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Argentina: The Honor Student—By Merit and By Mistake. A Natural Experiment on "Information Effects"

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Abstract

On January 7, 2025, Argentina's EMBI spread plunged by over 114 basis points. JP Morgan later revealed that this decline resulted from a technical mistake, creating a rare natural experiment—an exogenous shift in sovereign risk pricing. Because this mistake was unrelated to Argentina's fundamentals, it provides a unique opportunity to identify the "information effect" of asset prices. Using a Difference-in-Differences approach, we find that Argentine stocks outperformed other emerging markets during the mistake's window, indicating that investors revised their beliefs about Argentina's intrinsic asset values based on mispriced signals—consistent with the information effect. Stocks linked to the Vaca Muerta zone rose more sharply, suggesting investors viewed the EMBI drop as an improvement likely to facilitate investment in this major shale and gas reserve.

Keywords: EMBI, Argentina, Information Effect, Vaca Muerta, Natural Expriment

JEL Classification: G1, F3, E6

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1. Introduction

In the early hours of January 7, 2025, Argentina's EMBI spread dropped by more than 114 basis points compared to the previous day's close.[1] This sharp decline caught investors' attention, prompting speculation about reduced country risk.[2] Later that same day, however, JP Morgan revealed a technical error in its real-time index pages. With no changes in macroeconomic fundamentals or the global environment, Argentina's "grades" soared in just a few hours—without even having to "study." Thus, the technical error became a dream scenario for econometricians: a natural experiment allowing the isolation of exogenous variation in a primary sovereign risk pricing measure, the EMBI spread.

This natural experiment provides a unique opportunity to examine how investors use prices to shape their beliefs, particularly through the "information effect." When informational asymmetries exist, investors update their beliefs about an asset's intrinsic value based on (1) direct news about the issuer—such as earnings reports—and (2) signals inferred indirectly from asset prices. For example, less-informed investors may interpret a price rise as indicating higher intrinsic value (Grossman and Stiglitz, 1976). The information effect, in this context, refers to the enhanced desirability of an asset stemming from a price change that revises investor beliefs (Admati, 1985).

However, empirically identifying the information effect is significantly challenging. Even if an assets desirability were observable, desirability and price would move together in response to third factors——chiefly, the asset's intrinsic value—and not merely because of belief revisions.[3] Ideally, therefore, one would like to observe a shift in asset prices unrelated to intrinsic values. The EMBI pricing mistake provides precisely such an exogenous change.

We examine how this exogenous change influenced Argentina's stock market, a measure of desirability for Argentine assets. Using a Difference-in-Differences (DiD) model, we compare Argentina's stock market performance to that of other emerging market economies

[1] See, for instance, "Caída del riesgo país: qué dijo JP Morgan luego de la caída de más de 500 puntos en su índice para Argentina", Infobae, Jan 7th, 2025 and "Euforia por Argentina: el riesgo país se derrumba hasta los 454 puntos", El Cronista, Jan 7th, 2025.

[2] Juan Manuel Franco, chief economist at Grupo SBS, e.g., noted that the market had been on an upward trend since 2024, highlighting the performance of sovereign dollar-denominated bonds. "The country risk was able to break below 500 points thanks to the strong performance of bonds, reaching lows not seen since 2018," he stated. Similarly, Salvador Di Stefano emphasized that "the government's fiscal policy ensures there will be no deficit or money issuance, which supports macroeconomic stability."

[3] We use two Argentine assets: (i) the EMBI spread to account for an exogenous change in price signaling and changes in Argentina's stock markets as a measure of changes in Argentina's assets desirability.

(EMEs) from the early hours of January 7 until JP Morgan announced the mistake. Additionally, following an approach similar to Zhong et al. (2024), we use a Difference-in-Difference-in-Differences (DDD) technique to test whether the EMBI pricing mistake affected certain Argentine firms more than others.

