Income Inequality
Do Exchange Rate Regimes Matter?
A Literature Review

Bachelor Thesis

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Abstract

In a recent report by the United Nations Development Programme it was argued that the two corner solutions dictated under the Washington Consensus have had adverse impacts on inequality, for they put developing economies at the risk of currency crises and large currency devaluations.

The present paper thus intends to extend the discussion on optimal exchange rate regimes to the issue of income inequality by means of a literature analysis. The basic underlying question is whether there is a relationship between a country's exchange rate regime and the distribution of income within that country, and whether one type of exchange rate regime exhibits a superior performance pertaining to income inequality.

The review of the existing literature reveals that different studies come to opposite conclusions about the possible effect of the variables (inflation, output volatility, trade) through which the exchange rate regime could affect income inequality. For a more meaningful picture regarding the link between ERR and income inequality future research would have to resort to empirical methods, given that the findings from the literature review apparently come to nothing.

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LIST OF ABBREVIATIONS

AREAER	Annual Report on Exchange Arrangements and Exchange Restrictions
FDI	Foreign Direct Investment
ERR	Exchange Rate Regime
GDP	Gross Domestic Product
NBER	National Bureau of Economic Research
OECD	Organization for Economic Cooperation and Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific

1. Introduction

In a recent report by the United Nations Development Programme it was argued that exchange rate policies dictated under the Washington Consensus have had adverse impacts on inequality (UNDP, 2013, p. 84). As part of a wider set of policies, which were aimed at stabilizing economies and forcing structural change through market liberalization in the wake of the debt crises in the 1980s, developing economies (mostly in Latin America and Asia) were encouraged to adopt either a peg or a freely floating exchange rate regime (ERR). However, each of these two corner solutions put developing economies at the risk of currency crises and large currency devaluations, and the ensuing inflationary shocks led to rapid declining real wages, which often affected lower wage-earners disproportionately, thereby aggravating income inequality.

While there exists a vast amount of literature that investigates the consequences of ERRs on various macroeconomic variables, or the effects of the real exchange rate on income inequality, there is, to the best of the authors knowledge, no paper at hand, which explicitly analyses the link between ERRs and income inequality and could thus either confirm or confute the argument put forth in the UNDP report.

The question regarding the link between ERR and is particularly contentious given that research had called into question the relevance of ERR choice for quite some time. On the one hand, it has been argued that pegs do not really peg as "literally only a handful of countries in the world today have continuously maintained tightly fixed exchange rates against any currency for five years or more" (Obstefeld & Rogoff, 1995, p. 87). On the other hand, conjecture is made that floating rates do not really float as the governments of such regimes nonetheless intervene to minimize exchange rate fluctuations (Calvo & Reinhart, 2002). Thus, expect for the real exchange rate, the type of ERR was thought to play almost no role (Baxter & Stockman, 1989; Flood & Rose, 1995).

Only more recent literature employing de facto (instead of de jure) ERR classification schemes suggests that the ERR does play a role for various macroeconomic variables such as trade openness (Klein & Shambaugh, 2006); monetary autonomy (Obstfeld, Shambaugh & Taylor, 2005); growth (Ghosh, Gulde & Wolf, 2002; Levy-Yeyati & Sturzenegger, 2003; Aghion, Bachetta, Ranciere & Rogoff, 2006); inflation (Gosh et al., 2002); the transmission of trade shocks (Broda, 2001), output volatility (Morales-Zumaquero & Sosvilla-Rivero, 2014) and business cycles (Curdia & Finocchiaro,

2013).

Several of these variables are also found to affect income inequality, suggesting that the choice of the ERR could also have an effect on inequality via other variables than just inflation. For example, research conducted by the IMF (Sarel, 1997) on macroeconomic variables associated with an improvement in income distribution mentions higher growth rates, higher income levels, higher investment rates, real depreciation (found to be more important in the case of low-income countries), and an improvement in terms of trade. Bakker and Creedy (1999) who focus on the personal distribution of income in New Zealand find that cyclical macroeconomic changes in gross domestic product (GDP) growth and the unemployment rate contributed substantially to the observed increase in inequality from 1987 to 1991, while an increase in growth and a reduction in unemployment lead to a reduction in inequality during the years 1993 and 1994. Likewise, in a more recent study by García, Prieto-Alaiz and Simon (2013) on the influence of macroeconomic factors on personal income distribution in developing countries it is stated that both the employment rate and the real interest rate tend to increase inequality, whereas a higher GDP growth is associated with lower inequality. Furthermore Al-Marhubi (2000), Dolmas, Huffman, Wynne (2000) and Albanesi (2007) find a positive correlation between inflation and inequality, albeit the direction of causality is subject to discrepancy. Equally divisive is the found correlation between inequality and output volatility (Banerjee, 2013; Breen & García-Peñalosa, 2005; Levy, 2002). Inflation, trade, growth and output volatility are therefore all potential factors through which ERRs could indirectly exert influence on the level of income inequality within a country, and will thus be subjected to further investigation.

It is the purpose of the present paper to shed light on the possible link between ERRs and within-country income inequality, as well as extend the ongoing discussion on optimal ERRs to the issue of income inequality by devoting itself to the following questions:

1. How could the choice of ERR affect the level of income inequality within a country? What are the mechanisms through which different ERRs exert influence on income inequality?

2. Does one of the two corner solutions[1] outperform the other by achieving a

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[1] The two-corner solution argues that intermediate policy regimes between hard pegs and flexible exchange rates are not sustainable. Countries integrated into global financial markets should thus choose either a free float or a hard exchange rate commitment (Eichengreen, 1994, pp. 4-5).

lower income inequality; or might an intermediate ERR, as suggested in the UNDP report, be better suited to achieve low-income inequality than the two corner solutions?

Given that it has been well documented by Calvo and Reinhart (2002) that government's declaration to the IMF as to the ERRs in place are not always accurate; and in order to put some limitation on the literature to draw on for theory construction only research that has been conducted by the employment of a de facto ERR classification shall be consulted.

The paper is organized as follows: Chapter 2 provides a short illustrating of the major differences between fixed and flexible ERR by means of the policy trilemma, as well as a succinct outline of methodologies to classify ERR, and the difficulties that generally come along with it. Furthermore, the first part of the literature review in which the consequences of fixed and floating ERR on inflation, trade output volatility and growth are analyzed, will be conducted. Chapter two concludes with an analysis of different determinants of ERR choice. Chapter 3 is dedicated to income inequality: after it has been clarified what is meant by income inequality, the most common drivers of labor income inequality, the main source of personal and household income, are presented. Subsequently, we investigate in what way the variables for which the choice of ERR has shown to play a role, such as trade, financial liberalization, inflation and output volatility influence income inequality.

2. DEFINING ERR

An exchange rate is the price of one currency in terms of another. It is the most important price in any economy, for it affects all other prices. Under a flexible ERR the exchange rate is said to appreciate (depreciate) when the national currency becomes more (less) expensive due to supply and demand side factors. Under a fixed ERR, however, we speak of a revaluation (devaluation) if the monetary authority of that country consciously decides to increase (reduce) the value of its currency. Exchange rates can move differently against different currencies. The best summary measure is the effective exchange rate, which describes a country's exchange rate against other currencies weighted by their importance in the country's trade. Movements in the nominal exchange rate, which simply measures the relative value of the currency, are often less meaningful than changes in the real exchange rate, which adjusts for inflation differentials between countries. Because it affects the prices of national goods and services relative to those abroad, the real exchange rate is crucial to every open economy, and is often referred to as a country's competitiveness. And this in turn makes nominal exchange rate policy key, for in almost all circumstances nominal currency movements have a real effect (Frieden, 2014, p. 4).

An exchange-rate regime, on the other hand, is the way an authority manages its currency in relation to other currencies and the foreign exchange market. ERRs thus encompass the constraints or limits imposed by custom, institutions and nature on the ability of the monetary authorities to influence the evolution of macroeconomic aggregates (Bordo & Schwarz, 1999, p. 151). While scholars disagree on how effective exchange rate policy can be, most accept that nominal currency movements have a significant real impact, at least in the short and medium run (Frieden, 2014, p. 4). Through exchange rate policies, governments can not only set the price of foreign currency and determine the stability of this price, but by doing so, they also influence an economy's competitiveness and the size and stability of its international financial and trade flows. The consequences that exchange rate policies also have on a country's labor market has recently been shown when the Swiss National Bank abruptly abandoned a CHF 1.20 per euro cap on January 15, sending the currency soaring. In order to adapt to this significant overvaluation of the Swiss franc, export-reliant firms have immediately increased working hours, introduced short-time work, optimized production processes and have already moved certain activities abroad (swissinfo.ch). Given all of these ramifications it is not surprisingly that a perennial question in international economics—whether in academia or in policy circles—concerns the optimal choice of the appropriate ERR, as well as its consequences for

the economy (see for example Calvo, 1999).

Until the demise of the Bretton Woods System, this question had in any case, been redundant, given that countries were either defined in terms of gold (Gold Standard, 1879-1914) or pegged to the dollar, which itself was linked to gold (Bretton Woods, 1944-1973). Ever since Nixon's closing of the gold-window and the subsequent breakdown of Bretton Woods in 1971, however, there has been a steady trend away from fixed exchange rates to a so-called "managed non-system". Because the amended Articles of the Agreement of the International Monetary Fund (IMF) gave countries the ability to choose any exchange rate arrangement as long as they did not peg to gold (Leblang, 1999, p. 603).

