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Uncovering the Financial Effects of the Exchange Rate Regime Transition in Egypt

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ABSTRACT

We evaluate the financial effects of monetary policy over the transition from a fixed to a floating exchange rate regime in Egypt. Using high-frequency identification, we estimate the impact of monetary policy announcements on financial markets. Currency devaluations lead to significant increases in stock market prices, while changes in the monetary policy interest rate significantly affect treasury yields. Short-term yields respond significantly primarily to currency devaluations, whereas long-term yields respond significantly to both the exchange rate and the monetary policy interest rate. These effects are mainly driven by the period when the exchange rate regime was closer to a floating system, which was also characterized by relative political and economic stability. These results highlight how exchange rate and interest rate adjustments can differentially affect financial variables during the exchange rate regime transition.

JEL Classification: C22, E52, F31, G12, O23

1 | Introduction

Monetary authorities achieve their objectives through the application of their instruments. While the main conventional monetary policy instrument is the short-term interest rate in developed countries, monetary authorities use the foreign exchange rate as an additional instrument in developing countries where the exchange rate regime is not generally free floating. To confront the recent economic crises, unconventional monetary policy measures have also been employed (Swanson 2021). Since the collapse of the Bretton Woods system in the 1970s, countries have adopted different exchange rate regimes, from free floating to fixed systems (Levy-Yeyati and Sturzenegger 2024). The selection of the exchange rate regime has been based on the unique characteristics, political landscape, and economic circumstances of each country (Bird and Rowlands 2009; Markiewicz 2006).

The way a country manages its monetary policy is deeply intertwined with its choice of exchange rate regime and this interplay has significant policy implications (Gürkaynak et al. 2021). This feature implies that the choice of exchange rate regime is essential for monetary policy formulation, particularly for developing countries. The choice of exchange rate regime is also important for the macroeconomic stability of a country (Palazzo 2024). Both fixed and flexible regimes have advantages and disadvantages. A fixed exchange rate regime reduces the risk of trading and investing. Therefore, it is mainly adopted by developing countries to attract foreign investment. A flexible exchange rate regime can help adapt to external shocks (Manopimoke et al. 2024), restore the balance of payments equilibrium, and eliminate the need for monetary authorities to maintain substantial foreign exchange reserves. Nonetheless, to hedge against the risks associated with exchange rate fluctuations, financial market instruments should be widely available (Stone et al. 2008).

The effects of monetary policy on financial markets have mostly been studied for developed countries (e.g., Gürkaynak et al. 2005; Swanson 2021). Nevertheless, the examination of these effects is also crucial for developing countries, especially because of their less efficient financial markets, less transparent communication

from monetary authorities, and less confidence in their actions (Serwa 2006). These issues become aggravated in the cases of exchange rate devaluations and the transition to a flexible exchange rate regime (Bird and Rowlands 2009; Markiewicz 2006), as has recently been the case with Egypt. Therefore, this paper aims to evaluate the effects of monetary policy on financial markets in Egypt over its transition process from a fixed to a flexible exchange rate regime, which resulted in a series of currency devaluations from 2011 to 2024. According to the Worldwide Governance Indicators, around half of the world population lives in countries where the exchange rate is either fixed or systematically managed. Moreover, nearly 67.5% of countries did not have a floating exchange rate system in 2023 (IMF 2024a). Thus, the recent evidence from Egypt can also be useful for other countries in their transition to a floating exchange rate regime.

Egypt is an emerging developing country, combining growing integration into global markets and financial sectors with structural challenges typical of developing economies. It maintained an overvalued currency for a long time through a fixed exchange rate regime (Agarwal and Mazarei 2024). Egypt had largely unrestricted capital mobility. For instance, the outbreak of the Russo–Ukraine war triggered a substantial outflow of hot money (IMF 2023). Consequently, according to the principle of the impossible trinity, it was difficult for Egypt to sustain independent monetary policy. This limitation hindered the efficiency of monetary policy in Egypt. However, the situation began to improve when the CBE decided to align the exchange rate with its market value by devaluing the Egyptian pound, starting in 2016. This shift toward a more flexible exchange rate created new room for monetary policy. This process helped increase the independence of monetary policy and, as a result, its efficiency.

In Egypt, one of the main issues for the independence of monetary policy was fiscal dominance, which hindered the effectiveness of monetary policy, particularly in achieving both price and exchange rate stability. There were the clear signs of fiscal dominance, as the government financed its persistent budget deficits through direct or indirect reliance on central-bank credits, leading to a large accumulation of net domestic debt. As a result, the Central Bank of Egypt (CBE) faced conflicting objectives, such as maintaining price stability and exchange rate stability, with the priority for the latter. In such a setting, the implementation of conventional monetary policy, such as inflation targeting, might be undermined. For example, raising the policy rate in response to inflation could increase debt-servicing costs, exacerbating fiscal pressure on the CBE to finance the deficit, which might ultimately lead to higher price levels.

We evaluate the effects of monetary policy on financial variables over the period of the exchange rate regime transition from a fixed to a floating exchange rate system in Egypt. We estimate the effects of monetary policy announcements through high-frequency identification. We find that a currency devaluation has a significant positive impact on stock prices in Egypt. Our interpretation of this finding is that the acquisition of stocks tends to serve as a hedge against higher expected inflation following a currency devaluation. The results also indicate that monetary policy generally significantly affects treasury yields. The short-term yields respond significantly primarily to currency devaluations, reflecting their sensitivity to immediate changes in inflation expectations and exchange rate risk. In contrast, long-term yields respond significantly to both the exchange rate and the interbank rate, reflecting expectations about future inflation and path of monetary policy. At the same time, the transmission of monetary policy becomes more efficient as the system gets closer to a floating exchange rate regime, characterized also by relative political and economic stability.

This paper is related to different lines of research in the literature. First, it is related to the literature on high-frequency identification in the area of monetary policy evaluations (e.g., Gürkaynak et al. 2005, 2021; Kuttner 2001; Swanson 2021). While we use a similar approach with high-frequency identification, we apply this method to currency devaluations in addition to changes in the monetary policy interest rate. In contrast to studies on developed economies, we apply high-frequency identification to an economy that has not had sufficiently developed financial markets and that has experienced a transition from a fixed to a floating exchange rate regime.

This paper also contributes to the literature on exchange rate regimes in developing and emerging economies (among others, Bird and Rowlands 2009; Huett et al. 2014; Levy-Yeyati and Sturzenegger 2024; Markiewicz 2006; Martínez and Werner 2002; Palazzo 2024). In general, this literature examines different options for exchange rate regimes and their effects on an economy. Using high-frequency identification, we focus on the effects of a series of currency devaluations on financial markets during the transition from a fixed to a floating exchange rate system in Egypt.

Finally, this paper contributes to the literature on the relation between the exchange rate and financial markets in Egypt (e.g., El-Masry and Badr 2021; Elroukh 2024; Helmy 2024). In contrast to this literature, we use high-frequency identification by adapting it to account for the specific features of Egyptian financial markets. We investigate the responsiveness of short-term and long-term interest rates to monetary policy surprises over different response periods. We provide estimates based on the overall sample and subsamples associated with important political events and different degrees of exchange rate flexibility. We also contribute to the literature by providing estimates for the parallel exchange rate market and the most recent (March 2024) currency devaluation in Egypt.

This paper is structured as follows. Section 2 discusses the theoretical framework and related literature in detail. Section 3 presents the economic and institutional background as well as the monetary policy framework in Egypt. Section 4 describes the data used in the empirical analysis, while Section 5 discusses the applied methodology. Section 6 presents the main empirical results and discusses them. Section 7 provides additional empirical results, and Section 8 concludes this paper.

2 | Theoretical Framework and Literature Review

2.1 | Theoretical Framework

While countries and governments always strive to deploy all available capacities, resources, and policy tools to foster development, certain combinations of objectives are mutually

incompatible. Prioritizing one objective may limit the ability to achieve another. For instance, a country may seek an independent monetary policy to mitigate external shocks, while simultaneously fixing its exchange rate to ensure domestic price stability and, at the same time, maintaining free capital mobility to attract foreign investment. However, only two out of these three objectives can be achieved simultaneously, forcing policymakers to decide which one to forgo, a principle commonly known as the impossible trinity (Fleming 1962; Mundell 1963). Thus, this principle asserts that an economy cannot simultaneously maintain a fixed exchange rate, free capital movement, and an independent monetary policy.

Building on the principle of impossible trinity, the following subsections outline how shifts in the exchange rate regime can influence key financial variables. In particular, we discuss the links between the exchange rate and stock returns, followed by an examination of how movements in the interest rate relate to stock market performance. In other words, we analyze the transmission channels through which monetary policy instruments such as foreign exchange interventions and the policy rate influence stock market returns.

2.1.1 | Exchange Rate Channels

The relationship between exchange rate movements and stock market returns is commonly described through three theoretical channels. First, the flow oriented view (Dornbusch and Fischer 1980) suggests that a depreciation of the domestic currency improves the competitiveness of export-oriented firms. Higher external competitiveness raises export revenues and profits, which in turn supports equity valuations. In contrast, an appreciation of the domestic currency can weaken exporter earnings and lower stock returns. This mechanism is known as the competitiveness channel.

