

**UNIVERSIDAD DEL CEMA
Buenos Aires
Argentina**

Serie
DOCUMENTOS DE TRABAJO

Área: Finanzas

**THE 30-DAY US DOLLAR FUTURES CONTRACT
AT A3 MERCADOS AS A PREDICTOR
OF THE SPOT EXCHANGE RATE**

Julián R. Siri y José P. Dapena

**Octubre 2026
Nro. 940**

**https://ucema.edu.ar/publicaciones/doc_trabajo.php
UCEMA: Av. Córdoba 374, C1054AAP Buenos Aires, Argentina
ISSN 1668-4575 (impreso), ISSN 1668-4583 (en línea)
Editor: Jorge M. Streb; Coordinador del Departamento de Investigaciones: Maximiliano Ivickas**

The 30-Day US Dollar Futures Contract at A3 Mercados as a Predictor of the Spot Exchange Rate

Julián R. Siri^{*} José P. Dapena[†]

Universidad del CEMA (UCEMA)

2026

Documento de Trabajo

Abstract

This paper examines whether the 30-day US dollar futures contract traded on A3 Mercados (DLR) is a good predictor of the wholesale spot exchange rate thirty days ahead. Using 5,741 daily observations between January 2003 and September 2026, we build a constant-maturity 30-day futures series and compare it with the realized spot rate across six exchange-rate regimes, from managed floating to the current band scheme. Futures prices are not unbiased predictors regime by regime: they underestimated devaluation under the 2011–15 exchange controls and overestimated it by roughly 1.2% per month in 2019–25, when the futures price stood above the realized spot on 91% and 96% of days in the last two control sub-periods. Under floating regimes the futures forecast is barely distinguishable from a random walk (Theil's U between 0.90 and 1.02), because discrete jumps in the exchange rate cannot be anticipated. Pooled over the full sample the unbiasedness hypothesis is not rejected ($\beta = 1.06$), but this result conceals strong regime heterogeneity. We conclude that the DLR futures price measures expected devaluation adjusted for risk and interest rates, not an unbiased forecast.

JEL Classification: F31, G13, G17.

Keywords: Futures markets, exchange rates, forecasting, covered interest parity, risk premium, Argentina.

^{*}Universidad del CEMA (UCEMA), Av. Córdoba 374, C1054AAP Buenos Aires, Argentina. E-mail: jrs06@ucema.edu.ar.

[†]Universidad del CEMA (UCEMA). E-mail: jd@ucema.edu.ar.

Disclaimer: The views expressed in this paper are solely those of the authors and do not necessarily reflect the views of Universidad del CEMA, of any organization at which the authors are employed or affiliated.

1 Introduction

Few prices are watched as closely in Argentina as the exchange rate. Households, firms, investors and policymakers all form expectations about the path of the peso, and the dollar futures market is the one place where those expectations are traded openly, backed by a clearing house and supervised by the CNV. The futures curve is therefore routinely read as the market's forecast of future devaluation.

Whether it deserves that reading is an empirical question. In international finance, forward and futures rates have a long record of being biased predictors of future spot rates (Fama, 1984), and structural models have struggled to outperform a random walk at short horizons (Meese and Rogoff, 1983). Argentina offers an unusually demanding test: over the sample studied here the country moved through managed floating, two periods of exchange controls (known as “*cepo*”), a period without controls, a crawling peg combined with controls, and a band regime, with several large discrete devaluations along the way.

This paper asks a simple question: *is the 30-day DLR futures price an unbiased and accurate predictor of the spot exchange rate 30 days later, and does the answer depend on the exchange-rate regime?* We answer it using 23 years of daily data, a constant-maturity futures series, a regime-by-regime regression test of unbiasedness, and a forecast-accuracy comparison against the no-change benchmark.

The rest of the paper is organized as follows. Section 2 describes the futures market infrastructure in Argentina and the uses of futures. Section 3 presents the DLR contract and how it is used for hedging. Section 4 sets out the theoretical link between futures prices, interest rates and expected devaluation. Section 5 describes the data and methodology, Section 6 presents the results, Section 7 discusses them and Section 8 concludes.

2 Futures markets in Argentina and their uses

2.1 Market infrastructure

Argentina has a century-old tradition of organized forward trading. The term markets of Buenos Aires (1907) and Rosario (1909) were born around grains. Today the market is organized around A3 Mercados, the result of the merger of Matba Rofex and MAE, with Argentina Clearing acting as clearing house and central counterparty. The market is regulated and supervised by the CNV. The contracts listed cover several types of underlying assets: currencies (US dollar, Brazilian real and euro), agricultural commodities (soybeans, corn and wheat), financial assets (equity indices, shares, bonds and interest rates), and energy and metals (WTI crude oil and gold). Among them, the US dollar future (DLR) is the most liquid contract.