In their Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), which is based on self-identification by member countries, the IMF (2013, pp. 5-6) distinguished ten different types of exchange rate arrangements (no separate legal tender, currency board, conventional peg, stabilized arrangement, crawling peg, crawl-like arrangement, pegged exchange rate within horizontal bands, other managed arrangement, floating, free floating) which can be allotted three basic categories of ERRs, based on the flexibility of the arrangement and the way it operates in practice: fixed ERRs (also known as pegs) are tied to another currency, mostly more widespread currencies such as the U.S. dollar or the Euro, or a basket of currencies. In a flexible or floating regime on the other hand, it is the market that determines the exchange rate. A balance between those two extremes is struck by intermediate regimes, under which the central bank intervenes to prevent the exchange rate from deviating too far from a target ban or value, such as under the snake in the tunnel, or the European Monetary System (EMS).

2.1. THE POLICY TRILEMMA

Standard macroeconomic models of ERRs generally distinguish between a completely fixed and a freely floating ERR. In standard macroeconomic courses we have been taught that the two regimes produce diametrically opposed results concerning the effectiveness of fiscal and monetary policies. As we recall, under a peg, monetary policy is ineffective and fiscal policy is very effective, while under a floating regime, the reverse applies. In reality however, ERRs are rarely freely floating nor are they completely fixed.

The standard framework for understanding the economic effects of exchange rate policy since the 1960s has been the policy trilemma, also termed the impossible trinity. It dates back to the work of Fleming (1962) and Mundell (1963), and describes

a trade-off that policy makers in open economies typically face. The trilemma consists of three desirable, yet contradictory policy goals: (1) monetary policy independence, which is the freedom to set the short-term interest rate; (2) exchange rate policy independence, which is the freedom to set (and thus stabilize) the exchange rate; and (3) free open capital markets (Gagnon & Hinterschweiger, 2011, p. 18).
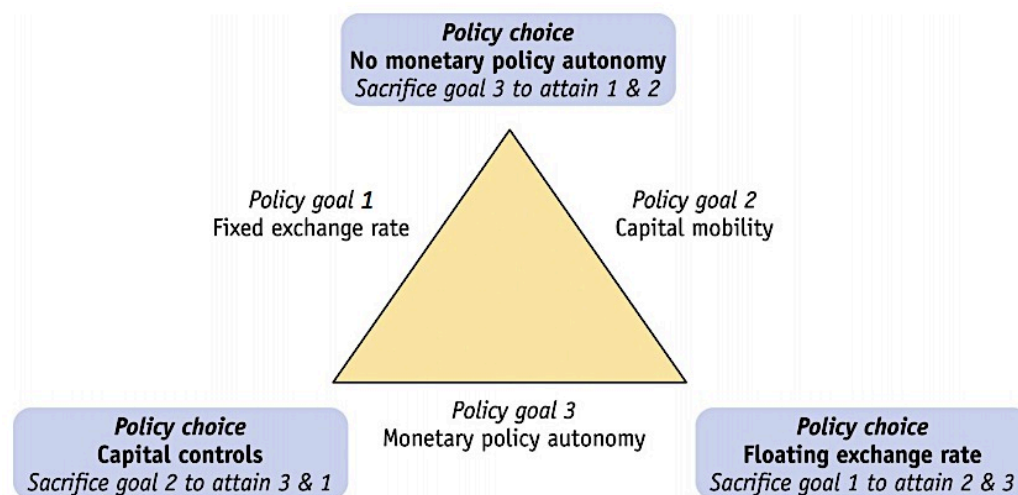

Figure 1: The Impossible Trinity (Feenstra & Taylor, 2008, p. 586)

Figure 1 intuitively shows that it is not possible to simultaneously be on all three sides of the triangle: suppose a country has an independent monetary policy and free capital mobility. In that case it would be impossible to have a fixed exchange rate because if interest rates were lowered to boost the economy, capital would leave the country to achieve higher returns somewhere else. This again would put the bite on the exchange rate, forcing the central bank to either deplete its reserves or dismiss the advantage of a fixed stable exchange rate. The key point to remember here is that under a fixed ERR, money supply is endogenous. All that this means is that when the exchange rate is pegged, the hands of the monetary authority are tied because the money supply and interest rates must be used to keep the exchange rate stable and cannot be freely determined.

Central banks thus have to make a decision between three policy combinations: if the central bank decides upon monetary autonomy and capital mobility, as is the case with the US or the Eurozone, it has to opt for a floating ERR. Conversely, the classical Gold Standard (1879-1914) guaranteed capital mobility and exchange rate stability, while the Bretton Woods system (1944-1973) provided monetary autonomy and exchange rate stability under capital controls[2]. However, contemporary international

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[2] For most of this paper, the choice of free and open capital markets is taken for granted, given that the only countries to have capital controls in place in 2014 were the Ukraine, Belarus,

financial markets and contemporary technologies have made capital controls a less viable option. Thereby effectively reducing the trilemma to a dilemma with respect to the choice of ERR (Frieden, 2014, p. 6)

2.1.1. THE DILEMMA WITH THE TRILEMMA

Although the real-world relevance of the tradeoffs suggested by the trilemma has been fleshed out by several empirical studies over the past decade (e.g. Aizenmann, Menzie, & Hiro, 2010), the argument that open capital markets and fixed exchange rates imply a loss of monetary autonomy has recently been challenged. On the one hand it is argued that even freely floating exchange rates cannot guarantee monetary autonomy without capital controls, thereby suggesting that the policy trilemma paints too rosy a picture of the ability of monetary authorities to manage an economy. On the other hand, it is maintained that the policy trilemma depicts too restrictive a view of the world because even countries with pegged exchange rates can gain monetary autonomy by "rounding the corners" of the triangle through the implementation of intermediate policies such as soft pegs or temporary, narrowly targeted capital controls (Klein & Shambaugh, 2013, p. 2). Hence, the view of the policy trilemma that countries with fully open capital markets and tightly pegged exchange rates forego all monetary autonomy, is thus complemented by a more nuanced view which suggests that the trilemma is much rather a representation of different trade-offs, with an economy having greater monetary autonomy the more exchange-rate flexibility it allows, or the more prohibitions it imposes on some type of international capital flows.

Rey (2013 p. 310) even goes as far as to declare the death of the trilemma, arguing that a global financial cycle makes the trilemma moot:

"Our VAR analysis suggests that one important determinant of the global financial cycle is monetary policy in the center country, which affects leverage of global banks, credit flows and credit growth in the international financial system. This channel invalidates the "trilemma," which postulates that in a world of free capital mobility, independent monetary policies are feasible if and only if exchange rates are floating. Instead, while it is certainly true that countries with fixed exchange rates cannot have independent monetary policies in a world of free capital mobility, my analysis suggests that cross-border flows and leverage of global institutions transmit monetary conditions globally, even under floating exchange-rate regimes."

Ghana, Venezuela, Argentina, Cyprus, Iceland and China (Xie, 2015). However, given that there is evidence that capital controls can influence income inequality to a certain extent, we will also take a brief look at the effects of capital controls on income inequality in the chapter on drivers of income inequality.

Although financial cycles and large country interest rates certainly do have important consequences for the world economy, research by Klein and Shambaugh (2013, p. 25) confirms that extensive capital controls or floating exchange rates nevertheless enable a country to have monetary autonomy, as suggested by the trilemma. They however also find that partial capital controls do not generally enable a country to have greater monetary control than in the case of open capital accounts unless they are quite extensive. In contrast, a moderate amount of exchange rate flexibility is said to allow for some degree of monetary autonomy, especially in emerging and developing economies. After all, the policy trilemma seems to be alive and well.

Before turning to the implications of the respective ERR on inflation, output volatility, trade and growth it is however important to understand how ERR regimes are defined and classified. For this reason the subsequent section will provide a succinct outline of methodologies to classify ERR, and the difficulties that generally come along with it.

2.2. CLASSIFYING ERRS

In order to study the effects of an ERR on income inequality it is necessary to employ the proper classifications for exchange rate systems. Until 1998 nominal ERR classifications were based on official statements of de jure policy intent by the national authorities to the IMF, which they chose from three predefined broad ERR categories – pegs (hard pegs, conventional pegs, horizontal bands), intermediate regimes (crawling pegs, crawling bands, target zones), and floating arrangements (free floats, managed floats (Habermeier, Kokenyne, Veyrune & Anderson, 2009, p. 16-17). In other words, countries were solely classified by what they declared to do.

Despite the actual operation of ERRs differing from the announced framework about 50% of the time, most of the empirical literature on ERRs nonetheless made use of the IMF's de jure classification (Rogoff, Husain, Mody, Brooks and Oomes, 2004, p. 7). On the one hand, the currencies of some economies, despite officially being declared pegs, frequently underwent devaluations as an attempt to enhance competitiveness (Obstfeld & Rogoff, 1995). On the other hand, the currencies of some economies officially declaring flexible regimes, exhibited what Calvo and Reinhart (2002, p. 2) designate a "fear of floating", which basically designates reliance on interest-rate adjustments and changes in reserves to inhibit fluctuations in the exchange rates. Not surprisingly, research based upon de jure classification called into question the relevance of ERR choice, and risked yielding results that led to deceptive statistical inferences. Hence, expect for the real exchange rate, the type of ERR was thought to play almost no role (see Baxter and Stockman, 1989; Flood and Rose, 1993).

