present the results obtained by running the regression of the benchmark model. We can observe that for the *Full Sample* the degree of current account persistence is 0.664 under more fixed exchange rate regimes, 0.390 under intermediate regimes and 0.5303 under the less fixed exchange rate regimes. Thus, the current account convergence is higher under intermediate regimes. Taking into account the *OECD Sample* we have that the ratio of current account persistence is 0.8560 under more fixed exchange rate regimes, 0.726 under intermediate regimes and 0.7429 under the less fixed exchange rate regimes. Hence, we can support that for the OECD sample the current account adjustment is more rapid under intermediate regimes. Regarding the *High Income countries sample*, the rate of current account persistence is 0.6304 under the most fixed exchange rate regimes, 0.189 under intermediate regimes and 0.6815 under more flexible regimes. So again, the intermediate regimes facilitate a more rapid convergence of current account. In the *Lower Middle Income countries sample*, we can observe that the rate of current account persistence is 0.6054 under more fixed regimes, 0.5789 under intermediate regimes and 0.4338 under more flexible regimes. Hence, increasing degrees of fixity lead to greater persistence of current account balance, so the current account adjustment is more rapid under more flexible exchange rate regimes, which is in accord with Friedman's hypothesis. Considering the sample of *Low Income countries*, the degree of current account persistence is 0.5183 under the less flexible regimes, 0.542 under intermediate

regimes and 0.608 under more flexible exchange rate regimes. Hence increasing degrees of flexibility lead to greater persistence of current account balance. Interestingly, now the current account convergence is more rapid under more rigid exchange rate regimes.

TABLE 1 - CURRENT ACCOUNT PERSISTENCE, BY COUNTRY SAMPLE

VARIABLES	(1) Full Sample	(2) OECD Sample	(3) High Income	(4) Lower Middle Income	(5) Low Income
CA(-1)	0.663***	0.856***	0.630***	0.605***	0.518***
	(0.0408)	(0.0273)	(0.0569)	(0.0707)	(0.0823)
Intermediate Regime	-1.346**	0.389	-0.720	0.101	-3.208
	(0.580)	(0.311)	(0.637)	(0.711)	(2.494)
Flexible Regime	-0.428	0.199	-0.0912	-0.442	-1.228
	(0.462)	(0.240)	(0.476)	(0.887)	(1.945)
CA(-1) × Intermediate	-0.273**	-0.130**	-0.441***	-0.0265	0.0237
	(0.117)	(0.0538)	(0.0484)	(0.0644)	(0.115)
CA(-1) × Flexible	-0.133**	-0.113***	0.0510	-0.172*	0.0901
	(0.0637)	(0.0312)	(0.0732)	(0.101)	(0.0926)
Constant	-2.076***	-0.326	-0.0241	0.665*	-4.757
	(0.564)	(0.466)	(0.491)	(0.359)	(4.255)
Observations	4,873	1,108	1,645	1,318	628
R-squared	0.310	0.672	0.237	0.417	0.461
Number of countries	172	35	53	47	23

Robust standard errors in parentheses.
The symbols *,**,*** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

*As a base exchange rate regime we have the Fixed regime. Thus, the autoregressive coefficient of the lagged current account describes the rate of current account persistence under fixed regimes.
In order to observe the degree of current account persistence under intermediate and flexible regimes, we have to add {CA (-1) + [CA(-1) × Intermediate]} and {CA(-1) + [CA(-1) × Flexible]}.
Below is represented the rate of current account persistence under intermediate and flexible exchange rate regime respectively.

CA(-1) + [CA(-1) × Intermediate]	0.390***	0.726***	0.634***	0.5789***	0.542***
	(0.123)	(0.0768)	(0.056)	(0.033)	(0.0649)
CA(-1) + [CA(-1) × Flexible]	0.530***	0.742***	0.6815***	0.4338***	0.608***
	(0.545)	(0.0289)	(0.045)	(0.067)	(0.060)

4.2 Openness to Trade and Capital Flows Model

Two key missing explanatory variables are trade openness and capital account openness. One might assume that greater trade openness makes it easier for trade accounts to respond to real exchange rate variations and consequently is linked with a faster current account adjustment. On the other hand, a higher degree of capital account openness makes an economy more sensitive to financing shocks, which might have as a result in more frequent current account reversals. Without taking into account the influence of trade and capital account openness, the accurate relationship between exchange rate regimes and current account convergence may be more difficult to detect.

A number of variables could be used to mandate for trade and capital account openness. For trade openness, we use the sum of imports and exports to GDP ratio. On the capital account openness side, we appeal to the Chinn and Ito (2006) financial openness index. We use the equation (3) as mentioned in section 3.2, as we want to estimate the differential effects of each exchange rate regime up to current account balance in a single regression using dummies for each regime, including control variables for trade and capital flows openness.

The dependent variable is the current account. As explanatory variables we have the lagged current account, the flexible and the intermediate regimes in the form of dummy variables. Additionally, in order to examine the effect of each regime up to current account we use as independent variables the interaction terms of flexible and intermediate regimes with the lagged current account. Furthermore, as control variables are included the trade openness and the capital flows openness, and the interaction terms of trade and capital flows openness with lagged current account. The form of the model is used in this case is the following:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_0 Intermediate_{it} + \theta_1 Flexible_{it} + \\ + \theta_3 (CA_{it-1} \times Intermediate_{it}) + \theta_4 (CA_{it-1} \times Flexible_{it}) + \theta_5 TradeOpennes_{it} \\ + \theta_6 FinancialOpenness_{it} + \theta_7 (CA_{it-1} \times TradeOpenness_{it}) + \\ + \theta_8 (CA_{it-1} \times FinancialOpenness_{it}) + \eta_{it}$$

TABLE 2 - CURRENT ACCOUNT PERSISTENCE WITH OPENNESS, BY COUNTRY SAMPLE

VARIABLES	(1) Full Sample	(2) OECD Sample	(3) High Income	(4) Lower Middle Income	(5) Low Income
CA(-1)	0.613***	0.697***	0.808***	0.524***	0.454***
	(0.0850)	(0.0704)	(0.173)	(0.147)	(0.0682)
Intermediate	-1.153**	0.629**	-0.453	-0.0508	-2.067
	(0.525)	(0.294)	(0.770)	(0.569)	(2.491)
Flexible	-0.270	0.439*	-0.117	-0.777	-0.0147
	(0.511)	(0.255)	(0.753)	(0.820)	(1.853)
CA(-1) × Intermediate	-0.245***	-0.0573	-0.474***	0.0331	0.0664
	(0.0785)	(0.0508)	(0.0461)	(0.100)	(0.123)
CA(-1) × Flexible	-0.0864	-0.0576	-0.00688	-0.0511	0.0904
	(0.0609)	(0.0535)	(0.0630)	(0.133)	(0.0997)
Trade Openness	-0.0242	0.0273**	-0.0330	-0.0161	-0.105***
	(0.0156)	(0.0101)	(0.0290)	(0.0142)	(0.0260)
Financial Openness	0.0255	0.898**	2.222	-0.137	2.566
	(0.601)	(0.413)	(1.452)	(1.167)	(1.904)
CA(-1) × Trade Openness	0.00134***	-0.00165***	-0.00195	0.000519	-0.00199***
	(0.000313)	(0.000602)	(0.00163)	(0.00105)	(0.000573)
CA(-1) × Financial Openness	-0.189*	0.294***	0.0444	0.00122	0.324***
	(0.104)	(0.0546)	(0.135)	(0.169)	(0.0746)
Constant	-0.456	-2.667***	0.964	3.316	0.457
	(1.215)	(0.692)	(1.712)	(4.071)	(4.458)
Observations	4,423	1,032	1,501	1,184	577
R-squared	0.321	0.676	0.234	0.415	0.444
Number of countries	161	34	49	45	22

Robust standard errors in parentheses.
The symbols *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

*As a base exchange rate regime we have the Fixed regime. Thus, the autoregressive coefficient of the lagged current account describes the rate of current account persistence under fixed regimes. In order to observe the degree of current account persistence under intermediate and flexible regimes, we have to add {CA (-1) + [CA (-1) × Intermediate]} and {CA(-1) + [CA(-1) × Flexible]}. Below is represented the rate of current account persistence under intermediate and flexible exchange rate regime respectively.

