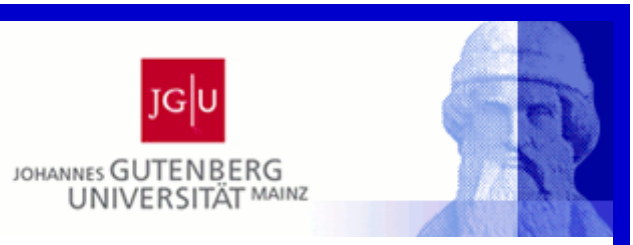

Gutenberg School of Management and Economics

& Research Unit “Interdisciplinary Public Policy”

Discussion Paper Series

Effective Exchange Rate Regimes and Inflation

Philipp Harms and Jakub Knaze

January 29, 2021

Discussion paper number 2102

Johannes Gutenberg University Mainz
Gutenberg School of Management and Economics
Jakob-Welder-Weg 9
55128 Mainz
Germany
https://wiwi.uni-mainz.de/

Contact Details:

Philipp Harms
Chair of International Economics
Johannes Gutenberg University Mainz
Jakob-Welder-Weg 4

55128 Mainz, Germany

philipp.harms@uni-mainz.de

Jakub Knaze
Chair of International Economics
Johannes Gutenberg University Mainz
Jakob-Welder-Weg 4

55128 Mainz, Germany

jakub.knaze@uni-mainz.de

Effective Exchange Rate Regimes and Inflation

Philipp Harms and Jakub Knaze*

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Abstract

This paper introduces a new *effective* exchange rate regime classification. Traditional classifications define the stability or flexibility of a currency with respect to one ("anchor") currency, thus implicitly neglecting information on exchange rate relationships against other currencies. Our new measure is computed as a trade-weighted average of *bilateral* exchange rate regimes, thus taking into account both direct and indirect relationships against all other currencies. We argue that our "effective" approach is superior when it comes to assessing the impact of exchange rate regimes on inflation, because fixing an exchange rate vis-à-vis one currency does not completely anchor domestic prices in a world with multiple trading partners. Using our measure of effective exchange rate regimes in a standard empirical analysis of inflation determinants, we find that – compared to freely floating regimes – not only hard pegs, but also narrow and wide soft pegs are associated with significantly lower inflation rates. This challenges the established view that soft pegs do not matter – or are even detrimental – for price stability. We find that the effect of fixing the exchange rate goes significantly beyond the "disciplining effect" on money growth, with the inflation reduction being at least as strong as the effect of an official inflation target.

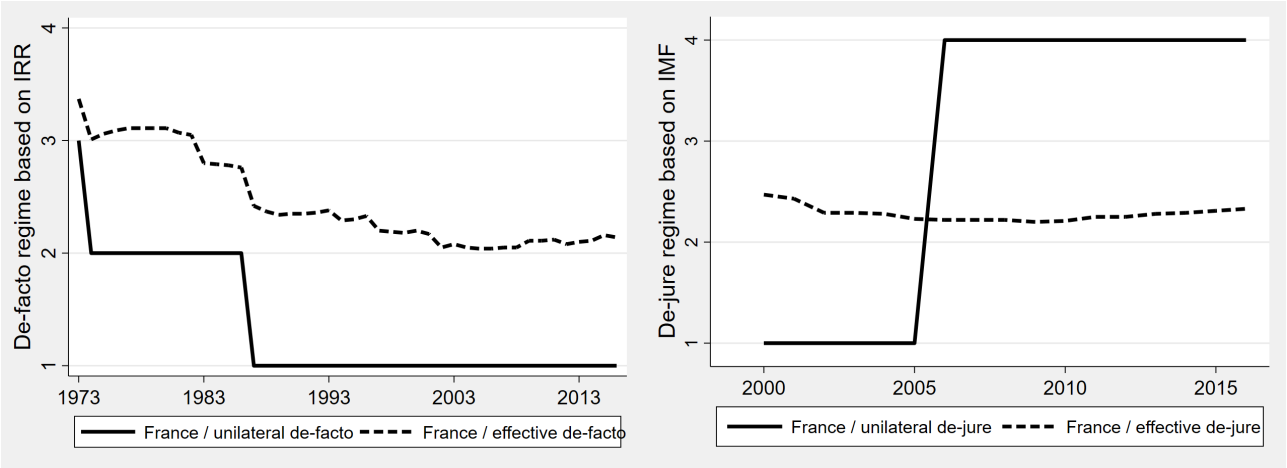
Keywords: Exchange rate regimes · Effective exchange rates · Inflation
JEL codes: E31, E52, F41

1 Introduction

Despite the substantial heterogeneity among currently available exchange rate regime classifications, they all share a common characteristic: Each classification defines a currency's stability or flexibility with respect to one *anchor currency*, thus ignoring the exchange rate relationships vis-à-vis all other currencies. In this paper, we argue that such a *unilateral* approach may be a problem for the following reasons: first, the correct assessment of the exchange rate regime crucially hinges on the choice of the anchor currency, and revisions of this choice may suggest large changes in the exchange rate regime that are not supported by actual policies. Second, and more importantly, a unilateral approach does not convey a sufficiently comprehensive picture of a country's exchange rate regime: In most cases, a currency that is stabilized against one anchor is *indirectly pegged* against many other currencies, with the extent of the peg depending on the whole set of bilateral exchange arrangements and on the relevance of these other currencies. The degree to which fluctuations of a currency's external value are *effectively* limited thus cannot be inferred from its stability towards the anchor currency alone.

*Johannes Gutenberg University Mainz, Gutenberg School of Management and Economics, Jakob-Welder-Weg 4, 55128 Mainz, Germany, phone: + 49-6131-39-22559, e-mail: philipp.harms@uni-mainz.de, jakub.knaze@uni-mainz.de. We are indebted to seminar audiences at Johannes Gutenberg University Mainz and Goethe University Frankfurt for helpful comments.

Figure 1: Unilateral and effective de-facto (IRR-based) and de-jure (IMF-based) exchange rate regimes of France



Notes: See Table A2 in Appendix A.1 for a definition of unilateral and effective exchange rate regimes. Regimes are defined on a scale between 1 (least flexible) and 4 (most flexible). The unilateral de-facto regime is based on Ilzetzki et al. (2019), the unilateral de-jure regime is based on IMF (2016). Effective regimes are based on own computations and Harms and Knaze (2018).

In this paper, we propose a new approach to assessing exchange rate stability. Our novel *effective exchange rate regime* [henceforth *eERR*] classification is based on the *bilateral* exchange rate regimes introduced by Harms and Knaze (2018), combined with information on bilateral trade flows. These bilateral regimes, in turn, are based on two prominent (unilateral) exchange rate regime classifications: the *de-jure* exchange rate regimes as published by the International Monetary Fund [henceforth *IMF*] in its *Annual Reports on Exchange Arrangements and Exchange Restrictions* (*AREAER*), and the unilateral *de-facto* classification provided by Ilzetzki et al. (2019) [henceforth *IRR*].[1] By computing trade-weighted averages of bilateral regimes, we derive series of (de-jure and de-facto) *effective* exchange rate regimes for each country. Unlike unilateral approaches, our classification thus accounts for both *direct* and *indirect* exchange rate relationships, since all other currencies are considered simultaneously.[2]

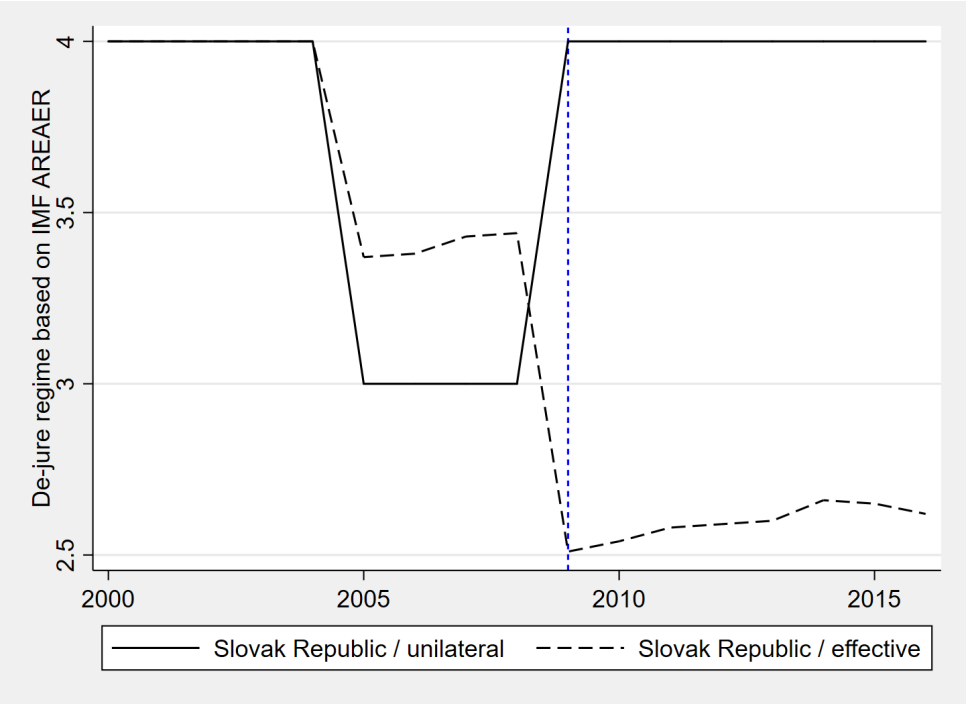
Two examples illustrate the advantages of using the *eERR* measure. Figure 1 plots the exchange rate regimes of France based on a "coarse" classification from least flexible (Regime 1) to most flexible (Regime 4), comparing the *unilateral* de-facto *IRR* and the *effective* de-facto (*IRR*-based) *eERR* classification for 1973 through 2016 as well as the *unilateral* de-jure *IMF* and the *effective* de-jure (*IMF*-based) *eERR* classification.[3] For the years 1974 to 1985, Ilzetzki et al. (2019) classify France as having a de-facto moving band (Regime 2). In 1986, the regime is reclassified as being officially pegged to the Deutsche Mark (Regime 1). Our novel measure suggests that France's *effective* exchange rate regime *gradually* became less flexible since 1973.

[1]Surveys on officially announced (de-jure) and actually implemented (de-facto) exchange rate regimes are provided by Klein and Shambaugh (2010) and Rose (2011). A description of the different unilateral classifications used in this paper is offered in Table A1 in Appendix A.1. Note that the *IMF*'s AREAER also account for cases in which de-jure and de-facto exchange rate regimes differ, and thus provide both de-jure and de-facto data on exchange rate regimes. However, we follow the convention in the academic literature by labeling the *IMF* classification as de-jure and the *IRR* classification as de-facto.

[2]Our data set on effective exchange rate regimes is available on the *International Economics* homepage at Johannes Gutenberg University Mainz: https://www.international.economics.uni-mainz.de/

[3]The time series on de-jure exchange rate regimes start in the year 2000. Of course, the IMF has been publishing information on exchange rate regimes for decades. However, it occasionally modified the granularity of its classification and explicitly disentangled de-jure and de-facto regimes in the late 1990s, such that our time series on bilateral exchange rate regimes cannot be constructed for the years before the turn of the millennium.

Figure 2: Unilateral and effective de-jure (*IMF*-based) exchange rate regimes of the Slovak Republic from 2000 through 2016



Notes: See Table A2 in Appendix A.1 for a definition of unilateral and effective exchange rate regimes. Regimes are defined on a scale between 1 (least flexible) and 4 (most flexible). Unilateral de-jure regimes are based on IMF (2016). Effective regimes are based on own computations and Harms and Knaze (2018). The blue dashed line denotes the year in which the Slovak Republic adopted the Euro.

The discrepancy between the *unilateral* regime and our *effective* measure becomes even more pronounced when we consider the IMF's *de-jure* classification: while the IMF classifies France as having a de-jure *hard peg* (Regime 1) through 2005, it interprets the country's exchange rate regime as being *fully flexible* (Regime 4) since 2006. The categorization through 2005 obviously refers to France's membership in the Euro area, whereas the categorization in 2006 and after is apparently due to the Euro area's floating exchange rate vis-à-vis the US dollar. Both of these assessments are correct in some way, but it is hard to interpret the jump from Regime 1 to Regime 4 as a dramatic change in the ECB's monetary policy strategy. By contrast, our *effective* measure suggests a much smoother evolution of France's de-jure exchange rate regime.

Our second example focuses on the *de-jure* unilateral and effective exchange rate regimes of the Slovak Republic. As shown in Figure 2, the *IMF* initially classified the Slovak Republic as free-floating. The regime was reclassified as a soft peg in the year 2005, when the Slovak Republic joined the ERM II as a precondition for adopting the Euro. After the country joined the Euro area in 2009, the unilateral regime was reclassified back to the most flexible regime, since – starting in 2006 – the *IMF* treats the Euro as having a free-floating regime. We argue that the IMF's *AREAER* offers an incomplete description of the Slovak Republic's exchange rate regime. Intuitively, we would expect de-jure exchange rate flexibility to *decrease* if a country becomes part of a currency union. On a more general level, the exchange rate regime should reflect the intensity of trade relationships both with the anchor-currency country and with other currencies. This is achieved by our *effective* exchange rate regime measure for the Slovak Republic, which is depicted by the dotted line in Figure 2: the country's effective de-jure exchange rate flexibility decreased following the country's entry into the ERM II in 2005, and further dropped following the adoption of the Euro in 2009. Interestingly, we can observe a slight *increase* in effective exchange rate flexibility since 2009. This is driven by the fact that,

more recently, trade relationships of the Slovak Republic with countries whose currencies float against the Euro have intensified.

In this paper, we argue that considering *effective* exchange rate stability is particularly important when it comes to assessing the effects of alternative exchange rate regimes on *inflation*: With a fixed exchange rate, price stability in the anchor country pins down domestic prices due to (relative) purchasing power parity (PPP). However, it is unlikely that trade relationships with the anchor country cover *all* tradable components of the domestic consumption basket. In fact, the anchor country may represent only a small share of a country's international trade, such that the exchange rate regime with respect to other currencies cannot be neglected when assessing the disciplining force of a peg. If a country trades a lot with "fellow peggers" – i.e. other countries who fix their currencies to the same anchor – we expect the effect on domestic price stability to be much stronger than for a country that fixes its currency against an anchor, but has most of its trade with countries against whose currencies the domestic currency is flexible.[4]

Note that we deliberately focus on the role of the exchange rate *regime* instead of the observed volatility of the (effective) exchange rate. This is for the following reasons: First, the exchange rate regime is a policy variable that signals monetary authorities' intentions and thus anchors market participants' expectations about future exchange rate movements. This is most obvious for the de-jure regime of the *IMF*, which is based on official announcements, but it also holds for the de-facto regime classification of Ilzetzki et al. (2019), which combines policy announcements with information on observed exchange rate volatility and on the behavior of foreign exchange reserves, thus identifying countries' exchange rate policy based both on words and on deeds.[5] The second reason for focusing on the role of exchange rate regimes instead of observed exchange rate volatilities as a potential determinant of inflation is the *endogeneity* of the observed exchange rate. While we are aware that exchange rate *regimes* may break down due to inflationary pressure, thus being potentially endogenous with respect to price stability, reverse causality is much more pronounced for the exchange rate itself.