In order to address this problem alternative mixed de jure-de facto as well as pure de facto classification approaches employing different techniques[3] and factual data such as reserve volatility, exchange rate movements and interest rate differentials were developed to capture governments' practices more accurately[4]. Although, more recent studies, drawing upon de facto classification, find that the type of ERR may after all play a role for various key macroeconomic variables, the various de facto regime classifications only exhibit minor correlation with one another (Frankel & Wei, 2008; Bleany & Francisco, 2007), and thus hardly correspond any more closely to each other than to the official de jure classification. The explanations for the variation in conclusions reached by the distinct classification approaches range from diverging choices as to where to draw the line between regimes, disparities in timing of the data (especially relevant in classification systems that rely on exchange rate behavior exclusively) and differences in methodology. The principle problem however arises due to the fact that most countries do not firmly peg nor freely float, but pursue some chaotic intermediate regime that is not unambiguously classifiable. Further discrepancies may emerge due to missing or highly unreliable reserves or exchange rate data; differences in the judgment of an intervention as excessive (regime is classified as "managed floating") or moderate (regime is classified as "independently floating"); the problem of choosing the relevant anchor currency; misclassifications based on different reactions to external shocks, which however are much more a consequence of a country's respective economic structure; some classification systems omitting official-interest rates movements despite their major role in influencing the exchange rate (Tavlas, Dellas & Stockman, 2008, p. 17-21).

Not surprisingly, the results of studies, employing different classification schemes not uncommonly contradict each other, reflecting the differences in their methods of classifying regimes, and highlighting the fact that a consistent coding has yet to be established.

2.3. ECONOMIC CONSEQUENCES OF ERR

Given the different scopes of action that the monetary authorities exhibit under varying regimes, one would presume that the influence exerted on the evolution of macroeconomic aggregates to be different as well. We shall thus take a look at what the respective impacts of ERR on inflation, trade openness, output volatility growth are.

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[3] For a summary on the functioning and constitution of the different approaches see Tavlas, Dellas and Stockman, 2008, p. 945 et seqq. or Rose, 2011, p. 653-654.
[4] For a comparison of various ERR classifications refer to the appendix from Klein & Shambaugh (2006)

Under a peg, the central bank wields influence on the nominal exchange rate via interest-rate policy measures or open market operations whenever the value of its currency threatens to deviate from the single foreign currency, basket of currencies or some other measure of value (e.g. gold) against which the central bank has fixed the value of its currency (so-called anchor). Such corrections for excess demand or supply in currency markets require a huge foreign exchange reserve, as has recently been highlighted after the Swiss National Bank's decision to scrap the Euro exchange rate ceiling[5]. Capital controls thus take on special significance in the context of a peg, as they allow an economy to shield itself from risks associated with fluctuations in international capital flows. From the policy trilemma we now know that any country implementing a hard peg without setting limitations on capital mobility will have to forgo the ability to independently pursue its own monetary policy objectives such as full employment, price stability, or economic growth. On the one hand, this lack of monetary autonomy precludes monetary policy from changing in response to the needs of the economy (Frankel, 2003, p. 6). For example, after 1998, Argentine farmers and manufacturers found themselves priced out of local and foreign markets, but the Argentine authorities could not do anything as long as they were bound by a currency pegged to the dollar. Moreover, Spain and Portugal would have been much better off with monetary polices tailored to their own conditions during the financial crisis. Their membership in the Eurozone however made this impossible (Frieden, 2014, p. 6-7). On the other hand, a lack of monetary autonomy can make pegs susceptible to speculative attacks and severe exchange rate overvaluations (Plümper & Neumayer, 2011, p. 1121-1122).

There are two main reasons why an economy would be willing to sacrifice its monetary freedom and peg its currency's foreign value:

2.3.1. LOWER INFLATION

Although inflation is likely to depend on much more than just the ERR[6], the predominant view on the relationship between the exchange regime and inflation is that pegged exchange rates contribute to lower and more stable inflation. On the one hand, this is due to exchange rate pegs imposing discipline on monetary policy (Klein

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[5] In January 2015 the Swiss national bank's foreign reserves stood at 498,4 Billion Swiss Francs, which amounts to almost 80% of Siwtzerland's 2013 GDP.

[6] Higher real GDP growth, by raising money demand, should reduce inflation. Conversely, faster growth of the money supply, should be associated with higher inflation (Ghosh et al., 2003, p. 76). Romer (1993) argues that greater trade openness raises the costs of a monetary expansion, implying lower inflaiton in more open economies, given the logic of the policy credibility models. Cukierman (1992) associates higher central bank governor turnover rates (an inverse proxy for central bank independence) with higher inflation.

& Shambaugh, 2010, p. 165). This discipline arises due to the constraint that the balance of payments places on an economy. The total supply of money in an economy is a combination of foreign exchange reserves (which reflect the balance of payments) and domestic credit (which reflects domestic monetary policy). To maintain the pegged value of a currency, a rise in demand for foreign exchange must be offset by the central bank's purchase of foreign exchange. Otherwise pressure will be put on the exchange rate. If the supply of money (domestic credit) grows faster than the demand, pressure will be put on foreign reserves and, subsequently, on the exchange rate. If the money supply continues to outstrip demand for local currency, reserves become depleted and the central bank looses its ability to intervene in international currency markets to maintain the pegged value of the domestic currency (Leblang, 1999, p. 600).

On the other hand, pegs allow policy makers in countries with a high inflation propensity to import central bank credibility by adopting a fixed exchange rate with a more stable currency (Cukierman, Leiderman & Spiegel, 2004, p. 384). For instance, empirical analyses provide broad support that dollarization and currency unions, *"which can be regarded as an extreme monetary regime where countries have the hardest of hard pegs"* (Edwards & Magendzo, 2003, p. 219), have had a significantly lower rate of inflation than countries with a domestic currency (Alesina & Barro, 2000; Cooper & Kempf, 2001). This is mainly due to central bank independence being complete in such cases, and thus allows especially less developed countries to deal with the inflationary-bias associated with monetary institutions that lack credibility.

Likewise, Ghosh, Gulde and Wolf (2002, p. 192) employ their consensus classification[7] over the period 1970-1999 for a group of 150 developed and developing economies and control for money growth rate[8], level of trade openness, central bank independence and real external shocks. They find the yearly inflation rate under pegged regimes to be 21 percentage points lower than under floating rates (7 percentage points are associated with lower money growth, and 14 percentage points with greater confidence). Yet, sub-dividing their country sample into three groups – lower and lower-middle income, upper-middle income and upper-income, the authors

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[7] For their consensus classification, the authors employ a continuous de facto measure based on observed exchange rate behavior which they convert into a discrete three-way classification of pegged, intermediate, and floating regimes utilizing the relative frequency distribution of regimes in the de jure classification. The consensus sample then consists of all observations for which their de facto and the official de jure classification overlap (Ghosh et al., 2002, p.46).

[8] When including money growth rate into the regression, the disciplinary effect on monetary policy is isolated and the results reflect only the credibility effects (Klein & Shaumbaugh, 2010, p. 176).

established that the association of pegs with lower inflation is weakest for industrialized countries, for which the differences in inflation rates across regimes are negligible and statistically insignificant. They attribute this finding to the strong institutional frameworks and the anyway low inflation rates developed countries enjoy, so that the ERR makes little difference.

Regressions by Rogoff et al. (2004, p. 54) who avail themselves of Reinhart and Rogoff's (2004) „Natural" coding, support the findings of the latter. They further expound that countries embrace greater exchange rate flexibility as they grow richer, and ascribe this phenomenon to the disappearance of the inflation benefit of pegs that policy credibility and well established track records under economic advancement entail. In addition, owing to improved policy credibility, it also becomes easier for governments to borrow in their own currencies. This diminishes the risk associated with exchange rate flexibility and makes floating regimes more attractive.

Bleany and Francisco (2005, p. 1463) reassess the correlation between inflation and ERRs in developing countries by using four different classification schemes for ERRs. They find that only hard pegs are consistently highly significant and negative for inflation, as only hard pegs achieve lower inflation through consistently tight monetary policy, while from soft pegs there are no credibility gains.

Klein and Shaumbaugh (2010, pp. 174-178) draw on a data set that covers the experience of 80 countries from 1980 to 1999 and employ estimates of bivariate regression that use a dummy variable equaling 1 in years where a country pegs. They find inflation to be significantly lower for years characterized by a peg (7.7 percentage points) as compared to other years without a peg (11.9 percentage points). After negatively testing for endogeneity with instrumental variables and controlling for other factors with an effect on inflation such as trade openness, capital controls, central bank turnover and growth in real GDP, inflation is still estimated to be significantly lower by 5.37 percentage points for industrial countries and 5.88 percentage points for developing countries in years characterized by a peg. However, when estimating the regression using country fixed effects to control for reasons unassociated with pegging that are not fully captured through the inclusion of other variables in the regression, inflation is found to be significantly lower only in the case of developed countries switching to a peg.