Our findings indicate that the "information effect" is statistically and economically significant. Argentina's stock market surged far more than those of other EMEs following the EMBI's apparent decline, suggesting that investors relied on this mispriced signal to revise their beliefs about the country's intrinsic asset values. The effect persists throughout most of the event window, intensifying as the news started to spread. At its peak, the Argentine stock market rose over 4%, while the estimated impact relative to the EME benchmark reached 3.60%—equivalent to 1.88 and 1.69 standard deviations of Argentina's stock market changes in comparable windows, respectively.

The DDD results show that the Argentine firms that reacted more strongly were those linked to the Vaca Muerta zone—one of the world's largest unconventional hydrocarbon reserves (around 1.21% to 1.30% more within the event window). This outcome suggests that investors saw the drop in the EMB as making these oil and gas reserves more profitable, potentially by granting the government greater political leeway to enact investor protection measures or by facilitating resource access for infrastructure investment in Vaca Muerta.

2. The "information effect" of asset prices

According to the theoretical literature, the "information effect" can drive significant price movements, potentially deviating prices from intrinsic values. This misalignment may trigger feedback loops as investors revise their beliefs, leading to excessive volatility or even financial crashes (Barlevy and Veronesi, 2003; Avdis, 2016). Additionally, shifts in the price of related assets can influence belief revisions, even when fundamentals remain unchanged—resulting in price correlations exceeding those of intrinsic values (Veldkamp, 2006).

Empirically isolating information effects is challenging, so studies often take an indirect approach, analyzing the relationship between intrinsic values and prices under different information conditions. Roll (1987) and Pindyck & Rotemberg (1993) document significant price deviations from intrinsic values and excess price comovement. Morck et al. (2000) find stronger excess comovement in EMEs, where public information is scarcer and informational asymmetries are greater, suggesting that asset prices influence each other

through information effects. Similarly, Bai et al. (2016) show that as information availability improves, prices align more with fundamentals and exhibit less comovement. Dessaint et al. (2019) find that firms cut investment in response to nonfundamental drops in peer firms' stock prices. Our paper differs from theirs in that we exploit a natural experiment providing an opportunity to isolate fully exogenous price variation unrelated to intrinsic values.

3. Data and empirical framework

We obtain 10-minute interval data from Bloomberg for the MSCI equity index of Argentina and a group of other EMEs, covering January 7th (the event day) and extending to the period before the close of January 6th.[4] We reference NYSE closing and opening times, as they coincide with the availability of the Argentine index.[5]

Our baseline specification follows the following DiD framework:

(1) $S_{i,t} = \alpha_i + \gamma_t + \beta T_i \times E_t + u_{i,t};$

where $S_{i,t}$ is the log-index price at each 10-minute interval for each country; α_i and γ_t are country and time fixed effects, respectively; T_i is a dummy variable that equals 1 for Argentina's index and 0 for those of the other EMEs; E_t is another dummy that equals 1 after the incorrect EMBI was published and 0 before; and β, our coefficient of interest, measures the effect of the mistake on Argentina relative to the other EMEs. In our baseline model, we exclude observations on January 7 after JP Morgan announced that the EMBI was incorrect.

To verify that Argentina's index and those of other EMEs followed similar trajectories before the event—and the observed effects can be attributed to the mistake—we conduct a pre-trend test using the following event study regression:

(2) $S_{i,t} = \alpha_i + \gamma_t + \sum_{s=first\ obs}^{s=last\ obs} \delta_s T_i \times 1\{t = s\} + u_{i,t};$

where $1\{t = s\}$ is an indicator function; δ_s measures the difference between the index of Argentina and those of the other EMEs at the 10-minute window *s*.

