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The impact of US monetary policy on managed exchange rates and currency peg regimes

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ABSTRACT

I study the impact of US monetary policy on managed exchange rates and currency peg regimes by analyzing the pricing of American Depositary Receipts (ADRs) around FOMC meetings. I identify a significant negative impact of US monetary surprises on abnormal ADR returns for currencies that are managed, which reflects changes in these currencies' fundamental values due to US monetary policy shocks. In line with currency crises models of interest rate defence like Lahiri and Végh (2007), positive US monetary surprises increase the breakdown probability of currency pegs of countries characterized by low real GDP growth, high fiscal deficits and a weak domestic banking sector.

1. Introduction

There is common agreement that US monetary policy has significant impact on exchange rates (e.g., Dedola et al., 2017; Mueller et al., 2017). However, identifying the effects of US monetary policy on managed exchange rates is nontrivial, since many central banks intervene in the foreign exchange market and thereby manipulate the value of the domestic currency (e.g. Fratzscher et al., 2019). Existing studies (e.g. Hausman and Wongswan, 2011) might not fully capture the impact of US monetary policy on managed exchange rates since the intervention of the domestic central bank prevents the official spot exchange rate from fully reflecting the change in the fundamental value of these currencies due to the US monetary policy shocks.[1]

In the extreme case of a currency pegged to the US dollar, there is – by definition - no change in the official spot exchange rate as long as the peg regime holds. However, an unexpected US policy rate increase might affect investors' assessment of the stability of the currency peg regime and thus lead to a higher expected peg breakdown probability. Second-generation currency crises models predict that domestic policy makers will opt to abandon a currency peg regime if the economic costs of maintaining the peg regime outweigh the benefits (e.g. Obstfeld, 1994; Bensaid and Jeanne, 1997).[2] To sustain the peg

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[1] For this paper, the fundamental value of a currency refers to the exchange rate that would materialize if there was no intervention by the domestic central bank and the exchange rate was fully determined by market force.

[2] This is not an exclusive feature of second-generation currency crises models, but can also be found in augmented first-generation models of interest rate defence (e.g. Flood and Jeanne, 2005; Lahiri and Végh, 2007).

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regime, the domestic central bank must mimic policy rate increases by the FED.[3] Lahiri and Végh (2007) state that raising the domestic policy rate is associated with fiscal and output cost and leads to a deterioration of the domestic banking system.

I introduce a novel empirical approach to identify the impact of US monetary policy on managed exchange rates and the stability of currency peg regimes. Following Kadiyala and Kadiyala (2004) and Eichler et al. (2009), I use American Depositary Receipts (ADRs) to identify investors' assessment of the fundamental values of managed exchange rates. ADR investors consider the impact of US monetary policy on the fundamental value of currencies. A positive (negative) US monetary surprise will decrease (increase) the true fundamental value of any currency relative to the US dollar. If the return of the spot exchange rate does not fully reflect this change in the fundamental value of the currency due to the intervention by the domestic central bank, the new fundamental value will be below (above) the current spot exchange rate of the currency. However, the domestic central bank might eventually cease intervening in the foreign exchange market, either voluntarily or if its foreign reserves are depleted. Therefore, there is the risk of a sudden convergence of the spot exchange rate to the true fundamental value of the currency, which is reflected in abnormal ADR returns (e.g. Eichler and Roevekamp, 2018). In the extreme case of a currency pegged to the US dollar, investors will perceive a higher reluctance of domestic policymakers to maintain the currency peg using an interest rate defence if they anticipate that the domestic government faces high economic costs of mimicking an unexpected US policy rate increase. Consequently, significant negative abnormal ADR returns will reflect a higher peg breakdown probability.

To my best knowledge, I am the first to study deviations from the law of one price of ADRs around FOMC meetings and relate them to the exchange rate regime of the country from where the ADR originates. I contribute to the existing literature in two ways. First, I introduce a new ADR-based methodology that allows identifying the impact of US monetary surprises on the fundamental values of currencies with managed exchange rate regimes. Second, I test the predictions of currency crises models of interest rate defence by applying this methodology to currencies pegged to the US dollar and study how US monetary policy shocks affect the stability of these peg regimes, conditional on the current state of the domestic economy. The pricing of ADRs around FOMC meetings offers a unique setting that allows for the identification of investors' assessment of the probability that domestic policy makers opt to abandon the currency peg regime in response to an exogenous shock.

I identify increases in the expected peg breakdown probability by negative abnormal ADR returns following positive US monetary surprises.[4] By interacting with macro fundamentals that proxy the three dimensions of costs associated with raising the domestic policy rate following Lahiri and Végh (2007) (i.e. current real GDP growth, the fiscal balance, the current state of the banking system), I identify investors' assessment of the domestic policy makers' willingness to raise the domestic policy rate. Higher costs of raising the domestic policy rate result in a higher reluctance to maintain the peg regime and thus lead to a higher expected peg breakdown probability.

For managed exchange rate regimes (characterized by the domestic central bank's intervention in the foreign exchange market), current returns of the spot exchange rate might not fully reflect changes in the true fundamental value of these currencies due to US monetary policy shocks as the central bank intervention drives the official spot exchange rate away from the fundamental value that would materialize without intervention. Existing studies do not account for these effects and might therefore underestimate the impact of US monetary policy on managed exchange rates. Analyzing the response of abnormal ADR returns to US monetary surprises allows identifying investors' assessment of the change in the fundamental value of managed currencies. For policy makers and investors, it is important to be aware of these differences between the current value of currencies and their true fundamental value. Once the domestic central bank stops intervening in the foreign exchange market,[5] there might be a sudden drop in the exchange rate, potentially causing severe losses to investors and real disruptions.

The empirical approach used in this paper provides a valuable tool to policy makers that are eager to monitor investors' perception of currency peg stability, the government's willingness to defend the peg regime and the risk of speculative attacks against the domestic currency in real-time. In addition, employing daily data of ADRs allows for a clean identification of the impact of US monetary shocks on managed exchange rate regimes (as compared to existing approaches using macro variables at lower frequency, e.g., Maćkowiak, 2007). One alternative way to identify currency risk would be to use prices of currency options and futures. However, as Nedeljkovic and Saborowski (2019) document, these are also affected by the intervention of the domestic central bank and therefore provide no unbiased measures of currency risk. In contrast, prices of ADRs are not manipulated by the domestic central bank and can therefore serve as an unbiased measure of currency risk.[6]

[3] While standard textbook models claim that this relation does not necessarily hold if capital flows are restricted, the empirical evidence is ambiguous. For example, Miniane and Rogers (2007) and Dedola et al. (2017) show that restrictions on capital flows do not insulate countries from US monetary policy shocks. I will discuss the role of capital account openness in the robustness check sections of this paper.

[4] Negative abnormal ADR returns following positive US monetary surprises in currency peg regimes might either result from increases in the expected breakdown probability of the currency peg regime or from a higher expected depreciation of the currency with respect to the US dollar if the peg regime breaks down. Empirically, I cannot distinguish between the two. Therefore, for the remainder of the paper, "the breakdown probability of peg regimes" refers to both possibilities.

[5] There might be several reasons for that. According to first-generation currency crises models, the domestic central bank might be forced to stop its intervention since foreign exchange reserves are depleted. According to second-generation currency crises models, the domestic policy maker might voluntarily decide to abandon a peg regime (and thus stop the intervention in the foreign exchange market), since the costs of maintaining the peg regime outweigh the benefits.

[6] Eichler (2011) shows that price discounts of Chinese cross-listed stocks are better able to forecast the yuan/US dollar exchange rate than forward exchange rates, especially at longer horizons.

My paper adds to the general literature that studies the effects of US monetary policy shocks on financial markets in the US (e.g., Thorbecke, 1997; Ehrmann and Fratzscher, 2004; Bernanke and Kuttner, 2005; Lucca and Moench, 2015) and their global transmission (e.g., Kim, 2001; Ehrmann and Fratzscher, 2009; Han and Wei, 2018; Buch et al., 2019). More specifically, it contributes to the strand of literature that investigates the impact of US monetary policy on exchange rates. Mueller et al. (2017) identify significant currency risk premia on FOMC announcement days that compensate investors for their exposure to monetary policy uncertainty. Using a Large BVAR, Dedola et al. (2017) document a significant negative impact of US monetary surprises on the value of foreign currencies against the US dollar. Hausman and Wongswan (2011) use a standard event study approach and regress the actual returns in spot exchange rates over a one-day window around FOMC meetings on the US monetary surprise for the respective FOMC meeting. They also find that positive US monetary surprises lead to a depreciation of foreign currencies against the US dollar, whereas the effect is smaller for currencies with a less flexible exchange rate regime. My paper contributes to this literature by studying the interaction between US monetary surprises and exchange rate regimes, taking the effect on the fundamental values of currencies into consideration.

It also adds to a strand of literature that studies the pricing of ADRs. Liang and Mougoue (1996) show that ADRs respond significantly to changes in the exchange rate of the domestic currency against the US dollar and identify the risk premia associated with foreign exchange risk. Several papers build on the idea that ADR prices are not only affected by the current spot exchange rate, but also reflect investors' expectations about the future exchange rate. Arquette et al. (2008) document that exchange rate expectations drawn from forward rates drive the price spread between Chinese securities and their cross-listed ADRs and H-shares. Eichler (2011) is able to predict the yuan-US dollar exchange rate more accurately than the random walk and forward exchange rates using price discounts on Chinese cross-listed stocks. A number of papers study the capital control episode in Argentina 2001/02 and find that ADRs traded at a price discount relative to their corresponding underlying stocks prior to the devaluation of the peso (e.g. Melvin, 2003; Kadiyala and Kadiyala, 2004; Levy Yeyati et al., 2004; Auguste et al., 2006; Eichler et al., 2009). Kadiyala and Kadiyala (2004) relate this relative discount to investors' expectations of the true exchange rate. Moreover, Eichler et al. (2009) study the determinants of currency crisis expectations, finding that falling commodity prices, currency overvaluation and rising sovereign default risk drive ADR investors' currency crisis expectations. Furthermore, Maltritz and Eichler (2010) employ an options-based approach to disentangle the probabilities of currency crises from expected devaluations.

My sample includes daily data of 249 level II and level III ADRs from 31 countries over the period from 1996 to 2016, covering 168 FOMC meetings (2,866 observations by country and meeting in total).[7] I find robust evidence that the impact of US monetary surprises on abnormal ADR returns differs significantly by the exchange rate regime of the country from where the underlying stock originates. US monetary surprises significantly negatively affect abnormal ADR returns for countries with managed currencies, whereas there is no significant effect for countries with freely floating currencies. A one standard deviation increase in US monetary surprises reduces abnormal ADR returns for countries with managed exchange rates by 12.3–13.3 basis points (equivalent to 0.12–0.13 standard deviations).[8] These results are robust to the inclusion of various control variables to account for potential sources of deviations from the law of one price other than the exchange rate channel[9] and a variety of robustness checks.

Second, I test the predictions of standard currency crises models of interest rate defence with respect to the stability of currency peg regimes. I find that following positive US monetary surprises, abnormal ADR returns are more negative for peg regimes with low current real GDP growth relative to average past growth, high primary fiscal deficits and low returns of the domestic banking index since the previous FOMC meeting. These results indicate that investors perceive high costs of maintaining the currency peg regime by raising the domestic policy rate and thus expect a higher breakdown probability.

2. Methodology, hypotheses and data

2.1. Definition of abnormal ADR returns

American Depositary Receipts (ADRs) represent ownership of a fixed number of underlying shares and provide the same rights (such as dividend claims and voting rights). While ADRs are denominated in US dollars and trade in the United States, their underlying shares are denominated in local currency and trade on the local stock market. Since ADRs and their underlyings can be converted into each other, the law of one price implies that prices of both should be equal when expressed in the same currency and adjusted for a fixed conversion ratio (Gagnon and Karolyi, 2010):

[7] Due to limitations in space, a list of the ADRs in my sample is not included in the paper, but is available upon request.

[8] When judging the economic significance of this effect, it must be kept in mind that as long as arbitrage possibilities exist, abnormal ADR returns should not be significantly different from zero. However, it is important to note that the focus of this paper is not to make a statement about whether profitable arbitrage possibilities exist in the ADR market around FOMC meetings. The economic significance of US monetary surprises is higher than for other control variables included in the analysis, except for the return of the local market.

[9] I control for limits to arbitrage (following Gagnon and Karolyi, 2010) as well as financial (dis-)integration (following Pasquariello, 2008). Furthermore, I include additional control variables that are specific to the domestic economy of the underlying and capture how the unexpected change in the FED Funds Rate affects the economic conditions in the domestic economy. These include the US dollar return of the domestic stock index and changes in the domestic sovereign yield and the domestic money market interest rate (potentially capturing an immediate or expected response of the domestic central bank to the monetary surprise in the US). Finally, I include the return of the US market and the change in the VIX as global control variables.

$$P_{i,j,t}^{ADR,LOOP} = \frac{P_{i,j,t}^{UND} * \gamma_{i,j}}{S_{j,t}} \tag{1}$$

with $P_{i,j,t}^{ADR,LOOP}$ and $P_{i,j,t}^{UND}$ representing the prices of ADR i from country j and its corresponding underlying stock, $\gamma_{i,j}$ is a fixed ADR-underlying pair-specific conversion parameter and $S_{j,t}$ is the current spot exchange rate of the respective country from where the underlying originates in local currency units per US dollar. Accordingly, the return of the ADR should equal the US dollar return of the respective underlying:

$$ret_{i,j,t}^{ADR,LOOP} = ret_{i,j,t}^{UND} - ret_{j,t}^{S} \tag{2}$$

Abnormal ADR returns represent deviations from the law of one price:

$$AR_{i,j,t}^{ADR} = ret_{i,j,t}^{ADR} - ret_{i,j,t}^{ADR,LOOP} = ret_{i,j,t}^{ADR} - (ret_{i,j,t}^{UND} - ret_{j,t}^{S}) \tag{3}$$

Nonzero abnormal ADR returns can be observed if actual ADR returns do not match ADR returns predicted by the returns of the underlying stock and the spot exchange rate.[10] It is not a priori clear how actual ADR returns might deviate from predicted ADR returns around FOMC meetings. The existing literature documents well how stock prices and exchange rates respond to US monetary surprises (e.g., Thorbecke, 1997; Kim, 2001; Ehrmann and Fratzscher, 2004, 2009; Bernanke and Kuttner, 2005; Lucca and Moench, 2015; Mueller et al., 2017). In the following section, I will introduce the two central hypotheses of this paper.