2.2 Why futures are used

Futures serve four broad purposes, which are not mutually exclusive:

- **Hedging:** fixing today the price of a future transaction.
- **Price discovery:** the futures curve reveals expectations about devaluation and interest rates.
- **Investment and speculation:** obtaining exposure with little capital.
- **Arbitrage:** aligning the futures price, the spot price and interest rates.

The second function is the focus of this paper: to the extent that arbitrage ties futures prices to interest rates, the question is how much information about future spot prices the curve contains beyond what interest rates already reveal.

3 The DLR contract and its use as a hedge

3.1 Contract definition

A futures contract is a standardized agreement to buy or sell an asset on a future date T at a price $F_{t,T}$ agreed today, traded on an exchange and guaranteed by a clearing house. At maturity, the payoff to each side is the difference between the spot price and the agreed price:

$$\Pi_{\text{buyer}} = S_T - F_{t,T}, \quad \Pi_{\text{seller}} = F_{t,T} - S_T. \quad (1)$$

The game is zero-sum, and gains and losses are settled every day through marking to market. Compared with a forward contract, a future is standardized, carries no bilateral counterparty risk and allows the position to be closed before maturity (see Cox et al., 1981, on the differences between forward and futures prices). The main features of the DLR contract are summarized in Table 1.

Table 1: Main features of the DLR contract (A3 Mercados)

Feature	Description
Underlying asset	Wholesale US dollar
Contract size	USD 1,000 per contract
Maturities	Monthly (last business day of the month)
Settlement	Cash settlement in pesos by difference against the BCRA Communication “A” 3500 exchange rate
Delivery	No delivery of dollars
Clearing and supervision	Argentina Clearing (central counterparty); CNV

3.2 Hedging with DLR futures

The position a participant takes depends on which side of the exchange-rate risk they bear (Table 2). An importer with a dollar debt buys futures and fixes the peso cost of the payment; an exporter who collects in dollars sells futures and fixes the peso revenue. A peso investor can buy futures to dollarize the portfolio without dismantling it, while a dollar investor can sell futures and place pesos at the prevailing interest rate (a covered carry).

Table 2: Typical users of DLR futures

Participant	Position	Purpose
Importer (USD debt)	Buy	Fix the cost in pesos
Exporter (USD income)	Sell	Fix the revenue in pesos
Peso investor	Buy	Dollarize the portfolio without liquidating it
Dollar investor	Sell	Place pesos at the interest rate (covered carry)

Table 3 and Figure 1 illustrate the mechanics for an importer who owes USD 100,000 in 30 days and buys 100 DLR contracts at $F = \text{ARS } 1,450$. If the spot rate at maturity is 1,350, the import costs ARS 135.0 million but the futures position loses ARS 10.0 million; if it is 1,600, the import costs ARS 160.0 million but the futures position gains ARS 15.0 million. In both cases the net cost is ARS 145.0 million. Hedging eliminates risk, not “bad luck”: the importer gives up the gain if the dollar falls.

Table 3: Importer hedge: USD 100,000 due in 30 days, 100 DLR contracts bought at $F = \text{ARS } 1,450$

ARS million	$S_T = 1,350$	$S_T = 1,600$
Import payment	135.0	160.0
Futures result	-10.0	+15.0
Net cost	145.0	145.0

3.3 Open interest, margins and tied-up capital

Three features of futures markets matter for users. *Open interest* counts the contracts outstanding and not yet closed; it measures commitment, not daily activity (volume). The *initial margin* is a guarantee per contract set by the clearing house according to volatility. Losses are paid every day (*daily settlement*), which requires liquidity. Since only the margin, and not the notional amount, is tied up, futures provide leverage: with a 10% margin, a USD 100,000 hedge ties up approximately USD 10,000.

Figure 2 shows the evolution of DLR open interest since 2003. It grew with the post-2008 expansion of the market, peaked above USD 12 billion in early 2016, immediately after the