CA(-1) + [CA(-1) × Intermediate]	0.367***	0.639***	0.334*	0.5566***	0.520***
	(0.058)	(0.069)	(0.1701)	(0.1092)	(0.1271)
CA(-1) + [CA(-1) × Flexible]	0.526***	0.639***	0.801***	0.4724***	0.544***
	(0.077)	(0.056)	(0.161)	(0.117)	(0.102)

Using the regression output (Table 2), we present the results obtained by running the regression of the openness to trade and capital flows model. We can observe that for the *Full Sample* the rate of current account persistence is 0.613 under more fixed

exchange rate regimes, 0.367 under intermediate regimes and 0.526 under the less fixed regimes. Hence, we can conclude that the current account convergence is more rapid under intermediate regimes. Regarding the *OECD sample*, the degree of current account persistence is 0.697 under the more fixed regimes, 0.6399 under intermediate regimes and 0.6396 under the more flexible exchange rate regimes. So, we can observe that current account balance is more rigid under more fixed exchange rate regimes and the adjustment of it is faster under more flexible regimes. In *High Income countries sample*, the degree of current account persistence is 0.808 under less flexible exchange rate regimes, 0.334 under intermediate regimes and 0.801 under less rigid regimes. Thus, intermediate regimes facilitate the convergence of current account balance. For the *Lower Middle Income countries sample*, we can observe that the current account adjustment is more rapid under flexible exchange rates as the rate of current account persistence is 0.5235 under more fixed regimes, 0.5566 under intermediate regimes and 0.4724 under less fixed exchange rate regimes. Here, we can observe that the convergence of current account balance is faster under more flexible regimes, but we have to notice that as the degree of exchange rate fixity increases and tends to more fixed exchange rate regimes the current account persistence has a tendency to decline. Considering, *Low Income countries sample*, the rate of current account persistence is 0.453 for more fixed regimes, 0.52 for intermediate exchange rate regimes and 0.544 for more flexible regimes. Thus, a greater degree of exchange rate fixity goes hand in hand with a more rapid convergence of the current account balance.

4.3 GDP per capita in PPP terms Model

In this section we want to examine how the gross domestic product affects the relationship between current account convergence and exchange rate regimes. We use the equation (3), as mentioned in section 3.2, because we want to estimate the differential effects of each exchange rate regime up to current account balance in a single regression using dummies for each regime, including control variables for trade, capital flows openness and for gross domestic product. The most appropriate variable to represent the gross domestic product is the GDP per capita (PPP).

The dependent variable of this model is the current account. As explanatory variables we have the lagged current account, the flexible and the intermediate regimes in the form of dummy variables. Additionally, we use as independent variables, the interaction terms of flexible and intermediate regimes with the lagged current account. Furthermore, as control variables are included the trade openness, the capital flows openness and the interaction terms for trade and capital flows openness with lagged current account. Finally, we add the GDP per capita based on purchasing power parity. Hence, in this section our model has the following form:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_0 Intermediate_{it} + \theta_1 Flexible_{it} + \\ + \theta_3 (CA_{it-1} \times Intermediate_{it}) + \theta_4 (CA_{it-1} \times Flexible_{it}) + \theta_5 TradeOpennes_{it} \\ + \theta_6 FinancialOpenness_{it} + \theta_7 (CA_{it-1} \times TradeOpenness_{it}) + \\ + \theta_8 (CA_{it-1} \times FinancialOpenness_{it}) + \theta_9 GDP_{it} + \eta_{it}$$

Using the Regression output (Table 3) we present the results obtained by running the regression of the GDP per capita in PPP terms model. We can observe that for the *Full Sample* the rate of current account persistence is 0.554 for more fixed exchange rate regimes, 0.4224 for intermediate regimes and 0.4069 for more flexible exchange rate regimes. Thus, the greater degree of exchange rate flexibility accommodates the current account adjustment as the current account persistence is higher as the fixity of exchange rate regime increasing. Regarding the *OECD sample*, the degree of current account persistence is 0.651 for less flexible regimes, 0.5908 for intermediate regimes and 0.557 for more flexible regimes. Hence, by decreasing the fixity of exchange rate regime has as a result a faster adjustment of current account balance. Taking under consideration the *High Income countries sample*, the rate of current account persistence is 0.539 under more fixed regimes, 0.384 for intermediate exchange rate regimes and 0.468 under more flexible exchange rate regimes. So, we can observe that the current account convergence is faster under intermediate exchange rate regimes. Taking into account the *Lower Middle Income countries sample,* the rate of current account persistence is lower for more flexible regimes as it is equal to 0.6149, is 0.699 under intermediate exchange rate regimes and 0.7556 for more fixed regimes. So, a greater degree of exchange rate flexibility goes hand in hand with a faster convergence of the current account balance. Considering, the *Low Income countries sample*, the degree of current account persistence is 0.715 under more fixed regimes, 0.844 under more intermediate regimes and 0.793 under more flexible exchange rate regimes. Thus, in contrast with the other countries samples the adjustment of current account balance is faster under

more fixed exchange rate regimes. However, the current account persistence is very high for each regime.

TABLE 3 - CURRENT ACCOUNT PERSISTENCE WITH GDP PER CAPITA IN PPP, BY COUNTRY SAMPLE

VARIABLES	(1) Full Sample	(2) OECD Sample	(3) High Income	(4) Lower Middle Income	(5) Low Income
CA(-1)	0.554***	0.651***	0.540***	0.756***	0.715***
	(0.0786)	(0.102)	(0.0942)	(0.141)	(0.120)
Intermediate	-0.240	0.466	-0.304	0.0863	2.022
	(0.385)	(0.366)	(0.513)	(0.660)	(1.522)
Flexible	0.108	0.0295	-0.730	0.447	1.630
	(0.520)	(0.339)	(0.591)	(0.903)	(1.371)
CA(-1) × Intermediate	-0.132**	-0.0601	-0.155***	-0.0566	0.130
	(0.0558)	(0.0592)	(0.0402)	(0.111)	(0.116)
CA(-1) × Flexible	-0.147***	-0.0938	-0.0740	-0.141	0.0778
	(0.0547)	(0.0618)	(0.0577)	(0.178)	(0.105)
Trade Openness	-0.0188	0.0312***	-0.00387	-0.0233	-0.151***
	(0.0188)	(0.0108)	(0.0142)	(0.0191)	(0.0374)
Financial Openness	0.547	0.882	1.936	1.384	1.776
	(0.669)	(0.907)	(1.382)	(1.573)	(2.301)
CA(-1) × Trade Openness	0.00140***	-0.00135**	2.66e-05	-0.00110	-0.00574***
	(0.000297)	(0.000622)	(0.000368)	(0.00118)	(0.000962)
CA(-1) × Financial Openness	-0.0407	0.291***	0.198***	-0.0468	-0.236***
	(0.0797)	(0.0899)	(0.0643)	(0.205)	(0.0653)
GDP	0.000116***	-1.93e-05	0.000131*	-0.000372	0.00436
	(3.47e-05)	(4.21e-05)	(7.72e-05)	(0.000277)	(0.00264)
Constant	-0.507	-3.162***	-1.870	0.0212	-2.895
	(1.633)	(1.139)	(1.882)	(1.906)	(3.655)
Observations	3,221	764	1,081	863	391
R-squared	0.443	0.638	0.508	0.415	0.373
Number of countries	160	34	49	44	22