Our empirical analysis of the influence of exchange rate regimes on inflation yields some important findings: first, we confirm the standard result that hard pegs are associated with significantly lower inflation compared to freely floating regimes, demonstrating that the effect is even stronger when an *effective* (instead of unilateral) classification is considered. Second, and more importantly, we contradict the conclusion of the existing literature that soft pegs either do not matter or are even detrimental for inflation performance (e.g. Ghosh et al., 2011): in fact, we find that both narrow and wide soft pegs are associated with significantly lower inflation compared to freely floating regimes, with the effect being about half as large compared to hard pegs. These results hold for the entire sample as well as for the sub-sample of low and middle-income countries. By contrast, we find no effect of exchange rate regimes on inflation for high-income countries. Moreover, the reduction of inflation for countries that adopt soft pegs is about the size of the effect associated with inflation targeting policies. These results do not change when we explicitly account for the growth rate of the money supply, suggesting that the results are driven by a substantial *credibility* effect (Ghosh et al., 2003), which goes beyond the pure *discipline* effect operating through monetary growth.

The rest of the paper is structured as follows: Section 2 offers a brief survey of the literature

[4]For example, both Bermuda and Bangladesh are unilaterally classified as having a hard peg against the U.S. dollar. The *effective* exchange rate regime stability of Bermuda is very high since the U.S. represents Bermuda's biggest trading partner. By contrast, the *effective* exchange rate stability in Bangladesh is rather low, since the country's biggest trading partners are China, India and the European Union whose currencies float against the U.S. dollar.

[5]Compared to *IMF*, *IRR* adjust their data for cases in which the observed behavior of the exchange rate and of foreign exchange reserves differs from the announced exchange rate regime (hence the *de-facto* nature of their classification).

on the relationship between exchange rate regimes and inflation. Section 3 presents a simple model that highlights the importance of going beyond a unilateral approach when classifying exchange rate regimes. Section 4 describes the construction of our *effective* (de jure and de facto) exchange rate regimes measures and offers some descriptive evidence. Section 5 outlines our empirical methodology for estimating the relationship between exchange rate regimes and inflation, and presents our benchmark empirical results. Section 6 discusses further extensions and robustness tests, and Section 7 concludes.

2 Exchange rate regimes and inflation: a brief survey of the empirical literature

Our paper contributes to a large literature on the role of the exchange rate regime for inflation. Within this literature, many contributions split the *total* effect of pegging into a *discipline* and a *credibility* (or *direct*) effect. The discipline effect operates through monetary growth as a direct constraint on monetary independence of the central bank. The credibility effect can be identified once we control for money growth, and reflects the role of exchange rate policy for inflation expectations (Ghosh et al., 2003). Among the most recent studies, Ghosh et al. (2014) focus on the credibility effect arising from formal commitments. The authors distinguish between de-jure and de-facto exchange rate regimes, claiming that the former are more effective in anchoring inflation expectations. The authors find that, on average, credible de-jure pegs that are also implemented de-facto have inflation rates lower by 4 percentage points than de-facto pegs alone. Using the de-facto classification by Shambaugh (2004), Klein and Shambaugh (2010) find that pegs are associated with inflation lower by around 4 percentage points compared to non-pegs for both industrial and developing countries.[6] More recently, Ha et al. (2019) confirm these findings, also using the Shambaugh (2004) de-facto classification.

All the studies mentioned so far use a *binary* classification of "pegs" and "non-pegs", thus implicitly ignoring the broad variety of regimes within the group of pegs. This may neglect important information, since intermediate regimes (soft pegs) allow an intermediate degree of exchange rate flexibility in return for an intermediate degree of monetary independence (Frankel, 2019). The contributions by Ghosh et al. (2003) and Ghosh et al. (2011) also consider intermediate regimes. Ghosh et al. (2003) find that de-jure hard pegs are associated with considerably lower inflation rates than floating rates. Surprisingly, intermediate regimes are found to be associated with inflation *higher* by 3 percentage points than free-floating regimes. The positive coefficient is found to be driven by a group of upper to middle-income countries. Similarly, Ghosh et al. (2011) find that de-jure pegs are associated with inflation lower by 5 percent compared to intermediate or floating regimes. Intermediate regimes are found to have even *higher* average inflation than freely floating regimes, with the coefficient being particularly large and significant when "de-facto" and "peg-consensus" classifications are used. The findings of the previous literature thus suggest that soft pegs either do not matter or are even detrimental for constraining inflation. As we will show below, this result is reversed once the impact of *effective* exchange rate regimes is considered.

[6] According to the Shambaugh (2004) classification, an exchange rate is pegged if it fluctuates within a +/- 2 percent band relative to a country-specific anchor currency, or has a zero-percent change of the exchange rate in 11 out of 12 months.

3 A simple model of *effective exchange rate regimes* and inflation

In this section, we present a simple theoretical framework to show that the inflation-reducing effect of pegging the domestic economy's currency against a stable anchor currency is underrated if "indirect pegs" – i.e. the implicit pegs vis-à-vis other currencies that are pegged against the same anchor – are neglected. We therefore argue that an accurate description of exchange rate stability cannot be achieved by only considering the relationship between the domestic currency and the anchor (i.e. the *unilateral* exchange rate regime), but should be based on a weighted sum of (direct and indirect) bilateral exchange rate regimes, i.e. the domestic currency's *effective* exchange rate regime. The model structure and assumptions are deliberately simplifying to drive home our main point.

We consider a world that consists of a large number of small open economies and a large economy (A) that issues an *anchor currency*. Individuals living in country H consume a basket of domestic and foreign goods. The nominal exchange rate of the domestic currency is fixed vis-à-vis the anchor currency. Since other countries also maintain a peg with respect to the anchor, the domestic currency is *indirectly* fixed towards these "fellow peggers".

We write the logarithm of the consumer price index (CPI) in the domestic economy H at time t (p_t^H) as

$$p_t^H = \alpha_H p_t^{HH} + \alpha_A p_t^{AH} + \sum_i \alpha_i p_t^{iH} + \left(1 - \alpha_H - \alpha_A - \sum_i \alpha_i\right) m_t^H. \tag{1}$$

In (1), p_t^{HH} denotes the domestic price of goods that are produced in H and that are also exported to those countries to which the domestic currency is – directly or indirectly – pegged, while α_H denotes the share of these goods in the domestic CPI.[7] Similarly, p_t^{AH} denotes the domestic price of goods that are imported from A, and α_A is the consumption share of these goods. Finally, p_t^{iH} is the domestic price of good i, which is imported from some country whose currency is also pegged to the anchor – i.e. a "fellow pegger" –, and α_i is the corresponding consumption share. The last term in equation (1) denotes the influence of goods that are either non-traded or exchanged with countries against whose currencies the domestic currency is freely floating. These goods' prices depend on domestic monetary policy conditions, summarily denoted by m_t^H.[8] To save notation, we define $(1 - \alpha_H - \alpha_A - \sum_i \alpha_i) \equiv (1 - \lambda)$.

The price p_t^{HH} depends on domestic marginal costs, which, in turn, depend on the (logarithm) of the domestic nominal wage w_t^H. For simplicity, we write

$$p_t^{HH} = \mu + w_t^H, \tag{2}$$

where μ may be interpreted as reflecting a combination of firms' markup and labor productivity, both of which are assumed to be constant. Due to delayed wage adjustment, the nominal wage in period t depends on workers' and firms' expectations of the future CPI, i.e.

$$w_t^H = \psi + \mathbf{E}_t\left(p_{t+1}^H\right), \tag{3}$$

with ψ being some positive constant. Equations (1) to (3) imply that firms' pricing decisions depend on the nominal wage, that the wage depends on the expected CPI, which, in turn,

[7] For simplicity, we assume that this weight – as all other weights we will introduce – does not change over time.

[8] The evolution of non-traded goods prices is not constrained by international competition. For goods imported under a flexible exchange rate, a domestic monetary expansion results in a nominal depreciation of the currency and an increase in prices.

depends on all prices that enter the consumption basket. Combining the above equations and transforming them into first differences yields

$$\pi_t^{HH} = \alpha_H \mathbf{E}_t\left(\pi_{t+1}^{HH}\right) + \alpha_A \mathbf{E}_t\left(\pi_{t+1}^{AH}\right) + \sum_i \alpha_i \mathbf{E}_t\left(\pi_{t+1}^{iH}\right) + (1-\lambda)\,\mathbf{E}_t\left(\Delta m_{t+1}^H\right) \tag{4}$$

where $\pi_{t+1}^{ij} = p_{t+1}^{ij} - p_t^{ij}$ denotes (goods-specific) inflation rates, $\mathbf{E}_t$ the expectations operator, and $\mathbf{E}_t\left(\Delta m_{t+1}^H\right)$ expected changes in domestic monetary policy conditions. Equation (4) illustrates an important relationship: if agents' expect a large share of foreign prices to remain stable in the future, this constrains current increases in domestic prices – which, in turn, results in lower inflation. As we will demonstrate below, tying the domestic currency to the (low-inflation) anchor-currency of country A has a direct and an indirect effect on domestic inflation: first via the direct influence of $\mathbf{E}_t\left(\pi_{t+1}^{AH}\right)$. Second, through the influence of $\sum_i \alpha_i \mathbf{E}_t\left(\pi_{t+1}^{iH}\right)$, which is also affected by the anchor currency's expected price stability.

By virtue of relative PPP, a credibly announced peg implies that $\mathbf{E}_t\left(\pi_{t+1}^{AH}\right) = \mathbf{E}_t\left(\pi_{t+1}^{AA}\right)$ and that $\mathbf{E}_t\left(\pi_{t+1}^{iH}\right) = \mathbf{E}_t\left(\pi_{t+1}^{ii}\right)$ – i.e., individuals expect domestic price increases of goods originating in countries to which the domestic currency is directly or indirectly pegged to reflect price increases in those countries. Our assumption that countries (except for the anchor) are structurally symmetric implies that $\pi_{t+1}^{ii} = \pi_{t+1}^{HH}$ and that $\Delta m_{t+1}^H = \Delta m_{t+1}^i = \Delta m_{t+1}$. This allows writing $(1-\lambda) = (1-\alpha_H-\alpha_A-\alpha_F)$, where $\alpha_F \equiv \sum_i \alpha_i$ reflects the share of "fellow peggers" in the domestic consumption basket. To further simplify, we assume that both (exogenous) price increases in the anchoring country and (exogenous) monetary policy parameters follow a random walk. This implies that $\mathbf{E}_t\left(\pi_{t+1}^{AA}\right) = \pi_t^{AA}$ and $\mathbf{E}_t\left(\Delta m_{t+1}\right) = \Delta m_t$. Due to the linear nature of the model, all endogenous price changes inherit this random-walk property.

Using these observations and assumptions, we can re-write equation (4) as

$$\pi_t^{HH} = \alpha_H \pi_t^{HH} + \alpha_A \pi_t^{AA} + \alpha_F \pi_t^{HH} + (1-\lambda)\,\Delta m_t, \tag{5}$$

Moreover, domestic CPI-inflation is given by

$$\pi_t^{H} = (\alpha_H + \alpha_F)\,\pi_t^{HH} + \alpha_A \pi_t^{AA} + (1-\lambda)\,\Delta m_t, \tag{6}$$

Solving (5) for π_t^{HH} and substituting into (6) yields

$$\pi_t^{H} = \frac{\alpha_A}{1-\alpha_H-\alpha_F}\pi_t^{AA} + \frac{1-\alpha_A-\alpha_H-\alpha_F}{1-\alpha_H-\alpha_F}\Delta m_t. \tag{7}$$

Domestic inflation is thus a *weighted average* of price increases of those goods that are traded with the anchor country (π_t^{AA}) and of domestic monetary policy changes (Δm_t). If we finally assume that $\pi_t^{AA} = \pi_t^{A}$, i.e. that all prices in the anchor country increase at the same rate, we can write the expression in (7) as

$$\pi_t^{H} = \theta \pi_t^{A} + (1-\theta)\Delta m_t, \tag{8}$$

with the definition of θ following from (7). If $\pi_t^A < \Delta m_t$ – thus justifying the peg as an inflation-constraining device – domestic inflation decreases as θ increases. Obviously, θ is larger for larger values of α_A. More interestingly, θ also increases in α_F – i.e. the share of "fellow peggers" in the domestic consumption basket.

Equation (8) illustrates that distinguishing between countries that (unilaterally) peg their currencies against some anchor currency and those that do not is not sufficient when it comes to explaining the effect of exchange rate regimes on inflation. The power of this effect crucially depends on the volume of trade with the anchor currency (as reflected by α_A), but also on the volume of trade with "fellow peggers" (as reflected by α_F). The mechanism through which α_F

matters is straightforward: low inflation in the anchor country directly reduces CPI-inflation in the domestic economy (H) and in the economies of "fellow peggers" (F). This lowers the growth of wages in the respective countries, which, in turn, constrains firms in H and F in implementing price increases. The latter, again, feeds into lower inflation rates at home and abroad.

These insights have some important implications for analyses of the empirical relationship between exchange-rate regimes and inflation: first, characterizing a country's *effective exchange rate regime* by combining information on direct and indirect pegs with information on trade weights is superior to just looking at *unilateral* pegs. Second, *de-jure* exchange rate regimes matter, since they guide agents' expectations and thus their wage-setting decisions.

Note that this argument is still valid if we take into account that a large number of international trade transactions are invoiced neither in the exporter's nor the importer's currency, but that a small number of *vehicle currencies* — most prominently, the US dollar — dominate international pricing.[9] To see why this is the case, bear in mind that it does not make a difference whether the "fellow peggers" use the anchor currency or their own currency for their exports. If a share of the residual group of countries — those whose currencies are neither directly nor indirectly linked to the domestic currency — price their exports in the anchor currency, variations in export prices mirror these countries' domestic inflation rate. This inflation rate, in turn, is usually higher than the anchor country's inflation rate. Hence, even in the presence of vehicle currency pricing, a larger share of trade covered by direct or indirect pegs to a low-inflation anchor currency is likely to reduce domestic inflation rates.

4 Data and methodology

4.1 Computing effective exchange rate regimes

As suggested by the theoretical model presented in the previous section, we construct our measure of *effective exchange rate regimes* (*eERR*) by computing trade-weighted averages of *bilateral* exchange rate regimes as described in Harms and Knaze (2018).[10] Bilateral *de-jure* regimes are based on the *IMF* classification and originally take values from 1 to 10. Bilateral *de-facto* regimes are based on the *IRR* classification and originally take values from 1 to 13.[11] Table A2 in Appendix A.1 shows how we map both de-jure and de-facto regimes into four coarse regimes, ranging from regime 1 (least flexible) to regime 4 (free-floating). We use this coarse classification for two reasons: first, our averaging of bilateral exchange rate regimes assumes that regimes can be interpreted in a cardinal way. While this problem applies to all orderings, it is more pronounced if we use a very fine classification. For example, it is hard to tell whether crawling pegs or crawling bands represent the more flexible arrangement. A coarser classification allows for clear-cut differences that differentiate the stability of each exchange

[9]The importance of vehicle currencies is documented by Kamps (2006), Goldberg and Tille (2016), Ito and Chinn (2014), Gopinath (2016), Gopinath et al. (2020) as well as Boz et al. (2017).

