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Faculty of Economics and Business Administration


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Joscha Beckmann
Robert L. Czudaj

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Chemnitz University of Technology
Faculty of Economics and Business Administration
Thüringer Weg 7
09107 Chemnitz, Germany

Phone +49 (0)371 531 26000
Fax +49 (0371) 531 26019
https://www.tu-chemnitz.de/wirtschaft/index.php.en
wirtschaft@tu-chemnitz.de

# Fundamental determinants of exchange rate expectations*

Joscha Beckmann[†] Robert L. Czudaj[‡]

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**Abstract**

This paper provides a new perspective on the exchange rate disconnect puzzle by referring to the expectations building mechanism in foreign exchange markets. We analyze the role of expectations regarding macroeconomic fundamentals for expected exchange rate changes. In doing so, we assess real-time survey data for 29 economies from 2002 to 2020 and consider expectations regarding GDP growth, inflation, interest rates, and current accounts. Our empirical findings show that fundamentals expectations are more important over the long run compared to the short run. We find that an expected increase in GDP growth relative to the US leads to an expected appreciation of the domestic currency while higher relative inflation expectations lead to an expected depreciation, a finding consistent with purchasing power parity. Our results also indicate that the expectation building process differs systematically across pessimistic and optimistic forecasts with the former paying more attention to expected fundamentals. Finally, we also observe that incorporating expected fundamentals tends to reduce forecast errors over the long run.

*Keywords*: Exchange rates, Expectations, Forecast errors, Fundamentals, Survey data
*JEL*: F31, F37, G17

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[†]FernUniversität in Hagen, Faculty of Business Administration and Economics, Chair for Macroeconomics, Universitätsstr. 11, D-58097 Hagen, Germany, University of Greifswald, Faculty of Economics, Friedrich-Loeffler-Str. 70, D-17489 Greifswald, Germany, e-mail: joscha.beckmann@uni-greifswald.de and Kiel Institute for the World Economy, Hindenburgufer 66, D-24105 Kiel, Germany.

[‡]Ludwig-Maximilians-University of Munich, Faculty of Mathematics, Computer Science and Statistics, Chair for Statistics and Econometrics, Akademiestr. 1/I, D-80799 Munich, Germany and Chemnitz University of Technology, Faculty of Economics and Business, Chair for Empirical Economics, Thüringer Weg 7, Chemnitz D-09126, Germany, e-mail: robert-lukas.czudaj@wirtschaft.tu-chemnitz.de, phone: (0049)-371-531-31323, fax: (0049)-371-531-831323.

# 1 Introduction

Understanding and forecasting exchange rates remains one of the central areas of research in international economics. An enormous amount of research has focused on the exchange rate disconnect puzzle, i.e., the loose link between exchange rates and fundamentals. The latter is often found to be weak and time-varying, resulting in substantial model uncertainty (Kouwenberg *et al.*, 2017). One potential piece of the jigsaw corresponds to the expectation building mechanism on currency markets, which is a cornerstone of several theoretical models that emphasize the role of the exchange rate as an asset price.

One strand of the literature has focused on the performance of professional exchange rate forecasts as a proxy for expectations. Early work by Blake *et al.* (1986), Dominguez (1986) and Chinn and Frankel (1994) shows that surveys are unable to provide adequate point forecasts at an aggregated level. At the micro level, there is plenty of evidence that expectations are heterogeneous across market participants (Frankel and Froot, 1986). There is also a consensus that some professionals pay attention to macroeconomic fundamentals. Recent work by Dick *et al.* (2015) suggests that a proper understanding of fundamentals improves exchange rate forecasts. The scapegoat approach introduced by Bacchetta and Van Wincoop (2004) also derives aggregated effects from heterogeneous expectations at the micro level. It is based on the assumption that investors are not completely informed but tend to blame a certain macro indicator for exchange rate changes. In the same spirit, imperfect knowledge models emphasize that market participants have limited knowledge of fundamental determinants in financial markets (Frydman and Goldberg, 2007; Frydman and Stillwagon, 2018). Further evidence based on survey data has confirmed that forecasters frequently switch between different models (Goldbaum and Zwinkels, 2014), a pattern which is in line with the observation that the relationship between exchange rates and macroeconomic fundamentals is strongly time-varying (Sarno and Valente, 2009; Beckmann *et al.*, 2011). The question whether exchange rate forecasters explicitly account for expectations regarding fundamentals has not been answered yet.

This paper contributes to the literature by assessing the key question of whether expected macroeconomic fundamentals are useful for explaining the formulation and implications of professional exchange rate forecasts. Despite the fact that many theoretical models correspond to the link between expected exchange rates and expected fundamentals (Bacchetta and Van Wincoop, 2004; Engel *et al.*, 2007), most empirical studies focus on the link between observed exchange rates and observed fundamentals (Sarno, 2005), implicitly assuming that exchange rate expectations provide adequate estimates of future realized exchange rates. However, evaluating the expectation linkage between exchange rates and fundamentals is an essential step towards understanding the transmission channels between changes in fundamentals such as the stance of monetary policy and exchange rate fluctuations. A direct advantage of using expectations is that there is no need to ensure that information on macroeconomic fundamentals has actually been available in real time at the time of the survey. Our analysis is based on a setting where expectations regarding exchange rates and fundamentals are surveyed at the same point in time.

Our empirical analysis relies on a novel data set provided by FX4casts, which includes exchange rate expectations over different horizons as well as forecasts related to GDP growth, inflation, interest rates, and the current account. Our monthly data set runs from 2002 to 2020 and includes 29 countries/currencies and enables us to provide the first study that compares drivers of exchange rate expectations for industrial and emerging economies. While previous research by Beckmann and Czudaj (2017) has focused on drivers of exchange rate expectations after the global financial crisis at a country level, relying on observed fundamentals, we are interested in common patterns in the cross-section by focusing on expectations regarding macro fundamentals instead of actual observations. The first question we address is whether expected exchange rate changes are driven by expected fundamentals, focusing on a panel perspective. This includes the question of whether such effects differ between optimistic and pessimistic forecasts with regard to the domestic currency against the US dollar. In addition, we evaluate whether the importance of expected fundamentals differs over time.[1] Finally, we also address potential effects of expected fundamentals on expected excess returns and forecast errors.

The main findings of the present study are as follows. First, we find that expectations regarding macro fundamentals are able to explain expected exchange rate changes to some extent. The corresponding effects are much stronger over a 12-month horizon compared to 3 months. We show that an expected increase in GDP growth relative to the US leads to an expected appreciation of the domestic currency while higher relative inflation expectations result in an expected depreciation, a finding consistent with purchasing power parity. We also find that more pessimistic forecasts with regard to the domestic currency pay more attention to interest rate expectations compared to optimistic forecasts. Finally, we find that incorporating expected fundamentals tends to reduce forecast errors over the long run.

The remainder of this paper is organized as follows. The next section provides a brief review of the existing literature and summarizes conventional fundamental exchange rate models. Section 3 introduces our data set and in Section 4 we report and discuss our empirical findings. In doing so, we focus on expected exchange rate changes, optimistic

[1]There is also some evidence that points to time-variation in expectations. At the micro level, studies dealing with decision making among forecasters suggest that professionals rely on different models at different points in time with fundamentals deemed more important in times of uncertainty (Jongen *et al.*, 2012).

and pessimistic forecasts, expected excess returns, and forecast errors. Extensions reported in Section 5 also show that our results align with the existing literature and display evidence for the changing effects of expected fundamentals, a finding in line with the scapegoat approach mentioned above. The corresponding findings also demonstrate the robustness of our results. Section 6 concludes.

# 2 Theoretical Framework and Literature Review

## 2.1 Literature Review

The literature on exchange rate expectations can be broadly subdivided into studies evaluating the adequacy of professional forecasts and studies explaining the formation of expectations on an aggregated or a disaggregated level.

Going back to the seminal work of Frankel and Froot (1986, 1987), the most common theoretical framework to explain exchange rate expectations at a disaggregated level is built on the idea that two kinds of market participants should be distinguished: fundamentalists, who rely on a fundamental model when building expectations, and chartists, who extrapolate past exchange rate behavior for forecasting. A simple benchmark model for exchange rate expectations is, for instance, provided by Goldbaum and Zwinkels (2014) and incorporates both groups of market participants. Various studies have adopted such models for analyzing different characteristics of expectation building among exchange rate forecasters (de Jong *et al.*, 2010; ter Ellen *et al.*, 2013). One group potentially dominates the resulting exchange rate dynamics at the aggregated level, with fundamentalists, for example, driving exchange rate dynamics in times of uncertainty.

Comprehensive surveys on related studies and theoretical explanations for the weak statistical performance of professional forecasts are provided by Lewis (1989), Engel

(1996), MacDonald (2000), and Jongen *et al.* (2008), among others. Beckmann and Czudaj (2017) illustrate a potential contradiction between statistical and economic measures by evaluating a large number of currencies and focusing on the period after the global financial crises. Their results suggest that survey forecasts can still contain useful information in the case of high mean squared forecast errors. The weak statistical performance is in line with the generally weak predictability of exchange rates, with model uncertainty being one of the main reasons for the inability to beat simple benchmarks (Rossi, 2013; Kouwenberg *et al.*, 2017).

When analyzing expectation building mechanisms, recent research has emphasized the importance of information rigidity as an explanation for forecast errors (Coibion and Gorodnichenko, 2015). Even if participants use all available information, they can be unable to provide adequate forecasts due to imperfect information. The existence of such rigidities has been established by Coibion and Gorodnichenko (2012, 2015) for various macroeconomic variables other than exchange rates. In the context of exchange rates, expectation errors are well established and do not contradict rationality given the unpredictability of financial markets (Bacchetta and van Wincoop, 2006). Against this background, it seems important to analyze the drivers of both expectations and expectation errors. Therefore, we study the potential effects of expected fundamentals on expected and unexpected excess returns. In addition, the pattern that professionals frequently switch between different forecasting techniques also suggests the need to assess potential time variation in expectation building (Jongen *et al.*, 2012).[2]

[2]Changing forecasting strategies can also be derived from imperfect knowledge models (Frydman and Goldberg, 2007), learning models, or approaches that emphasize the importance of heterogeneous agents (de Grauwe and Grimaldi, 2006).

## 2.2 Theoretical Exchange Rate Models

To motivate the selection of macroeconomic fundamentals potentially affecting exchange rate behavior, the following section briefly recapitulates conventional models for explaining the nominal exchange rate. As a result, our empirical framework includes expectations regarding fundamentals such as short-term interest rates, GDP growth, inflation, and the current account relative to GDP. Out of the following models that we present, we propose at least one of them as a driver of exchange rate changes. Expectations regarding the corresponding fundamentals should also affect exchange rate expectations if market participants believe in such models. The next subsection begins with a general representation of the exchange rate before we turn to models that consider specific macroeconomic fundamentals.

### 2.2.1 Present Value Approach and General Representation

Taking into account the character of the exchange rate as a forward-looking asset price leads to the general proposition that the exchange rate represents a discounted value of expectations regarding future fundamentals (Engel and West, 2004, 2005). The current exchange rate can then be expressed as follows:

$$s_t = (1-b)\sum_{j=0}^{\infty} b^j E_t(f_{1,t+j} + u_{1,t+j}) + b\sum_{j=0}^{\infty} b^j E_t(f_{2,t+j} + u_{2,t+j}), \quad (1)$$

where $b$ is a discount factor with $0 < b < 1$ and $E_t(.)$ represents the expectation operator based on information available in $t$. This general representation shows that the exchange rate $s_t$, defined as the natural logarithm of the home currency price of the US dollar, is driven by expectations regarding systematic and unsystematic components. The systematic components $f_{1,t+j}$ and $f_{2,t+j}$ reflect the macroeconomic fundamentals that we include in our empirical investigation while the unsystematic components $u_{1,t+j}$ and $u_{2,t+j}$ denote factors unobservable to the econometrician (Engel and West, 2005).

To link these considerations to exchange rate expectations, we can also decompose the actual exchange rate change $s_{t+j} - s_t$ into an unexpected and an expected component:

$$s_{t+j} - s_t = [s_{t+j} - E_t(s_{t+j})] + [E_t(s_{t+j}) - s_t]. \tag{2}$$

The first bracket term reflects the forecast error while the second one reflects the expected exchange rate change. Market participants who consider the exchange rate to be a forward-looking asset price will therefore take their expectations regarding $f_{1,t+j}$ and $f_{2,t+j}$ into account when forming their expectations $E_t(s_{t+j})$. However, forecasters who consider the exchange rate to be random walk will expect $E_t(s_{t+j}) = s_t$, making an analysis of exchange rate expectations redundant.

#### 2.2.2 Uncovered Interest Rate Parity and Excess Returns

According to the uncovered interest rate parity (UIP), the difference in interest rates between two countries should equal the expected change in the exchange rate between the countries' currencies (Engel, 2016):

$$E_t(\Delta s_{t+h}) = ir_t - ir_t^*, \tag{3}$$

where $\Delta s_{t+h} \equiv s_{t+h} - s_t$. $E_t(\Delta s_{t+h})$ gives the expected change (at time $t$ for $t+h$) of the log exchange rate, again denominated as domestic currency per US dollar. $ir_t$ ($ir_t^*$) is the domestic (US) $h$-period nominal interest rate. The following forecasting equation arises under the assumption that $E_t(\Delta s_{t+h})$ equals $\Delta s_{t+h}$:

$$\Delta s_{t+h} = ir_t - ir_t^*. \tag{4}$$

This equation implies that a higher interest rate of the domestic economy compared to the US (i.e., $ir_t > ir_t^*$) should increase the exchange rate, which means that the domestic currency should depreciate relative to the US dollar. However, there is plenty of evidence that countries with higher interest rates also appreciate rather than depreciate (Sarno, 2005; Engel, 2016), a finding which is also referred to as the forward premium puzzle (since the interest rate differential is equal to the difference between the forward and the spot rate due to the covered interest rate parity).

This suggests that forecasters can believe either in an appreciation or a depreciation of the domestic currency in case of higher interest rates compared to the US. It is also important to keep in mind that the current interest rate differential should already be a determinant of expected exchange rate changes. However, we use expected interest rates to account for expectation effects regarding the stance of monetary policy, which is also necessary given that we focus on expectations over different horizons.

Unsurprisingly, early empirical tests rejected UIP based on linear regressions among the lines of Eq. (4), identifying excess returns and finding that countries with higher interest rates often appreciate instead of depreciate (Engel, 2016). Early explanations for this so-called forward premium puzzle include speculative bubbles and the peso problem. Excess returns are also often considered to stem from risk premia and are often assumed in early studies to be equal to the residual of the equation above (Froot and Thaler, 1990). However, the equivalence of excess returns and risk premia is based on the unrealistic assumption that rational expectations hold, i.e., $E_t(\Delta s_{t+h}) = \Delta s_{t+h}$. Blake *et al.* (1986), Dominguez (1986), Chinn and Frankel (1994) and Beckmann and Czudaj (2017) all reject this assumption based on survey data.

The analysis can therefore be further extended if we distinguish between expected and unexpected excess returns resulting from UIP regressions. The overall excess return is given by the residual, that is, the difference between the actual exchange rate change and the interest rate differential:

$$\text{Realized Excess Return}_t = \Delta s_{t+h} - (ir_t - ir_t^*) \quad (5)$$

while the expected excess return is obtained by using the expected exchange rate change instead of the actual change:

$$\text{Expected Excess Return}_t = E_t(\Delta s_{t+h}) - (ir_t - ir_t^*). \quad (6)$$

As a result, the unexpected excess return simply reflects the forecast error among professionals. Our empirical strategy will therefore also address the question of whether the impact of expected fundamentals differs between expected and unexpected excess returns (i.e., forecast errors). Therefore, our study also provides a new perspective in the sense that expected fundamentals might serve as compensation for risk.

#### 2.2.3 Purchasing Power Parity

According to the purchasing power parity (PPP), the price differential between two countries explains the fundamental nominal exchange rate:

$$f_t^{PPP} = p_t - p_t^*, \quad (7)$$

where $p_t$ ($p_t^*$) gives the domestic (US) price level. This implies that an increase (decrease) in the domestic (US) price level results in a depreciation of the domestic currency to ensure that the real exchange rate is constant and that real goods prices are equal across countries. Deviations of the current exchange rate from $f_t^{PPP}$ reflect a predictor for the nominal exchange rate change $\Delta s_{t+h}$ based on the idea that PPP deviations are corrected via nominal exchange rate adjustments. Thus, if PPP holds, we also expect that $\Delta s_{t+h} = f_t^{PPP} - s_t$. Against the background of the existing evidence and the higher fluctuations of nominal exchange rates, PPP should be more important for long-run expectations (Sarno, 2005).

### 2.2.4 Monetary Fundamentals

The simplest version of the monetary exchange rate approach postulates that the exchange rate between two countries is driven by the relative development of money supply and industrial production (Dornbusch, 1976; Bilson, 1978). Combining both equilibrium conditions with PPP and UIP leads to the finding that a relative increase in money supply depreciates the domestic currency, while a relative increase in industrial production appreciates the domestic currency. This is reflected in the following equation:

$$f_t^{MON} = (m_t - m_t^*) - (ip_t - ip_t^*), \tag{8}$$

where $m_t - m_t^*$ and $ip_t - ip_t^*$ refer to differentials regarding (log) money supply and (log) industrial production between the domestic and the US economy, respectively.[3] Exchange rate changes are then determined as $\Delta s_{t+h} = f_t^{MON} - s_t$.

Several extensions of this framework are discussed in the literature. Hooper and Morton (1982) suggest the inclusion of the current account as an useful determinant of the exchange rate and argue that real exchange rate changes (PPP deviations) are related to movements in the current account through changes in expectations about the long-run equilibrium real exchange rate and the risk premium. The idea is that an increase in the accumulated current account surplus appreciates the equilibrium real exchange rate, which also results in an expected appreciation of the nominal exchange rate.

[3] It should be noted that our empirical model does not include a measure of money supply due to the lack of expectation data regarding money supply. As a measure of expectations related to the stance of monetary policy we rely on interest rate expectations. Expectations regarding industrial production are proxied by GDP growth expectations.

#### 2.2.5 Taylor Rule Fundamentals

The Taylor rule states that a central bank adjusts the short-run nominal interest rate in order to respond to inflation ($\pi_t$) and the output gap ($ou_t$). The idea of this approach can be exploited to two central banks, which both follow a Taylor rule model and respond to inflation and the output gap. In such a case, the interest rate differential that drives the exchange rate can be explained by the inflation and output gap differentials between both countries:

$$\Delta s_{t+h} = w_\pi(\pi_t - \pi_t^*) + w_{ou}(ou_t - ou_t^*). \tag{9}$$

Established ad-hoc weights in the exchange rate literature based on previous empirical findings for inflation and output gap are, for example, $w_\pi = 1.5$ and $w_{ou} = 0.1$ (Della Corte *et al.*, 2009), respectively. It is worth mentioning that we do not harbor any expectations for the output gap and therefore use GDP growth expectations instead. The Taylor rule also provides another motivation for using interest rate and inflation expectations, which are directly linked to expectations about monetary policy. The following section provides details on our data and on our empirical approach.