An exception to the "rule", which associates pegs with lower inflation, is found by Atish, Ghosh and Ostry (2009, p. 39). They argue that the inflation benefit from pegs does not occur, when the peg is at an undervalued rate, and the country is unable to

countervail the money supply growth that occurs when persistent current account surpluses and resulting accumulation of foreign reserves translate into excessive monetary growth.

2.3.2. TRADE OPENNESS

The unpredictable volatility of a floating exchange rate, both from a short-term perspective and a long-term one, is believed to reduce international trade, discourage investment, and compound the problems people face in insuring their human capital in incomplete asset markets. A long-lasting fixed exchange rate on the other hand creates a stable basis for planning and pricing and thus helps to develop investment and international trade. The primary motivation behind the international Gold Standard prior to World War I and the Bretton Woods system was that a system of pegged exchange rates would not only constrain policymakers and decrease the frequency of inflationary policies but also stabilize expectations and increase international trade and capital flows (Eichengreen, 1996, p. 42).

This argument is being supported by research conducted by Adam and Cobham (2007, p. 7562) who find that ERRs, which reduce exchange rate risk and transaction costs, including currency unions, are significantly more trade enhancing than flexible exchange rates. Moreover, their findings suggest that in general the positive direct and indirect effects on trade of such reductions even outweigh the trade-diverting substitution effect[9].

Furthermore, Abbott, Cushman and De Vita (2012, p. 104) who investigate the influence of different ERRs for foreign direct investment (FDI), find a strong and significant effect from fixed rates on FDI flows in developed economies, but no significant effect for developing countries.

2.3.3. OUTPUT VOLATILITY

As mentioned before, flexible exchange rates are determined by the market, and are thus often termed „self correcting", as imbalances in currency markets are allowed to settle themselves. The pressure on the government to intervene is thus greatly reduced, which in turn decreases the foreign exchange reserves that the central bank is required to hold. Central banks under a flexible ERR are afforded monetary policy autonomy, and are thus equipped with a powerful tool for regulating a national economy: they can inject money into the system to avert a recession, or reduce the money supply when excessively rapid growth brings about inflationary tendencies.

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[9] A regime may also affect the trade between two countries negatively by encouraging one country to substitute it by trade with a third country with which it has a "closer" ERR.

Floating ERRs thus give authorities more room for maneuver to insulate the economy against real shocks in that policymakers can choose a variety of policy tools to smooth consumption and/or investment and thereby avoid costly and tedious adjustment processes, so as to achieve greater stability of output in the long run. A flexible exchange rate furthermore allows policymakers to choose an appropriate balance between inflation and output (employment) without being constrained by international factors (Leblang, 1999, p. 601). However, if the nominal exchange rate is fixed, the adjustment in the equilibrium real exchange rate after a real negative shock (IS-curve moves to the left in the Mundell-Fleming Model) will take place through changes in domestic nominal prices and domestic wages (Edwards & Levy-Yeyati, 2003, p. 1). This is because the central bank has to resort to restrictive monetary policy in order to hold the peg. From the quantitative theory of money we know that a reduction in M will result in a decrease in P; or in other words, contractionary monetary policy effectuates a deflation of the price level. In the presence of nominal price and wage rigidities, this will again induce unemployment and slower growth (Edwards, 2001, p. 9).

In line with these assertions, Edwards and Levy-Yeyati (2003, p. 12) unveil that *"under flexible exchange rates the effects of terms-of-trade shocks on growth are approximately one half that under pegged regimes".* Levy-Yeyati and Sturzenegger (2003, p. 1176), who employ their own coding, find the standard deviation of growth over a 5-year period to be 4.3% for pegs, 4% for intermediate regimes, and 3.4% for floats. Similarly, dollarized economies are associated with higher growth volatility than other regimes, including different types of pegs (Edwards, 2001; Edwards, Magendzo, Galati & Rankin, 2006).

However, in countries where the public and private sectors hold large foreign currency-denominated liabilities flexible ERRs will not be effective in buffering real external shocks and may even amplify their negative effects (Eichengreen & Hausmann, 1999, p. 3). The reasoning behind this is that the currency depreciation induced by the external shock will lead to large increases in the value of the debt denominated in domestic currency, which in turn may unleash bankruptcies, lead the public sector into insolvency, and reduce the growth rate. In addition, when it comes to output stability in the presence of monetary shocks originating in the domestic economy, fixed exchange rates are said to exhibit a superior performance (McKinnon, 1988, p. 89), as monetary shocks require an adjustment in real money balances. This can be most easily carried out through changes in nominal money balances, which happen endogenously under fixed exchange rates.

2.3.4. GROWTH

Arguments regarding the impact of different ERRs on long-term economic growth are highly inconclusive. On the one hand, long-run monetary neutrality, and its implication that no nominal variable has an effect on real outcomes over an extended period of time, is one of the oldest, and most widely accepted propositions in macroeconomics (Klein & Shambaugh, 2010, p. 185). Thus, the choice of the ERR should have no impact on long-run economic growth[10]. In line with those assertion, Gagnon and Hinterschweiger (2011, p. 232) argue that it is not possible to detect any reliable effect of the type of ERR on the level of economic output or the long-run growth rate, given that long-run economic output is influenced by many other more important factors than the ERR. Similarly, Klein and Shambaugh (2010, p. 186-187) contend that it is not possible to detect any reliable effect of the type of ERR on economic growth over twenty years once one controls for other variables that typically are included in growth regression. Likewise, Ghosh et al. (2002, p. 98) conclude that *"overall, and in line with the theoretical literature, the results do not suggest a strong link between the ERR and real GDP growth"*.

On the other hand, arguments, however, are made that the exchange rate is a particularly important price, and efforts to manage it might have long-run consequences. For example, Atish, Ghosh and Ostry (2009, p. 39) associate intermediate ERRs with faster per capita output growth of about half a percentage point a year, as they represent an expedient balance between pegs and floating ERRs:

"Pegged regimes are associated with lower inflation, lower nominal and real exchange rate volatility, and greater trade openness – all of which are associated with faster growth. But pegged regimes are also more susceptible to exchange rate overvaluation, which hurts competitiveness and undermines growth performance. Compared with pegged regimes, floating exchange rates are at less risk for overvaluation, but they also fail to deliver low inflation, reduced volatility, or better trade integration".

Since economic theory does not allow for making precise predictions regarding the effect on growth of different ERRs, the question is essentially an empirical matter. As indicated in Table 1 below the majority of research papers, despite employing different ERRs and slightly different methods, conclude that flexible ERRs seem to have a more favorable effect on growth.

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[10] Analysis of long-run economic growth typically considers experience over a minimum of a decade, and, more often, over the course of two or more decades (Klein & Shambaugh, 2010, p. 186).

STUDY	DATA & SAMPLE	MODEL	GROWTH ENHANCING ERR		
			Float	Peg	Comment
Moreno (2000)	- 1974-1999; - 98 developing countries; - East-Asian countries; - Moreno (2001) coding	Descriptive analysis Means and standard deviations comparison across ERRs		X	
Levy-Yeyati & Sturzenegger (2003)	- 1974-2000; - 183 countries; - LYS (2001) coding	Pooled regression Real growth = f(regional, year and ERR dummies, rate of change of the terms of trade, investment to GDP ratio, political instability, initial per capita GDP, population, secondary enrolment, population growth, lagged government consumption)	X		Results only apply to nonindustrial countries. For industrial countries the ERR appears to be irrelevant
Bailliu, Lafrance & Perrault (2003)	- 1973 – 1998; - 60 countries; - own coding	GMM Real per capita growth = (ERR dummies, initial growth, secondary schooling enrolment, investment-to-GDP, real government share of GDP, trade-to-GDP, M2-to-GDP, private sector credit-to-GDP, gross private capital flows-to-GDP, domestic credit-to-GDP)		(X)	Intermediate and flexible ERR without an anchor are detrimental for growth. It is the presence of a strong monetary policy framework, rather than the type of ERR per se, that matters for economic growth.
Edwards & Levy-Yeyati (2003)	- 1974-2000; - 183 countries; - LYS (2001) coding	Pooled regression (OLS) Real growth = f(log of initial GDP per capita, investment ratio, secondary school enrolment, openness, government consumption to GDP, regional and ERR dummies)	X		
Bleany & Francisco (2007)	1984-2001; - 91 developing countries; 5 different codings - IMF (2004) - LYS (2005) - Reinhart & Rogoff (2004) - Bubula & Ötker-Robe(2002)	OLS Per capita growth = f(lagged per capita growth, ER dummies, regional dummies, dummy for parallel-rate premium >50%, dummy or inflation < 25%)	X		All alternative schemes, expect for Reinhart & Rogoff, suggest that hard pegs are associated with slower growth

Table 1: Summary of research papers regarding the effect of ERR on growth

Yet, even the empirical research papers come to nothing, thereby suggesting that the ERR does not seem to matter for growth. Furthermore, empirical research investigating cross-country relationships between growth and inequality (Bruno, Ravallion & Squire, 1998, p. 21-22) finds that growth tends to be "*distribution neutral*", meaning that it does not lead to a worsening or an improvement in income distribution. It is thus not growth per se that seems to affect inequality. Much rather it is structural factors and policy stances that define the way in which growth comes about, and what its precise effects on inequality will be (UNCTAD, 2000, p. 4).We can thus safely eliminate growth as a possible variable through which the ERR could have an impact on inequality.

