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Foreign Exchange Rate Exposure : Empirical Evidence From Morocco.

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Abstract

In a context of transition to a more flexible exchange rate regime in Morocco ; the increased volatility of the exchange rate presents critical challenges for corporate financial stability. While this monetary reform is intended to support trade liberalization and external competitiveness, it may also increase firms' vulnerability to exchange rate shocks. This study employs a rigorous econometric approach to investigate how such fluctuations affect the market value of Moroccan firms. Two models were estimated: one assessing the direct impact of exchange rate movements, and another incorporating a control variable to better isolate the specific effects. The empirical evidence reveals that several sectors are significantly exposed to exchange rate risk, with the financial services industry demonstrating particularly high sensitivity. These findings emphasize the need for proactive currency risk management in an increasingly liberalized and volatile economic environment.

Keywords : Exchange rate volatility, corporate financial stability, econometric approach, currency risk management, Moroccan firms.

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INTRODUCTION

Over recent decades, the relationship between exchange rate movements and firm value has attracted growing attention, particularly in the context of globalization, trade liberalization, and increasingly flexible exchange rate regimes. While financial theory predicts a strong link between exchange rate fluctuations and corporate market valuation (Shapiro, 1974; Adler & Dumas, 1984), empirical studies have often shown limited exposure levels, thereby challenging these theoretical expectations (Bodnar & Wong, 2003; He & Ng, 1998; Bartov et al., 1996). This gap, widely known as the "exposure puzzle," has been the subject of various explanatory attempts (Bartram, Brown & Minton, 2010; Snaith et al., 2017).

In this regard, Morocco's transition to a more flexible exchange rate regime since January 2018 offers a timely opportunity to re-examine this issue. This monetary shift could potentially affect the sensitivity of Moroccan listed firms to currency fluctuations. However, existing academic literature on this subject in the Moroccan context remains scarce and outdated, with the latest studies stopping at 2015 (Mrhari & Daoui, 2017; Ibenrissoul & Zouigui, 2015; Hutson et al., 2014), thereby excluding the effects of both the exchange rate reform and the COVID-19 pandemic.

This context highlights a significant knowledge gap that calls for a renewed and data-driven analysis focused on an emerging market undergoing institutional and financial transformation. It is therefore necessary to update the analysis over a more recent period to better understand exchange rate exposure in an emerging and evolving economy. This study seeks to answer the following research question: To what extent do exchange rate fluctuations affect the market value of firms listed on the Casablanca Stock Exchange in the context of Morocco's exchange rate reform?

By addressing this question, the study aims to contribute to both academic literature and policy discussions by identifying the degree and determinants of exchange rate exposure among Moroccan firms, and by exploring whether macroeconomic shocks such as monetary reforms and global crises have reshaped market sensitivities.

To address this question, the article employs an econometric approach to assess the effects of exchange rate variations on the stock returns of Moroccan firms over the period from May 2015 to December 2021.

The paper is structured into three main sections: a review of the contextual and theoretical background, a presentation of the methodological framework including model specifications

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and data selection, and finally, an empirical analysis and discussion of the findings in light of existing literature.

This structure allows for a comprehensive understanding of the phenomenon, combining theoretical foundations, empirical rigor, and contextual insights.

1. Literature Review

The floating exchange rate system, introduced after the collapse of the Bretton Woods agreement in 1971, marked a significant shift in global economic policy frameworks. This system, by allowing currencies to fluctuate according to market forces, has fostered increased international financial integration. However, it also introduced higher risks related to exchange rate volatility, particularly for firms engaged in international trade and finance.

In this context, developing countries, including Morocco, have gradually moved toward more flexible exchange rate regimes, seeking to enhance their competitiveness, promote external trade, and attract foreign capital flows. Since January 2018, Morocco has initiated a reform of its exchange rate regime, moving from a fixed peg to a more flexible arrangement by widening the fluctuation band of the dirham, initially from ±0.3% to ±2.5%, and later to ±5%. These reforms aim to allow market forces greater influence over currency values, improve resilience to external shocks, and align monetary policy with broader macroeconomic goals.