Robust standard errors in parentheses.
The symbols *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

*As a base exchange rate regime we have the Fixed regime. Thus, the autoregressive coefficient of the lagged current account describes the rate of current account persistence under fixed regimes.
In order to observe the degree of current account persistence under intermediate and flexible regimes, we have to add {CA (-1) + [CA (-1) × Intermediate]} and {CA (-1) + [CA(-1) × Flexible]}.
Below is represented the rate of current account persistence under intermediate and flexible exchange rate regime
respectively.

lcurrentaccount-intermediate	0.422***	0.5908***	0.384***	0.6990***	0.844***
	(0.058)	(0.134)	(0.104)	(0.1233)	(0.104)
lcurrentaccount-flexible	0.406***	0.557***	0.465***	0.6149***	0.793***
	(0.0727)	(0.117)	(0.098)	(0.201)	(0.103)

4.4 Inflation Model

It is a fact that as inflation in an economy increases, the prices of goods in the domestic market rise. This situation has as a result, products to be more expensive and hence the economy to be less competitive in the international markets. This makes the current account balance weaker. In this model we want to examine the role of inflation as control variable in the relationship between current account adjustment and exchange rate regimes. For the purpose of this section we have to add as a control variable the inflation, hence we have to use the equation (3) as mentioned in 3.2.

The dependent variable of this model is the current account. As explanatory variables we have the lagged current account, the flexible and the intermediate regimes in the form of dummy variables. Additionally, we use as independent variables the interaction terms of flexible and intermediate regimes, with the lagged current account. Furthermore, as control variables are included the trade openness and the capital flows openness and the interaction terms for trade and capital flows openness with lagged current account. Moreover, we add the GDP per capita based on purchasing power parity, and finally, we add the Inflation in to observe how the effect of this variable over our analysis. Hence, in this section our model has the following form:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_0 Intermediate_{it} + \theta_1 Flexible_{it} + \\ + \theta_3(CA_{it-1} \times Intermediate_{it}) + \theta_4(CA_{it-1} \times Flexible_{it}) + \theta_5 TradeOpennes_{it} \\ + \theta_6 FinancialOpenness_{it} + \theta_7(CA_{it-1} \times TradeOpenness_{it}) + \\ + \theta_8(CA_{it-1} \times FinancialOpenness_{it}) + \theta_9 GDP_{it} + \theta_{10} Inflation_{it} + \eta_{it}$$

Taking into account the regression output (Table 4) we present the results obtained by running the regression of Inflation model. We can observe that for the *Full Sample* the degree of current account persistence is 0.577 under more rigid regimes, 0.434 under intermediate exchange rate regimes and 0.405 under more flexible regimes. Hence, we can support that by increasing the exchange rate fixity the current account persistence is higher hence the more flexible exchange rate regimes the faster is the convergence of current account balance. Considering the *OECD sample*, we have that the rate of current account persistence is 0.629 under more fixed regimes, 0.5746 under intermediate exchange rate regimes and 0.542 under more flexible regimes. Thus, the more flexible regimes the faster is the current account adjustment. Regarding the *High Income countries sample* the degree of current persistence is 0.551 under more rigid regimes, 0.384 under intermediate regimes and 0.462 under more flexible exchange rate regimes. So, the convergence of current account balance is more rapid under intermediate regimes. Regarding, the *Lower Middle Income countries sample* we can observe that the rate of current account persistence is 0.8076 under less flexible regimes, 0.6134 under intermediate exchange rate regimes and 0.5239 under more flexible regimes. Hence, a greater degree of exchange rate flexibility goes hand in hand with a more rapid adjustment of current account balance. Considering the *Low Income countries sample* we have that the degree of current

account persistence is higher under intermediate regimes as it is equal to 0.905, under more flexible regimes the rate of persistence is 0.813 and under more fixed exchange rate regimes is 0.765. Thus, for low income countries the current account convergence is faster under more rigid regimes which is against the conventional belief.

Figure 2 - Inflation Consumer Price (annual%), 2016 (Source: World Development Indicator)