2.4. A WORD ON INTERMEDIATE ERRs AND SUSCEPTIBILITY TO CRISES

One reason why the argument put forth in the UNDP article is somewhat questionable concerns the claim that fixed exchange rates are affiliated with an increased risks of currency crisis[11]. Although fixed ERR are indeed unable to cope with external shocks, and prone to speculative attacks due to the large amount of reserves necessary to hold the fixed exchange rate, conventional wisdom, articulated by Fischer (2001) has it that countries should adopt floats or hard pegs and avoid intermediate regimes, as they tend to be more susceptible to crisis.

In a new paper Ghosh, Ostry and Qureshi (2014) revisit the bipolar prescription for exchange rate regime choice by asking whether hard pegs and pure floats are still safer than intermediate regimes. They find financial vulnerabilities to be significantly greater under less flexible intermediate regimes – including hard pegs – as compared to floats. While not especially susceptible to banking or currency crises, hard pegs are found to be significantly more prone to growth collapses, thus suggesting that the security provided by hard pegs is largely illusory. Most surprisingly, especially in consideration of the made assertion in the UNDP report, is the finding that intermediate, and not fixed ERR, are found to be the most susceptible to crisis. Only managed floats, which constitute a subclass of intermediate regimes and behave much more like pure floats, exhibit significantly lower risks and fewer crises.

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[11] "*Each of these 'two corner solutions' put developing economies at the risk of currency crises and large currency devaluations. On the one hand, fixed nominal exchange rate regimes are unable to cope with external shocks such as trade shocks and are prone to speculative attacks, thus increasing the risk of a currency crisis. On the other hand, free floats often turn into a 'free fall', given the volatile and pro-cyclical behaviour of capital flows (Reinhart and Rogoff, 2003). Massive currency devaluations and crises that arose from the adoption of these two 'extreme' exchange rate regimes led to rapid declining real wages, often affecting lower wage-earners disproportionately in comparison to other wage-earners, capital owners and land owners (van der Hoeven, 1991)*" (UNDP, 2013, p. 84).

To the same conclusion come Bubula and Otker-Robe (2003), who explore the incidence of crises (defined as episodes of severe exchange market pressure) during 1990–2001, and find that pegged regimes exhibit a higher incidence of crises than floating regimes in countries that are more integrated with international capital markets. Intermediate regimes (mainly soft pegs and tightly-managed floating regimes) have been found to be even more crisis prone than both hard pegs and other floating regimes.

2.5. THE DETERMINANTS OF ERR CHOICE

Before turning to income inequality, we want to take a look at the factors that influence the choice of the ERR that will be adopted. Because countries do not choose ERR for the regimes per se. As we have seen different regimes produces different outcomes, and countries choose them according to the outcomes they desire. One can basically group the literature addressing the problem of ERR choice into five different strands of research:

2.5.1. MACROECONOMIC AND STRUCTURAL VARIABLES

First, literature from economics has produced models and empirical answers to this question based on characteristics on a country's economy. Given certain factors such as economic openness, country size, and labor mobility, the optimal exchange arrangement can be determined. One factor is a lack of reserves, which is said to increases the probability of adjusting or abandoning a peg. Capital controls, on the other hand, are said to increase the sustainability of pegs, since it is less likely that inconsistencies between fiscal or monetary policy and exchange rate policy will result in capital outflows and the collapse of the regime. As we have already seen, capital controls also make it possible for countries to fix the exchange rate without sacrificing monetary policy. Pegs are thus expected to be more prevalent in periods when countries have capital controls. Again another example is high inflation, which makes a peg unsustainable, while moderate inflation requires frequent readjustments of the peg. Inflation furthermore increases the political cost of abandoning a peg and thus decreases the probability of choosing a fixed regime. Conversely, hyperinflation will increase the likelihood of adopting a peg, because under hyperinflation the nominal exchange rate becomes a natural reference for prices, and pegging makes it easier to stop the inertial component of inflation (Frieden, Ghezzi & Stein, 2000, p. 13-15).

The problem with such models however is that the preferences of policymakers are assumed to be fixed and exogenous. The analytical usefulness of these models diminishes once it is recognized that different conclusions can be (and often are) reached depending on initial assumptions regarding policymakers' preferences over price stability, aggregate output, or both (Leblang, 1999, p. 601). In addition,

economic theories of exchange rates by themselves leave much unexplained, and are often not the pivotal factor for deciding on an ERR.

2.5.2. HEGEMONIC STABILITY THEORY

Second, political scientists and political economists have frequently examined ERR choice through the lens of hegemonic stability theory, which focuses on the presence of an international hegemon that yields sufficient resources to manage the international system. While the presence of a hegemon is argued to have allowed for the smooth functioning of the international monetary system, both during the classical Gold Standard and the Bretton Woods era, the absence of a hegemonic power led to competitive devaluations and beggar-thy-neighbor policies during the interwar period (e.g. see Eichengreen, 1992; Keohane, 1984). More recent research from political economists furthermore suggests that disembodied international capital flows can be just as influential as hegemonic control. It is argued that financial globalization, at a minimum, *"has put governments distinctly on the defensive, eroding much of the authority of the contemporary sovereign state. At a maximum, it may have irreversibly altered the meaning of geography in the world today"* (Cohen, 1996, p. 270).

2.5.3. INTEREST GROUP VARIABLES

Third, political considerations are particularly relevant in exchange rate policy due to two reasons. On the one hand, the choices available to currency policymakers involve real trade-offs between macroeconomic outcomes that different sociopolitical actors value differently. On the other hand, there are no unambiguous welfare criteria (as there are for example in trade policy) to guide policymakers[12]. Exchange rate policy thus differs from many other economic policies, in that it is entirely the result of political economy factors (Frieden, 2014, p. 8). The principle factors involved in the choice of currency regimes and values are thus how different options affect the constraints and opportunities available to policy makers, and how they affect economic agents in society.

In an open economy, there are two dimensions along which these options can be evaluated: When choosing a currency regime in a financially open economy the trade-off is between monetary stability and predictability of a fixed exchange rate on the one side and policy flexibility of a floating exchange rate regime on the other. Fixing the exchange rate is especially attractive to actors whose economic activities directly involve international trade and payments and who therefore are highly sensitive to

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[12] One potential eception to this rule ist he litetrature on optimal currency areas, which does in fact suggest clear welfare criteria.

currency fluctuations. International traders and investors and the producers of export-oriented tradable goods tend to suffer from exchange market volatility, since it makes their business riskier. These actors are also relatively unconcerned about macroeconomic conditions, since they can respond to depressed local demand by shifting their business to other countries. Conversely, producers of no-tradable goods and services, and producers of import-competing tradable goods for the domestic market tend to be relatively indifferent about exchange rate volatility, as currency volatility only indirectly affects their business at best.

The second dimension applies to flexible ERR only[13], and pertains to the level (value or price) of the exchange rate, which eventually comes down to a trade-off between the purchasing power of domestic residents and consumers versus the competitiveness of domestic producers (Frieden, 2014, p. 6). However, the level of exchange rate also affects the price ratio of tradable to non-tradable goods. Producers of tradable goods will prefer a weaker (more depreciated) currency, as their output prices rise more than the prices of the non-tradable inputs they use, and makes their products more competitive in domestic and foreign markets. In contrast, producers in the nontradables sector will be expected to lobby for a strong currency that raises the domestic relative price of their goods and lowers the domestic relative price of tradables. Likewise, international traders and investors, who are interested in purchasing assets overseas, favor an appreciation (Frieden, 1991, p. 443-448)

The prominence of choosing the ERR even increased as countries have advanced in the process of trade liberalization, as the subsidies and specific tariffs to compensate those who are hurt by the exchange rate policy in place become less available with progressive liberalization. Hence, special interest groups tend to shift their focus away from swaying these compensatory mechanisms in their favor and become more vocal about exchange rate policy (Frieden, Ghezzi & Stein, 2000, p. 38).

2.5.4. CLASS-BASED (PARTISAN) APPROACHES TO REGIME CHOICE

Fourth, given that exchange rates have broad distributional effects, it makes sense to analyze the politics of regime choice at a broad level of political aggregation. According to Hibbs (1977, p. 1468) low unemployment-high inflation configurations are generally found in nations governed by the Left, while a high unemployment-low inflation pattern prevails in political systems dominated by center and rightist parties. Center-right parties are thus likely to support

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[13] Policymakers can engineer a real appreciation or depreciation even with a fixed exchange rate by acting to raise or lower domestic prices. For simplicity, focus will only be set on nominal exchange rate movements with real effects, which in any event are normally far easier to engineer and far more common (Frieden, 2014, p. 7).

pegs as their business constituencies benefit from the credible commitment to low inflation that fixing brings. While left-wing parties would be expected to favor flexible regimes given that labor bears the brunt of adjusting the domestic economy to external conditions (Simmons, 1994 in Broz & Frieden, 2001, p. 328).