2.2. Hypotheses

In this paper, I study the impact of US monetary surprises on abnormal ADR returns, conditional on the exchange rate regime of the country from where the underlying stock of the ADR originates. I hypothesize that there is a significant difference between countries with a managed exchange rate regime (characterized by some degree of intervention by the domestic central bank in the foreign exchange market) and countries with a freely floating exchange rate regime (characterized by the absence of intervention by the domestic central bank in the foreign exchange market).

There is common agreement that US monetary policy has an immediate effect on exchange rates (e.g., Hausman and Wongswan, 2011; Mueller et al., 2017). Following standard exchange rate models, (unexpected) US policy rate increases ceteris paribus lead to a lower fundamental value (defined as the exchange rate that would materialize if it was fully determined by market force and there was no intervention by the domestic central bank) of any currency relative to the US dollar. However, the actual response of exchange rates to US monetary policy shocks depends on the exchange rate regime. For freely floating regimes, the return of the spot exchange rate – by definition – fully reflects the change in the fundamental value of the currency. However, for managed exchange rates, the return of the spot exchange rate might not fully reflect the change in the currency's fundamental value either due to an immediate intervention of the domestic central bank or market participants' expectation of future intervention. Hausman and Wongswan (2011) support this notion empirically by documenting that currencies with less flexible exchange rate regimes respond less to US monetary policy shocks.

The pricing of ADRs around FOMC meetings presents an ideal laboratory to identify the impact of US monetary policy on managed exchange rates. ADR investors do not only consider the current spot exchange rate, but also take into account their expectations of the future value of the exchange rate (e.g., Kadiyala and Kadiyala, 2004; Eichler et al., 2009). A positive (negative) US monetary surprise decreases (increases) the true fundamental value of any currency relative to the US dollar. If the return of the current spot exchange rate does not fully reflect this change in the fundamental value of the currency due to the intervention by the domestic central bank, the new fundamental value will be below (above) the current spot exchange rate. However, the domestic central bank might eventually either be forced to stop its intervention if its foreign reserves are depleted or it might voluntarily opt to switch its exchange rate regime to a more flexible one. Either way, in this case the spot exchange rate would converge to its fundamental value. Abnormal ADR returns reflect this risk (Eichler and Roevekamp, 2018).

In the case of a positive (negative) US monetary surprise, we should therefore observe negative (positive) abnormal returns for ADRs from countries with managed exchange rate regimes. For freely floating exchange rate regimes however, there is no reason for significant abnormal ADR returns due to this exchange rate channel since the return of the current spot exchange rate by definition fully reflects the change in the fundamental value of the currency (due to the absence of intervention by the domestic central bank).[11] Therefore, ADRs from countries with freely floating exchange rate regimes are included as a placebo test and the first central hypothesis of this paper is as follows:

[10] It is not the focus of this paper to analyze whether profitable arbitrage possibilities exist in the ADR market around FOMC meetings. This question is difficult to answer empirically since it is unclear whether an ADR and its underlying stock can be traded in the exact same instance. In addition, I abstract from differences between bid and ask prices (although I will include the change in the bid-ask-spread of both the ADR and its underlying stock as control variables in the following analysis). Finally, price differences between predicted and actual ADR prices might not be large enough to cover the transaction cost of arbitrage transactions.

[11] The literature has provided empirical evidence of various reasons for deviations from the law of one price of ADRs beyond changes in the (expected) fundamental value of the underlying currency. These include the (dis-)integration of the domestic economy from the world economy (Pasquariello, 2008), capital control circumvention premia (e.g., Melvin, 2003; Auguste et al., 2006) as well as limits to arbitrage (Gagnon and Karolyi, 2010). As I will point out more in detail in the following section, I control for these other sources of deviations from the law of one price.

(H1): *Abnormal returns of ADRs from countries with managed exchange rates respond significantly negatively to US monetary surprises. There are no significant effects for ADRs from countries with floating exchange rates.*

In the extreme case of a currency pegged to the US dollar, there is no change in the current spot exchange rate due to an unexpected FOMC policy rate change as long as the peg regime holds. However, US monetary surprises might have an impact on investors' assessment of the stability of a currency peg regime. To sustain a currency peg regime to the US dollar, the domestic central bank must mimic policy rate changes by the FED. As predicted by standard currency crises models of interest rate defence, domestic policy makers will opt to abandon a currency peg regime if the economic costs of increasing the domestic policy rate outweigh the benefits of maintaining the currency peg regime. This will be the case if, following a positive US monetary surprise, domestic policy makers perceive high costs of increasing the domestic policy rate (e.g., Bensaid and Jeanne, 1997; Flood and Jeanne, 2005; Lahiri and Végh, 2007). Lahiri and Végh (2007) consider three different dimensions of costs of increasing the domestic policy rate to defend a currency peg: fiscal cost, output cost and a further deterioration of an already weak banking system. Consequently, domestic policy makers might be especially reluctant to mimic US policy rate increases if the country currently runs a fiscal deficit, current real GDP growth is low and the domestic banking system is in a weak state. If ADR investors perceive a high reluctance of domestic policy makers to raise the domestic policy rate, they will expect a higher breakdown probability of the currency peg, which will be reflected in negative abnormal ADR returns of countries with currencies pegged to the US dollar. ADR investors have a strong incentive to monitor the breakdown probability of currency peg regimes since once the domestic policy makers opt to abandon the currency peg regime, the resulting sudden depreciation of the domestic currency would lead to severe losses to ADR investors (e.g. Kadiyala and Kadiyala, 2004; Eichler et al., 2009). Therefore, the second central hypothesis of this paper is as follows:

(H2): *Abnormal returns of ADRs from countries with currencies pegged to the US dollar respond significantly negatively to positive US monetary surprises around FOMC meetings if the costs of mimicking the policy rate increase by the FED are high,* i.e. *real GDP growth is low, the country currently runs a fiscal deficit and the domestic banking system is in a weak state.*

H2 hypothesizes a negative impact of positive US monetary surprises on abnormal ADR returns of countries with currencies pegged to the US dollar, conditional on the current state of the economy. Positive US monetary surprises should not lead to significant negative abnormal ADR returns for countries with currencies pegged to the US dollar whose economy currently is in a good state (i.e. characterized by a fiscal surplus, high real GDP growth and a solid state of the domestic banking system). For those countries, investors would not expect domestic policy makers to be reluctant to mimic the US policy rate change. Also, negative US monetary surprises should not have a significant impact on abnormal ADR returns since decreasing the domestic policy rate is not considered as costly.

2.3. Data description

To study the impact of policy rate decisions by the FOMC on abnormal ADR returns as precisely as possible, I calculate daily returns based on intraday data from Thomson Reuters Tick History. I consider the last values prior to 3p.m. UTC as closing prices for the respective day.[12] FOMC statements on meeting days are published at approximately 2:15p.m. ET.

Following Kuttner (2001), I derive US monetary surprises (i.e., unexpected changes in the FED Funds Rate) from FED Funds Futures that are settled at 4p.m. CST. Therefore, prices of FED Funds Futures already incorporate the monetary surprise of a FOMC meeting on the respective day, whereas this is not the case for the prices of ADRs and their underlyings stocks. Therefore, I match abnormal ADR returns between day $t + 1$ (incorporating the FOMC decision) and day t (not incorporating the FOMC decision) to monetary surprises on day t.

I identify potential pairs of ADRs and underlying stocks using information from the ADR databases of JP Morgan and the Bank of New York Mellon, as well as from Thomson Reuters DATASTREAM. Following Gagnon and Karolyi (2010) and Pasquariello (2008), I exclude Level I ADRs as well as SEC Regulation S shares and private placements under SEC Rule 144a.[13] This yields a sample of 249 level II and III ADRs from 31 countries over the period from 1996 to 2016 (covering 168 FOMC meetings).

3. The impact of US monetary surprises on managed exchange rates

3.1. Results

Before I test the impact of US monetary surprises on abnormal ADR returns conditional on the exchange rate regime as outlined in H1, I begin my analysis by testing an unconditional impact of US monetary surprises on abnormal ADR returns, regardless of the exchange rate regime of the underlying currency. Therefore, I estimate the following panel regression:

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[12] I chose this time because most of the stock markets of the 33 countries in my sample operate in regular mode. Also, Gau and Wu (2017) show that price discovery in foreign exchange markets on days with US announcements is dominant during overlapping trading hours of London and New York.

[13] This is common standard in the literature as Level II and Level III ADRs trade on regular exchanges (in contrast to Level I ADRs which can only be traded OTC) and require compliance with U.S. GAAP and SEC disclosure reules. It is assumed that Level II and Level III ADRs are characterized by higher liquidity and are less prone to mispricing.

$$AR_{j,t}^{ADR} = \beta_1 monetary\ \ surprise_t + \sum_{l=2}^{L} \beta_l X_{l,j,t} + \mu_{j,a} + \varepsilon_{j,t} \tag{4}$$

where $AR_{j,t}^{ADR}$ represents the mean of abnormal returns over all ADRs from country j for FOMC meeting t[14] and $monetarysurprise_t$ corresponds to the US monetary surprise of the respective FOMC meeting (calculated using the methodology proposed by Kuttner, 2001). $\sum_{l=2}^{L} X_{l,t}$ represents a large set of control variables,$\mu_{j,a}$ a country × year fixed effect and $\varepsilon_{j,t}$ the error term. Eq. (4) is estimated using robust standard errors clustered at the country level. Table 1 summarizes the results of these panel regressions for different specifications including various control variables. The unconditional impact of US monetary surprises (irrespective of the exchange rate regime) on abnormal ADR returns around FOMC meetings is insignificant.

Next, I study the impact of US monetary surprises on abnormal ADR returns around FOMC meetings conditional on the exchange rate regime of the currency underlying the ADR. Analyzing abnormal ADR returns around FOMC meetings can help identify the impact of US monetary policy on investors' assessment of the true fundamental value of currencies, which might not be fully reflected in the current spot exchange rate of currencies that are managed. Within an interaction model, I distinguish ADRs by the exchange rate regime of the country from where their underlying stock originates. Therefore, I estimate the following panel regression:

$$\begin{aligned} AR_{j,t}^{ADR} &= \beta_1 monetary\ \ surprise_t + \beta_2 managed_{j,t} + \beta_3 peg_{j,t} + \beta_4 falling_{j,t} \\ &+ \beta_5 monetary\ \ surprise_t x managed_{j,t} + \beta_6 monetary\ \ surprise_t x peg_{j,t} \\ &+ \beta_7 monetary\ \ surprise_t x falling_{j,t} + \textstyle\sum_{l=1}^{L} \beta_{8,l} X_{l,j,t} \\ &+ \textstyle\sum_{l=1}^{L} (\beta_{9,l} X_{l,j,t} x managed_{j,t}) + \sum_{l=1}^{L} (\beta_{10,l} X_{l,j,t} x peg_{j,t}) \\ &+ \textstyle\sum_{l=1}^{L} (\beta_{11,l} X_{l,j,t} x falling_{j,t}) + \mu_{j,a} + \varepsilon_{j,t} \end{aligned} \tag{5}$$

where $AR_{j,t}^{ADR}$ represents the mean of abnormal returns over all ADRs from country j for FOMC meeting t and $monetarysurprise_t$ corresponds to the US monetary surprise of the respective FOMC meeting (calculated using the methodology proposed by Kuttner, 2001). I distinguish the different exchange rate regimes based on the Ilzetzki et al. (2019) monthly coarse classification of de facto exchange rate regimes. $managed_{j,t}$ is a dummy variable equal to 1 if the country's exchange rate regimes is classified as "3″ in the Ilzetzki et al. (2019) de facto exchange rate classification and the anchor currency is the US dollar, and zero otherwise.[15] $peg_{j,t}$ is a dummy variable equal to 1 if the country's exchange rate regimes is classified as "1" or "2" in the Ilzetzki et al. (2019) de facto exchange rate classification and the anchor currency is the US dollar, and zero otherwise.[16,17] $falling_{j,t}$is a dummy variable equal to 1 if the country's exchange rate regimes is classified as "5" in the Ilzetzki et al. (2019) de facto exchange rate classification, and zero otherwise.[18] After including dummy variables for managed regimes, peg regimes and freely falling regimes, freely floating exchange rate regimes (characterized by the absence of intervention by the domestic central bank) represent the base category for the analysis in this section. Table A1 in the appendix provides an overview of the currencies in my sample and their respective exchange rate regime definition. $\sum_{l=1}^{L} X_{l,j,t}$ represents a large set of control variables,$\mu_{j,a}$ is a country × year fixed effect and $\varepsilon_{j,t}$ is the error term. $monetary\ \ surprise_t$ and all control variables are also included as interactions with the dummy variables describing the different exchange rate regimes to allow for a heterogeneous impact of US monetary surprises and the control variables on abnormal ADR returns between different exchange rate regimes. Eq. (5) is estimated using robust standard errors clustered at the country level.

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[14] This approach is chosen to avoid potential bias resulting from the different number of ADRs by country in my sample. In the case of the ADR-underlying pair specific variables controlling for limits to arbitrage, I also consider the means of the measures over all ADRs from the respective country and FOMC meeting. For the eurozone, the means of all ADRs from EMU member countries for the respective FOMC meeting are used as aggregate measures. However, treating EMU member countries as individual observations does not significantly alter the results of this paper.

[15] The Ilzetzki et al. (2019) coarse classification="3″ comprises the following items: "Pre announced crawling band that is wider than or equal to +/-2%"; "De facto crawling band that is narrower than or equal to +/-5%"; "Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and depreciation over time)" and "Managed floating". 31.51% of the observations are classified as managed regimes with the US dollar as anchor currency. Norway, Sweden (2008/09 – 2016/12), Switzerland (2001/05 – 2011/08 and 2015/02 –2016/12), Turkey (2000/08 – 2001/01) and the United Kingdom (1996/03 – 2008/12) are also classified as "3" in the Ilzetzki et al. (2019) coarse classification for some years, but have the DEM/EUR as their anchor currency. Therefore, for my analysis, I include them into the base category of currencies that are freely floating against the US dollar. However, this decision does not significantly change the results in this section.