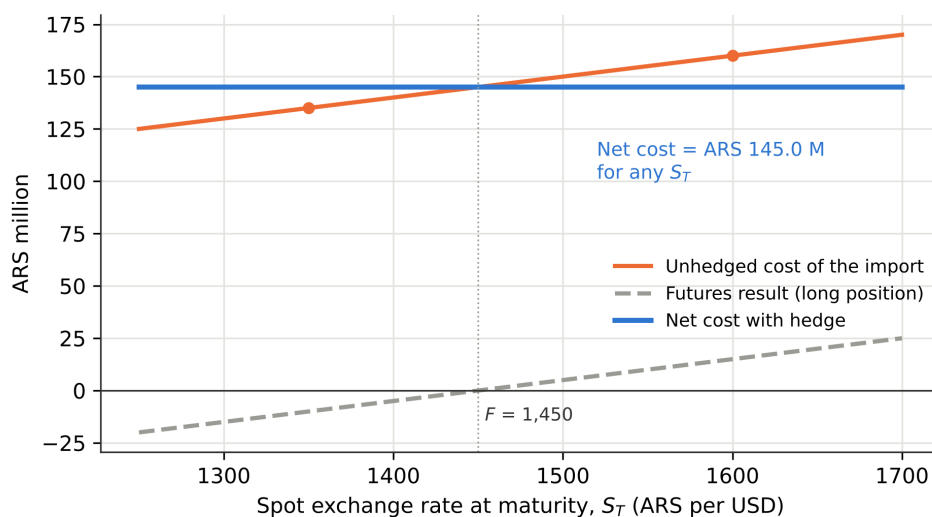


Figure 1: Net cost of the importer's position with and without the hedge, as a function of the spot exchange rate at maturity. Dots mark the two scenarios in Table 3.

period in which the BCRA sold futures (2015), and reached a second high of around USD 8 billion in 2025–26.

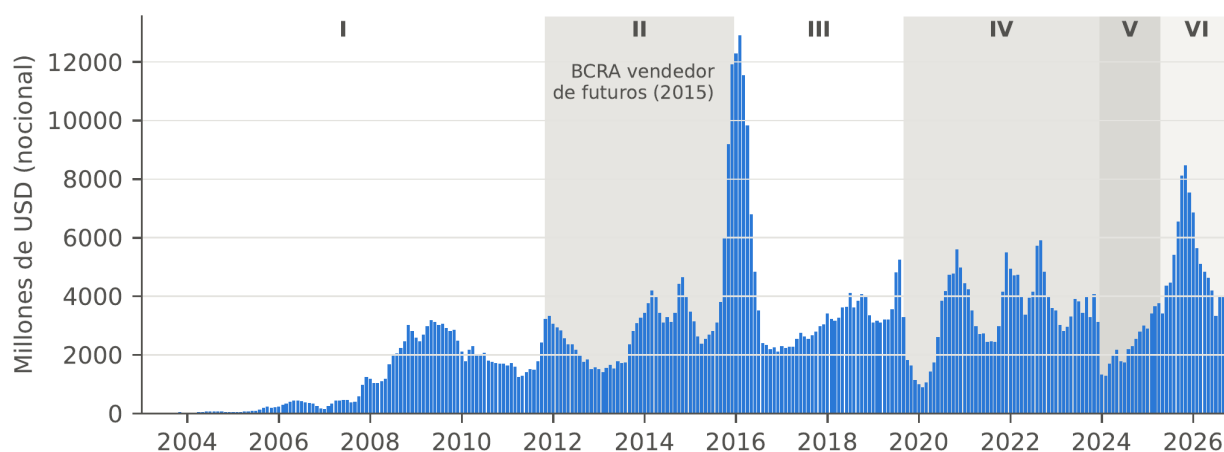


Figure 2: DLR open interest, all positions (monthly average, USD million of notional), 2003–2026. Roman numerals and shading denote the regimes described in Section 5. Source: CEM and A3 Mercados. Chart labels are in Spanish.

4 Theoretical framework

4.1 Covered interest parity and the cost of carry

The futures price is not a pure bet on the future spot rate: it incorporates the interest-rate differential. Under covered interest parity (the cost-of-carry relation; see [Hull, 2022](#)),

$$F_{t,T} = S_t \frac{1 + i_{\$} \tau}{1 + i_{\text{USD}} \tau}, \quad \tau = \frac{T - t}{365}, \quad (2)$$

where S_t is the spot rate, $i_{\$}$ and i_{USD} are the nominal annual rates (TNA) in pesos and dollars, and τ is the time to maturity in years. With effective rates the relation becomes $F_{t,T} = S_t [(1 + i_{\$}) / (1 + i_{\text{USD}})]^\tau$. Buying the future is equivalent to borrowing pesos and buying dollars today. Inverting the relation yields the devaluation rate implied by the futures price, expressed as an annualized nominal rate:

$$\text{TNA} = \left(\frac{F}{S} - 1 \right) \times \frac{365}{T - t}. \quad (3)$$

4.2 Futures as a predictor of the spot rate

If markets are efficient and agents are risk neutral, the futures price equals the expected future spot rate, $F_{t,T} = \mathbb{E}_t[S_T]$. Two conditions can break this equality. First, the futures price may contain a *risk premium* paid by hedgers to those who supply cover, so that it exceeds the expected spot rate on average. Second, in regimes where the spot rate is administered, the futures price reflects the peso interest rate plus the market's assessment of the probability and size of a regime change, which need not coincide with what actually happens within the 30-day window. We therefore test two properties. *Unbiasedness* requires that, in a regression of realized on implied devaluation, the slope is one. *Accuracy* requires that the futures price forecasts the spot rate at least as well as the naive prediction that the exchange rate will not change.