2.5.5. POLITICAL FACTORS

Fifth, although the importance of societal preferences and pressures cannot be ignored, a focus on societal actors only ignores the importance of those who determine and supply policies. Politicians seek to maintain their office and are concerned with the balance of political forces they must face. As such, macroeconomic policy may reflect the desires of policymakers rather than the preferences of constituencies. As noted above, a peg limits the amount of discretion policymakers can have over domestic monetary policy. The wiliness of a policymaker to give up monetary policy autonomy for the sake of external monetary stability depends on, in part, the configuration of domestic political institutions. For example, Leblang (1999, p. 600) finds that floating exchange rate regimes are more likely in democratic than in authoritarian polities, while democratic polities with majoritarian electoral systems are more likely to fix their exchange rates than those with systems of proportional representation. Frieden, Ghezzi and Stein (2000, p. 42) furthermore find authoritarian governments to rely more heavily on regimes that cater to the anti-inflation objective, while strong government and governments with weak opposition tend to fix. Their interpretation is that government strength relative to the opposition diminishes the political cost associated with devaluation, and at the same time makes the need for devaluation less likely, given that it is easier for the government to achieve a winning coalition in support of the necessary adjustment programs. Moreover, Edwards (1996, p. 15) finds countries that are politically more unstable have a lower probability of selecting a pegged ERR.

3. DEFINING INCOME INEQUALITY

The gap between rich and poor is at its highest level in most OECD countries in 30 years. Today, the richest 10% of the population in the OECD area earn 9.5 times more than the poorest 10%. By contrast, in the 1980s the ratio stood at 7:1 (OECD, 2014, p. 1). Also for developing countries the 1980s appear to be one of the turning points, when there was a sizeable increase in income inequality in virtually all regions (UNCTAD, 2012, p. 46).

The single most popular index applied to inequality measurement is the Gini Coefficient, which measures inequality across the whole of society rather than simply comparing different income groups (Atkinson & Brandolini, 2001, p. 777). It is based on the Lorenz curve and can take values between 0 ('perfect' equality) and 1 (complete inequality, where one individual holds 100% of the income).

Although most policy discussions on inequality focus on secondary household income distribution (UNDP, 2013, p. 70), which is the distribution of household income after the deduction of taxes and inclusion of transfer payments (e.g. as determined by fiscal policies), most of the empirical papers under investigation focus on market income distribution. Despite measuring the distribution of income before taxes and transfers are taken into account, market income nonetheless cannot be regarded as "pre-government". This is because a wide range of non-distributive government policies, from job-training programs and public education to capital accounts regulations, also affect income distribution (Morgan & Kelly, 2013, p. 672). Market-income inequality furthermore includes the feedback effects of redistributive policies on household's decisions regarding savings, employment, and retirement. For example, where solid public pension schemes are in place most households will save little for retirement, thereby resulting in most elderly households being without market income. Hence, market income inequality will be exaggerated in comparison to settings in which public pensions are less complete (Jesuit & Mahler, 2010, p. 1393). Solely focusing on labor earnings would allow for abstracting from changes in redistributive policies, in interest rates, or in patterns of household formation (Bourguignon, 1981 in García-Peñalosa, 1999, p. 1621). However, output volatility and inflation are also said to affect income, and not solely wages. Yet, in seeking to understand the impact of growth and trade on inequality, it becomes more appropriate to concentrate on the distribution of wages rather than income.

3.1. Most Common Drivers of labor income inequality

Given that shifts in the market distribution of income are the primary factors driving the rise in inequality (Ieldhouse, 2013), one should know of the most common factors associated with improving of aggravating labor income inequality, which after all is the main source of personal and household income, and thus has major implications for income inequality (Aghion, Caroli, García-Peñalosa, 1999, p. 1632).

Focusing on country-level data for 22 OECD countries over the period 1981 to 2008 the OECD report "Inequality in labor income – What are its drivers and how can it be reduced" looks at the effect of a wide range of factors on labor income inequality of full-time workers:

❖ **Technological change** has contributed to a rise in income inequality. As the late Dutch economist Tinbergen put it, inequality is the result of a race between technology and education. If societies are not able to produce highly educated workers in the number needed in the new economy, their wages will rise relative to their less-skilled counterparts (Milanovic, 2011, p. 302).

❖ **Globalization** may widen the dispersion of labor income, for example through greater outsourcing of tasks from richer to poorer countries. To the extent that these tasks are not skill intensive from the perspective of the rich country, but they are from the perspective of the poor country, labor demand will become more skill intensive in both poorer and richer countries, thus increasing inequality in both groups of countries. Another channel for trade to increase labor income inequality operates if firms differ in their profitability and low-income workers work disproportionately in low-productivity firms that are battered by import competition. Trade thus only raises the dispersion of income when unions have little clout or when employment protection is lax. However, trade seems to have more negative employment effects in the presence of strong unions.

Given the importance that ERRs play for trade and financial liberalization, and the ambiguous results regarding the effect of trade on income inequality, further attention shall be paid to these two factors in the next chapter.

❖ **Part time work** is an important driver of labor income inequality and the removal of policies and practices that distort workers' choice of working hours is said to reduce income inequality.

❖ A rise in the share of workers with upper-secondary **education** and ensuring greater equity in educational attainment is associated with a decline in the dispersion of labor income.

❖ On average across countries, workers on **temporary contracts** earn 25% less than workers on permanent contracts, even if the workers have similar working hours, education, age and gender. Consequently, a general rise in the share of workers with a temporary contract should be associated with a rise in income inequality.

❖ A rise in the **minimum wage** raises the income of those at the bottom of the income distribution thereby contributing to greater income equality. However, if minimum wages are set too high they may limit the job market opportunities for young and low-skilled workers, thus at least partly offsetting the inequality-reducing effect through lower employment of these groups.

❖ Despite some decline over past decades, **gender differences in labor income** are still striking in the majority of OECD countries. Even after fully accounting for differences in working hours and education between men and women, a significant income gap remains, reaching over 25% for the median worker in many OECD countries. Policies addressing these issues – for example, improvements in the availability of formal care for children and the elderly – may therefore help to reduce labor income inequality.

3.2. OTHER POSSIBLE DRIVERS OF INCOME INEQUALITY

3.2.1. INFLATION

The most evident mechanism at work when it comes to the relationship between inflation and income inequality, is probably put forth by Piketty (in Buttonwood's notebook, 2014) as follows:

People sometimes believe that inflation is the enemy of the rentier and that this may in part explain why modern societies like inflation. But...it is enough to invest one's wealth in real assets, such as real state or share of stock, in order to escape the inflation tax entirely. Rich people can afford to use intermediaries to help them avoid the inflation tax. By contrast, a person with only 10 or 50 thousand euros to invest will not be offered the same choices by their broker...many people in this category keep most of their savings in checking accounts that pay little or nothing and/or savings accounts that pay little more than the rate of inflation.

This argument is supported by research conducted by Albanesi (2007, p. 24), who draws on cross-country evidence from a sample of 51 industrialized and developing countries over the time period from 1966 to 1990 and finds a positive correlation between inflation and income inequality. Like Piketty, she attributes this relationship

to the relative higher vulnerability of low-income households to inflation[14], as they hold more cash as a fraction of their total savings[15]. Furthermore, the political process for determining government policy is modeled as a bargaining game in which government finances its consumption either by taxes on labor income or monetary financing, if an agreement is not reached. Given the higher vulnerability of low-income households in case of disagreement, their bargaining position is ultimately weakened and implies that the outcomes of the political process will be biased against them.

Drawing on the positive effect of financial development in reducing income inequality (through enhanced loan markets, but also through more developed stock markets), Barugahara (2012) finds that this effect ceases as inflation rises. The main reasoning behind this process is that high levels of inflation intensify credit rationing through a reduction and greater variability of real returns. As a consequence, „the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital investment" (Barugahara, 2012, p. 196).

However, most studies find that the correlation between inflation and inequality is not straightforward positive. Whether the correlation is positive or negative appears to be dependent on various other factors. For instance, Jin (2009, p. 146) develops a monetary endogenous growth model with capital and skill heterogeneity to analyze the relationship among inflation, growth and income inequality. He argues that the effect of long-run money growth rates on income inequality is dependent on the relative importance of the two types of heterogeneity. If capital heterogeneity dominates, the correlation between inflation and inequality is negative. A positive correlation prevails, if differing skill endowments across households is the dominant factor. According to Aleš' (2012, p. 16), *"lower inflation rates – in addition to the level of development and fiscal redistribution – are found to improve income equality and their impact is uniform for all levels of GDP per capita"*. Yet, the effect of price stabilization on income distribution appears to be nonlinear, given that countries with inflation below 5% seem to benefit less than countries with inflation rates between 5% and 40%. His argumentation builds on a model, where inflation shifts the labor supply schedule of outsiders (workers who are not subject to inflation-adjusted nominal

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14 This finding is supported by Easterly and Fischer (2001), who draw on household polling data for 38 countries and find that the poor are more likely to mention inflation as a top national concern.

