



Term structure of interest rates in Morocco: A Descriptive Empirical Analysis

Manal Ziani ^{1*}, Abdelouahab Maarouf ²

Faculty of Law, Economics and Social Sciences (FSJES-Agdal), University Mohammed V Rabat, Morocco.

*Corresponding Author

Manal Ziani

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Abstract: The term structure of interest rates serves as a fundamental indicator of monetary policy transmission, market expectations, and economic conditions. In Morocco, understanding the dynamics of the yield curve and secondary market behavior is crucial for policymakers, investors, and financial institutions. This study presents a descriptive empirical analysis of the term structure of interest rates in Morocco over the period 2004-2025. The analytical framework examines spread differentials across debt instruments, yield curve construction and evolution, secondary market indicators, and the temporal dynamics of interest rates. The analysis reveals key characteristics of the Moroccan interest rate market, including the shape and shifts of the yield curve, spread behavior across maturities, and the responsiveness of secondary market rates to monetary policy signals. Four major specificities of the yield curve in Morocco emerge from the analysis: first, the absence of yield curve inversion throughout the entire study period; second, the captive holding of government securities by domestic institutional investors; third, the dominant role of Bank Al-Maghrib on the short end of the curve through its weekly open market operations; and fourth, the dependence of the term structure on Treasury financing needs. These findings provide valuable insights into the efficiency and depth of Morocco's debt market, highlighting both the strengths and limitations of the current interest rate transmission mechanism, and offering practical implications for monetary policy design and fixed-income investment strategies in emerging markets.

Keywords: Term structure, Yield curve, Monetary policy, Bond market.

JEL Classification : E43, E52, E58, G12.

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¹ Corresponding author. Faculty of Juridical, Economic and Social sciences, University Mohammed V, Av. Des Nations Unies, Rabat, Morocco.

Introduction

The term structure of interest rates serves as a fundamental indicator of monetary policy transmission, market expectations, and broader economic conditions. It has remained a central focus in finance and macroeconomics since Lutz's (1940) foundational work on the pure expectations theory. Under this framework, the slope of the yield curve reflects market participants' forecasts of future short-term interest rates, which are primarily driven by monetary policy actions. Hicks (1946) later expanded this perspective by introducing the term premium, representing the compensation investors demand for bearing interest rate risk over longer maturities. Building on these insights, Modigliani and Sutch (1966) developed the preferred habitat theory, emphasizing how market segmentation and institutional preferences shape the term structure.

In Morocco, tracking the dynamics of the yield curve and secondary market behavior is essential for policymakers, investors, and financial institutions. Between 2004 and 2025, the Moroccan Treasury bill and bond market underwent substantial transformations. These shifts mirror a combination of domestic and international macroeconomic shocks, adjustments in Bank Al-Maghrib's monetary policy framework, and structural developments within the national financial system. Despite these changes, empirical studies focusing specifically on the chronological evolution of Morocco's yield curve remain limited. How have monetary policy decisions and external disruptions shaped the term structure over this period? What institutional characteristics explain the observed patterns in yield spreads and curve configurations?

To address these questions, this paper conducts a chronological and cross-sectional analysis of the Moroccan yield curve, integrating established term structure theories with the institutional realities of the domestic debt market. The analysis relies on annual average secondary market yields for six representative maturities: 13 weeks, 26 weeks, 52 weeks, 2 years, 5 years, and 10 years, covering the 2004–2025 period. This dataset captures twenty-two years of structural evolution in Morocco's interest rate environment.

We identify seven distinct phases characterized by specific yield curve configurations. Each phase is examined in light of Bank Al-Maghrib's monetary policy decisions, major domestic shocks (such as the 2013 banking liquidity crisis and the 2018 exchange rate regime reform), international disruptions (including the 2008 global financial crisis, the 2020 pandemic, and the 2022-2023 inflation surge), and structural changes in the Moroccan bond market.