5 Data and methodology

5.1 Data

The sample covers daily observations from January 2003 to September 2026 (5,741 observations). The futures series is a constant-maturity 30-day contract, obtained by linear interpolation of the DLR settlement prices between the current-month and next-month positions. The spot series is the BCRA Communication “A” 3500 reference rate until 2015 and the wholesale closing rate from 2016 onward. The last futures observation is dated 4 September 2026, whose realized spot value corresponds to 4 October 2026. Open interest data are from

the CEM and A3 Mercados. Figures 2 to 5 reproduce the original charts of the study, whose labels are in Spanish; Figures 1, 6 and 7 are drawn from the figures reported in the tables.

5.2 Exchange-rate regimes

Because the exchange-rate framework changed repeatedly, the analysis is carried out for the full sample and separately for six regimes (identified in Table 4). The same regime classification is used to shade Figures 2 to 5.

Table 4: Exchange-rate regimes and sample periods

Regime	Description	Period	Controls	Observations
I	Managed floating	Jan 2003 – Oct 2011	No	2,181
II	Exchange controls (<i>cepo</i>)	Oct 2011 – Dec 2015	Yes	955
III	No controls	Dec 2015 – Aug 2019	No	905
IV	Exchange controls (<i>cepo</i>)	Sep 2019 – Dec 2023	Yes	1,040
V	Controls and crawling peg	Dec 2023 – Apr 2025	Yes	324
VI	Exchange-rate bands	Apr 2025 – Sep 2026	No	336
Full sample		Jan 2003 – Sep 2026		5,741

Notes. the “Controls” column follows the shading convention of the original figures (regimes II, IV and V are shaded as control regimes).

5.3 Variables and tests

Three statistics are used. The *realized spread* compares the futures price at t with the spot price 30 days later:

$$s_t = \ln\left(\frac{F_t}{S_{t+30}}\right). \quad (4)$$

A positive spread means that the futures price anticipated more devaluation than occurred (the seller of the future gains); a negative spread corresponds to unanticipated exchange-rate jumps (the buyer gains). To test unbiasedness we estimate, in each regime and in the full sample, the regression of the monthly log devaluation on the log devaluation implied by the futures price,

$$\ln\left(\frac{S_{t+30}}{S_t}\right) = \alpha + \beta \ln\left(\frac{F_t}{S_t}\right) + \varepsilon_t, \quad (5)$$

and test $H_0: \beta = 1$ (unbiasedness) with a t statistic based on Newey and West (1987) standard errors with 21 lags, which accounts for the overlap between consecutive 30-day windows (Hansen and Hodrick, 1980). The null is rejected at the 5% level when $|t| > 1.96$. Forecast accuracy is measured with Theil’s (1966) U statistic,

$$U = \frac{\text{RMSE}(\text{futures})}{\text{RMSE}(\text{current spot})}, \quad (6)$$

where values below one indicate that the futures price predicts better than the random walk.

6 Results

6.1 Futures and realized spot rates

Figure 3 plots the 30-day futures price against the spot rate realized 30 days later. On a logarithmic scale, the two series are almost indistinguishable: the exchange rate rose from about ARS 3 per dollar in 2003 to around ARS 1,500 in 2026, and the futures price tracked that path closely. The level comparison, however, hides what matters for prediction, namely the size and sign of the gap between the two, which is examined next.

