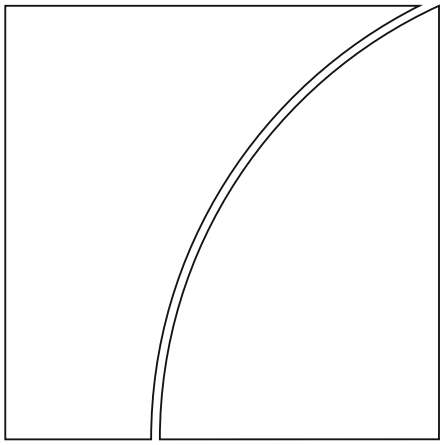

BIS Working Papers

No 1080

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by Julián Caballero and Blaise Gadanecz

Monetary and Economic Department

March 2023

JEL classification: E52, E58.

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This publication is available on the BIS website (www.bis.org).

ISSN 1020-0959 (print)
ISSN 1682-7678 (online)

Did interest rate guidance in emerging markets work?*

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February, 2023

Abstract

This paper studies the experience of emerging markets with explicit interest rate guidance during 2020-2021. Despite some heterogeneity, interest rate guidance generally provided additional monetary stimulus, as reflected in lower medium-term yields and lower term spreads. The magnitude of the reduction in 10-year yields ranged between five and twenty basis points, and these effects are found when the policy rate was at its historical minima. Outcome-based guidance appears to have had the largest effects. In the immediate aftermath of the guidance, we do not observe a systematic negative market reaction of the kind that would be associated with a loss of central bank credibility or with concerns about fiscal dominance, such as a de-anchoring of inflation expectations, currency depreciation pressures, or increased sovereign credit risk.

Keywords: Monetary policy; Forward guidance; Central bank communication; Emerging markets.
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1 Introduction

Explicit interest rate guidance (IRG henceforth) has been used in major advanced economies (AEs) since the Great Financial Crisis but was only recently adopted in Emerging Market Economies (EMEs).[1] As the experience in AEs has shown, IRG statements can serve as a useful policy tool in a crisis or in the wake of an unusual shock. Brazil, Chile, India, Israel, and Peru adopted IRG in the wake of the Covid-19 pandemic in 2020, as part of unprecedented measures taken amid the Covid-19 pandemic (albeit that both India and Israel had already experimented with IRG in August and October 2019, respectively).

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[1] By IRG we refer to statements by the monetary policy setting authority explicitly committing to a future path of policy rates. Such statements in AEs have been called forward guidance (see, among others, CGFS, 2019 and Bernanke, 2020). IRG does not include the publication of policy rate forecasts, as some small open economies regularly do. Their experience is discussed in Svensson (2015), Natvik, Rime and Syrstad (2020), Brubakk, Ellen and Xu (2021) and Hofmann and Xia (2022).

By making IRG statements, the central bank can attempt to influence agents' expectations of the economic outlook and steer long-term interest rates in a desired direction – eg by announcing a period of "low for long" (referred to as "Odyssean" forward guidance by Campbell, 2013, Bassetto, 2019 and Bernanke, 2020). IRG can also provide clarity about the monetary authority's policy reaction function in a situation of increased uncertainty (referred to as "Delphic" forward guidance).

IRG also involves trade-offs and risks. The strength of the policy commitment is traded off against its flexibility. The possibility of the central bank reneging on its commitments after announcing IRG creates credibility risks for it (see discussion in Campbell, 2013), while a commitment to "low for long" can de-anchor inflation expectations. These challenges and trade-offs can be exacerbated by the exposure of some EMEs to volatile capital flows and changeable financial conditions, and by their history of more persistent inflation and less well-anchored inflation expectations. Even more so in an environment of rising inflation, such as the one prevailing in the second half of 2021 that drove Brazil, Chile, and Peru to hike policy rates.

Because the adoption of IRG in EMEs is relatively new and took place during a severe external shock that hit economies simultaneously, little is known about its effects. This paper aims at filling this gap by taking stock of the experience of five EMEs that adopted IRG in 2019-2021,[2] highlighting the key characteristics of their policy statements. Then it uses a high-frequency event study and OLS local projections regressions à la Jordà (2005) to assess IRG statements' market impact and their potential negative side effects.

We find that long-term local-currency yields fell after interest rate guidance statements in emerging economies, despite some heterogeneity in the reduction of yields across countries. The reduction in long-term yields was accompanied by a compression of term spreads, and a fall in market expectations of future policy rates and in in term premia. The magnitude of the reduction in 10-year yields ranged between five and twenty basis points. The median reduction in long-term yields corresponds to a median reduction in term spreads of about 10 basis points. These effects are economically significant and in line with existing literature studying the effects of interest rate guidance in AEs. Importantly, we do not observe a systematic negative market reaction of the kind that would be associated with a loss of central bank credibility or with concerns about fiscal dominance, such as a de-anchoring of inflation expectations, currency depreciation pressures, or

[2] As detailed in Section 3, we codified the monetary policy statements of twenty large EMEs in the period January 2019–July 2021. Only Brazil, Chile, India, Israel and Peru adopted IRG.

increased sovereign credit risk.

The next section discusses the main features of interest rate guidance adopted in EMEs and compares it with that adopted in AEs. The section also discusses the main literature on interest rate guidance (aka forward guidance) and the main empirical findings of AEs's experience with that policy. Section 3 presents the data and our empirical strategy. Section 4 discusses the baseline results for the effects of IRG statements on long-term yields, term spreads, interest rate expectations and term premia. In Section 5 we explore whether risks associated with interest rate guidance in EMEs materialised. Section 6 offers some robustness and sensitivity checks of the baseline results, and Section 7 concludes.

2 Interest rate guidance in EMEs

Explicit interest rate statements, or forward guidance as it is known in AEs, are central bank communication tools that may affect activity through a number of channels. The literature distinguishes three main mechanisms. First, by signalling an easier policy stance than expected by markets, the statements lower the level of future expected short-term rates, and thus the *expectations component* of long-term rates. Second, by providing greater clarity about the future path of interest rates, they reduce the volatility and dispersion of expected future policy rates, and thus the term premium, through the *risk component* of long-term rates. Third, they may alter the transmission of monetary policy: if markets believe central banks' announcements, they may be more responsive to the type of economic news that conditions policy (for further discussion see Ehrmann, Gaballo, Hoffmann and Georg, 2019; Filardo and Hoffmann, 2014; Moessner and Rungcharoenkitkul, 2019; Woodford, 2012).

The literature on forward guidance in AEs identifies three distinct types of guidance (Campbell, Ferroni, Fisher and Melosi, 2019; Filardo and Hoffmann, 2014; Moessner, Jansen and de Hann, 2017): (i) Open-ended, in which the central bank commits to an expansionary policy stance "for an extended period of time." (ii) Outcome- or threshold-based, in which exit is subject to the realisation of a pre-specified economic outcome. (iii) Calendar-based, which specifies the future policy stance for a defined period. While open-ended guidance may not convey a strong commitment, as central banks can change policy at discretion, it affords flexibility if conditions change. Calendar-based guidance offers a strong commitment but comes at the cost of tying the monetary authority's hand (if conditions change, it may be forced to follow a time-inconsistent policy, on pain of damage to its reputation if it reneges on its promise). Both open-ended and outcome-based guidance

lower the risk of time-inconsistency, in the sense of the central bank having previously committed to a stance which is now wrong because circumstances changed (for a discussion of trade-offs between different types of guidance see CGFS, 2019; Ehrmann *et al.*, 2019; Filardo and Hoffmann, 2014; Mishkin, 2017; Woodford, 2012).

What form did IRG take in EMEs? The guidance that was adopted in Brazil, Chile, India, Israel, and Peru fits in with the typology above (see Table 1). Chile, India and Israel resorted to open-ended statements when adopting IRG (making pronouncements about keeping rates at their levels – or not increasing them – for an extended period of time). Brazil and Peru made their first statements conditional on future outcomes. Brazil went beyond the typical central bank's concerns of stabilizing inflation. Its statement also referred to "*the maintenance of the current fiscal regime*." Despite evidence suggesting higher effectiveness of calendar-based statements (Ehrmann *et al.*, 2019; Woodford, 2012), no EME central bank adopted this at first. As did AEs, most EMEs subsequently fine-tuned their statements, with some central banks switching from one type of statement to another as conditions changed (eg Chile in June 2020, India in October 2020).

What led these five EME central banks to adopt IRG? Improved central bank credibility, lack of policy space, concerns about stagnating or shirking economic activity as well as about market disruptions all played a role.

First, as discussed in Aguilar and Cantú (2020), improved central bank credibility may have dissipated concerns about a de-anchoring of inflation expectations, which are traditionally considered a potential risk of tying one's hand with low rates that may have to be reneged ex post if inflation picks up (see eg Mishkin, 2017).

Second, as in AEs, the monetary environment in IRG-adopting EMEs was one of historically low nominal policy rates (Figure 1), which constrained their traditional policy space to cut rates.[3] In such conditions, explicit statements can help lower long-term rates through their expectations and risk components (Bernanke, 2020). While the central banks of Brazil, Chile and Peru adopted IRG in 2020 when interest rates hit their historical minima, the central banks of India and Israel first adopted IRG in 2019 when their policy rates were not at those minima. These central banks fine-tuned their IRG stance later on during the Covid-19 pandemic when interest rates hit their historical minima (see Figure A.1 in the Appendix). The analysis in this paper focuses on the IRG announcements made during the period in which a country hit its historical minimum interest

[3] Interestingly, the interest rate levels in EMEs at adoption of IRG were not that far from the levels in AEs when those countries adopted the policy after the Global Financial Crisis (see Figure A.2 in the Appendix).

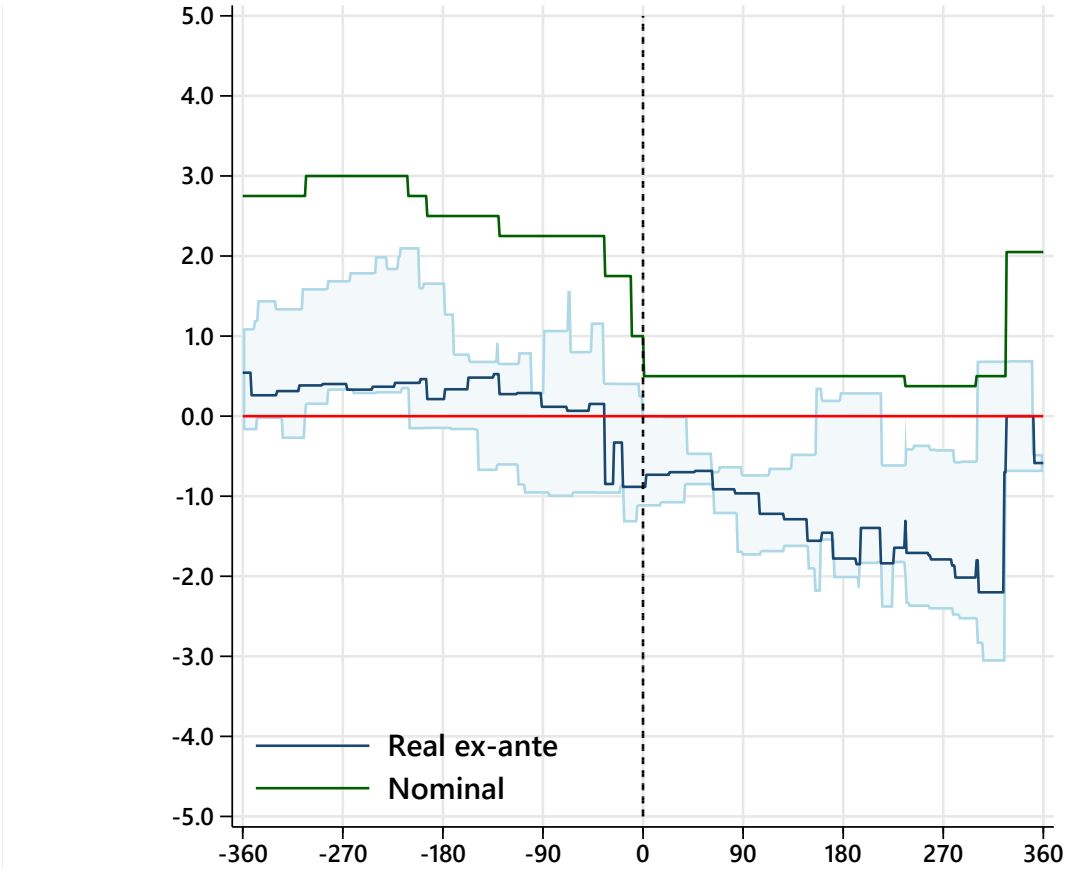
Table 1: Monetary policy statements announcing the adoption of IRG in EMEs and AEs