[10]Harms and Knaze (2018) compute bilateral exchange rate regimes both on a de-jure and a de-facto basis. They start by identifying currencies that are linked to a common anchor, e.g. the US dollar or the Euro. The bilateral regime between currency i and currency j is the most flexible regime between any of these currencies and the common anchor. Of course, if a currency has no fixed arrangement vis-à-vis any anchor, it is floating against all currencies.

[11]The original *IRR* classification defines a separate *freely falling* category for regimes with very high inflation rates (over 40 percent per annum; regime 14 in Table A2 in Appendix A.1). Observations for these cases were excluded in the construction of our de-facto *eERR* measure as this regime is treated as a residual category and not assigned to any particular exchange rate regime. We also exclude observations that IRR classify as "dual market in which parallel market data is missing" (Regime 15).

rate regime more reliably. Second, a split into four categories makes our effective exchange rate regimes comparable with the previous literature and across de-jure and de-facto classifications.

The bilateral trade weight between country i and country j in year t is given by the following expression:

$$weight_{ij,t} = \frac{exports_{ij,t} + imports_{ij,t}}{\sum_{k=1}^{n}(exports_{ik,t} + imports_{ik,t})} \tag{9}$$

where $exports_{ij,t}$ denotes exports from country i to country j and $imports_{ij,t}$ denotes imports to country i from country j in the year t. A higher weight implies a more intense trade relationship between country i and country j.[12] In a second step, we combine these weights with information on bilateral exchange rate regimes to obtain:

$$eERR_{i,t} = \sum_{j=1}^{n} regime_{ij,t} * (weight_{ij,t-1} + weight_{ij,t-2} + weight_{ij,t-3})/3 \tag{10}$$

where $regime_{ij,t}$ denotes the bilateral (de-jure or de-facto) exchange rate regime between countries i and j in the year t, ranging from 1 (least flexible) to 4 (most flexible). We multiply the bilateral exchange rate regime in year t by the average trade weights of the previous three years ($t-1$, $t-2$ and $t-3$) in order to eliminate the effects of short-term fluctuations in trade volumes.[13]

4.2 A first look at the data

Figure 3 shows the evolution of sample means of *unilateral* and *effective* de-facto (*IRR*-based) regimes over time. It is not surprising that the *eERR* measure is, on average, more flexible than the unilateral measure, since even countries that are strongly pegged to a unilateral anchor also trade with countries which are freely floating against that anchor. We see that, until the early 1990s, both series were characterized by an upward trend. Later on, the mean of unilateral regimes shows no obvious changes, while we can observe a slow decline of the effective measure back to the levels seen in 1973, suggesting that, on average, effective exchange rate flexibility decreased. A sample split between income groups plotted in Figure 4 shows that the observed fall in the *eERR* measure can mainly be attributed to the group of high-income countries.[14] Note, however, that while the introduction of the Euro is clearly discernible in the time series of (average) *unilateral* regimes, the average of *effective* regimes evolves in a much smoother way. Figure 4 also indicates that, since the late 1990s, the high-income country group had effectively less flexible regimes than the group of non-high-income countries.

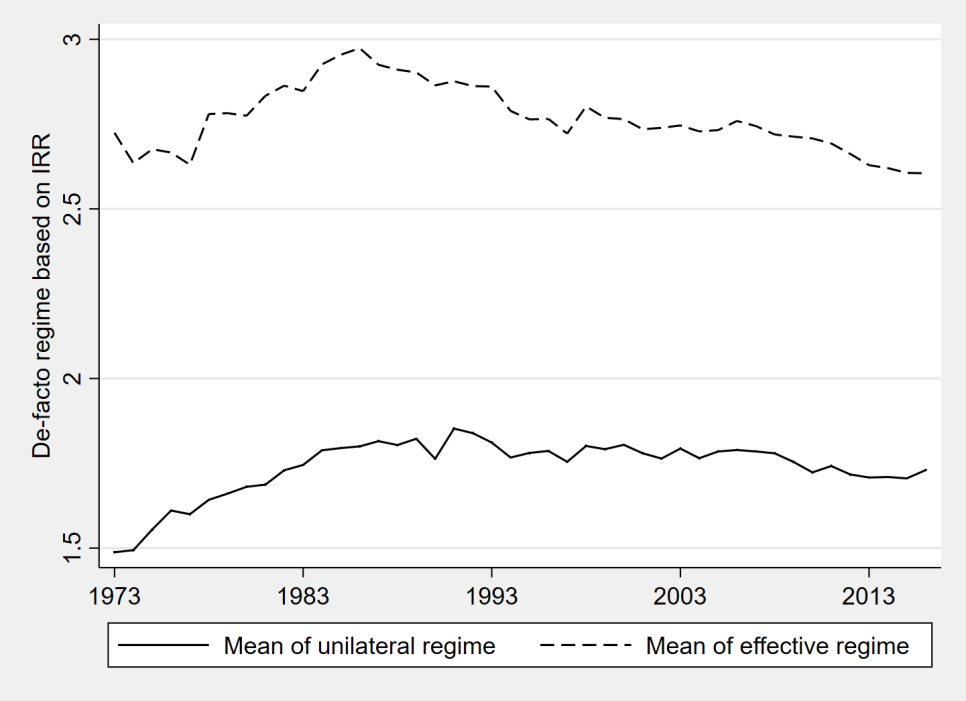
The evolution of average *de-jure* regimes (based on *IMF*) is plotted in Figure 5. The upward jump of average *unilateral* IMF regimes for high income countries between 2005 and 2006, suggesting a dramatic shift towards more flexible exchange rate regimes (the blue dashed line), illustrates one of the problems associated with a use of the unilateral IMF classification. This jump does not reflect any underlying structural change, but a mere variation in the

[12] Despite having the same numerator, $weight_{ji,t}$ is not necessarily the same as $weight_{ij,t}$, since the total trade volume of country j may differ from the total trade volume of country i.

[13] In a battery of robustness tests, we will later apply alternative weighting approaches to ensure that the results are not driven by this specific choice. Alternatives include using trade weights centered around the current period t, and updating the weights only every five years.

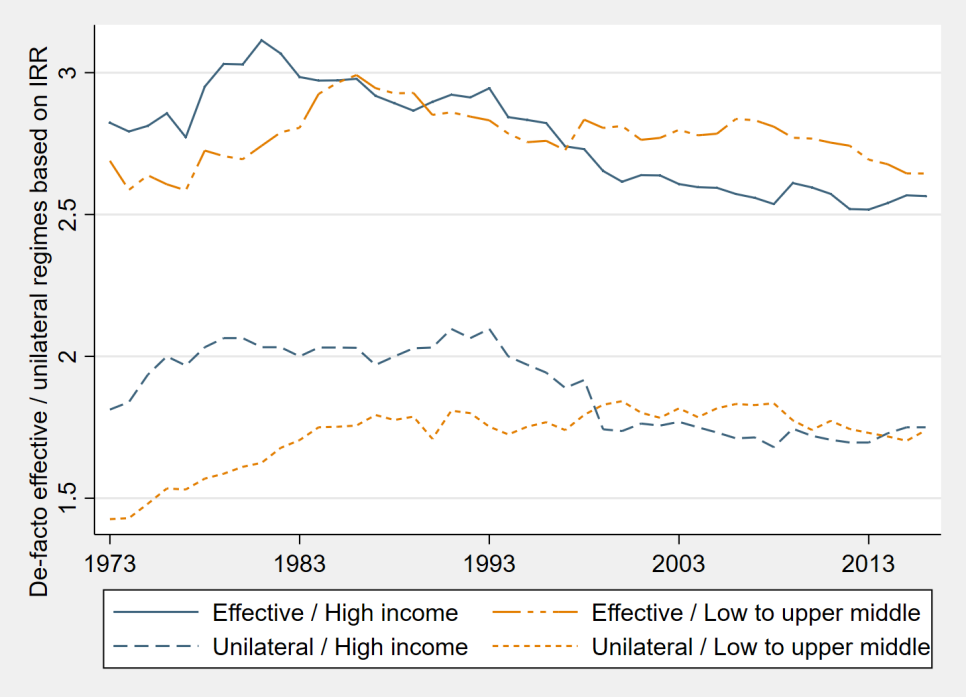
[14] The split of the sample into (1) high-income and (2) low-income, lower-middle-income and upper-middle-income country groups is based on the World Bank's analytical classification using the Atlas methodology. This classification has the advantage of being time-varying and covers the years from 1987 to 2016. The classification is available under `https://datahelpdesk.worldbank.org/knowledgebase/articles/906519`. Note that our sample includes observations starting already before 1987. In order not to lose any observations, we use the income status published in the first available year of the Atlas dataset.

Figure 3: Sample means of unilateral and effective *de-facto* (IRR-based) exchange rate regimes



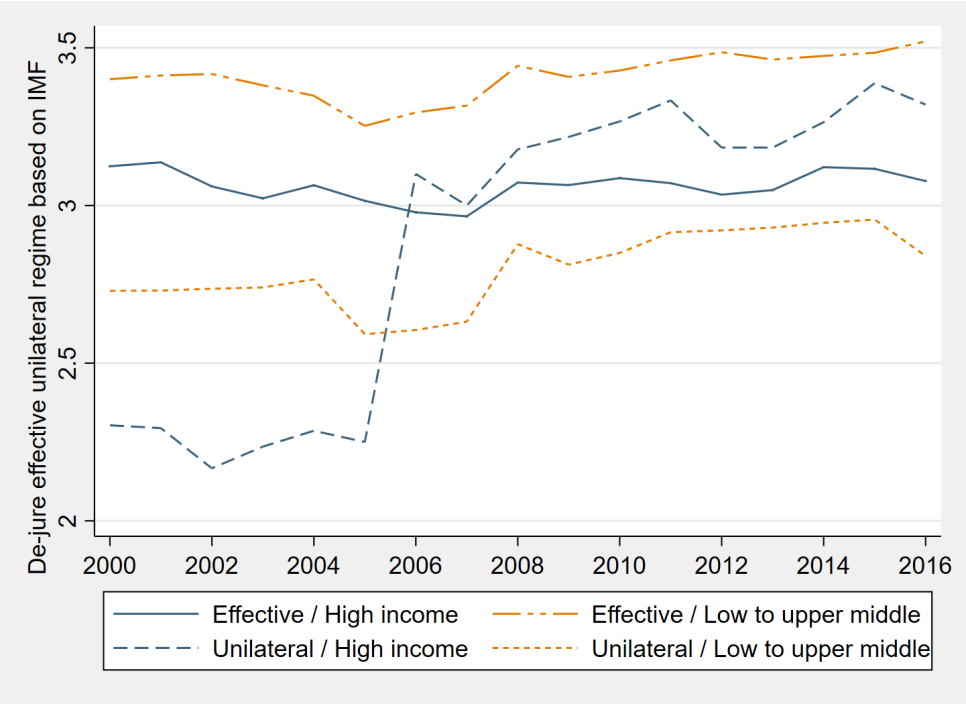
Notes: Exchange rate regimes range from 1 (least flexible) to 4 (most flexible). See Table A2 in Appendix A.1 for definitions.

Figure 4: Sample means of unilateral and effective *de-facto* (IRR-based) exchange rate regimes, split by income groups



Notes: Exchange rate regimes range from 1 (least flexible) to 4 (most flexible). See Table A2 in Appendix A.1 for definitions.

Figure 5: Sample means of unilateral and effective *de-jure* (IMF-based) exchange rate regimes, split by income groups



Notes: Exchange rate regimes range from 1 (least flexible) to 4 (most flexible). See Table A2 in Appendix A.1 for definitions.

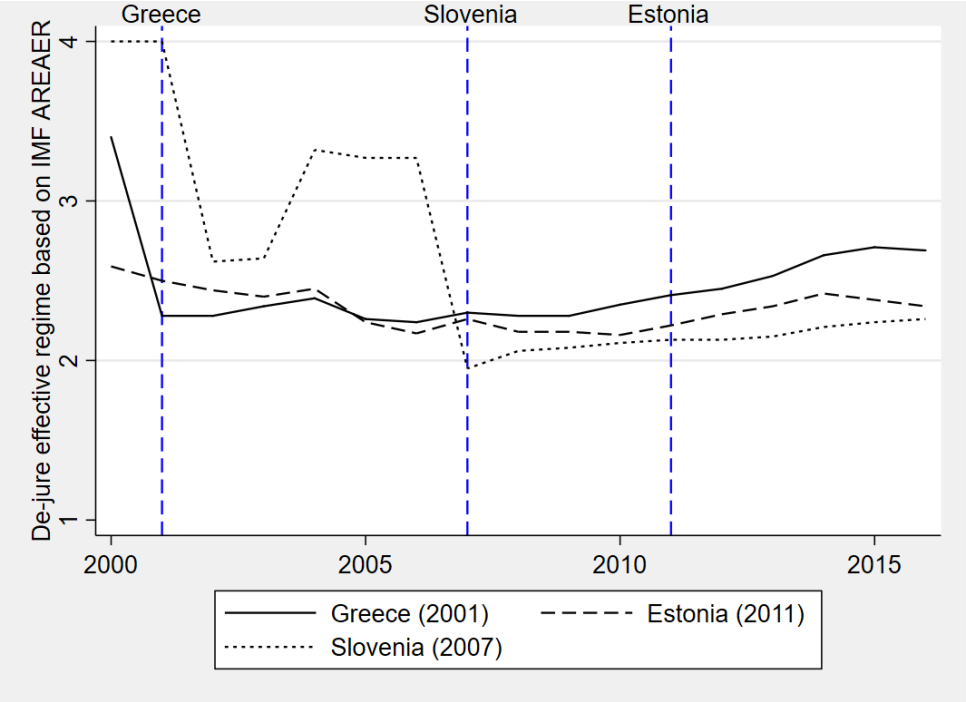
IMF's interpretation of the Euro area members' exchange rate regimes: through 2005, the IMF classified these countries as having an exchange rate arrangement *with no separate legal tender* (Regime 1). By contrast, the data covering the years 2006 and later classify the Euro area countries as having a *freely floating exchange rate arrangement* (Regime 4), since the exchange rate of the Euro against the US dollar and many other currencies is flexible (Harms and Knaze, 2018). We find no such shift in the *eERR* de-jure measure (the blue solid line), with the average level of exchange rate flexibility being quite stable. Sample means of the IMF's *de facto* regimes are plotted in Figure A1 in Appendix A.1.

Focusing on our novel *eERR* measure, Figure 6 indicates that the reduction in (effective) exchange rate flexibility upon Euro adoption is not the same across all Euro area countries. For Greece and Slovenia, adopting the Euro led to a substantial reduction in effective de-jure exchange rate regime flexibility. Conversely, the effective exchange rate regime of Estonia stayed basically unchanged, since Estonia had adopted a very strong peg against the Euro long before the Euro was adopted as an official currency. Thus, changes in the effective exchange rate regime following the Euro adoption tend to be heterogeneous even in structurally similar countries.