However, exchange rate flexibility can increase firms' exposure to currency risk, thereby affecting their cash flows, profitability, and valuation. Exchange rate movements influence the revenues and costs of companies involved in importing, exporting, or borrowing in foreign currencies. As such, managing currency risk becomes a key concern for corporate financial strategy, particularly for listed firms whose market valuation is sensitive to such fluctuations.

The concept of exchange rate exposure has been widely explored in the theoretical and empirical literature. According to Hekman (1983) and Adler and Dumas (1984), exchange rate exposure is defined as the sensitivity of a firm’s economic value to changes in exchange rates. Adler and Dumas (1984) further suggest using a linear regression model where exchange rate variation is the explanatory variable and the firm's value—often proxied by stock returns—is the dependent variable. This approach laid the foundation for a large body of empirical research. Jorion (1990) was among the first to empirically test this framework, finding that only 15 out of 287 U.S. multinationals exhibited statistically significant exposure to exchange rate risk. This result, later corroborated by other studies, highlights a puzzling gap between theory and empirical findings—a phenomenon now referred to as the "exposure puzzle" (Jorion, 1990).

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Other studies in developed countries such as Bodnar and Gentry (1993) found that approximately 30% of firms in their sample were significantly exposed to exchange rate fluctuations, while He and Ng (1998) reported that 25% of 171 Japanese multinationals were significantly and positively exposed to yen fluctuations over the 1979–1993 period. These findings further emphasize the variability of exposure across contexts and time periods.

The discrepancy between theoretical expectations of widespread exposure and the limited empirical evidence has led researchers to refine measurement techniques. Bodnar and Wong (2003) and Dominguez and Tesar (2006) highlight the importance of model specification when estimating exchange rate exposure. Some researchers, following Adler and Dumas (1984), focus solely on the relationship between stock returns and exchange rate changes, neglecting broader macroeconomic influences (Du et al., 2014; Koutmos and Martin, 2007; Pritamani et al., 2004). Others argue for the inclusion of control variables, such as market returns, to isolate firm-specific exchange rate exposure from general market movements.

In this regard, Bodnar and Wong (2003) argue that incorporating market returns helps control for macroeconomic factors affecting all firms. This approach allows for the estimation of residual exchange rate exposure, a more precise measure of firm-specific sensitivity. Empirical studies adopting this method across various countries include Jorion (1990), Bodnar and Gentry (1993), He and Ng (1998), Bodnar and Wong (2003), Mefteh (2006), and He et al. (2021).

Despite the richness of this literature in developed economies, studies on exchange rate exposure in emerging markets remain limited. In the Moroccan context, only a few empirical works have been conducted, and these are relatively recent and sparse. To date, only three major studies have examined the issue of exchange rate exposure among Moroccan firms.

The first empirical contribution came from Ye, Hutson, and Muckley (2014), who sought to estimate the exchange rate exposure of Moroccan listed companies. Their analysis focused on a sample of 28 firms included in the MADEX index. They found that 28% of these firms exhibited statistically significant sensitivity to exchange rate fluctuations. However, their study included Moroccan firms as part of a broader dataset of 1,523 firms from 20 emerging markets, limiting the depth of analysis specific to Morocco.

In a separate study, Ibenrissoul and Zouigui (2015) investigated the impact of financial risks, including exchange rate risk, on 72 Moroccan listed companies over a short time frame from May 2013 to April 2014. Their findings indicated that only 8% of these firms were significantly exposed to exchange rate movements.

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More recently, Mrhari and Daoui (2017) conducted a study over a longer period, from January 2006 to December 2015, examining the impact of exchange rate volatility on stock prices. Analyzing 58 listed Moroccan firms, they found that 6.89% showed statistically significant sensitivity to exchange rate volatility.