Second, the portfolio balance channel (Frankel 2010) highlights that exchange rate fluctuations affect foreign investor returns in domestic currency terms. These changes can prompt portfolio reallocations between domestic equities and foreign assets. Such reallocations directly influence stock demand and prices.

Third, particularly relevant for emerging-market economies, is the financial channel of the exchange rate (Bruno et al. 2022). In this channel, currency fluctuations affect the local currency value of foreign currency debt, raising external balance risks and potentially undermining investor confidence. As a result, a depreciation may be perceived negatively, signalling macroeconomic vulnerability and triggering the risk channel. In economies undergoing structural transitions, such as an exchange rate regime transition, the net impact of exchange rate changes on stock returns depends critically on the relative strength of the competitiveness and the risk channels.

2.1.2 | Interest Rate Channels

The theoretical link between interest rate changes and stock returns is similarly well documented. Based on the discounted cash flow model (Fama 1981), higher interest rates raise the discount rate applied to future corporate earnings, reducing the present value of equities. Consequently, a tightening of monetary policy diminishes future cash flows, raises the discount rates applied to these cash flows, and leads to a preference for bonds over stocks. Higher rates also increase the opportunity cost of holding stocks relative to fixed income securities, lowering equity demand. In addition, higher borrowing costs for firms constrain investment and future profit growth, thereby dampening expected stock returns. Recent empirical work suggests that this relationship is neither uniform nor static, with the sensitivity of equity returns to interest rate changes strongly influenced by the expected inflation component and firm-level growth prospects (Kim et al. 2025).

Importantly for our context, when monetary authorities use both the exchange rate and the interest rate as policy tools, particularly during an exchange rate regime transition, the interaction between the two channels becomes crucial. Exchange rate changes convey information about expected interest rate paths through inflation and external balance effects, while interest rate changes influence currency expectations and capital flows. In transitional regimes, the strengths of the competitiveness channel, the portfolio balance channel, and the external vulnerability risk channel of the exchange rate may also shift. Given these potential shifts, we examine different phases of the exchange rate transition process in our empirical analysis. In particular, we investigate how overall stock market returns (changes in the stock index) respond to changes in the exchange rate and the interbank rate during the regime transition.

Exchange rates and interest rates are also closely linked while previous analysis focused on their effects on stock returns. Following a currency devaluation, interest rates typically rise because of several interacting channels. Devaluation raises import costs, generating higher inflation expectations and prompting tighter monetary policy. Domestic assets also become riskier, leading investors to demand higher returns to compensate for currency losses. In addition, according to interest rate parity, expected currency depreciation requires domestic rates to rise relative to foreign rates to attract capital and prevent outflows. These channels together explain why interest rates generally respond positively to a devaluation, reflecting the combined effects of monetary policy, market expectations, and interest rate parity.

2.2 | Literature Review

In the recent literature, high-frequency identification is commonly employed to evaluate the effects of monetary policy on financial markets. For this method, an essential feature is the differentiation between expected and unexpected changes in financial markets following monetary policy announcements (Kuttner 2001). Unexpected changes in financial variables are often termed policy surprises. The rationale behind this distinction is that an efficient market reacts only to a surprise policy change and not to an expected one. To construct policy surprises, many researchers have used various proxies, including federal funds futures and Eurodollar futures (among others, Bernanke and Kuttner 2005; Gürkaynak et al. 2005; Kuttner 2001; Swanson 2021). Gürkaynak et al. (2005) show

that high-frequency identification captures the response of asset prices to monetary policy information releases. This methodology is crucial in capturing the immediate effects of monetary policy changes on financial markets.

There is a large literature on exchange rate regimes and economic performance. Levy-Yeyati and Sturzenegger (2024) discuss the dynamics of the choices of exchange rate regimes and indicate that there has been an increasing trend toward floating regimes. Bird and Rowlands (2009) find that countries with an intermediate exchange rate regime tend to be less dependent on external assistance in comparison to countries with a fixed exchange rate system. Analogously, Markiewicz (2006) indicates that countries with high inflation and more developed financial markets favour a floating exchange rate system. Based on evidence on the transition from a fixed to a floating exchange rate regime in Mexico, Martínez and Werner (2002) find that the floating system is more useful for reducing exchange rate exposure. Moreover, Manopimoke et al. (2024) find for Latin American and Asian countries that a floating exchange rate system helps absorb global demand and monetary policy shocks.

Several studies examine the economic implications of exchange rate regime transitions and currency devaluations. Fuertes (2019) finds a structural break in the US net external position associated with the transition from the fixed exchange rates of the Bretton Woods system to a floating exchange rate regime. Palazzo (2024) provides evidence for Argentina that competitive sectors are likely to increase exports after continuous currency devaluations. Using data from the Belarusian black exchange rate market, Huett et al. (2014) show that devaluations of the official exchange rate can be predicted by transactions in the black market.

There are several studies on the relation among exchange rates, interest rates, and the stock market for a group of countries. Salisu and Vo (2021) examine how exchange rate movements affect stock returns across countries with different interest rate environments. They show that in low interest rate economies such as Canada, Denmark, Japan, and South Korea, exchange rate changes are positively linked to stock returns in the long run, whereas in high interest rate economies such as Brazil, China, India, and Indonesia, the relationship is negative in the short run, reflecting greater vulnerability to currency shocks. Their findings indicate that the relation between exchange rates, interest rates, and stock returns is regime dependent and shaped by monetary policy conditions.

Corzo et al. (2025) evaluate the efficiency of floating and pegged exchange rate regimes and examine how regime changes affect market efficiency. For the empirical analysis, they employ daily data on 81 currencies spanning 23 years. Their results indicate that floating regimes display higher market efficiency and that a transition from a pegged to a floating system positively affects market efficiency.

Moussa and Delhoumi (2022) explore the asymmetric effects of interest rate and exchange rate fluctuations on stock market indices across the MENA region, including Egypt. They find that stock markets in developing economies exhibit short-term asymmetric responses to positive and negative changes in interest rates and exchange rates. The authors emphasize the role of these dynamics in shaping market responses during periods of monetary and currency adjustments.

Xiao et al. (2024) investigate the impact of global economic disruptions, including the Russia-Ukraine war, on the spreads of African sovereign bond markets. They find significant spillover effects, highlighting that geopolitical conflicts and external shocks increase volatility and yield fluctuations in these markets. In particular, their work reveals that the link between the exchange rate and the bond spread for Egypt varies over time, while it remains static for other countries.

A few recent empirical studies examine the link between the exchange rate and the stock market in Egypt, predominantly employing time series methods. El-Masry and Badr (2021) explore the relationship between the foreign exchange and stock markets over the period 2009–2016. The authors examine the period from the January 25 Revolution in 2011 to 2016 within the context of a broader study period. Their results indicate that there is no significant relationship between the exchange rate and stock market indices in Egypt in the post-revolution years 2011–2016.

Elroukh (2024) examines the response of the stock market to major exchange rate adjustments in Egypt in 2022, a year marked by the outbreak of the Russo–Ukrainian war and two devaluations of the Egyptian pound in March and October. Using an event study methodology, the author analyzes the behaviour of abnormal returns for the stock market index around the devaluation events. The findings reveal significant positive abnormal returns on the devaluation days and in the 2 weeks prior to and after them.

In contrast to the aforementioned studies, which rely on daily data, Helmy (2024) uses monthly time series data spanning January 2000 to June 2022 to examine the short-run and long-run dynamics among stock prices, exchange rates, interest rates, and inflation. The study finds that the depreciation of the Egyptian pound leads to a significant increase in stock prices both in the short run and the long run. At the same time, the author finds that interest rates significantly decrease stock prices in the short run.

The results of this paper contribute to the literature by providing evidence on the effects of exchange rate regime transition on financial markets in Egypt. In contrast to the existing literature on Egypt, we use high-frequency identification, which is now a common method to evaluate the effects of monetary policy. At the same time, we adapt this method to account for the underdevelopment and specific features of Egyptian financial markets. In particular, we use a longer response period to monetary policy surprises, applying an event window of two business days instead of the 30-min window generally used for advanced economies to capture their effects, and we conduct robustness analysis using the response period of four business days. We apply high-frequency identification for estimations based on the overall sample and subsamples related to important political

events and different degrees of exchange rate flexibility. The results indicate that monetary policy surprises transmit more significantly to financial markets when the exchange rate is more flexible.

We examine the responsiveness of short-term and long-term interest rates to monetary policy surprises across the different response periods, providing new evidence on the transmission of monetary policy to financial markets in the context of the evolving exchange rate regime in Egypt. We complement our empirical analysis with estimations for the parallel exchange rate market, using more conventional methods due to the frequently adjusted exchange rate in this market. In addition, we contribute to the literature by separately evaluating the effects of the latest currency devaluation, after which the official and the parallel market exchange rates have exhibited similar dynamics.

3 | Economic and Institutional Background

This section provides an examination of the major economic and institutional changes in Egypt over the past decades. It assesses the effects of political upheavals in the early 2010s and subsequent reform initiatives aimed at achieving the objectives of Egypt Vision 2030.[1] In particular, this section describes the close collaboration between Egypt and the International Monetary Fund (IMF) between 2016 and 2022. This collaboration has been crucial in obtaining financial assistance and implementing essential economic reforms. Additionally, this section examines the development of the Egyptian monetary policy framework. In general, this section seeks to provide a thorough overview of the historical context, institutional changes, and policy developments that have influenced the present economic environment in Egypt.