The remainder of this paper is organized as follows. We begin with an empirical review of the literature surrounding the term structure of interest rates, followed by an overview of the stylized facts characterizing the Moroccan debt market. The core of the study then presents a descriptive empirical analysis of the term structure of interest rates in Morocco. This section details the data and methodological approach, presents the empirical results, and examines the structural specificities of the Moroccan market alongside their implications for monetary policy transmission. The paper concludes with a summary of the key findings and actionable policy implications.

1. Empirical literature revue

The term structure of interest rates is widely recognized in the financial literature as a critical macroeconomic indicator. Seminal works by Estrella and Mishkin (1996, 1997) and Goodfriend (1998) highlight its dual importance for both monetary authorities and market participants. For central banks, the yield curve provides essential insights into the transmission mechanism of short-term policy rates to long-term rates, which ultimately drive aggregate demand, while also revealing the structure of economic agents' expectations. For private agents, the term structure serves as a barometer of monetary policy credibility, particularly through the inflation premium embedded in longer-maturity securities.

The foundational explanation for these dynamics is the pure expectations theory, formally articulated by Lutz (1940). This framework posits that a long-term interest rate is simply the arithmetic average of current and anticipated future short-term rates, commonly referred to as forward rates. Under the assumption of identical risk profiles, an investor should be indifferent between purchasing a single two-year bond or sequentially rolling over two one-year bonds. The same logic applies to borrowers issuing debt. However, this theoretical indifference rarely holds in practice, as risk inherently increases with the maturity of the investment.

To address this limitation, Hicks (1946) integrated Keynesian liquidity preference and risk aversion into term structure analysis. Investors inherently favor liquid, short-term assets to maintain financial flexibility, meaning they are not indifferent between maturities even if expected returns are identical. Consequently, they demand a liquidity premium that scales with the maturity of the security. Furthermore, risk aversion regarding future uncertainties, such as inflation or fiscal shifts, diminishes the substitutability between different maturities. This substitutability can only be restored by offering additional compensation, or a risk premium. Thus, the long-term rate is better understood as the average of expected future short-term rates plus a risk premium.

Shifting the focus from risk to institutional constraints, Culbertson (1957) proposed the segmented markets theory. This approach argues that financial markets are compartmentalized, with each maturity segment operating largely independently. In this view, interest rates are determined strictly by the supply and demand dynamics within each specific segment, driven by institutional mandates, legal constraints, and regulatory frameworks, rather than by risk considerations. Recognizing the rigidity of this model, Modigliani and Sutch (1966) introduced the preferred habitat theory. While acknowledging that investors have a preferred maturity segment, this theory allows for cross-maturity arbitrage. Agents will deviate from their preferred habitat only if compensated by a specific "habitat premium" that covers the additional risks associated with switching market segments.

Ultimately, any robust theory of the term structure must align with observed empirical realities. Mishkin (2013) identifies three primary stylized facts that a comprehensive model must explain: interest rates of different maturities tend to move together over time; yield curves are typically steeper when short-term rates are low compared to when they are high; and yield curves are generally upward-sloping. While the pure expectations theory adequately explains the first two phenomena, it fails to account for the persistent upward slope. Conversely, the segmented markets

theory explains the upward slope but cannot justify the co-movement of rates. The preferred habitat theory, by synthesizing the strengths of both approaches, provides the most coherent and complete explanation for all three stylized facts, making it a highly relevant framework for analyzing modern debt markets.