# 3 Data and Preliminary Analysis

## 3.1 Data

Survey data on exchange rate expectations over three different horizons (3-, 6-, and 12-month) is obtained from FX4casts, formerly known as The Financial Times Currency Forecaster (see `http://www.fx4casts.com/`), on a monthly basis. The consensus is based on individual responses of 48 professionals, mostly banks,[4] and follows standard

[4] The contributors include: Allied Irish Bank, ANZ Bank, Bank of America/Merrill Lynch, Bank of New York Mellon, Barclays Capital, Bayerische Landesbank, BNP Paribas, Canadian Imperial Bank of Commerce, Credit-Agricola, Citigroup, Commerzbank, Credit Suisse - First Boston, Danske Bank, Deka Bank, Deutsche Bank, DnBNOR, The Economist - Intelligence Unit, Goldman Sachs, Handels-

procedures in the literature to aggregate exchange rate expectations (Jongen *et al.*, 2008). Spot rates $s_t$ and their expectations are measured in units of domestic currency per one unit of the US dollar (i.e., a decrease corresponds to an appreciation of the domestic currency) and are provided for 29 currencies according to the FX4casts classification. Expectations are proxied by the individual forecasts of 48 professionals, which are aggregated to a single composite forecast for each currency by taking the geometric mean across forecasters.[5,6]

Our overall empirical approach can be seen as a "Kitchen Sink" regression. In the following, we adopt expectations regarding all macroeconomic fundamentals based on theoretical models, for which data is available. This includes expectations regarding GDP growth, inflation, short-term interest rates, and the current account to GDP ratio. The exchange rate is also measured in units of domestic currency per one unit of the US dollar. Therefore, in line with the theoretical models, for macro fundamentals we rely on expectation differentials relative to the US economy. Our empirical model can therefore also be seen as an empirical test for the belief of professional forecasters in these models. We simultaneously include all variables in the model to also control for effects potentially stemming from other models.

For our empirical analysis we use three different kinds of endogenous variables to

banken, HSBC, IHS Global Insight, ING Bank, Intesa Sanpaolo, JP Morgan Chase, Julius Baer, Lloyds TSB, Macquarie Capital Securities, Moody's Economy.com, Morgan Stanley, National Australia Bank, Nomura, Nordea, Rabobank, Royal Bank of Canada, Royal Bank of Scotland, Scotiabank, SEB, Societe Generale, Standard Chartered, Suntrust, Swedbank, Bank of Tokyo-Mitsubishi UFJ, Toronto Dominion, UBS Warburg, UniCredit, Vontobel, Wachovia, and Westpac.

[5]See Tables A.1 and A.2 in the Appendix for a forecast evaluation of survey mean forecasts for each individual currency, which are provided in absolute terms (Table A.1) and also relative to the random walk benchmark (Table A.2). The results show that forecast errors unsurprisingly increase by increasing the forecast horizon (see Table A.1) but survey forecasts tend to outperform the random walk benchmark for higher compared to lower horizons (see Table A.2).

[6]Another widely used database for exchange rate expectations is published by Consensus Economics. However, their data also does not provide individual forecasts throughout the sample for all currencies and the monthly data coverage in terms of expected exchange rates and expected fundamentals is less comprehensive.

examine the research questions stated in the Introduction. First, we compute the expected percentage exchange rate change as the relative difference between the expected exchange rate defined as the mean forecast across forecasters and its current spot rate for horizon $h$ with $h = 3, 6, 12$:

$$\%\Delta \text{FX}_{i,t}^{h} = 100 \frac{E_t(s_{i,t+h}) - s_{i,t}}{s_{i,t}}, \tag{10}$$

where $i = 1, \ldots, 29$ stands for the corresponding currency as the cross-section unit and $s_{i,t}$ is the spot rate at the time $t$ the expectations are made. The entire data sample covers a time period running from 2002M01 to 2020M12 and 29 countries/currencies including Argentina, Australia, Brazil, Canada, Chile, China, Colombia, the Czech Republic, Denmark, the Euro Area, Hungary, India, Indonesia, Japan, Korea, Mexico, New Zealand, Norway, Philippines, Poland, Russia, Singapore, South Africa, Sweden, Switzerland, Taiwan, Thailand, Turkey, and the UK.[7] Therefore, our balanced panel includes 6612 observations ($n = 29$ and $T = 228$). Second, we also use the 2.5% and the 97.5% quantiles of the forecasts in the consensus as optimistic and pessimistic forecasts with regard to the domestic currency in order to study differences across the distribution of forecasts. In this case the two quantiles replace mean forecasts in Eq. (10). For this setting, the sample is reduced to a period between 2004M11 to 2020M12 ($T = 194$) and 29 countries resulting in $N = 5626$. Third, we compute expected excess returns:

$$\%\text{ER}_{i,t}^{h} = 100 \frac{E_t(s_{i,t+h}) - s_{i,t}}{s_{i,t}} - (ir_{i,t} - ir_{US,t}), \tag{11}$$

where $ir_{i,t} - ir_{US,t}$ stands for the realized interest rate differential of the domestic economy compared to the US at the time $t$ expectations are made. Finally, we compute relative forecast percentage errors as

$$\%\text{FE}_{i,t}^{h} = 100 \frac{s_{i,t+h} - E_t(s_{i,t+h})}{s_{i,t+h}}, \tag{12}$$

[7] We have excluded Venezuela from our analysis as it constitutes a clear outlier.

where $s_{i,t+h}$ in this case represents the actual end-of-month exchange rate that has been forecast by the professionals $h$-periods ago. In this case the sample size is adjusted for the forecast horizon $h$ and therefore $T$ is reduced by $h = 3, 6, 12$ months.

As explanatory variables, we rely on survey data also provided by FX4casts for expectations regarding short-term (i.e., 3-month) interest rates, which are again available over 3-, 6-, and 12-month horizons, GDP growth, inflation, and the current account relative to GDP. The forecasts on GDP growth, inflation, and the current account provided by FX4casts are fixed event forecasts; that is, expectations are provided for the current and the next year at each point in time. This implies that disagreement about the current year naturally decreases over time, meaning that the uncertainty about this year's GDP growth, inflation, or current account is, for example, much lower in November than in January. We therefore adopt the approach suggested by Patton and Timmermann (2011), which has also been applied by Dovern *et al.* (2012) to transform fixed event into fixed horizon forecasts via weighted averaging.[8] The intuitive idea is to use the weighted average of fixed event forecasts for the current and the next year with the weight of the former (latter) linearly decreasing (increasing) as time evolves based on the following formula:

$$\hat{g}_{t,t-12} = w\hat{g}_{1,0} + (1 - w)\hat{g}_{2,1}, \tag{13}$$

where $\hat{g}_{t,t-12}$ denotes the approximated fixed horizon forecast while $\hat{g}_{1,0}$ and $\hat{g}_{2,1}$ give the fixed event forecasts for the current and the next year and $w$ represents the ad-hoc weight $(24 - t)/12$ for $t = 12, 13, \ldots, 23$. This approach has been applied to compute fixed horizon forecasts for GDP growth, inflation, and the current account.

[8]See Knüppel and Vladu (2016) for an alternative way of transforming fixed event into fixed horizon forecasts by choosing a different weighting $w$.

## 3.2 Preliminary Analysis

Table 1 reports conventional descriptive statistics which are computed for each variable pooled across countries for the total panel and two sub-panels including only industrial and emerging economies, respectively.[9] Unsurprisingly, expected exchange rate changes and their variations according to the standard deviation (SD) increase with the forecast horizon $h$. In addition, expectations for emerging economies display much higher variation compared to industrial economies. When considering expected exchange rate changes, it is important to keep in mind that professionals often take the random walk behavior of exchange rates into account and only expect minor changes compared to the current spot rate over the short run. Therefore, 12-month expectations display higher variation for essentially all currencies.

*** Insert Table 1 about here ***

In a preliminary step, we have conducted several panel unit root tests to ensure that our data set includes stationary time series and our regression estimates are not spurious. As can be seen in Table 2, in nearly all cases the null of a unit root is rejected at least at the 5% level.[10] To ensure that these results are not driven by cross-sectional dependence often existent in macroeconomic data, we have also applied two tests, which account for cross-sectional dependence, suggested by Pesaran (2007) and Demetrescu *et al.* (2006) (see the last two columns in Table 2).

[9] Australia, Canada, Denmark, the Euro Area, Japan, New Zealand, Norway, Russia, Sweden, Switzerland, and the UK are classified as industrial economies in our panel. All remaining countries are classified as emerging economies.

[10] The stationarity of interest rate expectations is solely indicated by the Pesaran (2007) test.

*** Insert Table 2 about here ***

Table 3 also shows that our regressors (pooled across countries) do not exhibit a strong correlation and therefore do not cause any multicollinearity problems. Table 3 also provides first insights into the behavior of professionals by displaying correlation coefficients for the whole sample as well as for industrial and emerging countries separately. The findings indicate some differences between industrial and emerging countries. For example, interest rate and GDP growth expectations display low but positive correlations for industrial countries yet turn out to be negative for emerging economies. The latter demonstrates the contrary demand effect of higher interest rates while the former is in line with a Taylor rule reaction function of monetary policy with expectations of lower interest rates in case of a recession.

*** Insert Table 3 about here ***

# 4 Empirical Results

Our empirical analysis is based on estimating the following regression:

$$\%\Delta \mathrm{FX}^h_{i,t} = \alpha + \beta_1 \mathrm{IR}^h_{i,t} + \beta_2 \mathrm{GDP}_{i,t} + \beta_3 \mathrm{Inflation}_{i,t} + \beta_4 \mathrm{CA}_{i,t} + u_{i,t}, \qquad (14)$$

where $\%\Delta \mathrm{FX}^h_{i,t}$ represents the expected percentage exchange rate change at $t$ for horizon $t+h$ with $h = 3, 6, 12$ as defined in Eq. (10),[11] $\mathrm{IR}^h_{i,t}$ gives the expected 3-month interest

[11] As already mentioned, we also study the effect of fundamentals expectations on optimistic and pessimistic forecasts, expected excess returns, and forecast errors made by professionals. In doing so, the left-hand side variable in Eq. (14) is substituted by our measure of either optimistic and pessimistic forecasts, expected excess returns, or forecast errors already introduced in Section 3.1.

rate at $t$ for horizon $t+h$ with $h = 3, 6, 12$ relative to the US, $\text{GDP}_{i,t}$ stands for expected GDP growth relative to the US, $\text{Inflation}_{i,t}$ gives the expected inflation rate relative to the US and $\text{CA}_{i,t}$ represents the expected current account to GDP ratio relative to the US. The term 'relative to the US' refers to the relative difference of expectations between the domestic economy and the US in line with traditional exchange rate models presented in Section 2.2 and is computed as follows in case of GDP growth expectations

$$\text{GDP}_{i,t} = 100\frac{E_t(y_{i,t+h}) - E_t(y_{US,t+h})}{E_t(y_{US,t+h})}, \tag{15}$$

where $y_{i,t+h}$ ($y_{US,t+h}$) refers to GDP growth in economy $i$ (the US).[12] The other fundamental expectations have been constructed in the same way. Relative measures against the US have been used since our left-hand side variable refers to expected exchange rate changes of the domestic currency against the US dollar.[13] This set of expected fundamentals captures major dynamics of the fundamental exchange rate models introduced in Section 2.2 and therefore gives an indication whether forecasters believe in any of these models. Adopting the expected exchange rate as the left-hand side variable is a standard proceeding in the literature referring to the presented models. However, our estimation strategy also accounts for the potential of reversed causality, which stems from the fact that expectations regarding macroeconomic fundamentals and the exchange rate are possibly jointly determined (Engel and West, 2005).

First, we estimate Eq. (14) with pooled OLS, a fixed effects (FE) model including country fixed effects (i.e., $u_{i,t} = \mu_i + \varepsilon_{i,t}$), a FE model including country and time fixed effects (i.e., $u_{i,t} = \mu_i + \lambda_t + \varepsilon_{i,t}$) and a random effects (RE) model. Second, to account for potential cross-correlation among the different economies, we apply the common

[12]It is also worth mentioning that the forecasts, which we use as proxies for expectations, are made by the same forecasters for all countries and are therefore comparable enough to compute relative differences.

[13]As a robustness check we have also carried out estimations for the raw expectations as regressors instead of their relative counterparts. These mainly confirm our findings discussed in this section and are available upon request.

correlated effects mean group (CCEMG) estimator following Pesaran (2006). Third, to allow for the potential of simultaneous causality mentioned above, we have also used a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects, and a RE-IV model. In all three cases, we apply one-period lags of all regressors as instruments. These instruments are relevant since each regressor is affected by its own first lag and is also exogenous for our regression model since they are at most able to affect our left-hand side variable indirectly through the corresponding regressor.

## 4.1 Total Panel Results

The estimation results for 3- and 12-month forecast horizons are reported in Tables 4 and 5 together with various specification tests. Estimation results for the 6-month forecast horizon are generally very similar to the 12-month horizon case and are therefore omitted from the main body of the paper but are reported in the Appendix (see Table A.3).

We start our assessment with regression results for 3-month exchange rate forecasts. The (incremental) $R^2$ is relatively low for all specifications but the signs and magnitudes of most estimated coefficients are relatively robust across the different specifications.[14] For all regression models, we have conducted various specification tests. The $F$ test as well as the LM test proposed by Honda (1985) confirm the importance of both country and time fixed effects, at least for the models without instruments. Including fixed effects ensures that our estimation results are not driven by outliers or specific countries to a large extent. The Hausman test favors both fixed effects models compared

[14]The term 'incremental' means in this case that the $R^2$ measures only the explanatory power of the regressors for the variation of the left-hand side variable but not the explanatory power of the country and time fixed effects. For the FE models, we otherwise get a much higher $R^2$. However, because of comparability, we decided not to report these findings in the main tables.

to the random effects specification since the null is rejected at the 1% level. Therefore, both models including country and time fixed effects (FE and FE-IV) appear to be the most reasonable specifications and all other models can be seen as robustness checks. The fact that the Breusch-Godfrey-Wooldridge tests indicate serial correlation in the residuals is not surprising. To account for this issue, we use robust standard errors with respect to heteroskedasticity and serial correlation according to Arellano (1987).[15] The cross-sectional dependence test by Pesaran (2004) also rejects the null of cross-sectional independence. Therefore, we rely on the common correlated effects mean group (CCEMG) estimator following Pesaran (2006).

*** Insert Table 4 about here ***

Interest rate expectations are shown to be significantly positive at the 5% level for most specifications. According to this finding, professionals expect the domestic currency to depreciate against the US dollar when their interest rate expectations for the domestic economy exceed those for the US. This is plausible since investors expecting a lower interest rate in the US compared to the domestic economy would expand investment within the US. This in turn would result in an increased demand for the US dollar compared to the domestic currency and would therefore force the domestic currency to depreciate. This also reflects the underlying idea of the UIP condition. However, the magnitude of coefficients is rather small and already shows that professionals do not believe in UIP in the strict sense.

[15] In Section 5 we also mention additional findings based on the dynamic panel model GMM estimator proposed by Arellano and Bond (1991), which also includes the first lag of the left-hand side variable as an additional regressor to account for serial correlation. Overall, our findings are not sensitive to the inclusion of lagged expected exchange rate changes into our regression model.

The coefficient estimates for GDP growth are significantly negative at least at a 10% level in nearly all cases, which implies that professional forecasters expect an appreciation of the domestic currency when their GDP growth expectations are larger for the domestic economy than for the US. There are essentially two explanations for this finding. First, a stronger expected growth path reflects a belief in the strength of the domestic economy and stabilizes the domestic economy. The second explanation stems from the monetary exchange rate approach, which postulates that higher economic growth increases money demand and leads to a domestic appreciation due to the interest rate change necessary to restore money market equilibrium as outlined in Section 2.2.4.

The effect stemming from inflation expectations displays a positive and mostly significant coefficient (at the 10% level), which is in line with PPP since it implies that professional forecasters expect the domestic currency to depreciate against the US dollar when their inflation expectations for the domestic economy exceed US inflation expectations. More precisely, if professional forecasters expect domestic inflation to be above US inflation, they expect the domestic currency to depreciate against the US dollar over the next three months. The effect size seems to be relatively low, but it should be kept in mind that professionals often follow a random walk when forming their expectations over the short run and only expect minor changes compared to the current spot rate. The main takeaway therefore is that the directional effect is in line with PPP.

Coefficient estimates for current account expectations are significantly negative at least at the 10% level in nearly all cases (except for the simple pooled regression). This result implies that a worsening in the current account coincides with an expected depreciation, a result which is line with the theoretical prediction that a decrease in the accumulated current account surplus leads to an expected depreciation of the nominal exchange rate.

A comparison of the 3-month forecasts with the regression results for the 12-month horizon given in Table 5 shows that determinants of expectations are robust across forecast horizons and also show a stronger connection for higher forecast horizons. As can be seen in Table 5, the signs of coefficient estimates are fully in line with those reported in Table 4. They are higher in magnitude compared to the 3-month horizon for expected fundamentals. The significance of GDP growth and in particular inflation and current account forecasts has increased substantially. The $R^2$ has roughly doubled for most of the models. This implies that long-run exchange rate expectations are much more strongly affected by expectations regarding macroeconomic fundamentals. This pattern is fully plausible since it reflects the fact that fundamentals are considered to be a long-run anchor while forecasters are aware of the random walk behavior over the short run. In this vein, previous findings suggest that professionals predominantly rely on chartist rules in the short run but attach greater weight to fundamentals in the long run (Kouwenberg *et al.*, 2017).

*** Insert Table 5 about here ***

Extensions of our empirical approach discussed in Section 5 will also consider time-varying and single-country parameters as robustness tests. In relation to this, Figure 1 illustrates the heterogeneity of the parameter estimates across countries (Panel (a)) and across time (Panel (b)). Both graphs show that the estimates are mostly close to zero in terms of magnitude, a finding which is not surprising given the fact that expected exchange rates are often of small magnitude. We identify some heterogeneity across countries, particularly for current account expectations, but expectations also show a high degree of co-movement, which is not surprising given that they are all expressed against the US dollar.

*** Insert Figure 1 about here ***

## 4.2 Distribution of Forecasts: Optimistic and Pessimistic Forecasts

We now add another dimension to our analysis by taking potential differences across forecasters into account. The whole distribution of individual forecasts is unavailable for all currency pairs but the data set includes the strongest and weakest forecasts, which allows us to assess whether expectation building differs between optimists and pessimists.[16] It is important to keep in mind that optimists might still expect a domestic appreciation which is, however, less pronounced compared to other market participants. Tables 6 to 9 provide results for the 2.5 percent quantile forecasts (optimists with regard to the domestic currency) and 97.5 percent quantile forecasts (pessimists with regard to the domestic currency) for the 3-month and the 12-month horizon, respectively.

*** Insert Tables 6 to 9 about here ***

With regard to the comparison of 3-month and 12-month forecasts, the findings confirm our previous result that expected fundamentals turn out to be more important

[16]We have also considered the effect of expectations regarding macro fundamentals on exchange rate disagreement among forecasters proxied by the difference of the 97.5 and the 2.5 percent quantile. The corresponding findings are available upon request. We believe that considering both quantile forecasts separately allows a better comparison with our previous findings and is easier to interpret.

over the long run. The significance and magnitude of coefficients as well as $R^2$ increases significantly for both groups. At the same time, we find that expectation building differs significantly across both groups. Overall, optimistic forecasts are less driven by expected fundamentals compared to the geometric mean and pessimistic forecasts. Pessimists pay much greater attention to expected fundamentals with a much higher $R^2$ for both horizons. This finding is strongly driven by the substantial effect of interest rate expectations for pessimistic forecasts, which is significant at the 5 (1)% level for all configurations over a horizon of 3 (12) months. Optimistic forecasters do not pay attention to interest rate forecasts over both horizons.

Strong differences in other expected fundamentals are not observable. Inflation and current account forecasts do not display significance for both groups while their relevance seems also to increase with the forecast horizon. GDP growth forecasts are only significant for optimistic forecasts in FE-IV specifications over 3 months while there are no notable differences between both groups over 12 months.