[16] The Ilzetzki et al. (2019) coarse classification="1″ or "2″ comprises the following items: "No separate legal tender"; "Pre announced peg or currency board arrangement"; "Pre announced horizontal band that is narrower than or equal to +/-2%"; "De facto peg"; "Pre announced crawling peg"; "Pre announced crawling band that is narrower than or equal to +/-2%"; "De factor crawling peg" and "De facto crawling band that is narrower than or equal to +/-2%". 19.85% of the observations are classified as peg regimes with the US dollar as anchor currency. Denmark, Ireland (from 1996/01 to 1998/12), Italy (from 1996/03 to 1998/12), Sweden (from 2006/09 to 2008/08) and Switzerland (from 2011/09 to 2015/01) are also classified as "1" or "2" for some years in the Ilzetzki et al. (2019) coarse classification, but these currencies have the DEM/EUR as their anchor currency. Therefore, for my analysis, I include them into the base category of currencies that are freely floating against the US dollar. However, this decision does not significantly change the results in this section.

[17] I obtain results similar to those in this section if I use one aggregate category for managed exchange rates (if the Ilzetzki et al. (2019) classification is equal to 1,2 or 3) and test this against freely floating exchange rates as the base category (controlling for freely falling episodes). Results are available upon request.

[18] This is a residual category for currencies that are "freely falling", i.e. currently experiencing a currency crisis. 1.71% of the observations are classified as "freely falling" episodes.

Table 1
The unconditional impact of US monetary surprises on abnormal ADR returns around FOMC meetings.

	(1)	(2)	(3)	(4)	(5)	(6)
Monetary surprise	−1.364	−1.444*	−1.312	−1.303	−1.237	−1.219
	(1.024)	(0.817)	(0.789)	(0.789)	(0.811)	(0.813)
Return US market		0.210***	0.160***	0.160***	0.160***	0.160***
		(0.054)	(0.046)	(0.046)	(0.045)	(0.045)
Return local market		−0.170***	−0.172***	−0.172***	−0.174***	−0.172***
		(0.039)	(0.039)	(0.039)	(0.038)	(0.038)
Δ VIX			−0.000**	−0.000**	−0.000**	−0.000**
			(0.000)	(0.000)	(0.000)	(0.000)
Δ CAPM beta				0.001	0.001	0.001
				(0.003)	(0.003)	(0.002)
Δ sovereign yield					−0.198	−0.197
					(0.164)	(0.168)
Δ interest rate MM					0.000	−0.000
					(0.020)	(0.020)
Δ bid-ask ADR						0.003*
						(0.001)
Δ bid-ask UND						0.019
						(0.042)
Δ idiosyncratic risk						0.215
						(0.358)
constant	−0.000	0.000	−0.000	−0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations						
Number of Countries	2,866	2,866	2,866	2,866	2,866	2,866
R^2	31	31	31	31	31	31
Country × Year FEs	0.17	0.23	0.24	0.24	0.24	0.24

Notes: This table reports the panel estimation results of the regression model outlined in Eq. (4):
$AR^{ADR}_{j,t} = \beta_1 monetary\ \ surprise_t + \sum_{l=2}^{L} \beta_l X_{l,j,t} + \mu_{j,a} + \varepsilon_{j,t}$
where $AR^{ADR}_{j,t}$ represents the mean of abnormal returns over all ADRs of the respective country for the respective FOMC meeting and $monetarysurprise_t$ corresponds to the monetary surprise of the respective FOMC meeting (following Kuttner, 2001). $\sum_{l=2}^{L} X_{l,t}$ represents a broad set of control variables, $\mu_{j,a}$ a country × year fixed effect and $\varepsilon_{j,t}$ the error term. Control variables include the returns of the US and the local market as well as first differences in VIX, the country-specific CAPM betas, sovereign yields, money market interest rates, bid-ask spreads of the ADR and its underlying as well as ADR-underlying pair specific idiosyncratic risk. Robust standard errors clustered at the country level are reported in parentheses. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

I include various control variables to account for potential sources of deviations from the law of one price other than the exchange rate channel hypothesized in Section 2.2. The first set of control variables is specific to the ADR-underlying pair. Deviations from the law of one price might emerge if arbitrage possibilities are limited. Therefore, I follow Gagnon and Karolyi (2010) and include the change of the bid-ask-spread of both the ADR and its underlying stock as well as the change in ADR-specific idiosyncratic risk[19] to control for changes in limits to arbitrage around FOMC meetings.

I further include control variables that capture how the economic conditions in the home country of the underlying stock change around the respective FOMC meeting. These include the US dollar return of the domestic stock index, changes in the domestic sovereign yield and the domestic money market interest rate (potentially capturing an immediate or expected response of the domestic central bank to the policy rate change in the US). In addition, I follow Pasquariello (2008) and include the change in the domestic CAPM β with respect to the US market, capturing potential (dis-)integration of the domestic economy from the US economy.[20] Finally, I include the return of the US market and the change in the VIX as global control variables. If other reasons for deviations from the law of one price beyond the ones that I control for drove abnormal ADR returns around FOMC meetings, they would only affect my results if they significantly interacted with the exchange rate regime.

Table A2 in the appendix gives an overview over the variables and their sources and Table A3 provides descriptive statistics. Fig. A1 in the appendix presents a histogram of US monetary surprises around FOMC meetings. Table 2 summarizes the results from estimating Eq. (5), Tables 3 and 4 report the corresponding marginal effects of $monetary\ \ surprise_t$ for each exchange rate regime separately.

The interaction between $monetary\ \ surprise_t$ and $managed_{j,t}$ is significantly negative at the 5% level throughout a variety of different specifications and is robust to the inclusion of the various control variables described above. Also, the corresponding marginal effects of $monetary\ \ surprise_t$ are significantly negative at least at the 5% level for managed regimes, whereas this

[19] Following Gagnon and Karolyi (2010), ADR-specific idiosyncratic risk is calculated as the standard deviation of the residuals from regressing the difference between US dollar returns of the ADR and its underlying stock on contemporaneous and one day lagged and leading values of the US stock market, the respective domestic stock market and the change in the EUR/USD exchange rate using a rolling window of 30 trading days, see eq. (1) in Gagnon and Karolyi (2010).

[20] Computed as the daily change in the CAPM beta of the US dollar returns of the local stock index of the respective country with respect to the US market, estimated using a rolling regressions framework of 30 trading days.

Table 2
The impact of US monetary surprises on abnormal ADR returns conditional on the exchange rate regime.

	(7)	(8)	(9)	(10)	(11)	(12)
Monetary surprise	0.459	0.268	0.294	0.294	0.473	0.503
	(0.689)	(0.640)	(0.647)	(0.644)	(0.659)	(0.675)
Managed regime	0.002*	0.002*	0.001*	0.002*	0.001*	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Peg regime	0.002	0.001	0.001	0.001	0.001	0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Freely falling regime	0.007***	0.008***	0.008***	0.008***	0.008***	0.008***
	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Monetary surprise × managed regime	−4.700**	−4.828**	−4.809**	−4.832**	−4.896**	−4.966**
	(1.912)	(2.004)	(2.000)	(2.001)	(1.984)	(1.908)
Monetary surprise × peg regime	−4.898*	−2.702	−1.978	−1.975	−2.043	−1.839
	(2.847)	(2.374)	(2.220)	(2.210)	(2.264)	(2.265)
Monetary surprise × freely falling regime	19.434***	10.705*	11.138	10.848**	10.062*	7.560
	(4.362)	(5.819)	(6.704)	(4.760)	(5.402)	(7.181)
Return US market		0.149**	0.136**	0.133**	0.132**	0.132**
		(0.068)	(0.064)	(0.064)	(0.063)	(0.064)
Return local market		−0.111*	−0.112*	−0.111*	−0.113*	−0.109*
		(0.058)	(0.059)	(0.058)	(0.058)	(0.058)
Δ VIX			−0.000	−0.000	−0.000	−0.000
			(0.000)	(0.000)	(0.000)	(0.000)
Δ CAPM beta				0.004	0.004	0.004
				(0.004)	(0.004)	(0.004)
Δ sovereign yield					−0.531*	−0.512
					(0.300)	(0.301)
Δ interest rate MM					0.013	−0.001
					(0.021)	(0.028)
Δ bid-ask ADR						−0.000
						(0.003)
Δ bid-ask UND						−0.067
						(0.053)
Δ idiosyncratic risk						0.571
						(0.498)
Constant	−0.001	−0.001	−0.001	−0.001	−0.001	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	2,866	2,866	2,866	2,866	2,866	2,866
Number of countries	31	31	31	31	31	31
R^2	0.18	0.26	0.27	0.27	0.27	0.28
Country × Year FEs	YES	YES	YES	YES	YES	YES

Notes: This table reports the panel estimation results of the regression model outlined in Eq. (5):

$$\begin{aligned} AR_{j,t}^{ADR} &= \beta_1 monetary\ surprise_t + \beta_2 managed_{j,t} + \beta_3 peg_{j,t} + \beta_4 falling_{j,t} + \beta_5 monetary\ surprise_t x managed_{j,t} \\ &+ \beta_6 monetary\ surprise_t x peg_{j,t} + \beta_7 monetary\ surprise_t x falling_{j,t} + \textstyle\sum_{l=1}^{L} \beta_{8,l} X_{l,j,t} + \\ &+ \textstyle\sum_{l=1}^{L} (\beta_{9,l} X_{l,j,t} x managed_{j,t}) + \sum_{l=1}^{L} (\beta_{10,l} X_{l,j,t} x peg_{j,t}) + \sum_{l=1}^{L} (\beta_{11,l} X_{l,j,t} x falling_{j,t}) + \mu_{j,a} + \varepsilon_{j,t} \end{aligned}$$

where $AR_{j,t}^{ADR}$ represents the mean of abnormal returns over all ADRs of the respective country for the respective FOMC meeting and $monetarysurprise_t$ corresponds to the monetary surprise of the respective FOMC meeting (following Kuttner, 2001). $managed_{j,t}$, $peg_{j,t}$ $falling_{j,t}$ are dummy variables describing the respective exchange rate regimes according to the Ilzetzki et al. (2019) classification as described in Section 3.1. $\sum_{l=2}^{L} X_{l,t}$ represents a broad set of control variables, $\mu_{j,a}$ a country × year fixed effect and $\varepsilon_{j,t}$ the error term. Control variables include the returns of the US and the local market as well as first differences in VIX, the country-specific CAPM betas, sovereign yields, money market interest rates, bid-ask spreads of the ADR and its underlying as well as ADR-underlying pair specific idiosyncratic risk. Please note that for limitations with respect to space, Table 2 only reports the unconditional effects as well as interactions with $monetary\ surprise_t$. The coefficients of the interactions with the other control variables are available upon request. Robust standard errors clustered at the country level are reported in parentheses. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

is not the case for freely floating exchange rates. These results are in line with H1, suggesting a strong negative impact of US monetary surprises on abnormal ADR returns for countries with managed exchange rates, whereas there is no significant impact for countries with freely floating exchange rates and peg regimes. Positive (negative) US monetary surprises decrease (increase) the fundamental value of managed exchange rates below (above) the current spot exchange rate which does not fully reflect the new fundamental value due to the intervention of the domestic central bank. After controlling for other potential sources of deviations from the law of one price, these findings indicate that ADR returns reflect the risk that the actual spot exchange rate will converge to the fundamental value of the exchange rate if the domestic central bank ceases its intervention in the foreign exchange market.

The relation for managed regimes is also economically significant, i.e., a one standard deviation increase in $monetary\ surprise_t$ decreases abnormal ADR returns by about 12.3–13.3 basis points (equivalent to 0.12–0.13 standard devi-

Table 3
The impact of US monetary surprises on abnormal ADR returns conditional on the exchange rate regime: Marginal effects by exchange rate regime based on specification (7) – (9).

	(7)				(8)				(9)			
	Managed	Peg	Freely floating	Freely falling	Managed	Peg	Freely floating	Freely falling	Managed	Peg	Freely floating	Freely falling
Monetary_surprise	−4.241**	−4.439	0.459	19.893***	−4.560**	−2.434	0.268	10.973*	−4.516**	−1.684	0.294	0.294
	(1.799)	(2.760)	(0.689)	(4.386)	(1.842)	(2.274)	(0.640)	(5.701)	(1.850)	(2.111)	(0.647)	(0.647)
Return US market					0.120*	0.396***	0.149**	0.161***	0.079	0.273**	0.136**	0.207
					(0.068)	(0.128)	(0.068)	(0.055)	(0.082)	(0.112)	(0.064)	(0.146)
Return local market					−0.195*	−0.195*	−0.111*	−0.272**	−0.165***	−0.194*	−0.112*	−0.266**
					(0.106)	(0.106)	(0.058)	(0.120)	(0.033)	(0.105)	(0.059)	(0.131)
Δ VIX									−0.000	−0.001***	−0.000	0.001
									(0.000)	(0.000)	(0.000)	(0.001)
Δ CAPM beta												
Δ sovereign yield												
Δ interest rate MM												
Δ bid-ask ADR												
Δ bid-ask UND												
Δ idiosyncratic risk												
Observations	903	569	1,345	49	903	569	1,345	49	903	569	1,345	49
Number of countries	13	9	18	5	13	9	18	5	13	9	18	5

Notes: This table reports the marginal effects by exchange rate regime based on specifications (7) to (9) of the interaction model presented in Table 2. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

Table 4
The impact of US monetary surprises on abnormal ADR returns conditional on the exchange rate regime: Marginal effects by exchange rate regime based on specification (10)–(12).