To estimate the differential impact on firms involved in Vaca Muerta we replace Argentina's stock index with the log of the stock price for each Argentine firm individually.[6] We also introduce an additional dummy VM_i that equals 1 if firm *i* is an Argentine firm

[4] We use the 16 countries from the MSCI Emerging Markets Index with available data during the event window.
[5] Even though there is a two-hour time difference between New York and Buenos Aires, the trading hours of both stock exchanges overlap.
[6] Bloomberg provides data on 10 f the Argentine firms included in the MSCI Index separately. They account for 85.95% of the stock index capitalization.

linked to Vaca Muerta and 0 otherwise, which yields the following DDD regression (see section 5 for robsutness checks):

$$(3) \quad S_{i,t} = \alpha_i + \gamma_t + \beta_1 T_i \times E_t + \beta_2 T_i \times E_t \times VM_i + u_{i,t};$$

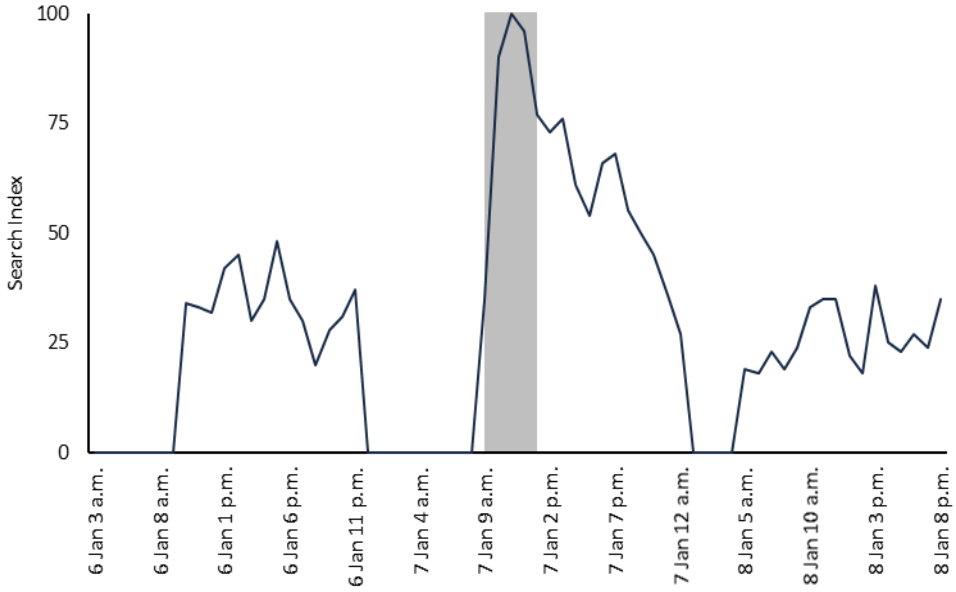
where β_2 captures the additional effect of firms involved in Vaca Muerta.

4. Event background

To define the event window—spanning from JP Morgan's publication of the incorrect real-time EMBI to its announcement of the mistake—we rely on Bloomberg News. The first article reporting the EMBI spread decline was published at 9:23 a.m. New York time, while the first article reporting JP Morgan's correction appeared at 1:22 p.m.[7] Accordingly, we set the event's start and end times at 9:30 a.m. (market opening) and 1:20 p.m., respectively.[8]

Consistent with these findings, Google Trends data show a significant increase in search activity for the term riesgo país (Spanish for "country risk") during the event window (shaded area in Figure 1) compared to the previous day. Search activity rose sharply after 9:30 a.m., peaking at 11:00 a.m. As shown in Figure 2, most of these searches originated in Argentina, confirming their connection to the EMBI mistake.

Figure 1: Google Trends searches of "riesgo pais"