Country group	Country	Date of IRG	Statement when adoption of IRG	Type of IRG adopted
EMEs	IL	28.Aug.19	The Monetary Committee's assessment is [...], the interest rate will not be increased **for an extended period.** Moreover, if necessary, the Committee will take additional steps toward making monetary policy even more accommodative in order to support a process at the end of which inflation will stabilize around the midpoint of the target range, and to support economic activity.	Open-ended
	IN	04.Oct.19	The MPC also decided to continue with an accommodative stance **as long as it is necessary** to revive growth, while ensuring that inflation remains within the target.	Open-ended
	CL	31.Mar.20	[...] the Board estimates that for inflation to converge to the 3% target, monetary policy needs to remain highly expansionary **for an extended period.**	Open-ended
	PE	07.May.20	The Board considers it appropriate to maintain a strong expansionary monetary stance for an extended period and **while the negative effects of the pandemic on inflation and its determinants persist.**	Outcome-based
	BR	05.Aug.20	[...] the Copom does not foresee reductions in the monetary stimulus **unless inflation expectations, as well as its baseline scenario inflation projections, are sufficiently close to the inflation target at the relevant horizon for monetary policy**, which currently includes 2021 and, to a lesser extent, 2022. This intention is conditional on the maintenance of the current fiscal regime and on the anchoring of long-term inflation expectations.	Outcome-based
AEs	US	16.Dec.08	[...] the Committee anticipates that weak economic conditions are likely to warrant exceptionally low levels of the federal funds rate **for some time.**	Open-ended
	CA	16.Dec.08	[...] Conditional on the outlook for inflation, the target overnight rate can be expected to remain at its current level **until the end of the second quarter of 2010 in order to achieve the inflation target.**	Calendar-based
	JP	05.Oct.10	The Bank will maintain the virtually zero interest rate policy **until it judges**, on the basis of the "understanding of medium- to long-term price stability," **that price stability is in sight**, on condition that no problem will be identified in examining risk factors, including the accumulation of financial imbalances.	Outcome-based
	EA	04.Jul.13	[...] Looking ahead, our monetary policy stance will remain accommodative for as long as necessary. The Governing Council expects the key ECB interest rates to remain at present or lower levels **for an extended period of time.**	Open-ended
	GB	07.Aug.13	The Committee intends at a minimum to maintain the current highly stimulative stance of monetary policy **until economic slack has been substantially reduced**, provided this does not entail material risks to either price stability or financial stability. In particular, the MPC intends not to raise Bank Rate from its current level of 0.5% **at least until the Labour Force Survey headline measure of the unemployment rate has fallen to a threshold of 7%, subject to the conditions below.**	Outcome-based

rate, which we see as its effective lower bound – ELB (also shown in Figure A.1).

Third, all five EMEs which resorted to IRG stated that their objective was to support economic

Figure 1: Real ex-ante monetary policy rates at the time IRG was introduced in EMEs



This graph shows the level of interest rates in emerging market economies at adoption of IRG for the first time. The vertical dashed line indicates implementation of forward guidance for the first time. The horizontal axis indicates the number of days before and after the first interest rate guidance statement. The band shows the inter-quartile range of the real ex-ante interest policy rates, and the dark blue line the medians. The green line stands for the median nominal policy rates. The dates of first adoption of IRG are as follows: IL 28.Aug.2019, IN 04.Oct.2019, CL 31.Mar.2020, PE 07.May.2020, BR 05.Aug.2020.

activity and help inflation and inflation expectations converge to target, (Table 1). Indeed, in 2019 and 2020 inflation rates were at historically low levels in all five EMEs. IRG statements made in Brazil, Chile and Peru expressed concerns about the pandemic's effects on economic activity, first and foremost (before concerns about inflation overshooting its target arose and led to a hiking cycle in the second half of 2021).

Lastly, some of the IRG statements contained concerns about market dislocations,[4] particularly at the height of the Covid-19 crisis, and IRG was deployed to reduce uncertainty about the future

[4]See for example the policy statement of August 2019 from the Bank of Israel in Table 1, or the monetary policy statement of July 2021 from the Central Reserve Bank of Peru: "The Board considers it appropriate to maintain an expansionary stance as long as the negative effects of the pandemic on inflation and its determinants persist [...] *Financial markets were highly volatile* in a context of electoral uncertainty *and the BCRP's actions were intended to mitigate this volatility*," (emphasis added).

path of interest rates. In Chile, India and Israel, central banks complemented IRG with large-scale asset purchases (LSAPs), though the latter were implemented with the stated objective of remedying market dislocations rather than providing additional monetary easing.

3 Data and Empirical methodology

To gauge the effects of IRG in EMEs, we codified the monetary policy statements of twenty large EMEs[5] in the period January 2019–July 2021 and identified statements of explicit interest rate guidance. We sourced the statements from each central bank, double-checked against the database of unconventional monetary policy measures compiled by Cantú, Cavallino, De Fiore and Yetman (2021), and identified IRG in only five EMEs: Brazil, Chile, India, Israel and Peru. We coded those statements as either open-ended, outcome-based, or calendar-based based on our reading and following the literature on forward guidance in AEs. To illustrate, the statement excerpts relevant for the coding are shown in bold in Table 1. There are fifty IRG statements in our baseline sample. See summary in Table 2 and the complete list in Table A.1 in the Appendix.

Table 2: Interest rate guidance statements in EMEs, 2019–21

Country	Date IRG was introduced	Number of IRG statements	Number of times IRG was changed	Concurrent measures		IRG statements at the ELB without simultaneous rate cuts or LSAPs
				Rate cuts	LSAPs	
BR	05.Aug.20	5	1	1	0	1
CL	31.Mar.20	11	2	1	3	1
IL	28.Aug.19	8	1	0	0	1
IN	04.Oct.19	11	2	3	1	1
PE	07.May.20	15	0	0	0	1

This table summarizes the interest rate guidance statements in our sample and detailed in Table A.1 in the Appendix.

We focus on the statements in which IRG was adopted for the first time or in which the wording was significantly changed (eg where the type was modified, say from open-ended to outcome-based, or where conditionalities were altered) and those adopted at the historical minimum of the policy rate (which we treat as the effective lower bound – ELB). From the baseline sample we excluded extensions or restatements of previous announcements that carry neither additional information nor a change in type (open-ended/outcome-based/calendar-based), under the assumption that they do not feed additional news to the market.[6] To strip out the effects of concurrent pol-

[5] Brazil, Chile, Colombia, Croatia, Czechia, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Romania, Singapore, South Africa, Thailand, and Turkey.

[6] In section 6 we show that such statements indeed did not move local currency yields.

icy measures, we eliminate statements accompanied by policy rate cuts and/or LSAPs announcements.[7] This reduces the sample to five "clean" IRG statements, listed in Table A.1 in the Appendix (the "baseline sample", for short).

We first analyse the effects of IRG based on an event study using daily data. For both medium- (5-year) and long-term (10-year) yields, we compute cumulative changes for windows starting five days before and ending five days after each announcement. We present results separately for each of the five baseline IRG statements in the baseline sample, and, in addition, for the "median" statement.

We complement the event study approach with a local linear projection regression analysis following the methodology proposed by Jordà (2005). We estimate variations of the following baseline model:

$$y_{i,t}^{h} = \alpha_i^h + \beta^h IRG_{i,t} + \theta^h X_{i,t} + \varepsilon_{i,t}^h \tag{1}$$

where $y_{i,t}^h$ denotes the cumulative change of variable y in country i from the statement of date t to day h, for $h = 1, ..., 5$. Our main variable of interest is local-currency yields (5-year and 10-year yields), but we also estimate the model for term spreads, inflation expectations, sovereign CDSs and exchange rates. $IRG_{i,t}$ is a dummy variable that takes value 1 on the date of a baseline IRG statement in country i (those at the ELB, not simultaneous with an interest rate cut or announcement of a bond purchase programme). The coefficients of interest are the β^h, which quantify the impact of a baseline IRG statement at horizon h on variable y.

The regressions controls for a vector $(X_{i,t})$ of daily country-specific control variables. In our baseline specification for local currency yields this includes a dummy that takes the value 1 if a large-scale asset purchase programme was announced that day, the level of the monetary policy rate, the daily change in the monetary policy rate, the level of sovereign CDSs, the returns of the domestic stock exchange index and the volatility of such returns, the level of the term spread, and the level of the exchange rate.[8]

We estimate model 1 country by country, treating α_i^h as the constant in each country-specific regression. Following Montiel-Olea and Plagborg-Møller (2021), the regression also includes the

[7] For a discussion of the signalling effects of LSAP announcements, see Bauer and Rudebusch (2014); on their use in combination with forward guidance refer to Andrade, Breckenfelder, De Fiore, Karadi and Tristani (2016), Masayuki and Kaihatsu (2016) and Ehrmann *et al.* (2019). A decomposition of the effects of the ECB's forward guidance and QE using high-frequency data is performed by Rostagno, Altavilla, Carboni, Lemke, Motto and Saint Guilhem (2021).

[8] All daily financial variables were sourced from Bloomberg.

first lag of the dependent variable. These authors show that inference based on lag-augmented local projections models is asymptotically valid for stationary data and for long horizons.

As with the literature studying any other single policy, a problem that we cannot easily solve is that some of the IRG statements took place simultaneously with other measures. The baseline results exclude statements that were concurrent with interest rate cuts and/or LSAPs announcements. While in principle the estimated effects of IRG statements may be confounded by other central bank or fiscal policies (eg lending operations, FX market interventions, or fiscal stimuli), the daily frequency of the observations that we work with greatly limits this risk.

The sample in the regressions includes the five EMEs that made IRG statements: BR, CL, IL, IN, and PE. We use daily data from 1 January 2019 to 15 July 2021.

4 Did interest rate guidance work in EMEs?

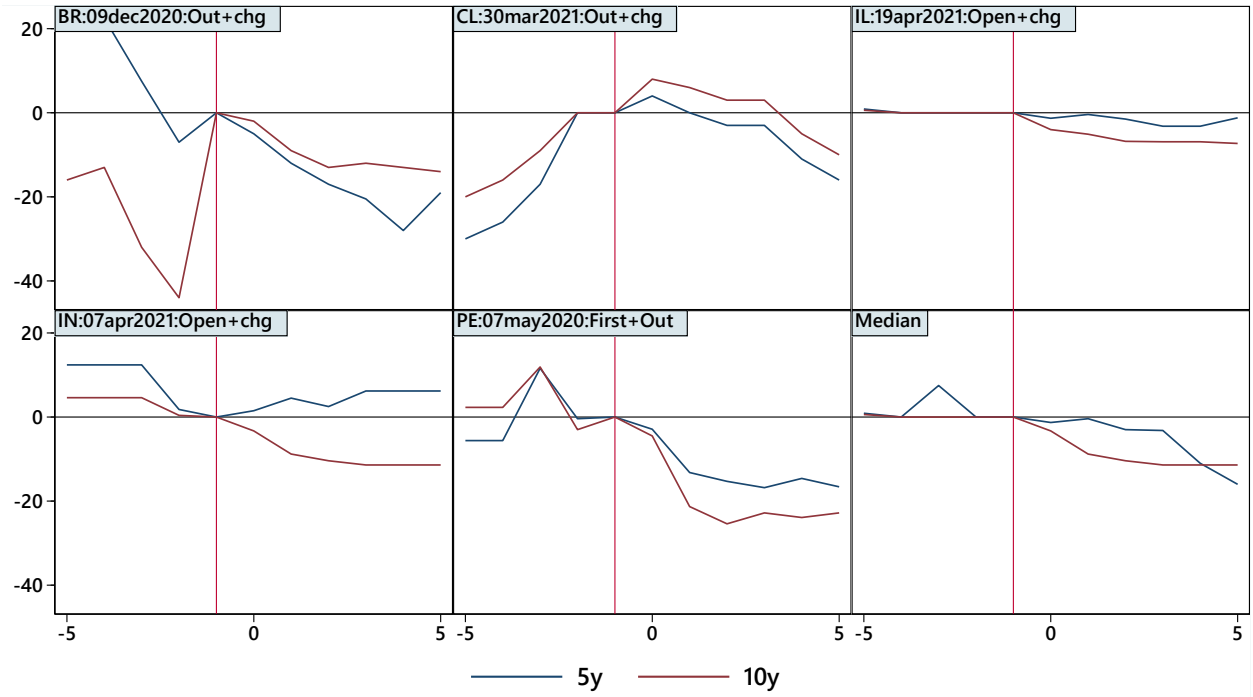
4.1 Effects on medium- and long-term local currency yields

We start by analysing the responses of local currency yields to each of the five baseline IRG statements by means of an event study, as shown in Figure 2. Despite some heterogeneity, interest rate guidance was followed by a reduction in long-term yields in the sample of five EMEs . The reductions in 5- and 10-year local currency yields one day after an IRG statement reach up to five basis points (bps). In most countries the cumulative reduction reaches over twenty bps by day 5. The largest reductions are seen in Brazil, Chile and Peru.