While these studies provide an initial understanding of the issue in Morocco, they remain limited in scope and methodology, especially in light of recent reforms. They do not fully capture the dynamics introduced by Morocco's transition toward a more flexible exchange rate regime since 2018. Therefore, there is a clear need for more comprehensive and updated empirical analyses that consider the new macroeconomic environment, identify the determinants of exchange rate exposure, and assess how Moroccan firms are adapting their risk management practices under the new regime.

Another strand of literature has examined the relationship between exchange rate exposure and exchange rate regimes. For example, Parsley and Popper (2006), Patnaik and Shah (2010), Ye, Hutson, and Muckley (2014), and Kamil (2006) found that firms in countries with fixed exchange rate regimes tend to be more exposed to exchange rate risk than those in floating regimes. This supports the moral hazard hypothesis put forth by Eichengreen and Hausmann (1999), which suggests that fixed regimes, through implicit government guarantees, encourage firms to take uncovered positions in foreign currencies, thereby increasing financial fragility. Kamil (2006) further argues that firms in fixed regimes may underestimate or ignore exchange rate risks due to perceived exchange rate stability.

In sum, the empirical literature demonstrates that exposure to exchange rate risk is shaped not only by firm-level characteristics but also by macroeconomic variables, measurement models, and exchange rate policy regimes. Given the Moroccan dirham’s recent move toward flexibility, further empirical investigation is needed to assess how Moroccan firms are adjusting to this new risk landscape.

2. Methodological Framework

In this study, we adopted a post-positivist approach, based on the theory of the firm by Coase (1937), which views firms as entities maximizing their efficiency based on transaction costs. This theory provides the framework for analyzing how exchange rate fluctuations affect the stock returns of firms. Our reasoning follows a hypothetico-deductive approach, in line with our epistemological stance, where hypotheses are formulated from existing theories and tested through empirical data analysis.

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To address the research questions, we opted for a quantitative research method, suited to the explanatory nature of our study. This approach allows us to model the causal relationships between exchange rate fluctuations and stock returns. We chose this method to produce generalizable and robust results, providing a better understanding of the impact of exchange rate variations on market performance.

2.1.Econometric Models Overview

In the context of assessing exchange rate risk exposure, we have observed that the choice of econometric model is critical for accurately measuring this exposure. Drawing on insights from the literature review, this research aims to estimate both total exposure (without control variables) and residual exposure (with control variables) to exchange rate fluctuations. To achieve this, we employ two distinct linear regression models, which provide robust estimates of exposure and establish a solid foundation for our results.

- **Model 1 : Total Exchange Rate Exposure**

The first model seeks to measure the total exposure to exchange rate risk, expressed by the following regression equation :

$$R_{stock,\,it} = \beta_0 + \beta_i^{€}.\Delta FX_t^{€} + \beta_i^{\$}.\Delta FX_t^{\$} + \epsilon_{it}$$

Where:

- $R_{stock,\,it}$: monthly return of stock *i* at time *t* ;
- $\Delta FX_t^{€}$: monthly change in the EUR/MAD exchange rate ;
- $\Delta FX_t^{\$}$ monthly change in the USD/MAD exchange rate ;
- $\beta_i^{€}$ and $\beta_i^{\$}$: exposure coefficients to each currency ;
- ϵ_{it} : error term.

This model estimates the **total exposure** of companies to fluctuations in the US dollar and euro exchange rates, providing an initial overview of how these variations affect stock returns.

- **Model 2 : Residual exposure with control Variable**

The second model refines the analysis by incorporating control variables, allowing us to estimate the **residual exposure**. This model is expressed as follows :

$$R_{stock,\,it} = \beta_0 + \beta_i^{€}.\Delta FX_t^{€} + \beta_i^{\$}.\Delta FX_t^{\$} + \beta_i^{m}.R_{\,market,t} + \epsilon_{it}$$

Where:

- $R_{stock,\,it}$: monthly return of stock *i* at time *t* ;
- $\Delta FX_t^{€}$: monthly change in the EUR/MAD exchange rate ;
- $\Delta FX_t^{\$}$ monthly change in the USD/MAD exchange rate ;

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- $\beta_i^{€}$ and $\beta_i^{\$}$: exposure coefficients to each currency ;
- $R_{market,t}$: monthly return of the MASI index ;
- β_i^m **:** sensitivity of the stock's return to the overall market ;
- ϵ_{it} : error term.