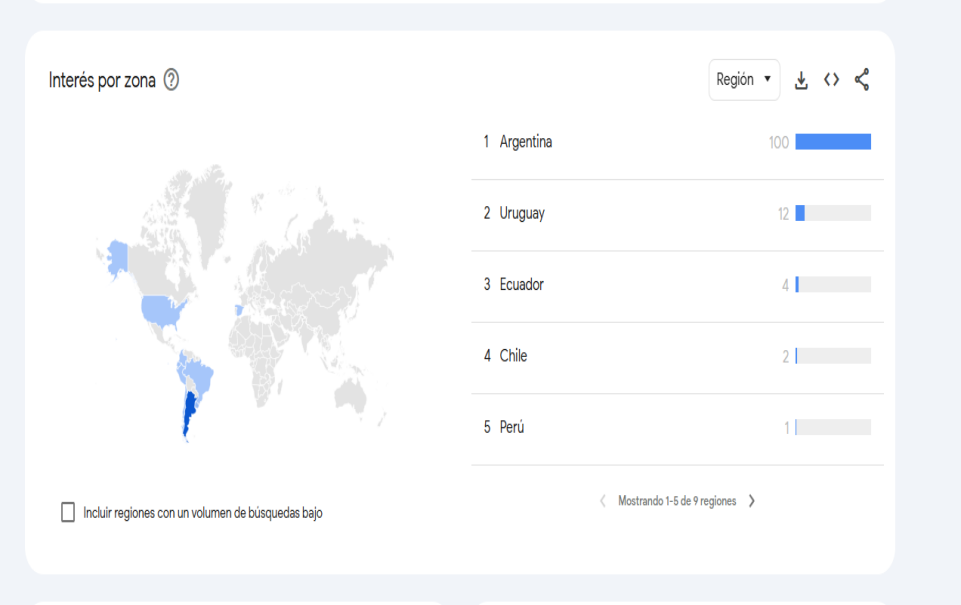


Source: Google trends

[7] We searched "Argentina riesgo pais" on Bloomberg News. Other similar searches deliver the same results.
[8] The article published at 9.23 a.m. is "Euforía por Argentina: el riesgo país se derrumba hasta los 454 puntos," El Cronista, Jan. 7th, 2025 and the article published at 1.22 p.m. is "El riesgo país baja a nuevos mínimos, pero no tanto: JP Morgan explica por qué", El Cronista, Jan. 7th, 2025.

Notes: Google Trends searches for "riesgo país" on January 6th and 7th, 2025. The index is normalized to 100 at the time with the highest search intensity within the two days. The shaded area represents the event window.

Figure 2. Location of Google Trends searches



Source: Google trends
Notes: Countries of origin for Google Trends searches of "riesgo país" on January 6th and 7th, 2025. The index is normalized to 100 at the time with the highest search intensity within the two days.

5. Results

a. Effect on the Argentine stock market

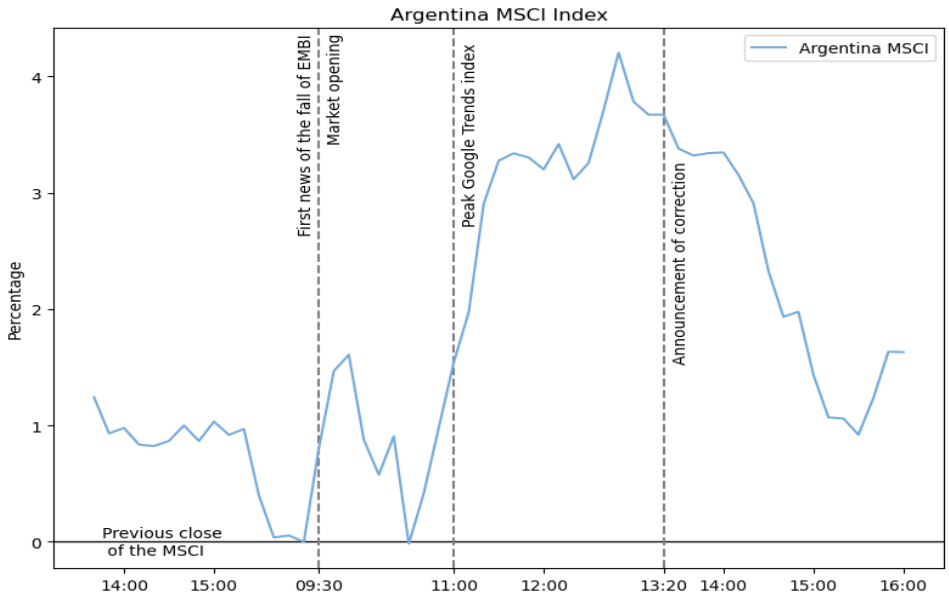
Table 1 shows the results for the specification in Equation (1). In the first column, β is positive and statistically significant (1.1845, $p < 1\%$), indicating that the EMBI mistake caused Argentina's stock prices to increase by more than those of other EMEs. In addition to data on Argentina's MSCI Index, Bloomberg provides stock prices for 10 of its largest companies, which account for 85.95% of the index's total market capitalization. Since we use these data in the DDD framework, in this subsection we ensure consistency by running two alternative specifications in the second and third columns of Table 1 where we use only data on these firms. Instead of using the original index, in these columns we include: (i) the 10 firms separately; and (ii) an alternative index constructed with these firms. In both regressions, β remains positive and statistically significant at the 1% level (1.0770, $p < 1\%$ and 1.2196, $p < 1\%$). The EMBI mistake led Argentina's stock market to rise by approximately 1.08% to 1.22% more than other EMEs on average during the event window.