The reductions in long-term yields documented in the event studies are borne out and statistically significant based on the regression analysis using OLS local projections à la Jordà (2005), explained in Section 3. Table 3 shows the estimated coefficients β^h from model 1 for each country that adopted IRG, for each estimating horizon $h = 0, ..., 5$ after baseline IRG statements, for both 5- and 10-year local currency yields. The results of these regressions indicate that IRG statements reduced long-term local currency yields in a significant and persistent way in all countries, with the exception of 5-year LC yields in India. One day after an IRG statement 5-year yields fell up to 13 basis points in Brazil and 10-year LC yields fell up to 18 basis points in Peru. In all cases, that effect persists and continues to build up in subsequent days.

Comparisons based on country-specific regressions, however, should be taken with care as the level of LC currency yields is quite different across countries (eg in 2019, the average 10-year LC yield was 7.9 percent in Brazil, 7.0 percent in India, 4.7 percent in Peru, 3.6 in Chile, and 1.4 per-

Figure 2: Changes in local currency yields around baseline IRG statements (in basis points)



This figure shows the cumulative change in 5- and 10-year local currency yields five days before and five days after the five baseline IRG statements referred in the text and listed in Table A.1 in the Appendix. Changes are calculated as the cumulative differences in basis points in 5- and 10-year yields relative to the day prior to the IRG statement.

cent in Israel). Expressing the results in basis points, nonetheless, allows us to compare them with existing literature and assess their economic significance. Despite some variation of the estimated effects across jurisdictions and over time, they are economic significant and in the same ballpark as previous estimates for explicit interest rate statements in AEs. For example, Bernanke (2020) reports one-day yield reductions on 10-year Treasuries of 27 basis point in the United States following the forward guidance announcements of 9.Aug.2011 and 25.Jan.2012, while Filardo and Hoffmann (2014) document reductions of between 1 and 12 bps in the UK, the Euro Area, and Japan for the period 2010-2013 (see also Borio and Zabai, 2016, CGFS, 2019, and Swanson, 2021).

Table 3: Baseline results. Changes in local yields after interest rate guidance statements

This table shows the estimated coefficients for the cumulative change in 5- and 10-year local currency yields after the five baseline IRG statements referred in the text and listed in Table A.1 in the Appendix. Changes are calculated as the cumulative differences in basis points in 5- and 10-year yields relative to the day preceding the IRG statement. Estimated coefficients are based on the regression model presented in Section 3. Control variables include a dummy for announcement of large-scale asset purchase programme, the level of the monetary policy rate, the daily change in the monetary policy rate, the level of sovereign CDS, the returns of the domestic stock exchange index and their volatility, the level of the term spread, and the level of the exchange rate. Robust standard errors are shown in parenthesis. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	5-year LC yields						10-year LC yields					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil	-7.84***	-13.02***	-17.70***	-22.39***	-28.74***	-21.93***	-6.84***	-10.73***	-14.39***	-13.01***	-13.89***	-17.42***
	(2.053)	(2.644)	(2.887)	(3.299)	(3.905)	(4.229)	(2.006)	(2.675)	(2.773)	(3.408)	(3.872)	(4.165)
Chile	2.35***	-2.67**	-6.43***	-7.27***	-16.08***	-22.13***	6.47***	4.07***	1.14	0.92	-7.43***	-12.96***
	(0.673)	(1.071)	(1.368)	(1.574)	(1.722)	(1.888)	(0.623)	(0.978)	(1.236)	(1.449)	(1.613)	(1.765)
India	1.33***	4.07***	1.78**	5.13***	4.69***	4.78***	-3.52***	-9.24***	-11.23***	-12.56***	-12.74***	-12.89***
	(0.406)	(0.581)	(0.721)	(0.817)	(0.959)	(1.024)	(0.316)	(0.420)	(0.513)	(0.593)	(0.695)	(0.736)
Israel	-1.19***	-0.11	-1.09***	-2.59***	-2.56***	-0.50	-4.01***	-4.73***	-6.26***	-6.12***	-6.13***	-6.58***
	(0.177)	(0.245)	(0.286)	(0.333)	(0.356)	(0.377)	(0.282)	(0.473)	(0.544)	(0.601)	(0.636)	(0.669)
Peru	-1.51*	-10.78***	-11.26***	-11.35***	-7.42***	-8.01***	-3.01*	-18.10***	-20.47***	-15.78***	-14.46***	-10.79**
	(0.848)	(0.993)	(1.414)	(1.623)	(1.946)	(2.029)	(1.616)	(2.336)	(2.858)	(3.286)	(3.937)	(4.335)
Obs	663	663	662	661	660	659	663	663	662	661	660	659

4.2 Effects on term spreads

The decline in long-term yields observed after IRG statements is also accompanied by a compression in term spreads – defined as the difference between longer-term and 1-year yields. Table 4 shows the results of country-specific OLS local projections for both term spreads: 5Y-1Y and 10Y-1Y. While there are some differences across countries in speed and intensity, both term spreads decrease in the days following IRG announcements (with the exception of India's 5Y-1Y term spread). Figure A.3 in the Appendix shows the plot with the event studies for term spreads for each country and for the median country. The compression in term spreads is in line with the findings of the literature on forward guidance in AEs. For example, Woodford (2012) reports a flattening of the OIS yield curve after the "mid-2013" announcement made by the Federal Reserve in 2011.

4.3 Effects on expected interest rates and term premia

So far we have shown that IRG statements in EMEs reduced long-term yields and that this was accompanied by a compression of term spreads. This is in line with the expected effects of interest rate guidance discussed in Section 2. In this subsection, we further document that IRG statements in EMEs were also accompanied by a reduction in the market's expectations of future policy rates and in term premia. For this, we show the changes in both expected interest rates and term premia before and after the five IRG in our baseline sample, rather than estimating a model.[9]

Figure 3 shows that the market's expected policy rates and term premia fell after IRG statements in the EMEs that implemented the policy (with the exception of Chile, which we discuss below). This was the case in Brazil following a significant change in the wording of the policy statement in December 2020 – making more explicit the central bank's reading of economic conditions.[10]

[9] Market expectations of rates at 1-, 2-, and 5-year horizons are market implied policy interest rates from Bloomberg. Lack of data precludes us from undertaking this analysis for Peru. For the three Latin American countries, we also use the decomposition of 10-year local currency yields between expected average short-term interest rate (or risk-neutral rate) and term premium from CEMLA (the Association of Central Banks of Latin America and the Caribbean).

[10] In its policy statement of 9 December, the Central Bank of Brazil remarked that "[...] *the Copom does not intend to reduce the monetary stimulus as long as specified conditions are met. The Committee judges that those conditions continue to hold. In spite of having increased since the last meeting, in particular for 2021, inflation expectations, as well as inflation projections for its baseline scenario, are still below the inflation target for the relevant horizon for monetary policy; the current fiscal regime has not been changed; and long-term inflation expectations remain well anchored.* [...]." In its previous statement on 28 October, it only said "[...] *the Copom does not intend to reduce the monetary stimulus unless inflation expectations, as well as its baseline scenario inflation projections, are sufficiently close to the inflation target at the relevant horizon* [...]."

Table 4: Changes in term spreads after baseline IRG statements

This table shows the estimated coefficients for the cumulative change in term spreads, defined as the difference between 5- and 10-year local currency yields with 1-year yields, after the five baseline IRG statements referred in the text and listed in Table A.1 in the Appendix. Changes are calculated as the cumulative differences in basis points in term spreads relative to the day preceding the IRG statement. Estimated coefficients are based on the regression model presented in Section 3. Control variables include the level of the local-currency 10-year yield, a dummy for announcement of large-scale asset purchase programme, the level of the monetary policy rate, the daily change in the monetary policy rate, the level of sovereign CDS, the returns of the domestic stock exchange index and their volatility, and the level of the exchange rate. Robust standard errors are shown in parenthesis. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	5-year Term Spreads						10-year Term Spreads					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil	-11.31***	-5.37	7.07*	4.42	7.40*	25.80***	-0.82	-13.87***	-7.83***	-7.82***	-7.26***	-4.45**
	(2.629)	(4.333)	(3.951)	(4.300)	(3.974)	(3.833)	(1.967)	(1.775)	(1.811)	(2.032)	(1.963)	(1.960)
Chile	-4.63***	-3.44***	-0.39	-0.02	-8.22***	-5.29***	0.09	2.19**	3.29***	3.54***	-5.35***	-1.97*
	(0.818)	(1.251)	(1.144)	(1.151)	(1.076)	(1.359)	(0.825)	(1.023)	(1.023)	(1.055)	(1.047)	(1.106)
India	-4.22***	14.15***	12.07***	7.82***	10.05***	10.58***	-9.35***	1.95	5.97***	-2.06**	4.87***	5.39***
	(0.765)	(1.091)	(0.684)	(0.628)	(0.691)	(0.722)	(0.702)	(1.539)	(1.101)	(1.013)	(1.343)	(1.180)
Israel	-2.33***	-0.43	-1.63***	-3.50***	-1.58***	0.65*	-5.09***	-3.19***	-3.49***	-2.76***	-1.71***	-1.94***
	(0.194)	(0.290)	(0.231)	(0.265)	(0.334)	(0.348)	(0.299)	(0.559)	(0.479)	(0.467)	(0.499)	(0.648)
Peru	-1.98**	-11.41***	-5.16***	-4.33***	0.03	-4.09***	-3.66**	-19.48***	-10.90***	-3.16	-5.96**	-3.27
	(0.799)	(0.886)	(1.364)	(1.151)	(1.398)	(1.428)	(1.725)	(1.979)	(2.600)	(1.947)	(2.572)	(2.389)
Obs	662	662	661	660	659	658	662	662	661	660	659	658

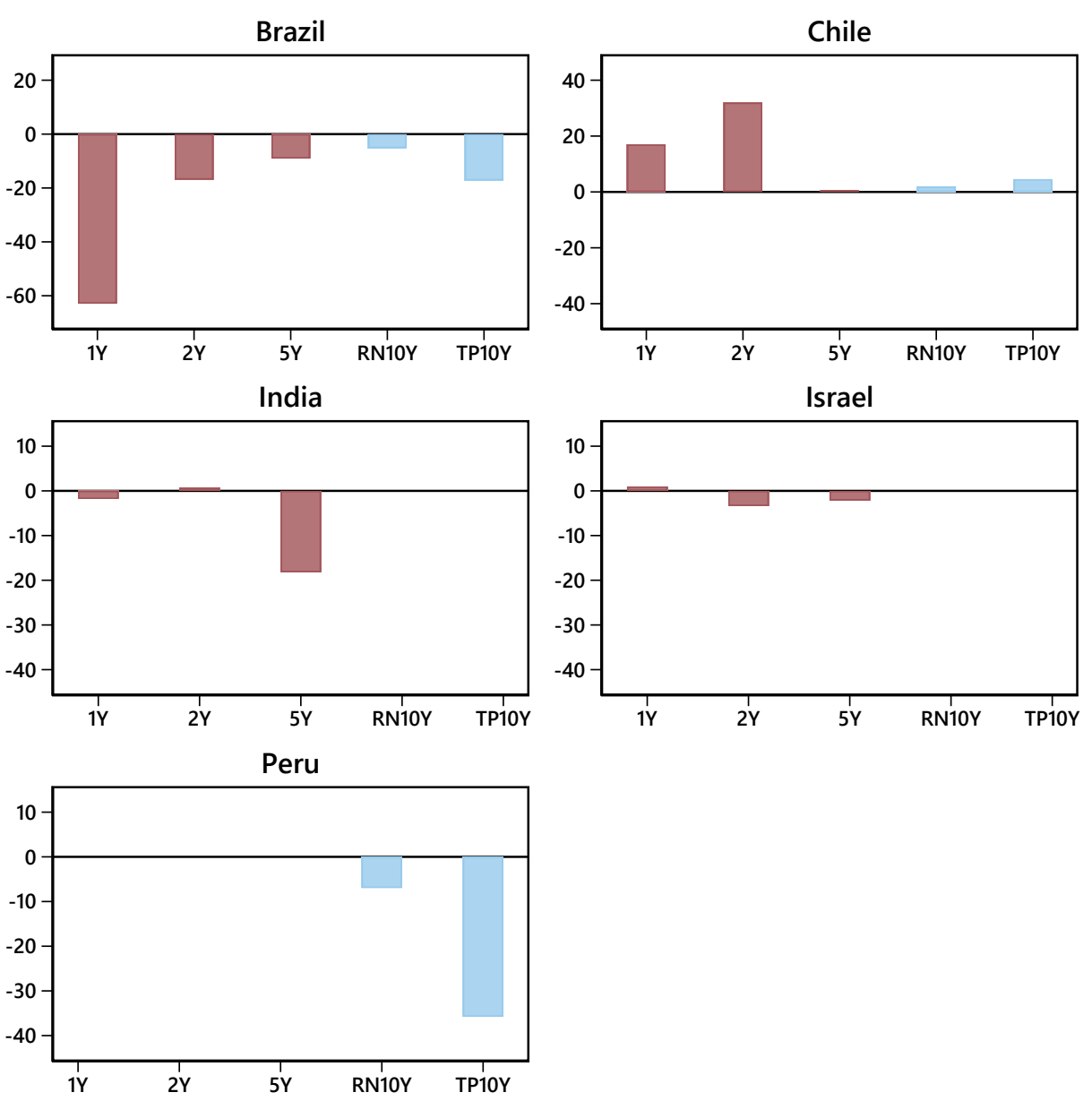
Expected rates also fell after a change in IRG in April 2021 in India, when the central bank made its guidance open-ended,[11] and in Israel when the Bank of Israel re-introduced open-ended guidance in April 2021 after removing such guidance one year before.[12] In the case of Peru, market-implied policy rates are not available but the decomposition of 10-year yields indicates that both expected average short-term rates and term premium fell after the adoption of IRG in May 2020 (statement in Table 1). Interestingly, and as was the case for Brazil, the decrease is more pronounced for the term premium component. This suggests that IRG statements in EMEs may reduce long-term yields mainly by reducing the risk component of long-term rates.