3.1 | Economic and Institutional Reforms

Over the past three decades, the Egyptian economy has undergone significant transformations. These transformations have affected overall economic performance and shaped the implementation of monetary policy. The economic history of Egypt can be divided into three distinct periods.

The initial phase, spanning from 1960 to 1973, was marked by a state-controlled economy in which the government exerted substantial regulation over market mechanisms and implemented a range of directive policies. The subsequent period, from 1974 to 1991, represented a shift toward liberalization, characterized by the adoption of free-market principles and open economic policies. The final phase, from 1991 to 1996, involved comprehensive economic and structural reforms aimed at further enhancing market efficiency and integration into the global economy (Abo El-Oyon 2003).

In the last period, Egypt initiated a comprehensive reform program in its economic, monetary, and financial sectors with support from international financial institutions.[2] Following extended negotiations that began in 1989, Egypt reached agreements with the IMF in May 1991 and with the World Bank in November of the same year on a package of stabilization and structural adjustment measures. These agreements form the foundation of the Economic Reform and Structural Adjustment Program (ERSAP).

The monetary policy reforms recommended by ERSAP focused on various aspects and resulted in the elimination of the parallel market for foreign currencies and the unification of the exchange rate system following a devaluation in February 1991. They also led to the removal of interest rate ceilings to halt distortions in capital markets and to ensure the efficient allocation of financial resources. Moreover, they facilitated the introduction of Treasury bill auctions to reduce the involvement of the CBE in funding government deficits.[3] Subsequently, in 1992 and 1993, restrictions on lending to the private and public sectors were abolished to encourage the greater mobilization of domestic savings through competitive, positive real interest rates (Korayem 1997).

Twenty-five years later, following the economic disruptions caused by local revolutions in January 2011 and June 2013, and faced with a decline in financial resources, Egypt was compelled to embark on a comprehensive national reform program aimed at kick-starting development and achieving the objectives of Egypt Vision 2030. In pursuit of this, Egypt commenced negotiations with the IMF and secured a $12 billion loan, repayable over 3 years, in August 2016. This financial support was integral to a broader program of economic reform designed to restore macroeconomic stability and lay the foundations for sustainable long-term growth (Abouleinein 2021).

Six years later, Egypt once more turned to the IMF for financial support. The Fund approved a $3 billion loan in December 2022, which was later expanded to about $8 billion in March 2024 following another currency devaluation (IMF 2022, 2024b). In 2022, Kristalina Georgieva, Managing Director and Chair of the IMF's Executive Board, emphasized that Egypt had managed the COVID-19 shock effectively, partly as a result of reforms undertaken under previous IMF-supported arrangements (IMF 2022).

While economic recovery gathered pace in 2021, underlying imbalances began to emerge amid a fixed exchange rate regime, elevated public debt, and delayed structural reforms. The outbreak of the Russo–Ukrainian war amplified these pre-existing vulnerabilities, leading to significant capital outflows. Within the constraints of the fixed exchange rate framework, the war further depleted the foreign reserves of the CBE and the net foreign assets of the banking sector, worsening the exchange rate misalignment (IMF 2023). Similarly, Xiao et al. (2024) found that Egypt, among other African countries, has been significantly influenced by the Russo–Ukrainian war, particularly in terms of the sovereign bond spreads.

The reform agenda under Egypt Vision 2030 and the complementary strategies of the CBE, including the modernization of the financial system, have expanded financial inclusion and digitization. Overall, these reforms have strengthened the institutional and structural foundation for more effective monetary policy transmission. Broader access to banking services and

advances in payment infrastructure have enhanced the interest rate and credit channels of monetary policy transmission.

Egypt has historically experienced fiscal dominance. The government has relied on financing from the CBE. Large net domestic credits to the government resulted in conflicting objectives for the CBE. Exchange rate stabilization was often prioritized over inflation targeting, putting the independence of monetary policy at risk. Despite structural reforms and optimistic visions, fiscal pressures remain acute. In particular, the government's current interest payments account for about half of its total expenditures.

Thus, Vision 2030 and related reforms have improved the effectiveness of monetary policy transmission. Nevertheless, they appear insufficient without comprehensive fiscal consolidation and debt management reforms. Fiscal dominance and large debt services continue to limit the capacity of monetary policy to operate more independently and efficiently.

The agreements with international organizations required various economic and structural reforms in both fiscal and monetary policies. They also required reducing the state footprint and promoting private sector-led growth. However, the key metric for securing financial funds was a permanent shift to a flexible exchange rate system.

3.2 | Monetary Policy Background

Similar to the general economic history of Egypt, the implementation of monetary policy also went through three main phases. Selim (2010) categorizes these phases as follows. The first phase (1974–1990) was characterized by direct control measures such as the administrative setting of interest rates. Credit ceilings were also used to provide revenues for the government and subsidize debt for public enterprises. In the second phase (1991–2003), the first attempts took place to address the inconsistencies in the monetary policy framework, with the adoption of the ERSAP in 1991. Following successive rounds of Egyptian pound (EGP) devaluations that started in 2000, inflation spiked until it reached double digits following the massive devaluation in 2003.[4] The announcement of this devaluation in 2003 marked the start of the third and final phase. Following several reforms after 2003 that helped stabilize the exchange rate, in January 2005, the CBE announced its intention to shift toward inflation targeting as a new policy regime, and the Monetary Policy Committee (MPC) was established.

The adoption of the inflation targeting regime by the CBE was gradual. Currently, the CBE official website states that, since June 2005, its operational target has shifted toward the overnight interbank rate from the quantitative target of excess reserves. The CBE has become committed to achieving and maintaining low and stable inflation in the medium term and has been responsible for two key objectives: (i) formulating and implementing the Egyptian monetary policy, issuing financial papers and instruments, commensurate with the nature of its funds and activities, as well as engaging in open market operations, (ii) establishing the foreign exchange rate system and its implementation, as well as regulating and supervising the foreign exchange market.

The MPC systematically evaluates and delivers various economic, financial, and material reports, while the CBE division of Monetary Policy and Markets formulates recommendations.[5] Following a thorough discussion of potential perspectives, the members of the committee cast votes on essential decisions concerning the orientation of monetary policy, utilizing available monetary instruments. The MPC sets key policy interest rates to align with the predetermined inflation target and to ensure price stability in the medium term. The committee meets eight times throughout the year to review the settings of the monetary policy. The schedule of these meetings is made public at the beginning of each year on the official website of the CBE. In addition, extraordinary meetings may occur under special circumstances.[6] Following each meeting, the MPC issues a press release on the CBE website, detailing the decisions made and providing explanations for them to anchor inflation expectations. The announcements are usually published on the website on Thursday afternoons.[7]

4 | Data Description

The empirical analysis covers the period from January 2011 to May 2024. Although the initial objective was to begin the empirical analysis in 2005, in line with the adoption of the inflation targeting policy, this was not feasible due to data limitations and inconsistencies in reporting methodologies prior to 2011. In addition, 2011 marks a critical turning point in the Egyptian economic and political landscape, with local and regional transformative events significantly influencing the economy in subsequent years. After 18 days of nationwide protests sparked by the revolution on January 25 of 2011, the president, Hosni Mubarak, resigned on February 11 of 2011, ending his 30-year tenure in office. Moreover, the end of the sample period in May 2024 reflects the last stage of the exchange rate regime transition.

During the study period, the MPC conducted 110 meetings. Therefore, the full estimation sample contains 110 observations. The data set is divided into four panels that represent key and distinct periods within the full sample. The first panel covers the complete sample from January 2011 to May 2024 (110 meetings). The second panel represents the period before the first currency devaluation in November 2016 (45 meetings). The third panel represents the period between the devaluation in 2016 and the outbreak of the Russo–Ukrainian war (44 meetings). The fourth panel represents the period after the outbreak of the Russo–Ukrainian war (21 meetings). Some values of the variables are not available for the periods corresponding to the MPC meetings. As a result, the effective number of observations used in the estimations is smaller than the number of MPC meetings for a given sample. We report the effective number of observations in the tables with our estimates.

The data used in this empirical analysis include the interbank overnight rate (IR), the yields of 3, 6, and 12 months treasury bills (T3M, T6M, and T12M), and the yields of 5 and 10 years treasury bonds (T5Y and T10Y).[8] All these variables are in percent. The data also contain the main Egyptian stock market index (EGX30), which includes the thirty most liquid and active stocks on the Egyptian stock exchange. The EGX30 is in index points.[9] We take the natural logarithm of EGX30 before

using it in the empirical analysis.[10] The interbank rate is obtained from the CBE, while the other variables are obtained from Investing.com.

We use the exchange rate of Egyptian pounds (EGP) per US dollar (USD). We use CBE official exchange rates (ERO), which are from the central bank database.[11] This series of exchange rates is the longest available for the Egyptian exchange rate over our overall study period. Nevertheless, the data for ERO are not available for four MPC meetings.[12] For these four meetings, we use average market exchange rates, which are also from the CBE. The values of official and average market exchange rates were close in Egypt during the fixed exchange rate regime. For these four MPC meetings, we compute the first-order differences of exchange rates based on average market rates to ensure consistency in computations.