The existing literature has only addressed the distinction between optimistic and pessimistic forecasts with regard to systematic over- and underestimation of a fundamental value (de Grauwe and Kaltwasser, 2007). Our results provide a different perspective by showing that forecasters who pay more attention to expected interest rates systematically tend to be more pessimistic about the domestic exchange rate against the US dollar. This might relate to the perception of a global financial cycle driven by monetary policy in the United States, which implies that there is little trust in domestic monetary policy when it comes to stabilizing the domestic exchange rate. At the same time, this pattern is in line with the fact that the sustained period of unconventional monetary policy in the US has not resulted in a significant deterioration of the US dollar.

## 4.3 Expected Excess Returns and Forecast Errors

Next, we examine the effect of expected fundamentals on expected excess returns and realized forecast errors by professionals. The rationale for this is the fact that if fundamentals expectations do not affect the expected exchange rate but forecast errors, there must be an unexpected effect on the realized exchange rate stemming from expectations regarding macro fundamentals (see also Eq. (2)). As outlined in Section 2.2.2, a comparison of expected excess returns from UIP regressions and forecast errors also sheds some light on the role of expectations for UIP deviations. Tables 10 and 11 report results for regressions of expected excess returns, computed as the difference between expected exchange rate changes and interest rate differentials, on expected macro fundamentals.

*** Insert Tables 10 and 11 about here ***

The results show that the effect of expected fundamentals is larger over a 3-month horizon compared to a 12-month horizon. This finding is predominantly driven by the significance of interest rate forecasts over 3 months, a pattern that simply reflects the stronger relevance of current and expected interest rates, which is higher over 3 months. This finding is nevertheless important since it shows that the significance of expected fundamentals discussed in previous sections does not simply reflect the effect of realized interest rates. Significance remains even if we account for current interest rate movements on the left-hand side. This confirms our common and previous finding that professionals do not believe in UIP in the strict sense. The remaining significance of GDP growth, inflation, and current account forecasts therefore suggests that part of the expected excess return can be seen as a compensation for expected fundamentals.

As a next step, we regress forecast errors computed as the relative percentage difference between the forecast in period $t$ for period $t+h$ and the realized end-of-month spot rate in period $t+h$ on expected fundamentals. The results are reported in Tables 12 and 13.

*** Insert Tables 12 and 13 about here ***

Generally speaking, any information available in $t$ should be unable to explain forecast errors in $t+h$ under rational expectations. Current information or expectations related to fundamentals should not affect realized expectation errors. A positive coefficient estimate implies that higher (lower) expected fundamentals relative to the US increase (decrease) forecast errors. This indicates that professionals are more successful in processing their fundamental expectations if they expect stronger movements, which in turn implies that there is no systematic misjudgement of professionals with regard to forecast errors.

The estimation results reported in Tables 12 and 13 show that expectations regarding each macro fundamental turn out to be significant at least at the 10% level for several model specifications considered. In line with our previous results, where we use the expected exchange rate change on the left-hand side, we find that the $R^2$ is much higher over 12 months. At the same time, the $R^2$ is now clearly lower over both forecast horizons. This deterioration is not surprising given that forecast errors include future realized exchange rates. The results do not provide a clear picture with regard to the sign, displaying higher and lower forecast errors. Overall, findings over the 12-month horizon tend to display the opposite pattern with expectations having a negative effect on forecast errors. Interestingly, we also find that survey exchange rate forecasts tend to outperform the random walk benchmark for higher compared to lower horizons (see Table A.2 in the Appendix) which overall suggests that forecasters are more effective in predicting exchange rates over the long run based on expected fundamentals and that the use of expected fundamentals is partly responsible for this result.

# 5 Robustness Tests and Extensions

The rich amount of empirical findings already includes a large set of robustness tests in terms of estimation methods and forecast horizons. The following subsections summarize additional results that extend the perspective of our analysis and confirm our main findings.

## 5.1 Time-Varying Coefficients

Previous studies have illustrated the time-varying nature of exchange rate expectations and it is common wisdom that events such as the global financial crisis have affected foreign exchange rate markets (ter Ellen *et al.*, 2013). There is also evidence that forecasters' behavior often varies across the business cycle (Dovern and Jannsen, 2017). Therefore, to shed some light on time-variation in expected exchange rates, we consider parameter estimates that are achieved by a rolling window regression with country fixed effects and a window size of 30 months. In addition, we apply a rolling window version of the dynamic panel model GMM estimator suggested by Arellano and Bond (1991), which also includes the first lag of the left-hand side variable. The corresponding estimates are provided for forecasting horizons of 3, 6, and 12 months in Figures 2 and 3, respectively. Time-varying parameter estimates are given by the solid line, its significance at least at the 10%-level is highlighted in red, and full sample period parameter estimates discussed in the previous section are indicated by the dotted line for comparison. The findings appear to be broadly robust across the three different horizons.

*** Insert Figures 2 and 3 about here ***

The financial crisis period around 2008 results in substantial changes in estimated coefficients but most changes in significance are not driven by this period. The overall pattern is in line with the rich evidence on the time-varying relationship between realized exchange rates and realized fundamentals and also reflects the main theoretical implications of the scapegoat approach: market participants pay attention to different fundamentals at different points in time when forming their expectations. We are the first to link expected exchange rates to expected fundamentals but our findings align with the existing evidence focusing on the relevance of realized macroeconomic fundamentals for expected exchange rate movements. The empirical results provided by Fratzscher *et al.* (2015) already confirm time-varying scapegoats based on survey data from Consensus Economics where participants are asked to rank the relevance of different fundamentals.[17]

Reconciling the estimation results with our theoretical models is also a difficult task since not only the significance but also the magnitude of the parameter estimates vary over time. Nevertheless, we identify some theory-conform patterns in case of significance which are in line with our previous findings. For instance, we find that

[17]Our findings are also in line with survey-based evidence by Cheung and Chinn (2001), which shows that the importance of individual macroeconomic variables in determining exchange rate expectations changes over time. Furthermore, there is rich evidence for the pattern that different fundamentals matter at different points in time (Beckmann *et al.*, 2011; Rossi, 2013). Each of the expected fundamentals (interest rate, GDP growth, inflation, current account) matters at some point in time but none emerges as dominant.

higher expected GDP growth mostly leads to an expected domestic appreciation and is particularly relevant between 2013 and 2019. This finding is in line with the monetary model of exchange rate determination, which postulates that an appreciation occurs due to higher money demand resulting from an increase in income. It also confirms the intuitive idea that higher growth expectations lead to an expected appreciation since they reflect an expected positive path of the domestic economy.

Both expected higher interest rates and expected higher inflation lead to an expected depreciation in most cases, which is a pattern that supports our previous findings as well as PPP and UIP. An opposite effect for inflation is observed around 2006 and between 2015 and 2019. A possible explanation for the second sub-sample period is that an expected increase in inflation can also ease deflation fears and therefore result in an expected appreciation. The negative coefficient for inflation expectations might be traced back to the changing role of monetary policy during the second sub-sample. Although inflation remained low after the implementation of quantitative easing, recent evidence suggests a significant deterioration of the anchoring of long-term inflation expectations after 2008 (Ciccarelli *et al.*, 2017). Higher expected interest rates also result in an expected appreciation between 2015 and 2019, reflecting the forward premium puzzle. Current account estimates are scarcely significant and display different signs. Overall, the rolling window estimates with dynamic panel data models that account for lagged endogenous variables reported in Figure 3 confirm the patterns shown in Figure 2 and therefore indicate that the findings are not sensitive to the inclusion of lagged expected exchange rate changes.

The scapegoat approach argues that fundamentals should become a scapegoat for unexpected exchange rate movements when they deviate from their long-term trend. An in-depth analysis of this issue is beyond the scope of this paper since it would require time-varying country-by-country regressions, but the frequent changes in coefficients around 2008 and 2009 certainly suggest that this explanation has its merits. Another common explanation for the exchange rate disconnect puzzle is that different groups of market participants dominate at different points in time, which would imply that significance indicates that fundamentalists dominate chartists in terms of the expected exchange rate.

## 5.2 Country-Specific Effects

We have also extended our analysis by conducting single-country regressions as a next step for assessing the link between expected exchange rates and expected fundamentals. The countries under investigation display some heterogeneity as already shown in Figure 1, which raises the question of whether the observed insignificance of some coefficients for some models might be due to the aggregation across countries. The findings provided in Tables A.8 and A.9 in the Appendix suggest that this might be true since the expectations regarding at least one macro fundamental affect expected exchange rate changes for over 90 percent of the countries under investigation.

The explanatory power tends to be higher for emerging economies compared to currencies of G10 economies. This is intuitive given the evidence that fundamentals tend to be more important in case of large deviations from fundamental models, a situation which is more present in emerging countries. Indonesia, Korea, and Argentina all display an $R^2$ of over 0.45 for 12-month expectations while such an explanatory power is not observed for the 3-month horizon. In line with panel estimates, we find that the $R^2$ is also much higher over 12 months compared to the 3-month horizon. Overall, we identify 9 currencies where the $R^2$ exceeds 0.2 over the 12-month horizon, although this is only the case for 2 currencies over the 3-month horizon. This confirms that long-run exchange rate expectations are much more strongly affected by expected fundamentals.

Significant coefficient estimates for interest rate expectations display both positive and negative coefficients. The former pattern is in line with the theoretical prediction of the UIP outlined in Section 2.2.2. The latter suggests that an expected increase in interest rates compared to the US allows professionals to predict an appreciation of the domestic currency. This might stem from increasing capital flows or from the fact that forecasters largely agree that an interest rate increase relates to a currency appreciation reflecting the empirical forward premium puzzle, which states that countries with higher interest rates appreciate. This finding also supports the work of Dick *et al.* (2015). GDP growth expectations show a mostly negative effect, as already observed at the aggregated level. The same holds for the coefficient estimates of inflation and current account expectations, which turn out to be positive and negative in several cases.

The overall pattern of the single-country regression results is in line with our panel data findings since expected fundamentals drive expectations regarding the future exchange rate. However, we also observe some country-specific differences such as opposite effects of interest rates expectations, which might blur expectation effects in the cross-section.

## 5.3 Forecasting Horizon and Domestic Expectations

As an add-on, we have also conducted estimates for all settings presented above for the 6-month forecasting horizon. The findings, which are provided in the Appendix, do not change the overall conclusions since all results remain essentially unchanged. We have also run a sub-sample analysis distinguishing between the groups of industrial and emerging economies. However, we found the country-specific estimates to be more informative. In addition, to ensure that our results are not solely driven by US expectations, we have re-estimated all models only including expectations regarding the domestic economy instead of expectation differentials. The findings also confirm the presented results and are available upon request.

## 6 Summary and Concluding Remarks

This paper has analyzed the importance of expected fundamentals for expected exchange rates, expected excess returns, and forecast errors at an aggregated as well as at a single-country level. Our real-time sample including 29 countries/currencies for the period between 2002 and 2020 has enabled us to conduct various sensitivity checks in terms of sample period, country selection, and estimation methods.

Our findings provide several important insights into the decision making of professional forecasters, the determinants of exchange rate expectations, and the exchange rate disconnect puzzle. Our empirical findings identify an impact of expected fundamentals, which is consistent with traditional fundamentals models. We also find that expected fundamentals are overall more important over the long run compared to the short run, a result which is in line with the root idea of fundamental exchange rate models. We find that an expected increase in GDP growth relative to the US leads to an expected appreciation of the domestic currency while higher relative inflation expectations lead to an expected depreciation, which is consistent with the purchasing power parity.

We have also assessed the expectation building between optimistic and pessimistic forecasts and show that the latter systematically put more weight on expected fundamentals and interest rate expectations in particular. Optimistic forecasts are similarly less driven by expected fundamentals as the geometric mean. Finally, we also observe that the superior forecasting performance of expectations can be partly traced back to expected fundamentals. Our additional results align with established findings in the literature. Expectation building can differ over time, a finding which is in line with the scapegoat approach.

Potential issues for further research include a more detailed disaggregated view on individual expectations. Another interesting extension corresponds to the importance of exchange rate policy within the impossible trinity restrictions given the fact that interest rate increases under fixed and flexible exchange rates bear different macroeconomic implications. Finally, a joint modeling of countries in a global framework, such as that recently proposed by Dovern *et al.* (2016), constitutes a possible extension.

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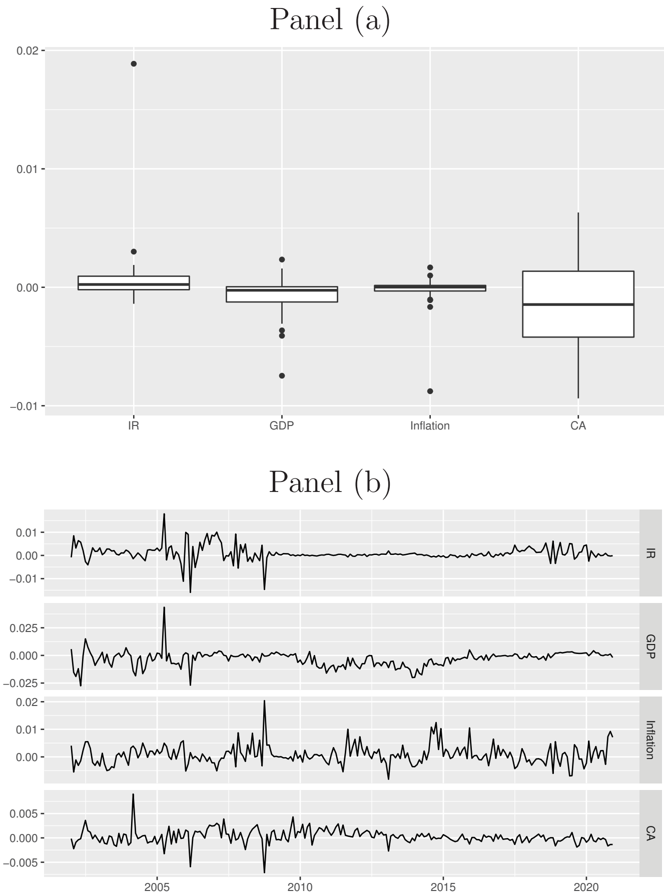
# Figures and Tables

Figure 1: **Panel data estimation heterogeneity**

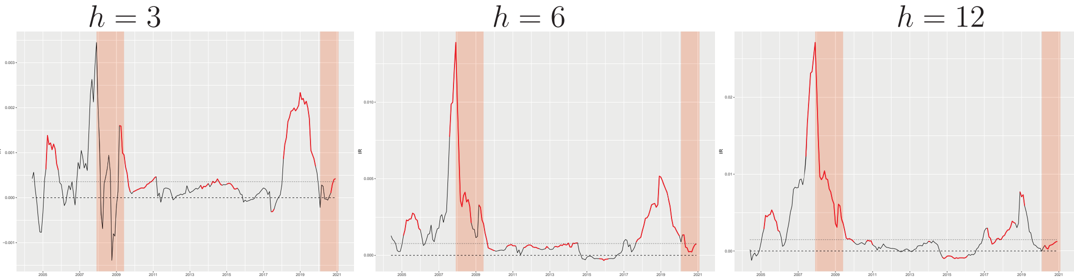
The plots shows the heterogeneity of the parameter estimations across countries (Panel (a)) and across time (Panel (b)) for a regression of expected percentage exchange rate changes on interest rate expectations (IR), GDP growth expectations (GDP), inflation expectations (Inflation) and current account to GDP ratio expectations (CA).



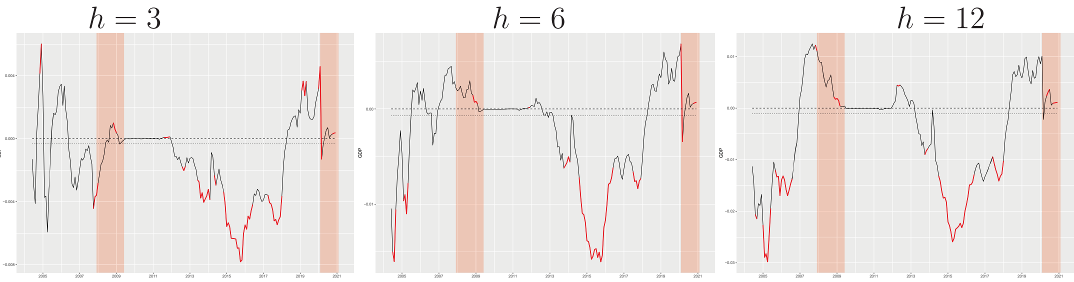
# Figure 2: **Time-varying parameter estimation**

The plots shows the variation of the parameter estimations over time for a regression of expected percentage exchange rate changes on interest rate expectations (IR), GDP growth expectations (GDP), inflation expectations (INF) and current account to GDP ratio expectations (CA) for three different forecast horizons $h$. The parameter estimates are achieved by a rolling window fixed effects regression with country fixed effects and a window size of 30 months. Time-varying parameter estimates are given by the solid line, its significance at least at the 10%-level is highlighted in red, full sample parameter estimates are given by the dotted line and a zero effect is illustrated by the dashed line. The pink rectangle visualizes the US recession periods between December 2007 and June 2009 and in 2020 defined by the NBER.

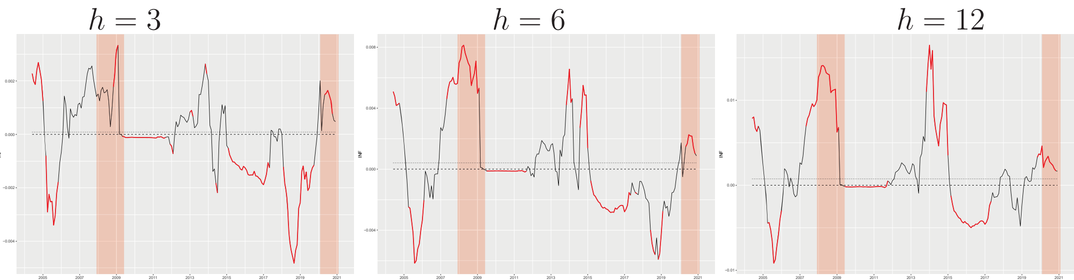
Panel (a): Interest rate expectations (IR)



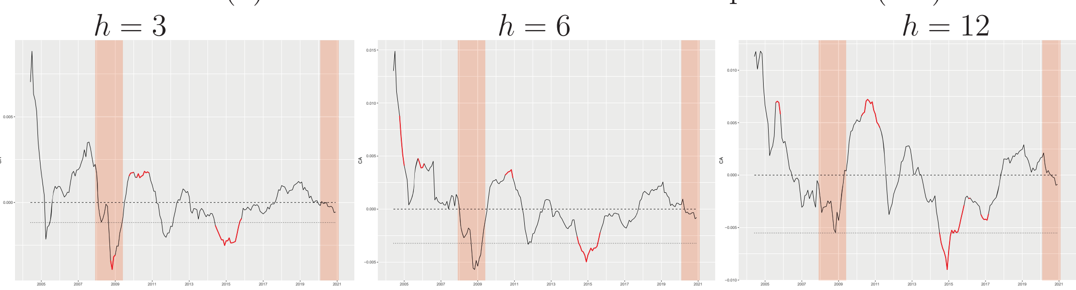

Panel (b): GDP growth expectations (GDP)




Panel (c): Inflation expectations (INF)




Panel (d): Current account to GDP ratio expectations (CA)

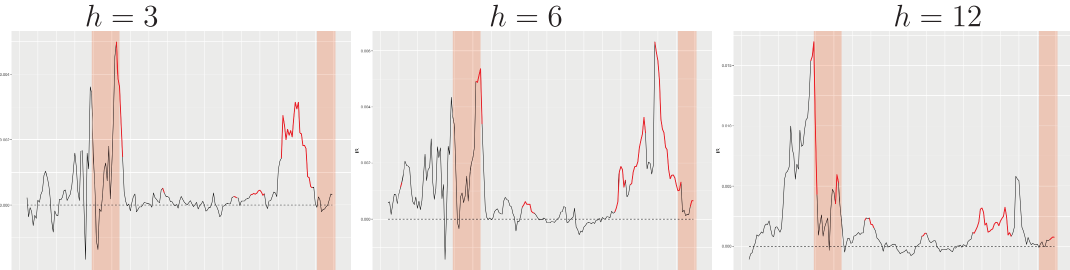


## Figure 3: **Time-varying parameter estimation for a dynamic panel model**

The plots shows the variation of the parameter estimations over time for a regression of expected percentage exchange rate changes on interest rate expectations (IR), GDP growth expectations (GDP), inflation expectations (INF), current account to GDP ratio expectations (CA) and one lag of the endogenous variable for three different forecast horizons $h$. The parameter estimates are achieved by a rolling window Arellano and Bond (1991) GMM estimator with country fixed effects and a window size of 30 months. Time-varying parameter estimates are given by the solid line, its significance at least at the 10%-level is highlighted in red and a zero effect is illustrated by the dashed line. The pink rectangle visualizes the US recession periods between December 2007 and June 2009 and in 2020 defined by the NBER.