Focusing on the Moroccan context, Ait Cheikh et al. (2022) examined the causal link between the interbank market rate and sovereign bond yields from 2004 to 2020. Using Granger causality tests, their findings revealed that monetary policy significantly influences only the very short end of the curve (up to 13 weeks), with no statistically significant transmission to longer maturities. A subsequent study by the same authors, employing an Autoregressive Distributed Lag (ARDL) model, corroborated this asymmetry, demonstrating that long-term rates are primarily driven by investor expectations, fiscal deficits, and Treasury issuance policies, while medium-term rates reflect a complex mix of monetary decisions and fiscal behavior. This dichotomy between short-term monetary control and long-term fiscal dominance is further supported by structural macroeconomic analyses. Bennouna and Bounader (2018) used Structural Vector Autoregression (SVAR) models over the 2007-2017 period to isolate the impact of macroeconomic shocks on sovereign rates. Their impulse response functions indicated that monetary tightening steepens the yield curve, as long-term rates (5 and 10 years) are predominantly shaped by risk premiums rather than direct policy shocks, whereas the 2-year rate remains firmly anchored to monetary policy. Similarly, Ahokpossi et al. (2016) applied the dynamic Nelson-Siegel model to monthly data from 2004 to 2015, extracting latent factors of the yield curve. They confirmed that monetary tightening only generates moderate, transient increases in short-term yields, while fiscal consolidation significantly reduces both short- and long-term rates, underscoring the critical role of fiscal fundamentals in shaping the Moroccan debt market.

While these econometric investigations provide robust statistical evidence of the asymmetric transmission mechanism in Morocco, they often abstract from the deep institutional specificities of the Moroccan market, such as the captive holding of public debt by domestic institutional investors or the structural liquidity constraints. To complement these econometric findings, there is a distinct need for a comprehensive, descriptive empirical analysis that traces the actual trajectory of the term structure over an extended period. By eschewing estimations in favor of a direct, chronological examination of secondary market data from 2004 to 2025, this study captures the raw dynamics of the yield curve across seven distinct macroeconomic phases. This descriptive approach allows for a granular observation of how structural market frictions, Treasury financing needs, and Bank Al-Maghrib's operational framework continuously shape the Moroccan term structure in reality, offering a necessary empirical backdrop to the existing econometric literature.

2. Stylized facts and institutional context

2.1. Evolution of monetary policy and the operational framework

The evolution of Moroccan monetary policy since independence reflects a profound transition from administrative dirigisme focused on quantity controls to a modern price-based steering

mechanism, anchored in central bank independence and nominal stability.

2.1.1. From administrative controls to rate-based steering

During the initial decades (1969 - 1990), Morocco relied on direct credit control, built on two primary pillars. First, credit ceilings, introduced in 1969, aimed to cap the expansion of the money supply by setting growth limits on bank lending, thereby managing aggregate demand in a largely non-liberalized economy. Second, credit selectivity allowed Bank Al-Maghrib (BAM) to channel resources toward priority sectors, such as agriculture and social housing, through incentive mechanisms like rediscount facilities or preferential rates. A major structural break occurred in January 1991 with the official abolition of credit ceilings. This shift marked the transition from a debt-driven economy to a financial market economy, where resource allocation is governed by interest rates. This transition was consolidated in 1997 when the policy rate became the central pivot of monetary regulation, definitively replacing direct administrative constraints with indirect liquidity management. The current operational framework relies on steering the interbank market, specifically targeting the Weighted Average Rate (Taux Moyen Pondéré, TMP).

2.1.2. Exchange rate anchoring and BAM's independence (2001-2017)

From 2001 to 2017, the monetary strategy was structured around a fixed nominal anchor, pegging the Moroccan Dirham to a currency basket representative of the country's external trade structure. This regime successfully imported price stability from major trading partners, notably the Eurozone, keeping inflation consistently below the 2% threshold for extended periods. In April 2015, the basket was reweighted (60% Euro, 40% US Dollar) to better reflect Morocco's growing economic ties with the dollar zone. A critical institutional milestone was the 2005 Statute, which granted BAM formal independence in formulating and conducting monetary policy. Crucially, this autonomy entailed a near-total prohibition on direct central bank financing of the Treasury, forcing the state to borrow under market conditions and thereby reinforcing macroeconomic discipline.