In addition to the official exchange rate, we use data on the exchange rate from the parallel market (ERP).[13] The data for the parallel market consist of daily observations of the exchange rate EGP/USD from Investing.com. During the period between January 2023 and March 2024, the difference between official rates and parallel market rates was substantial, as shown in Figure 1. Since the adoption of the free-floating exchange rate regime by the CBE in March 2024, the official and parallel market exchange rates have generally coincided. Therefore, for an additional empirical analysis, we use the period between January 2023 and March 2024.[14]

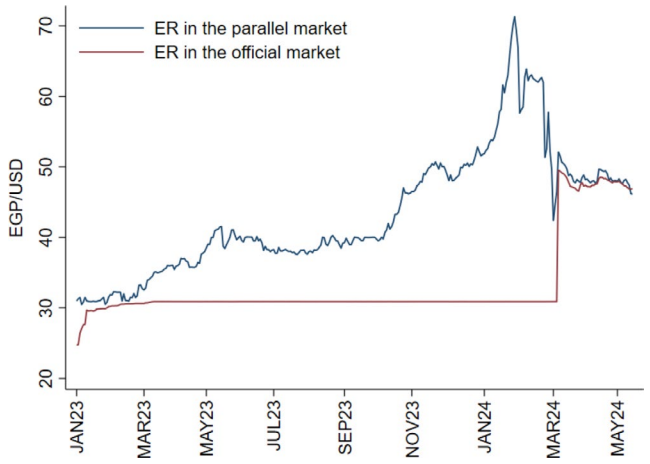

FIGURE 1 | EGP/USD, official and parallel market rates. *Source:* Central Bank of Egypt and Investing.com. [Colour figure can be viewed at wileyonlinelibrary.com]

For interoperability and comparability of results, we use the exchange rate and the interest rates in their original units. Hence, their first-order differences indicate a 1 EGP depreciation or appreciation in the exchange rate and a change in percentage points in the interest rates. At the same time, we use the stock index in natural logs. This transformation allows us to examine percent changes when we take their first-order differences.

The descriptions of the original variables are provided in Table A1 and the dynamics of the variables are presented in Figure A1. The summary of descriptive statistics is presented in Table 1. It latter includes the mean, the standard deviation, the minimum, and the maximum of the data series. We can see from the table that the exchange rates are quite different in the official market (14.63) and the parallel market (43.30) even though they are measured over different periods. The mean values of the interest rates vary with the level of their maturity. The average level of stock prices (in index points) is 11,063.89, with a wide variation from the minimum value of 3586.55 to the maximum value of 33,382.51 over the study period.

5 | Methodology

During the period of analysis from January 2011 to May 2024, the monetary policy framework in Egypt showed similarities with that of the US, and in some periods, similar to other emerging economies, Egypt followed the path of US monetary policy when the Federal Reserve (Fed) changed the policy interest rate. In both countries, monetary authorities publicly announce monetary policy decisions following their meetings, the Federal Open Market Committee in the US and the Monetary Policy Committee in Egypt (Table A7). After these meetings, the decisions are communicated to the public on specific dates. Nevertheless, the data for Egypt are not available at the same high frequency as in the case of the US.

To empirically assess the impact of monetary policy changes on financial variables, we follow Swanson (2021) and use high-frequency identification (an event study methodology) to isolate exogenous monetary policy surprises. High-frequency identification is commonly used in the related literature since the influential papers by Kuttner (2001) and Gürkaynak et al. (2005) to evaluate causal effects. It allows us to trace the causal transmission of monetary policy to financial variables. This methodology involves analyzing the response of financial variables to unexpected shifts in monetary policy. These

TABLE 1 | Descriptive statistics.

	EGX30	IR	T3M	T6M	T12M	T5Y	T10Y	ERO	ERP
MEAN	11063.89	12.49	15.13	15.72	16.07	16.35	16.85	14.63	43.30
STD DEV	5233.87	4.21	3.86	4.14	4.20	3.33	2.97	8.48	8.71
MAX	33382.51	27.67	27.25	30.97	31.82	28.87	28.77	49.50	71.30
MIN	3586.55	8.25	9.35	9.90	9.75	11.40	12.70	5.79	30.48
OBSERVATIONS	3153	3183	2628	2619	2571	2581	2580	3183	331

Note: The table reports descriptive statistics for the stock market index (EGX30), the yields of 3, 6, and 12 months treasury bills (T3M, T6M and T12M), and the yields of 5 and 10 years treasury bonds (T5Y and T10Y), the official exchange rate (ERO), and the parallel market exchange rate (ERP). Statistics are computed over the period from 2 January 2011 to 30 May 2024, except for the parallel market statistics, which are computed from January 2023 to March 2024.

unexpected shifts are usually called "monetary surprises" in the literature. The use of high-frequency identification assumes that the change in the variables of interest is affected by the shift in monetary policy, given the measurement of that change closely after the announcement of monetary policy decisions. Thereby, using high-frequency identification around policy announcements, our approach mitigates endogeneity concerns, including reverse causality from stock prices to monetary policy. In addition, the consideration of the variables in first-order differences ensures their stationarity for estimation. The variables are integrated of order one, as the results of the Augmented Dickey-Fuller (ADF) test show for our study period.

For the high-frequency estimation, we consider the following regression model:

$$\Delta Y_t = \beta_0 + \beta_1 \Delta ERO_t + \beta_2 \Delta IR_t + \varepsilon_t, \quad (1)$$

where t indexes MPC announcements, Y denotes a financial instrument of interest, Δ is the change in two-business-day window bracketing each MPC announcement, *ERO* is the official exchange rate of Egyptian pounds per one USD, *IR* is the interbank overnight rate, and ε_t is an error term.[15] β_is are the parameters of the model, which are estimated by ordinary least squares (OLS). The exogeneity of the independent variables and the consistent estimation of the model parameters are ensured by the timing of the measurement of the changes in the variables closely after MPC announcements.

In our analysis, we estimate the effects of the two key monetary policy tools used by the CBE, namely, the interbank overnight rate and the currency exchange rate. As discussed in previous sections, various monetary policy tools are used in the literature to evaluate the effects of monetary policy. In particular, for high-frequency identification, the literature uses the futures of monetary policy interest rates for developed countries (since the work by Kuttner (2001)) to ensure that monetary policy surprises are unexpected. Given that the financial markets are not well developed in Egypt[16] and the monetary policy actions of the CBE are not fully transparent, the changes in the interbank overnight rate should be unexpected. At the same time, official monetary policy announcements in Egypt are publicly observable and can generate measurable reactions in financial markets. We focus on narrow event windows to isolate the unanticipated component of monetary policy. In addition, because of the nature of the Egyptian monetary policy framework for the period under consideration, we include the exchange rate as a policy instrument in the model in addition to the short-term interest rate. As a country that controls its exchange rate, Egypt used to adjust the currency exchange rate as a monetary policy tool to achieve its policy targets.

Our objective of the high-frequency estimation is to observe the changes in the target variables closely after monetary policy announcements, taking into account the features of the Egyptian financial markets. As mentioned in Section 3, MPC announcements generally take place on Thursday afternoons, usually after the closure of the financial markets. Since Thursday is the last business day of the week[17] in Egyptian markets, the effects of MPC decisions cannot materialize until the following business day, Sunday.[18] Nevertheless, the treasury yields are not available for all Sundays, being mainly available for Mondays.

To account for the timing of MPC announcements and the availability of the treasury yields, we set the event window to be two business days following MPC announcements. That is, we compute the difference between the values of the variables between Monday ($t+2$) and the preceding Thursday (t), when the MPC announced its decision in the afternoon of that day. This formulation of the event window ensures that the model can capture the changes in the variables that take place due to MPC announcements. In addition, as a robustness check, we also estimate the effects using a window of four business days, which is twice as long as the baseline event window. Yet, for longer evaluation windows, there is a caveat that the dependent variables might be affected by events other than the changes in the monetary policy instruments.

This paper addresses potential structural breaks using narrow event windows within the high-frequency identification strategy. This method limits the role of low-frequency shifts in the underlying variables. In addition to the estimation based on the overall sample, the models are also estimated across three subsamples corresponding to periods of unstable events and different degrees of exchange rate flexibility, as specified in Section 4. These subsample analyses ensure that the main results are not driven by specific episodes of instability. As a robustness check, we include dummy variables for the subsamples in the estimations based on the overall sample.