	(10)				(11)				(12)			
	Managed	Peg	Freely floating	Freely falling	Managed	Peg	Freely floating	Freely falling	Managed	Peg	Freely floating	Freely falling
Monetary_surprise	−4.538**	−1.681	0.294	11.142**	−4.423**	−1.570	0.473	10.535**	−4.463***	−1.336	0.503	8.063
	(1.846)	(2.101)	(0.644)	(4.620)	(1.803)	(2.152)	(0.659)	(5.276)	(1.725)	(2.146)	(0.675)	(7.072)
Return US market	0.079	0.271**	0.133**	0.203*	0.074	0.273**	0.132**	0.198	0.074	0.275**	0.132**	8.063
	(0.083)	(0.113)	(0.064)	(0.115)	(0.084)	(0.110)	(0.063)	(0.158)	(0.085)	(0.109)	(0.064)	(7.072)
Return local market	−0.165***	−0.193*	−0.111*	−0.269**	−0.170***	−0.198**	−0.113*	−0.270**	−0.172***	−0.190**	−0.109*	−0.243***
	(0.033)	(0.106)	(0.058)	(0.111)	(0.033)	(0.100)	(0.058)	(0.107)	(0.035)	(0.096)	(0.058)	(0.091)
Δ VIX	−0.000	−0.001***	−0.000	0.001	−0.000	−0.001***	−0.000	0.000	−0.000	−0.001***	−0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.002)
Δ CAPM beta	−0.001	0.002	0.004	−0.003	−0.001	0.002	0.004	−0.003	−0.001	0.002	0.004	0.003
	(0.002)	(0.003)	(0.004)	(0.027)	(0.002)	(0.003)	(0.004)	(0.027)	(0.002)	(0.003)	(0.004)	(0.021)
Δ sovereign yield					−0.487	−0.249	−0.531*	0.317	−0.471	−0.224	−0.512*	0.433
					(0.359)	(0.243)	(0.300)	(0.888)	(0.362)	(0.266)	(0.301)	(0.924)
Δ interest rate MM					0.003	(0.158)	0.013	−0.024	0.004	−0.002	−0.001	0.023
					(0.026)	−0.001	(0.021)	(0.158)	(0.025)	(0.022)	(0.028)	(0.103)
Δ bid-ask ADR									0.000	0.013***	−0.000	0.003***
									(0.002)	(0.002)	(0.003)	(0.000)
Δ bid-ask UND									0.071	−0.031	−0.067	0.086**
									(0.073)	(0.069)	(0.053)	(0.034)
Δ idiosyncratic risk									0.823*	−0.292	0.571	−3.428***
									(0.434)	(0.675)	(0.498)	(0.670)
Observations	903	569	1,345	49	903	569	1,345	49	903	569	1,345	49
Number of countries	13	9	18	5	13	9	18	5	13	9	18	5

Notes: This table reports the marginal effects by exchange rate regime based on specifications (10) to (12) of the interaction model presented in Table 2. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

Table 5
The impact of US monetary surprises on abnormal ADR returns conditional on the exchange rate regime: Standardized marginal effects by exchange rate regime based on specification (12).

	(12)			
	Managed	Peg	Freely floating	Freely falling
Monetary surprise	−0.131***	−0.034	0.009	0.349
Return US market	0.101	0.273**	0.096**	0.24
Return local market	−0.327***	−0.232**	−0.19*	−0.519***
Δ VIX	−0.000	−0.156***	−0.000	0.231
Δ CAPM beta	−0.013	0.016	0.037	0.038
Δ sovereign yield	−0.049	−0.036	−0.084*	0.035
Δ interest rate MM	0.002	−0.002	−0.001	0.012
Δ bid-ask ADR	0.000	0.086***	0.000	0.015***
Δ bid-ask UND	0.079	−0.016	−0.047	0.052**
Δ idiosyncratic risk	0.079*	−0.292	0.041	−0.377***
Observations	903	569	1,345	49
Number of countries	13	9	18	5

Notes: This table reports standardized marginal effects by exchange rate regime based on specification (12) of the interaction model presented in Table 2. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

ations). Table 5 shows that for managed regimes, the economic significance of $monetary\ surprise_t$ by far exceeds that of the other variables (expressed in standard deviations of abnormal ADR returns for one standard deviation of the respective variable) except for the return of the local market.

3.2. Robustness checks

In this section, I present a variety of tests to demonstrate the robustness of the results in the previous section.[21] I begin by considering additional variables that might have an impact on ADR pricing around FOMC meetings. I add four different variables as additional controls to Eq. (5). For each of these additional variables, I test for their unconditional effect on abnormal ADR returns as well as their interactions with $monetary\ surprise_t$ and the other control variables that were already included in Eq. (5).

As described in Section 2.3, I use last prices available prior to 3 p.m. UTC to calculate daily returns of ADRs, their respective underlyings as well as the spot exchange rates against the US dollar. While for most of the countries in my sample (European and Latin American countries) domestic stock markets operate in regular mode at that time, most Asian markets are already closed. I include the dummy variable $synchronous\ trading_j$ (equal to one if the country's stock market operates in regular mode at 3 p.m. UTC, zero otherwise) as the first additional variable into my model.

Next, I ensure that results hold regardless of differences in capital account openness between the countries in my sample. Although Miniane and Rogers (2007) and Dedola et al. (2017) document that countries with restrictions on capital flows are not insulated from US monetary policy shocks, I will use two different concept to control for a potential impact of capital account openness on my results. First, I use the Chinn and Ito (2008) index of de jure capital account openness. Second, I follow Lane and Milesi-Ferretti (2017) and use the sum of FDI assets and liabilities as well as portfolio equity assets and liabilities relative to nominal GDP as a measure of de facto capital account openness. Low values of this Lane and Milesi-Ferretti (2017) ratio indicate low capital account openness and low financial integration. Again, I include both concepts of capital account openness (in separate specifications) as additional variables, as interactions with $monetary\ surprise_t$ and the other control variables from Eq. (5).

Third, I include log GDP per capita (in constant US dollar) of the respective country as an additional variable to validate that my results are not affected by omitted macro variables, such as the development status of the respective countries that might be correlated with the exchange rate regime.

Finally, I test whether differences in the liquidity of currencies drive my results. Some managed emerging market currencies might be characterized by a relatively low level of liquidity. The significant negative impact of US monetary surprises on abnormal ADR returns might result from the fact that actual returns of the spot exchange rate do not yet incorporate the effect of the US monetary surprise due to their low trading activity. To account for the heterogeneity in the level of liquidity between the different currencies in my sample, I include the bid-ask-spread of the spot exchange rate of the respective currency against the US dollar as an additional control variable. Table 6 presents the marginal effects of this interaction model, additionally controlling for synchronous trading, capital account openness, real GDP per capita and liquidity in the spot exchange rate of the respective currency. The two specifications differ by their measure of capital account openness (Chinn and Ito, 2008, in the left column vs. Lane and Milesi-Ferretti, 2017, in the right column). Again, the marginal effects of US monetary surprises on abnormal ADR returns for managed regimes remain significantly negative at least at the 5% level.

[21] Not all the results of this section are displayed in the paper due to limitations with respect to space. However, they are available upon request.

Table 6
The impact of US monetary surprises on abnormal ADR returns conditional on the exchange rate regime: Marginal effects of the robustness check controlling for synchronous trading, capital account openness, real GDP per capita and liquidity of the exchange rate.

	(13)				(14)			
	Managed	Peg	Freely floating	Freely falling	Managed	Peg	Freely floating	Freely falling
Monetary surprise	−4.522**	−0.114	−0.055	15.316**	−4.446***	1.215	−0.640	13.303
	(1.928)	(1.438)	(0.784)	(7.235)	(1.505)	(1.464)	(0.698)	(8.355)
Return US market	0.068	0.179***	0.121***	0.006	0.074	0.126*	0.164***	−0.162
	(0.057)	(0.067)	(0.038)	(0.387)	(0.060)	(0.072)	(0.045)	(0.365)
Return local market	−0.136***	−0.137***	−0.117***	−0.182	−0.142***	−0.095**	−0.130***	−0.135*
	(0.039)	(0.050)	(0.033)	(0.117)	(0.036)	(0.045)	(0.034)	(0.079)
Δ VIX	−0.001*	−0.001*	−0.000	−0.001	−0.000	−0.002***	0.000	−0.002
	(0.000)	(0.001)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.002)
Δ CAPM beta	−0.001	−0.004	0.002	0.029**	−0.002	0.002	0.004	0.026**
	(0.002)	(0.005)	(0.003)	(0.015)	(0.002)	(0.004)	(0.004)	(0.011)
Δ sovereign yield	−0.241	−0.095	0.025	2.083***	−0.199	−0.255	−0.272	4.277
	(0.472)	(0.441)	(0.449)	(0.675)	(0.497)	(0.455)	(0.443)	(2.606)
Δ interest rate MM	0.022	−0.085	0.002	0.208	0.081	−0.060	0.112	0.421
	(0.067)	(0.085)	(0.102)	(0.179)	(0.084)	(0.093)	(0.089)	(0.264)
Δ bid-ask ADR	0.006***	0.239	−0.000	0.011**	−0.028*	0.697**	−0.060**	−0.031
	(0.001)	(0.284)	(0.003)	(0.005)	(0.017)	(0.347)	(0.030)	(0.022)
Δ bid-ask UND	0.013	−0.048	−0.055	−0.055	0.011	−0.047	−0.106**	−0.214
	(0.082)	(0.088)	(0.040)	(0.040)	(0.084)	(0.080)	(0.046)	(0.153)
Δ idiosyncratic risk	0.688	−0.307	0.491	−1.118	0.747	−0.315	0.706	−2.217**
	(0.531)	(0.785)	(0.396)	(1.639)	(0.546)	(1.071)	(0.434)	(0.943)
Observations	903	542	1,345	48	828	523	1,277	39
Number of countries	13	9	18	5	13	9	18	5

Notes: This table reports the marginal effects of a robustness check of the regression model outlined in Eq. (5) where additional variables as well as their interactions with $monetarysurprise_t$ and the control variables are included as described in Section 3.2:

$$AR^{ADR}_{j,t} = \beta_1 monetary\ surprise_t + \beta_2 managed_{j,t} + \beta_3 peg_{j,t} + \beta_4 falling_{j,t} + \beta_5 monetary\ surprise_t x managed_{j,t} + \beta_6 monetary\ surprise_t x peg_{j,t} + \beta_7 monetary\ surprise_t x falling_{j,t} + \sum_{l=1}^{L} \beta_{8,l} X_{l,j,t} + \sum_{l=1}^{L} (\beta_{9,l} X_{l,j,t} x managed_{j,t}) + \sum_{l=1}^{L} (\beta_{10,l} X_{l,j,t} x peg_{j,t}) + \sum_{l=1}^{L} (\beta_{11,l} X_{l,j,t} x falling_{j,t}) + \sum_{n=1}^{N} \beta_{12,n} Y_{n,j,t} + \sum_{n=1}^{N} \beta_{13,n} monetary\ surprise_t x Y_{n,j,t} + \sum_{n=1}^{N} \sum_{l=1}^{L} (\beta_{14,n,l} Y_{n,j,t} x X_{l,j,t}) + \mu_{j,a} + \varepsilon_{j,t}$$

These additional variables include a synchronous trading dummy (equal to 1 if the domestic stock market operates in regular mode at 3p.m. UTC, zero otherwise), capital account openness (as measured by the Chinn-Ito, 2008, de jure index (specification 13) and the Lane and Milesi-Ferretti, 2017, index (specification 14)), log real GDP per capita and the bid-ask-spread of the exchange rate. Robust standard errors clustered at the country level are reported in parentheses. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively

I continue by discussing the role of US unconventional monetary policy and its potential impact on my results. The global financial crisis of 2007/2008 and the unconventional monetary policy measures implemented by the FED and other central banks all over the world in its aftermath affect a significant fraction of the sample of this paper. Several recent papers study the global transmission of US unconventional monetary policy (e.g., Bauer and Neely, 2014; Bowman et al., 2015; Neely, 2015; Anaya et al., 2017).

One concern with the identification of the impact of US monetary policy on managed exchange rate regimes in this paper might be that the distribution of US monetary surprises during the zero lower bound (ZLB) period from December 2008 to December 2015 differs from the rest of the sample. In the empirical approach used for the analysis in this paper as described in Eq. (5), country × year fixed effects are included to control for the general conditions of the global economy as well as the state of the respective local economy. I thereby account for the possibility that financial crises (such as the Asian Crisis 1997/1998, the burst of the dotcom bubble 2000/2001 and the global financial crisis of 2007/2008) and other major macro events affect my results.

Gürkaynak et al. (2007) suggest using the one-month Eurodollar deposit rate as an alternative to identify US monetary surprises. Also with this measure, I identify a significant negative impact of daily changes in the Eurodollar rate on abnormal ADR returns for managed exchange rate regimes, whereas there is no significant effect for freely floating exchange rates. The left panel of Table 7 shows the marginal effects of the interaction model using changes in the Eurodollar rate.

In addition, I ensure that the significant negative impact of US monetary surprises on abnormal ADR returns for countries with managed exchange rates also holds if all observations during the ZLB period are excluded. The right panel of Table 7 displays the corresponding marginal effects of this interaction model.

As additional robustness checks, I ensure that my results are not driven by outliers. First, I re-estimate specification (6), dropping single countries or meetings one at a time. Second, I exclude all observations below the 1st and above the 99th percentiles of abnormal ADR returns. In all these cases, the results remain significant.

Table 7
The impact of US monetary surprises on abnormal ADR returns conditional on the exchange rate regime: Marginal effects of the robustness check using changes in the one-month Eurodollar deposit rate following (Gürkaynak et al., 2007, spec. (15)) and excluding observations from the zero lower bound period (December 2008 – December 2015, spec. (16)).