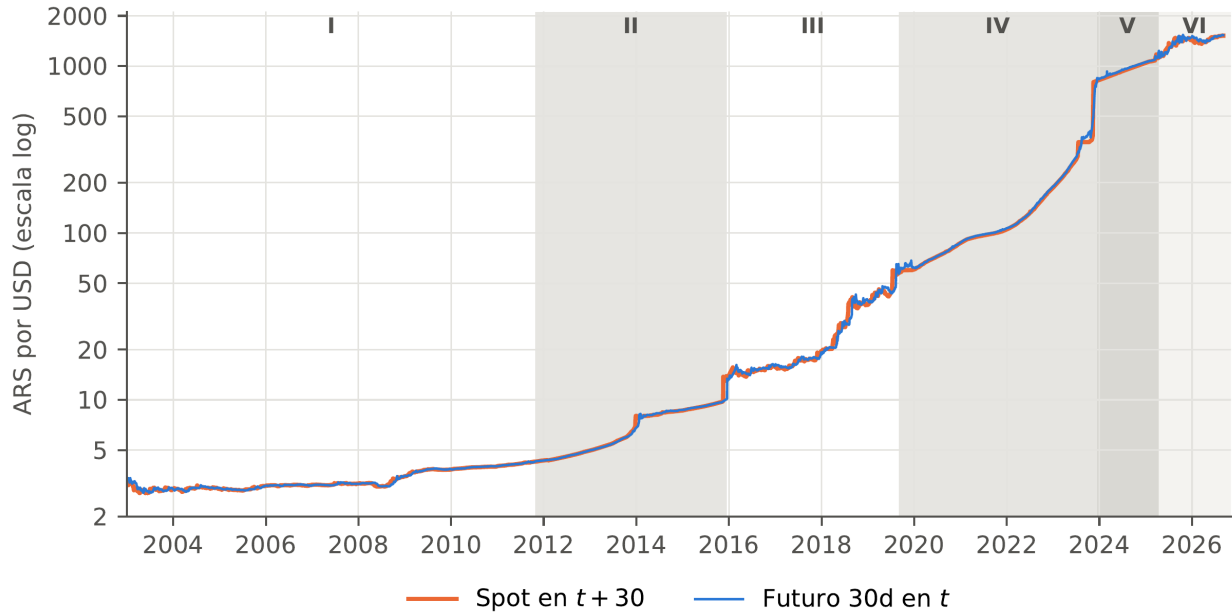


Figure 3: 30-day futures price at t versus spot rate at $t + 30$ (ARS per USD, logarithmic scale), 2003–2026. Note: constant-maturity 30-day futures, obtained by linear interpolation of settlement prices between the current-month and next-month DLR positions. Spot: Com. “A” 3500 until 2015, wholesale close from 2016. Last futures observation: 4 September 2026 (spot at 30 days: 4 October 2026). Shading denotes exchange-rate regimes (see Table 4). Chart labels are in Spanish.

6.2 The realized spread

Figure 4 shows the realized spread $\ln(F_t/S_{t+30})$. Under managed floating (regime I) and in the early years of the controls, the spread is small and close to zero. The large deviations are almost all negative and coincide with abrupt, unanticipated currency adjustments: January 2014, December 2015, the 2018 crisis, the 2019 primary elections (PASO 19), the 2023

primary elections (PASO 23) and, most prominently, the December 2023 devaluation. In these episodes the spot price jumped well above what the futures curve had priced in. The spread reached roughly -30% in December 2015, and the December 2023 episode reached the bottom of the chart's axis, at -50% .

The picture reverses in the regimes with administered exchange rates after 2019 (IV and V): the spread is persistently positive, which means that the futures price systematically stood above the realized spot rate.

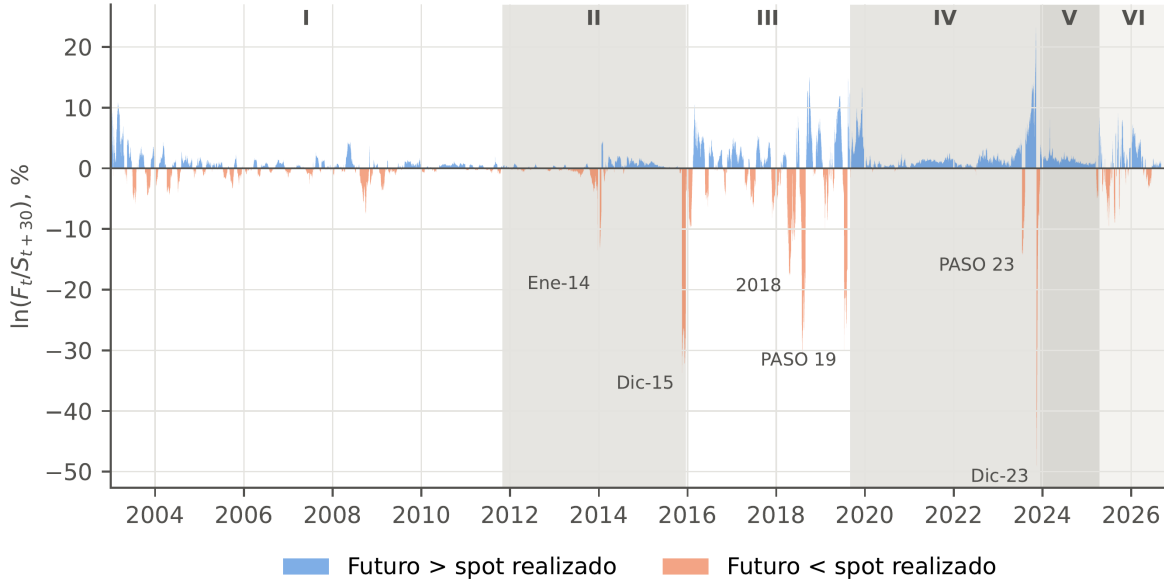


Figure 4: Realized spread $\ln(F_t/S_{t+30})$, in percent, 2003–2026. Blue areas: futures above realized spot; orange areas: futures below realized spot. Note: a positive value means that the futures price anticipated more devaluation than occurred (the seller gains); a negative value reflects exchange-rate jumps that were not anticipated. Chart labels are in Spanish.