In addition to applying high-frequency identification, we use an autoregressive distributed lag (ADL) model to evaluate the effects of monetary policy on stock prices using data from the parallel exchange rate market. The ADL model allows us to study monetary transmission in this market segment, where high-frequency identification is not feasible. These two approaches operate in different market segments and therefore provide distinct but complementary evidence. In this case, the crucial difference is that t indexes consecutive business days instead of MPC announcements. Consequently, we cannot assume that the dynamics of stock prices are solely due to changes in monetary policy. Therefore, in the model, we include lagged values of the stock prices to control for their potential inertia, as well as other variables that can impact them. At the same time, as in the baseline case, we consider the contemporaneous values of the independent variables. Thus, for data from the parallel exchange rate market, we use the following model:

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta Y_{t-1} + \ \dots \ + \alpha_p \Delta Y_{t-p} + \beta_1 \Delta ERP_t + \beta_2 \Delta IR_t + \upsilon_t, \quad (2)$$

where t indexes consecutive days, Y is the stock market index (EGX30), Δ is a daily change, p is a lag order, υ_t is an error term, and *ERP* and *IR* are the parallel exchange rate and the interbank overnight rate, respectively. Based on the ADF test results, the variables are integrated of order one, and so we take the first order differences of the variables to ensure their stationarity before estimating the model with the OLS. As the lag order p of the dependent variable, we choose the lowest lag in which case the residuals of the model are not serially correlated.

6 | Empirical Results

This section presents the empirical results for the evaluation of the effects of changes in the exchange rate and the interbank overnight rate on Egyptian stock and treasury yields. We examine the responses of the financial markets over two different event windows following MPC announcements: two and four business days. The two-day response measures the change in the financial variables following the two business days after an MPC announcement[19] and the estimation results are presented in the current section. The four-day response captures the change in the financial variables following the four business days after an MPC announcement and the results are provided in Tables A2–A4. In the regression models, the intercept has no substantive interpretation and is therefore not reported. At the same time, in the robustness analysis, when the regressions include dummy variables, the intercept captures the omitted reference period and is reported (Tables A5 and A6).

6.1 | Responses of the Stock Market Index

We present the responses of the stock market index over different estimation samples in Table 2. The results are provided in four columns. The first column summarizes the effects of the two monetary policy instruments over the entire sample. Yet, before analysing these results, we first discuss the sub-sample estimates. The second column reports the results for the period of the fixed exchange rate regime when the Egyptian pound was pegged to the US dollar. During this period, the interbank rate was raised six times and was cut on four occasions. For this period, the estimation results show that the changes in the exchange rate and the interbank rate generally do not have significant effects on financial markets. These results are consistent with the work by El-Masry and Badr (2021), who also do not find a significant relation between the exchange rate and stock market indices in Egypt for this period.

TABLE 2 | Estimated effects of changes in the exchange rate and the interbank overnight rate on the stock market index.

	Full sample	Pegged phase	Controlled flotation	Russo–Ukrainian war period
	Jan 2011–May 2024	Jan 2011–Oct 2016	Nov 2016–Feb 2022	Feb 2022–May 2024
ΔER	3.01***	9.84	3.68***	−1.02
	(4.06)	(0.36)	(6.74)	(−0.42)
ΔIR	0.14	−0.75	−0.03	0.04
	(0.44)	(−0.70)	(−0.07)	(0.06)
N	107	42	44	21
R^2	0.14	0.02	0.53	0.01

Note: The coefficients are in units of percentage point changes, except for the effects on EGX30, which represent percent changes. Δ indicates a change in the variable over an event window of two business days. EGX30 denotes the stock market index, ERO refers to the official exchange rate, and IR refers to the interbank rate. *t* statistics are in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

In the third column of the table, we report the estimates for the period between November 2016 and February 2022, before the outbreak of the Russo–Ukrainian war. The results show that a 1 EGP depreciation significantly increases the stock market index by 3.68%. At the same time, the change in the interbank rate does not have a significant effect on the EGX30 index. In the fourth column of the table, we present the estimates for the period following the outbreak of the Russo–Ukrainian war, that is, the period between February 2022 and the end of the sample in May 2024. For this period, the stock index does not move significantly in response to the changes in the exchange rate and the interbank rate.

Finally, in the case of the full-sample estimates presented in the first column of the table, the response of the stock market index to the change in the interbank rate is insignificant, as in the cases of the sub-sample estimations, while the response of the stock market index to the change in the exchange rate is significant. The stock market index increases significantly by 2.98% following a 1 EGP depreciation. The results are similar to the findings by Helmy (2024), Moussa and Delhoumi (2022) in terms of the significant positive effect of exchange rate devaluations on the stock market index.

We present the results for the responses over four business days following an MPC announcement in Table A2. The two-day responses are similar to the previous estimates. Thus, we can infer from the results that the window of two business days is sufficient to capture the effects of MPC announcements on the Egyptian stock market index.

6.2 | Responses of Market Interest Rates

Standard monetary theory posits that monetary policy tightening typically leads to an increase in short-term and long-term market interest rates and vice versa. This relationship is well documented in the economic literature (Ellingsen and Söderström 2001). Below, we discuss the results related to the market interest rate responses to the changes in the exchange rate and the interbank overnight rate. We expect that exchange rate depreciation should lead to an increase in the interest rates,[20] while the elevation of the interbank rate should trigger a rise in the market interest rates. As short-term interest rates, we utilize the yields of 3, 6, and 12 months treasury bills. As long-term interest rates, we use the yields of 5 and 10 years treasury bonds.

6.2.1 | Responses of Short-Term Interest Rates

In line with the discussion of the results on the stock market index, we analyse the results, which are provided in Table 3, on the short-term interest rates first for the sub-samples and then for the full sample. In the pegged phase, the short-term interest rates do not react significantly to changes in the exchange rate. However, they respond significantly to the changes in the interbank rate. Their responses are similar. In particular, a 1 percentage-point increase in the interbank rate raises the 3-month interest rate by 0.40 percentage points.

For the controlled flotation phase, the 3-month and the 12-month interest rates respond significantly to the changes in the

TABLE 3 | Estimated effects of changes in the exchange rate and the interbank overnight rate on short-term treasury yields.

	Full sample	Pegged phase	Controlled flotation	Russo–Ukrainian war period
	Jan 2011–May 2024	Jan 2011–Oct 2016	Nov 2016–Feb 2022	Feb 2022–May 2024
T3M				
Δ*ER*	1.25***	3.80	1.30***	0.95
	(6.54)	(1.16)	(6.11)	(1.16)
Δ*IR*	0.10	0.40***	0.09	0.05
	(1.19)	(3.00)	(0.67)	(0.22)
N	101	38	43	20
R^2	0.31	0.21	0.49	0.07
T6M				
Δ*ER*	−0.10	−1.29	−0.06	−0.21
	(−0.78)	(−0.31)	(−0.72)	(−0.35)
Δ*IR*	0.09	0.30*	0.08	0.06
	(1.58)	(1.80)	(1.64)	(0.37)
N	101	38	43	20
R^2	0.03	0.10	0.07	0.02
T12M				
Δ*ER*	0.99***	3.75	1.11***	0.24
	(7.27)	(1.24)	(5.78)	(1.13)
Δ*IR*	0.06	0.35***	0.06	−0.00
	(0.97)	(2.84)	(0.49)	(−0.03)
N	98	35	43	20
R^2	0.36	0.21	0.46	0.07

Note: The coefficients are in units of percentage point changes. Δ indicates a change in the variable over an event window of two business days. ERO refers to the official exchange rate and IR refers to the interbank rate. *t* statistics are in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 4 | Estimated effects of changes in the exchange rate and the interbank overnight rate on long-term treasury yields.

	Full sample	Pegged phase	Controlled flotation	Russo–Ukrainian war period
	Jan 2011–May 2024	Jan 2011–Oct 2016	Nov 2016–Feb 2022	Feb 2022–May 2024
T5Y				
Δ*ER*	0.36**	1.71	0.42*	−0.09
	(2.54)	(0.82)	(2.01)	(−0.43)
Δ*IR*	0.14**	0.38***	0.28**	0.03
	(2.28)	(4.40)	(2.18)	(0.58)
N	97	35	42	20
R^2	0.11	0.38	0.19	0.04
T10Y				
Δ*ER*	0.36**	1.62	0.43**	−0.19
	(2.53)	(0.43)	(2.30)	(−0.58)
Δ*IR*	0.10*	0.26*	0.20*	0.01
	(1.73)	(1.73)	(1.77)	(0.08)
N	97	36	41	20
R^2	0.09	0.08	0.19	0.02

Note: The coefficients are in units of percentage point changes. Δ indicates a change in the variable over an event window of two business days. ERO refers to the official exchange rate and IR refers to the interbank rate. *t* statistics are in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

exchange rate, in contrast to the 6-month interest rate. For the Russo–Ukrainian war period, the results are not significant at any maturity. These results are in line with the findings by Xiao et al. (2024), which show that the relation between the exchange rate and treasury yields varies over time for Egypt, with higher fluctuations during unstable periods.

For the full sample, the responses of the 3-month and the 12-month interest rates are significant at the 1% level, while the response of the 6-month interest rate is not significant. Following a 1 EGP depreciation, the 3-month and the 12-month interest rates increase by 1.25 and 0.99 percentage points, respectively. At the same time, the short-term interest rates do not respond significantly to changes in the interbank rate.

We obtain analogous results in the case of the estimations with an event window of four business days (Table A3). The main notable difference is that, over the full sample, the 6-month interest rate significantly rises by 0.18 percentage points following a 1 percentage-point increase in the interbank rate. Thus, the short-term interest rates were more responsive to the changes in the interbank rate over the period of the exchange rate regime transition.