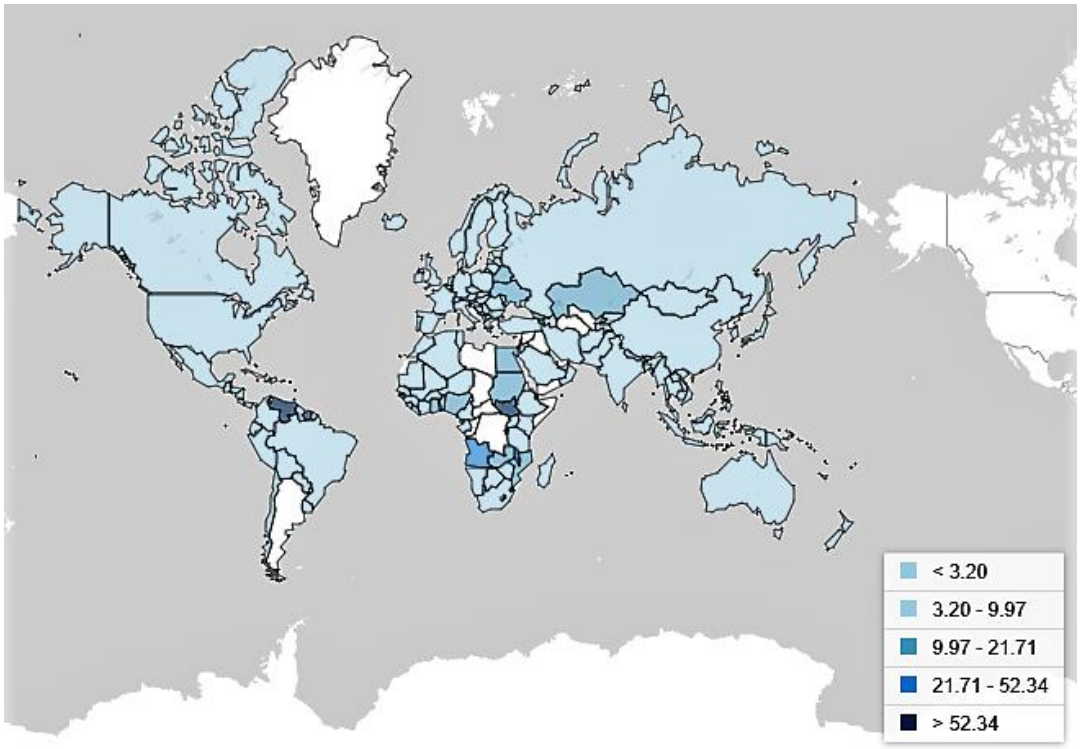


TABLE 4 - CURRENT ACCOUNT PERSISTENCE WITH INFLATION, BY COUNTRY SAMPLE

VARIABLES	(1) Full Sample	(2) OECD Sample	(3) High Income	(4) Lower Middle Income	(5) Low Income
CA(-1)	0.577***	0.629***	0.551***	0.808***	0.765***
	(0.0779)	(0.110)	(0.0937)	(0.148)	(0.100)
Intermediate	-0.149	0.541	-0.285	0.146	2.355*
	(0.404)	(0.361)	(0.516)	(0.664)	(1.246)
Flexible	0.189	0.136	-0.748	0.434	1.467
	(0.531)	(0.297)	(0.597)	(0.917)	(1.250)
CA(-1) × Intermediate	-0.142**	-0.0546	-0.167***	-0.194**	0.140
	(0.0552)	(0.0581)	(0.0360)	(0.0806)	(0.0872)
CA(-1) × Flexible	-0.172***	-0.0870	-0.0886	-0.284**	0.0483
	(0.0514)	(0.0609)	(0.0589)	(0.137)	(0.0903)
Trade Openness	-0.0187	0.0318***	-0.00587	-0.0201	-0.145***
	(0.0193)	(0.0109)	(0.0129)	(0.0178)	(0.0401)
Financial Openness	0.753	1.191	1.732	2.670*	0.514
	(0.655)	(0.939)	(1.305)	(1.529)	(2.126)
CA(-1) × Trade Openness	0.00139***	-0.00129**	-5.76e-05	-0.00113	-0.00565***
	(0.000280)	(0.000630)	(0.000393)	(0.00111)	(0.00110)
CA(-1) × Financial Openness	-0.0260	0.306***	0.212***	0.126	-0.236**
	(0.0764)	(0.0953)	(0.0649)	(0.109)	(0.112)
GDP	0.000101***	-3.02e-05	0.000119	-0.000313	0.00412
	(3.35e-05)	(4.50e-05)	(7.67e-05)	(0.000249)	(0.00265)
Inflation	0.00414***	0.0262	-0.0345	0.00429***	0.0403
	(0.000682)	(0.0204)	(0.0335)	(0.00110)	(0.0257)
Constant	-0.418	-3.544***	-1.536	-0.0122	-2.936
	(1.682)	(1.172)	(1.869)	(1.977)	(3.758)
Observations	3,133	762	1,059	855	363
R-squared	0.460	0.640	0.513	0.462	0.389
Number of countries	158	34	49	43	21

Robust standard errors in parentheses.
The symbols *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

*As a base exchange rate regime we have the Fixed regime. Thus, the autoregressive coefficient of the lagged current account describes the rate of current account persistence under fixed regimes. In order to observe the degree of current account persistence under intermediate and flexible regimes, we have to add {CA (-1) + [CA (-1) × Intermediate]} and {CA(-1) + [CA(-1) × Flexible]}. Below is represented the rate of current account persistence under intermediate and flexible exchange rate regime respectively.

CA(-1) + [CA(-1) × Intermediate]	0.434***	0.5746***	0.384*	0.6134***	0.905***
	(0.05)	(0.1407)	(0.104)	(0.104)	(0.967)
CA(-1) + [CA(-1) × Flexible]	0.405***	0.542***	0.462***	0.5239***	0.813***
	(0.069)	(0.129)	(0.097)	(0.167)	(0.096)

4.5 Real Effective Exchange Rate Model

In this model we want to examine how the value that an individual consumer pays for an imported good at the consumer level, will affect the relationship between current account adjustment and exchange rate regimes. We use the equation (3), as mentioned in section 3.2 in order to be able to estimate the differential effects of each exchange rate regime up to current account balance in a single regression using dummies for each regime and including control variables for trade and capital flows openness, for the gross domestic product, for inflation and for the real effective exchange rate.

The dependent variable of this model is the current account. As explanatory variables we have the lagged current account, the flexible and the intermediate regimes in the form of dummy variables. Additionally, we use as independent variables the interaction terms of flexible and intermediate regimes with the lagged current account. Furthermore, as control variables are included the trade openness and the capital flows openness and the interaction terms for trade and capital flows openness with lagged current account. Moreover, we add the GDP per capita based on purchasing power parity, the inflation and the real effective exchange rate. Hence, in this section the model has the following form:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_0 Intermediate_{it} + \theta_1 Flexible_{it} + \\ + \theta_3(CA_{it-1} \times Intermediate_{it}) + \theta_4(CA_{it-1} \times Flexible_{it}) + \theta_5 TradeOpennes_{it} \\ + \theta_6 FinancialOpenness_{it} + \theta_7(CA_{it-1} \times TradeOpenness_{it}) + \\ + \theta_8(CA_{it-1} \times FinancialOpenness_{it}) + \theta_9 GDP_{it} + \theta_{10} Inflation_{it} + REER_{it} \\ + \eta_{it}$$

Considering the regression output (Table 5) we present the results were obtained by running the regression of the Real effective exchange rate model we can observe that for the *Full sample* the degree of current account persistence is 0.428 under more fixed exchange rate regimes, 0.358 under intermediate regimes and 0.328 under more flexible exchange rate regimes. Hence, we can support that more flexible regimes facilitate the adjustment of current account balance. Taking into account the *OECD sample* we have that the rate of current account persistence is 0.647 for more rigid regimes, 0.592 for intermediate exchange rate regimes and 0.544 for less rigid regimes. Thus, more flexible regimes accommodate the current account convergence. Regarding the *High Income countries sample* the rate of current account persistence is 0.612 under more rigid exchange rate regimes, 0.5349 under intermediate regimes and 0.521 under more flexible regimes. Thus, in contrast with what we have concluded in previous models (at which the intermediate regimes tend to accommodate the current account convergence), by including the real effective exchange rate we observe that the current account adjustment is facilitated by the more flexible exchange rate regimes as by increasing the fixity of regimes the current account persistence is greater. Taking under consideration the *Lower Middle Income countries sample* we observe that the degree of current account persistence is 0.9535 under more fixed regimes, 0.5182 under intermediate exchange rate regimes and 0.4056 under less rigid regimes. Again, the current account convergence is more rapid under more flexible exchange rate regimes. For the *Low Income countries sample*, the rate of current account persistence is -0.085 under more fixed regimes, 0.031 under intermediate regimes and 0.210 under more

flexible regimes. Hence as in previous models, the current account adjustment for Low income countries is accommodated by more fixed exchange rate regimes. However, in this case the current account change sign, i.e. if we observe current account deficit then by adopting fixed exchange rate regimes the current account will be surplus and vice versa.