6.3 Implied versus realized devaluation

Figure 5 compares the 30-day devaluation implied by the futures price with the devaluation actually realized (21-trading-day moving averages). Without exchange controls, arbitrage links the futures price to the peso interest rate, so the implied devaluation is smooth, while the realized devaluation is much more volatile. During the 2011–15 controls, the futures price underestimated devaluation, notably in January 2014 and December 2015; in 2015 the BCRA itself was selling futures (see Figure 2). During the 2019–25 controls, with an administered spot rate, the futures price reflected the peso interest rate plus a risk premium and exceeded the realized spot rate on 91% of days in regime IV and 96% of days in regime V.

Table 5 reports the descriptive statistics by regime and Figure 6 summarizes the mean implied and realized devaluations. The mean spread is negative in regimes II (-0.7%) and

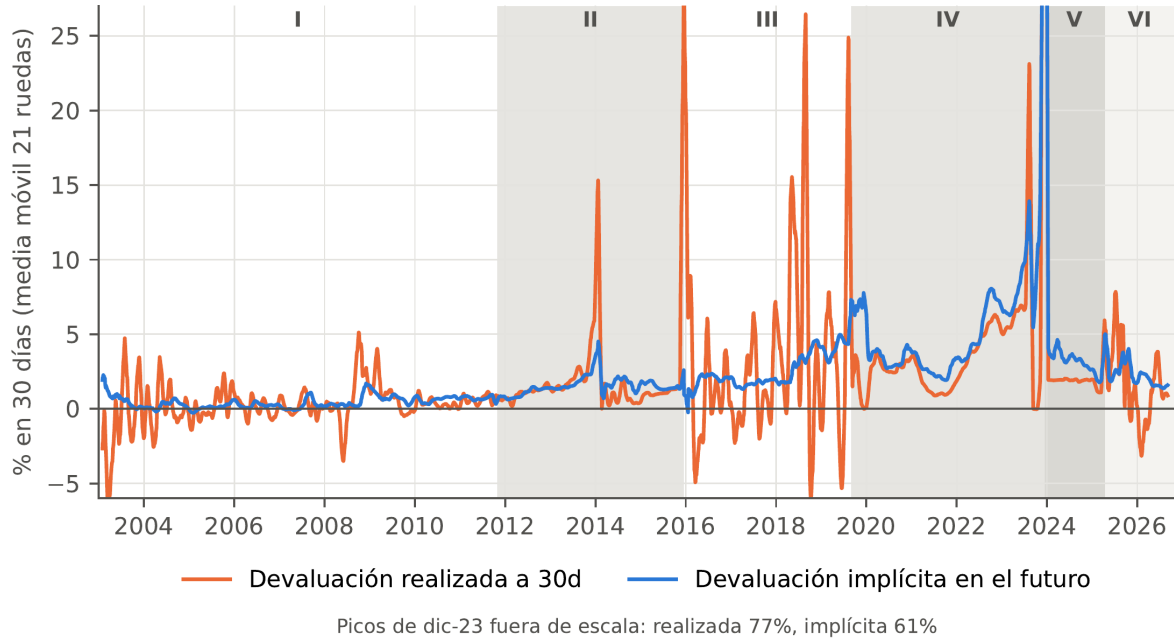


Figure 5: Devaluation implied by the 30-day futures price versus realized 30-day devaluation (% over 30 days, 21-trading-day moving average), 2003–2026. Note: December 2023 peaks are off the chart’s scale: realized 77%, implied 61%. Chart labels are in Spanish.

III (-0.5%), when exchange-rate jumps were larger than implied, and positive in regimes IV and V ($+1.2\%$ per month in both) and in regime VI ($+0.6\%$). The implied nominal annual rate (TNA) rises from 5% in regime I to 49% in regime IV and 40% in regime V, and has since come down to 25% under the band regime.

6.4 Unbiasedness and predictive accuracy

Table 6 and Figure 7 report the regression and forecast-accuracy results. The unbiasedness hypothesis ($\beta = 1$) is rejected at the 5% level in five of the six regimes. The slopes differ widely across regimes: $\beta = 3.40$ in regime II, where a given implied devaluation was followed by a much larger realized one, while β is well below one in regimes I (0.25), III (0.29) and V (0.51), where realized devaluation responded much less than one-for-one to the implied signal. Regime IV has a slope close to one (1.16) but is still rejected statistically, as the standard error is small. Only in the band regime (VI) does the slope (0.90) not differ significantly from one ($t = -0.19$). Over the full sample, the slope is 1.06 and unbiasedness is not rejected ($t = 0.70$), but this pooled result is influenced by the large devaluation episodes and hides the heterogeneity across regimes.