6.2.2 | Responses of Long-Term Interest Rates

The estimation results are presented in Table 4. As previously, we first discuss the results in the case of the sub-sample estimations. For the pegged exchange rate phase, the 5-year and the 10-year interest rates do not respond significantly to changes in the exchange rate, while their responses to the changes in the interbank rate are significant. For the controlled flotation phase, the long-term interest rates have similar significant responses to the changes in both monetary policy tools. In response to a 1 EGP depreciation, the 5-year and the 10-year interest rates increase by 0.42 and 0.43 percentage points, respectively. In response to a 1 percentage-point increase in the interbank rate, they also increase by 0.28 and 0.20 percentage points. For the Russo–Ukrainian war period, the long-term interest rates do not respond significantly to the changes in the policy tools, as in the previous cases (Xiao et al. 2024).

For the full sample, the results are significant and driven by the estimates from the controlled flotation phase. Following

a 1 EGP depreciation, both the 5-year and the 10-year interest rates increase by 0.36 percentage points. Following a 1 percentage-point increase in the interbank rate, the 5-year and the 10-year interest rates rise by 0.14 and 0.10 percentage points, respectively.

The two-business-day responses of the long-term interest rates are similar to the four-business-day responses of these interest rates (Table A4). The main notable difference is that the responses of the long-term interest rates to the changes in the interbank rate are less significant. Thus, the application of an event window of two business days is sufficient to capture the effects of monetary policy surprises on the long-term interest rates.

As a robustness check for potential structural breaks in our full-sample estimations, we include dummy variables for the three subsamples. We estimate these extended high-frequency regression models using event windows of both two and four business days. The results are presented in Tables A5 and A6. They are similar to those from the baseline estimations. Thus, the full-sample estimations are robust to potential structural breaks.

6.3 | Discussion

As discussed above, the results for the full sample are mainly driven by the results provided for the controlled flotation phase. We attribute the significant responses observed in this phase during the period between November 2016 and February 2022 to the political stability and financial autonomy of Egypt during this period. These features highlight the importance of their role in the transmission of monetary policy decisions to financial markets. Moreover, the results are also driven by the fact that the exchange rate regime was closer to a floating system during this period. Similarly, Manopimoke et al. (2024) find that a floating exchange rate regime helps enhance monetary policy transmission in emerging economies, and Corzo et al. (2025) provide evidence based on many currencies that a transition from a pegged to a floating system improves market efficiency. Thus, the results remain broadly consistent with findings from other developing economies. Nevertheless, the results primarily reflect the specific context of Egypt. Structural characteristics such as exchange rate history, parallel market dynamics, institutional environment, and the monetary policy implementation framework differ from those of many other developing economies.

The short-term interest rates respond significantly primarily to currency devaluations, reflecting their sensitivity to immediate market shocks. A currency devaluation can trigger sudden changes in inflation expectations and exchange rate risk, which directly influence short-term interest rates more than gradual adjustments in the interbank rate. In contrast, the long-term interest rates respond significantly to both the exchange rate and the interbank rate, as they incorporate expectations about future inflation and the trajectory of monetary policy. This distinction suggests that short-term financial variables are more responsive to transitory shocks, while long-term variables capture broader macroeconomic trends and policy expectations. These results highlight how currency and interest rate policies can have varying effects across different maturities in financial markets.

Low R-squared values obtained in the empirical analysis are expected in high-frequency estimations. Even within narrow event windows, financial variables display movements that are not driven by monetary policy shocks and are related to other factors such as market noise and unrelated news. As a result, only a portion of the within-window variation can be systematically linked to monetary policy surprises.

The insignificant results are mainly found in the periods of the pegged exchange rate and the Russo–Ukrainian war. The insignificance of the results implies the limited responsiveness of the financial variables to monetary policy announcements and we interpret it by the following factors. First, in the pegged exchange rate phase, the results are for the period between 2011 and 2016 when a lot of significant events took place in Egypt. A revolution took place in Egypt during the period from January 25 to February 11 of 2011. Hosni Mubarak, the president of Egypt, stepped down and the governance was transferred to the supreme council of the armed forces. In June 2013, another revolution led to the resignation of Mohamed Morsi, who was elected as a president in 2012. The aftermath of both revolutions was accompanied by regional tensions imposing significant threats and complications on the Egyptian economy. Thus, during such a volatile period, financial markets can be more affected by factors related to political stability rather than monetary policy decisions. Moreover, the exchange rate was mostly fixed during this period.

We attribute the insignificant results for the Russo–Ukrainian war period to the fact that the decisions of the MPC were largely anticipated by the financial markets in Egypt over that period. Although Egyptian monetary authorities had already followed US monetary policy previously, this practice was amplified because of the significant outflow of hot money from Egypt to developed countries (IMF 2023) as a response to increased risks following the outbreak of the Russo–Ukrainian war. Since over that period, Egyptian monetary authorities closely followed US monetary policy, MPC announcements usually took place 1 week after FOMC announcements, as can be seen from Table A7. Over the volatile period, Egypt closely had to follow the path of US economic policy, trying to mitigate the increased risks related to foreign exchange reserves. In general, as argued by the literature (Edwards 2012; Foley-Fisher and Guimaraes 2013), the US monetary policy significantly affects financial conditions in emerging economies. Thus, our results point out that the influence of the US monetary policy can be more pronounced over the volatile period, resulting in muted responses to MPC announcements.

7 | Additional Empirical Results

7.1 | Parallel Market Results

The official and parallel exchange rates played distinct roles during the exchange rate regime transition. The official rate reflected the formal monetary policy framework, while the parallel rate captured pressures when market conditions were constrained. Their convergence after the transition to the floating exchange rate system in March 2024 suggests that the subsequent official rate should fully reflect underlying market

forces. Thus, we also evaluate the effects of exchange rate changes in the parallel market on stock prices, complementing the analysis of the official exchange rate. As discussed in Section 5, we now use the ADL model with consecutive business day changes in the exchange rate for the period between January 2023 and March 2024, in contrast to the exchange rate changes following the MPC meetings.[21] After checking for serial correlation in the ADL model, we choose a lag order of one for the stock market index. The results of the Breusch-Godfrey test (Table A8) indicate that the residuals of this model are not serially correlated. The estimation results of the model are presented in Table 5.

As we can see from Table 5, the reaction of the stock market index to exchange rate changes in the parallel market is large and significant, similar to the results found by Huett et al. (2014). In particular, a 1 EGP depreciation in the exchange rate in the parallel market raises the stock market index by 0.34%. At the same time, in line with the baseline results, the change in the interbank rate does not significantly affect the stock market index. Thus, this complementary analysis shows that exchange rate depreciation in the parallel market also leads to an increase in stock prices.

7.2 | March 2024 Devaluation Effects

In the pursuit of transitioning to a floating exchange rate regime, the CBE eased control over the exchange rate, resulting in a substantial depreciation of the EGP in March 2024. This devaluation occurred only once, on the 6th of March 2024, and no further devaluations took place afterward. Consequently, we cannot apply our previous high-frequency estimation based on regression analysis. Instead, we evaluate the effects of this one-time devaluation by simply measuring the changes in the variables immediately following the event. They are measured over an event window of four working days to capture the effects on the variables more completely, given that it takes more time for the interest rates to respond to monetary policy surprises.

As can be seen from Table 6, the variables were substantially affected by the latest devaluation in March 2024. The Egyptian currency devalued against the US dollar by 18.14 EGP. This devaluation led to a 8.85% increase in the stock market index. The interbank overnight rate rose by 5.94 percentage points, and the yield on the 3 months treasury bills increased by 4.29 percentage points, while the changes in the yields on longer-term maturities were more moderate. Following the devaluation, the yields of 6 and the 12 months treasury bills rose by 2.86 and 1.91 percentage points, respectively. Thus, as in the case of the baseline results, the responses of short-term interest rates to the currency devaluation were stronger than those of long-term interest rates.

TABLE 5 | Estimates using parallel market data, January 2, 2023–March 4, 2024.

	$EGX30_t$
$EGX30_{t-1}$	−0.03
	(−0.55)
ΔERP_t	0.34***
	(4.58)
ΔIR_t	0.35
	(0.68)
N	284
R^2	0.07

Note: The coefficients are in units of percentage point changes, except for the EGX30 coefficient, which represents percent changes. Δ indicates a change in the variable over consecutive business days. EGX30 denotes the stock market index, ERP refers to the parallel market exchange rate, and IR refers to the interbank rate. *t* statistics are in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

8 | Conclusion

This paper evaluates the effects of monetary policy measures such as currency devaluations and interbank overnight rate adjustments on financial markets in Egypt. The analysis focuses on the period of the exchange rate regime transition from 2011 to 2024. Employing high-frequency identification, the results reveal relevant insights on the impact of monetary policy on financial variables such as the stock market prices as well as the yields of treasury bills and bonds.

The stock market prices respond significantly to currency devaluations, rising following such devaluations. The short-term yields also respond positively and significantly to currency devaluations. Nevertheless, the responses of these variables to changes in the interbank rate are less significant. In contrast, long-term yields respond positively and significantly to both changes in the exchange rate and the interbank rate. Overall, the results are mainly driven by the responses of the variables during the period of controlled flotation from November 2016 to February 2022.