Table 1: Results of Regression 1

	Event Window		
	Market opening to correction		
	MSCI Argentina Index	Top 10 largest firms of the MSCI Argentina Index	Index with only top 10 largest firms
Effect	1.1845*** (0.3015)	1.0770*** (0.1959)	1.2196*** (0.3165)
FE	YES	YES	YES
N	783	1142	774

Note: Effect refers to the interaction of regression 1, β. Standard deviations are reported in brackets. FE: index or firm, and time fixed effects. N: number of observations. *** (**): indicates statistical significance at the 1% (5%) level. MSCI Argentina Index: baseline model with the Argentine stock index and EME benchmarks as the dependent variables. Top 10 largest firms of the MSCI Argentina Index: model with the top 10 largest Argentine firms separately and EME benchmarks as the dependent variables. Index with only top 10 largest firms: model with an index built using only the top 10 firms and EME benchmarks as the dependent variables.

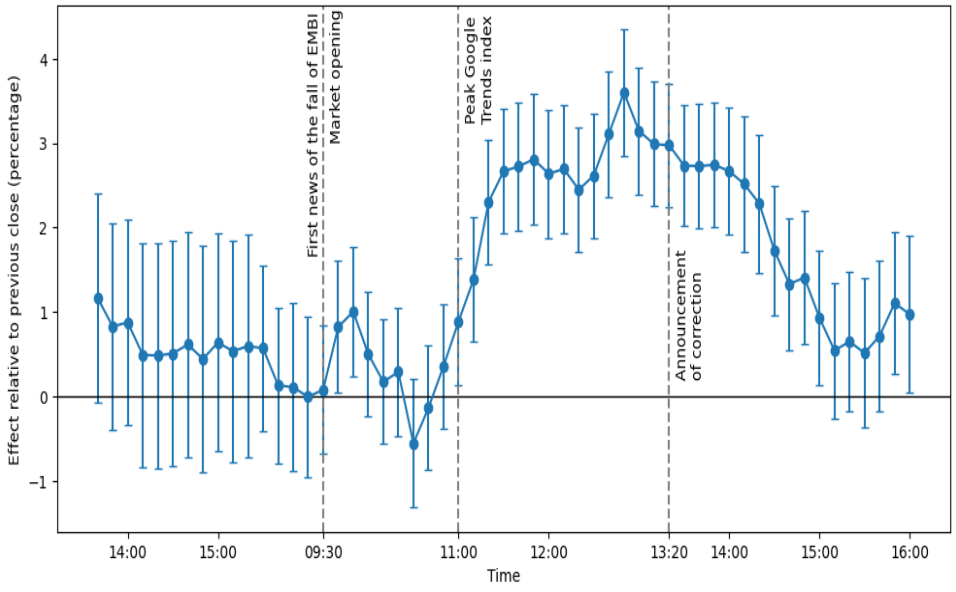
Figure 3: Argentina MSCI Index



Source: Bloomberg
Notes: The index is reported in 100 × natural logarithms and as differences relative to market closing on January 6th, i.e., the last 10-minute window before the first news of the EMBI drop.