In terms of accuracy, Theil’s U is close to one in regimes I, III and VI (1.02 , 0.93 and 0.90), where the exchange rate floats: the futures price predicts only marginally better than the current spot rate, since discrete jumps are not predictable. U is well below one in the control regimes IV (0.39) and V (0.70), where the futures price captured the trend of a spot

Table 5: Descriptive statistics by exchange-rate regime (monthly log devaluation, %)

Regime	Obs.	Implied (%)	Realized (%)	Spread (%)	Std. dev. (%)	$F > S_{t+30}$ (% of days)	TNA (%)
I	2,181	0.5	0.3	0.2	1.7	59	5
II	955	1.6	2.3	-0.7	4.5	58	18
III	905	2.6	3.1	-0.5	7.0	58	26
IV	1,040	6.3	5.1	1.2	4.7	91	49
V	324	3.3	2.1	1.2	1.2	96	40
VI	336	2.2	1.6	0.6	3.4	62	25
Total	5,741	2.3	2.1	0.2	4.2	67	19

Notes. “Implied” and “Realized” are mean monthly log devaluations; “Spread” is their difference (equal to the mean of $\ln(F_t/S_{t+30})$); “Std. dev.” is the dispersion reported in the source for the spread; “TNA” is the mean implied annual nominal rate.

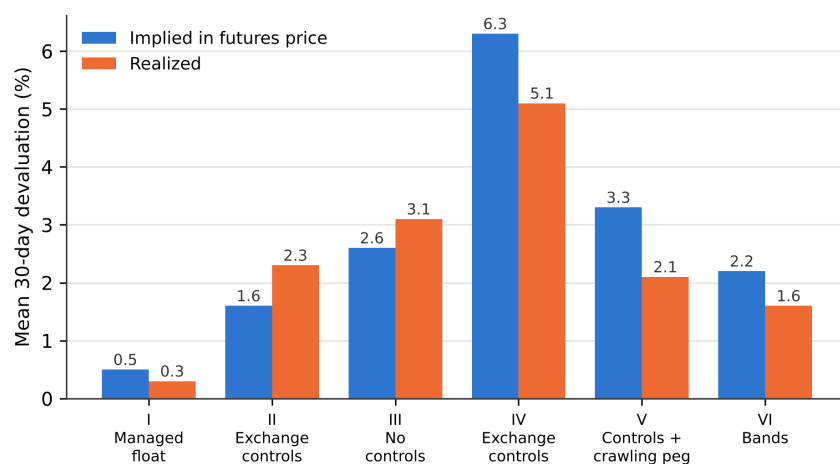


Figure 6: Mean monthly devaluation implied by futures prices and realized, by regime (%). Source: Authors' elaboration based on Table 5.

rate that was being adjusted gradually. Over the full sample, U is 0.63.

Table 6: Unbiasedness test and forecast accuracy by regime

Regime	Description	β	$t_{\beta=1}$	$H_0: \beta = 1$ rejected at 5%	Theil's U
I	Managed floating	0.25	-2.72	Yes	1.02
II	Exchange controls	3.40	2.34	Yes	0.85
III	No controls	0.29	-2.09	Yes	0.93
IV	Exchange controls	1.16	2.45	Yes	0.39
V	Controls + crawling peg	0.51	-2.73	Yes	0.70
VI	Bands	0.90	-0.19	No	0.90
Total	Full sample	1.06	0.70	No	0.63

Notes. monthly log devaluation. Regression: $\ln(S_{t+30}/S_t) = \alpha + \beta \ln(F_t/S_t)$; $t_{\beta=1}$ is the t statistic for $H_0: \beta = 1$, with Newey–West standard errors (21 lags); $|t| > 1.96$ rejects at 5%. Theil's $U = \text{RMSE}(\text{futures}) / \text{RMSE}(\text{current spot})$; $U < 1$ means the futures price predicts better than the random walk.