TABLE 5 - CURRENT ACCOUNT PERSISTENCE WITH REAL EFFECTIVE ECHANGE RATE, BY COUNTRY SAMPLE

VARIABLES	(1) Full Sample	(2) OECD Sample	(3) High Income	(4) Lower Middle Income	(5) Low Income
CA(-1)	0.428***	0.647***	0.612***	0.954***	-0.0855
	(0.0871)	(0.134)	(0.104)	(0.242)	(0.711)
Intermediate	-0.264	0.441	0.276	1.728*	-1.945
	(0.725)	(0.411)	(0.558)	(0.944)	(2.996)
Flexible	-0.178	-0.0817	-0.464	2.660**	1.545
	(0.913)	(0.296)	(0.485)	(1.134)	(2.179)
CA(-1) × Intermediate	-0.0701	-0.0544	-0.0766	-0.435**	0.117
	(0.0762)	(0.0584)	(0.0665)	(0.156)	(0.280)
CA(-1) × Flexible	-0.0994	-0.103	-0.0902*	-0.548***	0.296
	(0.0612)	(0.0634)	(0.0491)	(0.186)	(0.347)
Trade Openness	-0.0222	0.0305**	0.0218*	-0.00294	-0.142
	(0.0405)	(0.0116)	(0.0117)	(0.0267)	(0.107)
Financial Openness	2.383**	1.339	1.043	7.349*	2.285
	(1.012)	(1.060)	(1.041)	(3.474)	(2.266)
CA(-1) × Trade Openness	0.00177***	-0.00143*	-0.000172	-0.00179	0.00324
	(0.000167)	(0.000785)	(0.000712)	(0.00171)	(0.00566)
CA(-1) × Financial Openness	0.153	0.299**	0.159**	0.426***	0.116
	(0.0985)	(0.120)	(0.0640)	(0.108)	(0.283)
GDP	8.17e-05*	-1.39e-05	2.69e-05	8.98e-05	0.00442
	(4.57e-05)	(5.13e-05)	(6.45e-05)	(0.000338)	(0.00600)
Inflation	0.00306***	-0.000167	-0.00345	0.00703***	0.0687
	(0.00109)	(0.0478)	(0.0236)	(0.00220)	(0.0477)
REER	-0.0278**	-0.0107	-0.0368**	-0.0411**	0.0348
	(0.0117)	(0.0179)	(0.0162)	(0.0162)	(0.0225)
Constant	2.908	-2.064	1.131	-1.045	-8.719
	(3.934)	(2.344)	(2.613)	(4.135)	(5.636)
Observations	1,887	681	867	342	124
R-squared	0.492	0.636	0.563	0.536	0.536
Number of countries	88	30	38	17	6

Robust standard errors in parentheses.
The symbols *,**,*** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

*As a base exchange rate regime we have the Fixed regime. Thus, the autoregressive coefficient of the lagged current account describes the rate of current account persistence under fixed regimes.
In order to observe the degree of current account persistence under intermediate and flexible regimes, we have to add {CA(-1) + [CA(-1) × Intermediate]} and {CA(-1) + [CA(-1) × Flexible]}.
Below is represented the rate of current account persistence under intermediate and flexible exchange rate regime respectively.

CA(-1) + [CA(-1) × Intermediate]	0.358***	0.592***	0.5349***	0.5182***	0.031
	(0.052)	(0.160)	(0.123)	(0.1476)	(0.532)
CA(-1) + [CA(-1) × Flexible]	0.328***	0.544***	0.521***	0.405**	0.2109
	(0.077)	(0.160)	(0.1016)	(0.177)	(0.4400)

Chapter 5

5.1 Extension 1, Central government debt (% of GDP)

In this section we want to examine the relationship between current account convergence and exchange rate regimes in different groups of countries compared to countries samples were used in Chapter 4. We distinguish the Full sample taking into account the Central government debt relative to GDP. Caner, Grennes, and Koebler - Geib (2010) support that there is a threshold of public debt which affects the real growth of the economy and it is equal to 77 percent. They claim that if the debt is higher than 77 percent, each additional percentage point of debt costs 0.017 percentage points of annual growth. Hence, taking under consideration this threshold, we have over the period of 1980-2016 two country samples, the countries which are above the 77 percent and the countries which are below the 77 percent.

To accomplish this aim, we repeat a similar process in the previous section. Considering the analysis in section 3, we run a simple model as mentioned in equation (2) and afterward we run a model based on equation (3) because we want to include two control variables about trade and capital flows openness. At the first approach our model has the following form:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_0 Intermediate_{it} + \theta_1 Flexible_{it} + \\ + \theta_3 (CA_{it-1} \times Intermediate_{it}) + \theta_4 (CA_{it-1} \times Flexible_{it}) + \eta_{it}$$

And for the second approach (by including two key missing control variables), our model has the following form:

$$CA_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_0 Intermediate_{it} + \theta_1 Flexible_{it} + \\ + \theta_3 (CA_{it-1} \times Intermediate_{it}) + \theta_4 (CA_{it-1} \times Flexible_{it}) + \eta_{it}$$

In both models, the dependent variable is the current account. As explanatory variables we use the lagged current account, the flexible and the intermediate regimes in the form of dummy variables. Additionally, in order to be able to examine the effect of each regime up to current account we use as independent variables the interaction terms of flexible and intermediate regimes with the lagged current account. The only difference between the first and the second approach, is that in the last are included the trade openness and the capital flows openness and the interaction terms of trade and capital flows openness with lagged current account, in order to examine how the openness variables affect the relationship between current account adjustment and exchange rate regimes.

TABLE 6 - CURRENT ACCOUNT PERSISTENCY WITH CENTRAL GOVERNMENT DEBT

VARIABLES	(1) Above 77%	(2) Below 77%	(3) Above 77%	(4) Below 77%
CA(-1)	0.672***	0.660***	0.644***	0.445***
	(0.0455)	(0.0361)	(0.122)	(0.158)
Intermediate	-2.289**	0.179	-2.074**	0.606
	(0.900)	(0.626)	(0.895)	(0.591)
Flexible	-1.131*	0.467	-1.045	0.862
	(0.675)	(0.536)	(0.798)	(0.533)
CA(-1) × Intermediate	-0.353***	-0.0714	-0.270***	-0.0249
	(0.131)	(0.0806)	(0.0861)	(0.0869)
CA(-1) × Flexible	-0.243***	-0.0376	-0.173**	-0.0120
	(0.0812)	(0.0595)	(0.0723)	(0.0737)
Trade Openness			-0.0429	0.0225**
			(0.0261)	(0.0106)
Financial Openness			0.00151	-0.0845
			(0.964)	(0.996)
CA(-1) × Trade Opennes			0.00123***	0.000724
			(0.000457)	(0.00135)
CA(-1) × Financial Opennes			-0.287**	0.166*
			(0.115)	(0.0873)
Constant	-3.165***	-0.260	0.805	-2.320**
	(0.933)	(0.351)	(3.113)	(0.984)
Observations	3,220	1,220	2,875	1,168
R-squared	0.274	0.445	0.292	0.451
Number of countries	169	102	155	99

Robust standard errors in parentheses.
The symbols *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

*As a base exchange rate regime we have the Fixed regime.
Thus, the autoregressive coefficient of the lagged current account describes the rate of current account persistence under fixed regimes. In order to observe the degree of current account persistence under intermediate and flexible regimes, we have to add {CA (-1) + [CA (-1) × Intermediate]} and {CA (-1) + [CA(-1) × Flexible]}.
Below is represented the rate of current account persistence under intermediate and flexible exchange rate regime respectively.

CA(-1) + [CA(-1) × Intermediate]	0.319***	0.588***	0.3745***	0.419***
	(0.131)	(0.0755)	(0.075)	(0.132)
CA(-1) + [CA(-1) × Flexible]	0.428***	0.6221***	0.471***	0.4326***
	(0.070)	(0.057)	(0.105)	(0.119)

Our results are presented in Table 6. We can observe that without controlling for openness variables the rate of current account persistence is lower under intermediate regimes regardless the threshold of debt. The same results we observe by including as control variables the trade and capital flows openness. Hence taking into account the

classification of debt which is associated with the real growth we can support that regardless the threshold about the central government debt relative to GDP the current account adjustment is more rapid under intermediate regimes.

5.2 Extension 2, Exchange Rate Regimes and Persistence of the Real Exchange Rate

We claim that the current account responds to real exchange rate, not nominal exchange rate. If the real exchange rate adjustment does not depend very much on the nominal exchange rate regime, then the current account adjustment would not depend very much on nominal exchange rate regime either. We now examine whether the nature of a country's nominal exchange rate regime significantly affects the adjustment process of its real exchange rate.