	(15)				(16)			
	Managed	Peg	Freely floating	Freely falling	Managed	Peg	Freely floating	Freely falling
Δ Eurodollar	−1.433**	0.393	−0.166	0.619	−5.708***	−1.344	0.283	7.543
	(0.655)	(1.854)	(0.355)	(3.974)	(1.993)	(1.948)	(0.773)	(7.343)
Return US market	0.090	0.270**	0.134**	0.108	−0.129	0.219***	0.173***	0.187
	(0.087)	(0.120)	(0.065)	(0.170)	(0.111)	(0.066)	(0.053)	(0.194)
Return local market	−0.181***	−0.185*	−0.112*	−0.267***	−0.171***	−0.204***	−0.124**	−0.261***
	(0.034)	(0.106)	(0.058)	(0.100)	(0.054)	(0.070)	(0.052)	(0.084)
Δ VIX	−0.000	−0.001***	−0.000	0.000	−0.001*	−0.001**	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)
Δ CAPM beta	−0.001	0.002	0.003	0.002	−0.003	0.002	0.005	−0.005
	(0.002)	(0.003)	(0.004)	(0.022)	(0.003)	(0.006)	(0.005)	(0.022)
Δ sovereign yield	−0.421	−0.240	−0.448	0.560	−0.521	0.098	−0.728*	0.135
	(0.327)	(0.260)	(0.301)	(0.768)	(0.533)	(0.347)	(0.421)	(0.965)
Δ interest rate MM	0.005	−0.001	−0.002	0.049	−0.012	0.002	−0.009	−0.012
	(0.026)	(0.022)	(0.027)	(0.098)	(0.052)	(0.021)	(0.020)	(0.107)
Δ bid-ask ADR	−0.000	0.014***	−0.001	0.003***	0.000	0.012***	−0.000	0.003***
	(0.003)	(0.002)	(0.003)	(0.000)	(0.002)	(0.002)	(0.003)	(0.000)
Δ bid-ask UND	0.072	−0.027	−0.065	0.089**	0.039	−0.035	−0.100*	−0.100*
	(0.074)	(0.070)	(0.051)	(0.036)	(0.068)	(0.076)	(0.058)	(0.058)
Δ idiosyncratic risk	0.977**	−0.280	0.556	−3.743***	0.804	0.032	0.639	−2.706***
	(0.469)	(0.668)	(0.508)	(0.815)	(0.736)	(0.884)	(0.643)	(0.766)
Observations	886	564	1,328	47	438	354	867	41
Number of countries	13	9	18	5	12	9	18	5

Notes: This table reports the marginal effects of a robustness check of the regression model outlined in Eq. (5) where instead of the US monetary surprise based on FED Funds Futures following Kuttner (2001), the Δ in the one-month Eurodollar deposit rate (following Gürkaynak et al., 2007) is used (spec. 15) and where all observations of the zero lower bound period (from December 2008 to December 2015) are excluded (spec. 16):

$$\begin{aligned} AR^{ADR}_{j,t} &= \beta_1 \Delta Eurodollar_t + \beta_2 managed_{j,t} + \beta_3 peg_{j,t} + \beta_4 falling_{j,t} \\ &+ \beta_5 \Delta Eurodollar_t x managed_{j,t} + \beta_6 \Delta Eurodollar_t x peg_{j,t} \\ &+ \beta_7 \Delta Eurodollar_t x falling_{j,t} + \sum_{l=1}^{L} \beta_{8,l} X_{l,j,t} + + \sum_{l=1}^{L} (\beta_{9,l} X_{l,j,t} x managed_{j,t}) \\ &+ \sum_{l=1}^{L} (\beta_{10,l} X_{l,j,t} x peg_{j,t}) + \sum_{l=1}^{L} (\beta_{11,l} X_{l,j,t} x falling_{j,t}) + \mu_{j,a} + \varepsilon_{j,t} \end{aligned}$$

where $AR^{ADR}_{j,t}$ represents the mean of abnormal returns over all ADRs of the respective country for the respective FOMC meeting and $\Delta Eurodollar_t$ corresponds to the monetary surprise of the respective FOMC meeting as identified by the Δ in the one-month Eurodollar deposit rate (following Gürkaynak et al., 2007). $managed_{j,t}$, $peg_{j,t}$ $falling_{j,t}$ are dummy variables describing the respective exchange rate regimes according to the Ilzetzki et al. (2019) classification as described in Section 3.1. $\sum_{l=2}^{L} X_{l,t}$ represents a broad set of control variables, $\mu_{j,a}$ a country × year fixed effect and $\varepsilon_{j,t}$ the error term. Control variables include the returns of the US and the local market as well as first differences in VIX, the country-specific CAPM betas, sovereign yields, money market interest rates, bid-ask spreads of the ADR and its underlying as well as ADR-underlying pair specific idiosyncratic risk. Robust standard errors clustered at the country level are reported in parentheses. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

4. US monetary policy and currency peg stability

4.1. Results

Positive US monetary surprises might lead to a higher expected probability that a currency peg regime to the US dollar breaks down. As predicted by standard currency crises models of interest rate defence (e.g., Bensaid and Jeanne, 1997; Flood and Jeanne, 2005; Lahiri and Végh, 2007), domestic policy makers will opt to abandon a currency peg regime if the economic costs of mimicking a policy rate increase in the US outweigh the benefits of maintaining the peg regime. Increasing the domestic policy rate is costly if current real GDP growth is low, the country runs a fiscal deficit and the domestic banking system is in a weak state (Lahiri and Végh, 2007).

The previous section documented a significant negative impact of US monetary surprises on abnormal ADR returns for managed exchange rate regimes. Now, I focus on the effect of positive US monetary surprises on currency peg regimes, conditional on the current state of the domestic economy, to identify investors' assessment of the domestic government's willingness to defend the currency peg regime by raising the domestic policy rate. As before, I use the continuous measure of US monetary surprises derived from Fed Funds Futures (following Kuttner, 2001). However, I now distinguish between positive and negative US monetary surprises by defining the following two continuous variables:

$$pos\ \ MS_t = \begin{cases} monetary\ \ surprise_t & if\ \ monetary\ \ surprise_t \geq 0 \\ 0 & otherwise \end{cases}$$

$$neg\ \ MS_t = \begin{cases} 0 & if\ \ monetary\ \ surprise_t \geq 0 \\ monetary\ \ surprise_t & otherwise \end{cases}$$

According to H2, positive US monetary surprises might have a significant negative impact on abnormal ADR returns from countries with currencies pegged to the US dollar if investors perceive that domestic policy makers are reluctant to mimic the unexpected US policy rate increase because they associate high costs with it. For negative US monetary surprises however, there should be no significant impact on abnormal ADR returns of countries with currencies pegged to the US dollar since decreasing the domestic policy rate is not perceived as costly. Before testing the complete model, it must be ensured that the hypothesized negative impact of positive US monetary surprise for currency peg regimes with the US dollar as anchor currency really stems from the interaction between positive US monetary surprises and country-specific macro variables that capture the cost of raising the domestic policy rate as postulated in H2. Therefore, on average, as long as the cost of raising the domestic policy rate are not considered, an insignificant impact of positive US monetary surprises on abnormal ADR returns from countries with currency peg regimes would be expected. To test this, the same model as described in Eq. (5) is estimated, with the only difference that the model now distinguishes between positive and negative US monetary surprises. Accordingly, the model looks as follows:

$$AR^{ADR}_{j,t} = \begin{array}{c} \beta_1 pos\ MS_t + \beta_2 neg\ MS_t + \beta_3 managed_{j,t} + \beta_4 peg_{j,t} + \beta_5 falling_{j,t} \\ + \beta_6 pos\ MS_t x managed_{j,t} + \beta_7 neg\ MS_t x managed_{j,t} + \beta_8 pos\ MS_t x peg_{j,t} \\ + \beta_9 neg\ MS_t x peg_{j,t} + \beta_{10} pos\ MS_t x falling_{j,t} + \beta_{11} neg\ MS_t x falling_{j,t} \\ + \sum_{l=1}^{L} \beta_{12,l} X_{l,j,t} + \sum_{l=1}^{L} (\beta_{13,l} X_{l,j,t} x managed_{j,t}) + \sum_{l=1}^{L} (\beta_{14,l} X_{l,j,t} x peg_{j,t}) \\ + \sum_{l=1}^{L} (\beta_{15,l} X_{l,j,t} x falling_{j,t}) + \mu_{j,a} + \varepsilon_{j,t} \end{array} \quad (6)$$

As outlined in Table 8, the marginal effects of positive US monetary surprises for currency peg regimes to the US dollar are not significant. This shows that investors on average do not have any reason to believe that domestic policy makers will not

Table 8
Marginal effects of positive and negative US monetary surprises conditional on the exchange rate regime.

	Managed	Peg	Freely floating	Freely falling
Positive monetary surprise	−6.889***	−4.487	−1.205	−39.068***
	(2.112)	(3.865)	(1.073)	(15.132)
Negative monetary surprise	−2.590	1.568	1.324	19.448***
	(1.947)	(2.840)	(1.121)	(6.095)
Return US market	0.073	0.266**	0.137**	−0.143
	(0.089)	(0.109)	(0.064)	(0.290)
Return local market	−0.171***	−0.187*	−0.121*	−0.160**
	(0.035)	(0.096)	(0.063)	(0.062)
Δ VIX	−0.000*	−0.001***	−0.000	−0.001
	(0.000)	(0.000)	(0.000)	(0.002)
Δ CAPM beta	−0.000*	0.002	0.005	0.004
	(0.000)	(0.004)	(0.005)	(0.023)
Δ sovereign yield	−0.440	−0.224	−0.487	0.966
	(0.386)	(0.269)	(0.338)	(0.748)
Δ interest rate MM	−0.004	−0.002	0.029	0.051
	(0.021)	(0.023)	(0.047)	(0.119)
Δ bid-ask ADR	0.000	0.014***	−0.001	0.003***
	(0.002)	(0.002)	(0.003)	(0.001)
Δ bid-ask UND	0.069	−0.030	−0.060	0.027
	(0.078)	(0.072)	(0.062)	(0.054)
Δ idiosyncratic risk	0.845**	−0.343	0.458	−2.230***
	(0.429)	(0.698)	(0.365)	(0.627)
Observations	903	569	1,345	49
Number of countries	13	9	18	5

Notes: This table reports the marginal effects of Eq. (6) where instead of the continuous US monetary surprise measure based on FED Funds Futures following Kuttner (2001), positive and negative US monetary surprises are distinguished:

$$\begin{array}{c} AR^{ADR}_{j,t} = \beta_1 posMS_t + \beta_2 negMS_t + \beta_3 managed_{j,t} + \beta_4 peg_{j,t} + \beta_5 falling_{j,t} \\ + \beta_6 posMS_t x managed_{j,t} + \beta_7 negMS_t x managed_{j,t} + \beta_8 posMS_t x peg_{j,t} \\ + \beta_9 negMS_t x peg_{j,t} + \beta_{10} posMS_t x falling_{j,t} + \beta_{11} negMS_t x falling_{j,t} \\ + \sum_{l=1}^{L} \beta_{12,l} X_{l,j,t} + \sum_{l=1}^{L} (\beta_{13,l} X_{l,j,t} x managed_{j,t}) + \sum_{l=1}^{L} (\beta_{14,l} X_{l,j,t} x peg_{j,t}) \\ + \sum_{l=1}^{L} (\beta_{15,l} X_{l,j,t} x falling_{j,t}) + \mu_{j,a} + \varepsilon_{j,t} \end{array}$$

where $AR^{ADR}_{j,t}$ represents the mean of abnormal returns over all ADRs of the respective country for the respective FOMC meeting and $posMS_t$ ($negMS_t$) describe positive (negative) US monetary surprises for the respective FOMC meeting, $managed_{j,t}$, $peg_{j,t}$ $falling_{j,t}$ are dummy variables describing the respective exchange rate regimes according to the Ilzetzki et al. (2019) classification as described in Section 3.1. $\sum_{l=2}^{L} X_{l,t}$ represents a broad set of control variables, $\mu_{j,a}$ a country × year fixed effect and $\varepsilon_{j,t}$ the error term. Control variables include the returns of the US and the local market as well as first differences in VIX, the country-specific CAPM betas, sovereign yields, money market interest rates, bid-ask spreads of the ADR and its underlying as well as ADR-underlying pair specific idiosyncratic risk. Robust standard errors clustered at the country level are reported in parentheses. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

mimic US monetary surprises as long as country-specific factors are not accounted for and consequently the cost of increasing the domestic policy rate are not considered.

In the panel regression model that I estimate next to test H2, I additionally interact with a macro variable that proxies the three dimensions of costs associated with increasing the domestic policy rate suggested by Lahiri and Végh (2007): current real GDP growth, the fiscal balance and the current state of the domestic banking system:

$$AR^{ADR}_{j,t} = \begin{aligned} &\beta_1 pos\ MS_t + \beta_2 neg\ MS_t + \beta_3 managed_{j,t} + \beta_4 peg_{j,t} + \beta_5 falling_{j,t} + \beta_6 macro_{j,t} \\ &+\beta_7 macro_{j,t} x managed_{j,t} + \beta_8 macro_{j,t} x peg_{j,t} \\ &+\beta_9 macro_{j,t} x falling_{j,t} + \beta_{10} pos\ MS_t x managed_{j,t} + \beta_{11} pos\ MS_t x peg_{j,t} \\ &+\beta_{12} pos\ MS_t x falling_{j,t} + \beta_{13} pos\ MS_t x macro_{j,t} \\ &+\beta_{14} pos\ MS_t x macro_{j,t} x managed_{j,t} + \beta_{15} pos\ MS_t x macro_{j,t} x peg_{j,t} + \\ &+\beta_{16} pos\ MS_t x macro_{j,t} x falling_{j,t} + \beta_{17} neg\ MS_t x managed_{j,t} \\ &+\beta_{18} neg\ MS_t x peg_{j,t} + \beta_{19} neg\ MS_t x falling_{j,t} + \beta_{20} neg\ MS_t x macro_{j,t} \\ &+\beta_{21} neg\ MS_t x macro_{j,t} x managed_{j,t} + \beta_{22} neg\ MS_t x macro_{j,t} x peg_{j,t} \\ &+\beta_{23} neg\ MS_t x macro_{j,t} x falling_{j,t} + \textstyle\sum_{l=1}^{L} \beta_{24,l} X_{l,j,t} \\ &+\beta_{23} neg\ MS_t x macro_{j,t} x falling_{j,t} + \textstyle\sum_{l=1}^{L} \beta_{24,l} X_{l,j,t} \\ &+\textstyle\sum_{l=1}^{L} \beta_{25,l} X_{l,j,t} x managed_{j,t} + \textstyle\sum_{l=1}^{L} \beta_{26,l} X_{l,j,t} x peg_{j,t} \\ &+\textstyle\sum_{l=1}^{L} \beta_{27,l} X_{l,j,t} x falling_{j,t} + \textstyle\sum_{l=1}^{L} \beta_{28,l} X_{l,j,t} x macro_{j,t} \\ &+\textstyle\sum_{l=1}^{L} \beta_{29,l} X_{l,j,t} x macro_{j,t} x managed_{j,t} \\ &+\textstyle\sum_{l=1}^{L} \beta_{30,l} X_{l,j,t} x macro_{j,t} x peg_{j,t} \\ &+\textstyle\sum_{l=1}^{L} \beta_{31,l} X_{l,j,t} x macro_{j,t} x falling_{j,t} \\ &+\mu_{j,a} + \varepsilon_{j,t} \end{aligned} \quad (7)$$

where $AR^{ADR}_{j,t}$ represents the average of abnormal returns of all ADRs from country j for FOMC meeting t and $pos\ MS_t(negMS_t)$ denotes positive (negative) continuous US monetary surprises as defined above. $managed_{j,t}$, $peg_{j,t}$ and $falling_{j,t}$ are the same dummy variables based on the Ilzetzki et al. (2019) monthly coarse de facto exchange rate regime classification as used in Eq. (5), $macro_{j,t}$ is a continuous variable proxying the three cost dimensions of raising the domestic policy rate following Lahiri and Végh (2007), $\sum_{l=1}^{L} X_{l,j,t}$ represents the same set of control variables as used in Eq. (5), $\mu_{j,a}$ a country × year fixed effect and $\varepsilon_{j,t}$ the error term. Eq. (7) is estimated using robust standard errors clustered at the country level.