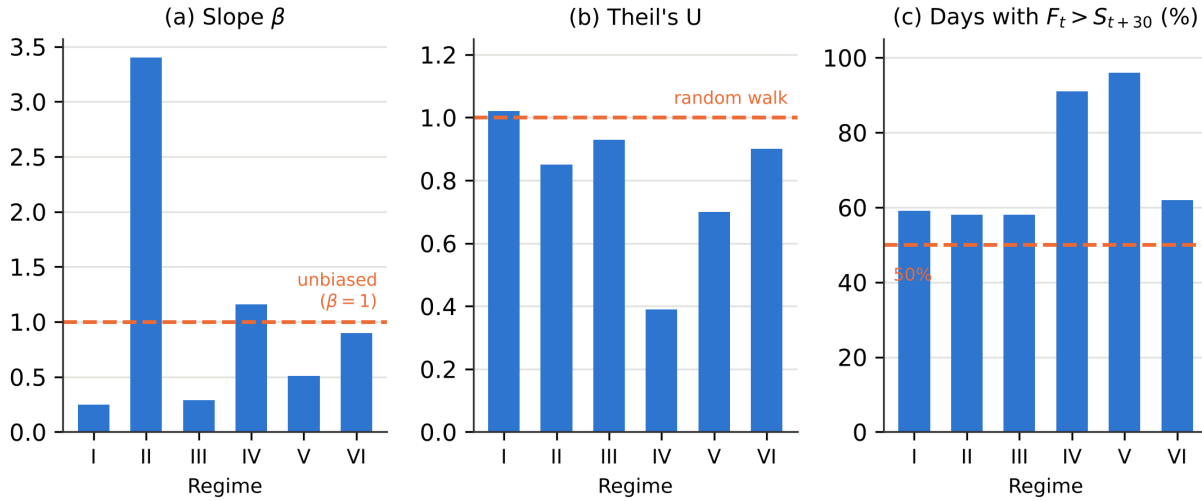


Figure 7: Predictive performance by regime: (a) slope β of the unbiasedness regression, (b) Theil's U , (c) share of days on which the futures price exceeds the realized spot rate. Note: dashed lines mark the reference values ($\beta = 1$, $U = 1$, 50%). Source: Authors' elaboration based on Tables 5 and 6.

7 Discussion

Three messages emerge from the evidence. First, the futures price should not be read as a forecast of the future exchange rate. Because of covered interest parity, a large part of its level simply reflects the peso–dollar interest-rate differential; what remains, once rates are

taken into account, is an expectation adjusted for risk. The sign of the bias is not stable: it was negative when the market failed to price in devaluation jumps (2011–15), and positive when the futures price embedded a premium over a spot rate that the authorities kept under control (2019–25).

Second, the cost of hedging is regime dependent. During 2019–25, the futures price exceeded the realized spot on 91% to 96% of days, with a mean excess of around 1.2% per month. For an importer who bought futures, this was the price of insurance, a premium that was collected by those who sold cover. In 2011–15 and in the period without controls (2015–19), by contrast, buyers of futures gained on average, because jumps in the exchange rate exceeded what was priced in. These patterns, together with the realized spreads in Figure 4, illustrate the point made in Section 3.2: a hedge removes risk, not the possibility of ex-post gains or losses.

Third, the jumps that dominate the forecast errors are, by their nature, difficult to predict. In regimes with floating or band-type exchange rates, Theil's U close to one confirms the finding of the exchange-rate literature that it is hard to improve on the no-change forecast over short horizons (Meese and Rogoff, 1983).

Some limitations deserve mention. The constant-maturity series is built by interpolation and therefore smooths the information from the two nearest contracts. The regime dates are an exogenous classification, and the number of independent discrete-devaluation episodes within each regime is small, so the regime-level tests have limited power to separate a genuine risk premium from the effect of a few large events. Finally, the analysis is descriptive: it documents the sign and size of the bias in each regime but does not identify its source, whether it is a risk premium, convertibility risk or expectations about regime change.

8 Conclusions

We analyzed whether the 30-day DLR futures price at A3 Mercados predicts the spot exchange rate 30 days ahead, using 5,741 daily observations from 2003 to 2026. The main conclusions are:

- Under floating regimes (I, III and VI), the futures price predicts almost as well as the current spot rate (Theil's U of 1.02, 0.93 and 0.90), because exchange-rate jumps cannot be anticipated.
- The sign of the bias depends on the regime: the futures price underestimated devaluation during the 2011–15 exchange controls and overestimated it by roughly 1.2% per month in 2019–25, a premium that is collected by those who sell cover.
- The futures price measures the devaluation expected by the market, adjusted for risk and for interest rates; it is not an unbiased forecast, and it should be read in that way by hedgers, investors and policymakers.

References

- Cox, J.C., Ingersoll, J.E. and Ross, S.A. (1981). The relation between forward prices and futures prices. *Journal of Financial Economics*, 9(4), 321–346.
- Fama, E.F. (1984). Forward and spot exchange rates. *Journal of Monetary Economics*, 14(3), 319–338.
- Hansen, L.P. and Hodrick, R.J. (1980). Forward exchange rates as optimal predictors of future spot rates: An econometric analysis. *Journal of Political Economy*, 88(5), 829–853.
- Hull, J.C. (2022). *Options, Futures, and Other Derivatives*, 11th edition. Pearson.
- Meese, R.A. and Rogoff, K. (1983). Empirical exchange rate models of the seventies: Do they fit out of sample? *Journal of International Economics*, 14(1–2), 3–24.
- Newey, W.K. and West, K.D. (1987). A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica*, 55(3), 703–708.
- Theil, H. (1966). *Applied Economic Forecasting*. North-Holland.