To accomplish this aim, we repeat a similar process in the previous section, except that we replace the current account with real effective exchange rates. We use the form of equation (2), but now in our model the depended variable is real effective exchange rate. Moreover, as explanatory variables we have the lagged real effective exchange rate, the intermediate and flexible regimes which are in the form of dummy variables. Additionally, as independent variables we have the interaction terms between the lagged real effective exchange rate with the intermediate and flexible regimes respectively. Our model has the following form:

$$REER_{it} = \rho_0 + \rho_1 REER_{it-1} + \theta_0 Intermediate_{it} + \theta_1 Flexible_{it} + \\ + \theta_3 (REER_{it-1} \times Intermediate_{it}) + \theta_4 (REER_{it-1} \times Flexible_{it}) + \eta_{it}$$

Using the regression output (Table 7), we can observe that for the Full Sample, the degree of the persistence of real effective exchange rate is very high under each regime (less persistent under more flexible exchange rate regimes). Considering the OECD sample the rate of reversion is higher under more flexible regimes (20% of real effective exchange rate reverts). Taking into account, for the *High income countries sample* the rate of reversion is higher under flexible regimes and very close to 20%. Regarding, the *Lower income countries sample*, the rate of reversion is higher under flexible regimes (more than 30%). Finally, for the *Low income countries sample*, again we have that the real effective exchange rate reverts more under flexible regimes in 22%).

TABLE 7 - REAL EFFECTIVE EXCHANGE RATE PERSISTENCE, BY COUNTRY SAMPLE

VARIABLES	(1) Full Sample	(2) OECD	(3) High Income	(4) Lower Middle Income	(5) Low Income
REER(-1)	0.988***	0.974***	0.930***	0.921***	0.860***
	(0.0367)	(0.0563)	(0.0154)	(0.0333)	(0.0306)
Intermediate	3.321	5.593	2.365	1.610	-18.49
	(3.355)	(5.473)	(1.870)	(6.863)	(15.74)
Flexible	12.52*	16.05**	11.27***	18.98***	-14.37
	(6.579)	(6.846)	(3.158)	(6.117)	(11.14)
REER(-1) × Intermediate	-0.0572*	-0.0616	-0.0264	-0.0664	-0.0546
	(0.0297)	(0.0584)	(0.0210)	(0.0429)	(0.0701)
REER(-1) × Flexible	-0.147**	-0.171**	-0.121***	-0.228***	-0.0721
	(0.0617)	(0.0735)	(0.0345)	(0.0302)	(0.0804)
Constant	2.183	3.547	7.204***	26.44***	16.15**
	(4.187)	(5.266)	(1.626)	(8.735)	(4.768)
Observations	3,038	1,157	1,464	498	198
R-squared	0.913	0.817	0.873	0.836	0.929
Number of countries	89	31	39	17	6

Robust standard errors in parentheses.
The symbols *,**,*** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

*As a base exchange rate regime we have the Fixed regime. Thus, the autoregressive coefficient of the lagged real effective rate describes the rate of real effective rate persistence under fixed regimes. In order to observe the degree of real effective rate persistence under intermediate and flexible regimes, we have to add {REER(-1) + [REER-1) × Intermediate]} and {REER(-1) + [REER(-1) × Flexible]}. Below is represented the rate of real effective rate persistence under intermediate and flexible exchange rate regime respectively.

REER(-1) + [REER-1) × Intermediate]	0.9310***	0.9125***	0.9037***	0.8546***	0.8056***
	(0.0076)	(0.0157)	(0.1464)	(0.0302)	(0.0735)
REER(-1) + [REER(-1) × Flexible]	0.8416***	0.8028***	0.8089***	0.6931***	0.7881***
	(0.054)	(0.02207)	(0.025)	(0.0111)	(0.0723)

5.3 Extension 3, Response of real effective exchange rate in current account.

In this section, we want to examine whether the nature of a country's nominal exchange rate regime makes the responds of the real effective exchange rate more intense. As it was mentioned above the Real Effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. Taking into account the definition of real effective rate, we can support that an increase in the real effective exchange rate implies a depreciation so the domestic currency losses value. On the other hand, an appreciation of real effective exchange rate implies an increase in the value of domestic currency. In order to accomplish this aim (i.e. to investigate whether the nature of a country's nominal exchange rate regime makes the responds of the real effective exchange rate more intense), we repeat a similar process from the previous section.

Basically, we use the format of equation (2) as mentioned in section 3.2, but now in this case the depended variable is real effective exchange rate in logarithm terms. As explanatory variables, we have the lagged current account, the intermediate and flexible regimes in the form of dummy variables. Moreover, as extra independent variables we have the interaction term of intermediate and flexible regime with the lagged current account respectively. Hence, the form of our model in this section is the following:

$$Log(REER)_{it} = \rho_0 + \rho_1 CA_{it-1} + \theta_0 Intermediate_{it} + \theta_1 Flexible_{it} + \theta_3(CA_{it-1} \times Intermediate_{it}) + \theta_4(CA_{it-1} \times Flexible_{it}) + \eta_{it}$$

We have to notice that in this model the autoregressive coefficient ρ_1 it describes the response of real effective exchange rate. Considering that the real effective exchange rate is defined as a measure of the value of a currency against a weighted average of several foreign currencies, we have that the higher the autoregressive coefficient is the more intense is the response of real effective exchange rate.

TABLE 8 - REAL EFFECTIVE EXCHANGE RATE RESPONSE, BY COUNTRY SAMPLE

VARIABLES	(1) Full Sample	(2) OECD Sample	(3) High Income	(4) Lower Middle Income	(5) Low Income
CA(-1)	-0.00277**	-0.0105***	-0.00257	-0.00204	0.00542
	(0.00136)	(0.00234)	(0.00172)	(0.00158)	(0.00940)
Intermediate	-0.202***	-0.0783*	-0.113**	-0.0670	-0.492
	(0.0453)	(0.0407)	(0.0429)	(0.0785)	(0.288)
Flexible	-0.151***	-0.122***	-0.133***	-0.0502	-0.442
	(0.0442)	(0.0418)	(0.0436)	(0.0682)	(0.272)
CA(-1) × Intermediate	-0.00468	0.00944*	0.00212	-0.00119	-0.00863
	(0.00404)	(0.00534)	(0.00464)	(0.00303)	(0.00935)
CA(-1) × Flexible	0.00229	0.00799**	0.00166	0.0133***	-0.00264
	(0.00328)	(0.00326)	(0.00297)	(0.00395)	(0.0104)
Constant	4.973***	4.811***	4.840***	5.439***	5.711***
	(0.0599)	(0.0664)	(0.0540)	(0.0576)	(0.191)
Observations	2,689	966	1,264	473	169
R-squared	0.307	0.244	0.211	0.487	0.753
Number of countries	89	31	39	17	6

Robust standard errors in parentheses.
The symbols *,**,*** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

*As a base exchange rate regime we have the Fixed regime. Thus, the autoregressive coefficient of the lagged current account describes the rate of current account persistence under fixed regimes.
In order to observe the degree of current account persistence under intermediate and flexible regimes, we have to add {CA(-1) + [CA(-1) × Intermediate]} and {CA(-1) + [CA(-1) × Flexible]}.
Below is represented the rate of current account persistence under intermediate and flexible exchange rate regime respectively.