Figures 3 and 4 illustrate the behavior of the (log) Argentine index and the results of the specification in Equation (2), respectively. The latter tests for pre-trends and enables us to track the impact of the EMBI mistake over time within the event window. Figure 3 shows that the index rose within the event window, peaking at over 4% (1.88 standard deviations of its percentage change in similar intraday windows over the previous month) before declining as the correction was announced. [9] Figure 4 shows that in the fifteen 10-minute intervals preceding the event window the δ_s coefficient is not statistically significant, implying there was no systematic difference between Argentina's index and the EME benchmark before the EMBI mistake. This absence of a pre-trend supports a causal interpretation of our results.

Figure 4: Results of Regression 2



Note: Interaction coefficients δ_s in regression 2: effect of the EMBI mistake on the Argentine stock market compared to the EMEs benchmark. Blue bars represent 95% confidence intervals.

Immediately after the publication of the incorrect EMBI, δ_s becomes significant and positive, confirming the mistake's impact. Then, the effect initially declined but rose shaprly later, coinciding with a spike in Google Trends searches related to Argentina's country risk (10 a.m.–11 a.m.). The intensification of the effect as search activity increased suggests that the "information effect" gained momentum as the apparent new EMBI value disseminated.

[9] In particular, we compute the standard deviation of the change in the natural logarithm of the Argentine stock market between 12.50 p.m. (when both the Argentine stock market and the effect reaches its peak on Jan 7th) each day and the market closing time on the previous day for December 6, 2024- January 6, 2025.

Possibly, early, better-informed investors—likely professional traders with greater knowledge of Argentine firms—relied less on the erroneous EMBI. However, as the news spread, potentially reaching less-informed investors who depended more on the EMBI as a signal, the effect grew. This pattern aligns with models where uninformed investors rely more on price information (Grossman and Stiglitz, 1976). At its peak, the impact reached 3.60% (1.69 standard deviations of the index's percentage change in similar intraday windows over the previous month) at 12:50 p.m., before declining following the correction at 1:20 p.m.

b. Additional Effects on Firms Directly Linked to Vaca Muerta

In this subsection, we analyze the 10 Argentine firms in the MSCI index for which Bloomberg provides separate information. We classify as directly linked to Vaca Muerta those engaged in exploration and production, unconventional hydrocarbon extraction, and gas supply and distribution from the region.[10] In a separate robustness exercise, we also consider a company operating gas transportation infrastructure that indirectly benefits from Vaca Muerta´s output. Notably, the stock prices of these firms began rising sharply, coinciding with a decline in sovereign risk pricing—measured by the EMBI spread— at the end of 2023, as presidential elections took place in Argentina and the new administration took office (Figure 5). This pattern suggests that Vaca Muerta's profitability is closely tied to sovereign risk perceptions, possibly because better perceptions grant greater political leeway to implement investor protections or facilitate infrastructure investment in the region.

Table 2 shows the results of the DDD estimation (Regression 3). In the first column, β_2 is statistically significant and positive (1.3062, p <1%), confirming that the EMBI mistake led to a greater increase in the stock price of firms linked to Vaca Muerta. The results remain robust when including an index for the firms involved in the region and another index for the remaining firms, rather than analyzing the 10 firms separately (second column, 1.2114, p <1%). Overall, stock prices of linked firms rose approximately 1.21% to 1.31% more than those of the other companies during the event window. This finding further supports the view

[10] Among the 10 firms, which represent 85.95% of the orginal index's capitalization, we consider as directly linked to Vaca Muerta to YPF, the leading operator; Vista Energy, a key player dealing with unconventional hydrocarbon production; and Pampa Energía, involved through energy generation units and gas-related projects, particularly in supplying and distributing gas. In the robustness check, we also include Transportadora de Gas del Sur (TGS), which operates gas transportation infrastructure that benefits indirectly from Vaca Muerta's production. The remaining firms belong to the banking sector, the telecommunication industry, thermal power, or the business of on-line platforms in the tourism industry, and therefore, do not have direct links to the region.

that investors interpreted the EMBI spread drop as enhancing the profitability of Vaca Muerta's oil and gas reserves.