4.3 Mapping *eERR* into four categories

Due to the averaging across trading partners, our measure of *effective* exchange rate regimes is a continuous variable. By contrast, the unilateral exchange rate regime classifications are split into four distinct categories, ranging from most stable (Regime 1, hard pegs) to least stable (Regime 4, freely floating) . This causes problems when comparing the effect of unilateral and effective exchange rate regimes on inflation. Moreover, using the *eERR* measure in regressions would prevent us from detecting any non-linear effect of exchange rate regimes. This is important since the – de jure or de facto – exchange rate regime may be irrelevant unless a minimal

Figure 6: Effective *de-jure* (IMF-based) exchange rate regimes in selected EU-countries before and after the Euro adoption



Notes: Exchange rate regimes range from 1 (least flexible) to 4 (most flexible). See Table A2 in Appendix A.1 for definitions. Dashed vertical lines denote the Euro area entry years of Greece, Slovenia, and Estonia in the years 2001, 2007 and 2011, respectively.

degree of exchange rate stability is reached. For this reason, we map our (continuous) *eERR* measure into a discrete four-way classification. For the effective *de-facto* regime based on *IRR*, we split the *eERR* sample into four equal-sized quantiles (see Table 1). For the effective *de-jure* regime based on *IMF*, we assign all country-year observations for which *eERR* equals 4.0 (34.57 percent of the sample) to the maximum-flexibility category and split the remaining sample into three equally large quantiles. Of course, this implies that the number of observations falling into each category differs quite substantially (see Table 1). While the unilateral IRR classification identifies only 234 country-year observations as freely floating, the effective classification assigns a free-floating regime to 1,390 country-year observations. The difference in the number of observations for the IMF classifications is less pronounced, but still substantial. However, the fact that a large number of country-year observations is assigned new values is the very essence of applying the new classification, which is based on the notion that countries' effective exchange rate regime may be more (or less) stable than the unilateral regime. Moreover, while computing *eERR* may result in a re-assessment of countries' exchange rate regimes and turn the ranking with respect to exchange rate stability upside down, our mapping of *eERR* into the four-way grid does not reverse the ranking of countries in terms of their effective exchange rate flexibility. Finally, while most of our results on the relationship between the exchange rate regime and inflation will be based on the dummy variables described in Table 1, we will later demonstrate that these results do not change if we use the original continuous *eERR* measure, or apply alternative approaches to mapping *eERR* into four discrete regimes.

Table 1: Distributions of unilateral and effective de facto (*IRR*-based) and de jure (*IMF*-based) exchange rate regimes

IRR de-facto classification	Unilateral IRR		Effective IRR	
	Obs.	% Share	Obs.	% Share
Regime 1 / Hard pegs	3,781	51.39	1,399	24.88
Regime 2 / Soft pegs narrow	1,925	26.17	1,415	25.16
Regime 3 / Soft pegs wide	1,417	19.26	1,420	25.25
Regime 4 / Freely floating	234	3.18	1,390	24.72
IMF de-jure classification	Unilateral IMF		Effective IMF	
	Obs.	% Share	Obs.	% Share
Regime 1 / Hard pegs	1,240	39.07	621	21.77
Regime 2 / Soft pegs narrow	420	13.23	623	21.84
Regime 3 / Soft pegs wide	228	7.18	622	21.81
Regime 4 / Freely floating	1,286	40.52	986	34.57

Notes: Effective exchange rate regimes are based on mapping a continuous variable ($eERR$) into four dummies to facilitate the comparison with the traditional unilateral exchange rate regime classifications. The effective de-facto (*IRR*-based) regimes are based on splitting the distribution of $eERR$ into four equal-sized quantiles. For the effective de-jure (*IMF*-based) regimes, we assign those 34.56 percent of country-year observations to the free-floating category that assume the maximum value of $eERR$ (4.0). The remaining 63.44 percent of country-year observations are split into three equally large quantiles.

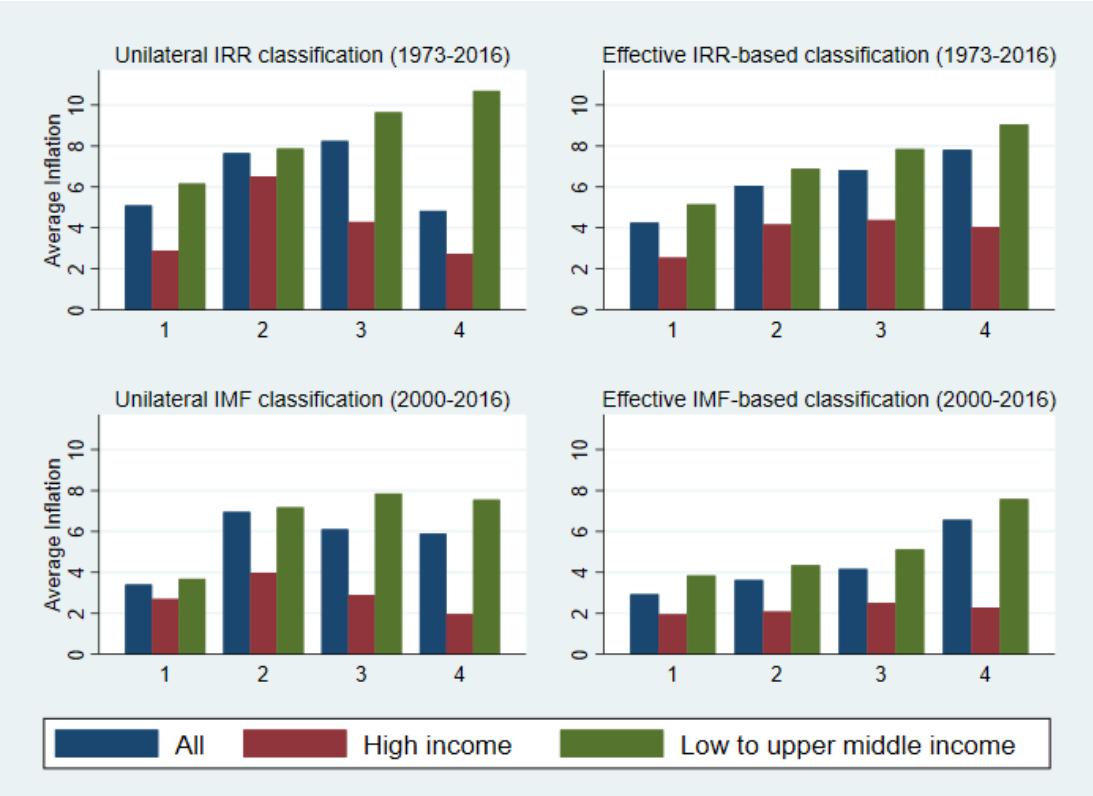
5 Exchange rate regimes and inflation: Empirical results

5.1 Descriptive evidence

In our analysis of the relationship between exchange rate regimes and inflation, we follow Ghosh et al. (2014) and transform the original inflation rate π_{it} into $\tilde{\pi}_{it} = \pi_{it}/(1 + \pi_{it})$ in order to reduce the influence of extreme observations. We begin our analysis by plotting the *mean* (transformed) inflation rate (averaged over country-time observations) associated with each exchange rate regime, using both the *de-jure* and the *de-facto* versions of unilateral and effective exchange rate regimes. The results displayed in Figure 7 show some striking differences between the *unilateral* and the *effective* exchange rate regime classifications. When we consider the unilateral *IRR* classification (see upper-left part) we find that, for the total country sample (blue bars), average inflation was lowest in countries with a *freely floating regime* (Regime 4). As the red bars illustrate, this is mostly driven by the high-income country subsample where the relationship between exchange rate flexibility and average inflation is characterized by a hump-shaped pattern. This pattern disappears when we focus on the *effective* exchange rate regime (see the upper-right part). In fact, we find that inflation is non-decreasing in the flexibility of the de-facto *eERR* measure. This pattern is particularly strong for low- to middle-income countries.

The unilateral *de-jure* (*IMF*-based) classification for the years 2000-2016 (lower-left part) shows a similar hump-shaped relationship between average announced exchange rate flexibility and inflation rates. Consistent with findings of Ghosh et al. (2011), de jure soft pegs (Regimes 2 and 3) seem to be associated with a higher average inflation rate than free floats. Again, this pattern is particularly prominent for the group of high-income countries, and possibly driven by the fact that the *IMF* classifies the Euro area countries as freely floating from the year 2006 onwards. When we consider *effective* exchange rate flexibility, the hump-shaped relationship disappears, and there is no obvious correlation between exchange rate regimes and inflation for high-income countries (see the lower-right part). By contrast, average inflation in low- to middle-income countries with effective floats is much higher than in countries with effective hard pegs. Finally, note the strikingly similar pattern for both the *IMF* and the *IRR effective*

Figure 7: Average (transformed) inflation rates across different exchange rate regimes



Notes: The graphs show average (transformed) inflation rates ($\tilde{\pi} = \pi/(1+\pi)$) for different exchange rate regimes and country groups. Exchange rate regime dummies range from least flexible (Hard pegs / Regime 1), to most flexible (Free floats / Regime 4).

measures, which holds despite the conceptual differences between de-jure and de-facto exchange rate regimes and the different time spans covered.

5.2 Empirical specification

The theoretical model of Section 3 suggests a negative influence of fixed exchange rates on countries' inflation rates, emphasizing that it is not only the relationship vis-à-vis one *anchor currency* that matters, but also the *indirect* relationships which link a country's currency to those of "fellow peggers". To test this hypothesis, we estimate variants of the following regression equation:

$$\tilde{\pi}_{it} = \beta_0 + \beta_{HP} HardPeg_{it} + \beta_{SPN} SoftPegNarrow_{it} + \beta_{SPW} SoftPegWide_{it} + \gamma \mathbf{X}_{it} + v_t + \epsilon_{it} \quad (11)$$

In (11), $\tilde{\pi}_{it}$ denotes the transformed annual inflation rate of country i in year t. $HardPeg_{it}$, $SoftPegNarrow_{it}$ and $SoftPegWide_{it}$ are dummy variables reflecting the regimes defined in Table A2. The dummy for *freely floating* regimes is excluded, such that the estimated coefficients reflect the differential impact of the regime relative to a pure float. The vector $\mathbf{X}_{it}$ accounts for other potential determinants of inflation, as suggested by previous studies: we include current and lagged money growth, measures of trade and financial openness, the current fiscal balance (in percent of GDP) and the growth rate of real GDP.[15] The variable v_t denotes year fixed effects, and ϵ_{it} is a random error term. Initially, we do *not* include country fixed effects because we would identify the effect of exchange rate regimes only through their within-country variation, which is problematic because exchange rate regimes change rather slowly. However, we follow Ghosh et al. (2014) by including region-specific fixed effects where we use

[15] Data sources and summary statistics for all variables are listed in Tables A3 and A4 in Appendix A.1.

Table 2: Unilateral and effective de-facto (*IRR*-based) classification: Inflation performance under different exchange rate regimes

	[A]			[B]		
	Unilateral IRR classification			Effective IRR-based classification		
Total effect	(1)	(2)	(3)	(4)	(5)	(6)
	All	High	Low/Middle	All	High	Low/Middle
Regime 1 / Hard pegs	-1.346	0.577	-3.965**	-2.991***	-0.247	-4.528***
	(0.826)	(0.475)	(1.573)	(0.693)	(0.403)	(0.856)
Regime 2 / Soft pegs narrow	1.482**	0.863*	-0.352	-1.286**	-0.288	-1.764**
	(0.739)	(0.514)	(1.444)	(0.649)	(0.405)	(0.773)
Regime 3 / Soft pegs wide	1.407*	0.952**	0.037	-0.944*	-0.386	-1.300**
	(0.745)	(0.370)	(1.416)	(0.557)	(0.385)	(0.656)
Openness	-0.001	0.001	-0.003	-0.002	0.002	-0.007
	(0.004)	(0.003)	(0.005)	(0.004)	(0.003)	(0.006)
Financial Openness	-4.150***	-3.536***	-3.377***	-4.011***	-3.947***	-2.849***
	(0.707)	(1.256)	(0.748)	(0.765)	(1.467)	(0.752)
Fiscal balance	0.002	0.009	0.006	-0.046***	0.009	-0.040***
	(0.005)	(0.016)	(0.004)	(0.008)	(0.014)	(0.007)
Real GDP growth	0.002	-0.006	-0.001	0.008	-0.006	0.008
	(0.022)	(0.031)	(0.027)	(0.022)	(0.032)	(0.027)
N	3636	1136	2500	3375	1094	2281
R^2	0.29	0.54	0.26	0.29	0.54	0.25
	[C]			[D]		
	Unilateral IRR classification			Effective IRR-based classification		
Direct effect	(7)	(8)	(9)	(10)	(11)	(12)
	All	High	Low/Middle	All	High	Low/Middle
Regime 1 / Hard pegs	-1.406**	0.575	-2.819***	-2.011***	0.182	-3.242***
	(0.572)	(0.406)	(0.933)	(0.517)	(0.316)	(0.641)
Regime 2 / Soft pegs narrow	0.661	0.533	-0.184	-0.942*	0.024	-1.477**
	(0.540)	(0.472)	(0.864)	(0.500)	(0.329)	(0.579)
Regime 3 / Soft pegs wide	0.805	0.527	0.517	-0.759*	-0.037	-1.194**
	(0.558)	(0.315)	(0.866)	(0.424)	(0.308)	(0.498)
Money growth	0.122***	0.050***	0.126***	0.119***	0.051***	0.123***
	(0.021)	(0.018)	(0.022)	(0.024)	(0.019)	(0.026)
Lag money growth	0.070***	0.069***	0.066***	0.076***	0.069***	0.071***
	(0.008)	(0.023)	(0.007)	(0.011)	(0.022)	(0.012)
Openness	-0.000	0.003	-0.001	-0.002	0.003	-0.006
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.005)
Financial Openness	-2.551***	-3.569***	-2.103***	-2.171***	-3.660***	-1.491**
	(0.576)	(0.994)	(0.600)	(0.587)	(1.051)	(0.605)
Fiscal balance	-0.004	-0.004	0.000	-0.027**	0.001	-0.019*
	(0.006)	(0.016)	(0.004)	(0.012)	(0.015)	(0.010)
Real GDP growth	-0.093***	-0.060*	-0.092***	-0.085***	-0.060*	-0.078*
	(0.030)	(0.031)	(0.034)	(0.032)	(0.030)	(0.039)
N	3375	965	2410	3135	943	2192
R^2	0.46	0.62	0.43	0.45	0.62	0.41

Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "High" denotes the group of high-income countries whereas "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. All specifications include a constant term, region-specific and year effects (not reported). The sample covers the years from 1981 through 2016.

the geographical and development status groups decomposition provided by UNCTAD.[16] We cluster the standard errors at the country level to allow for heteroskedasticity and a possible autocorrelation of error terms. We estimate equation (11) using both the unilateral and the effective version of de-facto (IRR) and the de-jure (IMF) exchange rate regimes.

5.3 De-facto exchange rate regimes and inflation

We follow the literature on exchange rate regimes and inflation by reporting both the *total* and the *direct* effect of exchange rate regimes on inflation. If the exchange rate regime affected inflation only by constraining monetary policy – the *disciplinary* channel – we would expect to find no effect of exchange rate regimes on inflation once we control for the growth rate of monetary aggregates (Klein and Shambaugh, 2010). Conversely, including the money growth rate allows isolating the *credibility* channel through which exchange rate regimes may affect inflation.