In the following, I test H2 by assessing the marginal effects of positive US monetary surprises on abnormal ADRs from countries with currencies pegged to the US dollar over the 5th to 95th percentiles of the macro fundamental variable tested in the respective specification.[22] Fig. 1 to Fig. 4 illustrate the marginal effects of positive and negative US monetary surprises and their 95% confidence intervalls. Table A4 in the appendix provides descriptive statistics over the respective marco fundamentals for the countries with currencies pegged tot he US dollar in my sample.

Lahiri and Végh (2007) name output cost as one of three cost dimensions associated with raising the domestic policy rate to defend a currency peg. Increasing the domestic policy rate leads to a credit crunch and an output contraction. Therefore, policy makers from countries that are characterized by relatively low real GDP growth should be reluctant to increase the domestic policy rate since this would further deter economic growth. To account for country-specific growth dynamics, I define relative GDP growth as current real GDP growth minus the country's average real GDP growth over the past ten years.

Fig. 1 illustrates the marginal effects and 95% confidence intervals of positive US monetary surprises (left panel) and negative US monetary surprises (right panel) on abnormal ADR returns of countries with currencies pegged to the US dollar over the 5th to 95th percentile of relative GDP growth.

If relative GDP growth is equal to or below zero, i.e. current real GDP growth is equal or lower compared to the respective country's average over the past ten years, positive US monetary surprises have a significant negative impact on abnormal ADR returns from countries with currencies pegged to the US dollar as hypothesized by H2. Effects are stronger (i.e. the impact is more negative), the lower current relative to past real GDP growth. These results indicate that investors will perceive domestic policy makers to be reluctant to mimic unexpected US policy rate increases if current economic growth is relatively low. Raising the domestic policy rate would further deter economic growth. Therefore, negative abnormal ADR returns reflect an increase in the expected peg breakdown probability for these countries.

Results are also economically significant. For a country that currently experiences a strong recession, i.e. where current real GDP growth is 8% below average real GDP growth over the past ten years, a one standard deviation increase in positive US monetary surprises reduces abnormal ADR returns by 0.38% (about 0.36 standard deviations). On the other hand, if current real GDP growth exceeds past growth, there are no significant effects of US monetary surprises. Thus, investors do not perceive domestic policy makers to be reluctant to mimic US policy rate increases if current real GDP growth is relatively

[22] The coefficients of the respective interactions are not reported due to limitations with respect to space. However, there are available upon request.

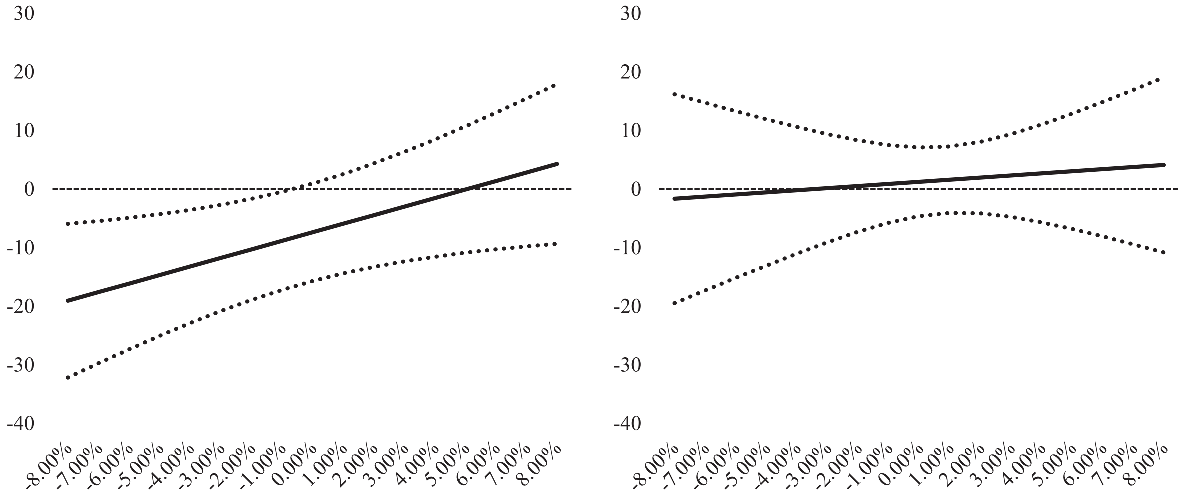

Fig. 1. Marginal effects of positive (left) and negative (right) US monetary surprises for peg regimes to the US dollar over the 5th to 95th percentiles of relative GDP growth. *Notes: Marginal effects and 95% confidence intervals of positive US monetary surprises (left) and negative US monetary surprises (right) for peg regimes to the US dollar over the 5th to 95th percentiles of relative GDP growth obtained by estimating the panel regression model outlined in* Eq. *(7). Relative GDP growth is defined as the respective country's current real GDP growth minus the country's average real GDP growth over the past ten years.*

high. In addition, there is no significant impact of negative US monetary surprises as the right panel of Fig. 1 documents. Apparently, investors do not associate any economic costs with lowering the domestic policy rate.

The second dimension of costs associated with increasing the domestic policy rate to defend a currency peg suggested by Lahiri and Végh (2007) are fiscal cost. If the government currently runs a fiscal deficit, the government will perceive high costs of defending the currency peg since raising the domestic policy rate will further deteriorate the financial situation of the government due to the increase in borrowing cost (e.g. Lahiri and Végh, 2003, 2007; Flood and Jeanne, 2005). Consequently, positive US monetary surprises should have a significant negative impact on abnormal ADR returns of countries with currencies pegged to the US dollar if these countries currently run a fiscal deficit. I proxy fiscal cost by the primary fiscal balance relative to GDP. Fig. 2 illustrates the marginal effects of positive US monetary surprises (left panel) and negative US monetary surprises (right panel) on abnormal ADR returns of countries with currencies pegged to the US dollar over the 5th to 95th percentile of the primary fiscal balance relative to GDP.

Results from this second interaction model are also in line with H2. There is a significant negative impact of positive US monetary surprises on abnormal returns of ADRs from countries with governments that currently run primary fiscal deficits equal to or larger than 2% of GDP, while there are no significant effects for countries with governments currently running primary fiscal surpluses or only minor primary fiscal deficits. Additionally, the size of the effect increases with the magnitude of the fiscal deficit.[23] At the same time, there is no significant impact of negative US monetary surprises.

Finally, I study the impact of US monetary surprises on the stability of currency peg regimes to the US dollar, conditional on the soundness of the domestic banking system. Policy makers take the health of the domestic banking system into consideration when deciding on policy rate changes (e.g., Eichler et al., 2018). Raising the domestic policy rate will be costly if it leads to a further deterioration of an already weak banking system (Lahiri and Végh, 2007). Therefore, domestic policy makers will be reluctant to increase the domestic policy rate if the current state of the domestic banking system is already fragile.[24] I proxy banking sector stability by the return of the respective country's banking index since the previous FOMC meeting. Fig. 3 illustrates the results of this interaction model.

The more fragile the current state of the domestic banking sector (i.e. the more negative the returns of the domestic banking index since the previous FOMC meeting), the more negative the impact of positive US monetary surprises on abnormal ADR returns for peg regimes. This result indicates that investors will perceive domestic policy makers to be reluctant to mimic US policy rate increases if this has an adverse impact on an already weak banking system. On the other hand, investors do not anticipate domestic policy makers to be reluctant to raise the domestic policy rate if the domestic banking system is in a relatively sound state (characterized by returns of the domestic banking index equal above 3%).

[23] First-generation currency crises models provide an alternative explanation for this finding. According to these models, the fiscal balance serves as a proxy for the overall stability of the peg regime. Persistent deficits of the domestic government are inconsistent with a peg regime if the domestic central bank refinances the fiscal deficit.

[24] From a theoretical point of view, the government's incentive to maintain a currency peg regime might also be higher if the domestic banking system is in a fragile state and domestic banks are mostly indebted in foreign currency. However, testing this theoretical argument empirically goes beyond the scope of this paper which focuses on identifying the cost side of maintaining a currency peg regime by increasing the domestic policy rate.

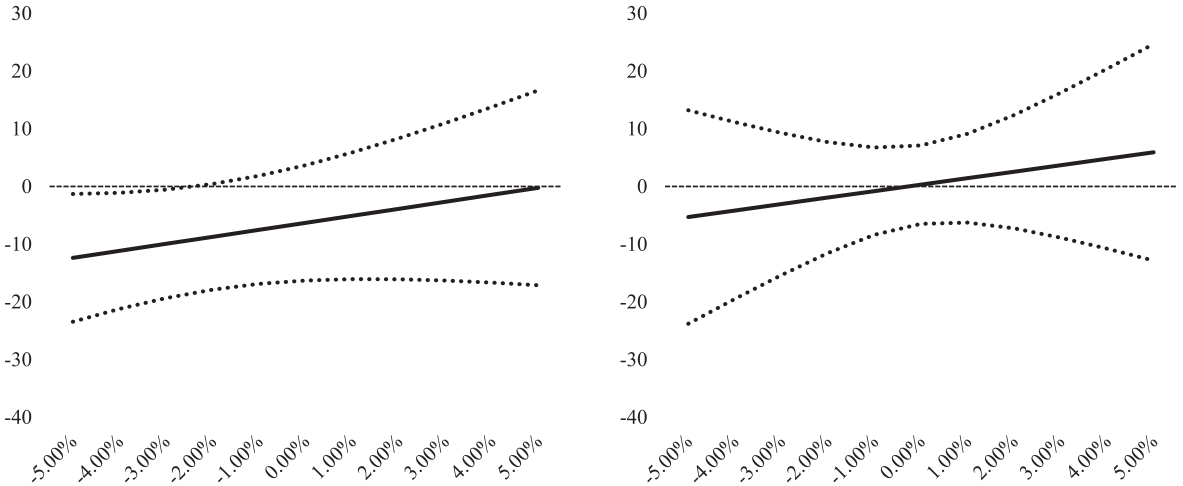

Fig. 2. Marginal effects of positive (left) and negative (right) US monetary surprises for peg regimes to the US dollar over the 5th to 95th percentiles of the primary fiscal balance. Notes: Marginal effects and 95% confidence intervals of positive US monetary surprises (left) and negative US monetary surprises (right) for peg regimes to the US dollar over the 5th to 95th percentiles of the primary fiscal balance obtained by estimating the panel regression model outlined in Eq. (7).

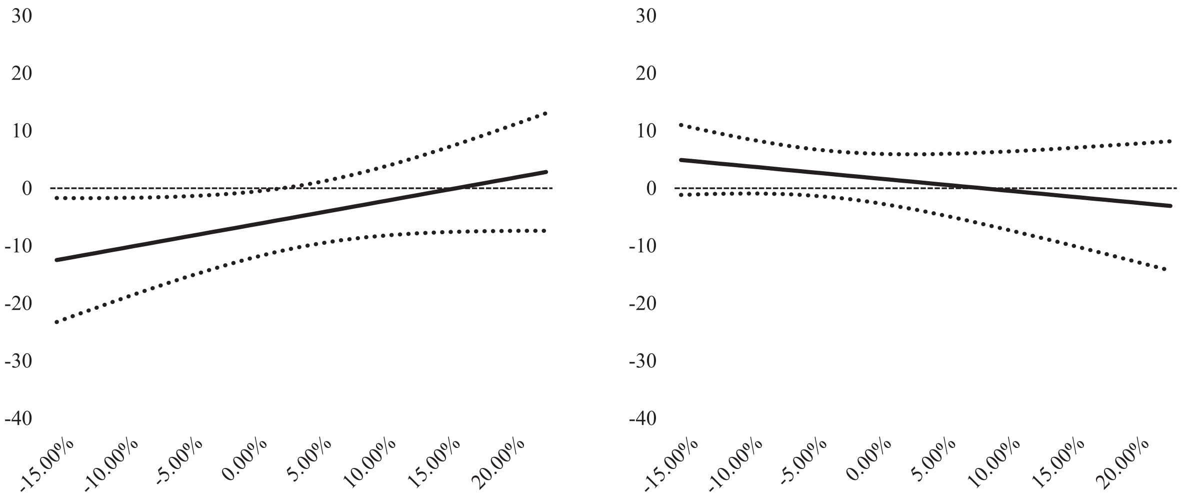

Fig. 3. Marginal effects of positive (left) and negative (right) US monetary surprises for peg regimes to the US dollar over the 5th to 95th percentiles of the return of the domestic banking index since the previous FOMC meeting. Notes: Marginal effects and 95% confidence intervals of positive US monetary surprises (left) and negative US monetary surprises (right) for peg regimes to the US dollar over the 5th to 95th percentiles of the return of the domestic banking index since the previous FOMC meeting obtained by estimating the panel regression model outlined in Eq. (7).

4.2. Robustness checks

In this section, I present a couple of tests that demonstrate the robustness of the results regarding the impact of US monetary policy on the stability of currency pegs. I start by using capital adequacy, defined as the ratio of capital to risk-weighted assets, as an alternative concept to proxy the soundness of the domestic banking system is. Fig. 4 illustrates the marginal effects of US monetary surprises of an alternative interaction model where I include the ratio of capital to risk-weighted assets instead of the return of the domestic banking index since the previous FOMC meeting.

The results regarding the impact of US monetary surprises on currency peg stability conditional on the soundness of the domestic banking system are robust to using this alternative measure. The impact of positive US monetary surprises is stronger (i.e. more negative) for countries with a weaker current state of their domestic banking system (characterized by lower capital adequacy ratios). Effects are insignificant for countries with a well-capitalized banking system (with a ratio of capital to risk-weighted assets equal above 17%).