Table 2

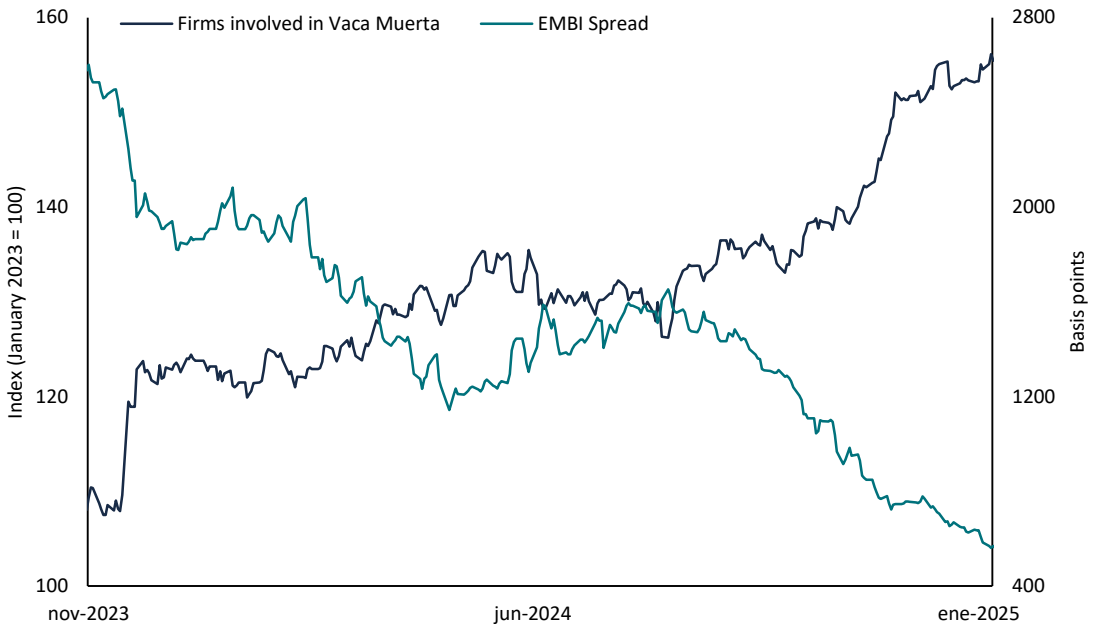
	Event Window	
	Market opening to correction	
	Top 10 largest firms of the MSCI Argentina Index	Index with only top 10 largest firms
Effect	0.6156*** (0.2278)	0.6566** (0.2962)
Effect x Vaca Muerta	1.3062*** (0.2619)	1.2114*** (0.3009)
FE	YES	YES
N	1116	812

Note: Effect refers to the interaction of regression 3, β_1 and Effect×VacaMuerta refers to the double interaction β_2. Standard deviations are reported in brackets. FE: index or firm, and time fixed effects. N: number of observations. *** (**): indicates statistical significance at the 1% (5%) level. Top 10 largest firms of the MSCI Argentina Index: model with the top 10 largest Argentine firms separately and EME benchmarks as the dependent variables. Index with only top 10 largest firms: model with two indexes, one built using the 3 firms involved in Vaca Muerta and another using the 7 firms uninvolved and the EME benchmarks as the dependent variables.

6. Conclusions

We exploit a technical error in JP Morgan's real-time EMBI for Argentina as a natural experiment to identify asset price "information effects." The Argentine stock index reacted strongly, especially for firms linked to Vaca Muerta, indicating that investors used the EMBI to reassess firms' intrinsic value, confirming significant information effects.

Figure 5: EMBI spread and firms involved in Vaca Muerta



Source: Bloomberg
Notes: "Firms involved in Vaca Muerta" refers to an index constructed using the stock prices of the three firms engaged in Vaca Muerta.

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