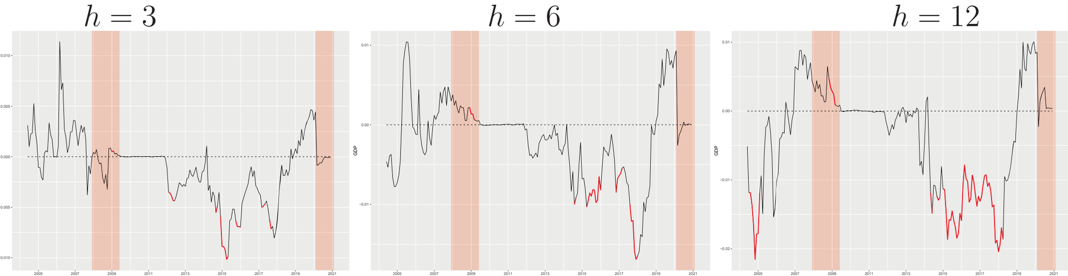
Panel (a): Interest rate expectations (IR)

$h = 3$ $h = 6$ $h = 12$



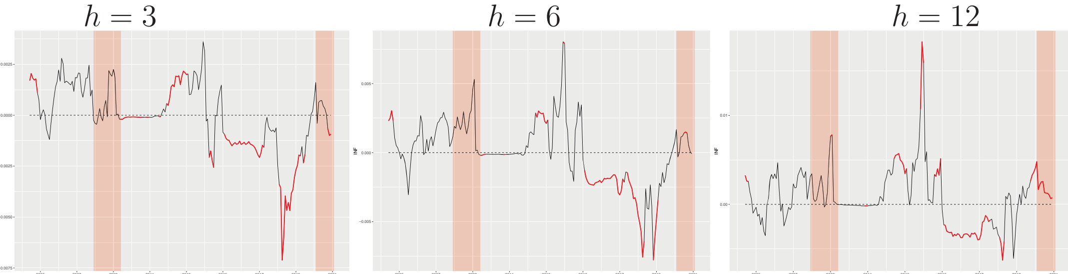
Panel (b): GDP growth expectations (GDP)

$h = 3$ $h = 6$ $h = 12$



Panel (c): Inflation expectations (INF)

$h = 3$ $h = 6$ $h = 12$



Panel (d): Current account to GDP ratio expectations (CA)

$h = 3$ $h = 6$ $h = 12$

Table 1: **Descriptive statistics**

| | **Mean** | **SD** | **Median** | **Min** | **Max** | **Skewness** | **Kurtosis** |
|---|---|---|---|---|---|---|---|
| %ΔFX-3m | 0.2218 | 1.5248 | 0.2574 | -12.3633 | 23.6967 | 1.8723 | 28.5781 |
| %ΔFX-6m | 0.3944 | 2.8912 | 0.1467 | -32.5342 | 41.2322 | 2.4613 | 26.8808 |
| %ΔFX-12m | 0.6193 | 4.6183 | -0.4333 | -14.7183 | 51.1765 | 2.2310 | 14.1772 |
| IR-3m | 4.9638 | 6.0928 | 3.6500 | -0.8700 | 81.8000 | 4.1500 | 29.2160 |
| IR-6m | 4.9111 | 5.7870 | 3.7500 | -0.8900 | 77.3000 | 3.8415 | 25.8706 |
| IR-12m | 4.8378 | 5.3500 | 3.7500 | -0.8900 | 77.3000 | 3.6412 | 25.2305 |
| GDP | 3.0965 | 2.1157 | 2.8833 | -24.9000 | 10.5000 | -0.1973 | 5.5599 |
| Inflation | 3.7544 | 4.5070 | 2.6417 | -1.6000 | 61.7500 | 4.9667 | 34.1701 |
| CA | 1.5695 | 6.0207 | 0.4000 | -16.0000 | 34.0000 | 1.3952 | 2.5328 |
| | | | **Industrial countries** | | | | |
| %ΔFX-3m | 0.1025 | 1.3564 | 0.1292 | -12.3633 | 8.0737 | -0.8391 | 8.9933 |
| %ΔFX-6m | 0.0574 | 2.3428 | -0.1820 | -13.5408 | 11.5497 | -0.0832 | 0.7604 |
| %ΔFX-12m | -0.0227 | 3.7078 | -0.9112 | -14.7183 | 13.7190 | 0.0735 | -0.6666 |
| IR-3m | 2.6383 | 3.3519 | 1.6500 | -0.8700 | 24.0000 | 2.1860 | 6.9953 |
| IR-6m | 2.6489 | 3.2735 | 1.6500 | -0.8900 | 22.0000 | 2.0531 | 5.9841 |
| IR-12m | 2.6884 | 3.1368 | 1.7500 | -0.8900 | 21.0000 | 1.8790 | 4.9095 |
| GDP | 1.9582 | 1.3625 | 2.0333 | -5.3250 | 6.8667 | -0.4597 | 3.6852 |
| Inflation | 2.1880 | 2.1934 | 1.8333 | -1.6000 | 17.0000 | 3.0797 | 11.6894 |
| CA | 2.5845 | 5.6381 | 2.5000 | -10.5000 | 22.1000 | 0.4915 | -0.1967 |
| | | | **Emerging countries** | | | | |
| %ΔFX-3m | 0.2947 | 1.6150 | 0.3030 | -11.3604 | 23.6967 | 2.8029 | 33.1606 |
| %ΔFX-6m | 0.6003 | 3.1628 | 0.4386 | -32.5342 | 41.2322 | 2.9621 | 29.0963 |
| %ΔFX-12m | 1.0116 | 5.0557 | 0.8487 | -11.4486 | 51.1765 | 2.6153 | 14.9865 |
| IR-3m | 6.3848 | 6.9010 | 5.0000 | 0.0000 | 81.8000 | 3.9911 | 24.7542 |
| IR-6m | 6.2936 | 6.5094 | 5.0000 | 0.0000 | 77.3000 | 3.7293 | 22.3645 |
| IR-12m | 6.1513 | 5.9630 | 5.0000 | 0.0000 | 77.3000 | 3.6098 | 22.7273 |
| GDP | 3.7921 | 2.1914 | 3.7000 | -24.9000 | 10.5000 | -0.7489 | 8.1414 |
| Inflation | 4.7117 | 5.2319 | 3.4792 | -1.0000 | 61.7500 | 4.5344 | 26.2824 |
| CA | 0.9492 | 6.1619 | -0.7167 | -16.0000 | 34.0000 | 1.9142 | 4.3986 |

*Note:* The table reports descriptive statistics for expected percentage exchange rate changes (%ΔFX) over 3-, 6- and 12-months, interest rate expectations (IR), GDP growth expectations (GDP), inflation expectations (Inflation) and current account relative to GDP expectations (CA) all pooled across countries. The upper part of the table reports statistics for the entire panel of countries, the middle part for industrial countries and the bottom part for emerging countries. SD denotes standard deviation.

Table 2: **Panel unit root tests**

| | **Levin *et al.* (2002)** | **Im *et al.* (2003)** | **Maddala and Wu (1999)** | **Pesaran (2007)** | **Demetrescu *et al.* (2006)** |
|---|---|---|---|---|---|
| %ΔFX-3m | -32.6660 | -36.1993 | 1351.8969 | -4.7814 | -24.1057 |
| $p$-value | [0.0000] | [0.0000] | [0.0000] | [0.0100] | [0.0000] |
| %ΔFX-6m | -12.9746 | -18.3543 | 566.2455 | -3.8598 | -13.5296 |
| $p$-value | [0.0000] | [0.0000] | [0.0000] | [0.0100] | [0.0000] |
| %ΔFX-12m | -8.3047 | -12.7342 | 353.1288 | -3.1802 | -10.1288 |
| $p$-value | [0.0000] | [0.0000] | [0.0000] | [0.0100] | [0.0000] |
| IR-3m | 3.8987 | 1.0217 | 41.6836 | -2.4339 | 0.4193 |
| $p$-value | [1.0000] | [0.8465] | [0.9477] | [0.0100] | [0.6625] |
| IR-6m | 4.9000 | 0.9309 | 58.9447 | -2.4845 | 0.9261 |
| $p$-value | [1.0000] | [0.8241] | [0.4407] | [0.0100] | [0.8228] |
| IR-12m | 6.4733 | 0.8594 | 69.7374 | -2.5908 | 0.7134 |
| $p$-value | [1.0000] | [0.8049] | [0.1390] | [0.0100] | [0.7622] |
| GDP | -38.3409 | -40.1008 | 1654.3592 | -3.8464 | -22.7415 |
| $p$-value | [0.0000] | [0.0000] | [0.0000] | [0.0100] | [0.0000] |
| Inflation | -53.0246 | -56.9344 | 2421.1486 | -3.1826 | -31.9277 |
| $p$-value | [0.0000] | [0.0000] | [0.0000] | [0.0100] | [0.0000] |
| CA | -3.8733 | -6.5630 | 186.7384 | -1.7273 | -5.2254 |
| $p$-value | [0.0001] | [0.0000] | [0.0000] | [0.1000] | [0.0000] |

*Note:* The table reports test statistics and $p$-values for five different panel unit root tests checking the null of a unit root for expected percentage exchange rate changes (%ΔFX) over 3-, 6- and 12-months, interest rate expectations (IR), GDP growth expectations (GDP), inflation expectations (Inflation) and current account relative to GDP expectations (CA). The test equations include lags determined by the BIC and an intercept but not a trend since the individual time series do not exhibit trending behavior.

## Table 3: **Correlation between regressors**

| | **Total panel** | | | | **Industrial countries** | | | | **Emerging countries** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **3-month interest rate expectations** | | | | | | | | | | | | |
| | IR | GDP | Inflation | CA | IR | GDP | Inflation | CA | IR | GDP | Inflation | CA |
| IR | 1.0000 | 0.0114 | 0.4315 | 0.2216 | 1.0000 | 0.0621 | 0.2738 | 0.0943 | 1.0000 | -0.0422 | 0.4431 | 0.2317 |
| GDP | 0.0114 | 1.0000 | 0.0053 | 0.0107 | 0.0621 | 1.0000 | -0.0533 | 0.0455 | -0.0422 | 1.0000 | -0.0160 | -0.0235 |
| Inflation | 0.4315 | 0.0053 | 1.0000 | 0.1198 | 0.2738 | -0.0533 | 1.0000 | 0.0252 | 0.4431 | -0.0160 | 1.0000 | 0.1324 |
| CA | 0.2216 | 0.0107 | 0.1198 | 1.0000 | 0.0943 | 0.0455 | 0.0252 | 1.0000 | 0.2317 | -0.0235 | 0.1324 | 1.0000 |
| **6-month interest rate expectations** | | | | | | | | | | | | |
| | IR | GDP | Inflation | CA | IR | GDP | Inflation | CA | IR | GDP | Inflation | CA |
| IR | 1.0000 | 0.0159 | 0.4080 | 0.2108 | 1.0000 | 0.0826 | 0.2537 | 0.0980 | 1.0000 | -0.0364 | 0.4180 | 0.2174 |
| GDP | 0.0159 | 1.0000 | 0.0053 | 0.0107 | 0.0826 | 1.0000 | -0.0533 | 0.0455 | -0.0364 | 1.0000 | -0.0160 | -0.0235 |
| Inflation | 0.4080 | 0.0053 | 1.0000 | 0.1198 | 0.2537 | -0.0533 | 1.0000 | 0.0252 | 0.4180 | -0.0160 | 1.0000 | 0.1324 |
| CA | 0.2108 | 0.0107 | 0.1198 | 1.0000 | 0.0980 | 0.0455 | 0.0252 | 1.0000 | 0.2174 | -0.0235 | 0.1324 | 1.0000 |
| **12-month interest rate expectations** | | | | | | | | | | | | |
| | IR | GDP | Inflation | CA | IR | GDP | Inflation | CA | IR | GDP | Inflation | CA |
| IR | 1.0000 | 0.0121 | 0.3956 | 0.1948 | 1.0000 | 0.0834 | 0.2512 | 0.1044 | 1.0000 | -0.0364 | 0.4048 | 0.1974 |
| GDP | 0.0121 | 1.0000 | 0.0053 | 0.0107 | 0.0834 | 1.0000 | -0.0533 | 0.0455 | -0.0364 | 1.0000 | -0.0160 | -0.0235 |
| Inflation | 0.3956 | 0.0053 | 1.0000 | 0.1198 | 0.2512 | -0.0533 | 1.0000 | 0.0252 | 0.4048 | -0.0160 | 1.0000 | 0.1324 |
| CA | 0.1948 | 0.0107 | 0.1198 | 1.0000 | 0.1044 | 0.0455 | 0.0252 | 1.0000 | 0.1974 | -0.0235 | 0.1324 | 1.0000 |

*Note:* The table reports the correlation coefficient between interest rate expectations (IR), GDP growth expectations (GDP), inflation expectations (INF) and current account relative to GDP expectations (CA) all pooled across countries for the entire panel (left), industrial countries (middle) and emerging countries (right). The table is separated into three parts since interest rate expectations are available over 3-, 6- and 12-months. All fundamental expectations have been computed as relative differences compared to the US in line with our regression models presented in Section 4.