By introducing the Moroccan market return, this model allows for a better understanding of how firms' stock returns are influenced not only by exchange rate variations but also by overall market trends, isolating the residual impact of exchange rate fluctuations.

2.2.Sample and Data

The study covers the period from May 2015 to December 2021, corresponding to 80 monthly observations per company, based on a sample of 67 firms listed on the Casablanca Stock Exchange across various sectors. This results in a total of 5,360 data points analyzed. The selected period is justified by the implementation of major exchange rate reforms in Morocco, including:

- The revision of the currency basket in 2015;
- The widening of the fluctuation band in January 2018 and March 2020.

These structural changes make the period particularly suitable for identifying significant exposure to exchange rate risk.

This methodology provides a comprehensive framework for evaluating the exposure of companies listed on the Casablanca Stock Exchange to exchange rate fluctuations, accounting for both total exposure and residual exposure. The use of linear regression models, incorporating control variables such as market returns, strengthens the robustness of our analysis, making it particularly well-suited to the specifics of the studied period, marked by exchange rate regime reforms.

3. Empirical Analysis

3.1. Descriptive Statistics

3.1.1. Univariate Analysis

The descriptive analysis provides an overview of the collected data, summarizing the main characteristics of each variable. It thus serves as an essential foundation for subsequent multivariate analyses.

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Table 1 : Summary Statistics of Independent Variables

Variable	N	Min	Max	Mean	Std. Dev.
ΔEURt	80	-0.0247	0.0279	-0.0003	0.0077
ΔUSDt	80	-0.0330	0.0459	-0.0008	0.0115
RMt	80	-0.2085	0.0910	0.0048	0.0374

Source: Authors

The euro exchange rate variations (ΔEURt) fall within a ±3% range, while those of the US dollar (ΔUSDt) fluctuate within approximately ±4.5%. The Moroccan stock market return (RMt) exhibits greater variability, notably due to the significant decline of the MASI index in 2020, linked to the COVID-19 crisis.

3.1.2. Bivariate Analysis

We conducted a Pearson correlation analysis among the explanatory variables. Only the relationship between ΔEURt and ΔUSDt is significant (-0.254), but remains weak according to the thresholds defined by Cohen (1988).

Table 2 : Pearson Correlation Matrix

	ΔEURt	ΔUSDt	RMt
ΔEURt	1	-0.254*	-0.165
ΔUSDt	-0.254*	1	-0.181
RMt	-0.165	-0.181	1

*Correlation is significant at the 0.05 level (2-tailed). N = 80.

Source: Authors

3.2. Empirical Results and Interpretation

We present below the empirical results from the two regression models used to assess the impact of exchange rate fluctuations on the stock returns of companies listed on the Casablanca Stock Exchange (BVC) for the period from May 2015 to December 2021. Analyses were conducted at the individual company level to avoid information loss and to evaluate the specific sensitivity of each firm. We employed the Ordinary Least Squares (OLS) method after verifying

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the stationarity of the series using the Dickey-Fuller test. The analytical tools used include SPSS, Excel, and E-Views.

The results indicate that exchange rate risk sensitivity varies across companies. This heterogeneity could be attributed to the specific exchange rate risk management policies adopted by each firm.

Table 3 : Proportion of Firms with Statistically Significant FX Exposure

Significance Level	Model 1	Model 2	Total
10%	11.94%	17.91%	23.88%
5%	7.46%	13.43%	14.92%
1%	2.98%	2.98%	4.47%

Source: Authors

At a 5% margin of error, 7.46% of companies are exposed to exchange rate risk according to the first model, compared to 13.43% in the second. Overall, 14.92% of companies exhibit significant exposure. This confirms the existence of a relationship between exchange rate variation and stock returns, although this proportion remains below theoretical forecasts.