We start by presenting the results of estimating equation (11) using de facto (*IRR*) exchange rate regime classifications. These results are reported in Table 2. The *total effect* of exchange rate regimes on inflation is reported in the upper part of that table. Considering the results based on the *unilateral IRR* classification (columns 1 to 3 in section [A]) we find that financial openness is the only control variable that has a significant effect on inflation. More importantly, the findings on the influence of exchange rate regimes are consistent with the existing literature: compared to freely floating regimes (the omitted category), hard pegs lower (transformed) inflation by around 4 percentage points for low- to middle-income countries (column 3), which is quite close to what Ghosh et al. (2013) have found.[17] The coefficient remains negative, but is no longer significant, when we consider the entire sample (column 1). Similar to Ghosh et al. (2013), we also find that soft pegs (Regimes 2 and 3) are associated with *higher* inflation compared to freely floating regimes when the entire sample or the high-income subsample are considered.

When the *effective* exchange rate regime dummies – based on the *eERR* measure – are used (columns (4) to (6) in section [B]), we keep finding that hard pegs are associated with (transformed) inflation lower by around 3 percent for the whole sample. Again, this result seems to be driven by the group of low- and middle-income countries (column 6), since we find no such relationship for the high-income subsample (column 5). More importantly, we do not find that soft pegs *raise* inflation. Instead, when we consider effective exchange rate regimes, not only hard pegs, but also narrow and wide soft pegs (Regimes 2 and 3) have a significantly *negative* effect on inflation, both in the entire sample and in the low- and middle-income subsample. The size of the coefficients (in absolute value) supports the idea that the impact of fixing the exchange rate becomes less powerful as the peg – and thus the commitment to stabilize the exchange rate – becomes weaker. But even for wide soft pegs, (transformed) inflation is lowered

[16]The classification is available under `https://unctadstat.unctad.org/EN/Classifications/DimCountries_DevelopmentStatus_Hierarchy.pdf`.

[17]We follow Ghosh et al. (2014) in interpreting the estimated coefficients as marginal effects on the inflation rate. This is not entirely correct, however, since the dependent variable is a non-linear transformation of a country's original inflation rate (in percent). It is easy to show that the marginal effect of any exchange rate-regime dummy on the (non-transformed) inflation rate is given by $\beta / \left[(1 - (\beta + \delta z)/100)\,(1 - \delta z/100)\right]$, where β represents the coefficient of the dummy variable and δz the combined effect of all control variables. This expression indicates that the estimated coefficients tend to underrate the effect of the exchange rate regime on the non-transformed inflation rate, and that we have to adjust the estimated coefficients displayed in Table 2. When we replace $(\beta + \delta z)$ in the above expression by a combination of estimated coefficients and sample averages, it turns out that, for example, the total effect of a hard peg on inflation in low/middle countries would amount to - 5.10 (instead of - 4.53) percentage points. Since this adjustment is not very large, and since the ordering of coefficients in terms of absolute value is not affected by this adjustment, we will keep presenting the estimated coefficients instead of average marginal effects on the original inflation rate.

by one percentage point relative to pure floats.[18]

The *direct* (*credibility*) effect of exchange rate regimes on inflation, which can be isolated when current and lagged money growth rates are included as control variables, is reported in the bottom part of Table 2. Not surprisingly, both the current and the lagged growth rate of broad money have a significantly positive effect on inflation. Moreover, the growth rate of real GDP is negatively associated with inflation once money growth is explicitly accounted for. Turning to the role of unilateral de-facto (*IRR*-based) exchange rate regimes, we find that only hard pegs have a significantly negative effect on inflation for the total sample and the low- and middle-income subsample (columns 7 and 9 in section [C]). Once we use *effective* (de-facto) regime dummies based on our new *eERR* measure (columns 10 to 12 in section [D]), we find, once more, that hard pegs, but also narrow and wide soft pegs have a significantly negative influence on inflation – both for the whole sample and the group of low to middle-income countries. By contrast, the exchange rate regime does not have a significant direct effect for the high-income subsample.

The bottom line of our findings is that, once we use the *effective* classification, the importance of the exchange rate regime for countries' inflation rates is greater than suggested by the *unilateral* classification. The coefficients estimated for the *total* effect (columns 4-6) are greater (in absolute value) than for the *direct* effect (columns 10-12), which is not surprising, given that the latter isolates the impact going beyond the constraint on monetary policy. However, the reduction is not substantial, which implies that low- and middle-income countries can credibly anchor inflation expectations by pegging their exchange rate. Moreover – and in contrast to the existing literature – we find that not only hard pegs, but also soft pegs contribute to lowering inflation. While the reduction in inflation rates is weaker for the more flexible regimes, our finding is in contrast to previous studies, which often find a *positive* effect of soft pegs on inflation. Finally, our finding seems to be driven by the low- and middle-income country subsample, while we find no such effect for high-income countries. This suggests that the exchange rate regime is less effective in the latter group of countries – possibly because these countries have other means to credibly anchor inflation expectations.

5.4 De-jure exchange rate regimes and inflation

The theoretical model of Section 3 stresses the role of fixed exchange rate regimes in anchoring inflation expectations. This implies that we should observe a particularly strong influence of exchange rate stability on inflation when we focus on explicit policy announcements, as reflected by *de-jure* regimes.[19] We thus re-estimate equation (11) using the de-jure (*IMF*-based) classification for the years from 2000 to 2016. The results reported in Table 3 are strikingly similar to those we found for the de-facto (IRR) classification.[20] Using the *unilateral IMF* classification (columns 1 and 2 in section [A]), we find that *hard* pegs are associated with lower inflation rates compared to freely floating regimes. This result is confirmed when we use the *effective* de-jure classification (columns 3 and 4 in section [B]). In addition – and in contrast to the results in section [A] – we find that the coefficients of *effective* narrow and wide soft pegs are negative and strongly statistically significant. The estimated coefficients are smaller in absolute value, but still statistically significant, when we only look at the *direct* effect of exchange rate regimes, taking the money growth rate into account (columns 5 to 8 in sections

[18]Interestingly, moving from the unilateral to the effective classification also gives a role to fiscal policy, with a higher fiscal balance lowering inflation in the entire sample and the low- and middle-income subsample.

[19]Recall that the de-facto (*IRR*-based) classification also considers *policy announcements*, but adjusts them to the observed volatility of exchange rates and reserves.

[20]We do not report estmation results for the *high-income* subsample, since exchange rate regimes continue to be irrelevant for this subsample (see also Figure 7). The results are available upon request.

Table 3: Unilateral and effective de-jure (*IMF*-based) classification: Inflation performance under different exchange rate regimes

	[A]		[B]	
	Unilateral (IMF)		*Effective (IMF)*	
Total effect	(1)	(2)	(3)	(4)
	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-4.149***	-5.451***	-4.143***	-5.592***
	(0.861)	(0.983)	(0.834)	(1.115)
Regime 2 / Soft pegs narrow	-0.065	-0.647	-3.519***	-4.436***
	(1.109)	(1.159)	(0.815)	(0.993)
Regime 3 / Soft pegs wide	0.159	0.345	-2.765***	-3.498***
	(0.934)	(1.331)	(0.749)	(0.929)
Openness	0.005	0.008	0.006	0.007
	(0.006)	(0.011)	(0.005)	(0.011)
Financial Openness	-3.346***	-3.438***	-3.234***	-3.305***
	(0.923)	(1.022)	(0.922)	(1.008)
Fiscal balance	-0.076*	-0.069	-0.108***	-0.085
	(0.040)	(0.057)	(0.038)	(0.053)
Real GDP growth	-0.073	-0.111	-0.071	-0.108
	(0.057)	(0.069)	(0.058)	(0.069)
N	2365	1688	2399	1720
R^2	0.25	0.21	0.23	0.18
	[C]		[D]	
	Unilateral (IMF)		*Effective (IMF)*	
Direct effect	(5)	(6)	(7)	(8)
	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-2.532***	-3.336***	-2.141***	-2.661***
	(0.483)	(0.540)	(0.479)	(0.615)
Regime 2 / Soft pegs narrow	0.089	-0.176	-2.248***	-2.833***
	(0.745)	(0.773)	(0.527)	(0.663)
Regime 3 / Soft pegs wide	0.808	0.603	-1.553***	-2.134***
	(0.799)	(1.085)	(0.430)	(0.495)
Money growth	0.095***	0.096***	0.095***	0.097***
	(0.012)	(0.013)	(0.012)	(0.013)
Lag money growth	0.109***	0.109***	0.112***	0.113***
	(0.008)	(0.009)	(0.008)	(0.009)
Openness	0.002	0.001	0.003	0.001
	(0.003)	(0.006)	(0.003)	(0.006)
Financial Openness	-1.650***	-1.765**	-1.563**	-1.608**
	(0.615)	(0.693)	(0.623)	(0.691)
Fiscal balance	-0.078***	-0.079*	-0.099***	-0.089**
	(0.028)	(0.042)	(0.027)	(0.039)
Real GDP growth	-0.169***	-0.195***	-0.163***	-0.187***
	(0.041)	(0.050)	(0.042)	(0.051)
N	2274	1634	2309	1666
R^2	0.51	0.48	0.49	0.46

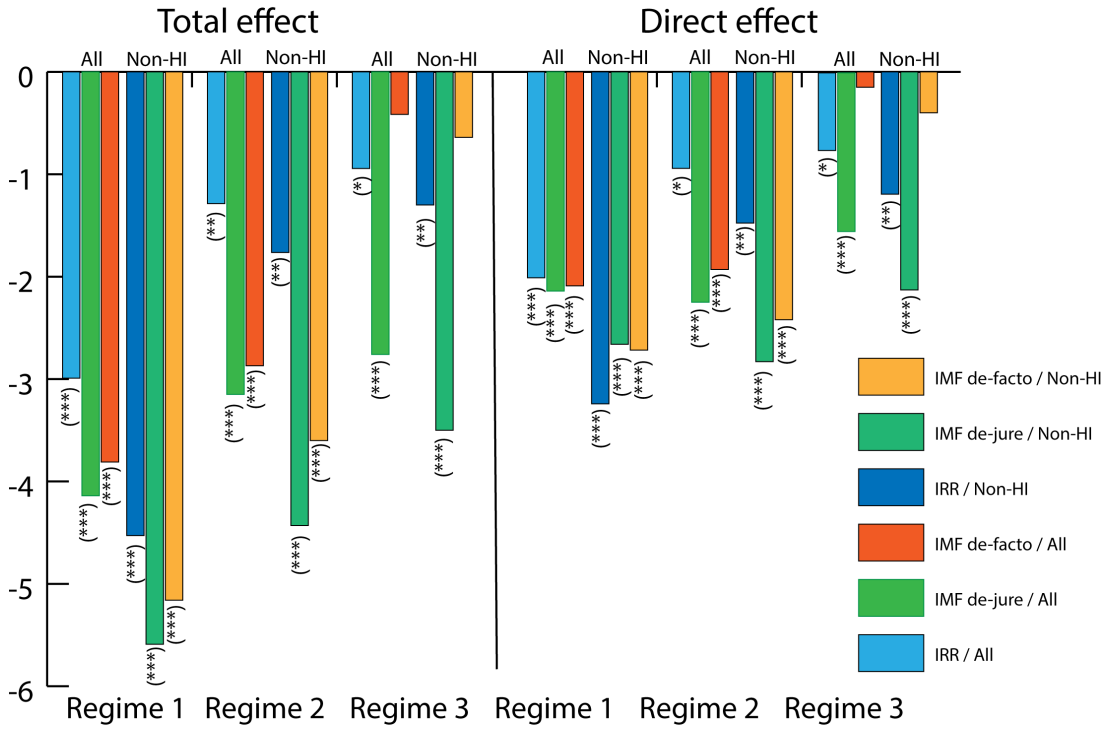
Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. All specifications include a constant term, region-specific and year effects (not reported). The sample covers the years from 2000 through 2016.

[C] and [D]). Finally, these results hold for the entire sample and for the low- and middle-income subsample.

The estimations whose results are displayed in Table 3 are based on the *IMF de-jure* classification. In Table A5 in Appendix A.2, we also report results based on the *IMF de-facto* classification.[21] The findings are consistent with those from our previous regressions. Note, in

[21]Recall that, in addition to publishing official (de-jure) announcements in the AREAER, the IMF also uses

Figure 8: *Effective* exchange rate regimes and inflation – estimated coefficients across different classifications and country groups



Notes: The bars visualize the estimated coefficients displayed in Table 2 (columns 4, 6, 10, 12), Table 3 and Table A5 (columns 4, 6, 10, 12). Coefficients reflect the difference in (transformed) inflation (ceteris paribus), compared to free-floating regimes. Sample splits are based on the (time-varying) World Bank income groups classification (Atlas method) where "All" denotes the entire sample while "Non-HI" denotes the group of low, lower-middle, and upper-middle income countries. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

particular, that the *positive* effect of wide soft pegs on inflation disappears once we replace the unilateral by the effective classification.

Figure 8 visualizes the estimated coefficients of *effective* exchange rate regimes across different classifications (IRR de-facto, IMF de-jure, IMF de-facto) and country groups (All countries / Non High-Income countries). In absolute terms, coefficients are largest for the *IMF de-jure* classification, which confirms the finding of Ghosh et al. (2014) that – due to their effect on expectations – *de-jure announcements* are of particular importance when it comes to reducing inflation.

6 Extensions and Robustness Tests

6.1 Using *eERR* and alternative dummy variables

The results presented so far related countries' inflation rates to a set of dummy variables that were based on turning the continuous $eERR$ measure, as defined by equations (9) and (10), into four discrete regimes (see Section 4.3). This gives rise to the question whether our findings are driven by the particular mapping described in Table 1. To address this concern, we first estimate equation (11) by replacing the regime dummies by the (continuous) $eERR$ measure. Recall that higher values of $eERR$ indicate a more flexible effective exchange rate regime. To assess the importance of *effective* regime flexibility, we juxtapose these results with the results of regressions where we use an exchange rate flexibility measure that is based on the

information on exchange rate volatilities and policy actions to construct its own *de-facto* classification.

unilateral (de facto or de jure) classification, and that ranges from 1 to 4. We expect that more flexible exchange rate regimes are associated with higher inflation rates. The results displayed in Table 4 show that this is indeed the case for both unilateral (columns 1 to 3) and effective classifications (columns 4 to 6) if we focus on the total sample and the low/middle income subsample. Moreover, the coefficients for the effective classification turn out to be larger than for the unilateral classification. Interestingly, the coefficient for the *unilateral* de-jure (*IMF*-based) classification turns out to be negative and statistically significant for the high-income country group (columns 14 and 20). Thus, the unilateral classification suggests that less flexible regimes are associated with higher average inflation. However, the coefficient turns insignificant once we use the *effective* classification (columns 17 and 23), which is in line with our previous findings.