Table 4: **Regression results for 3-month mean forecasts**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0004 | 0.0004 | 0.0003 | 0.0004 | 0.0006 | 0.0003 | 0.0003 | 0.0003 |
| se | (0.0001) | (0.0001) | (0.0002) | (0.0001) | (0.0000) | (0.0001) | (0.0002) | (0.0001) |
| $p$-value | [0.0005] | [0.0032] | [0.0695] | [0.0020] | [0.0000] | [0.0240] | [0.1658] | [0.0195] |
| GDP | -0.0006 | -0.0003 | -0.0001 | -0.0004 | -0.0007 | -0.0027 | -0.0012 | -0.0027 |
| se | (0.0002) | (0.0002) | (0.0001) | (0.0002) | (0.0000) | (0.0007) | (0.0007) | (0.0007) |
| $p$-value | [0.0026] | [0.0467] | [0.5463] | [0.0289] | [0.0000] | [0.0002] | [0.0687] | [0.0001] |
| Inflation | 0.0002 | 0.0001 | 0.0002 | 0.0001 | 0.0006 | 0.0005 | 0.0005 | 0.0006 |
| se | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0000) | (0.0003) | (0.0003) | (0.0003) |
| $p$-value | [0.0392] | [0.2917] | [0.0238] | [0.1742] | [0.0000] | [0.0698] | [0.0976] | [0.0293] |
| CA | 0.0001 | -0.0012 | -0.0007 | -0.0006 | -0.0007 | -0.0012 | -0.0007 | -0.0005 |
| se | (0.0002) | (0.0004) | (0.0003) | (0.0003) | (0.0000) | (0.0005) | (0.0004) | (0.0003) |
| $p$-value | [0.7857] | [0.0075] | [0.0551] | [0.0588] | [0.0000] | [0.0088] | [0.0593] | [0.0750] |
| Intercept | -0.0011 | | | -0.0638 | | | | 0.0032 |
| se | (0.0667) | | | (0.0659) | | | | (0.0668) |
| $p$-value | [0.9873] | | | [0.3330] | | | | [0.9620] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.1203 | 0.0571 | 0.0430 | 0.0650 | 0.4072 | 0.0270 | 0.0267 | 0.0341 |
| $F$-stat | | 15.6979 | 9.9622 | | | -5.4079 | 8.2873 | |
| $p$-value | | [0.0000] | [0.0000] | | | [1.0000] | [0.0000] | |
| Honda LM stat | | 41.0349 | 71.2941 | | | 19.5388 | 53.3852 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 110.8742 | 114.6062 | | | 44.6527 | 31.2733 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| BP LM stat | | 11138.6713 | 9011.6632 | 11381.2918 | 4985.8553 | 10304.1380 | 8455.3944 | 10587.5207 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 76.1895 | -8.2338 | 76.8663 | -6.6334 | 68.6414 | -8.3690 | 70.0175 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $\chi^2$-stat | | 1945.7062 | 1528.3604 | 1976.8333 | 2095.2267 | 1954.1797 | 1554.8707 | 1986.3539 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of expected percentage exchange rate changes on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table 5: **Regression results for 12-month mean forecasts**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0020 | 0.0015 | 0.0015 | 0.0015 | 0.0029 | 0.0013 | 0.0012 | 0.0014 |
| se | (0.0004) | (0.0005) | (0.0005) | (0.0005) | (0.0000) | (0.0005) | (0.0007) | (0.0005) |
| $p$-value | [0.0000] | [0.0026] | [0.0070] | [0.0016] | [0.0000] | [0.0118] | [0.0605] | [0.0094] |
| GDP | -0.0020 | -0.0011 | -0.0011 | -0.0011 | -0.0031 | -0.0064 | -0.0069 | -0.0065 |
| se | (0.0006) | (0.0005) | (0.0006) | (0.0005) | (0.0000) | (0.0019) | (0.0026) | (0.0018) |
| $p$-value | [0.0015] | [0.0397] | [0.0482] | [0.0329] | [0.0000] | [0.0007] | [0.0074] | [0.0004] |
| Inflation | 0.0017 | 0.0008 | 0.0012 | 0.0008 | 0.0030 | 0.0020 | 0.0026 | 0.0023 |
| se | (0.0006) | (0.0004) | (0.0006) | (0.0004) | (0.0000) | (0.0009) | (0.0013) | (0.0009) |
| $p$-value | [0.0088] | [0.0492] | [0.0314] | [0.0405] | [0.0000] | [0.0183] | [0.0546] | [0.0105] |
| CA | 0.0011 | -0.0055 | -0.0043 | -0.0040 | -0.0013 | -0.0057 | -0.0047 | -0.0040 |
| se | (0.0009) | (0.0019) | (0.0019) | (0.0016) | (0.0000) | (0.0020) | (0.0020) | (0.0015) |
| $p$-value | [0.2053] | [0.0046] | [0.0257] | [0.0099] | [0.0000] | [0.0038] | [0.0176] | [0.0098] |
| Intercept | -0.0015 | | | -0.5274 | | | | -0.4530 |
| se | (0.2867) | | | (0.4211) | | | | (0.4120) |
| $p$-value | [0.9957] | | | [0.2104] | | | | [0.2716] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.2212 | 0.0983 | 0.1088 | 0.1005 | 0.5796 | 0.0649 | 0.0689 | 0.0674 |
| $F$-stat | | 54.4868 | 17.1273 | | | 15.8997 | 11.4696 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 120.9709 | 130.7494 | | | 64.8023 | 95.8254 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 117.2013 | 28.6948 | | | 50.7748 | 58.7767 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| BP LM stat | | 17875.8449 | 16402.4954 | 18260.0239 | 8425.3014 | 17046.2432 | 13391.6528 | 17464.1635 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 88.1054 | -6.7890 | 88.9861 | -3.0233 | 89.2067 | -6.3770 | 90.5115 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0025] | [0.0000] | [0.0000] | [0.0000] |
| $\chi^2$-stat | | 4487.7758 | 4252.0492 | 4510.5215 | 4636.9629 | 4478.1664 | 4221.0192 | 4502.6669 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of expected percentage exchange rate changes on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table 6: **Regression results for 3-month 2.5% quantile forecasts**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0007 | 0.0001 | 0.0001 | 0.0001 | 0.0007 | 0.0001 | 0.0002 | 0.0001 |
| se | (0.0005) | (0.0001) | (0.0001) | (0.0001) | (0.0000) | (0.0001) | (0.0002) | (0.0001) |
| $p$-value | [0.1505] | [0.0828] | [0.3537] | [0.0745] | [0.0000] | [0.2915] | [0.3147] | [0.2715] |
| GDP | 0.0014 | -0.0007 | 0.0005 | -0.0007 | -0.0018 | -0.0034 | 0.0048 | -0.0033 |
| se | (0.0018) | (0.0003) | (0.0004) | (0.0003) | (0.0000) | (0.0015) | (0.0027) | (0.0014) |
| $p$-value | [0.4202] | [0.0524] | [0.2003] | [0.0537] | [0.0000] | [0.0208] | [0.0751] | [0.0227] |
| Inflation | 0.0003 | -0.0000 | -0.0003 | -0.0000 | -0.0027 | -0.0000 | -0.0006 | -0.0000 |
| se | (0.0002) | (0.0001) | (0.0003) | (0.0001) | (0.0000) | (0.0004) | (0.0008) | (0.0004) |
| $p$-value | [0.1784] | [0.7752] | [0.3810] | [0.7854] | [0.0000] | [0.9526] | [0.4797] | [0.9566] |
| CA | -0.0017 | -0.0029 | -0.0014 | -0.0029 | -0.0000 | -0.0033 | -0.0014 | -0.0032 |
| se | (0.0016) | (0.0018) | (0.0013) | (0.0018) | (0.0000) | (0.0021) | (0.0015) | (0.0021) |
| $p$-value | [0.2783] | [0.1113] | [0.3032] | [0.1116] | [0.0000] | [0.1172] | [0.3397] | [0.1174] |
| Intercept | -4.1931 | | | -3.9095 | | | | -3.8734 |
| se | (1.5654) | | | (1.3092) | | | | (1.3737) |
| $p$-value | [0.0074] | | | [0.0028] | | | | [0.0048] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.0181 | 0.0066 | 0.0029 | 0.0065 | 0.5611 | 0.0043 | 0.0014 | 0.0042 |
| $F$-stat | | 593.1125 | 76.5844 | | | 304.5144 | 67.8999 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 609.4328 | 433.0053 | | | 589.4256 | 421.7534 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 1.7505 | 858.6620 | | | 7.2733 | 61.6442 | |
| $p$-value | | [0.7815] | [0.0000] | | | [0.1221] | [0.0000] | |
| BP LM stat | | 6334.0389 | 3725.6452 | 6338.6582 | 2190.0634 | 5091.7984 | 4543.6647 | 5104.9863 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 66.0552 | 11.5567 | 66.0932 | -3.7657 | 51.9524 | 6.5953 | 52.1980 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0002] | [0.0000] | [0.0000] | [0.0000] |
| $\chi^2$-stat | | 4135.4786 | 4094.8391 | 4150.8331 | 4163.7966 | 4048.2474 | 3991.7710 | 4064.3682 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of optimistic expected percentage exchange rate changes (proxied by the 2.5% quantile of forecasts) on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table 7: **Regression results for 12-month 2.5% quantile forecasts**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0014 | 0.0001 | 0.0004 | 0.0001 | 0.0008 | 0.0000 | 0.0004 | 0.0000 |
| se | (0.0005) | (0.0003) | (0.0002) | (0.0003) | (0.0000) | (0.0004) | (0.0003) | (0.0004) |
| $p$-value | [0.0122] | [0.6665] | [0.0554] | [0.6567] | [0.0000] | [0.9215] | [0.1823] | [0.9126] |
| GDP | 0.0012 | -0.0006 | -0.0000 | -0.0006 | -0.0032 | -0.0040 | 0.0004 | -0.0039 |
| se | (0.0018) | (0.0003) | (0.0004) | (0.0003) | (0.0000) | (0.0015) | (0.0029) | (0.0015) |
| $p$-value | [0.5007] | [0.0624] | [0.9466] | [0.0645] | [0.0000] | [0.0096] | [0.8784] | [0.0109] |
| Inflation | 0.0017 | 0.0005 | 0.0006 | 0.0005 | 0.0004 | 0.0014 | 0.0012 | 0.0014 |
| se | (0.0006) | (0.0003) | (0.0004) | (0.0003) | (0.0000) | (0.0006) | (0.0009) | (0.0006) |
| $p$-value | [0.0073] | [0.0606] | [0.1266] | [0.0594] | [0.0000] | [0.0281] | [0.1848] | [0.0267] |
| CA | -0.0006 | -0.0058 | -0.0049 | -0.0057 | -0.0017 | -0.0062 | -0.0052 | -0.0061 |
| se | (0.0017) | (0.0022) | (0.0020) | (0.0022) | (0.0000) | (0.0023) | (0.0021) | (0.0023) |
| $p$-value | [0.7206] | [0.0079] | [0.0148] | [0.0081] | [0.0000] | [0.0086] | [0.0155] | [0.0087] |
| Intercept | -6.2113 | | | -6.3813 | | | | -6.4078 |
| se | (1.4881) | | | (1.3354) | | | | (1.3919) |
| $p$-value | [0.0000] | | | [0.0000] | | | | [0.0000] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.0463 | 0.0190 | 0.0191 | 0.0188 | 0.4939 | 0.0117 | 0.0174 | 0.0116 |
| $F$-stat | | 476.1500 | 63.1772 | | | 242.5345 | 60.4952 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 555.0090 | 398.4036 | | | 534.2455 | 386.7391 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 5.4158 | 302.0361 | | | 15.3279 | 148.5276 | |
| $p$-value | | [0.2472] | [0.0000] | | | [0.0041] | [0.0000] | |
| BP LM stat | | 9783.1452 | 11922.5008 | 9797.0557 | 6272.9831 | 9162.9425 | 11248.3026 | 9182.8856 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 52.8986 | 0.6688 | 52.9816 | -2.5534 | 50.4988 | 0.0588 | 50.6479 |
| $p$-value | | [0.0000] | [0.5036] | [0.0000] | [0.0107] | [0.0000] | [0.9531] | [0.0000] |
| $\chi^2$-stat | | 4360.2920 | 4377.8670 | 4374.7065 | 4409.4342 | 4296.3292 | 4301.2415 | 4311.8521 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of optimistic expected percentage exchange rate changes (proxied by the 2.5% quantile of forecasts) on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table 8: **Regression results for 3-month 97.5% quantile forecasts**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0013 | 0.0007 | 0.0010 | 0.0007 | 0.0015 | 0.0007 | 0.0010 | 0.0007 |
| se | (0.0005) | (0.0003) | (0.0003) | (0.0003) | (0.0000) | (0.0003) | (0.0004) | (0.0003) |
| $p$-value | [0.0135] | [0.0251] | [0.0017] | [0.0245] | [0.0000] | [0.0328] | [0.0113] | [0.0322] |
| GDP | 0.0009 | 0.0000 | 0.0001 | 0.0000 | -0.0046 | -0.0024 | -0.0004 | -0.0024 |
| se | (0.0019) | (0.0002) | (0.0004) | (0.0002) | (0.0000) | (0.0010) | (0.0030) | (0.0010) |
| $p$-value | [0.6423] | [0.9693] | [0.8916] | [0.9613] | [0.0000] | [0.0157] | [0.8826] | [0.0165] |
| Inflation | 0.0006 | 0.0002 | 0.0000 | 0.0002 | -0.0018 | 0.0001 | 0.0004 | 0.0001 |
| se | (0.0003) | (0.0002) | (0.0003) | (0.0002) | (0.0000) | (0.0005) | (0.0007) | (0.0005) |
| $p$-value | [0.0374] | [0.2916] | [0.9463] | [0.2875] | [0.0000] | [0.8551] | [0.5359] | [0.8477] |
| CA | -0.0004 | -0.0020 | -0.0021 | -0.0020 | -0.0027 | -0.0021 | -0.0022 | -0.0021 |
| se | (0.0017) | (0.0018) | (0.0015) | (0.0017) | (0.0000) | (0.0020) | (0.0016) | (0.0020) |
| $p$-value | [0.7922] | [0.2594] | [0.1565] | [0.2612] | [0.0000] | [0.2980] | [0.1571] | [0.2998] |
| Intercept | 0.9484 | | | 1.0912 | | | | 1.1627 |
| se | (1.6373) | | | (1.3477) | | | | (1.4113) |
| $p$-value | [0.5625] | | | [0.4181] | | | | 0.4100 |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.0436 | 0.0267 | 0.0369 | 0.0268 | 0.5297 | 0.0173 | 0.0366 | 0.0174 |
| $F$-stat | | 533.3405 | 66.1044 | | | 275.3449 | 63.0475 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 594.6661 | 420.9454 | | | 598.3103 | 423.6342 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 0.8081 | 55.8582 | | | 7.0078 | 70.7247 | |
| $p$-value | | [0.9374] | [0.0000] | | | [0.1355] | [0.0000] | |
| BP LM stat | | 6355.5235 | 4083.5627 | 6357.9627 | 1613.2951 | 6291.0467 | 3901.7622 | 6292.5534 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 58.7945 | 7.3927 | 58.8098 | -2.2176 | 59.6729 | 6.4146 | 59.6834 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0266] | [0.0000] | [0.0000] | [0.0000] |
| $\chi^2$-stat | | 3869.6806 | 3994.3419 | 3887.3359 | 3903.1800 | 3781.8069 | 3910.0809 | 3800.4496 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of pessimistic expected percentage exchange rate changes (proxied by the 97.5% quantile of forecasts) on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table 9: **Regression results for 12-month 97.5% quantile forecasts**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0034 | 0.0023 | 0.0022 | 0.0023 | 0.0036 | 0.0022 | 0.0020 | 0.0022 |
| se | (0.0006) | (0.0005) | (0.0005) | (0.0005) | (0.0000) | (0.0005) | (0.0006) | (0.0005) |
| $p$-value | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0015] | [0.0000] |
| GDP | -0.0009 | -0.0010 | -0.0009 | -0.0010 | -0.0063 | -0.0071 | -0.0053 | -0.0072 |
| se | (0.0019) | (0.0005) | (0.0006) | (0.0005) | (0.0000) | (0.0020) | (0.0037) | (0.0020) |
| $p$-value | [0.6308] | [0.0751] | [0.1489] | [0.0751] | [0.0000] | [0.0003] | [0.1487] | [0.0003] |
| Inflation | 0.0021 | 0.0008 | 0.0014 | 0.0008 | 0.0021 | 0.0020 | 0.0033 | 0.0020 |
| se | (0.0009) | (0.0005) | (0.0008) | (0.0005) | (0.0000) | (0.0010) | (0.0013) | (0.0010) |
| $p$-value | [0.0255] | [0.1370] | [0.0563] | [0.1351] | [0.0000] | [0.0443] | [0.0105] | [0.0426] |
| CA | 0.0004 | -0.0067 | -0.0051 | -0.0066 | -0.0006 | -0.0069 | -0.0055 | -0.0068 |
| se | (0.0020) | (0.0028) | (0.0026) | (0.0027) | (0.0000) | (0.0030) | (0.0026) | (0.0029) |
| $p$-value | [0.8349] | [0.0161] | [0.0470] | [0.0168] | [0.0000] | [0.0193] | [0.0350] | [0.0201] |
| Intercept | 3.2903 | | | 2.7246 | | | | 2.7911 |
| se | (1.6045) | | | (1.4675) | | | | (1.5317) |
| $p$-value | [0.0403] | | | [0.0634] | | | | [0.0685] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.1365 | 0.1047 | 0.0982 | 0.1046 | 0.5156 | 0.0752 | 0.0777 | 0.0751 |
| $F$-stat | | 353.9140 | 50.1243 | | | 166.2662 | 44.3477 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 501.7477 | 363.5788 | | | 485.1518 | 355.0366 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 4.7808 | 35.5259 | | | 21.0897 | 71.1510 | |
| $p$-value | | [0.3105] | [0.0000] | | | [0.0003] | [0.0000] | |
| BP LM stat | | 13635.0169 | 12368.8388 | 13654.0408 | 5824.3456 | 12918.9671 | 10446.8772 | 12939.6481 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 69.2401 | -0.8210 | 69.3131 | -1.5627 | 71.8850 | -0.9305 | 71.9929 |
| $p$-value | | [0.0000] | [0.4116] | [0.0000] | [0.1181] | [0.0000] | [0.3521] | [0.0000] |
| $\chi^2$-stat | | 4309.8394 | 4293.1043 | 4324.3437 | 4481.3235 | 4255.8826 | 4231.7130 | 4271.8349 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of pessimistic expected percentage exchange rate changes (proxied by the 97.5% quantile of forecasts) on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table 10: **Regression results for expected 3-month excess returns**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | -0.0022 | -0.0008 | -0.0008 | -0.0009 | -0.0025 | -0.0003 | -0.0002 | -0.0005 |
| se | (0.0004) | (0.0002) | (0.0003) | (0.0002) | (0.0000) | (0.0004) | (0.0004) | (0.0004) |
| $p$-value | [0.0000] | [0.0004] | [0.0027] | [0.0001] | [0.0000] | [0.3927] | [0.6780] | [0.2475] |
| GDP | -0.0004 | 0.0007 | 0.0007 | 0.0005 | 0.0004 | 0.0031 | 0.0032 | 0.0022 |
| se | (0.0006) | (0.0008) | (0.0007) | (0.0008) | (0.0000) | (0.0036) | (0.0038) | (0.0033) |
| $p$-value | [0.4941] | [0.4136] | [0.2891] | [0.4866] | [0.0000] | [0.3846] | [0.3964] | [0.4991] |
| Inflation | -0.0036 | -0.0023 | -0.0035 | -0.0024 | -0.0042 | -0.0061 | -0.0084 | -0.0066 |
| se | (0.0014) | (0.0010) | (0.0016) | (0.0011) | (0.0000) | (0.0018) | (0.0018) | (0.0018) |
| $p$-value | [0.0078] | [0.0295] | [0.0246] | [0.0247] | [0.0000] | [0.0007] | [0.0000] | [0.0003] |
| CA | -0.0042 | -0.0005 | 0.0010 | -0.0020 | -0.0015 | -0.0013 | 0.0005 | -0.0026 |
| se | (0.0014) | (0.0031) | (0.0034) | (0.0023) | (0.0000) | (0.0032) | (0.0033) | (0.0023) |
| $p$-value | [0.0029] | [0.8625] | [0.7676] | [0.3857] | [0.0000] | [0.6813] | [0.8733] | [0.2473] |
| Intercept | -2.1882 | | | -2.6903 | | | | -2.6686 |
| se | (0.6497) | | | (0.7589) | | | | (0.7988) |
| $p$-value | [0.0008] | | | [0.0004] | | | | [0.0008] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.3925 | 0.1013 | 0.1450 | 0.1272 | 0.6755 | 0.0825 | 0.1235 | 0.1063 |
| $F$-stat | | 113.7848 | 20.8182 | | | 33.5325 | 12.5712 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 180.4850 | 160.3203 | | | 105.3138 | 131.2064 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 1520.1492 | 795.2859 | | | 172.5815 | 302.3460 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| BP LM stat | | 18183.1404 | 12798.8011 | 17778.9041 | 5524.8183 | 21835.9400 | 19198.4821 | 22521.6809 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 108.2524 | 18.4349 | 105.2536 | 14.1032 | 121.6383 | 9.1044 | 121.8140 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $\chi^2$-stat | | 5202.5446 | 5075.9751 | 5227.3409 | 5239.3169 | 5218.1096 | 5099.4010 | 5250.2965 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of expected excess returns (i.e. $\%\mathrm{ER}^h_{i,t} = 100\frac{E_t(s_{i,t+h})-s_{i,t}}{s_{i,t}} - (ir_{i,t} - ir_{US,t})$) on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table 11: **Regression results for expected 12-month excess returns**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | -0.0011 | 0.0001 | 0.0001 | 0.0001 | 0.0006 | 0.0004 | 0.0005 | 0.0003 |
| se | (0.0010) | (0.0005) | (0.0006) | (0.0006) | (0.0000) | (0.0007) | (0.0007) | (0.0007) |
| $p$-value | [0.2728] | [0.8087] | [0.8698] | [0.9277] | [0.0000] | [0.5543] | [0.5084] | [0.6374] |
| GDP | -0.0018 | -0.0000 | -0.0002 | -0.0001 | -0.0013 | -0.0005 | -0.0024 | -0.0011 |
| se | (0.0006) | (0.0006) | (0.0004) | (0.0006) | (0.0000) | (0.0027) | (0.0025) | (0.0026) |
| $p$-value | [0.0021] | [0.9548] | [0.5826] | [0.8108] | [0.0000] | [0.8441] | [0.3341] | [0.6688] |
| Inflation | -0.0027 | -0.0017 | -0.0026 | -0.0018 | -0.0042 | -0.0046 | -0.0061 | -0.0047 |
| se | (0.0010) | (0.0008) | (0.0012) | (0.0008) | (0.0000) | (0.0011) | (0.0013) | (0.0012) |
| $p$-value | [0.0084] | [0.0262] | [0.0319] | [0.0236] | [0.0000] | [0.0001] | [0.0000] | [0.0000] |
| CA | -0.0038 | -0.0051 | -0.0030 | -0.0051 | -0.0019 | -0.0059 | -0.0035 | -0.0055 |
| se | (0.0017) | (0.0029) | (0.0029) | (0.0025) | (0.0000) | (0.0031) | (0.0030) | (0.0026) |
| $p$-value | [0.0254] | [0.0776] | [0.3008] | [0.0434] | [0.0000] | [0.0593] | [0.2536] | [0.0365] |
| Intercept | -2.5999 | | | -3.3091 | | | | -3.1531 |
| se | (0.6574) | | | (0.6684) | | | | (0.6878) |
| $p$-value | [0.0001] | | | [0.0000] | | | | [0.0000] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.1366 | 0.0302 | 0.0424 | 0.0339 | 0.5632 | 0.0270 | 0.0394 | 0.0301 |
| $F$-stat | | 66.2598 | 17.4662 | | | 25.5776 | 13.6305 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 151.3140 | 146.3981 | | | 97.4817 | 119.6216 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 135.5932 | 25.5269 | | | 54.3457 | 145.9922 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| BP LM stat | | 18253.6059 | 12205.4219 | 18243.1961 | 5516.5426 | 18315.2002 | 12344.0892 | 18468.9127 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 93.2623 | -3.5247 | 93.5314 | 0.1425 | 102.4533 | -2.7721 | 103.6993 |
| $p$-value | | [0.0000] | [0.0004] | [0.0000] | [0.8867] | [0.0000] | [0.0056] | [0.0000] |
| $\chi^2$-stat | | 4882.9883 | 4655.4453 | 4893.5839 | 4862.9378 | 4875.6748 | 4646.8634 | 4887.0176 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of expected excess returns (i.e. $\%\text{ER}^h_{i,t} = 100\frac{E_t(s_{i,t+h})-s_{i,t}}{s_{i,t}} - (ir_{i,t} - ir_{US,t})$) on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table 12: **Regression results for 3-month forecast errors**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0002 | -0.0002 | -0.0004 | 0.0002 | -0.0008 | -0.0004 | -0.0007 | -0.0003 |
| se | (0.0003) | (0.0003) | (0.0003) | (0.0003) | (0.0000) | (0.0003) | (0.0003) | (0.0003) |
| $p$-value | [0.3936] | [0.5656] | [0.1961] | [0.4638] | [0.0000] | [0.2331] | [0.0370] | [0.2860] |
| GDP | 0.0011 | 0.0009 | 0.0004 | 0.0011 | -0.0027 | 0.0074 | 0.0020 | 0.0054 |
| se | (0.0007) | (0.0006) | (0.0004) | (0.0006) | (0.0000) | (0.0027) | (0.0026) | (0.0021) |
| $p$-value | [0.0978] | [0.1121] | [0.3571] | [0.0966] | [0.0000] | [0.0056] | [0.4392] | [0.0094] |
| Inflation | -0.0001 | -0.0005 | 0.0003 | -0.0001 | -0.0022 | 0.0025 | 0.0017 | 0.0028 |
| se | (0.0007) | (0.0005) | (0.0006) | (0.0006) | (0.0000) | (0.0006) | (0.0007) | (0.0006) |
| $p$-value | [0.8869] | [0.3560] | [0.5529] | [0.8461] | [0.0000] | [0.0000] | [0.0196] | [0.0000] |
| CA | 0.0016 | 0.0049 | 0.0061 | 0.0018 | 0.0099 | 0.0049 | 0.0068 | 0.0014 |
| se | (0.0010) | (0.0029) | (0.0022) | (0.0010) | (0.0000) | (0.0035) | (0.0026) | (0.0010) |
| $p$-value | [0.0882] | [0.0873] | [0.0046] | [0.0829] | [0.0000] | [0.1584] | [0.0094] | [0.1809] |
| Intercept | 0.2715 | | | 0.3101 | | | | 0.1144 |
| se | (0.2795) | | | (0.2909) | | | | (0.2880) |
| $p$-value | [0.3315] | | | [0.2865] | | | | [0.6913] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6525 | 6525 | 6525 | 6525 | 6525 | 6525 | 6525 | 6525 |
| $R^2$ | 0.0051 | 0.0063 | 0.0117 | 0.0047 | 0.5232 | 0.0007 | 0.0083 | 0.0010 |
| $F$-stat | | 3.7918 | 17.4033 | | | -3.8783 | 16.4508 | |
| $p$-value | | [0.0000] | [0.0000] | | | [1.0000] | [0.0000] | |
| Honda LM stat | | 5.7922 | 83.2549 | | | 2.7434 | 83.7218 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0030] | [0.0000] | |
| Hausman stat | | 74.6823 | 247.9602 | | | 82.5624 | 227.2648 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| BP LM stat | | 23099.6028 | 6501.7216 | 23261.4921 | 4045.0386 | 22210.6681 | 6341.7176 | 22934.0803 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 138.2600 | -5.9288 | 138.7344 | -3.9369 | 134.6948 | -6.2390 | 137.7091 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0001] | [0.0000] | [0.0000] | [0.0000] |
| $\chi^2$-stat | | 3796.0250 | 3165.5206 | 3771.5251 | 3790.6930 | 3833.8264 | 3123.7608 | 3811.9200 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of relative exchange rate forecast percentage errors on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table 13: **Regression results for 12-month forecast errors**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0023 | 0.0014 | 0.0005 | 0.0017 | -0.0091 | 0.0008 | -0.0003 | 0.0012 |
| se | (0.0009) | (0.0009) | (0.0008) | (0.0009) | (0.0001) | (0.0012) | (0.0010) | (0.0013) |
| $p$-value | [0.0110] | [0.1017] | [0.5284] | [0.0507] | [0.0000] | [0.4920] | [0.7876] | [0.3635] |
| GDP | -0.0023 | -0.0030 | -0.0019 | -0.0028 | -0.0101 | -0.0151 | -0.0056 | -0.0125 |
| se | (0.0015) | (0.0019) | (0.0011) | (0.0017) | (0.0000) | (0.0086) | (0.0074) | (0.0070) |
| $p$-value | [0.1160] | [0.1117] | [0.0961] | [0.1075] | [0.0000] | [0.0797] | [0.4521] | [0.0734] |
| Inflation | 0.0011 | 0.0002 | 0.0023 | 0.0005 | 0.0029 | 0.0024 | 0.0061 | 0.0029 |
| se | (0.0020) | (0.0015) | (0.0016) | (0.0017) | (0.0001) | (0.0035) | (0.0026) | (0.0038) |
| $p$-value | [0.5918] | [0.8804] | [0.1474] | [0.7752] | [0.0000] | [0.4952] | [0.0199] | [0.4485] |
| CA | 0.0050 | 0.0230 | 0.0264 | 0.0117 | 0.0278 | 0.0258 | 0.0293 | 0.0118 |
| se | (0.0031) | (0.0100) | (0.0070) | (0.0057) | (0.0000) | (0.0112) | (0.0077) | (0.0059) |
| $p$-value | [0.1057] | [0.0208] | [0.0002] | [0.0404] | [0.0000] | [0.0218] | [0.0002] | [0.0445] |
| Intercept | 1.2306 | | | 2.4859 | | | | 2.8241 |
| se | (0.7186) | | | (1.0131) | | | | (1.0869) |
| $p$-value | [0.0868] | | | [0.0142] | | | | [0.0094] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6264 | 6264 | 6264 | 6264 | 6264 | 6264 | 6264 | 6264 |
| $R^2$ | 0.0380 | 0.0346 | 0.0620 | 0.0284 | 0.5940 | 0.0219 | 0.0557 | 0.0181 |
| $F$-stat | | 10.3294 | 19.1544 | | | 1.6143 | 17.1388 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0024] | [0.0000] | |
| Honda LM stat | | 18.3394 | 88.8549 | | | 17.0371 | 89.2166 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 109.7496 | 280.7318 | | | 102.5094 | 629.6001 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| BP LM stat | | 23437.8886 | 6454.0020 | 23871.0719 | 5481.6003 | 22259.5762 | 6236.3675 | 23071.0980 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 140.0233 | -5.6193 | 141.4329 | -3.4945 | 133.3747 | -5.9702 | 136.6292 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0005] | [0.0000] | [0.0000] | [0.0000] |
| $\chi^2$-stat | | 5045.8325 | 4661.7654 | 5069.5022 | 5122.9707 | 5046.5330 | 4672.4053 | 5074.2185 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of relative exchange rate forecast percentage errors on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