[15] This argument is supported by Erosa and Ventura (2000) who find that in the US low-income households use cash for a greater fraction of their total purchases than high-income households.

contracts and are usually located at the bottom of the income scale) inward[16], thereby lowering the amount of hours worked and earnings incurred. Insiders, on the other hand either receive most of their compensation in stock options or inflation-adjusted nonwage benefits, or are employed in a unionized sector with indexed earnings. Furthermore, return on assets owned by wealthy insiders might also be better protected from inflation as they have the possibilities to invest in assets that are uncorrelated with inflation or grow faster than inflation[17]. While inflation causes the incomes of both groups to fall in absolute terms, insiders nonetheless increase their incomes relative to outsiders, thereby exacerbating inequality[18]. Yet again, Desai, Olofsgård and Yousef (2004, p. 45) argue that the relationship of inequality and inflation is conditional on political structure. While inequality and inflation are positively correlated in more democratic political systems, a negative correlation prevails for non-democratic systems.

A series of studies also explore the inverse causal relation, and find that countries with a more unequal income distribution tend to have higher inflation that is, the causal relation from income inequality to inflation (Albanesi, 2007; Easterly and Fischer, 2001; Dolmas, Huffman & Wynne, 2000; Beetsma and Van Der Ploeg, 1996). One general argument for this approach is that inequality provides fertile grounds for populist policies that fuel inflationary processes, such as exchange rate overvaluation, expansion of aggregate demand or price controls (Dornbush & Edwards, 1991, p. 11-12). Another approach is based on the "wars of attrition" model, which suggests that a delay of stabilization resulting from strategic conflicts between different sociopolitical groups about how to share the burden of fiscal adjustment, constrains a governments revenue-collecting competences and tilts the optimal revenue mix towards an inefficient tax system that heavily depends on the inflation tax (Kaminsky & Pereira, 1996, p. 17). Yet another explanation is based on the distributive asymmetries of inflation and a median voter model. Given that the median voter is generally poor, government will commit itself to policies that create surprise inflation to erode the real value of debt and lower non-monetary taxes for all (Beetsma & van der Ploeg, 1996).

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[16] Aleš, 2001 proceeds on the assumption of a horizontal labor demand schedule and an upward-sloping labor supply schedule in the usual labor-wage space.

[17] Mulligan and Sala-i-Martin (2000) estimate the probability of adopting financial technologies that hedge against inflation and find that is positively related to the level of household income and wealth, and inversely related to the level of education. Attanasio, Guiso and Japelli (2002) find that the probability of using an interest bearing bank account increases with educational attainment, income and average consumption, based on cross-sectional household data for Italy.

[18] Research by Easterly and Fisher (2001) confirms that the poor generally are more concerned about inflation than the rich.

3.2.2. CURRENCY CRISIS, DEVALUATIONS AND UNEMPLOYMENT

In the UNDP report it has been argued that the massive currency devaluations and crises that arose from the adoption of these two 'extreme' exchange rate regimes led to rapid declining real wages, often affecting lower wage-earners disproportionately in comparison to other wage-earners, capital owners and land owners.

A currency crisis is a speculative attack on the foreign exchange value of a currency, resulting in a sharp depreciation or forcing the authorities to sell foreign exchange reserves and raise domestic interest rates to defend the currency (Glick & Hutchinson, 2011, p. 2). Therefore both a depreciation (or devaluation in the case of a fixed exchange rates) and currency crisis are both likely to contribute to inflationary pressures because of higher import prices and rising demand for exports [19]. Borensztein and De Gregoria (1999, p. 18), who studied the effect of large devaluations on inflation, show that about 30% of the devaluation is offset by higher inflation after three months, and the offset climbs to about 60% after two years, with a significant real depreciation present for longer periods.

Currency crises have always been a feature of the international monetary system. Dramatic episodes of currency crises include the breakdown of the Bretton Woods system in 1971-73, the Latin American Tequila Crisis following Mexico's peso devaluation in 1994-95, the financial crisis that swept through Asia in 1997-98 and, more recently, the global financial crisis in 2008-09 that forced sharp depreciations in many advanced and developing economies alike (Balakrishnan, Danninger, Elekdag & Tytell, 2009). Very often currency crises are followed by severe recessions, which the National Bureau of Economic Research (NBER) defines as a "significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production and wholesale-retail sales". For example, in the aftermath of the Tequila crisis, several of Mexico's banks collapsed amidst widespread mortgage defaults, and the Mexican economy experienced a severe recession, where unemployment and poverty increased. Likewise, the global financial crisis was followed by a global economic downturn, which is precisely termed the Great Recession. This does not really come as a surprise, for the major cause of recessions is said to be inflation (Chizoba, 2015). These high inflation rates prior to a recession are then wrung out of the economy during the recession. Hence, most recessions see falling (or negative) inflation rates

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[19] For an intuitive discussion on how devaluations cause inflation refer to http://www.economicshelp.org/macroeconomics/macroessays/does-devaluation-cause-inflation/

(McMahon, 2011).

When drawing on the theory of the Phillip's Curve (which suggests an inverse relationship between rates of unemployment[20] and corresponding rates of inflation), and newer research examining the effects of the recent financial and economic crisis on the unemployment rate and wages of different sectors, a negative correlation between inflation and inequality is in the offering. True, in the long run, monetary policy has no effect on unemployment, as wage inflation will eventually catch up and unemployment returns to its natural rate, which is determined by real factors independent of the inflation rate (Friedman, 1968). However, the expectations-augmented short-run Phillips curve suggests that monetary policy does allow for temporary decreases of unemployment through a permanent increase in inflation, and vice versa (Blanchard, 2012, Chapter 8). A tangible illustration of this mechanism is given by the two major economic crises which hit the world over the past century – the Great Depression starting in 1929, and the Great Recession, which took up in 2007 and still has a lasting effect into 2015 for some countries. According to Kumhof and Rancière (2010, p. 3), the Great Depresseion as well as the Great Recession *"were preceded by a sharp increase in income and wealth inequality, and by a similarly sharp increase in debt-to-income ratios among lower- and middle-income households"*. While the latter is consistent with conventional economic models of consumption smoothing, which predict that when incomes decline during an economic downturn, households will try to maintain a smooth path of consumption by chipping away at savings or by borrowing more (Modigliani & Brumberg, 1954), the explanatory mechanisms at work for an increase in income inequality <u>after</u> an economic downturn has hit are quite comprehensible as well: in a recent unemployment outlook by the OECD, it is unveiled that job and earnings losses have generally been most pronounced in low-skilled, low-income households in the wake of the global financial and economic crisis (OECD, 2014b, p. 9). These findings are supported by the European Vacancy and Recruitment Report which concludes that *„labour market conditions hit the low-educated worst of all, with their employment rate falling the most since 2008 to 45% in 2012, compared to 68% for the medium educated and 82% for the high educated"* (European Commission, 2014, p.9). Furthermore, 18 out of the top 25 occupations for which employment increased in the

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[20] Of course there are many other causes of unemployment, which bear much more heavily on the unemployment rate, such as frictional unemployment or structural unemployment due to occupational and geographical immobility and technological or structural change in the economy.

EU between 2011 and 2012, were jobs requiring higher-level skills (ibid, p. 8). In examining the effects of the major economic and political changes in the UK since 2007, Hills (2013) finds that (1) gaps between the lowest and highest-paid workers grew wider. (2) Median real hourly wages fell by 1.6%, but by nearly 3% for the lowest paid full-time men and women and by over 4% for the worst paid male part-timers. (3) Weekly earnings of the lowest paid full-timers fell by more than 5%. Moreover, pursuant to Checchi and García-Peñalosa (2010, p. 2), not even a higher minimum wage can be associated with lower inequality, "*as the effect of the resulting increase in unemployment on distribution dominates that of a more compressed distribution of wages*".

Although the influence of inflation on unemployment as proposed by the expectations-augmented short-run Phillips curve is only temporary, long-term unemployment may nonetheless have lasting implications for inequality. As has already been mentioned before, long-term unemployment is associated with a deterioration of skills (Stiglitz, 2013), implying a steadily increasing gap in wages between workers that have been temporarily unemployed and those who did not lose their job (Breen & García-Peñalosa, 1999). Moreover, unemployment insurance schemes, on the one hand, only provide benefits up to a limited period of time (e.g. Switzerland, 90 – 520 days). Yet, once the insurance program expires, the unemployed and their families find themselves in tremendous financial difficulties. This eventually forces them to resort to borrowing to meet their daily needs and again adds to their debt burden, increasingly pushing the unemployed towards the debt trap (EconomyWatch, 2010). Conversely, a recent study by Hagedorn, Karahan, Manovskii and Mitman (2013, p. 1) concludes that "most of the persistent increase in unemployment during the Great Recession can be accounted for by the unprecedented extensions of unemployment benefit eligibility", as they represent an implicit tax on market work, subsidize unemployment and discourage labor supply. For Krugman income inequality and unemployment are not only linked but perhaps even the same issue. By destroying the bargaining power of workers and making it hard for families in debt to work their way out, *"unemployment (...) has become a major source of rising inequality and stagnating incomes"* (2014, January 23)[21]. Yet, Barlevy and Tsiddon (2006) find that recessions will only exacerbate inequality in periods where inequality is already growing. If, however, a recession hits during a period where inequality is decreasing, it tends to accelerate that trend as well, leading to a more rapid decrease in inequality. Whether inequality is experiencing an upward or downward trend is dependent on the

launch of new technology. According to them, technological innovations will first increase earnings inequality, but in the longer run they tend to decrease it – at least until the next innovation is introduced.