The short-term yields respond significantly primarily to currency devaluations, as a currency devaluation can cause immediate changes in inflation expectations and exchange rate risk, which affect short-term yields more directly than gradual monetary

TABLE 6 | Changes in the variables after the devaluation.

	EGP/USD	EGX30	IR	T3M	T6M	T12M
Pre-devaluation	30.90	30668.89	21.67	22.96	28.11	29.91
Post-devaluation	49.04	33382.51	27.61	27.25	30.97	31.82
Percent change	58.71%	8.85%	27.71%	18.68%	10.17%	6.39%

Note: Changes are measured between the values of the variables for the 5th (Tuesday) and the 11th (Monday) of March, over an event window of four working days.

policy interest rate adjustments. In contrast, long-term yields respond significantly to both the exchange rate and the monetary policy interest rate, reflecting expectations about future inflation and the trajectory of monetary policy. This distinction highlights how exchange rate movements and monetary policy rate changes differentially affect short-term and long-term financial variables during the exchange rate regime transition.

Over the exchange rate transition period, the results are more pronounced for the controlled flotation period, which reflects a system closer to a floating exchange rate regime and a period of relative political and economic stability in Egypt. In contrast, monetary policy effects are muted for the periods marked by political upheaval or external shocks. These findings highlight the importance of having a flexible exchange rate system and overall stability to enhance the effectiveness of monetary policy. A potential limitation of this study is that results may differ in larger emerging or more developed markets because of differences in market efficiency, and the availability and depth of financial instruments. Future research could further explore these dynamics for other countries undergoing exchange rate transition to compare findings across different markets.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available upon request.

Endnotes

[1] Egypt Vision 2030 outlines an ambitious strategy to achieve sustainable development and create a brighter future for the nation. The vision focuses on six key objectives: improving the quality of life of Egyptians and raising living standards, ensuring social justice, protecting the environment, fostering a diversified, knowledge-based, and competitive economy, developing well-designed infrastructure, and enhancing the regional and global influence of Egypt. To bring these goals to fruition, the vision prioritizes essential enablers, with economic and institutional reforms taking a leading role. These reforms aim to strengthen governance, promote the expansion of the private sector, optimize public financial management, and establish a conducive environment for investment and innovation. By addressing deep-rooted challenges and building robust institutions, Egypt Vision 2030 lays the groundwork for a more inclusive, resilient, and prosperous future for Egypt.

[2] This is a continuous process that has continued to take place until the present date.

[3] The existence of a parallel market for the exchange rate was a persistent problem for the Egyptian economy. During the period of this study, the parallel market was present between January 2015 and November 2016 and between January 2023 and March 2024.

[4] The government partially floated the Egyptian currency to decrease its value against USD from EGP 3.85 to EGP 6.86 while it was traded at EGP 7 to USD in the parallel market.

[5] The Monetary Policy and Markets divisions of the CBE are responsible for analysing economic and market trends, providing reports and recommendations to support the MPC in making well-informed decisions.

[6] The last extraordinary meeting took place on the 6th of March 2024.

[7] This information is relevant and it is discussed again in the methodology section.

[8] The treasury yields of 9 months and 2 years are not included in the analysis because of their data limitations.

[9] EGX30 is the equivalent to the S&P 500 in the Egyptian stock market.

[10] The use of logarithms helps normalize large fluctuations, stabilize the variance of the data, and allows for the representation of the results in percentage changes, making them more comparable.

[11] As an exchange rate, we use the average of buying and selling prices, which have close values.

[12] These four MPC meetings took place on 27 November 2014, 15 January 2015, 26 February 2015, and 11 June 2015.

[13] The latter is also known as the black or shadow market and it is an informal unregulated market that has appeared in response to discrepancies between the official exchange rate and market demand.

[14] Before conducting any empirical analysis, we identify and correct for outliers in the data.

[15] As Y_t, we one by one consider the stock market index (EGX30), short-term treasury bills (T3M, T6M, and T1Y), and long-term treasury bonds (T5Y and T10Y).

[16] There were no futures contracts for the interbank overnight rate in Egypt during the study period.

[17] The standard business week in Egypt is from Sunday to Thursday.

[18] Campbell et al. (1998) claim that an event window can be expanded for two days, containing the day of the announcement and the day that follows, in order to capture the effects of announcements made after the market's closure on the announcement day.

[19] As explained earlier, we choose the two business days that follow an MPC announcement to allow the markets to respond to the decisions announced after the market closure on the day of the announcement and because of data availability.

[20] The devaluation of the currency generally makes imports more expensive and Egypt is a net importer with a long-term current account deficit. So, the devaluation of the currency should bring inflation up and consequently raise interest rates.

[21] For this period, only eleven meetings took place, so the application of high-frequency identification would not yield reliable results.

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Appendix A

Description of the Variables

TABLE A1 | Summary of the variables.

Variables	Measuring units	Descriptions	Sources
EGX30	Index points	The main Egyptian stock market index	Investing.com
ERO	EGP/USD	The official exchange rate	Central Bank of Egypt
ERP	EGP/USD	The parallel market exchange rate	Investing.com
IR	Percent	Central bank interbank overnight rate	Central Bank of Egypt
T3M	Percent	Three-month treasury bill yields	Investing.com
T6M	Percent	Six-month treasury bill yields	Investing.com
T1Y	Percent	One-year treasury bill yields	Investing.com
T5Y	Percent	Five-year treasury bond yields	Investing.com
T10Y	Percent	Ten-year treasury bonds yields	Investing.com

Note: The table provides summary information on the variables employed in the empirical analysis.

Four-Business-Day Responses

TABLE A2 | Estimated effects of changes in the exchange rate and the interbank overnight rate on the stock market index.

	Full sample	Pegged phase	Controlled flotation	Russo–Ukrainian war period
	Jan 2011–May 2024	Jan 2011–Oct 2016	Nov 2016–Feb 2022	Feb 2022–May 2024
ΔERO	2.92***	15.34	4.15***	−2.97
	(3.58)	(1.02)	(5.61)	(−1.33)
ΔIR	−0.09	−0.18	−0.14	−0.22
	(−0.23)	(−0.14)	(−0.32)	(−0.28)
N	108	43	44	21
R^2	0.11	0.03	0.44	0.09

Note: The coefficients are in units of percentage point changes, except for the effects on EGX30, which represent percent changes. Δ indicates a change in the variable over an event window of four business days. EGX30 denotes the stock market index, ERO refers to the official exchange rate and IR refers to the interbank rate. T statistics are in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE A3 | Estimated effects of changes in the exchange rate and the interbank overnight rate on short-term treasury yields.

	Full sample	Pegged phase	Controlled flotation	Russo–Ukrainian war period
	Jan 2011–May 2024	Jan 2011–Oct 2016	Nov 2016–Feb 2022	Feb 2022–May 2024
T3M				
ΔERO	0.51***	1.47	0.57***	0.29
	(2.65)	(1.09)	(3.38)	(0.33)
ΔIR	0.12	0.21*	0.18*	0.12
	(1.34)	(1.72)	(1.81)	(0.39)
N	99	38	41	20
R^2	0.08	0.09	0.27	0.01
T6M				
ΔERO	0.77***	0.83	1.16***	−0.99
	(3.99)	(0.52)	(6.00)	(−1.40)
ΔIR	0.18*	0.38**	0.14	0.15
	(1.97)	(2.65)	(1.22)	(0.58)
N	100	38	42	20
R^2	0.16	0.17	0.49	0.14
T12M				
ΔERO	0.65***	3.57*	0.93***	−0.74*
	(3.75)	(1.78)	(4.28)	(−1.90)
ΔIR	0.11	0.59***	0.13	−0.06
	(1.34)	(3.29)	(0.99)	(−0.42)
N	98	36	42	20
R^2	0.14	0.26	0.33	0.18

Note: The coefficients are in units of percentage point changes. Δ indicates a change in the variable over an event window of four business days. ERO refers to the official exchange rate and IR refers to the interbank rate. *T* statistics are in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE A4 | Estimated effects of changes in the exchange rate and the interbank overnight rate on long-term treasury yields.

	Full sample	Pegged phase	Controlled flotation	Russo–Ukrainian war period
	Jan 2011–May 2024	Jan 2011–Oct 2016	Nov 2016–Feb 2022	Feb 2022–May 2024
T5Y				
ΔERO	0.40***	1.18	0.54***	−0.26
	(2.98)	(0.75)	(2.73)	(−1.19)
ΔIR	0.13**	0.39**	0.17	0.02
	(2.04)	(2.67)	(1.46)	(0.24)
N	97	36	41	20
R^2	0.12	0.18	0.20	0.09
T10Y				
ΔERO	0.37***	0.91	0.52***	−0.36
	(2.85)	(0.59)	(3.08)	(−1.24)
ΔIR	0.09	0.34**	0.10	0.02
	(1.48)	(2.47)	(1.00)	(0.17)
N	96	35	41	20
R^2	0.10	0.16	0.21	0.09

Note: The coefficients are in units of percentage point changes. Δ indicates a change in the variable over an event window of four business days. ERO refers to the official exchange rate and IR refers to the interbank rate. *T* statistics are in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Estimations With Dummy Variables for the Full Sample

TABLE A5 | Estimated effects of changes in the exchange rate and the interbank overnight rate on the financial variables, based on an event window of two business days.