2.1.3. Exchange rate reform and managed floating (2018-2025)

On January 15, 2018, Morocco initiated a voluntary transition toward exchange rate flexibility to enhance economic resilience against exogenous shocks. The Dirham's fluctuation band was initially widened from $\pm 0.3\%$ to $\pm 2.5\%$, and subsequently expanded to $\pm 5\%$ in March 2020. This reform aims to alleviate pressure on foreign exchange reserves and lay the groundwork for a future inflation-targeting framework. This evolution was legally cemented by the 2019 Statute (Law 40-17), which enshrines price stability as the fundamental and sole mission of the central bank. Under this new framework, BAM operates using a multi-criteria analysis, assessing inflationary risks by evaluating aggregate demand, supply-side pressures, asset prices, and medium-term econometric forecasts.

2.2. Treasury Bill Market: architecture and functioning

2.2.1. Emergence of the Primary Market and institutional reforms

The Moroccan Treasury bill market developed within the broader global movement of local sovereign bond market expansion in

emerging economies during the late 1980s. The creation of the primary market in 1989 marked a fundamental break from the previous system of administered financing, which relied on regulated interest rates and forced placement with captive financial institutions. This transition was part of a wider financial liberalization process aimed at establishing market-based mechanisms for sovereign interest rate determination and improving the allocative efficiency of public financing.

The institutional architecture of the primary market rests on a system of weekly auctions introduced in 1989, enabling the Treasury to issue negotiable debt securities according to a predictable calendar. This regularity of issuance constitutes an essential element for developing liquidity and forming a benchmark yield curve². The 1996 reform introduced the system of

² Lalanne, F., & Turnbull, J. (2021) explain the development of local currency sovereign bond markets through the introduction of shorter-term securities to progressively establish benchmark prices along the yield curve. A systematic Treasury Bill issuance program helps anchor the short end of the yield curve by providing new reference points for short durations. Short-term issuances also foster money market development. The Treasury Bill issuance program should subsequently support and complement the benchmark rate formation program. Adjustments to Treasury Bill issuance volumes may be necessary to account for the regularity of bond issuances, as markets tend to absorb volume fluctuations more easily in short-term instruments. With improved capacity to manage refinancing risks, the absorption of Treasury Bills can

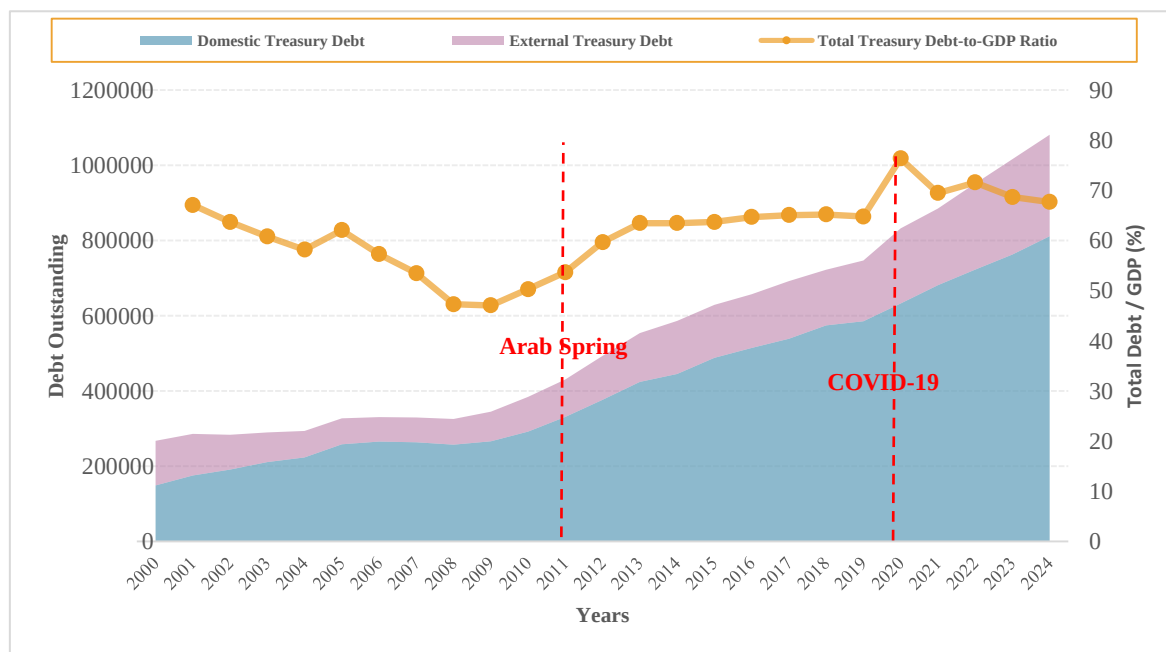
Treasury Security Specialists (Spécialistes en Valeurs du Trésor, SVT), modeled on the primary dealer frameworks observed in advanced economies. This arrangement grants a restricted group of approved financial institutions specific obligations regarding auction subscription and secondary market making, in exchange for privileged access to the primary market.