3.2.3. OUTPUT VOLATILITY

The linkage between macroeconomic volatility (defined as the standard deviation of the rate of output growth) and inequality was initially identified by Breen and García-Peñalosa (1999). Using a cross-section of developed and developing countries and regressing income inequality on volatility, they find that greater volatility significantly increases the Gini coefficient and the income share of the top quintile, while reducing the share of the other quintiles. The authors attribute this correlation to two reasons. First, in their model high income individuals (managers) are less risk-averse than workers and can extract a risk premium from the latter, thereby increasing their profits. The more volatile, and thus risky, the economy the greater the risk premium (the lower the wage of workers) and income received by managers. Higher volatility is therefore associated with greater inequality, as it raises the income share of the top income group, while simultaneously lowering that of the lower income groups, at least up to the point where wages are reduced to such an extent that workers decide to leave manufacturing. Second, the level of output determines whether or not low-income families can invest in education under imperfect capital markets and fixed costs for education investment. In that case, the degree of volatility will affect the distribution of human capital and thus income. Likewise, there could also be a loss of human capital if, in bad periods, those with less skills become unemployed. Given that long-term unemployment is associated with a deterioration of skills, the difference in skills and wages between these workers and those who did not lose their job will even increase over time.

In a more recent article Stiglitz (2012, 33-35) intends to explain the relationship between inequality and economic fluctuations with the possibility of causality running either way. On the one hand, increasing inequality effectively redistributes income from those with a high marginal propensity to consume to those with a low marginal propensity to consume, thereby reducing aggregate demand. A popular way of keeping the economy at full employment despite the reduced aggregate demand, is to lower interest rates and relax regulations. In almost all cases these measures contributed to volatility, and lead to bubbles that inevitably induce an economic downturn when they burst. On the other hand, Stiglitz identified various channels through which volatility can contribute to inequality. For one, unemployment exerts downward pressure on wages, and due to an upper bound on employment, economies

with greater volatility typically excerpt a higher average unemployment rate. Moreover, the adverse effects on inequality are all the greater, given that unemployment is typically strongest among low skilled workers. Because of the high costs of training skilled workers and the difficulties of recruiting good workers, firms are more likely to retain these workers through a downturn, assigning them, if necessary, to jobs requiring fewer skills. Furthermore, unemployment aggravates and makes inequality more persistent in that it decreases the skills and human capital of the unemployed (relative to the ones that don't lose their jobs).

Furthermore, in a more volatile economy, firms generally demand high-risk premiums. In order to achieve the same level of investment the share of wages will have to be lower. Alternatively, a lower level of investment will translate into lower growth and less resources for the government, forcing the latter to cut back on expenditure, and on social expenditures of particular importance to the poor.

3.2.4. TRADE

Whether trade openness is associated with declining or rising wage disparities within countries is still a matter of controversy. According to the Heckscher-Ohlin model, trade openness should exert an equalizing effect on wages in developing countries, while wage inequality is said to increase in developed countries (see Krugman, Obstelf & Melitz, 2012, p. 110-140). This is because countries specialize in the production of those goods that use intensively the factors of production they are abundantly endowed with. A developed country, abundant in skilled labor will thus export goods that are intensive in skilled-labor, and import goods that are abundant in unskilled labor. A globalization boom will thus drive up the demand and wages for skilled labor in rich countries, and reduce the demand and wages for skilled-workers in the country abundant in unskilled labor. Alternatively, if the wage of unskilled labor in the developed country were rigid to some extent, the fall in the relative demand for unskilled labor would result in a rise in unskilled unemployment. While skill-biased technical change is thought to induce a shift in labor demand towards skilled labor *within* all industries, trade would only induce a reallocation of labor *between* low-skill and high-skill industries (Aghion, Caroli, García-Peñalosa, 1999, p. 1637).

However, Berman, Bound and Grillches (1994, p. 378) for the United States and Machin (1996, p. 52-53) for Great Britain found that only a minor part (approximately 20%) of the shift away from high-skilled labor to low-skilled is due to between-industry changes, the remaining 80% were entirely attributed to within-industry shifts. Furthermore, findings regarding the impact of trade openness on inequality in more

recent studies come to nothing. Depending upon the sample, the econometric method or the estimation period, it is shown that openness has either no impact on inequality, has an equalizing effect, or worsens the income distribution (Bensidoun, Jean, & Sztulman, 2005 p. 11, Table 1). Hence, it is not surprising that the majority of labor and trade economists are skeptical of assigning too much importance to trade-based explanations for the increase in income inequality, as the assumptions of simple models of trade and distribution do not do justice to the complex relations between trade and inequality (Freeman, 2003, p. 20). Instead, the way in which trade triggers gains and losses among factors of production and classes of workers also depends on the specific institutional and social features of each country (UNDP, 2013, p. 73).

3.2.5. FINANCIAL LIBERALIZATION

Furthermore, trade openness frequently is accompanied by financial liberalization (opening of capital accounts) and FDI. In developed economies, financial liberalization stands as the single most adverse factor in terms of explaining the decline of labor income shares (ILO, 2013: Fig. 38, p. 52; Stockhammer, 2013, p. 33, Fig. 9, p. 4). On the one hand, this is because the opening of the capital account, without compensating national measures, causes the real exchange rate to rise in many countries. This in turn shifts aggregate demand towards imports and leads to a reorganization of production that reduces the absorption of unskilled labor and raises wage inequality (Taylor, 2004, p. 9). On the other hand, financial liberalization furnishes firms with more alternatives for investments, and empowers shareholders relative to workers by putting additional constraints on firms to make immediate profits while the development of a market for corporate control aligns management's interest to that of shareholders (Stockhammer, 2013, p. 6). Evidence of firms taking advantage of these alternative investment options is given by the increase of outward stocks of FDI in all OECD countries – from an average of less than 5% of GDP in 1980 to nearly 50% in the late 2000s (OECD, 2011, p. 28). Furthermore, capital account openness and the resulting large capital inflows, combined with high interest rates, makes banks more willing to lend to high-risk/high-return activities in sectors dominated by high skilled workers such as finance, insurance and real estate (Cornia, 2012, p. 17). Such an asymmetric distribution of the benefits of finance may "lead to poverty traps, negative effects on social and human development and a rise in inequality" (UNESCAP, 2013, p. 153).

Larrain (2013, p. 27) moreover finds that capital account liberalization increases aggregate wage inequality by 4%. He argues that opening the capital account increases the capital stock in industries that are highly dependent on external finance by 10%

more than in industries with low dependence. Within above-median dependence industries, liberalization increases wage inequality in industries with strong capital-skill complementarity[22] by 3.5% more than in industries with weak complementarity. Within below-median dependence industries, the effect on inequality does not vary with capital-skill complementarity.

In contrast, capital controls are associated with an increase in the labor share, an effect that Harrison (2005, p. 4) attributes to the weaker bargaining position of capital vis-à-vis labor if the cost of relocating production increases with capital controls. Capital controls are furthermore associated with significantly higher inflation rates in industrial countries (Klein & Shambaugh, 2010, p. 176).

4. CONCLUSION

We have seen that mechanisms through which the ERR could impact on within-country income inequality are highly complex and multifaceted. For reasons of clarity the findings of the literature review have been summarized in Table 2 below. As the summary illustrates, the empirical literature does not unambiguously point toward a clear superiority or inferiority of one ERR with respect to within-country income inequality. Despite the illustrated difficulty of classifying ERR, the found effects of ERRs on trade openness, inflation and output volatility are surprisingly straightforward: it is suggested that trade and output volatility are higher, while inflation is said to be lower under pegs. For the effect of ERRs on long-term economic growth both theory and empirics are highly inconclusive. Furthermore, the argument put forth in the UNDP report the two corner solutions are highly susceptible to currency crises is disproved by research that finds intermediate regimes to be even more prone to crisis. If one thus builds solely on the argument put forth in the UNDP report, then pegged and freely floating exchange rate regimes should be more favorable to reducing income inequality than intermediate regimes.

	Peg	Float
Trade openness	high	low
Inflation	low	high
Output Volatility	high	low

Table 2: Consequences of ERR

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[22] The capital-skill complementary hypothesis states that capital and skilled labor are relative complements while capital and unskilled labor are relative substitutes.

It has also been shown, that besides inflation, the exchange rate regime could also have an impact on income inequality through output volatility, financial liberalization and capital controls. However, whether the correlation between inflation and output volatility is positive or negative, or whether the direction of causation may even go from inequality to inflation cannot be said without fail. Also for trade, the effect on income inequality remains largely unknown. Yet output volatility and financial liberalization seem to increase income inequality, while capital controls are said to have a inequality reducing effect.

	Raises Income Inequality	Lowers Income Inequality
Trade	?	?
Financial Liberalization	✓	
Inflation	✓	
Output Volatility	✓	
Capital controls		✓

Table 3: Effect on inequality

For a more meaningful picture regarding the link between ERR and income inequality, and whether one type of ERR really exhibits a superior performance pertaining to income inequality, future research would have to resort to empirical methods, given that the findings from the literature review apparently come to nothing.

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