Our second test whether our benchmark results are driven by our particular mapping of $eERR$ into four regime dummies uses an alternative approach to the one described in Table 1: Instead of basing the mapping on *quantiles* of the $eERR$ distribution, we define *threshold values* that determine to which regime a certain value of $eERR$ is assigned. Specifically, we classify a country-year observation as a hard peg (Regime 1) if $eERR$ is smaller than 1.5, as a narrow soft peg (Regime 2) if $1.5 \leq eERR < 2.5$, as a wide soft peg (Regime 3) if $2.5 \leq eERR < 3.5$, and as a float (Regime 4) if $eERR \geq 3.5$. As demonstrated in Table A6 in Appendix A.2, most of our qualitative results are not affected by this alternative mapping.[22]

6.2 Alternative trade weights

Our $eERR$ classification hinges on the assumption that the weight assigned to each bilateral trading partner is appropriate. To compute the benchmark version of $eERR$, we used averages of the *past three years* to measure the intensity of trade relationships. The goal was to avoid excessive volatility caused by one-time spikes in trade flows. To test the robustness of our benchmark findings with respect to the weighting scheme, we adopted two alternative approaches, whose results are reported in Table A7 in Appendix A.2, focusing on the *direct* effect of exchange rate flexibility. To facilitate comparison, columns (1) and (4) reproduce the estimated coefficients of the original (continuous) $eERR$ measure that is based on our benchmark weighting (see Table 4). We find that our results remain almost identical when we use three-years averages of trade weights *centered around the current year t* (columns 2 and 5). The same applies when weights are updated only every five years (columns 3 and 6). The differences in the estimated coefficients are even smaller when we use the effective de jure (IMF-based) classification (see the lower part of Table A7). This demonstrates that our results do not hinge on a particular weighting scheme.

6.3 Accounting for inflation targeting

In recent decades, a growing number of countries has adopted *inflation targeting* as an alternative way to achieve monetary policy credibility (IMF, 2020). We explore whether an inflation target is an effective way to achieve price stability, noting that such a target is not constrained

[22]The boundaries underlying the results in Table A6 imply a fairly small amount of hard pegs. As an alternative, we also tested a set of boundaries that implied equidistant thresholds: Hard peg (Regime 1) if $eERR$ is smaller than 1.75, narrow soft peg (Regime 2) if $1.75 \leq eERR < 2.5$, wide soft peg (Regime 3) if $2.5 \leq eERR < 3.25$, and float (Regime 4) if $eERR \geq 3.25$. Our third alternative mapping allowed for a large number of hard pegs by defining a high threshold (2.0) for Regime 1, and established equidistant thresholds for all other regimes: hard peg (Regime 1) if $eERR$ is smaller than 2.0, narrow soft peg (Regime 2) if $2.0 \leq eERR < 2.7$, wide soft peg (Regime 3) if $2.7 \leq eERR < 3.4$, and float (Regime 4) if $eERR \geq 3.4$. None of these alternative mappings changes our qualitative findings on the influence of effective exchange rate regimes on inflation and, in particular, the relevance of soft pegs. The results are available upon request.

Table 4: The influence of unilateral and effective de-facto (*IRR*-based) and de-jure (*IMF*-based) exchange rate flexibility on inflation, using **continuous** measures of exchange rate flexibility (1 = minimal flexibility; 4 = maximal flexibility)

	All	High	Low/Middle	All	High	Low/Middle
IRR / Total effect	(1)	(2)	(3)	(4)	(5)	(6)
Unilateral exch. rate flex. (IRR)	1.105***	-0.016	1.994***			
	(0.273)	(0.171)	(0.348)			
Effective exch. rate flex. (IRR)				1.727***	0.129	2.565***
				(0.374)	(0.239)	(0.458)
Openness	-0.002	0.001	-0.004	-0.002	0.002	-0.006
	(0.004)	(0.003)	(0.006)	(0.004)	(0.003)	(0.006)
Financial Openness	-4.356***	-3.820***	-3.135***	-4.164***	-3.834***	-2.934***
	(0.730)	(1.281)	(0.755)	(0.746)	(1.415)	(0.758)
Fiscal balance	0.002	0.015	0.005	-0.047***	0.007	-0.041***
	(0.005)	(0.015)	(0.004)	(0.008)	(0.014)	(0.007)
Real GDP growth	0.012	-0.005	0.006	0.009	-0.010	0.008
	(0.022)	(0.031)	(0.027)	(0.022)	(0.032)	(0.027)
IRR / Direct effect	(7)	(8)	(9)	(10)	(11)	(12)
Unilateral exch. rate flex. (IRR)	0.889***	-0.119	1.583***			
	(0.195)	(0.120)	(0.251)			
Effective exch. rate flex. (IRR)				1.142***	-0.075	1.789***
				(0.265)	(0.177)	(0.336)
Money growth	0.126***	0.051***	0.128***	0.119***	0.051***	0.123***
	(0.020)	(0.018)	(0.022)	(0.024)	(0.019)	(0.026)
Lag money growth	0.072***	0.070***	0.068***	0.076***	0.069***	0.071***
	(0.008)	(0.023)	(0.008)	(0.011)	(0.022)	(0.012)
Openness	-0.001	0.003	-0.002	-0.002	0.003	-0.005
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.005)
Financial Openness	-2.603***	-3.676***	-1.879***	-2.253***	-3.611***	-1.535**
	(0.583)	(0.928)	(0.602)	(0.574)	(1.022)	(0.605)
Fiscal balance	-0.004	-0.002	0.000	-0.027**	-0.001	-0.020*
	(0.006)	(0.015)	(0.005)	(0.012)	(0.015)	(0.010)
Real GDP growth	-0.090***	-0.060*	-0.089***	-0.085***	-0.061*	-0.078**
	(0.029)	(0.031)	(0.034)	(0.032)	(0.031)	(0.038)
N	3375	965	2410	3135	943	2192
R^2	0.45	0.62	0.42	0.45	0.62	0.41
IMF de-jure / Total effect	(13)	(14)	(15)	(16)	(17)	(18)
Unilateral exch. rate flex. (IMF)	1.331***	-0.444**	1.753***			
	(0.282)	(0.186)	(0.322)			
Effective exch. rate flex. (IMF)				2.206***	0.068	2.852***
				(0.445)	(0.258)	(0.574)
Openness	0.006	-0.000	0.008	0.004	0.002	0.007
	(0.006)	(0.002)	(0.011)	(0.005)	(0.002)	(0.011)
Financial Openness	-3.461***	-3.811***	-3.463***	-3.375***	-3.495**	-3.351***
	(0.927)	(1.360)	(1.021)	(0.943)	(1.422)	(1.024)
Fiscal balance	-0.075*	-0.011	-0.065	-0.115***	-0.020	-0.081
	(0.040)	(0.028)	(0.057)	(0.039)	(0.026)	(0.054)
Real GDP growth	-0.069	0.017	-0.108	-0.080	0.006	-0.120*
	(0.057)	(0.045)	(0.070)	(0.058)	(0.048)	(0.069)
IMF de-jure / Direct effect	(19)	(20)	(21)	(22)	(23)	(24)
Unilateral exch. rate flex. (IMF)	0.798***	-0.391**	1.055***			
	(0.155)	(0.159)	(0.173)			
Effective exch. rate flex. (IMF)				1.239***	0.009	1.526***
				(0.258)	(0.234)	(0.326)
Money growth	0.096***	0.055**	0.097***	0.095***	0.056**	0.096***
	(0.012)	(0.026)	(0.013)	(0.011)	(0.027)	(0.012)
Lag money growth	0.110***	0.063**	0.110***	0.111***	0.063**	0.112***
	(0.008)	(0.024)	(0.009)	(0.008)	(0.026)	(0.009)
Openness	0.002	0.001	0.001	0.001	0.003	0.001
	(0.003)	(0.002)	(0.006)	(0.003)	(0.002)	(0.006)
Financial Openness	-1.671***	-3.315***	-1.740**	-1.667***	-3.109***	-1.619**
	(0.627)	(1.085)	(0.710)	(0.633)	(1.111)	(0.698)
Fiscal balance	-0.077***	-0.025	-0.076*	-0.103***	-0.033	-0.088**
	(0.028)	(0.027)	(0.042)	(0.027)	(0.024)	(0.040)
Real GDP growth	-0.165***	-0.037	-0.192***	-0.168***	-0.044	-0.194***
	(0.041)	(0.048)	(0.051)	(0.042)	(0.051)	(0.050)
N	2274	640	1634	2309	643	1666
R^2	0.50	0.49	0.48	0.49	0.47	0.45

to a particular type of exchange rate regime.[23] For this reason, we augment our benchmark specification by a dummy variable that adopts a value of one if countries have an official inflation target in a given year. The results are reported in Table A8 in Appendix A.2. We find that, ceteris paribus, countries that commit to an inflation target have significantly lower inflation rates. The size of the inflation reduction is at par with the effect stemming from the adoption of narrow soft pegs (Regime 2). In line with our benchmark results, the effect of hard pegs (Regime 1) is almost twice as large as the effect of soft pegs and of inflation-targeting. We conclude that the adoption of inflation targeting does not render the exchange rate regime irrelevant, and that pegging the exchange rate remains a powerful instrument to tame inflation – in particular in emerging and developing economies that may lack other means of anchoring inflation expectations.

6.4 Including country fixed effects

Our benchmark specfication includes only year dummies and region-specific dummies, but no country fixed effects. We adopted this approach, since exchange rate regimes are usually quite persistent, which makes an identification of their effect based on a within-country variation of the data difficult. Nevertheless, given the large time span covered by the effective de-facto (*IRR*-based) classification, we also report the results of regressions including country fixed effects in Table A9 in Appendix A.2.[24] In line with our benchmark results, we find that the *total effect* (columns 1 and 2) remains both large and statistically significant. When the *direct effect* of the exchange rate regime is isolated by including the growth rate of the money supply (columns 3 and 4), the coefficient of hard pegs (Regime 1) becomes insignificant for the low to middle-income country group, but the coefficients of soft pegs (Regimes 2 and 3) remain negative and significant. We interpret this as evidence that – even for a specification that completely relies on within-country variation – effective exchange rate regime stability contributes to reducing inflation.

6.5 Exclusion of commodity-exporting countries

Our argument in favor of using *effective* exchange rate regimes rested on the notion that a country has different trading partners – not just the country issuing the anchor currency – and that we have to consider the stability of its currency with respect to *several* currencies in order to correctly assess the extent to which prices are potentially anchored by an exchange rate peg. As we have argued in Section 3, this argument remains valid even if countries use a small set of *vehicle currencies* for international transactions. A group of countries for whom vehicle currency pricing is particularly important are commodity exporters, whose trade is usually denominated in US dollars (Friberg and Wilander, 2008). To demonstrate that our results are not driven by an erroneous classification of these countries' exchange rate regimes, we estimated equation (11) after dropping observations for commodity exporters, which we defined as countries for which commodity exports amount to more than 10 percent of GDP. The results are reported in Table A10 in Appendix A.2. We find that our results remain robust, particularly in the low to middle-income subsample, which suggests that our results are *not* driven by the inclusion of commodity-exporting countries.

[23] Ilzetzki et al. (2019) find that inflation targeting countries encompass a very broad spectrum of exchange arrangements, ranging from crawling arrangements to free floats, and that almost 40 percent of the inflation targeting countries involve soft pegs arrangements such as crawling pegs.

[24] Due to the short time period (2000 - 2016) and too few changes in exchange rate regimes over this period, we do not include country fixed effects when we consider the effective *de-jure* (*IMF*-based) classification.

6.6 Other extensions and robustness tests

The argument that a fixed exchange rate regime anchors inflation expectations hinges on the assumption that market participants perceive the peg as a credible commitment. If this is not the case – e.g. because of a contradiction between a country's monetary policy and its exchange rate regime, which eventually results in a currency crisis – this argument does not apply. Moreover, the high inflation episodes following currency crises may give an unfair disadvantage (in terms of inflation performance) to the flexible exchange rates that usually emerge after the breakdown of a peg. To make sure that these effects do not drive our results, we split the sample into observations *with* and *without* currency crisis. In Table A11 in Appendix A.2, the regressions underlying Columns (1) to (4) include only observations starting 3 years *before* and ending 3 years *after* a currency crisis occurred in a given country. We find that all coefficients turn out to be statistically insignificant for this subsample, suggesting that the exchange rate regime is irrelevant in periods surrounding currency crises. Results for country-year observations with crisis periods *excluded* (columns 5 to 8) remain in line with our benchmark results, with the exception of the coefficient of wide soft pegs (Regime 3) which is negative, but no longer statistically significant.

Results based only on country-year observations that are characterized by inflation rates below 5 percent are reported in Table A12 in Appendix A.2. We find that only hard pegs (Regime 1) remain significant when the effective *de facto* (*IRR*-based) classification is used (columns 1 to 4). The coefficients for the effective *de jure* (*IMF*-based) classification (columns 5 to 8) are lower in absolute value than our benchmark results, but remain negative and statistically significant, suggesting that the inflation-reducing benefits of pegging applies even for countries with relatively low inflation rates. Finally, our results do not change if we estimate the influence of the effective de facto (*IRR*-based) classification limiting the sample to those years (2000 through 2016) that are covered by the *IMF-based* classification.[25]

7 Summary and conclusions

In this paper, we have introduced a novel *effective exchange rate regime classification*, which – instead of defining the exchange rate regime with respect to *one* (anchor) currency only – accounts for the relationship of a country's currency vis-à-vis all other currencies. We argued that, unlike currently available *unilateral* exchange rate regimes classifications, this way of categorizing exchange rate regimes is more immune to choices (and changes) of anchor currencies. Moreover, we presented a simple model to demonstrate that, by accounting for potential "fellow peggers" – i.e. countries that fix their exchange rate to the same anchor currency – an effective exchange rate regime is better suited than a unilateral regime to capture the potential role of pegging on price stability.

Using the new *effective* classification in otherwise standard regressions, we provide evidence that is in strong contrast to the notion that fixed exchange rates – in particular soft pegs – do not matter or are even detrimental for inflation performance (Rose, 2011). We show that, especially in low and middle-income countries, not only hard pegs but also narrow and wide soft pegs are associated with significantly lower inflation rates when compared to free-floating regimes. We demonstrate that these findings apply both to the *de-facto* and the *de-jure* version of our effective exchange rate regime measure, and that they are robust to numerous variations with respect to sample and specification. In terms of take-aways for practical policymaking, we conclude that, in low to middle-income countries, fixing the exchange rate is a powerful tool to reduce inflation, especially when "fellow peggers" represent a large share of a country's

[25] The results of these regressions are available upon request.

international trade. In terms of future research, we suggest to base assessments of the relative merits of exchange rate regimes with respect to constraining inflation on an *effective* – rather than *unilateral* – classification.