CA(-1) + [CA(-1) × Intermediate]	-0.007**	-0.0011	-0.00045	(-0.00322)	(-0.0032)
	(0.0041)	(0.0051)	(0.0041)	(0.0019)	(0.0022)
CA(-1) + [CA(-1) × Flexible]	-0.000475	-0.0025	-0.00091	0.01121***	(0.0027)
	(0.003)	(0.0023)	(0.0023)	(0.0031)	(0.0096)

Taking into account the regression output (Table 6) we can observe that for the *Full Sample*, the rate of response of real effective exchange rate is -0.000475 under more flexible regimes, -0.0007 under intermediate regimes and -0.0027 under more fixed regimes. Hence, the response is greater under more flexible exchange rate regimes. Regarding the *OECD sample* the degree of real effective exchange rate response is -0.0025 under more flexible regimes, -0.0011 under intermediate regimes and -0.1053 under more fixed regimes. So, the response is higher under intermediate regimes. Considering the *High Income countries sample*, the rate of response is -0.00091 under more flexible exchange rate regimes, -0.00045 under intermediate regimes and -0.0025 under more fixed regimes. Thus, in that sample the response is higher under intermediate regimes. For *Lower Middle income countries sample*, the degree of response of real effective exchange rate is -0.00204 under more fixed regimes,

-0.00322under intermediate regimes and 0.01121under more flexible exchange rate regimes. So, the response, is more intense under more flexible regimes. Finally, taking under consideration the *Low income countries sample*, we can observe that the rate of response of real effective exchange rate is 0.0027 under more flexible exchange rate regimes, -0.0034 under intermediate regimes and 0.0054 under more rigid regimes. Hence, the response of real effective exchange rate is more intense under more fixed regimes. In general, we can conclude that the nature of exchange rate regime affects the response of real effective exchange rate index.

Chapter 6

Conclusion

In circles of both academies and policymakers it is believed that the external convergence is faster under flexible exchange rate regime, than under fixed exchange rate regime due to the price stickiness, Friedman (1953). In recent years, a small number of studies has attempted to assess whether Friedman's hypothesis is borne out by the data. The most known analysis against Friedman's suggestion is the paper of Chinn and Wei (2013), they support that there is no robust evidence that current account persistence depends upon the exchange rate regime declaring Friedman's hypothesis a matter of "faith".

The aim of this dissertation was to examine the relationship between exchange rate regime and the current account adjustment. For our purposes we used a sample of 189 countries (Full Sample) over the period of 1970-2016, and we used the exchange rate classification of Ilzetzki, Ethan, Carmen M. Reinhart and Kenneth S. Rogoff (2017). In order to delve more deeply the relationship between current account adjustment and exchange rate regimes, we used additionally the OECD countries and we distinguish the Full sample based on Gross National Income per capita, to High Income, Lower Middle income and Low income countries. We used a general first order auto-regressive AR (1) model which was augmented with interaction effects and control variables.

Taking under consideration the Full sample, we can observe that the current account adjustment is more rapid under more flexible regimes (when are included all the control variables in the model). In more detail, the current account convergence is more rapid under intermediate regimes in the benchmark model, and in the openness to trade and capital flows model. Whereas, when are included more variables (i.e. inflation, GDP per capita and real effective exchange rate) the current account adjustment is more rapid under more flexible regimes. So, we can support that by including more control variables there is a tendency for a more flexible regime to facilitate the current account convergence, which is come along with Friedman's hypothesis

Regarding the OECD sample, the current account convergence is faster under flexible regimes (when are included all the control variables in the model). The current account adjustment is faster under intermediate regimes only in the benchmark model. By controlling for variables such as, trade and capital flows openness, inflation, GDP per capita in PPP terms and real effective exchange rate the adjustment, is more rapid under flexible regimes. So again, by including more control variables the current account persistence is lower under more flexible regimes which is in favor with what Friedman supported.

Considering, the High income countries, the current account convergence is faster under more flexible regimes (when are included all the control variables in the model). In more detail, the adjustment of current account is more rapid under intermediate regimes for all the model that have examined above, except for the real effective exchange rate model, at which the adjustment is faster under more flexible exchange rate regimes. So, by including all the control variables, our results are come along with the conventional belief (i.e. the external adjustment is facilitated by more flexible regimes). Taking into account the Lower Middle income countries we can support that the current account adjustment is faster under more flexible regimes for each model we have examined in Chapter 4 of dissertation, which is come along with what Friedman suggested.

Interestingly for Low income countries, the current account convergence is more rapid under more rigid regimes. Low income countries are characterized by low levels of productivity, unproductive investment, massive unemployment and shortage of capital. Hence, we can claim that it is more beneficial for these countries to adopt a more fixed regime as it provides currency stability. A higher degree of stability is very important for countries with low income, as they have the chance to attract more foreign investment and hence to increase their GDP, since a pegged currency provides a signal of stability.

As an extension to our analysis, we tried to investigate the relationship between current account convergence and exchange rate regime under two different country samples based on the Central government debt. We concluded that the current account adjustment is more rapid under intermediate regimes regardless the threshold of debt. Furthermore, we tried to find if the reversion of real effective exchange rate is affected by the nature of the nominal exchange rate regimes. We concluded that, the persistence of real effective exchange rate is very high for each regime, however a more flexible regime provides a higher rate of real effective exchange rate reversion. Finally, we tried to examine whether the nature of a country's nominal exchange rate regime makes the respond of the real effective exchange rate more intense. Using a first order auto-regressive AR (1) model augmented with dummy variables for the different regimes, we found that for the Full and Lower Middle income countries samples the response is more intense under more flexible regimes. Regarding the OECD and High income countries the response is more intense under intermediate regimes, whereas for Low income countries the response is more intense under fixed regimes. So, the nature of country's nominal exchange rate regime matters when we care about the response of the real effective exchange rate.

Bibliography

Berger, H., Nitsch, V., (2014). "Wearing corset, losing shape: The euro's effect on trade imbalances," Journal of Policy Modeling, Elsevier, vol. 36(1), pages 136-155.

Caner, M., Grennes, Thomas J., Köhler-Geib, Friederike (Fritzi) N., (2010), "Finding the Tipping Point - When Sovereign Debt Turns Bad", SSRN Electronic Journal, pages 1-15

Carmen M. Reinhart, Kenneth S. Rogoff, (2004) "The Modern History of Exchange Rate Arrangements: A Reinterpretation," The Quarterly Journal of Economics, Oxford University Press, vol. 119(1), pages 1-48.

Chinn, Menzie D. and Hiro Ito (2006). "What Matters for Financial Development? Capital Controls, Institutions, and Interactions," Journal of Development Economics, Vol. 81(1), pages 163-192 (October).

Chinn, Menzie. D. and S.-J. Wei, (2013), "A Faith-Based Initiative Meets the Evidence: Does a Flexible Exchange Rate Regime Really Facilitate Current Account Adjustment?", Review of Economics and Statistics, 95(1), pages 168-184

Clower, E. and H. Ito (2012), "The Persistence of Current Account Balances and its Determinants: The Implications for Global Rebalancing", ADBI Working Papers 400, Asian Development Bank Institute.

Dornbusch, R., Fischer, S., (1980). "Exchange Rates and the Current Account," American Economic Review, American Economic Association, vol. 70(5), pages 960-971, December.

Eguren-Martín, Fernando, (2015), "Exchange rate regimes and current account imbalances: an empirical investigation", Bank of England Staff Working Paper.

E. Ilzetzki, C. M. Reinhart, K. S. Rogoff, (2017), "Exchange Arrangements Entering the 21st Century: Which Anchor Will Hold?", NBER Working Papers 23134, National Bureau of Economic Research, Inc.

Friedman, M., (1953), "The Case for Flexible Exchange Rates," in M. Friedman, Essays in Positive Economics (Chicago: The University of Chicago Press), pp. 157-203.

Herrmann, S. (2009), "Do we really know that flexible exchange rates facilitate current account adjustment? Some new empirical evidence for CEE countries", Discussion Paper Series 1: Economic Studies 2009, 22, Deutsche Bundesbank, Research Centre.