As an additional robustness check, I include binary variables to distinguish between countries with high costs of raising the domestic policy rate (characterized by low relative GDP growth, a low primary fiscal balance and low returns of the

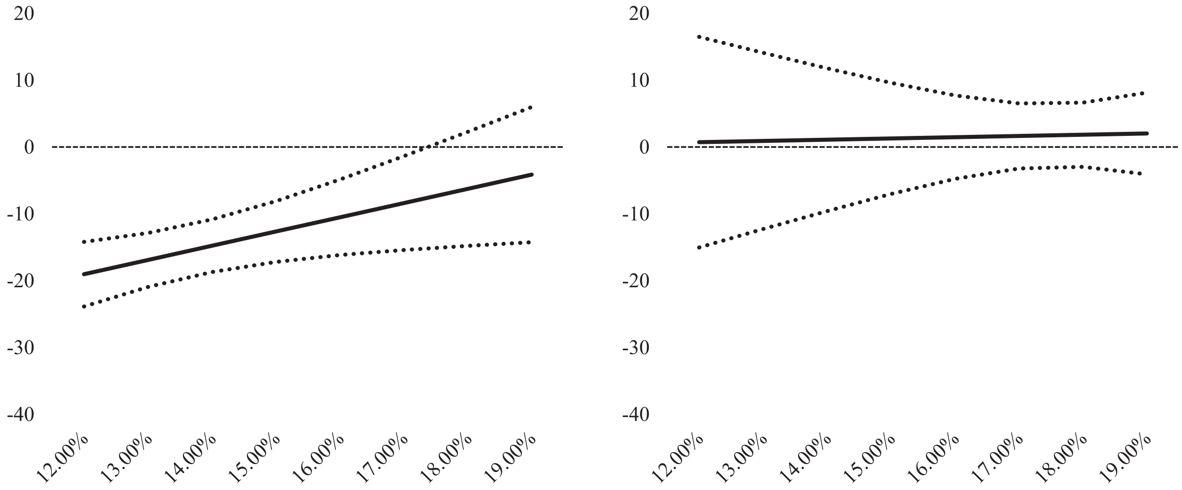

Fig. 4. Marginal effects of positive (left) and negative (right) US monetary surprises for peg regimes to the US dollar over the 5th to 95th percentiles of capital to risk-weighted assets in the domestic banking sector. Notes: Marginal effects and 95% confidence intervals of positive US monetary surprises (left) and negative US monetary surprises (right) for peg regimes to the US dollar over the 5th to 95th percentiles of capital to risk-weighted assets in the domestic banking sector obtained by estimating the panel regression model outlined in Eq. (7).

domestic banking index since the last FOMC meeting) instead of the continuous variables used so far. For each of the three cost dimensions, I construct a dummy variable equal to one if the respective variable is equal to or above the median. Table 9 summarizes the marginal effects for US monetary surprises and the additional control variables for currencies pegged to the US dollar for high vs. low costs of raising the domestic policy rate for the three dimensions of costs suggested by Lahiri and Végh (2007).

Table 9
Marginal effects of positive and negative US monetary surprises for peg regimes to the US dollar: High vs. low costs of raising the domestic policy rate following Lahiri and Végh (2007).

	(17)		(18)		(19)	
	Low rel. GDP growth	High rel. GDP growth	Low primary fiscal balance	High primary fiscal balance	Low return bank	High return bank
Positive monetary surprise	−8.212*	−190.324	−11.191***	−3.801	−10.928**	−4.062
	(4.488)	(166.307)	(3.019)	(5.888)	(4.485)	(3.628)
Negative monetary surprise	−0.764	33.485	−1.241	1.971	2.602	0.608
	(4.577)	(27.438)	(6.133)	(4.538)	(2.959)	(3.873)
Return US market	0.213*	−1.712	0.349**	0.163**	0.196**	0.163**
	(0.125)	(1.808)	(0.172)	(0.071)	(0.089)	(0.071)
Return local market	−0.149*	0.412	−0.228*	−0.256***	−0.234**	−0.156
	(0.088)	(0.636)	(0.118)	(0.080)	(0.112)	(0.099)
Δ VIX	−0.001*	−0.011	−0.001**	−0.002**	−0.002*	−0.001***
	(0.001)	(0.008)	(0.000)	(0.001)	(0.001)	(0.000)
Δ CAPM beta	−0.004	0.050	0.001	−0.000	0.005	−0.008
	(0.005)	(0.039)	(0.005)	(0.008)	(0.006)	(0.006)
Δ sovereign yield	−0.724	−9.143	−2.331***	0.211	0.013	−0.786**
	(1.368)	(8.209)	(0.430)	(0.354)	(0.362)	(0.401)
Δ interest rate MM	−0.030	0.039	−0.119*	0.018	0.065	−0.059
	(0.078)	(0.043)	(0.070)	(0.053)	(0.046)	(0.148)
Δ bid-ask ADR	0.011***	0.847**	−0.092***	0.032	0.014***	0.955***
	(0.004)	(0.329)	(0.029)	(0.160)	(0.002)	(0.295)
Δ bid-ask UND	0.038	40.150	0.008	0.027	0.028	−0.028
	(0.104)	(36.519)	(0.074)	(0.158)	(0.111)	(0.097)
Δ idiosyncratic risk	0.323	−1.088*	−1.812***	0.306	−0.579	0.390
	(0.863)	(0.624)	(0.445)	(0.921)	(0.685)	(0.960)
Observations	286	283	254	253	285	284
Number of countries	9	7	6	8	9	9

Notes: This table reports the marginal effects of a regression model similar to that outlined in Eq. (7), with the only difference that instead of the continuous macro variables used in the baseline specification I now use binary macro variables that are equal to one if the respective macro variable is above the sample median, zero otherwise. Robust standard errors clustered at the country level are reported in parentheses. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

The results from this interaction model using binary macro variables are in line with the results of the interaction model using continuous macro variables presented above. Positive US monetary surprises have a significant negative impact on abnormal returns of ADRs from countries with currencies pegged to the US dollar if investors perceive high costs of mimicking the US policy rate increases, i.e. if relative GDP growth, the primary fiscal balance and the return of the domestic banking index since the previous FOMC meeting are below the sample median. At the same time, there is no significant impact of positive US monetary surprises if investors perceive low costs of mimicking the US policy rate increases (if the three macro variables are above the median) and there is no significant impact of negative US monetary surprises.

Also for these binary interaction models, I ensure that the results are robust to accounting for differences in capital openness. Similar to the robustness checks presented in Section 3.2, I use the Chinn and Ito (2008) index of de jure capital account openness and the Lane and Milesi-Ferretti (2017) index of de facto capital account openness. In three different specifications, I drop observations with a score of zero in the Chinn-Ito (2008) index of de jure capital account openness[25] (Table A5 in the appendix), additionally control for the Chinn-Ito (2008) index (Table A6 in the appendix) and additionally control for the Lane and Milesi-Ferretti (2017) index (Table A7 in the appendix). In all three cases, the results remain robust.[26]

5. Conclusion

I study the impact of US monetary policy on managed exchange rates by analyzing the pricing of American Depositary Receipts around FOMC meetings. For a sample of 249 level II and level III ADRs from 31 countries over the period from 1996 to 2016 (covering 168 FOMC meetings), I identify a significant negative impact of US monetary surprises on abnormal ADR returns for countries with managed exchange rates. I interpret my findings as an indication of changes in the fundamental value of the currency of the country from where the ADR originates in the spirit of Kadiyala and Kadiyala (2004) and Eichler et al. (2009) due to the US monetary surprise.

I further test the predictions of standard currency crises models of interest rate defence with respect to the stability of currency pegs vis-à-vis the US dollar. In line with Lahiri and Végh (2007), I find that abnormal returns of ADRs from countries with currencies pegged to the US dollar respond significantly negatively to positive US monetary surprises if current real GDP growth is relatively low compared to past growth, the respective country runs a fiscal deficit and the domestic banking index has lost in value since the previous FOMC meeting. These results indicate that investors perceive a low willingness of the domestic policy maker to defend these currency pegs due to high costs associated with increasing the domestic policy rate. Investors therefore price a higher peg breakdown probability in ADRs, which is reflected in negative abnormal returns. Analyzing abnormal ADR returns around FOMC meetings therefore provides a valuable tool to policy makers eager to monitor investors' assessment of the fundamental value of currencies as well as currency peg stability, the costs of defending the peg and the risk of speculative attacks.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A

See Fig. A1, Tables A1–A7.

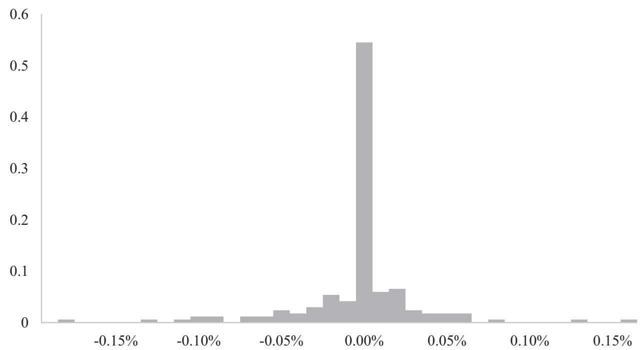

Fig. A1. Histogram of US monetary surprises by FOMC meeting.

Table A1
Countries in the sample by exchange rate regime classification.

Managed regimes with US dollar as anchor currency (31.51%)		Peg regimes with US dollar as anchor currency (19.85%)		Freely floating regimes (46.93%)		Freely falling (1.71%)	
Brazil	1999/10 – 2002/12	Argentina	1998/08 – 2001/11	Australia	1996/03 – 2016/12	Argentina	2001/12 – 2002/08
	2008/10 – 2016/12		2002/12 – 2015/10				2016/01 – 2016/12
Chile	2002/06 – 2016/12	Brazil	1998/08 – 1998/12	Brazil	2003/01 – 2008/09	Brazil	1999/02 – 1999/08
Colombia	2012/03 – 2016/12	China	2002/01 – 2016/12	Denmark	2003/06 – 2016/12	Indonesia	1997/08 – 1999/02
India	2009/03 – 2012/09	Hong Kong	1996/11 – 2016/12	EMU	1999/01 – 2016/12	Russia	2014/12 – 2016/01
Indonesia	1999/05 – 2007/06	India	1998/08 – 2009/01	France	1996/03 – 1998/12	Turkey	2001/03 – 2003/01
	2014/03 – 2016/12		2012/12 – 2016/12				
Israel	2002/05 – 2016/07	Indonesia	1997/02 – 1997/07	Germany	1997/12 – 1998/12		
			2007/08 – 2014/01				
Korea	2003/10 – 2016/12	Peru	2012/09 – 2016/11	Greece	1999/11 – 2000/12		
Mexico	1996/07 – 2016/12	Philippines	1999/12 – 2004/12	Ireland	1996/01 – 1998/12		
Peru	2004/05; 2005/09	Russia	2004/03 – 2008/06	Italy	1996/03 – 1998/12		
Philippines	1998/02 – 1999/10			Japan	1996/03 – 2016/12		
	2005/02 – 2016/12						
Russia	2009/01 – 2014/10			Netherlands	1996/03 – 1998/12		
	2016/03 – 2016/12						
South Africa	1998/05 – 1999/12			Norway	2001/06 – 2016/12		
Turkey	2008/09 – 2016/12			South Africa	2000/02 – 2016/12		
				Spain	1996/03 – 1998/12		
				Sweden	2006/09 – 2016/12		
				Switzerland	2001/05 – 2016/12		
				Turkey	2000/08 – 2001/01		
					2003/05 – 2008/08		
				United Kingdom	1996/03 – 2016/12		

Please note: I code Denmark, Ireland (from 1996/01 to 1998/12), Italy (from 1996/03 to 1998/12), Sweden (from 2006/09 to 2008/08) and Switzerland (from 2011/09 to 2015/01) which are coded as "1" or "2" in the Ilzetzki et al. (2019) classification with the Deutsche mark/euro as their anchor currency as "freely floating regimes" for my analysis. Similarly, I code Norway, Sweden (from 2008/09 to 2016/12), Switzerland (from 2001/05 to 2011/08 and 2015/02 –2016/12), Turkey (from 2000/08 to 2001/01) and the United Kingdom (from 1996/03 to 2008/12) which are coded as "3" in the Ilzetzki et al. (2019) classification with the Deutsche mark/euro as their anchor currency as "freely floating regimes" for my analysis.