The technological modernization of the auction system represents another major milestone in market development. The introduction in July 2009 of an electronic screen-based bidding system (téléadjudication) enhanced transparency, reduced transaction costs, and increased allocation efficiency. This evolution aligns with international recommendations on sovereign bond market development, which emphasize the importance of technological infrastructure for market depth and liquidity (IMF & World Bank, 2016).

2.2.2. Evolution of public debt structure (2001-2024)

Empirical analysis of public debt outstanding over the 2001-2024 period reveals sustained growth dynamics marked by several structural breaks. The total Treasury debt outstanding increased from 286.2 billion dirhams (MMDH) in 2010 to 1,081.6 MMDH in 2024, representing a 3.8-fold multiplication over 23 years. This expansion is accompanied by a profound transformation in debt composition, with domestic debt growing at a faster pace. The share of domestic debt in total outstanding rose from 61.3% in 2001 to 75% in 2024.

increase their potential amount and liquidity, thereby strengthening the short end of the yield curve.



Source: Created by author based on Ministry of Economy and Finance data

Figure 1. Evolution of domestic and external Treasury debt outstanding (left axis, in billion dirhams) and debt-to-GDP ratio (right axis, in %). Domestic debt increased from 292.2 billion dirhams in 2010 to 811.8 billion dirhams in 2024, while external debt rose from 92.3 billion dirhams to 269.8 billion dirhams. The debt-to-GDP ratio followed an upward trajectory, climbing from 50.3% in 2010 to a peak of 76.4% in 2020, before stabilizing around 68% in 2024.

This debt accumulation dynamic unfolded within a macroeconomic context marked by several major exogenous shocks. The 2008 global financial crisis, although its effects materialized with a temporal lag on Moroccan public finances, inaugurated a period of heightened fiscal tensions. The Arab Spring of 2011 led to a substantial increase in social spending and subsidies, resulting in a deterioration of the fiscal balance and an acceleration of debt accumulation. The 2013-2014 period was characterized by particularly acute budgetary strains, with the debt-to-GDP ratio

reaching 63.5% in 2014, prompting the adoption of a fiscal consolidation program.

Furthermore, the COVID-19 health crisis in 2020 triggered an abrupt rupture, driving the debt-to-GDP ratio to 76.4%. This surge resulted from the combined effect of GDP contraction and the expansion of public expenditure related to health and economic crisis management, despite the shift in public debt management initiated by the 2018 exchange rate regime reform.