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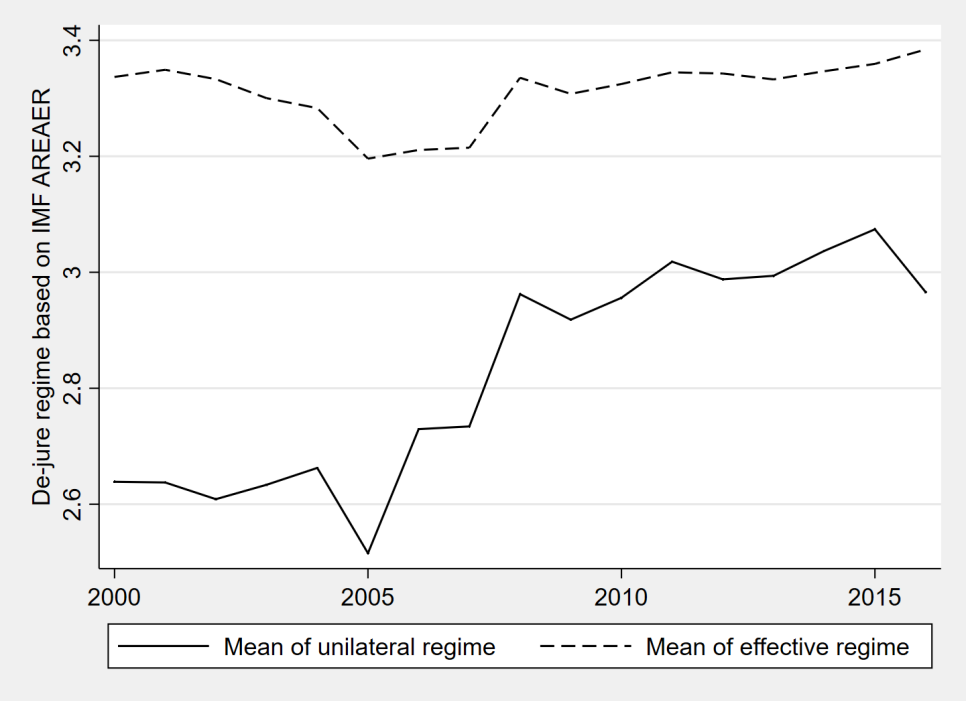
A Appendix

A.1 Data description

Figure A1: Sample averages of unilateral and effective **de-facto (IMF-based)** exchange rate regimes



Notes: Exchange rate regimes range from 1 (least flexible) to 4 (most flexible). See Table A2 in Appendix A.1 for definitions.

Table A1: Summary information on unilateral exchange rate regime classifications

Label	Authors	Years available	Observations	Number of regimes
IMF	IMF AREAER	2000-2016 (As hardcopies: since 1950)	2,751	10 (8 before 2009)
IRR	Ilzetzki, Reinhart and Rogoff	1973-2016 (Reported since 1946)	8,293	13 (plus 2 residual categories)

Label	Internet links:
IMF	https://www.elibrary-areaer.imf.org/
IRR	https://www.ilzetzki.com/irr-data

Label	Construction
IMF	De-jure regimes based on official information and de-facto regimes adjusted by IMF staff. (not compatible with prior 2000 data as regimes structure changed frequently)
IRR	Actual exchange rate behavior (market-determined rates) Merged information on capital controls and exchange rate regimes The new version from 2016 with focus on choice of anchor (explicitly determined) Allows for de facto baskets of currencies as anchors. Classify de jure inflation targeting cases and pay attention to the Eurozone. (1) look at the exchange rate volatility first (2) look at a pre-announced exchange rate arrangement (3) distinguish managed and freely floating based on external sources

Table A2: Mapping of fine unilateral exchange rate regime classifications into coarse (4-way) classifications

Ilzetzki, Reinhart and Rogoff (IRR)	Regime 4-way	Effective weight	Mapped regime (de-facto)
1. No separate legal tender or currency union	$Regime_1$	1	Hard peg
2. Pre announced peg or currency board arrangement	$Regime_1$	1	Hard peg
3. Pre announced horizontal band that is narrower than or equal to +/-2%	$Regime_1$	1	Hard peg
4. De facto peg	$Regime_1$	1	Hard peg
5. Pre announced crawling peg; de facto moving band narrower than or equal to +/-1%	$Regime_2$	2	Soft peg narrow
6. Pre announced crawling band / de facto horizontal band that is narrower than or equal to +/-2%	$Regime_2$	2	Soft peg narow
7. De facto crawling peg	$Regime_2$	2	Soft peg narrow
8. De facto crawling band that is narrower than or equal to +/-2%	$Regime_2$	2	Soft peg narrow
9. Pre announced crawling band that is wider than or equal to +/-2%	$Regime_3$	3	Soft peg wide
10. De facto crawling band that is narrower than or equal to +/-5%	$Regime_3$	3	Soft peg wide
11. Moving band that is narrower than or equal to +/-2%	$Regime_3$	3	Soft peg wide
12. De facto moving band +/-5%/ Managed floating	$Regime_3$	3	Soft peg wide
13. Freely floating	$Regime_4$	4	Freely floating
Residual categories			
14. Freely falling	-	-	-
15. Dual market in which parallel market data is missing	-	-	-

IMF *de-jure* and *de-facto* (AREAER)	Regime 4-way	Effective weight	Mapped regime
Hard pegs			
1. No separate legal tender	$Regime_1$	1	Hard peg
2. Currency board arrangement	$Regime_1$	1	Hard peg
Soft pegs			
3. Conventional pegged arrangement	$Regime_1$	1	Hard peg
4. Stabilized arrangement	$Regime_2$	2	Soft peg narow
5. Crawling peg	$Regime_2$	2	Soft peg narow
6. Crawling band / Crawling-like arrangement	$Regime_2$	2	Soft peg narow
7. Pegged within horizontal bands	$Regime_3$	3	Soft peg wide
8. Other managed (residual)	$Regime_3$	3	Soft peg wide
Floating arrangements			
9. (Managed) floating	$Regime_4$	4	Freely floating
10. Free (Independently) floating	$Regime_4$	4	Freely floating

Table A3: Data sources

Variable	Description	Source
	Main variables	
De-jure (IMF-based) regime	Bilateral *de-jure* IMF-based exchange rate regime, years 2000-2016	Harms and Knaze (2018); International Economics Website at Johannes Gutenberg University Mainz
De-facto (IMF-based) regime	Bilateral *de-facto* IMF-based exchange rate regime, years 2000-2016	
De-facto (IRR-based) regime de-facto	Bilateral *de-facto* IRR-based exchange rate regime, years 1973-2016	
Bilateral trade	Bilateral trade flows, years 1973-2016	IMF, Direction of Trade Statistics
eERR (de-jure) IMF-based	Effective *de-jure* IMF-based exchange rate regime	Own computation; International Economics Website at Johannes Gutenberg University Mainz
eERR (de-facto) IMF-based	Effective *de-facto* IMF-based exchange rate regime	
eERR (de-facto) IRR-based	Effective *de-facto* IRR-based exchange rate regime	
Inflation	Percentage change of the consumer price index (all items)	IMF, International Financial Statistics
	Other control variables	
Openness	Trade openness (Sum of exports and imports in percent of GDP)	World Bank, WDI
Financial Openness	Chinn-Ito Financial Opennes Index,	Chinn and Ito (2006); Chinn-Into Website
Fiscal balance	General government net lending/borrowing (percent of GDP)	IMF, World Economic Outlook
Real GDP growth	Annual percentage change in real GDP.	World Bank, WDI
(Lag) Money growth	(Lagged) broad money growth (in percent)	World Bank, WDI
Commodity exporters	Countries with general government commodity revenues above 10 percent of GDP.	IMF WCED (World Commodity Exporters): General government commodity revenues, percent of GDP
Currency crises	Dummy for country-year observations three years before and three years after a currency crisis	Valencia and Laeven (2012); Banking Library Website,
Inflation targeting	Country-year observations for inflation targeting countries.	IMF: IMF Website

Table A4: Summary statistics

	From	To	Obs	Mean	Std. Dev.	Min	Max	Unit
Main variables								
eERR (de-jure) IMF-based	2000	2016	2,835	3.31	0.807	1.12	4	Categorical
eERR (de-facto) IMF-based	2000	2016	2,852	3.15	0.794	1.12	4	Categorical
eERR (de-facto) IRR-based	1981	2016	5,624	2.75	0.666	1.11	4	Categorical
Inflation (transformed)	1981	2016	6,415	8.92	17.71	-22.13	99.58	Percent
Other control variables								
Openness (% of GDP)	1981	2016	6,507	81.27	52.38	.021	531.73	Index
Financial Openness	1981	2016	6,782	.45	.36	0	1	Index
Fiscal balance	1981	2016	4,900	-2.83	15.56	-557.5	122.2	Percent of GDP
Real GDP growth	1981	2016	6,847	3.67	6.36	-64.04	149.97	Percent
(Lag) Money growth	1981	2016	6,494	33.01	266.13	-99.86	12513	Percent
Commodity exporters	1981	2016	9,020	.117	.321	0	1	Dummy
Inflation targeting	1981	2016	9,020	.057	.232	0	1	Dummy

A.2 Additional regression results

Table A5: Unilateral and effective **de-facto** (*IMF*-based) classifications – Inflation performance under different exchange rate regimes

	[A]		[B]	
	Unilateral (IMF)		*Effective (IMF)*	
Total effect	(1)	(2)	(3)	(4)
	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-3.731***	-5.087***	-3.811***	-5.161***
	(0.822)	(1.002)	(0.882)	(1.144)
Regime 2 / Soft pegs narrow	0.053	-0.470	-2.868***	-3.550***
	(0.628)	(0.753)	(0.747)	(0.961)
Regime 3 / Soft pegs wide	1.857**	1.914*	-0.415	-0.639
	(0.786)	(0.999)	(0.666)	(0.826)
Openness	0.004	0.005	0.004	0.005
	(0.005)	(0.010)	(0.006)	(0.011)
Financial Openness	-3.701***	-3.603***	-3.022***	-2.941***
	(0.957)	(1.052)	(0.974)	(1.068)
Fiscal balance	-0.070**	-0.071	-0.129***	-0.098*
	(0.035)	(0.056)	(0.039)	(0.055)
Real GDP growth	-0.093	-0.128*	-0.069	-0.102
	(0.061)	(0.071)	(0.057)	(0.068)
N	2600	1878	2402	1723
R^2	0.23	0.20	0.22	0.17
	[C]		[D]	
	Unilateral (IMF)		*Effective (IMF)*	
Direct effect	(5)	(6)	(7)	(8)
	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-2.320***	-3.161***	-2.090***	-2.717***
	(0.477)	(0.576)	(0.516)	(0.659)
Regime 2 / Soft pegs narrow	-0.086	-0.439	-1.928***	-2.421***
	(0.433)	(0.510)	(0.430)	(0.575)
Regime 3 / Soft pegs wide	1.723***	1.511**	-0.146	-0.437
	(0.578)	(0.722)	(0.430)	(0.521)
Money growth	0.094***	0.094***	0.097***	0.099***
	(0.010)	(0.010)	(0.011)	(0.012)
Lag money growth	0.113***	0.113***	0.112***	0.112***
	(0.008)	(0.008)	(0.008)	(0.009)
Openness	0.002	0.001	0.001	-0.000
	(0.003)	(0.005)	(0.003)	(0.006)
Financial Openness	-1.975***	-1.921***	-1.422**	-1.390*
	(0.641)	(0.713)	(0.653)	(0.724)
Fiscal balance	-0.069**	-0.082**	-0.112***	-0.097**
	(0.027)	(0.040)	(0.027)	(0.041)
Real GDP growth	-0.186***	-0.211***	-0.162***	-0.183***
	(0.040)	(0.049)	(0.042)	(0.051)
N	2487	1813	2312	1669
R^2	0.49	0.46	0.49	0.45

Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "All" denotes the entire sample, while "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. All specifications include a constant term, region-specific and year effects (not reported). The sample covers the years from 2000 through 2016.

Table A6: Alternative mapping of *eERR* into exchange rate regime dummies

	[**Effective IRR-based classification**]			
	(1)	(2)	(3)	(4)
	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-4.469***	-5.072***	-2.942***	-3.321***
	(1.072)	(1.267)	(0.725)	(0.826)
Regime 2 / Soft pegs narrow	-2.996***	-4.482***	-2.171***	-3.311***
	(0.779)	(0.921)	(0.550)	(0.698)
Regime 3 / Soft pegs wide	-1.525**	-2.056***	-1.268**	-1.704***
	(0.693)	(0.769)	(0.514)	(0.617)
Openness	-0.002	-0.006	-0.002	-0.005
	(0.004)	(0.006)	(0.003)	(0.004)
Financial Openness	-4.066***	-2.793***	-2.208***	-1.445**
	(0.782)	(0.792)	(0.599)	(0.627)
Fiscal balance	-0.044***	-0.038***	-0.025**	-0.017*
	(0.008)	(0.007)	(0.011)	(0.010)
Real GDP growth	0.011	0.013	-0.082***	-0.075**
	(0.022)	(0.026)	(0.031)	(0.038)
Money growth			0.120***	0.125***
			(0.024)	(0.026)
Lag money growth			0.077***	0.072***
			(0.011)	(0.012)
N	3375	2281	3135	2192
R^2	0.29	0.25	0.45	0.41
	[**Effective IMF-based classification**]			
Regime 1 / Hard pegs	-4.731***	-4.942***	-2.127**	-1.814*
	(1.527)	(1.872)	(0.943)	(0.942)
Regime 2 / Soft pegs narrow	-3.822***	-5.251***	-2.186***	-2.867***
	(0.777)	(1.044)	(0.459)	(0.606)
Regime 3 / Soft pegs wide	-3.176***	-4.151***	-1.999***	-2.564***
	(0.754)	(0.956)	(0.431)	(0.531)
Openness	0.004	0.008	0.002	0.001
	(0.005)	(0.011)	(0.003)	(0.006)
Financial Openness	-3.281***	-3.214***	-1.599**	-1.562**
	(0.933)	(1.000)	(0.623)	(0.679)
Fiscal balance	-0.113***	-0.080	-0.102***	-0.086**
	(0.038)	(0.053)	(0.027)	(0.039)
Real GDP growth	-0.078	-0.123*	-0.167***	-0.196***
	(0.058)	(0.070)	(0.042)	(0.051)
Money growth			0.095***	0.096***
			(0.011)	(0.013)
Lag money growth			0.111***	0.112***
			(0.008)	(0.009)
N	2399	1720	2309	1666
R^2	0.23	0.18	0.49	0.46

Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. Details on the alternative mapping are given in Section 6.1.