Table A2
Description of variables and their sources

Variable	Variable description	Frequency	Source
$\boldsymbol{AR^{ADR}}$(%)	Mean of daily abnormal returns of all ADRs from the respective country for the respective FOMC meeting, calculated as described in Eq. (3).	By meeting.	Thomson Reuters Tick History, own calculation.
Monetary surprise (%)	US monetary surprise of the respective FOMC meeting calculated following the method by Kuttner (2001), derived from FED Funds Futures.	By meeting.	DATASTREAM, own calculation.
Managed regime (dummy)	Dummy equal to one if the Ilzetzki et al. (2019) monthly coarse exchange rate classification is equal to 3 and the Ilzetzki et al. (2019) anchor currency is the US dollar, zero otherwise.	Monthly.	Ilzetzki et al. (2019)
Peg regime (dummy)	Dummy equal to one if the Ilzetzki et al. (2019) monthly coarse exchange rate classification is equal to 1 or 2 and the Ilzetzki et al. (2019) anchor currency is the US dollar, zero otherwise.	Monthly.	Ilzetzki et al. (2019)
Freely falling regime (dummy)	Dummy equal to one if the Ilzetzki et al. (2019) monthly coarse exchange rate classification is equal to 6, zero otherwise.	Monthly.	Ilzetzki et al. (2019)
Return US market (%)	Log daily return of the S&P 500.	By meeting.	Thomson Reuters Tick History
Return local market (%)	Log daily US dollar return of the local stock market of the respective country.	By meeting.	Thomson Reuters Tick History
Δ VIX	Daily change in the VIX index.	By meeting.	Thomson Reuters Tick History
Δ CAPM beta	Daily change in the CAPM beta of the US dollar returns of the local stock index of the respective country with respect to the US market, calculated using a rolling regressions framework of 30 trading days.	By meeting.	Thomson Reuters Tick History, own calculation.
Δ sovereign yield (%)	Daily change in the sovereign yield of the respective country.	By meeting.	DATASTREAM
Δ interest rate MM (%)	Daily change in the money market interest rate of the respective country.	By meeting.	DATASTREAM
Δ bid-ask ADR (%)	Mean of daily changes in the bid-ask spread of all ADRs from the respective country for the respective FOMC meeting.	By meeting.	Thomson Reuters Tick History
Δ bid-ask UND (%)	Mean of daily changes in the bid-ask spread of all underlying stocks from the respective country for the respective FOMC meeting.	By meeting.	Thomson Reuters Tick History

Table A2 (*continued*)

Variable	Variable description	Frequency	Source
Δ idiosyncratic risk (%)	Mean of daily changes in idiosyncratic risk of all ADRs from the respective country for the respective FOMC meeting. ADR-specific idiosyncratic risk is calculated following Gagnon and Karolyi (2010) as the standard deviation of the residuals from regressing the difference between US dollar returns of the ADR and its underlying stock on contemporaneous and one day lagged and leading values of the US stock market, the respective domestic stock market and the change in the EUR/USD exchange rate using a rolling window of 30 trading days, see Eq. (1) in Gagnon and Karolyi (2010).	By meeting.	Thomson Reuters Tick History, own calculation.
Synchronous trading (dummy)	Dummy equal to one if stock market of the respective country operates in regular mode at 3 p.m. UTC, zero otherwise.	Time-invariant.	Own calculation.
ka open	Chinn-Ito (2006) index of de jure capital account openness.	Annually.	Chinn and Ito (2006)
LMF open	Lane and Milesi-Ferretti (2017) index of de facto capital account openness.	Annually.	Lane and Milesi-Ferretti (2017)
Log real GDP per capita	Log GDP per capita in constant US dollars of the respective country.	Annually.	WDI (indicator code "NY. GDP.PCAP.KD"), own calculation.
Bid-ask exchange rate	Bid-ask-spread of the exchange rate of the currency underlying the ADR vis-à-vis the US dollar.	By meeting.	Thomson Reuters Tick History
Δ Eurodollar	First difference in the one-month Eurodollar deposit rate (following Gürkaynak et al., 2007).	By meeting.	DATASTREAM
pos MS	US monetary surprise of the respective FOMC meeting calculated following the method by Kuttner (2001), derived from FED Funds Futures if the respective US monetary surprise is positive, zero otherwise.	By meeting.	DATASTREAM, own calculation.
neg MS	US monetary surprise of the respective FOMC meeting calculated following the method by Kuttner (2001), derived from FED Funds Futures if the respective US monetary surprise is negative, zero otherwise.	By meeting.	DATASTREAM, own calculation.
rel. GDP growth	The respective country's current real GDP growth minus the country's average real GDP growth over the past ten years.	Annually.	WDI (indicator code "NY. GDP.MKTP.KD.ZG"), own calculation.
Fiscal balance (% of GDP)	Government net lending relative to GDP.	Annually.	WEO (indicator code "GGXCNL_NGDP").
Return bank (%)	Return of the domestic banking index of the respective country since the previous FOMC meeting.	By meeting.	DATASTREAM, own calculation.
Capital to risk-weighted assets	Ratio of capital to risk-weighted assets of the banking sector of the respective country.	Annually.	IMF Financial Soundness Indicators.

Table A3
Descriptive statistics over all countries and FOMC meetings.

Variable	Mean	Standard deviation	5%	95%
AR^{ADR}	−0.08%	1.03%	−1.83%	1.51%
Monetary surprise	−0.00pp	0.03pp	−0.05pp	0.04pp
Managed regime	0.32	0.46	0	1
Peg regime	0.20	0.40	0	1
Freely falling regime	0.02	0.13	0	0
Return US market	0.04%	1.32%	−2.31%	2.11%
Return local market	0.15%	1.82%	−2.69%	2.80%
Δ VIX	−0.35	2.00	−3.16	3.05
Δ CAPM beta	−0.01	0.12	−0.17	0.13
Δ sovereign yield	−0.01pp	0.13pp	−0.13pp	0.11pp
Δ interest rate MM	−0.02pp	0.81pp	−0.22pp	0.17pp
Δ bid−ask ADR	0.43pp	20.28pp	−0.47pp	0.51pp
Δ bid−ask UND	−0.01pp	0.79pp	−0.58pp	0.61pp
Δ idiosyncratic risk	0.00pp	0.11pp	−0.12pp	0.14pp
Synchronous trading	0.59	0.49	0	1
ka open	0.69	0.33	0.17	1
LMF open	154.19%	592.27%	17.14%	586.79%
log real GDP per capita	9.67	1.19	7.41	11.24
bid−ask exchange rate	0.11%	0.21%	0.01%	0.37%
Δ Eurodollar	−0.00pp	0.07pp	−0.06pp	0.05pp

Table A4
Descriptive statistics for regimes pegged to the US dollar

Variable	Mean	Standard deviation	5%	95%
pos MS	0.01pp	0.02pp	0.00pp	0.05pp
neg MS	−0.01pp	0.03pp	−0.06pp	0.00pp
rel. GDP growth	0.13%	3.96%	−7.57%	7.54%
Fiscal balance	−1.86%	3.96%	−9.06%	4.14%
Return bank since previous FOMC meeting	1.26%	11.99%	−16.49%	21.69%
Capital to RWA	15.65%	2.21%	12.32%	19.16%

Table A5
Robustness check excluding observations with a Chin-Ito (2008) index score of zero: Marginal effects of positive US monetary surprises and control variables for peg regimes to the US dollar: High vs. low costs of raising the domestic policy rate following Lahiri and Végh (2007).

	Low growth	High growth	Fiscal deficit	Fiscal surplus	Neg. return bank	Pos. return bank
pos MS	−11.493***	−2.939	−8.918**	−2.003	−10.666***	−2.784
	(3.125)	(3.847)	(4.449)	(5.545)	(3.714)	(4.612)
neg MS	2.177	4.351*	1.844	1.907	8.027***	0.479
	(3.523)	(2.525)	(2.517)	(3.831)	(2.222)	(2.728)
return US market	0.315**	0.206***	0.196*	0.494***	0.283***	0.258**
	(0.125)	(0.075)	(0.115)	(0.140)	(0.086)	(0.116)
return local market	−0.256***	−0.212**	−0.197***	−0.331***	−0.232**	−0.209***
	(0.067)	(0.089)	(0.063)	(0.127)	(0.114)	(0.031)
Δ VIX	−0.002**	−0.002***	−0.002***	−0.000	−0.001**	−0.002***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Δ CAPM beta	−0.001	0.012**	0.004	0.006	0.010**	−0.002
	(0.004)	(0.006)	(0.003)	(0.005)	(0.005)	(0.005)
Δ sovereign yield	0.670	0.152	1.245	0.026	0.145	0.696
	(1.411)	(0.162)	(1.020)	(0.119)	(0.136)	(0.939)
Δ interest rate MM	−0.031	0.027	−0.048	0.436***	−0.019	0.160
	(0.055)	(0.052)	(0.040)	(0.074)	(0.020)	(0.160)
Δ bid-ask ADR	0.016***	0.683***	0.017***	0.032	0.016***	0.897***
	(0.002)	(0.227)	(0.002)	(0.105)	(0.003)	(0.267)
Δ bid-ask UND	−0.064	0.035	−0.115	0.288***	−0.087	0.068
	(0.076)	(0.099)	(0.073)	(0.100)	(0.101)	(0.103)
Δ idiosyncratic risk	0.170	−0.370	−0.088	0.409	−0.256	−0.089
	(0.545)	(1.075)	(0.673)	(0.661)	(0.603)	(1.025)
Observations	2,840		2,827		2,840	
Number of countries	31		31		31	
R^2	0.20		0.20		0.21	
Country FEs	YES		YES		YES	
Year FEs	YES		YES		YES	
SE clustered by	Country		Country		Country	

Notes: This table reports the marginal effects of a regression model similar to that outlined in Eq. (7), with the only difference that instead of the continuous macro variables used in the baseline specification I now use binary macro variables that are equal to one if the respective macro variable is >0, zero otherwise. As a robustness check, all observations with a Chinn-Ito (2006) index score of zero are excluded. Robust standard errors clustered at the country level are reported in parentheses. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

Table A6
Robustness check additionally controlling for the Chinn-Ito (2006) index: Marginal effects of positive US monetary surprises and control variables for peg regimes to the US dollar: High vs. low costs of raising the domestic policy rate following Lahiri and Végh (2007).

	Low growth	High growth	Fiscal deficit	Fiscal surplus	Neg. return bank	Pos. return bank
pos MS	−11.017***	−3.398	−8.576**	−3.910*	−8.665***	−3.682
	(3.125)	(3.513)	(4.167)	(2.219)	(3.170)	(3.607)
neg MS	3.423	7.289**	3.443	2.449	9.229***	1.884
	(2.988)	(2.868)	(2.233)	(4.423)	(3.114)	(2.137)
Return US market	0.312***	0.141	0.140	0.509***	0.268***	0.251**
	(0.115)	(0.091)	(0.099)	(0.117)	(0.092)	(0.111)
Return local market	−0.217***	−0.181*	−0.145**	−0.340**	−0.202*	−0.177***
	(0.066)	(0.099)	(0.066)	(0.136)	(0.114)	(0.061)
Δ VIX	−0.001*	−0.002***	−0.002***	−0.000	−0.001*	−0.002***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Δ CAPM beta	−0.003	0.007	−0.003	0.004	0.005	−0.006
	(0.007)	(0.005)	(0.004)	(0.007)	(0.007)	(0.006)
Δ sovereign yield	−0.500	0.506	0.385	0.260	0.360	0.408
	(1.101)	(0.369)	(0.830)	(0.680)	(0.250)	(0.612)

Table A6 (*continued*)

	Low growth	High growth	Fiscal deficit	Fiscal surplus	Neg. return bank	Pos. return bank
Δ interest rate MM	0.004	0.113	−0.092	0.310***	−0.022	0.187
	(0.099)	(0.189)	(0.099)	(0.077)	(0.059)	(0.225)
Δ bid−ask ADR	0.027***	0.710***	0.025**	0.002	0.020*	0.901***
	(0.002)	(0.231)	(0.012)	(0.135)	(0.010)	(0.241)
Δ bid−ask UND	−0.015	−0.024	−0.073	0.259***	−0.048	0.045
	(0.078)	(0.115)	(0.086)	(0.078)	(0.085)	(0.087)
Δ idiosyncratic risk	0.887	−0.720	−0.311	0.365	−0.643	0.230
	(0.628)	(1.170)	(0.857)	(0.563)	(0.853)	(0.900)
Observations	2,866		2,853		2,866	
Number of countries	31		31		31	
R^2	0.21		0.20		0.21	
Country FEs	YES		YES		YES	
Year FEs	YES		YES		YES	
SE clustered by	Country		Country		Country	

Notes: This table reports the marginal effects of a regression model similar to that outlined in Eq. (7), with the only difference that instead of the continuous macro variables used in the baseline specification I now use binary macro variables that are equal to one if the respective macro variable is >0, zero otherwise. As a robustness check, I additionally control for the Chinn-Ito (2006) index by including this variable unconditionally, but also interacted with $posMS_t$, $negMS_t$ as well as the other control variables. Robust standard errors clustered at the country level are reported in parentheses. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

Table A7
Robustness check additionally controlling for the Lane and Milesi-Ferretti (2017) index: Marginal effects of positive US monetary surprises and control variables for peg regimes to the US dollar: High vs. low costs of raising the domestic policy rate following Lahiri and Végh (2007).

	Low growth	High growth	Fiscal deficit	Fiscal surplus	Neg. return bank	Pos. return bank
pos MS	−10.872***	−3.650	−9.280**	1.274	−10.483***	0.674
	(4.128)	(3.663)	(4.495)	(2.997)	(3.727)	(3.387)
neg MS	2.101	3.505	2.836	4.474	8.021***	0.865
	(3.615)	(2.768)	(2.328)	(7.052)	(3.039)	(2.581)
return US market	0.290**	0.176**	0.102	0.362***	0.277***	0.231**
	(0.113)	(0.080)	(0.116)	(0.139)	(0.070)	(0.116)
return local market	−0.169**	−0.214**	−0.063	−0.239	−0.195*	−0.120
	(0.066)	(0.086)	(0.078)	(0.191)	(0.103)	(0.078)
Δ VIX	−0.001***	−0.002**	−0.002***	−0.001	−0.001	−0.002***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)
Δ CAPM beta	−0.000	0.013**	0.004	0.006	0.008	0.001
	(0.004)	(0.006)	(0.003)	(0.009)	(0.005)	(0.004)
Δ sovereign yield	−0.826	0.112	0.018	−0.065	−0.085	−0.136
	(1.138)	(0.165)	(0.864)	(0.154)	(0.143)	(0.748)
Δ interest rate MM	−0.018	0.252***	0.135	0.374***	0.023	0.076
	(0.083)	(0.082)	(0.121)	(0.100)	(0.045)	(0.183)
Δ bid-ask ADR	0.023***	0.698***	0.033***	0.590***	0.024***	0.972***
	(0.007)	(0.243)	(0.002)	(0.174)	(0.005)	(0.211)
Δ bid-ask UND	−0.002	0.040	−0.078	0.295***	−0.110	0.060
	(0.107)	(0.143)	(0.113)	(0.113)	(0.100)	(0.084)
Δ idiosyncratic risk	−0.010	−0.396	−0.661	0.053	−0.405	0.044
	(0.572)	(1.128)	(0.714)	(1.557)	(0.592)	(1.002)
Observations	2,695		2,682		2,695	
Number of countries	31		31		31	
R^2	0.21		0.21		0.22	
Country FEs	YES		YES		YES	
Year FEs	YES		YES		YES	
SE clustered by	Country		Country		Country	

Notes: This table reports the marginal effects of a regression model similar to that outlined in Eq. (7), with the only difference that instead of the continuous macro variables used in the baseline specification I now use binary macro variables that are equal to one if the respective macro variable is >0, zero otherwise. As a robustness check, I additionally control for the Lane and Milesi-Ferretti (2017) index by including this variable unconditionally, but also interacted with $posMS_t$, $negMS_t$ as well as the other control variables. Robust standard errors clustered at the country level are reported in parentheses. *, **, and *** indicate the 10%, 5%, and 1% levels of significance, respectively.

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