Ghosh, A., M. Terrones, and J. Zettelmeyer, (2010), "Exchange Rate Regimes and External Adjustment: New Answers to an Old Debate," in C. Wyplosz (ed.), The New International Monetary System: Essays in Honor of Alexander Swoboda (UK: Routledge).

Ghosh. R. Atish, M. S. Qureshi and C. G. Tsangarides (2014), "Friedman Redux: External Adjustment and Exchange Rate Flexibility", IMF Working Paper 14/146

Kouri, Pentti (1976), "The Exchange Rate and the Balance of Payments in the Short Run and in the Long Run: A Monetary Approach", Scandinavian Journal of Economics, vol.78, pages 280-304.

Levy-Yeyati, E., and F. Sturzenegger, 2003, "To Float or to Fix: Evidence on the Impact of Exchange Rate Regimes on Growth," American Economic Review, 93(4), pp. 1173-1193.

L. S. Copeland, (2014)," Exchange Rates and International Finance", 6th edition, Pearson Education, Inc., ISBN-10: 0273786040, pages 23-35.

Pancaro C. (2013) "Current account reversals in industrial countries: does the exchange rate regime matter?", Working Paper Series 1547, European Central Bank.

Sebastian E., (2004), "Financial Openness, Sudden Stops and Current Account Reversals", NBER Working Papers 10277, National Bureau of Economic Research, Inc.

De facto Exchange rate regime classification Appendix

The fine classification codes are:

1	•	No separate legal tender or currency union	Fixed
2	•	Pre announced peg or currency board arrangement	Fixed
3	•	Pre announced horizontal band that is narrower than or equal to +/-2%	Fixed
4	•	De facto peg	Fixed
5	•	Pre announced crawling peg; de facto moving band narrower than or equal to +/-1%	Intermediate Intermediate
6	•	Pre announced crawling band that is narrower than or equal to +/-2% or de facto horizontal band that is narrower than or equal to +/-2%	Intermediate Intermediate
7	•	De facto crawling peg	Intermediate
8	•	De facto crawling band that is narrower than or equal to +/-2%	Intermediate
9	•	Pre announced crawling band that is wider than or equal to +/-2%	Intermediate
10	•	De facto crawling band that is narrower than or equal to +/-5%	Floating
11	•	Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and depreciation over time)	Floating Floating
12	•	De facto moving band +/-5%/ Managed floating	Floating
13	•	Freely floating	Floating
14	•	Freely falling	-
15	•	Dual market in which parallel market data is missing.	-

Countries Appendix

OECD countries

Australia	Estonia	Ireland	Mexico	Slovenia
Austria	Finland	Israel	Netherlands	Spain
Belgium	France	Italy	New Zealand	Sweden
Canada	Germany	Japan	Norway	Switzerland
Chile	Greece	Korea Dep.	Poland	Turkey
Czech Republic	Hungary	Latvia	Portugal	UK
Denmark	Iceland	Luxemburg	Slovak Rep.	USA

Full Sample countries

Aruba ***
Afghanistan *
Angola **
Albania
United Arab Emirates ***
Argentina
Armenia **
Antigua and Barbuda ***
Australia ***
Austria ***
Azerbaijan
Burundi *
Belgium ***
Benin *
Burkina Faso *
Bangladesh **
Bulgaria
Bahrain ***
Bahamas, The ***
Bosnia and Herzegovina
Belarus
Belize
Bermuda ***
Bolivia **
Brazil
Barbados ***
Brunei Darussalam ***
Bhutan **
Botswana
Central African Republic *
Canada ***
Switzerland ***
Chile ***
China
Cote d'Ivoire **
Cameroon **
Congo, Rep. **
Colombia
Comoros *
Kiribati **

Cabo Verde **
Costa Rica
Curacao ***
Cyprus ***
Czech Republic ***
Germany ***
Djibouti **
Dominica
Denmark ***
Dominican Republic
Algeria
Ecuador
Egypt, Arab Rep. **
Eritrea *
Spain ***
Estonia ***
Ethiopia *
Finland ***
Fiji
France ***
Micronesia, Fed. Sts.
Gabon
United Kingdom ***
Georgia **
Ghana **
Guinea *
Guinea-Bissau *
Equatorial Guinea
Greece ***
Grenada
Guatemala **
Guyana
Saudi Arabia ***
Honduras **
Croatia
Haiti *
Hungary ***
Indonesia **
India **
Kenya **

Ireland ***
Iran, Islamic Rep.
Iraq
Iceland ***
Israel ***
Italy ***
Jamaica
Jordan **
Japan ***
Kazakhstan
Kenya
Kyrgyz Republic **
Cambodia **
Kiribati
St. Kitts and Nevis ***
Korea, Rep. ***
Kuwait ***
Lao PDR **
Lebanon
Liberia *
Libya
St. Lucia
Liechtenstein ***
Sri Lanka **
Lesotho **
Lithuania ***
Luxembourg ***
Latvia ***
Macao SAR, China ***
Morocco **
Monaco ***
Moldova **
Madagascar *
Maldives
Mexico
Marshall Islands
Macedonia, FYR
Mali *
Malta ***
El Savador **

Myanmar **
Montenegro
Mongolia **
Mozambique **
Mauritania **
Mauritius
Malawi *
Malaysia
Namibia
Niger *
Nigeria **
Nicaragua **
Netherlands ***
Norway ***
Nepal *
New Zealand ***
Oman ***
Pakistan **
Panama
Peru
Philippines **
Palau ***
Papua New Guinea **
Poland ***
Portugal ***
Paraguay
Qatar ***
Russian Federation
Rwanda *
Saudi Arabia
Sudan **
Senegal *
Singapore
Solomon Islands
Sierra Leone *
El Salvador
San Marino ***
Somalia *
Serbia
Singapore ***

Sao Tome and Principe **
Suriname
Slovak Republic ***
Slovenia ***
Sweden ***
Swaziland **
Seychelles ***
Syrian Arab Republic **
Chad *
Togo *
Thailand
Tajikistan **
Turkmenistan
Tonga
Trinidad and Tobago ***
Tunisia **
Turkey
Tanzania *
Uganda *
Ukraine
Uruguay ***
United States ***
Uzbekistan **
St. Vincent & Grenadines
Venezuela, RB
Vietnam **
Vanuatu **
Samoa
Yemen, Rep. **
South Africa
Zambia **
Zimbabwe *
Gambia *
Greenland ***
Guam ***
Hong Kong SAR, China ***

Low Income countries *
Lower Middle Income Countries **
High Income countries ***

DATA APPENDIX

Variables	Definition	Source
CA_{it}	Current account balance in GDP ratio	WDI
$TradeOpennes_{it}$	Trade in GDP ratio	WDI
$FinancialOpenness_{it}$	Financial Openness Index[7]	Chinn & Ito (2010)
GDP_{it}	GDP per capita, PPP (current international $)	WDI
$Inflation_{it}$	Inflation, consumer prices (annual %)	WDI
$REER_{it}$	Real effective exchange rate index	WDI
$Flexible_{it}$	Dummy variable corresponding to flexible exchange rate regime.	Ilzetzki, Reinhart, Rogoff fine de facto exchange rate arrangement classification.
$Intermediate_{it}$	Dummy variable corresponding to intermediate exchange rate regime.	Ilzetzki, Reinhart, Rogoff fine de facto exchange rate arrangement classification.

[7] We use as financial openness, the Chinn & Ito (2010) normalized index (ka_open).