The reduction in expected interest rates in EMEs was also economically significant, despite differences across countries due to widely different levels (on the days of baseline IRG statements, policy rates were 2% in Brazil, 0.5% in Chile, 4% in India, 0.1% in Israel, and 0.25% in Peru). Short rates for 1- and 2-years ahead dropped the most in Brazil, falling 63 and 17 bps, respectively. The decrease in Israel for 2-years rates was 3 bps, and that for India's 1-year rate 2 bps. The reduction in expected rates was much more uniform for medium-term rates, with the 5-year expected rate falling 9, 18 and 2 bps in Brazil, India and Israel, respectively. These results are consistent with the empirical evidence of Filardo and Hoffmann (2014), documenting reductions in forward interbank rates on the days following IRG effected by the Federal Reserve, the ECB and Japan during the period 2008-13 (ranging from 2.5 to 30 bps). Del Negro, Giannoni and Patterson (2015) find that US announcements lower the short-term rate four quarters ahead by 15 bps, and the long-term rate by 20 bps.

[11] In its policy statement of 5 February, the Reserve Bank of India stated that "[...] *The MPC also decided to continue with the accommodative stance as long as necessary – at least during the current financial year and into the next financial year – to revive growth on a durable basis* [...]." In its statement of 7 April it changed the calendar-based guidance to an open-ended guidance, stating that "[...] *The MPC also decided to continue with the accommodative stance as long as necessary to sustain growth on a durable basis* [...]."

[12] In its policy statement of 19 of April, the Bank of Israel included the statement that "[...] *there are still challenges to economic activity in view of the health risks in Israel and abroad. The crisis's adverse effects on the economy, particularly the labor market, are expected to be prolonged. The Committee will therefore continue to conduct a very accommodative monetary policy for a prolonged time, using a range of tools as necessary, including the interest rate tool* [...]." Such statements with explicit guidance were stopped in February 2020, after the bank made its first IRG statement in August 2019.

Figure 3: Changes in expected interest rates and term premia after IRG statements (in basis points)



This figure shows the change in the market-implied policy rate (MIPR) at 1-, 2- and 5-year horizons, and expected average short-term rates and term premium derived from 10-year yields after IRG statements. Variables are measured as the average in the five trading days after and before baseline IRG statements. MIPRs are sourced from Bloomberg, which computes them using forward interest rates for 1-, 2-, and 5-years. Expected average short-term rates (RN10Y) and term premium (TP10Y) are from the decomposition of 10-year local currency yields available from CEMLA for Latin American economies.

In the case of Chile, a change in wording introduced by the central bank on 30 March 2021, which switched its guidance from outcome- to calendar-based, resulted in rather higher expected rates. While contrary to the expected effect of the new explicit interest rate guidance, this seems a rational reaction to the change in wording and next day's update to the central bank's policy rate corridor showing a higher ceiling for the end-2021 policy rate.[13]

In summary, we find that long-term local-currency yields fell after interest rate guidance statements in emerging economies. The reduction in long-term yields was accompanied by a compression of term spreads and a fall in market expectations of future policy rates and term premia. The magnitude of the reduction in long-term yields, terms spreads and expected policy rates is in line with existing literature studying the effects of interest rate guidance in AEs. These results are obtained non-parametrically based on an event study approach, and also analytically based on the OLS local projections approach of Jordà (2005) (which allows controlling for a battery of daily covariates).

5 Did negative market reactions to IRG materialise?

Explicit interest rate guidance statements also carry risks, notably with respect to central bank credibility, a de-anchoring of inflation expectations, and fiscal dominance. When their aim is to commit to keeping monetary conditions loose in future, IRG may risk conveying the idea that the central bank does not sufficiently care about fighting inflation. This could de-anchor inflation expectations (Hofman and Kamber, 2020). Consistent with addressing such concerns, all IRG statements in our sample made a point of bringing inflation or inflation expectations back to its target; or, in the case of India, reviving growth while ensuring that inflation remained within target.

Concerns about fiscal dominance may also preclude the central bank from fighting inflation (see Filardo and Hoffmann, 2014 and Mishkin, 2017 for a discussion).[14] In countries with high levels of government debt, the central bank may face pressure to keep interest rates low for long

[13] In its policy statement of 27 January, the Central Bank of Chile stated that "[...] *the MPR will remain unchanged over most of the two-year monetary policy horizon* [...]." While in its statement of 30 March it changed the calendar-based guidance to an outcome-based guidance, stating that "[...] *the MPR will be held at its 0.5% minimum until the recovery of the economy takes hold and spreads to the more lagging components of expenditure, which will take several quarters* [...]." In addition, this was followed the next day by a monetary policy report showing an interest rate corridor with a higher ceiling for the policy rate by end-2021. Unsurprisingly, market-implied policy rates were also brought forward and higher than previously expected.

[14] EME central banks adopting IRG were quite aware of this risk. For example, IRG statements in Brazil were "*conditional on the maintenance of the current fiscal regime and on the anchoring of long-term inflation expectations*," while statements in Israel made references to monitoring "*developments in fiscal policy*."

to keep public debt service costs down. Investors' concerns about such risks may trigger hikes in CDS spreads and currency depreciations.[15]

Market reactions following IRG statements suggest that market participants were not concerned about these risks. Following the five IRG statements in our baseline sample, market-based measures of expectations of inflation stayed basically unchanged, remaining in all cases at or below central banks' target bands (Figure 4).[16] CDS spreads on sovereign bonds stayed flat or fell in Brazil, Chile and Israel, and increased in India and Peru (Figure 5). These increases, however, were quite small, in the range of 5 points when the levels of CDS the day before the IRG announcement were 94 and 104 for India and Peru, respectively. For the median country (bottom right panel), there is no discernible negative effect. Exchange rates also remained quite stable, with very mild depreciation of up to 2% by day five after the IRG announcement in India (and smaller for Peru).

One may argue that these risks may materialise if the interest rate guidance is for a long period, and may not be identified when looking only at the baseline IRG statements in our baseline sample. Also, if small increases in CDS or depreciation are the norm after IRG statements, this could be seen as troublesome. However, similar patterns of no systematic negative market reactions were present when looking at all IRG statements (Figures A.4 and A.5 in the Appendix).

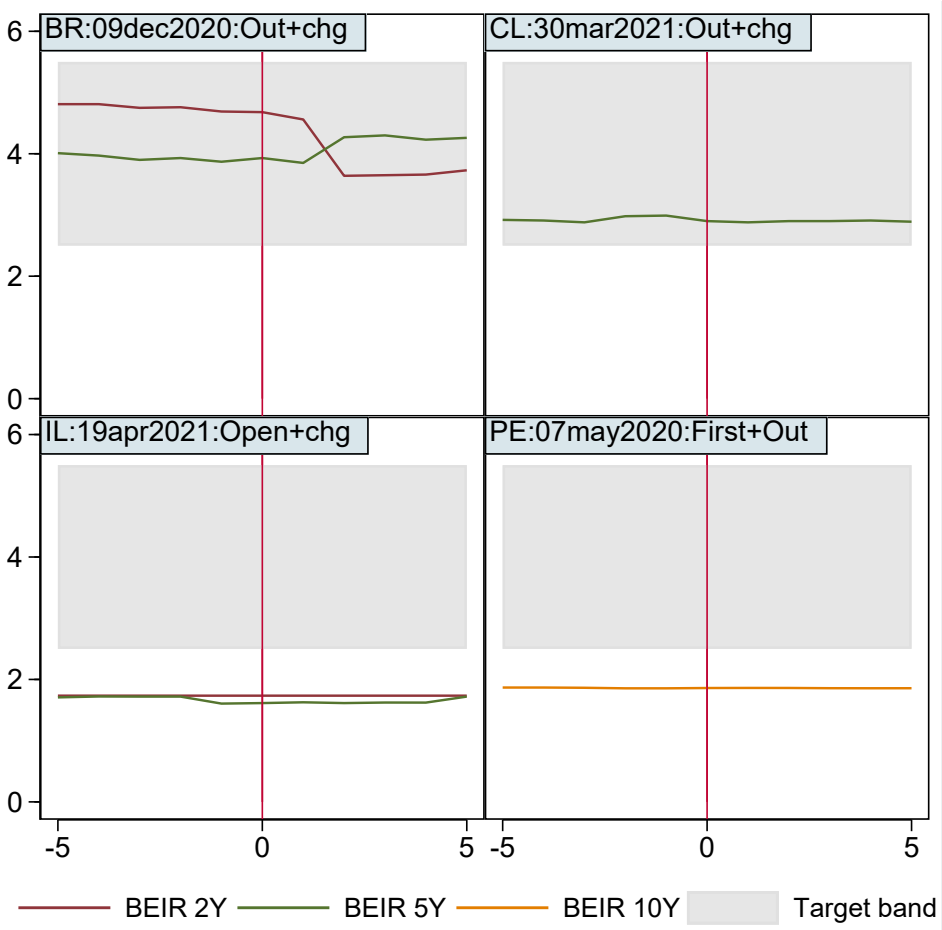
Similar results for both subsamples of IRG statements – baseline and all statements – are found based on OLS local projections à la Jordà (2005) (Tables A.2, A.3, A.4 and A.5 in the Appendix). While the regressions for the baseline IRG statements indicate that 5-year inflation expectations for Brazil and Israel increased, the increment was relatively small and kept inflation expectations well anchored within the central banks' target bands (the increases were in the range of between 5 and 40 bps; Table A.2). Short-term inflation expectations at a 2-year horizon fell or kept flat. The results also indicate that sovereign CDS increased and nominal exchange rates depreciated moderately in India and Peru. These increments were relatively small, up to 4 units for sovereign CDS and up to 1% depreciation (Table A.3).

Importantly, in the full sample of IRG announcements, both the changes in inflation expectations (Table A.4) and in CDS and the nomianl exchange rate (Table A.5) are statistically not different from zero. This suggests that there was no systematic negative market reaction in EMEs when IRG statements were adopted. All in all, changes in sovereign CDS and exchange rates after IRG statements were negligible, while inflation expectations remained well anchored.

[15] See Zoli (2005) for a discussion of fiscal dominance in EMEs during the early 2000s.

[16] We proxy markets' inflation expectations by break-even rates derived from inflation-linked bonds at 2-, 5-, and 10-year horizons sourced from Bloomberg (BEIRs, for short). Data availability varies, and there is none for India.