Table A7: Effective de-facto (*IRR*-based) and de-jure (*IMF*-based) exchange rate flexibility and inflation – Using **alternative trade weights** (*Direct effect* only)

	(1)	(2)	(3)	(4)	(5)	(6)
		All			*Low/Middle*	
IRR de-facto classification	(t-3 to t-1)	(t-1 to t+1)	(5 years)	(t-3 to t-1)	(t-1 to t+1)	(5 years)
Effective exch. rate flex. (IRR)	1.142***	1.058***	1.028***	1.789***	1.692***	1.578***
	(0.265)	(0.270)	(0.261)	(0.336)	(0.344)	(0.333)
Money growth	0.119***	0.120***	0.120***	0.123***	0.124***	0.124***
	(0.024)	(0.023)	(0.022)	(0.026)	(0.025)	(0.024)
Lag money growth	0.076***	0.076***	0.076***	0.071***	0.072***	0.072***
	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)
Openness	-0.002	-0.002	-0.002	-0.005	-0.005	-0.005
	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)
Financial Openness	-2.253***	-2.278***	-2.347***	-1.535**	-1.556**	-1.681***
	(0.574)	(0.579)	(0.590)	(0.605)	(0.609)	(0.634)
Fiscal balance	-0.027**	-0.010	-0.010	-0.020*	-0.006	-0.008
	(0.012)	(0.008)	(0.007)	(0.010)	(0.006)	(0.006)
Real GDP growth	-0.085***	-0.094***	-0.091***	-0.078**	-0.089**	-0.085**
	(0.032)	(0.032)	(0.032)	(0.038)	(0.038)	(0.038)
N	3135	3153	3209	2192	2209	2265
R^2	0.45	0.45	0.44	0.41	0.41	0.40
	(7)	(8)	(9)	(10)	(11)	(12)
		All			*Low/Middle*	
IMF de-jure classification	(t-3 to t-1)	(t-1 to t+1)	(5 years)	(t-3 to t-1)	(t-1 to t+1)	(5 years)
Effective exch. rate flex. (IMF)	1.239***	1.256***	1.239***	1.526***	1.544***	1.514***
	(0.258)	(0.258)	(0.253)	(0.326)	(0.325)	(0.313)
Money growth	0.095***	0.094***	0.094***	0.096***	0.095***	0.095***
	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)
Lag money growth	0.111***	0.111***	0.111***	0.112***	0.112***	0.112***
	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)
Openness	0.001	0.002	0.002	0.001	0.001	0.002
	(0.003)	(0.003)	(0.003)	(0.006)	(0.006)	(0.006)
Financial Openness	-1.667***	-1.730***	-1.717***	-1.619**	-1.667**	-1.627**
	(0.633)	(0.647)	(0.644)	(0.698)	(0.707)	(0.690)
Fiscal balance	-0.103***	-0.101***	-0.101***	-0.088**	-0.085**	-0.086**
	(0.027)	(0.027)	(0.027)	(0.040)	(0.040)	(0.039)
Real GDP growth	-0.168***	-0.167***	-0.164***	-0.194***	-0.194***	-0.188***
	(0.042)	(0.041)	(0.041)	(0.050)	(0.049)	(0.049)
N	2309	2322	2353	1666	1678	1709
R^2	0.49	0.49	0.49	0.45	0.45	0.45

Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. All specifications include a constant term, region-specific and year effects (not reported). Exchange rate flexibility is defined on a scale from 1 (minimal flexibility) to 4 (maximal flexibility). Details on alternative weighting schemes are given in Section 6.2.

Table A8: Effective de-facto (*IRR*-based) and de-jure (*IMF*-based) exchange rate regimes and inflation – Controlling for **inflation targeting**

	(1)	(2)	(3)	(4)
	Total effect		*Direct effect*	
Effective de-facto (IRR) classification	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-3.952***	-5.376***	-2.598***	-3.851***
	(0.707)	(0.825)	(0.560)	(0.659)
Regime 2 / Soft pegs narrow	-2.031***	-2.468***	-1.381***	-1.956***
	(0.648)	(0.751)	(0.512)	(0.577)
Regime 3 / Soft pegs wide	-1.345**	-1.612***	-0.998**	-1.430***
	(0.527)	(0.613)	(0.414)	(0.478)
Inflation targeting	-2.310***	-3.123***	-1.292***	-1.849***
	(0.497)	(0.618)	(0.369)	(0.492)
Openness	-0.005	-0.011*	-0.004	-0.008*
	(0.004)	(0.006)	(0.003)	(0.005)
Financial Openness	-3.710***	-2.489***	-2.045***	-1.289**
	(0.749)	(0.726)	(0.578)	(0.582)
Fiscal balance	-0.048***	-0.043***	-0.028**	-0.021**
	(0.008)	(0.007)	(0.012)	(0.010)
Real GDP growth	0.009	0.014	-0.081**	-0.069*
	(0.022)	(0.028)	(0.034)	(0.041)
Money growth			0.116***	0.120***
			(0.025)	(0.027)
Lag money growth			0.074***	0.068***
			(0.011)	(0.012)
N	3375	2281	3135	2190
R^2	0.30	0.27	0.46	0.42
	(5)	(6)	(7)	(8)
	Total effect		*Direct effect*	
Effective de-jure (IMF) classification	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-5.406***	-6.480***	-2.911***	-3.264***
	(0.917)	(1.095)	(0.553)	(0.621)
Regime 2 / Soft pegs narrow	-4.832***	-5.482***	-3.028***	-3.487***
	(0.886)	(0.945)	(0.586)	(0.647)
Regime 3 / Soft pegs wide	-3.751***	-4.148***	-2.127***	-2.554***
	(0.836)	(0.940)	(0.492)	(0.522)
Inflation targeting	-3.324***	-3.683***	-1.862***	-2.162***
	(0.671)	(0.767)	(0.458)	(0.550)
Openness	0.002	-0.001	0.001	-0.003
	(0.005)	(0.011)	(0.003)	(0.006)
Financial Openness	-3.021***	-3.009***	-1.507**	-1.479**
	(0.835)	(0.938)	(0.594)	(0.652)
Fiscal balance	-0.087**	-0.078	-0.088***	-0.085**
	(0.038)	(0.052)	(0.027)	(0.039)
Real GDP growth	-0.075	-0.103	-0.162***	-0.180***
	(0.057)	(0.069)	(0.042)	(0.052)
Money growth			0.091***	0.093***
			(0.012)	(0.012)
Lag money growth			0.110***	0.111***
			(0.008)	(0.009)
N	2399	1720	2309	1666
R^2	0.26	0.21	0.50	0.47

Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "All" denotes the entire sample, while "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. All specifications include a constant term, region-specific and year effects (not reported).

Table A9: Effective de-facto (*IRR*-based) exchange rate regimes and inflation – Including **country fixed effects**

	(1)	(2)	(3)	(4)
	Total effect		*Direct effect*	
	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-2.141***	-2.273***	-0.792*	-0.957
	(0.447)	(0.623)	(0.448)	(0.608)
Regime 2 / Soft pegs narrow	-1.390***	-1.739***	-0.684*	-1.012**
	(0.371)	(0.493)	(0.364)	(0.473)
Regime 3 / Soft pegs wide	-1.194***	-1.712***	-0.753**	-1.310***
	(0.317)	(0.416)	(0.302)	(0.393)
Openness	-0.000	0.008	0.004	0.006
	(0.004)	(0.006)	(0.004)	(0.005)
Financial Openness	-7.079***	-5.707***	-5.146***	-4.094***
	(0.488)	(0.716)	(0.491)	(0.666)
Fiscal balance	-0.028***	-0.031***	-0.020***	-0.017*
	(0.008)	(0.010)	(0.008)	(0.009)
Real GDP growth	0.011	-0.009	-0.063***	-0.073***
	(0.018)	(0.023)	(0.017)	(0.021)
Money growth			0.102***	0.108***
			(0.005)	(0.007)
Lag money growth			0.067***	0.066***
			(0.005)	(0.006)
N	3375	2281	3135	2192
R^2	0.09	0.04	0.22	0.21

Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "All" denotes the entire sample, while "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. All specifications include year effects (not reported) and country fixed effects.

Table A10: Effective de-facto (*IRR*-based) and de-jure (*IMF*-based) exchange rate regimes and inflation – **Excluding commodity exporters**

	(1)	(2)	(3)	(4)
	Total effect		*Direct effect*	
IRR de-facto classification	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-2.925***	-4.525***	-1.957***	-3.254***
	(0.754)	(0.941)	(0.546)	(0.674)
Regime 2 / Soft pegs narrow	-1.133	-1.536*	-0.750	-1.302**
	(0.717)	(0.850)	(0.542)	(0.628)
Regime 3 / Soft pegs wide	-0.821	-1.268*	-0.643	-1.182**
	(0.608)	(0.709)	(0.461)	(0.541)
Openness	-0.002	-0.008	-0.001	-0.005
	(0.004)	(0.007)	(0.003)	(0.006)
Financial Openness	-3.862***	-2.569***	-2.049***	-1.374**
	(0.796)	(0.749)	(0.603)	(0.599)
Fiscal balance	-0.084*	-0.047	-0.078**	-0.049
	(0.045)	(0.055)	(0.034)	(0.045)
Real GDP growth	0.017	-0.010	-0.111***	-0.126***
	(0.039)	(0.047)	(0.041)	(0.047)
Money growth			0.124***	0.128***
			(0.027)	(0.029)
Lag money growth			0.076***	0.070***
			(0.012)	(0.013)
N	3008	2045	2769	1957
R^2	0.30	0.26	0.47	0.43
	(5)	(6)	(7)	(8)
	Total effect		*Direct effect*	
IMF de-jure classification	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-3.870***	-5.333***	-2.121***	-2.667***
	(0.774)	(1.033)	(0.457)	(0.578)
Regime 2 / Soft pegs narrow	-3.122***	-3.970***	-2.148***	-2.737***
	(0.697)	(0.899)	(0.510)	(0.674)
Regime 3 / Soft pegs wide	-2.026***	-2.408***	-1.182***	-1.747***
	(0.554)	(0.667)	(0.401)	(0.455)
Openness	0.005	0.007	0.004	0.004
	(0.004)	(0.008)	(0.003)	(0.006)
Financial Openness	-2.886***	-2.961***	-1.425**	-1.483**
	(0.878)	(0.960)	(0.592)	(0.652)
Fiscal balance	-0.074*	-0.022	-0.058*	-0.027
	(0.043)	(0.053)	(0.034)	(0.042)
Real GDP growth	-0.081	-0.130	-0.202***	-0.249***
	(0.070)	(0.082)	(0.056)	(0.065)
Money growth			0.093***	0.099***
			(0.015)	(0.017)
Lag money growth			0.114***	0.120***
			(0.016)	(0.018)
N	2136	1550	2047	1497
R^2	0.25	0.20	0.42	0.37

Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "All" denotes the entire sample, while "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. All specifications include a constant term, region-specific and year effects (not reported). Observations for countries whose commodity exports are larger than 10 percent of GDP are excluded.

Table A11: Effective de-facto (*IRR*-based) exchange rate regimes and inflation – **The role of currency crises**

*Observations covering **only** currency crisis periods (t-3 to t+3)*				
	(1)	(2)	(3)	(4)
	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-1.203	-2.383	-0.091	-0.413
	(2.238)	(2.084)	(1.455)	(1.500)
Regime 2 / Soft pegs narrow	-0.993	-0.367	1.030	0.787
	(1.137)	(1.169)	(0.824)	(0.832)
Regime 3 / Soft pegs wide	-2.185*	-1.413	-0.654	-0.610
	(1.143)	(1.015)	(0.839)	(0.850)
Openness	0.003	-0.003	0.004	0.003
	(0.011)	(0.011)	(0.010)	(0.010)
Financial Openness	-7.553***	-6.553***	-2.819**	-3.126**
	(1.735)	(1.770)	(1.309)	(1.545)
Fiscal balance	-0.019**	-0.020***	0.024**	0.026***
	(0.008)	(0.008)	(0.009)	(0.009)
Real GDP growth	-0.070	-0.045	-0.092	-0.082
	(0.051)	(0.044)	(0.056)	(0.056)
Money growth			0.201***	0.204***
			(0.030)	(0.029)
Lag money growth			0.041*	0.036
			(0.023)	(0.024)
N	437	396	421	387
R^2	0.28	0.29	0.56	0.55
*Observations **excluding** currency crisis periods (t-3 to t+3)*				
	(5)	(6)	(7)	(8)
	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-2.174***	-3.635***	-1.810***	-3.112***
	(0.515)	(0.656)	(0.432)	(0.573)
Regime 2 / Soft pegs narrow	-0.704	-1.243**	-0.813*	-1.473***
	(0.496)	(0.623)	(0.429)	(0.525)
Regime 3 / Soft pegs wide	-0.093	-0.374	-0.175	-0.602
	(0.458)	(0.574)	(0.385)	(0.486)
Openness	-0.003	-0.005	-0.002	-0.004
	(0.003)	(0.005)	(0.002)	(0.004)
Financial Openness	-2.452***	-1.391*	-1.523**	-0.762
	(0.704)	(0.751)	(0.617)	(0.671)
Fiscal balance	-0.059**	-0.052*	-0.057***	-0.058**
	(0.023)	(0.030)	(0.021)	(0.029)
Real GDP growth	0.060**	0.050	-0.030	-0.031
	(0.025)	(0.030)	(0.025)	(0.030)
Money growth			0.060***	0.057***
			(0.007)	(0.008)
Lag money growth			0.078***	0.077***
			(0.009)	(0.010)
N	2938	1885	2714	1805
R^2	0.34	0.32	0.44	0.41

Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "All" denotes the entire sample, while "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. All specifications include a constant term, region-specific and year effects (not reported).

Table A12: Effective de-facto (*IRR*-based) and de-jure (*IMF*-based) exchange rate regimes and inflation – Including only observations with **inflation rates below 5 percent per year**

	(1)	(2)	(3)	(4)
	Total effect		*Direct effect*	
IRR de-facto classification	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-0.533**	-0.766***	-0.588***	-0.787**
	(0.206)	(0.285)	(0.217)	(0.303)
Regime 2 / Soft pegs narrow	-0.087	-0.241	-0.156	-0.304
	(0.194)	(0.289)	(0.202)	(0.301)
Regime 3 / Soft pegs wide	0.027	0.288	0.004	0.248
	(0.167)	(0.265)	(0.175)	(0.278)
Openness	-0.001	0.001	-0.001	0.000
	(0.001)	(0.002)	(0.001)	(0.002)
Financial Openness	-0.377	0.270	-0.243	0.296
	(0.257)	(0.304)	(0.262)	(0.291)
Fiscal balance	-0.013	-0.030**	-0.016	-0.034***
	(0.013)	(0.012)	(0.014)	(0.013)
Real GDP growth	0.016	0.017*	0.007	0.012
	(0.010)	(0.009)	(0.011)	(0.009)
Money growth			0.010**	0.010*
			(0.004)	(0.006)
Lag money growth			0.010	0.005
			(0.006)	(0.007)
N	1956	1050	1810	1013
R^2	0.20	0.21	0.21	0.21
	(5)	(6)	(7)	(8)
	Total effect		*Direct effect*	
IMF de-jure classification	All	Low/Middle	All	Low/Middle
Regime 1 / Hard pegs	-0.655***	-0.792***	-0.631***	-0.742***
	(0.219)	(0.258)	(0.216)	(0.268)
Regime 2 / Soft pegs narrow	-0.842***	-1.177***	-0.855***	-1.189***
	(0.202)	(0.247)	(0.204)	(0.263)
Regime 3 / Soft pegs wide	-0.310*	-0.579**	-0.274	-0.496*
	(0.184)	(0.245)	(0.193)	(0.252)
Openness	-0.000	0.001	-0.000	0.000
	(0.001)	(0.003)	(0.001)	(0.003)
Financial Openness	-0.020	0.302	0.077	0.285
	(0.254)	(0.290)	(0.252)	(0.279)
Fiscal balance	-0.034***	-0.040***	-0.035***	-0.044***
	(0.011)	(0.013)	(0.011)	(0.014)
Real GDP growth	-0.002	-0.002	-0.022	-0.018
	(0.023)	(0.028)	(0.022)	(0.027)
Money growth			0.007	0.006
			(0.005)	(0.006)
Lag money growth			0.010**	0.010
			(0.005)	(0.006)
N	1460	835	1399	806
R^2	0.23	0.20	0.23	0.21

Notes: The sample is split using the (time-varying) World Bank income group classification (Atlas method), where "All" denotes the entire sample, while "Low/Middle" denotes the group of low, lower-middle, and upper-middle income countries. Clustered standard errors (at the country level) are reported in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the transformed annual inflation rate $\tilde{\pi} \equiv \pi/(1+\pi)$. All specifications include a constant term, region-specific and year effects (not reported).