Table 3 illustrates that listed companies are more sensitive to exchange rate risk when market return is included as a control variable. At a 10% significance level, the proportion of exposed companies increases from 11.94% to 17.

The analysis of the results and their comparison with the existing literature reveals a strong consistency between our findings and previous studies. Indeed, the results from Model 1, which measures total exchange rate exposure, align with those of earlier research, both nationally (Mrhari and Daoui, 2017) and internationally (Bodnar and Wong, 2003), which observed a low percentage of companies significantly exposed to exchange rate risk. Similarly, the results from Model 2, which measures residual exposure, also show a low proportion of companies sensitive to exchange rate fluctuations, consistent with findings from several previous studies (Mrhari and Daoui, 2017; Ibenrissoul and Zouigui, 2015; He, Liu, and Zhang, 2021; Aggarwal et al., 2011; Bartram, 2004; Zubairu and Iddrisu (2019) ; He and Ng, 1998; Jorion, 1990; Mefteh, 2006).

The results from both models highlight the so-called "exposure puzzle," a controversial issue in financial theory. While theory posits that exchange rate fluctuations should significantly

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impact a company's value, empirical literature shows that this impact only affects a small number of firms (Mefteh, 2006; He and Ng, 1998; Jorion, 1990). It is also noteworthy that incorporating market returns as a control variable in the exposure model significantly altered the estimation results, confirming the findings of Bodnar and Wong (2003) and Dominguez and Tesar (2006), who emphasized the considerable influence of model specification on the measurement of exchange rate exposure.

Finally, regarding the sectors most sensitive to exchange rate fluctuations, the banking sector stands out as the most exposed. However, this finding does not provide evidence to support the hypothesis by Chue and Cook (2008) that financial firms implement measures to hedge their exchange rate risk.

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CONCLUSION

Through this study, we attempted to measure the exchange rate risk exposure of 67 companies listed on the Casablanca Stock Exchange over the period from May 2015 to December 2021 using two econometric models. At the end of our analysis, it was found that, with a 5% margin of error, the proportion of companies significantly exposed to exchange rate risk was 7.46% for Model 1 (without control variable) and 13.43% for Model 2 (with control variable). Therefore, we deduce that the percentage of companies sensitive to exchange rate risk remains low compared to the results of previous studies conducted in similar contexts in emerging countries with international openness. Moreover, we observed that the banking sector is the most sensitive to exchange rate fluctuations.

These findings reflect the limited but non-negligible exposure of Moroccan listed firms to currency movements, especially in a financial environment characterized by partial capital account liberalization and evolving monetary policy frameworks. The stronger exposure of banks is consistent with their role as intermediaries in foreign exchange markets and their higher integration into global financial flows.

From a managerial and policy standpoint, these results highlight the need for enhanced risk management practices, particularly through the adoption of hedging strategies and the development of financial instruments that mitigate currency-related vulnerabilities. In this regard, the results of our research could have various contributions, as our study will help raise awareness among companies about the risks associated with exchange rate fluctuations, particularly in a Moroccan context marked by exchange reforms and a financial system typically fragile in terms of exchange risk hedging instruments.

In this research, we focused solely on measuring companies' exposure to exchange rate risk. Therefore, we encourage future researchers to conduct complementary empirical studies to identify the explanatory factors of exchange rate risk exposure in order to better understand the characteristics of firms sensitive to exchange rate fluctuations.

More specifically, future studies could explore the role of firm-level variables such as export intensity, debt structure, foreign currency invoicing, and operational flexibility. Additionally, macro-financial dimensions like monetary credibility, capital mobility, and institutional development may also help explain the heterogeneous exposure patterns observed across sectors. Ultimately, a deeper understanding of these determinants could support both firm-level risk mitigation strategies and the design of macroprudential policies aligned with Morocco’s gradual exchange rate liberalization.