Figure 4: Inflation expectations around baseline IRG statements (in percentage points)



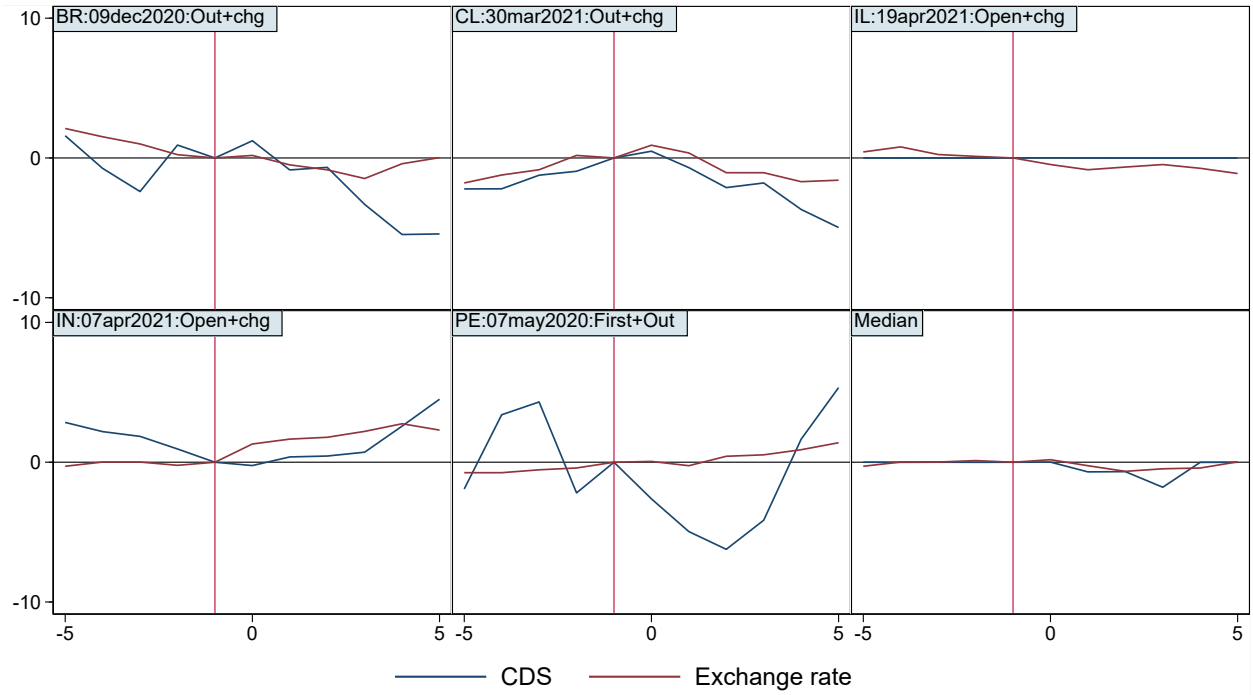
This figure shows the *level* of markets' inflation expectations five days before and after the baseline IRG statements referred in the text and listed in Table A.1 in the Appendix. Inflation expectations are proxied by break-even rates derived from inflation-linked bonds at 2-, 5-, and 10-year horizons. Day zero is the day of the IRG statement. The plots also show the inflation target band in each country.

6 Robustness and sensitivity checks

6.1 Different types of IRG: outcome-based statements had the largest effects

One factor explaining the cross-country heterogeneity of the effects of IRG observed in Figure 2 may be the type of statement. We explore this in Figure 6, where we present the cumulative changes in local-currency yields for two different types of IRG statements. The left panel shows the median change in yields in the two open-ended statements in our baseline sample (IL 19.Apr.2021 and IN 07.Apr.2021). The right panel shows the median change in the other three statements in the baseline sample, which were all outcome-based statements (BR 09.Dec.2020, CL 30.Mar.2021, and

Figure 5: Changes in sovereign CDS and exchange rates around baseline IRG statements (in units for CDS and percentage points for exchange rates)



This figure shows the cumulative change in CDSs and nominal exchange rates five days before and after interest rate guidance statements in the baseline sample of five baseline IRG statements listed in Table A.1 in the Appendix. Changes are calculated as the cumulative differences in units for CDS and percentage points for exchange rates relative to the day prior to the IRG statement. Day zero is the day of the IRG statement. An increase in the exchange rate denotes a depreciation of the local currency against the US dollar.

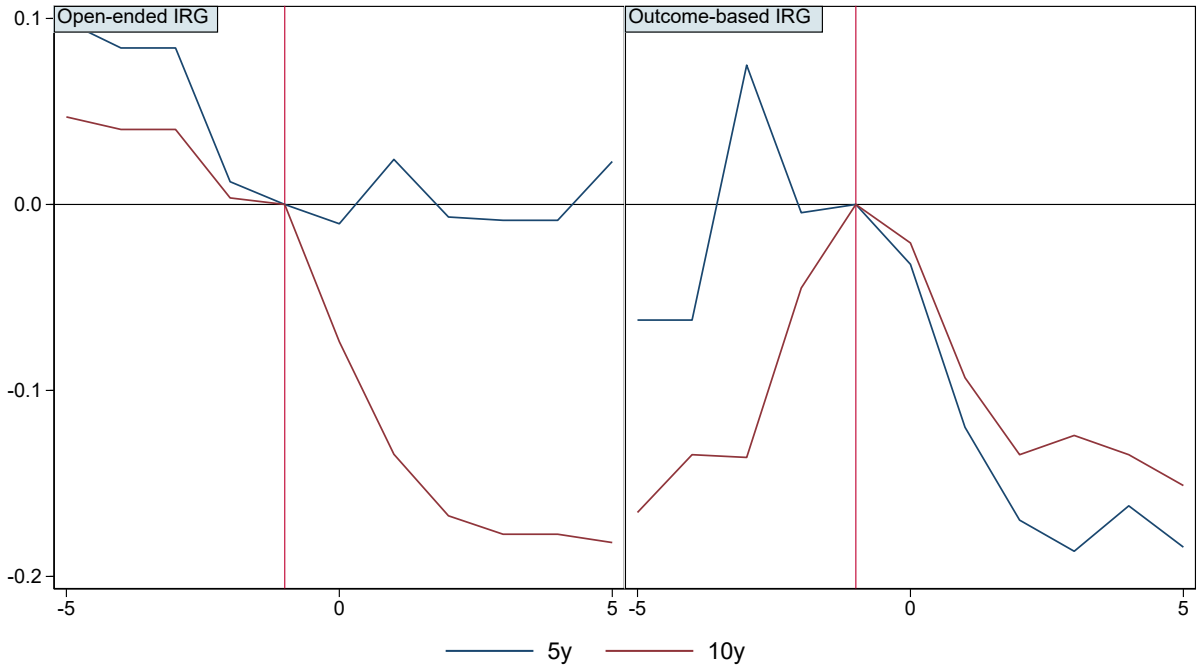
PE 07.May.2020). Because the different levels in yields across EMEs, these plots show cumulative changes in standardised yields.[17] These event studies indicate that outcome-based statements had the most robust effect, affecting both 5- and 10-yields. The size of the effect for 10-year yields is about the same in the two types of IRG statements.

6.2 Adding lags of all explanatory variables

In the baseline specification of model 1 we included the first lag of the dependent variable. This, following Montiel-Olea and Plagborg-Møller (2021) who show that inference based on lag-augmented local projections models is more robust. In this robustness check we further add the first lags of all explanatory variables. Table A.6 shows the results of this exercise, which corroborates the baseline findings.

[17] We follow the usual practice of standardizing variables by subtracting their sample mean and dividing the result by the sample standard deviation. Both mean and standard deviation are computed over the period Jan 2019 – Jul 2021.

Figure 6: Changes in local yields by type of interest rate guidance statement (in standardised yields)



The left panel shows the median cumulative change in 5- and 10-year local currency yields five days before and five days after the two baseline open-ended IRG statements: IL 19.Apr.2021 and IN 07.Apr.2021. The right panel shows the median change for baseline outcome-based statements: BR 09.Dec.2020, CL 30.Mar.2021, and PE 07.May.2020. Changes are calculated as the cumulative differences in 5- and 10-year yields relative to the day prior to the IRG statement using standardised yields.

6.3 Controlling for all IRG statements

In the baseline specification of model 1 we included a dummy $IRG_{i,t}$ to identify the effects of baseline IRG statements, those at the effective lower bound and not simultaneous with an interest rate cut or LSAP announcement. In this robustness check we additionally include in the model a dummy that takes the value of one on days that there was an interest rate guidance statement regardless of its type.[18] This allows for identification of the effect of baseline IRG statements taking into account that a given country may have made other IRG statements in different dates. Figure A.7 shows the results of this exercise, which corroborates the baseline findings. In fact, the estimated effect of baseline IRG statements is somewhat larger in this specification.

[18]This is equivalent to estimating the model with an interaction of the dummy for baseline IRG statements and the dummy for any IRG statement, plus additionally controlling for the dummy of any IRG statement.

6.4 Were non-first, no-wording change IRG statements truly inconsequential?

Our baseline sample only includes policy statements in which IRG was introduced for the first time or the statement's wording was materially changed. We did this under the premise that the only consequential statements for markets should be those providing new information. In this robustness check we double check this presumption. Table A.8 in the Appendix shows results OLS local projections regressions when only considering non-first, no-wording change IRG statements. They corroborate the presumption that these statements were inconsequential.

6.5 Placebo: US IRG statements

A concern when studying monetary policy in EMEs is whether the evolution of local rates is driven by developments in AEs. This concern is heightened in the period of study of this paper, given the massive and forceful actions by central banks in core economies during the Covid-19 pandemic. As a double check, we re-run the analysis for IRG statements defined as those dates in which the Federal Reserve of the US made a guidance statement in 2020 amid the pandemic (16.Mar.2020, 16.Sep.2020, and 16.Dec.2020). Table A.9 in the Appendix shows that long-term local currency yields in EMEs where not responsive to IRG statements in the US. Yields barely moved in basis points following these statements. This gives credence to the baseline finding that changes in yields after EMEs' IRG statements reflect market reaction to such domestic statements, rather than to developments in global markets.

7 Concluding remarks

In this paper we provided evidence that the adoption of explicit statements on the future path of interest rates in Brazil, Chile, India, Israel and Peru in 2020-2021 appear to have succeeded in providing additional monetary accommodation. When made for the first time or with significant changes to their wording, IRG statements were followed by reductions in local currency yields, term spreads and expected policy rates. These effects are found when the nominal interest rate hit its historical minimum (ie at the effective lower bound), and were not driven by simultaneous announcements of LSAP programmes or interest rate cuts. This confirms the usefulness of IRG not only as a policy tool to complement policy rates when policy space has decreased, but also as a means of influencing long-term yields. Importantly, we did not observe a systematic negative market reaction reflecting concerns that may be associated with IRG, such as threats to central

bank credibility in keeping inflation within target, rises in sovereign CDS spreads or depreciation pressures.

That said, communication regarding the future path of interest rates in EMEs is still in its infancy and it is unclear whether the experience during the Covid-19 pandemic may be replicated, and what its overall economic impact is. First, the results in this paper are based on a small number of countries that made IRG statements during extraordinary times, and the evidence so far is insufficient to predict whether under different circumstances a similar easing of financial conditions without undesirable side effects may be obtained. Similarly, the analysis of negative side effects was limited to market reactions immediately following IRG statements, and such effects may take time to materialise. Second, the economic effects on growth in EMEs – not studied in this paper – may differ from the positive experience reported in AEs (see CGFS, 2019 and Bernanke, 2020). Some structural features of EMEs, such as a generally greater importance of bank credit relative to market-based finance, and a greater share of loans with short maturities and/or with indexed or variable rates, may render the observed fall in long-term yields less effective than in AEs.

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Appendix with additional tables and figures