# Appendix

In the following, we provide additional findings, which include:

A Forecast evaluation of survey mean exchange rate forecasts for each individual currency, which are provided in absolute terms (see Table A.1) and also relative to the random walk benchmark (see Table A.2). Such a forecast evaluation is not provided for macro fundamentals forecasts due to different data availability issues. For example, actual GDP growth is usually provided on a quarterly and not a monthly frequency and is also revised several times. Therefore, we do not have the necessary real time data, which was available to the professional forecasters at the time the forecasts are made.

B Additional estimations carried out for the 6-month horizon (see Tables A.3 to A.7).

C Single-country regressions (see Tables A.8 and A.9).

The Appendix is provided for the reviewing process but does not necessarily need to be published. Additional estimations carried out using the raw expectations as regressors instead of their relative counterparts with respect to the US are not reported to save space but are also available upon request.

Table A.1: **Survey forecasts evaluation**

| | $h = 3$ | | | $h = 6$ | | | $h = 12$ | | |
|---|---|---|---|---|---|---|---|---|---|
| | **RMSE** | **MAE** | **MAPE** | **RMSE** | **MAE** | **MAPE** | **RMSE** | **MAE** | **MAPE** |
| UK | 0.0321 | 0.0239 | 3.6523 | 0.0461 | 0.0338 | 5.1727 | 0.0569 | 0.0436 | 6.6785 |
| CZ | 1.4794 | 1.1417 | 5.1939 | 1.9939 | 1.5735 | 7.2940 | 2.4507 | 1.9427 | 9.1106 |
| DK | 0.3084 | 0.2456 | 4.0603 | 0.4320 | 0.3553 | 5.9505 | 0.5535 | 0.4574 | 7.6408 |
| EU | 0.0414 | 0.0330 | 4.0638 | 0.0580 | 0.0476 | 5.9387 | 0.0738 | 0.0607 | 7.5562 |
| HU | 15.4169 | 12.0026 | 5.2770 | 21.0541 | 16.8383 | 7.5389 | 25.6190 | 21.5706 | 9.5492 |
| NO | 0.4593 | 0.3373 | 4.7666 | 0.6000 | 0.4686 | 6.6769 | 0.7965 | 0.6079 | 8.6067 |
| PL | 0.2310 | 0.1741 | 5.2461 | 0.3175 | 0.2314 | 7.1718 | 0.3831 | 0.2958 | 9.3183 |
| RU | 4.4577 | 2.4618 | 5.1524 | 5.4333 | 3.2159 | 6.9123 | 7.5761 | 4.7670 | 10.1323 |
| SE | 0.4796 | 0.3610 | 4.6224 | 0.6735 | 0.5200 | 6.6791 | 0.8509 | 0.6702 | 8.5549 |
| CH | 0.0556 | 0.0424 | 3.9059 | 0.0731 | 0.0559 | 5.2159 | 0.0942 | 0.0678 | 6.4700 |
| TR | 0.3049 | 0.1775 | 6.7460 | 0.4030 | 0.2387 | 9.3149 | 0.5659 | 0.3643 | 14.0705 |
| AU | 0.0852 | 0.0620 | 4.8342 | 0.1236 | 0.0913 | 7.1539 | 0.1547 | 0.1190 | 9.5177 |
| CN | 0.1170 | 0.0766 | 1.1284 | 0.1750 | 0.1160 | 1.7048 | 0.2503 | 0.1810 | 2.6755 |
| IN | 2.2358 | 1.5572 | 2.8551 | 3.2445 | 2.4046 | 4.3963 | 4.9408 | 3.8857 | 7.1314 |
| ID | 582.6073 | 394.2061 | 3.5444 | 833.7983 | 599.9245 | 5.4797 | 1104.2043 | 848.4110 | 7.7809 |
| JP | 5.2599 | 4.0961 | 3.9235 | 7.6192 | 5.9817 | 5.7877 | 10.9143 | 9.0974 | 8.8523 |
| NZ | 0.1014 | 0.0770 | 5.1775 | 0.1472 | 0.1082 | 7.2510 | 0.1938 | 0.1480 | 9.9986 |
| PH | 1.4157 | 1.1184 | 2.3263 | 2.0926 | 1.6301 | 3.3852 | 3.2468 | 2.6254 | 5.3994 |
| SG | 0.0391 | 0.0317 | 2.2222 | 0.0545 | 0.0433 | 3.0326 | 0.0697 | 0.0557 | 3.9765 |
| KR | 58.9229 | 39.7627 | 3.4559 | 87.9991 | 58.2640 | 5.0186 | 123.6973 | 79.1877 | 6.7966 |
| TW | 0.8627 | 0.6639 | 2.0950 | 1.2889 | 1.0199 | 3.2187 | 1.6400 | 1.3469 | 4.2869 |
| TH | 1.2252 | 0.9925 | 2.8625 | 1.7051 | 1.4261 | 4.0882 | 2.2420 | 1.9271 | 5.6137 |
| AR | 5.7545 | 1.2582 | 17.1339 | 6.3852 | 1.8804 | 20.6386 | 7.7948 | 3.2655 | 24.0841 |
| BR | 0.2926 | 0.1995 | 6.9068 | 0.4387 | 0.3161 | 11.0334 | 0.6071 | 0.4733 | 16.6706 |
| CA | 0.0566 | 0.0414 | 3.4371 | 0.0772 | 0.0585 | 4.8795 | 0.0985 | 0.0756 | 6.3706 |
| CL | 35.6411 | 26.9341 | 4.4496 | 52.0131 | 40.2227 | 6.5982 | 70.0856 | 55.3525 | 9.0836 |
| CO | 180.8277 | 128.6796 | 5.0539 | 242.9607 | 182.4110 | 7.1719 | 362.4639 | 276.9619 | 10.7072 |
| MX | 0.9845 | 0.6375 | 4.1744 | 1.2717 | 0.8354 | 5.4692 | 1.5996 | 1.1425 | 7.5681 |
| ZA | 0.9637 | 0.6872 | 6.7636 | 1.3495 | 0.9961 | 10.1026 | 1.9566 | 1.4293 | 15.2802 |

*Note:* The table reports three forecast accuracy diagnostics: the root mean squared error (RMSE), the mean absolute error (MAE) and the mean absolute percentage error (MAPE) given in %. These measures are provided for three forecast horizons of $h$ months and for 31 currencies against the US dollar of the following economies: Argentina (AR), Australia (AU), Brazil (BR), Canada (CA), Chile (CL), China (CN), Colombia (CO), the Czech Republic (CZ), Denmark (DK), the Euro Area (EU), Hong Kong (HK), Hungary (HU), India (IN), Indonesia (ID), Japan (JP), Korea (KR), Mexico (MX), New Zealand (NZ), Norway (NO), Philippines (PH), Poland (PL), Russia (RU), Singapore (SG), South Africa (ZA), Sweden (SE), Switzerland (CH), Taiwan (TW), Thailand (TH), Turkey (TR) and the UK.

Table A.2: **Survey forecasts evaluation relative to random walk forecasts**

| | $h = 3$ | | | | | $h = 6$ | | | | | $h = 12$ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **RMSE** | **MAE** | **MAPE** | **DM** | **p-value** | **RMSE** | **MAE** | **MAPE** | **DM** | **p-value** | **RMSE** | **MAE** | **MAPE** | **DM** | **p-value** |
| UK | 1.0384 | 1.0308 | 1.0299 | 2.0567 | 0.0409 | 1.0060 | 0.9800 | 0.9752 | 0.1647 | 0.8693 | 0.9420 | 0.9363 | 0.9235 | -1.0048 | 0.3161 |
| CZ | 1.0579 | 1.0618 | 1.0622 | 3.1361 | 0.0019 | 0.9854 | 1.0040 | 1.0164 | -0.2967 | 0.7670 | 0.9097 | 0.9071 | 0.9239 | -1.2710 | 0.2051 |
| DK | 1.0474 | 1.0953 | 1.0978 | 2.0531 | 0.0412 | 0.9928 | 1.0095 | 1.0191 | -0.1419 | 0.8873 | 0.8959 | 0.9234 | 0.9264 | -1.1987 | 0.2319 |
| EU | 1.0440 | 1.0888 | 1.0922 | 1.7158 | 0.0876 | 0.9910 | 1.0057 | 1.0150 | -0.1737 | 0.8623 | 0.8894 | 0.9131 | 0.9160 | -1.2397 | 0.2164 |
| HU | 1.0243 | 1.0306 | 1.0247 | 1.0975 | 0.2736 | 1.0066 | 1.0331 | 1.0374 | 0.1897 | 0.8497 | 0.9357 | 0.9501 | 0.9424 | -1.0249 | 0.3065 |
| NO | 1.0515 | 1.0409 | 1.0354 | 1.5594 | 0.1203 | 1.0014 | 1.0143 | 1.0058 | 0.0393 | 0.9687 | 0.9825 | 0.9726 | 0.9532 | -0.2744 | 0.7841 |
| PL | 1.0351 | 1.0198 | 1.0172 | 1.6946 | 0.0915 | 1.0011 | 1.0039 | 1.0062 | 0.0398 | 0.9683 | 0.9294 | 0.9164 | 0.9241 | -1.2586 | 0.2095 |
| RU | 1.0647 | 1.0449 | 1.0292 | 1.1416 | 0.2548 | 1.0053 | 1.0239 | 1.0181 | 0.1069 | 0.9150 | 0.9900 | 0.9922 | 1.0020 | -0.1175 | 0.9065 |
| SE | 1.0575 | 1.0526 | 1.0458 | 2.4319 | 0.0158 | 0.9920 | 1.0002 | 0.9949 | -0.2537 | 0.8000 | 0.9156 | 0.8933 | 0.8811 | -1.2664 | 0.2067 |
| CH | 1.0730 | 1.1016 | 1.1019 | 2.2090 | 0.0282 | 0.9956 | 1.0022 | 1.0159 | -0.0625 | 0.9502 | 0.9348 | 0.9212 | 0.9469 | -0.5527 | 0.5810 |
| TR | 1.0063 | 1.0492 | 1.1228 | 0.0858 | 0.9317 | 0.9670 | 0.9705 | 1.0907 | -0.4602 | 0.6458 | 0.9166 | 0.9521 | 1.1057 | -0.8825 | 0.3785 |
| AU | 1.0287 | 1.0508 | 1.0555 | 0.8907 | 0.3740 | 0.9925 | 1.0184 | 1.0288 | -0.2132 | 0.8314 | 0.9131 | 0.9135 | 0.9247 | -1.0009 | 0.3180 |
| CN | 0.9708 | 0.9845 | 0.9885 | -0.6016 | 0.5480 | 0.9110 | 0.8882 | 0.8922 | -0.9974 | 0.3196 | 0.8732 | 0.8534 | 0.8623 | -0.8209 | 0.4126 |
| IN | 1.0493 | 1.0262 | 1.0233 | 1.8762 | 0.0619 | 1.0852 | 1.0850 | 1.0814 | 2.2243 | 0.0271 | 1.1320 | 1.1415 | 1.1381 | 2.3393 | 0.0202 |
| ID | 1.0365 | 1.0699 | 1.0711 | 1.5101 | 0.1324 | 1.0612 | 1.0693 | 1.0687 | 2.2866 | 0.0232 | 1.0775 | 1.0656 | 1.0613 | 2.2408 | 0.0260 |
| JP | 1.0572 | 1.0915 | 1.0908 | 2.4189 | 0.0164 | 1.0868 | 1.1076 | 1.1116 | 1.6052 | 0.1099 | 1.1202 | 1.1883 | 1.1964 | 1.1202 | 0.2638 |
| NZ | 1.0176 | 1.0305 | 1.0419 | 0.4644 | 0.6428 | 0.9712 | 0.9998 | 1.0163 | -0.6910 | 0.4903 | 0.9102 | 0.9446 | 0.9583 | -0.9679 | 0.3342 |
| PH | 1.0507 | 1.0479 | 1.0429 | 1.4116 | 0.1594 | 1.0527 | 1.0401 | 1.0307 | 0.8171 | 0.4147 | 1.0856 | 1.0639 | 1.0432 | 0.8019 | 0.4235 |
| SG | 1.0500 | 1.0615 | 1.0604 | 1.4652 | 0.1442 | 1.0021 | 0.9619 | 0.9607 | 0.0340 | 0.9729 | 0.9480 | 0.9435 | 0.9537 | -0.5493 | 0.5833 |
| KR | 1.0146 | 1.0148 | 1.0149 | 1.0073 | 0.3148 | 1.0438 | 1.0431 | 1.0331 | 0.9764 | 0.3299 | 1.0488 | 0.9995 | 0.9852 | 0.7899 | 0.4304 |
| TW | 1.0736 | 1.0632 | 1.0597 | 2.2109 | 0.0280 | 1.1343 | 1.1525 | 1.1456 | 2.3231 | 0.0211 | 1.1517 | 1.1718 | 1.1657 | 1.4223 | 0.1564 |
| TH | 1.1306 | 1.1298 | 1.1268 | 2.0853 | 0.0382 | 1.0990 | 1.0882 | 1.0835 | 1.8380 | 0.0674 | 1.0791 | 1.1626 | 1.1540 | 0.9040 | 0.3670 |
| AR | 1.0291 | 0.8720 | 1.0063 | 0.5532 | 0.5807 | 0.9999 | 0.8085 | 1.0115 | -0.0020 | 0.9984 | 0.8918 | 0.8173 | 0.9333 | -1.2029 | 0.2303 |
| BR | 1.0577 | 1.0635 | 1.0600 | 2.8774 | 0.0044 | 1.0505 | 1.0833 | 1.0942 | 1.6295 | 0.1046 | 1.0429 | 1.0827 | 1.0996 | 1.1434 | 0.2541 |
| CA | 1.0497 | 1.0322 | 1.0304 | 1.6253 | 0.1055 | 1.0098 | 0.9984 | 0.9943 | 0.3141 | 0.7537 | 0.9361 | 0.9235 | 0.9219 | -1.2020 | 0.2307 |
| CL | 1.0221 | 1.0354 | 1.0313 | 0.9266 | 0.3551 | 1.0493 | 1.0339 | 1.0262 | 1.7354 | 0.0840 | 1.0506 | 1.0132 | 0.9972 | 0.9867 | 0.3249 |
| CO | 1.0143 | 1.0310 | 1.0233 | 0.5891 | 0.5564 | 1.0097 | 1.0192 | 1.0044 | 0.3455 | 0.7301 | 1.0367 | 1.0363 | 1.0202 | 0.7193 | 0.4727 |
| MX | 1.0095 | 1.0119 | 1.0093 | 0.4154 | 0.6782 | 1.0161 | 1.0113 | 1.0077 | 0.6363 | 0.5252 | 1.0144 | 0.9845 | 0.9794 | 0.2948 | 0.7684 |
| ZA | 1.0793 | 1.0925 | 1.0977 | 2.1787 | 0.0304 | 1.1304 | 1.0838 | 1.1039 | 1.2809 | 0.2016 | 1.1916 | 1.0972 | 1.1460 | 0.9135 | 0.3620 |