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REFERENCES

Adler, M., & Dumas, B. (1984). Exposure to currency risk: definition and measurement.Financial management, 41-50.

Bartov, E., Bodnar, G. M., & Kaul, A. (1996). Exchange rate variability and the riskiness of US multinational firms: Evidence from the breakdown of the Bretton Woods system.Journal of Financial Economics,42(1), 105-132.

Bartram, S. M. (2004). Linear and nonlinear foreign exchange rate exposures of German nonfinancial corporations. *Journal of international money and finance*, *23*(4), 673-699

Bartram, S. M., Brown, G. W., & Minton, B. A. (2010). Resolving the exposure puzzle: The many facets of exchange rate exposure.Journal of Financial Economics,95(2), 148-173.

Bodnar, G. M., & Wong, M. F. (2003). Estimating exchange rate exposures: issues in model structure. Financial management, 35-67.

Chue, T. K., & Cook, D. (2008).Emerging market exchange rate exposure. Journal of Banking et Finance, 32(7), 1349-1362.

Dominguez, K. M., & Tesar, L. L. (2006). Exchange rate exposure.Journal of international Economics,68(1), 188-218.

Du, D., Hu, O., & Wu, H. (2014). Emerging market currency exposure: Taiwan. Journal of Multinational Financial Management, 28, 47-61.

Eichengreen, Barry & Hausmann, Ricardo, (1999), Exchange Rates and Financial Fragility, No 7418, NBER Working Papers, National Bureau of Economic Research, Inc.

He, J., & Ng, L. K. (1998). The foreign exchange exposure of Japanese multinational corporations.The Journal of Finance,53(2), 733-753.

He, Q., Liu, J., & Zhang, C. (2021). Exchange rate exposure and its determinants in China.China Economic Review,65, 101579

Hekman, C. R. (1985). A financial model of foreign exchange exposure. Journal of International Business Studies, 16(2), 83-99

Ibenrissoul, A., & Zouigui, M. (2015). Evaluation empirique des effets des risques financiers sur les entreprises marocaines. International Journal of Innovation and Applied Studies,12(2), 424.

Jorion, P. (1990). The exchange-rate exposure of US multinationals.Journal of business,331-345.

Kamil, H. (2006). Does moving to a flexible exchange rate regime reduce currency mismatches in firms' balance sheets?. International Monetary Fund.

African Scientific Journal
ISSN : 2658-9311
Vol : 03, Numéro 30, Juin 2025

Koutmos, G., & Martin, A. D. (2007). Modeling time variation and asymmetry in foreign exchange exposure. Journal of Multinational Financial Management, 17(1), 61-74.

Mefteh, S., (2006).La sensibilité du cours boursier des entreprises exportatrices au taux de change : Le cas français. Banques et Marchés. 85, 51-61.

Mrhari, E. M., & Daoui, D. (2017). Analysis of the Exchange Rate Volatility Influence on the Share Price: Morocco, as Case Study.Journal of Public Administration, Finance and Law, 114.

Patnaik, I., & Shah, A. (2010). Does the currency regime shape unhedged currency exposure?. Journal of International Money and Finance, 29(5), 760-769.

Pritamani, M. D., Shome, D. K., & Singal, V. (2004). Foreign exchange exposure of exporting and importing firms. Journal of Banking et Finance, 28(7), 1697-1710.

Shapiro, A. C. (1975). Exchange rate changes, inflation, and the value of the multinational corporation.The Journal of Finance,30(2), 485-502.

Snaith, S., Termprasertsakul, S., & Wood, A. (2017). The exchange rate exposure puzzle: The long and the short of it.Economics Letters,159, 204-207.

Ye, M., Hutson, E., & Muckley, C. (2014). Exchange rate regimes and foreign exchange exposure: The case of emerging market firms.Emerging Markets Review,21, 156-182.

Zubairu, I., & Iddrisu, A. J. (2019). Foreign exchange exposure: An investigation of the determinants in the UK multinationals.International Journal of Economics, Finance and Management Sciences,7(4), 95-102.