- Figures
  - Nominal interest rates and adoption of IRG in Brazil, Chile, India, Israel and Peru
  - Real ex-ante monetary policy rates at the time IRG was introduced in AEs
  - Changes in term spreads around baseline IRG statements
  - Changes in inflation expectations around all IRG statements
  - Changes in sovereign CDS and nominal exchange rates around all IRG statements
- Tables
  - Interest rate guidance (IRG) statements in EMEs 2019-2021
  - Changes in inflation expectations around baseline IRG statements
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  - Changes in inflation expectations around all IRG statements
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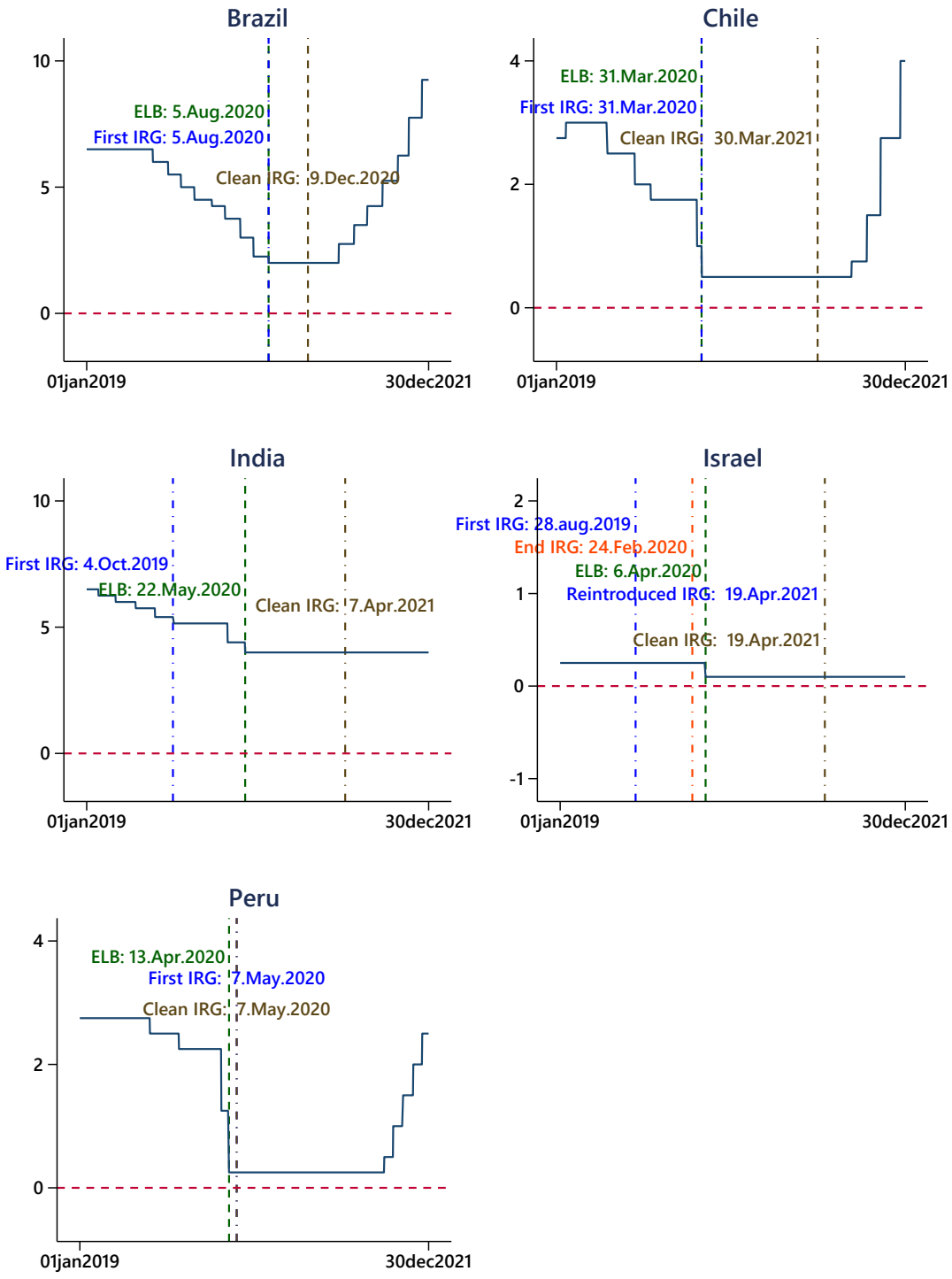
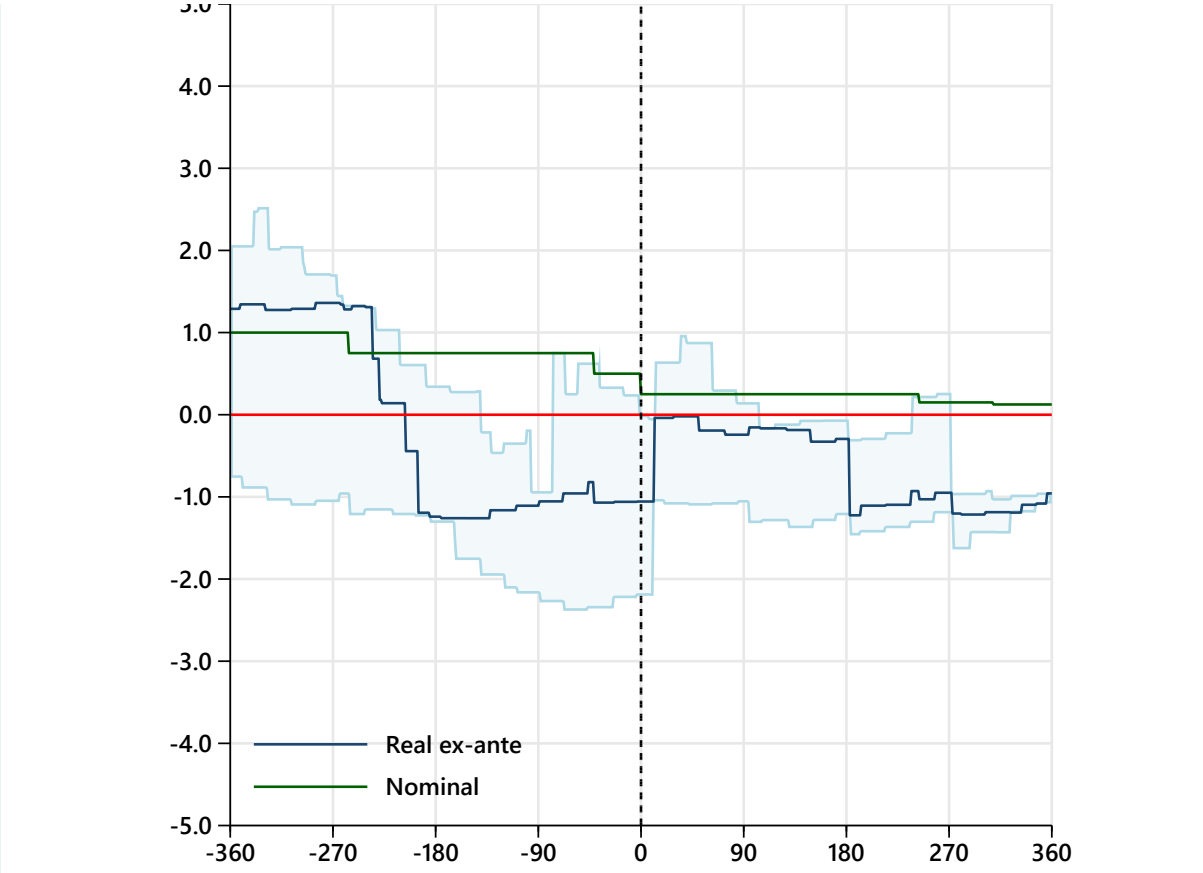
  - Robustness checks
    - Adding lags of all explanatory variables. Changes in local currency yields after baseline IRG statements
    - Controlling for all other IRG statements. Changes in local currency yields after baseline IRG statements
    - Non-baseline IRG statements. Changes in local currency yields
    - Placebo US forward guidance. Changes in local currency yields

Figure A.1: Nominal interest rates and adoption of IRG in Brazil, Chile, India, Israel and Peru



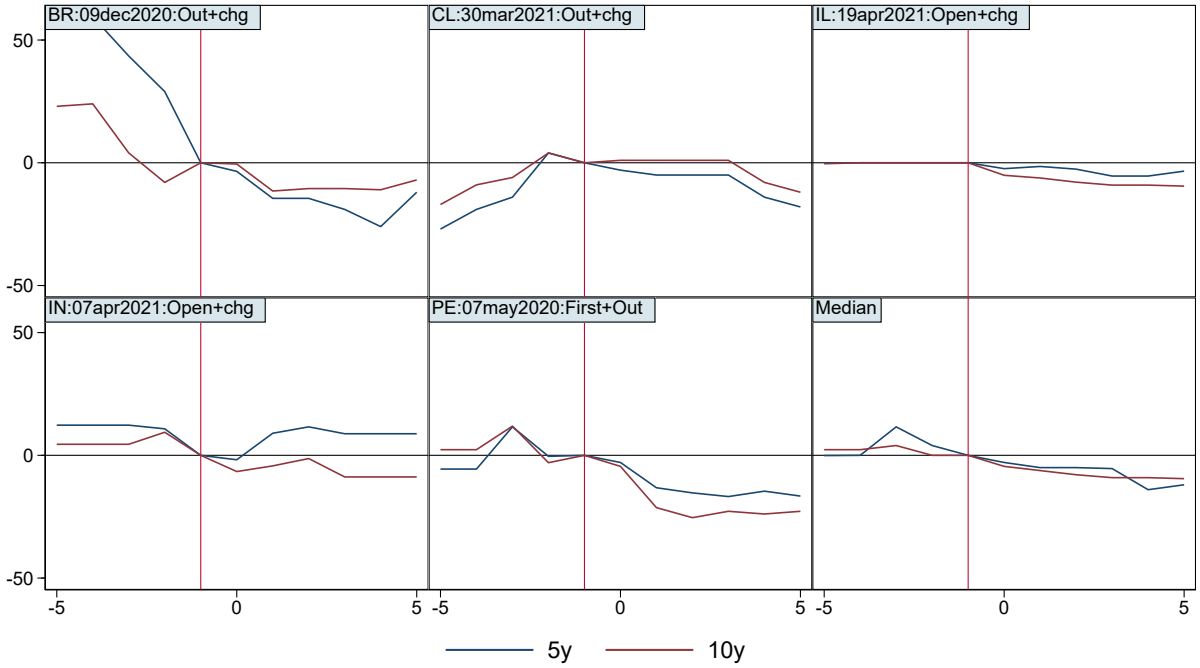
This graph shows the level of nominal interest rates in period January 2019 – December 2021, the date in which a country hit its historical minimum nominal rate (green line), the date of adoption of IRG for the first time (blue line), and the "clean" or baseline IRG statement we study in our baseline results (brown line). See Section 3 for a detailed definition of baseline IRG statements.

Figure A.2: Real ex-ante monetary policy rates at the time IRG was introduced in AEs



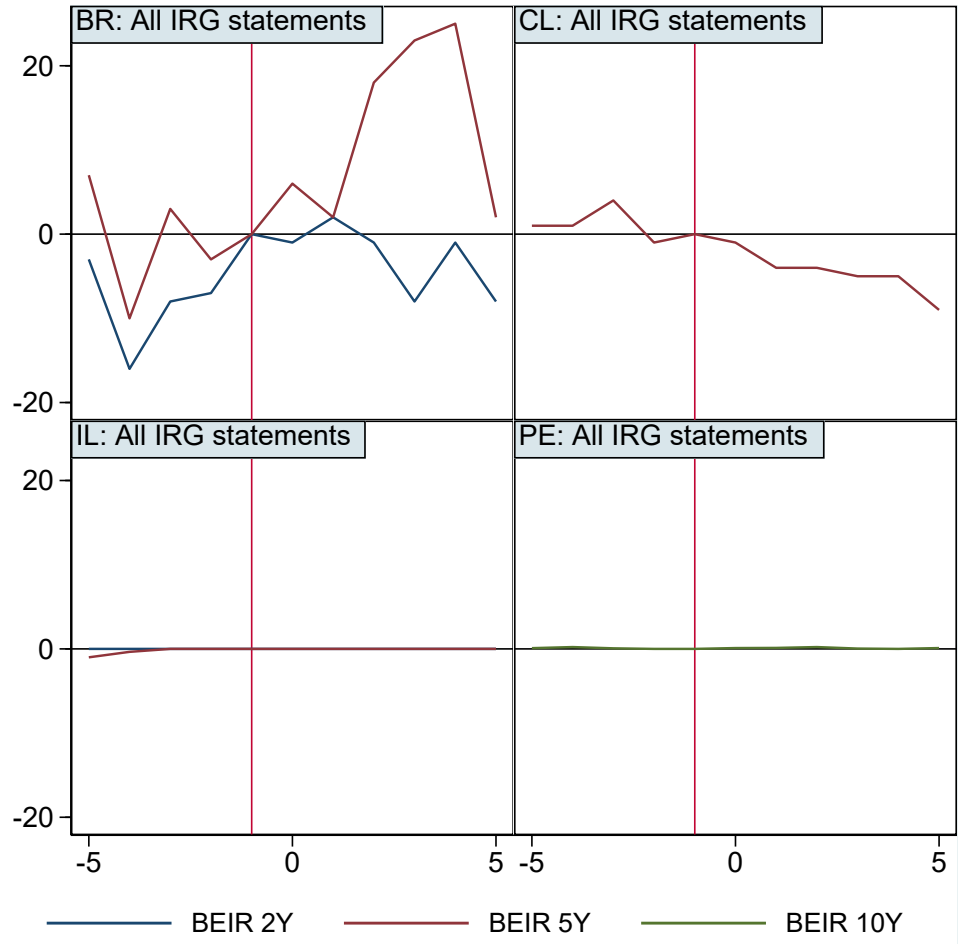
This graph shows the level of interest rates in advanced economies at adoption of IRG for the first time after the Global Financial Crisis. The horizontal axis indicates the number of days before and after the first interest rate guidance statement. The band shows the inter-quartile range of the real ex-ante interest policy rates, and the dark blue line the medians. The green line stands for the median nominal policy rates. The dates of first adoption of IRG are as follows: US 16.Dec.2008, CA 21.Apr.2009, JP 05.Oct.2010, EA 04.Jul.2013, GB 07.Aug.2013.