*Note:* The table reports five forecast accuracy diagnostics: the root mean squared error (RMSE), the mean absolute error (MAE) and the mean absolute percentage error (MAPE) given in %, the modified Diebold-Mariano test statistic (DM) following Harvey *et al.* (1997) and its p-value. The first three measures are computed for survey forecasts relative to random walk forecasts and imply that a value below (above) unity indicates superiority of survey (random walk) forecasts. The Diebold-Mariano test checks the null of equal forecast accuracy. These measures are provided for three forecast horizons of $h$ months and for 31 currencies against the US dollar of the following economies: Argentina (AR), Australia (AU), Brazil (BR), Canada (CA), Chile (CL), China (CN), Colombia (CO), the Czech Republic (CZ), Denmark (DK), the Euro Area (EU), Hong Kong (HK), Hungary (HU), India (IN), Indonesia (ID), Japan (JP), Korea (KR), Mexico (MX), New Zealand (NZ), Norway (NO), Philippines (PH), Poland (PL), Russia (RU), Singapore (SG), South Africa (ZA), Sweden (SE), Switzerland (CH), Taiwan (TW), Thailand (TH), Turkey (TR) and the UK.

Table A.3: **Regression results for 6-month mean forecasts**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0010 | 0.0008 | 0.0007 | 0.0008 | 0.0014 | 0.0007 | 0.0006 | 0.0007 |
| se | (0.0002) | (0.0003) | (0.0003) | (0.0003) | (0.0000) | (0.0003) | (0.0004) | (0.0003) |
| $p$-value | [0.0000] | [0.0027] | [0.0489] | [0.0016] | [0.0000] | [0.0134] | [0.1539] | [0.0102] |
| GDP | -0.0012 | -0.0007 | -0.0005 | -0.0008 | -0.0018 | -0.0050 | -0.0040 | -0.0050 |
| se | (0.0004) | (0.0004) | (0.0003) | (0.0004) | (0.0000) | (0.0014) | (0.0017) | (0.0013) |
| $p$-value | [0.0029] | [0.0451] | [0.1428] | [0.0361] | [0.0000] | [0.0003] | [0.0159] | [0.0002] |
| Inflation | 0.0009 | 0.0004 | 0.0007 | 0.0005 | 0.0016 | 0.0011 | 0.0015 | 0.0013 |
| se | (0.0003) | (0.0002) | (0.0003) | (0.0002) | (0.0000) | (0.0005) | (0.0007) | (0.0005) |
| $p$-value | [0.0127] | [0.0814] | [0.0119] | [0.0604] | [0.0000] | [0.0343] | [0.0238] | [0.0158] |
| CA | 0.0004 | -0.0032 | -0.0022 | -0.0021 | -0.0015 | -0.0033 | -0.0023 | -0.0020 |
| se | (0.0005) | (0.0011) | (0.0010) | (0.0009) | (0.0000) | (0.0012) | (0.0010) | (0.0009) |
| $p$-value | [0.4596] | [0.0041] | [0.0217] | [0.0142] | [0.0000] | [0.0062] | [0.0221] | [0.0221] |
| Intercept | -0.0624 | | | -0.3082 | | | | -0.2016 |
| se | (0.1482) | | | (0.2137) | | | | (0.2155) |
| $p$-value | [0.6736] | | | [0.1492] | | | | [0.3496] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.1884 | 0.0832 | 0.0726 | 0.0875 | 0.4850 | 0.0474 | 0.0430 | 0.0522 |
| $F$-stat | | 35.3897 | 13.0035 | | | 4.8186 | 9.5075 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 83.7167 | 100.9988 | | | 44.3412 | 74.6702 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 53.9108 | 46.0917 | | | 51.2429 | 52.2231 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| BP LM stat | | 14924.0436 | 12321.2077 | 15345.3462 | 5782.6332 | 13877.4043 | 10474.4198 | 14337.8509 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 84.5443 | -6.5613 | 85.5700 | -3.0381 | 81.3283 | -6.6165 | 82.9343 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0024] | [0.0000] | [0.0000] | [0.0000] |
| $\chi^2$-stat | | 3211.9265 | 2860.1299 | 3245.0292 | 3397.0452 | 3258.7175 | 2922.8685 | 3289.5806 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of expected percentage exchange rate changes on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table A.4: **Regression results for 6-month 2.5% quantile forecasts**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0010 | 0.0002 | 0.0003 | 0.0002 | 0.0007 | 0.0001 | 0.0003 | 0.0001 |
| se | (0.0005) | (0.0002) | (0.0002) | (0.0002) | (0.0000) | (0.0002) | (0.0003) | (0.0002) |
| $p$-value | [0.0364] | [0.1844] | [0.0742] | [0.1766] | [0.0000] | [0.4622] | [0.1757] | [0.4498] |
| GDP | 0.0013 | -0.0006 | 0.0003 | -0.0006 | -0.0031 | -0.0043 | 0.0025 | -0.0043 |
| se | (0.0017) | (0.0004) | (0.0004) | (0.0004) | (0.0000) | (0.0016) | (0.0027) | (0.0016) |
| $p$-value | [0.4429] | [0.0673] | [0.4002] | [0.0691] | [0.0000] | [0.0066] | [0.3588] | [0.0073] |
| Inflation | 0.0009 | 0.0002 | 0.0001 | 0.0002 | -0.0010 | 0.0006 | 0.0003 | 0.0006 |
| se | (0.0004) | (0.0002) | (0.0003) | (0.0002) | (0.0000) | (0.0005) | (0.0008) | (0.0005) |
| $p$-value | [0.0234] | [0.2895] | [0.7179] | [0.2848] | [0.0000] | [0.2253] | [0.7289] | [0.2197] |
| CA | -0.0013 | -0.0045 | -0.0030 | -0.0044 | -0.0010 | -0.0047 | -0.0031 | -0.0047 |
| se | (0.0017) | (0.0020) | (0.0015) | (0.0020) | (0.0000) | (0.0022) | (0.0017) | (0.0022) |
| $p$-value | [0.4212] | [0.0240] | [0.0506] | [0.0244] | [0.0000] | [0.0347] | [0.0717] | [0.0351] |
| Intercept | -5.1959 | | | -5.1208 | | | | -5.0740 |
| se | (1.5272) | | | (1.3173) | | | | (1.3839) |
| $p$-value | [0.0007] | | | [0.0001] | | | | [0.0002] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.0326 | 0.0135 | 0.0086 | 0.0134 | 0.5107 | 0.0071 | 0.0044 | 0.0071 |
| $F$-stat | | 538.5579 | 68.8308 | | | 271.9438 | 65.3589 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 586.6018 | 417.5666 | | | 572.1133 | 409.6576 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 3.4917 | 343.8154 | | | 11.0312 | 78.3847 | |
| $p$-value | | [0.4791] | [0.0000] | | | [0.0262] | [0.0000] | |
| BP LM stat | | 5706.8632 | 6367.8973 | 5715.2884 | 3058.9108 | 4925.6819 | 6035.2678 | 4932.2000 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 49.8577 | 5.3191 | 49.9225 | -3.3751 | 40.0179 | 3.7763 | 40.2060 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0007] | [0.0000] | [0.0002] | [0.0000] |
| $\chi^2$-stat | | 3964.3521 | 3953.8607 | 3980.4885 | 4014.1886 | 3925.1263 | 3907.2155 | 3942.0083 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of optimistic expected percentage exchange rate changes (proxied by the 2.5% quantile of forecasts) on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table A.5: **Regression results for 6-month 97.5% quantile forecasts**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0021 | 0.0013 | 0.0015 | 0.0013 | 0.0026 | 0.0013 | 0.0014 | 0.0013 |
| se | (0.0006) | (0.0004) | (0.0004) | (0.0004) | (0.0000) | (0.0004) | (0.0005) | (0.0004) |
| $p$-value | [0.0002] | [0.0013] | [0.0003] | [0.0012] | [0.0000] | [0.0024] | [0.0038] | [0.0023] |
| GDP | -0.0000 | -0.0006 | -0.0004 | -0.0006 | -0.0057 | -0.0058 | -0.0034 | -0.0058 |
| se | (0.0019) | (0.0004) | (0.0005) | (0.0004) | (0.0000) | (0.0017) | (0.0032) | (0.0017) |
| $p$-value | [0.9841] | [0.1071] | [0.3942] | [0.1084] | [0.0000] | [0.0005] | [0.2996] | [0.0006] |
| Inflation | 0.0012 | 0.0004 | 0.0007 | 0.0004 | -0.0002 | 0.0008 | 0.0017 | 0.0008 |
| se | (0.0006) | (0.0004) | (0.0005) | (0.0004) | (0.0000) | (0.0008) | (0.0008) | (0.0008) |
| $p$-value | [0.0294] | [0.2139] | [0.1634] | [0.2112] | [0.0000] | [0.3651] | [0.0378] | [0.3588] |
| CA | -0.0001 | -0.0040 | -0.0034 | -0.0040 | -0.0019 | -0.0041 | -0.0035 | -0.0040 |
| se | (0.0018) | (0.0021) | (0.0018) | (0.0020) | (0.0000) | (0.0023) | (0.0019) | (0.0023) |
| $p$-value | [0.9502] | [0.0493] | [0.0634] | [0.0506] | [0.0000] | [0.0801] | [0.0651] | [0.0818] |
| Intercept | 1.8649 | | | 1.7075 | | | | 1.8522 |
| se | (1.6256) | | | (1.3819) | | | | (1.4524) |
| $p$-value | [0.2514] | | | [0.2167] | | | | [0.2023] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.0837 | 0.0620 | 0.0650 | 0.0619 | 0.4816 | 0.0382 | 0.0529 | 0.0382 |
| $F$-stat | | 428.7049 | 55.4794 | | | 207.8996 | 51.1977 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 548.8239 | 391.5880 | | | 550.1557 | 393.1507 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 1.8104 | 7.8289 | | | 10.8306 | 67.7797 | |
| $p$-value | | [0.7706] | [0.0980] | | | [0.0285] | [0.0000] | |
| BP LM stat | | 8738.9649 | 7494.0934 | 8744.8027 | 3161.0903 | 8384.8586 | 6383.8891 | 8390.3738 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 60.1431 | 2.8413 | 60.1767 | -0.6458 | 60.7906 | 2.4058 | 60.8311 |
| $p$-value | | [0.0000] | [0.0045] | [0.0000] | [0.5184] | [0.0000] | [0.0161] | [0.0000] |
| $\chi^2$-stat | | 3566.4749 | 3595.8343 | 3583.4847 | 3698.7409 | 3525.7135 | 3551.8380 | 3543.7587 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of pessimistic expected percentage exchange rate changes (proxied by the 97.5% quantile of forecasts) on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table A.6: **Regression results for expected 6-month excess returns**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | -0.0018 | -0.0004 | -0.0005 | -0.0006 | -0.0015 | -0.0001 | -0.0000 | -0.0002 |
| se | (0.0006) | (0.0003) | (0.0004) | (0.0004) | (0.0000) | (0.0005) | (0.0005) | (0.0005) |
| $p$-value | [0.0060] | [0.1913] | [0.2056] | [0.1191] | [0.0000] | [0.8278] | [0.9316] | [0.6844] |
| GDP | -0.0010 | 0.0003 | 0.0004 | 0.0002 | -0.0002 | 0.0009 | 0.0004 | 0.0002 |
| se | (0.0005) | (0.0007) | (0.0005) | (0.0006) | (0.0000) | (0.0029) | (0.0029) | (0.0028) |
| $p$-value | [0.0565] | [0.6291] | [0.4971] | [0.7416] | [0.0000] | [0.7708] | [0.8787] | [0.9452] |
| Inflation | -0.0032 | -0.0020 | -0.0031 | -0.0021 | -0.0045 | -0.0055 | -0.0073 | -0.0057 |
| se | (0.0012) | (0.0009) | (0.0014) | (0.0009) | (0.0000) | (0.0014) | (0.0015) | (0.0015) |
| $p$-value | [0.0068] | [0.0252] | [0.0261] | [0.0218] | [0.0000] | [0.0001] | [0.0000] | [0.0001] |
| CA | -0.0041 | -0.0027 | -0.0008 | -0.0034 | -0.0023 | -0.0034 | -0.0011 | -0.0038 |
| se | (0.0015) | (0.0030) | (0.0032) | (0.0024) | (0.0000) | (0.0031) | (0.0031) | (0.0025) |
| $p$-value | [0.0074] | [0.3675] | [0.8089] | [0.1669] | [0.0000] | [0.2819] | [0.7342] | [0.1242] |
| Intercept | -2.3922 | | | -2.9853 | | | | -2.8491 |
| se | (0.6608) | | | (0.7163) | | | | (0.7368) |
| $p$-value | [0.0003] | | | [0.0000] | | | | [0.0001] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 | 6612 |
| $R^2$ | 0.2900 | 0.0590 | 0.0928 | 0.0736 | 0.5973 | 0.0518 | 0.0839 | 0.0640 |
| $F$-stat | | 90.9831 | 19.4043 | | | 31.0172 | 14.0758 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 168.8363 | 155.8166 | | | 100.9627 | 126.6526 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 1341.7908 | 29470.1815 | | | 102.8728 | 255.1324 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| BP LM stat | | 17419.4329 | 9821.7903 | 17159.3582 | 4128.6884 | 19472.8097 | 13875.1891 | 19747.7556 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 100.2344 | 4.2662 | 99.6336 | 6.5551 | 114.3828 | 3.2374 | 115.3853 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0012] | [0.0000] |
| $\chi^2$-stat | | 4733.4735 | 4504.3227 | 4758.5382 | 4728.6469 | 4804.5572 | 4602.1061 | 4832.8684 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of expected excess returns (i.e. $\%\text{ER}^h_{i,t} = 100\frac{E_t(s_{i,t+h})-s_{i,t}}{s_{i,t}} - (ir_{i,t} - ir_{US,t})$) on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table A.7: **Regression results for 6-month forecast errors**

| | **Pooled** | **FE** | **FE** | **RE** | **CCEMG** | **FE-IV** | **FE-IV** | **RE-IV** |
|---|---|---|---|---|---|---|---|---|
| IR | 0.0006 | -0.0001 | -0.0000 | 0.0003 | -0.0041 | -0.0004 | -0.0001 | -0.0001 |
| se | (0.0003) | (0.0002) | (0.0004) | (0.0003) | (0.0000) | (0.0003) | (0.0004) | (0.0003) |
| $p$-value | [0.0482] | [0.7281] | [0.9873] | [0.2547] | [0.0000] | [0.2403] | [0.8626] | [0.7618] |
| GDP | -0.0005 | -0.0010 | 0.0003 | -0.0007 | -0.0087 | 0.0025 | 0.0086 | 0.0028 |
| se | (0.0007) | (0.0009) | (0.0010) | (0.0008) | (0.0000) | (0.0036) | (0.0050) | (0.0029) |
| $p$-value | [0.4694] | [0.2815] | [0.7366] | [0.3617] | [0.0000] | [0.4818] | [0.0855] | [0.3308] |
| Inflation | -0.0009 | -0.0015 | -0.0003 | -0.0012 | -0.0044 | 0.0003 | -0.0005 | 0.0009 |
| se | (0.0009) | (0.0007) | (0.0007) | (0.0009) | (0.0000) | (0.0010) | (0.0012) | (0.0011) |
| $p$-value | [0.3475] | [0.0325] | [0.6468] | [0.1720] | [0.0000] | [0.7726] | [0.7123] | [0.4217] |
| CA | 0.0034 | 0.0123 | 0.0130 | 0.0053 | 0.0201 | 0.0129 | 0.0148 | 0.0051 |
| se | (0.0017) | (0.0052) | (0.0037) | (0.0025) | (0.0000) | (0.0061) | (0.0046) | (0.0026) |
| $p$-value | [0.0521] | [0.0185] | [0.0004] | [0.0310] | [0.0000] | [0.0335] | [0.0012] | [0.0506] |
| Intercept | 0.8316 | | | 1.2739 | | | | 1.1308 |
| se | (0.4134) | | | (0.5009) | | | | (0.5222) |
| $p$-value | [0.0443] | | | [0.0110] | | | | [0.0304] |
| Country effects | no | yes | yes | no | no | yes | yes | no |
| Time effects | no | no | yes | no | no | no | yes | no |
| $N$ | 6438 | 6438 | 6438 | 6438 | 6438 | 6438 | 6438 | 6438 |
| $R^2$ | 0.0088 | 0.0172 | 0.0234 | 0.0093 | 0.5726 | 0.0081 | 0.0112 | 0.0011 |
| $F$-stat | | 6.8982 | 19.5458 | | | 4.9424 | 17.3281 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Honda LM stat | | 12.1615 | 91.5316 | | | 8.3531 | 92.8469 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| Hausman stat | | 98.0925 | 733.9962 | | | 99.8209 | 185.1727 | |
| $p$-value | | [0.0000] | [0.0000] | | | [0.0000] | [0.0000] | |
| BP LM stat | | 24730.4864 | 6976.0413 | 25428.1597 | 4541.0630 | 25413.1326 | 6161.4016 | 26138.1691 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |
| $CD$-stat | | 143.5255 | -5.7018 | 145.9085 | -2.6401 | 146.7331 | -6.7006 | 148.9047 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0083] | [0.0000] | [0.0000] | [0.0000] |
| $\chi^2$-stat | | 4564.8569 | 3920.1506 | 4570.2769 | 4559.0038 | 4716.7953 | 4078.7047 | 4730.0020 |
| $p$-value | | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] | [0.0000] |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Arellano (1987), $p$-values, the (incremental) $R^2$ and the number of observations ($N$) for a regression of relative exchange rate forecast percentage errors on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). Estimations are carried out for a pooled model, a fixed effects (FE) model including country fixed effects, a FE model including country and time fixed effects, a random effects (RE) model, the common correlated effects mean group (CCEMG) estimator following Pesaran (2006), a fixed effects instrumental variable (FE-IV) model including country fixed effects, a FE-IV model including country and time fixed effects and a RE-IV model. We use one-period lags of all regressors as instruments. The table also provides several specification tests: $F$-stat gives the $F$ test statistic for testing for country and time fixed effects, Honda LM stat reports the LM test statistic provided by Honda (1985) for testing for country and time fixed effects, Hausman stat gives the Hausman $\chi^2$ test statistic, BP LM stat reports the Breusch-Pagan LM test statistic for testing for cross-sectional dependence, $CD$-stat reports the test statistic of the Pesaran (2004) cross-sectional dependence test and $\chi^2$-stat gives the Breusch-Godfrey-Wooldridge test statistic for serial correlation.