	EGX30	T3M	T6M	T12M	T5Y	T10Y
ΔERO	2.90***	1.25***	−0.08	0.99***	0.36**	0.35**
	(3.93)	(6.46)	(−0.62)	(7.19)	(2.61)	(2.46)
ΔIR	−0.00	0.11	0.10*	0.08	0.20***	0.14**
	(−0.01)	(1.25)	(1.72)	(1.26)	(3.10)	(2.13)
Dummy 2	0.42	−0.00	−0.09	0.03	0.09	0.10
	(0.83)	(−0.00)	(−0.94)	(0.35)	(0.87)	(0.96)
Dummy 3	1.24**	−0.08	−0.18	−0.09	−0.23*	−0.08
	(1.99)	(−0.46)	(−1.58)	(−0.72)	(−1.87)	(−0.66)
Constant	−0.35	0.01	0.07	−0.00	0.05	0.01
	(−1.00)	(0.12)	(1.10)	(−0.07)	(0.72)	(0.09)
N	107	101	101	98	97	97
R^2	0.17	0.31	0.06	0.37	0.17	0.11

Note: The coefficients are in units of percentage point changes, except for the effects on EGX30, which represent percent changes. The constant represents the omitted reference period from January 2011 to October 2016. Dummy 2 covers the period from November 2016 to February 2022, while Dummy 3 covers the period from February 2022 to May 2024. Δ indicates a change in the variable over an event window of two business days. The dependent variables are the stock market index (EGX30), the yields of 3, 6, and 12 months treasury bills (T3M, T6M, and T12M), and the yields of 5 and 10 years treasury bonds (T5Y, and T10Y). Along with the dummy variables, the independent variables are the official exchange rate (ERO) and the interbank rate (IR). *T* statistics are in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE A6 | Estimated effects of changes in the exchange rate and the interbank overnight rate on the financial variables, based on an event window of four business days.

	EGX30	T3M	T6M	T12M	T5Y	T10Y
ΔERO	2.92***	0.52***	0.78***	0.65***	0.40***	0.37***
	(3.54)	(2.74)	(3.98)	(3.70)	(2.95)	(2.86)
ΔIR	−0.10	0.17*	0.20**	0.13	0.15**	0.11*
	(−0.24)	(1.77)	(2.07)	(1.51)	(2.22)	(1.71)
Dummy 2	−0.08	−0.02	−0.02	0.05	0.04	0.00
	(−0.13)	(−0.15)	(−0.16)	(0.37)	(0.37)	(0.03)
Dummy 3	0.03	−0.34*	−0.14	−0.12	−0.11	−0.14
	(0.04)	(−1.78)	(−0.71)	(−0.69)	(−0.84)	(−1.06)
Constant	0.76*	0.02	0.07	0.02	0.01	0.04
	(1.74)	(0.17)	(0.63)	(0.24)	(0.16)	(0.49)
N	108	99	100	98	97	96
R^2	0.11	0.11	0.17	0.15	0.13	0.11

Note: The coefficients are in units of percentage point changes, except for the effects on EGX30, which represent percent changes. The constant represents the omitted reference period from January 2011 to October 2016. Dummy 2 covers the period from November 2016 to February 2022, while Dummy 3 covers the period from February 2022 to May 2024. Δ indicates a change in the variable over an event window of four business days. The dependent variables are the stock market index (EGX30), the yields of 3, 6, and 12 months treasury bills (T3M, T6M, and T12M), and the yields of 5 and 10 years treasury bonds (T5Y, and T10Y). Along with the dummy variables, the independent variables are the official exchange rate (ERO) and the interbank rate (IR). *T* statistics are in parentheses. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Supplementary Information

TABLE A7 | FOMC and MPC announcements between 2022 and 2024.

2022			2023			2024		
Meeting day	**US**	**EGYPT**	**Meeting day**	**US**	**EGYPT**	**Meeting day**	**US**	**EGYPT**
26-01-22	—		01-02-23	0.25		31-01-24	—	
03-02-22		—	02-02-23		—	01-02-24		2
16-03-22	0.25		22-03-23	0.25		06-03-24		6
21-03-22		1	30-03-23		2	20-03-24	—	
04-05-22	0.50		03-05-23	0.25		01-05-24	—	
19-05-22		2	18-05-23		—	23-05-24		—
15-06-22	0.75		14-06-23	—				
23-06-22		—	22-06-23		—			
27-07-22	0.75		26-07-23	0.25				
18-08-22		—	03-08-23		1			
21-09-22	0.75		20-09-23	—				
22-09-22		—	21-09-23		—			
27-10-22		2	01-11-23	—				
02-11-22	0.75		02-11-23		—			
14-12-22	0.50		13-12-23	—				
			21-12-23		—			

Note: The table is compiled based on data from the Fed and the CBE. Announcements are presented in terms of the percentage point changes in monetary policy rates. The sign "–" denotes no change in monetary policy rates.

TABLE A8 | Results of the serial correlation test.

Lags	χ^2	*df*	*p*-value
—	0.69	1	0.41

Note: The table reports the results of the Breusch–Godfrey LM test for autocorrelation. The null hypothesis (H0) is no serial correlation. χ^2 denotes the Chi-square test statistic and *df* indicates degrees of freedom.

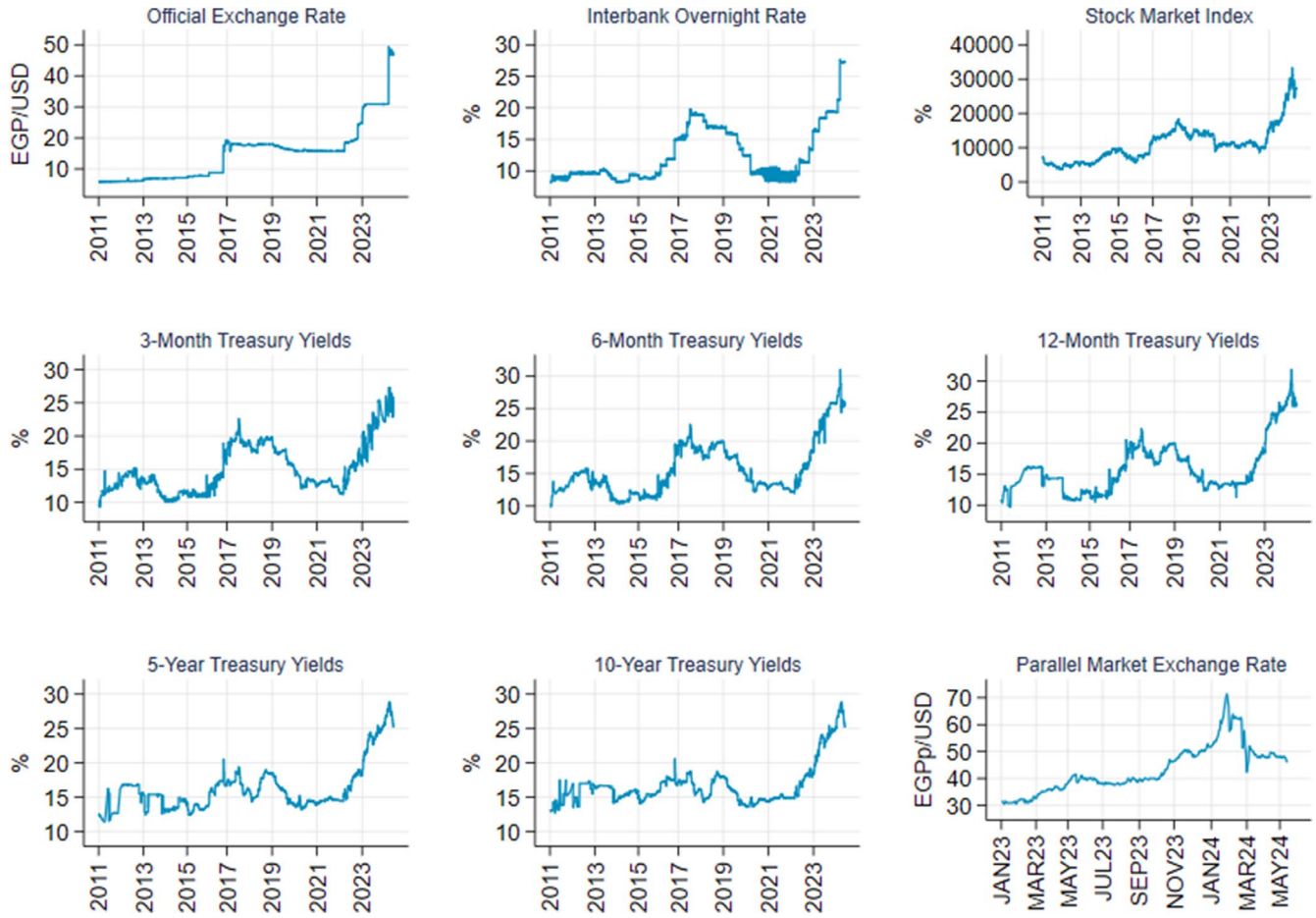

FIGURE A1 | Dynamics of the variables. The graphs are based on the data from the CBE and Investing.com. [Colour figure can be viewed at wileyonlinelibrary.com]