Figure A.3: Changes in term spreads around baseline IRG statements (in basis points)



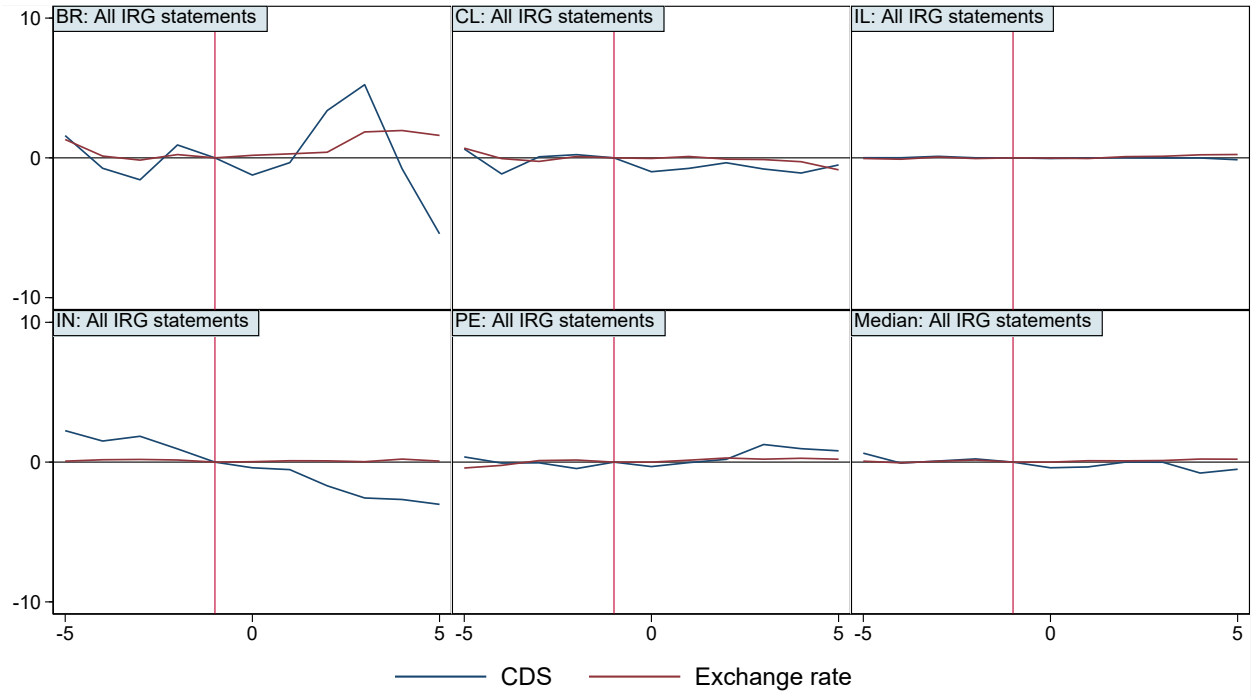
This graph shows the cumulative change in term spredas, defined as the difference between 5- and 10-year with 1-year local currency yields, five days before and five days after the five baseline IRG statements referred in the text and listed in Table A.1 in the Appendix. Changes are calculated as the cumulative differences in basis points relative to the day prior to the IRG statement. Day zero is the day of the IRG statement.

Figure A.4: Changes in inflation expectations around all IRG statements (in basis points)



This figure shows the cumulative change in markets' inflation expectations five days before and after interest rate guidance statements in the full sample of fifty IRG statements listed in Table A.1 in the Appendix. Changes are calculated as the cumulative differences in inflation expectations in basis points relative to the day prior to the IRG statement. Day zero is the day of the IRG statement. Inflation expectations are proxied by break-even rates derived from inflation-linked bonds at 2-, 5-, and 10-year horizons.

Figure A.5: Changes in sovereign CDS and nominal exchange rates around all IRG statements (in units for CDS and percentage points for exchange rates)



This figure shows the cumulative change in CDSs and nominal exchange rates five days before and after interest rate guidance statements in the full sample of fifty IRG statements listed in Table A.1 in the Appendix. Changes are calculated as the cumulative differences in units for CDS and percentage points for exchange rates relative to the day prior to the IRG statement. Day zero is the day of the IRG statement. An increase in the exchange rate denotes a depreciation of the local currency against the US dollar.

Table A.1: Interest rate guidance (IRG) statements in EMEs 2019-2021

Country	Date	FG first	FG type	FG change	Simult. rate cut	Simult. BPP	Baseline IRG at ELB announcement
BR	05.Aug.20	Y	Outcome-based	0	Y		
BR	16.Sep.20		Outcome-based	0			
BR	28.Oct.20		Outcome-based	0			
BR	09.Dec.20		Outcome-based	1			Y
BR	20.Jan.21		Last	0			
CL	31.Mar.20	Y	Open-ended	0	Y	Y	
CL	06.May.20		Open-ended	0			
CL	16.Jun.20		Calendar-based	1		Y	
CL	15.Jul.20		Calendar-based	1			
CL	01.Sep.20		Calendar-based	0			
CL	15.Oct.20		Calendar-based	0			
CL	07.Dec.20		Calendar-based	0			
CL	27.Jan.21		Calendar-based	0		Y	
CL	30.Mar.21		Outcome-based	1			Y
CL	13.May.21		Outcome-based	0			
CL	08.Jun.21		Outcome-based	0			
IL	28.Aug.19	Y	Open-ended	0			N
IL	07.Oct.19		Open-ended	0			
IL	25.Nov.19		Open-ended	0			
IL	09.Jan.20		Open-ended	0			
IL	24.Feb.20		Open-ended	0			
IL	19.Apr.21		Open-ended	1			Y
IL	31.May.21		Open-ended	0			
IL	05.Jul.21		Open-ended	0			
IN	04.Oct.19	Y	Open-ended	0	Y		
IN	05.Dec.19		Open-ended	0			
IN	06.Feb.20		Open-ended	0			
IN	27.Mar.20		Open-ended	0	Y		
IN	22.May.20		Open-ended	0	Y		
IN	06.Aug.20		Open-ended	0			
IN	09.Oct.20		Calendar-based	1		Y	
IN	04.Dec.20		Calendar-based	0			
IN	05.Feb.21		Open-ended	0			
IN	07.Apr.21		Open-ended	1			Y
IN	04.Jun.21		Open-ended	0			
PE	07.May.20	Y	Outcome-based	0			Y
PE	11.Jun.20		Outcome-based	0			
PE	09.Jul.20		Outcome-based	0			
PE	13.Aug.20		Outcome-based	0			
PE	10.Sep.20		Outcome-based	0			
PE	07.Oct.20		Outcome-based	0			
PE	12.Nov.20		Outcome-based	0			
PE	10.Dec.20		Outcome-based	0			
PE	14.Jan.21		Outcome-based	0			
PE	11.Feb.21		Outcome-based	0			
PE	11.Mar.21		Outcome-based	0			
PE	08.Apr.21		Outcome-based	0			
PE	13.May.21		Outcome-based	0			
PE	10.Jun.21		Outcome-based	0			
PE	08.Jul.21		Outcome-based	0			

Table A.2: Changes in inflation expectations around baseline IRG statements

This table shows the estimated coefficients for the cumulative change in the market's 2- and 5-year inflation expectations after the five baseline IRG statements referred in the text and listed in Table A.1 in the Appendix. Inflation expectations are proxied by break-even rates derived from inflation-linked bonds at 2- and 5-years horizons (10-years for Peru). Changes are calculated as the cumulative differences in basis points relative to the day preceding the IRG statement. Estimated coefficients are based on the regression model presented in Section 3. Control variables include the level of the local-currency 10-year yield, a dummy for announcement of large-scale asset purchase programme, the level of the monetary policy rate, the daily change in the monetary policy rate, the level of sovereign CDS, the returns of the domestic stock exchange index and their volatility, the level of the term spread, and the level of the exchange rate. Robust standard errors are shown in parenthesis. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	2-year inflation expectations						5-year inflation expectations (10-year for Peru)					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil	-1.39**	-10.04***	-93.62***	-32.70**	-25.81**	-16.51	5.12***	-2.15***	44.31***	21.93***	9.39***	17.24***
	(0.579)	(1.383)	(2.672)	(12.718)	(11.620)	(11.053)	(0.430)	(0.410)	(0.631)	(1.597)	(1.362)	(1.181)
Chile							-8.66***	-9.41***	-5.17***	-5.76***	-3.69***	-5.88***
							(0.440)	(0.738)	(0.896)	(0.784)	(0.700)	(0.806)
Israel	-0.33	-0.35	-0.34	-0.35	-0.32	-0.31	-0.27	6.84***	6.55***	9.03***	8.81***	19.30***
	(0.607)	(0.753)	(0.768)	(0.852)	(0.878)	(0.895)	(3.653)	(1.528)	(1.675)	(1.645)	(1.613)	(1.327)
Peru							0.52***	0.41***	0.18	-0.22	-0.01	0.12
							(0.134)	(0.155)	(0.164)	(0.169)	(0.179)	(0.182)
Obs BR, CL, PE	663	662	661	660	659	658	663	662	661	660	659	658
Obs IL	416	415	414	413	412	411	502	501	500	499	498	497

Table A.3: Changes in CDS and nominal exchange rates around baseline IRG statements

This table shows the estimated coefficients for the cumulative change in sovereign 5-year CDS and nominal exchange rates after the five baseline IRG statements referred in the text and listed in Table A.1 in the Appendix. Changes are calculated as the cumulative differences in units for CDS and percentage points for exchange rates relative to the day preceding an IRG statement. Estimated coefficients are based on the regression model presented in Section 3. For both dependent variables, the model includes as control variables the level of the local-currency 10-year yield, a dummy for announcement of large-scale asset purchase programme, the level of the monetary policy rate, the daily change in the monetary policy rate, the returns of the domestic stock exchange index and their volatility, and the level of the term spread. The model for CDS in addition includes the level of the nominal exchange rate. The model for the exchange rate in addition includes the level of sovereign CDS. Robust standard errors are shown in parenthesis. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	CDS						Exchange Rates					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil	-1.01	-2.68**	-1.72	-4.80***	-5.00***	-4.34***	0.22**	-0.68***	-0.64***	-1.15***	0.58***	0.04
	(0.631)	(1.194)	(1.575)	(1.223)	(1.028)	(1.336)	(0.107)	(0.134)	(0.146)	(0.169)	(0.162)	(0.166)
Chile	0.44	-1.46***	-2.78***	-1.36**	-3.25***	-3.51***	0.92***	-0.08	-1.22***	-0.11	-0.69***	0.02
	(0.372)	(0.470)	(0.599)	(0.558)	(0.555)	(0.740)	(0.071)	(0.095)	(0.097)	(0.107)	(0.100)	(0.110)
India	0.65**	1.80***	1.54***	2.21***	3.37***	4.03***	1.39***	1.06***	0.73***	0.86***	0.99***	-0.01
	(0.256)	(0.280)	(0.330)	(0.419)	(0.400)	(0.447)	(0.024)	(0.077)	(0.085)	(0.076)	(0.091)	(0.092)
Israel	0.13**	0.09	0.08	0.05	0.05	0.03	-0.46***	-0.53***	0.00	0.13*	-0.25***	-0.39***
	(0.057)	(0.065)	(0.068)	(0.063)	(0.069)	(0.067)	(0.032)	(0.063)	(0.080)	(0.068)	(0.058)	(0.063)
Peru	-1.45**	-4.07***	-3.89***	-0.74	3.62***	3.03***	-0.03	-0.53***	0.30***	-0.16**	0.06	0.25***
	(0.672)	(0.865)	(0.849)	(0.887)	(0.913)	(1.025)	(0.050)	(0.062)	(0.059)	(0.068)	(0.069)	(0.070)
Obs	662	661	660	659	658	657	662	661	660	659	658	657

Table A.4: Changes in inflation expectations around all IRG statements

This table shows the estimated coefficients for the cumulative change in the market's 2- and 5-year inflation expectations following all fifty IRG statements listed in Table A.1 in the Appendix. Inflation expectations are proxied by break-even rates derived from inflation-linked bonds at 2- and 5-years horizons (10-years for Peru). Changes are calculated as the cumulative differences in basis points relative to the day preceding the IRG statement. Estimated coefficients are based on the regression model presented in Section 3. Control variables include the level of the local-currency 10-year yield, a dummy for announcement of large-scale asset purchase programme, the level of the monetary policy rate, the daily change in the monetary policy rate, the level of sovereign CDS, the returns of the domestic stock exchange index and their volatility, the level of the term spread, and the level of the exchange rate. Robust standard errors are shown in parenthesis. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	2-year inflation expectations						5-year inflation expectations (10-year for Peru)					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil	-2.06	-1.11	-20.92	-10.99*	-9.06	-7.22*	3.12	2.52	11.56	5.58	4.53**	-5.68
	(2.324)	(3.477)	(16.854)	(6.234)	(5.509)	(4.374)	(3.281)	(2.794)	(9.276)	(4.821)	(1.792)	(6.539)
Chile							-2.54	-0.65	-2.32	-0.09	0.20	-6.40
							(1.779)	(2.312)	(3.874)	(3.389)	(2.394)	(5.495)
Israel	-4.94	-2.33	-1.88	-3.22	-2.06	-1.51	-0.39	1.49	0.69	-0.79	0.23	2.37
	(3.456)	(1.666)	(1.611)	(2.948)	(1.617)	(1.479)	(1.757)	(1.924)	(1.591)	(1.866)	(1.608)	(2.515)
Peru							-0.13	-0.24	-0.49	-0.88	-1.42	-1.69
							(0.355)	(0.451)	(0.547)	(0.945)	(1.462)	(1.739)
Obs BR, CL, PE	663	662	661	660	659	658	663	662	661	660	659	658
Obs IL	416	415	414	413	412	411	502	501	500	499	498	497