Table A.8: **Single-country regression results for 3-month mean forecasts**

| | IR | se | *p*-value | GDP | se | *p*-value | INF | se | *p*-value | CA | se | *p*-value | Intercept | se | *p*-value | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UK | 0.0005 | (0.0011) | [0.6401] | -0.0000 | (0.0007) | [0.9801] | 0.0008 | (0.0005) | [0.1344] | 0.0046 | (0.0018) | [0.0097] | 0.2236 | (0.1355) | [0.1004] | 0.0468 |
| CZ | -0.0014 | (0.0018) | [0.4435] | -0.0028 | (0.0014) | [0.0472] | -0.0011 | (0.0003) | [0.0001] | 0.0000 | (0.0026) | [0.9904] | 0.4068 | (0.1991) | [0.0422] | 0.0556 |
| DK | 0.0019 | (0.0010) | [0.0523] | 0.0016 | (0.0005) | [0.0020] | -0.0002 | (0.0005) | [0.6476] | -0.0042 | (0.0013) | [0.0019] | -0.6837 | (0.3362) | [0.0432] | 0.0837 |
| EU | 0.0030 | (0.0011) | [0.0047] | -0.0006 | (0.0023) | [0.8043] | -0.0010 | (0.0003) | [0.0008] | -0.0094 | (0.0034) | [0.0058] | -1.0961 | (0.5052) | [0.0311] | 0.0802 |
| HU | 0.0005 | (0.0002) | [0.0007] | 0.0001 | (0.0002) | [0.6903] | -0.0003 | (0.0001) | [0.0033] | -0.0044 | (0.0010) | [0.0000] | -0.3183 | (0.1504) | [0.0354] | 0.1725 |
| NO | -0.0008 | (0.0004) | [0.0318] | -0.0036 | (0.0011) | [0.0011] | 0.0004 | (0.0003) | [0.1615] | -0.0024 | (0.0009) | [0.0083] | -1.2534 | (0.3630) | [0.0007] | 0.0542 |
| PL | 0.0009 | (0.0003) | [0.0021] | -0.0012 | (0.0007) | [0.0768] | -0.0003 | (0.0002) | [0.1246] | -0.0016 | (0.0029) | [0.5948] | -0.0590 | (0.2445) | [0.8096] | 0.1010 |
| RU | 0.0003 | (0.0001) | [0.0043] | -0.0003 | (0.0006) | [0.6321] | -0.0001 | (0.0000) | [0.0015] | -0.0044 | (0.0019) | [0.0248] | -0.6344 | (0.4913) | [0.1980] | 0.1016 |
| SE | -0.0004 | (0.0003) | [0.2199] | 0.0023 | (0.0008) | [0.0055] | -0.0017 | (0.0020) | [0.3973] | -0.0027 | (0.0020) | [0.1910] | -0.9827 | (0.5519) | [0.0763] | 0.0376 |
| CH | 0.0014 | (0.0015) | [0.3543] | -0.0075 | (0.0034) | [0.0311] | -0.0088 | (0.0024) | [0.0004] | -0.0030 | (0.0012) | [0.0128] | -1.8358 | (0.5433) | [0.0009] | 0.1100 |
| TR | 0.0002 | (0.0001) | [0.0804] | -0.0007 | (0.0013) | [0.5895] | 0.0002 | (0.0005) | [0.7298] | -0.0046 | (0.0022) | [0.0340] | 0.9854 | (0.2841) | [0.0006] | 0.0746 |
| AU | 0.0011 | (0.0003) | [0.0000] | 0.0002 | (0.0006) | [0.7758] | -0.0003 | (0.0005) | [0.4997] | 0.0029 | (0.0025) | [0.2426] | -0.2889 | (0.1986) | [0.1471] | 0.1551 |
| CN | -0.0001 | (0.0001) | [0.3967] | 0.0000 | (0.0000) | [0.1251] | -0.0009 | (0.0003) | [0.0038] | 0.0038 | (0.0012) | [0.0021] | 0.5870 | (0.2197) | [0.0081] | 0.1566 |
| IN | -0.0002 | (0.0001) | [0.0103] | -0.0001 | (0.0001) | [0.2634] | 0.0002 | (0.0001) | [0.0713] | 0.0026 | (0.0017) | [0.1233] | 0.1390 | (0.1617) | [0.3910] | 0.0473 |
| ID | -0.0002 | (0.0001) | [0.0788] | 0.0000 | (0.0002) | [0.9915] | -0.0001 | (0.0001) | [0.1908] | 0.0063 | (0.0015) | [0.0000] | 0.4587 | (0.2134) | [0.0327] | 0.1529 |
| JP | 0.0189 | (0.0043) | [0.0000] | 0.0000 | (0.0006) | [0.9863] | 0.0010 | (0.0009) | [0.2786] | -0.0064 | (0.0039) | [0.1027] | 0.6403 | (0.5887) | [0.2780] | 0.1604 |
| NZ | 0.0013 | (0.0003) | [0.0001] | -0.0003 | (0.0026) | [0.9243] | 0.0000 | (0.0012) | [0.9902] | 0.0014 | (0.0023) | [0.5596] | -0.4241 | (0.1860) | [0.0236] | 0.1226 |
| PH | -0.0002 | (0.0002) | [0.2018] | -0.0001 | (0.0002) | [0.7567] | -0.0003 | (0.0001) | [0.0384] | -0.0001 | (0.0017) | [0.9444] | 0.2042 | (0.2309) | [0.3773] | 0.0555 |
| SG | 0.0008 | (0.0018) | [0.6624] | -0.0003 | (0.0012) | [0.8144] | -0.0010 | (0.0003) | [0.0017] | -0.0015 | (0.0005) | [0.0084] | -1.1855 | (0.3870) | [0.0025] | 0.1752 |
| KR | -0.0008 | (0.0002) | [0.0001] | 0.0008 | (0.0008) | [0.3297] | 0.0001 | (0.0002) | [0.6955] | -0.0042 | (0.0009) | [0.0000] | -0.8937 | (0.2412) | [0.0003] | 0.1468 |
| TW | -0.0012 | (0.0004) | [0.0066] | 0.0005 | (0.0004) | [0.2873] | 0.0008 | (0.0006) | [0.2203] | -0.0023 | (0.0005) | [0.0000] | -1.0508 | (0.1923) | [0.0000] | 0.2289 |
| TH | -0.0001 | (0.0004) | [0.7076] | 0.0000 | (0.0004) | [0.9283] | 0.0017 | (0.0007) | [0.0207] | -0.0009 | (0.0010) | [0.3960] | -0.1317 | (0.3383) | [0.6974] | 0.0149 |
| AR | 0.0005 | (0.0002) | [0.0004] | -0.0026 | (0.0032) | [0.4147] | 0.0001 | (0.0002) | [0.7219] | 0.0058 | (0.0031) | [0.0580] | 1.3177 | (0.5186) | [0.0117] | 0.3230 |
| BR | 0.0002 | (0.0001) | [0.0736] | -0.0031 | (0.0009) | [0.0006] | 0.0004 | (0.0002) | [0.0421] | -0.0054 | (0.0033) | [0.0978] | -0.1386 | (0.3238) | [0.6691] | 0.1096 |
| CA | 0.0011 | (0.0009) | [0.2190] | 0.0010 | (0.0043) | [0.8111] | 0.0002 | (0.0005) | [0.7748] | 0.0008 | (0.0013) | [0.5337] | -0.1521 | (0.1346) | [0.2595] | 0.0217 |
| CL | 0.0001 | (0.0001) | [0.3266] | -0.0012 | (0.0003) | [0.0003] | 0.0000 | (0.0002) | [0.8186] | 0.0017 | (0.0007) | [0.0113] | 0.3055 | (0.1044) | [0.0038] | 0.0534 |
| CO | 0.0001 | (0.0002) | [0.4713] | -0.0041 | (0.0009) | [0.0000] | 0.0001 | (0.0002) | [0.5198] | 0.0013 | (0.0021) | [0.5346] | 0.2282 | (0.1863) | [0.2218] | 0.1229 |
| MX | -0.0008 | (0.0001) | [0.0000] | -0.0008 | (0.0006) | [0.2462] | -0.0001 | (0.0001) | [0.0872] | 0.0004 | (0.0014) | [0.7459] | 0.6622 | (0.1550) | [0.0000] | 0.1532 |
| ZA | 0.0004 | (0.0002) | [0.0702] | -0.0018 | (0.0014) | [0.1851] | 0.0001 | (0.0001) | [0.1628] | -0.0022 | (0.0024) | [0.3508] | 0.4697 | (0.2217) | [0.0352] | 0.0337 |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Newey and West (1994), *p*-values and the $R^2$ for single-country regressions of expected percentage exchange rate changes on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). The table includes estimations for the following economies: Argentina (AR), Australia (AU), Brazil (BR), Canada (CA), Chile (CL), China (CN), Colombia (CO), the Czech Republic (CZ), Denmark (DK), the Euro Area (EU), Hong Kong (HK), Hungary (HU), India (IN), Indonesia (ID), Japan (JP), Korea (KR), Mexico (MX), New Zealand (NZ), Norway (NO), Philippines (PH), Poland (PL), Russia (RU), Singapore (SG), South Africa (ZA), Sweden (SE), Switzerland (CH), Taiwan (TW), Thailand (TH), Turkey (TR) and the UK.

Table A.9: **Single-country regression results for 12-month mean forecasts**

| | IR | se | $p$-value | GDP | se | $p$-value | INF | se | $p$-value | CA | se | $p$-value | Intercept | se | $p$-value | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UK | 0.0019 | (0.0058) | [0.7490] | -0.0017 | (0.0013) | [0.2119] | 0.0032 | (0.0019) | [0.0885] | 0.0117 | (0.0055) | [0.0343] | 0.1100 | (0.4844) | [0.8205] | 0.0660 |
| CZ | -0.0103 | (0.0110) | [0.3538] | -0.0023 | (0.0037) | [0.5222] | -0.0004 | (0.0009) | [0.6676] | 0.0021 | (0.0103) | [0.8376] | 0.8142 | (0.9078) | [0.3707] | 0.0320 |
| DK | 0.0132 | (0.0065) | [0.0424] | -0.0007 | (0.0023) | [0.7542] | -0.0009 | (0.0014) | [0.5408] | -0.0124 | (0.0092) | [0.1800] | -2.5662 | (2.5155) | [0.3088] | 0.1048 |
| EU | 0.0110 | (0.0054) | [0.0443] | -0.0004 | (0.0084) | [0.9635] | -0.0022 | (0.0012) | [0.0625] | -0.0227 | (0.0196) | [0.2489] | -2.7357 | (2.9826) | [0.3600] | 0.0641 |
| HU | 0.0022 | (0.0011) | [0.0529] | -0.0017 | (0.0011) | [0.1322] | -0.0004 | (0.0008) | [0.5817] | -0.0159 | (0.0055) | [0.0043] | -1.1722 | (0.8567) | [0.1726] | 0.2675 |
| NO | -0.0041 | (0.0019) | [0.0290] | 0.0028 | (0.0080) | [0.7268] | 0.0011 | (0.0009) | [0.2243] | -0.0126 | (0.0029) | [0.0000] | -6.8819 | (1.1902) | [0.0000] | 0.1879 |
| PL | 0.0017 | (0.0017) | [0.3262] | 0.0024 | (0.0024) | [0.3293] | -0.0006 | (0.0011) | [0.5897] | 0.0222 | (0.0093) | [0.0184] | 1.1202 | (0.9802) | [0.2543] | 0.1359 |
| RU | 0.0011 | (0.0009) | [0.2424] | -0.0017 | (0.0021) | [0.4209] | -0.0002 | (0.0002) | [0.1706] | -0.0093 | (0.0086) | [0.2835] | -0.2776 | (2.5059) | [0.9119] | 0.0656 |
| SE | -0.0028 | (0.0020) | [0.1661] | 0.0093 | (0.0070) | [0.1845] | 0.0123 | (0.0053) | [0.0217] | -0.0252 | (0.0041) | [0.0000] | -8.0824 | (1.1737) | [0.0000] | 0.2725 |
| CH | 0.0183 | (0.0062) | [0.0033] | 0.0343 | (0.0120) | [0.0046] | -0.0285 | (0.0096) | [0.0033] | -0.0170 | (0.0034) | [0.0000] | -6.1945 | (1.3584) | [0.0000] | 0.3674 |
| TR | 0.0005 | (0.0004) | [0.1531] | 0.0005 | (0.0033) | [0.8903] | 0.0019 | (0.0020) | [0.3238] | -0.0257 | (0.0080) | [0.0015] | 5.6077 | (1.0233) | [0.0000] | 0.2736 |
| AU | 0.0035 | (0.0012) | [0.0055] | 0.0008 | (0.0040) | [0.8452] | -0.0015 | (0.0009) | [0.0909] | 0.0193 | (0.0080) | [0.0161] | -0.6576 | (0.8042) | [0.4144] | 0.1268 |
| CN | -0.0004 | (0.0006) | [0.4732] | 0.0001 | (0.0001) | [0.1548] | -0.0036 | (0.0013) | [0.0065] | 0.0164 | (0.0066) | [0.0135] | 2.3311 | (1.2985) | [0.0740] | 0.1630 |
| IN | -0.0006 | (0.0005) | [0.1970] | -0.0004 | (0.0002) | [0.0244] | 0.0003 | (0.0004) | [0.5284] | 0.0085 | (0.0066) | [0.1999] | -0.2980 | (0.6468) | [0.6455] | 0.0291 |
| ID | -0.0014 | (0.0004) | [0.0001] | 0.0004 | (0.0003) | [0.2171] | -0.0000 | (0.0002) | [0.9732] | 0.0283 | (0.0034) | [0.0000] | 1.6959 | (0.5371) | [0.0018] | 0.4505 |
| JP | 0.0862 | (0.0336) | [0.0110] | -0.0016 | (0.0028) | [0.5632] | 0.0046 | (0.0039) | [0.2357] | -0.0197 | (0.0189) | [0.2991] | 4.8186 | (2.6632) | [0.0717] | 0.1938 |
| NZ | 0.0032 | (0.0015) | [0.0280] | 0.0047 | (0.0094) | [0.6190] | -0.0016 | (0.0031) | [0.6028] | 0.0181 | (0.0087) | [0.0384] | -1.2345 | (0.6946) | [0.0769] | 0.1697 |
| PH | -0.0010 | (0.0007) | [0.1676] | -0.0001 | (0.0009) | [0.9183] | -0.0006 | (0.0004) | [0.0929] | 0.0049 | (0.0067) | [0.4604] | 0.7726 | (0.9443) | [0.4141] | 0.0670 |
| SG | -0.0074 | (0.0077) | [0.3358] | -0.0014 | (0.0025) | [0.5743] | -0.0015 | (0.0006) | [0.0125] | -0.0069 | (0.0012) | [0.0000] | -5.9750 | (0.7160) | [0.0000] | 0.3869 |
| KR | -0.0019 | (0.0008) | [0.0169] | 0.0015 | (0.0033) | [0.6581] | -0.0002 | (0.0009) | [0.8078] | -0.0204 | (0.0031) | [0.0000] | -5.5339 | (0.8868) | [0.0000] | 0.4592 |
| TW | -0.0056 | (0.0018) | [0.0016] | 0.0021 | (0.0016) | [0.1744] | 0.0048 | (0.0023) | [0.0331] | -0.0109 | (0.0014) | [0.0000] | -5.4815 | (0.4369) | [0.0000] | 0.5411 |
| TH | -0.0012 | (0.0017) | [0.5077] | 0.0009 | (0.0020) | [0.6431] | 0.0092 | (0.0036) | [0.0115] | -0.0065 | (0.0036) | [0.0738] | -1.9903 | (1.2860) | [0.1231] | 0.0699 |
| AR | 0.0021 | (0.0003) | [0.0000] | -0.0126 | (0.0066) | [0.0586] | 0.0006 | (0.0006) | [0.3128] | 0.0265 | (0.0100) | [0.0090] | 8.2602 | (1.5018) | [0.0000] | 0.6008 |
| BR | -0.0002 | (0.0007) | [0.7461] | -0.0091 | (0.0033) | [0.0067] | 0.0016 | (0.0009) | [0.0610] | -0.0143 | (0.0120) | [0.2341] | 1.2630 | (1.0183) | [0.2161] | 0.1512 |
| CA | -0.0009 | (0.0035) | [0.7914] | 0.0082 | (0.0126) | [0.5178] | -0.0025 | (0.0014) | [0.0886] | 0.0019 | (0.0044) | [0.6640] | -0.3618 | (0.4602) | [0.4327] | 0.0133 |
| CL | 0.0003 | (0.0006) | [0.6361] | -0.0035 | (0.0019) | [0.0680] | -0.0002 | (0.0003) | [0.5450] | 0.0076 | (0.0026) | [0.0037] | 0.7527 | (0.4433) | [0.0909] | 0.0768 |
| CO | 0.0001 | (0.0009) | [0.8716] | -0.0106 | (0.0052) | [0.0436] | 0.0009 | (0.0008) | [0.2774] | 0.0053 | (0.0109) | [0.6286] | 0.8765 | (0.9502) | [0.3573] | 0.1039 |
| MX | -0.0039 | (0.0008) | [0.0000] | -0.0030 | (0.0020) | [0.1367] | -0.0006 | (0.0004) | [0.1103] | -0.0000 | (0.0051) | [0.9950] | 2.4011 | (0.6452) | [0.0003] | 0.2618 |
| ZA | 0.0010 | (0.0015) | [0.5003] | -0.0003 | (0.0028) | [0.9166] | 0.0003 | (0.0003) | [0.3715] | -0.0128 | (0.0067) | [0.0574] | 3.7566 | (0.6977) | [0.0000] | 0.0391 |

*Note:* The table reports coefficient estimates, robust standard errors (se) with respect to heteroskedasticity and serial correlation according to Newey and West (1994), $p$-values and the $R^2$ for single-country regressions of expected percentage exchange rate changes on interest rate expectations relative to the US (IR), GDP growth expectations relative to the US (GDP), inflation expectations relative to the US (Inflation) and current account to GDP ratio expectations relative to the US (CA). The table includes estimations for the following economies: Argentina (AR), Australia (AU), Brazil (BR), Canada (CA), Chile (CL), China (CN), Colombia (CO), the Czech Republic (CZ), Denmark (DK), the Euro Area (EU), Hong Kong (HK), Hungary (HU), India (IN), Indonesia (ID), Japan (JP), Korea (KR), Mexico (MX), New Zealand (NZ), Norway (NO), Philippines (PH), Poland (PL), Russia (RU), Singapore (SG), South Africa (ZA), Sweden (SE), Switzerland (CH), Taiwan (TW), Thailand (TH), Turkey (TR) and the UK.