Table A.5: Changes in CDS and nominal exchange rates around all IRG statements

This table shows the estimated coefficients for the cumulative change in sovereign 5-year CDS and nominal exchange rates following all the fifty IRG statements listed in Table A.1 in the Appendix. Changes are calculated as the cumulative differences in units for CDS and percentage points for exchange rates relative to the day preceding an IRG statement. Estimated coefficients are based on the regression model presented in Section 3. For both dependent variables, the model includes as control variables the level of the local-currency 10-year yield, a dummy for announcement of large-scale asset purchase programme, the level of the monetary policy rate, the daily change in the monetary policy rate, the returns of the domestic stock exchange index and their volatility, and the level of the term spread. The model for CDS in addition includes the level of the nominal exchange rate. The model for the exchange rate in addition includes the level of sovereign CDS. Robust standard errors are shown in parenthesis. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	CDS						Exchange Rates					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil	-3.70**	-2.38*	-0.43	2.67	-2.69	2.34	0.07	0.29	0.56	1.12	0.26	0.34
	(1.839)	(1.400)	(2.037)	(5.491)	(3.530)	(5.738)	(0.376)	(0.321)	(0.624)	(0.969)	(0.344)	(0.734)
Chile	-1.37	-1.37**	0.16	-0.27	-0.20	0.60	0.06	0.05	-0.39*	-0.10	-0.24	-0.32**
	(1.096)	(0.619)	(1.016)	(0.968)	(1.335)	(1.809)	(0.206)	(0.140)	(0.202)	(0.273)	(0.148)	(0.156)
India	-0.15	0.10	-0.77	-1.16	-0.51	-0.15	0.12	0.24**	0.08	0.14	0.24*	0.08
	(0.364)	(0.396)	(1.068)	(0.964)	(0.994)	(0.955)	(0.172)	(0.122)	(0.123)	(0.116)	(0.127)	(0.083)
Israel	-0.10	0.14	0.11	-0.01	0.14	0.04	-0.02	-0.12	0.07	0.04	0.08	-0.08
	(0.345)	(0.386)	(0.238)	(0.212)	(0.248)	(0.186)	(0.099)	(0.130)	(0.073)	(0.096)	(0.164)	(0.199)
Peru	0.38	0.60	0.27	0.24	0.37	0.58	-0.08	0.16	0.34**	0.15	0.12	0.21
	(1.227)	(0.976)	(0.724)	(0.624)	(0.629)	(0.802)	(0.118)	(0.156)	(0.156)	(0.144)	(0.172)	(0.150)
Obs	662	661	660	659	658	657	662	661	660	659	658	657

Table A.6: Adding lags of all explanatory variables. Changes in local currency yields after baseline IRG statements

This table shows a robustness check of Table 3 but adding lags of all explanatory variables, not only that of the dependent variable. Robust standard errors are shown in parenthesis, next to estimated coefficients. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	5-year LC yields						10-year LC yields					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil	-4.80***	-11.84***	-14.52***	-13.43***	-17.36***	-4.95	0.58	-12.26***	-30.40***	-28.07***	-32.87***	-37.49***
	(1.745)	(2.179)	(2.402)	(2.915)	(2.904)	(3.068)	(2.103)	(3.882)	(2.485)	(2.398)	(2.517)	(2.261)
Chile	2.16**	-4.22***	-3.89***	-0.85	-9.22***	-7.87***	6.85***	2.42*	-0.01	1.86*	-6.26***	-5.73***
	(0.882)	(1.112)	(1.114)	(1.239)	(1.061)	(1.292)	(0.580)	(1.251)	(1.212)	(1.078)	(1.133)	(1.307)
India	2.00*	4.53***	2.60*	5.06***	2.33	4.40***	-1.20	-5.15***	-3.50***	-3.49***	-2.18	-0.62
	(1.059)	(1.406)	(1.469)	(1.337)	(1.529)	(1.472)	(0.784)	(1.034)	(1.232)	(1.139)	(1.379)	(1.327)
Israel	0.86***	1.93***	0.05	-0.86**	-0.18	1.76***	0.59***	0.46	-1.14	0.21	-0.15	-0.60
	(0.326)	(0.330)	(0.365)	(0.376)	(0.467)	(0.400)	(0.162)	(0.514)	(0.706)	(0.642)	(0.772)	(0.862)
Peru	-1.79***	-10.63***	-4.90***	-2.87**	0.78	-2.81*	-0.00	-15.71***	-9.84***	-2.70	-4.86**	-1.26
	(0.648)	(0.886)	(1.830)	(1.164)	(1.726)	(1.567)	(0.000)	(1.689)	(2.808)	(1.880)	(2.102)	(2.532)
Obs	662	662	661	660	659	658	662	662	661	660	659	658

Table A.7: Controlling for all other IRG statements. Changes in local currency yields after baseline IRG statements

This table shows a robustness check of Table 3 additionally including in addition to the dummy for baseline IRG statement a dummy for all IRG statements. Robust standard errors are shown in parenthesis. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	5-year LC yields						10-year LC yields					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil baseline IRG	-9.96**	-10.22**	-21.90***	-22.21***	-15.38**	-8.67	-2.75	-28.51***	-35.84***	-34.72***	-40.95***	-40.21***
	(4.256)	(4.197)	(7.694)	(7.206)	(6.222)	(10.921)	(7.443)	(7.349)	(4.525)	(4.394)	(7.675)	(14.067)
All IRG	2.69	-2.35	7.84	7.00	-2.11	3.38	-0.27	3.73	2.24	3.14	5.38	-0.09
	(4.033)	(3.915)	(7.527)	(6.733)	(5.585)	(10.726)	(6.798)	(6.773)	(4.403)	(4.297)	(7.583)	(14.090)
Chile baseline IRG	6.06***	-1.74	-4.41	1.86	-6.85***	-3.56*	6.59***	1.58	-2.31	3.13	-3.09**	-0.88
	(1.920)	(1.830)	(2.695)	(3.130)	(2.518)	(1.915)	(2.043)	(1.575)	(3.397)	(2.638)	(1.330)	(1.736)
All IRG	-3.61*	-1.21	1.33	-2.52	-1.28	-3.01*	0.21	-0.16	2.15	-1.37	-3.14***	-3.80**
	(1.919)	(1.737)	(2.621)	(3.065)	(2.442)	(1.668)	(2.049)	(1.399)	(3.401)	(2.607)	(1.115)	(1.574)
India baseline IRG	-0.12	1.18	-2.05	2.95	-0.08	-0.51	-5.75**	-8.62***	-6.78***	-5.52***	-3.67**	-4.00**
	(4.272)	(3.417)	(2.878)	(2.312)	(2.375)	(1.915)	(2.264)	(2.019)	(1.202)	(1.588)	(1.845)	(1.583)
All IRG	1.55	3.53	2.73	2.74	2.65	3.56*	2.18	1.50	2.08*	1.88	1.36	2.26
	(4.267)	(3.411)	(2.859)	(2.307)	(2.373)	(1.905)	(2.268)	(2.030)	(1.061)	(1.524)	(1.776)	(1.500)
Israel baseline IRG	-0.50	1.04**	-2.30**	-1.19**	-0.39	0.90**	-2.12*	-2.11*	-1.69*	-0.61	-0.40	-3.06***
	(0.600)	(0.525)	(1.131)	(0.525)	(0.378)	(0.455)	(1.275)	(1.191)	(0.901)	(1.686)	(0.664)	(1.049)
All IRG	-0.75	-0.62	1.24	-0.65	-0.19	0.62	-1.89	-0.20	-1.07	-0.36	-0.54	1.80**
	(0.582)	(0.487)	(1.109)	(0.474)	(0.291)	(0.390)	(1.252)	(1.108)	(0.807)	(1.644)	(0.488)	(0.890)
Peru baseline IRG	-2.49**	-11.48***	-6.62***	-4.78***	-0.85	-3.10	-0.19	-20.42***	-11.63***	-2.47	-6.10*	-0.07
	(1.022)	(1.546)	(1.796)	(1.834)	(1.869)	(2.053)	(2.721)	(2.822)	(2.871)	(2.879)	(3.350)	(3.649)
All IRG	0.53	0.07	1.50	0.46	0.91	-1.02	-3.57*	0.97	0.76	-0.71	0.14	-3.28
	(0.708)	(1.322)	(1.275)	(1.518)	(1.317)	(1.522)	(2.109)	(2.104)	(1.424)	(2.276)	(2.286)	(2.886)
Obs	662	662	661	660	659	658	662	662	661	660	659	658

Table A.8: Non-baseline IRG statements. Changes in local currency yields

This table shows a robustness check for all non-baseline IRG statements: those that did not introduce or change materially the interest rate guidance, did not take place at the effective lower bound, and/or were no simultaneous with an interest rate cut and/or an announcement of a large-scale asset purchase programme. IRG statements are listed in Table A.1 in the Appendix. The model and control variables are as in Table 3. Robust standard errors are shown in parenthesis. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	5-year LC yields						10-year LC yields					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil	2.66	-2.36	7.83	6.97	-2.09	3.39	-0.31	3.72	2.26	3.13	5.38	-0.10
	(4.022)	(3.905)	(7.520)	(6.715)	(5.578)	(10.721)	(6.782)	(6.764)	(4.403)	(4.289)	(7.576)	(14.075)
Chile	-3.63*	-1.24	1.31	-2.56	-1.32	-3.04*	0.19	-0.19	2.13	-1.41	-3.18***	-3.83**
	(1.925)	(1.739)	(2.619)	(3.072)	(2.443)	(1.663)	(2.054)	(1.408)	(3.405)	(2.623)	(1.113)	(1.570)
India	1.55	3.53	2.73	2.74	2.65	3.57*	2.17	1.49	2.08*	1.88	1.36	2.28
	(4.264)	(3.408)	(2.858)	(2.305)	(2.372)	(1.904)	(2.268)	(2.033)	(1.062)	(1.523)	(1.774)	(1.492)
Israel	-0.75	-0.62	1.24	-0.65	-0.19	0.63	-1.89	-0.20	-1.06	-0.36	-0.54	1.82**
	(0.582)	(0.487)	(1.108)	(0.473)	(0.291)	(0.391)	(1.251)	(1.108)	(0.807)	(1.642)	(0.487)	(0.894)
Peru	-0.75	-0.62	1.24	-0.65	-0.19	0.63	-1.89	-0.20	-1.06	-0.36	-0.54	1.82**
	(0.582)	(0.487)	(1.108)	(0.473)	(0.291)	(0.391)	(1.251)	(1.108)	(0.807)	(1.642)	(0.487)	(0.894)
Obs	660	660	659	658	657	656	660	660	659	658	657	656

Table A.9: Placebo US forward guidance. Changes in local currency yields

This table shows the estimated coefficients for the cumulative change in 5- and 10-year local currency yields after three IRG statements in the US during 2020: 16 March, 2020; 16 September, 2020; and 16 December, 2020. Changes are calculated as the cumulative differences in basis points in 5- and 10-year yields relative to the day preceding the US IRG statement. The model and control variables are as in Table 3. Robust standard errors are shown in parenthesis. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

	5-year LC yields						10-year LC yields					
	t=0	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*
Brazil	0.49	-46.85	-27.85	22.34***	-20.57*	-0.88	3.17	-43.26	-6.19	-5.12	-23.24**	0.35
	(7.934)	(42.882)	(36.238)	(7.128)	(11.282)	(7.226)	(5.305)	(34.147)	(10.915)	(8.843)	(9.997)	(5.749)
Chile	-10.79	-14.04*	1.80	-0.25	1.75	2.08	-15.83	-17.00**	13.32	2.36	3.97	2.16
	(6.783)	(8.242)	(3.514)	(4.530)	(2.743)	(3.153)	(10.137)	(7.769)	(12.418)	(5.271)	(4.900)	(3.071)
India	-7.19***	-2.21	-4.69	-1.36	-8.80	-1.92	-7.73*	-1.69	-3.35*	-0.12	-8.92	-1.34
	(2.727)	(4.956)	(5.189)	(3.294)	(7.981)	(2.610)	(4.673)	(2.576)	(2.024)	(0.954)	(7.444)	(1.251)
Israel	0.68	4.86	2.49	0.05	0.91	-1.83	1.41	4.03	9.15	-2.86***	0.92	-2.17
	(1.166)	(4.865)	(2.396)	(2.016)	(1.686)	(1.440)	(1.960)	(5.252)	(7.749)	(1.055)	(2.929)	(3.443)
Peru	9.10	13.49	11.56	5.56	-2.91	-8.64	-1.01	-3.77	11.55	-11.63	-12.50	-14.35
	(6.266)	(11.610)	(10.653)	(6.144)	(5.184)	(6.715)	(3.219)	(4.194)	(8.690)	(12.195)	(15.282)	(14.994)
Obs	662	662	661	660	659	658	662	662	661	660	659	658

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