➤ Maturity structure and debt lengthening

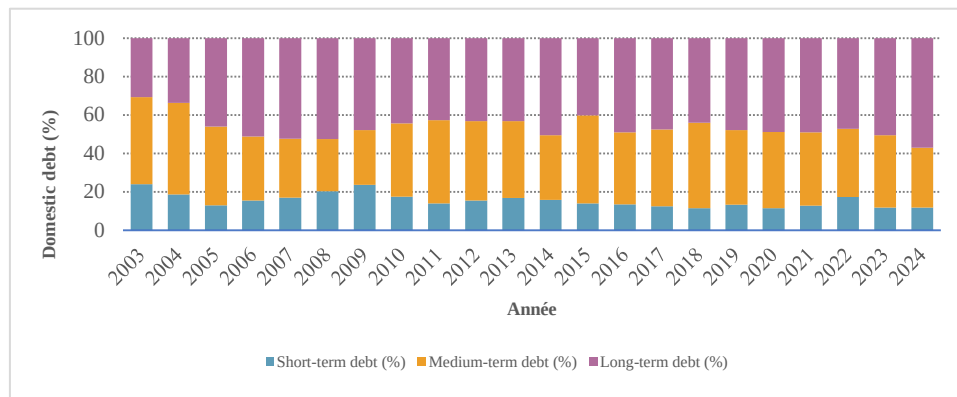


Figure 2. Distribution of domestic debt by residual maturity (2003-2024). **Source:** Created by author based on Ministry of Economy and Finance data

The distribution of domestic debt by residual maturity reveals a major structural transformation in the temporal composition of the Treasury's debt portfolio (Figure 2). Over the 2003-2024 period, the share of short-term debt (residual maturity ≤ 1 year) underwent a significant reduction, declining from approximately 24% in 2003 to 12% in 2024. Concurrently, long-term debt (residual maturity $>$

5 years) expanded substantially, now accounting for nearly 55-60% of total outstanding debt. This evolution reflects a deliberate strategy of extending the average life of the debt, aimed at mitigating refinancing risk and reducing vulnerability to liquidity shocks.

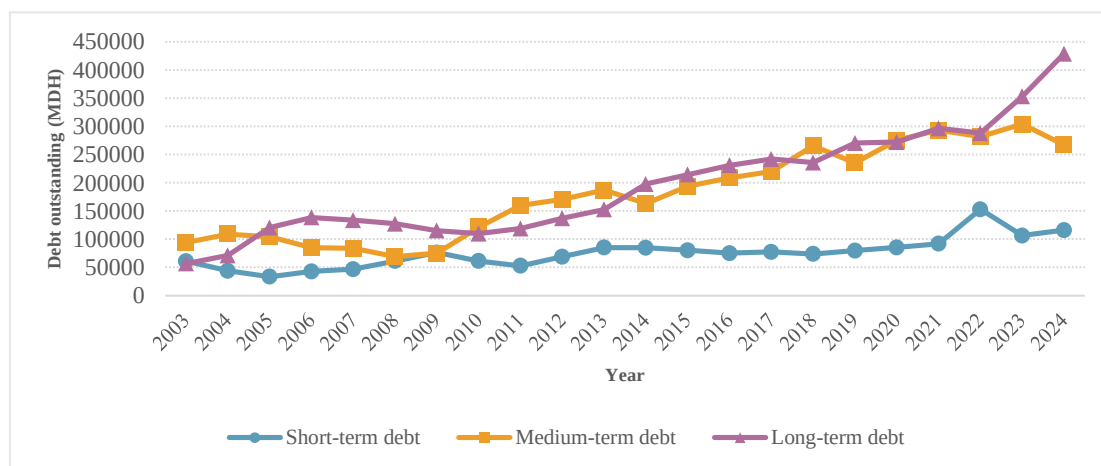


Figure 3. Evolution of debt outstanding by residual maturity (2003-2024). **Source:** Created by author based on Ministry of Economy and Finance data

Long-term debt experienced sustained growth over the study period, rising from approximately 60,000 million dirhams in 2003 to over 425,000 million dirhams in 2024, thereby confirming the Treasury's strategy of lengthening the debt structure. Medium-term debt also expanded steadily, reaching approximately 270,000 million dirhams by 2024. In contrast, short-term debt remained

relatively stable within the 50,000-100,000 million dirhams range, with a temporary peak in 2022 likely associated with the financing needs arising from the COVID-19 crisis. This trajectory reflects active refinancing risk management and a clear prioritization of long-term debt sustainability.

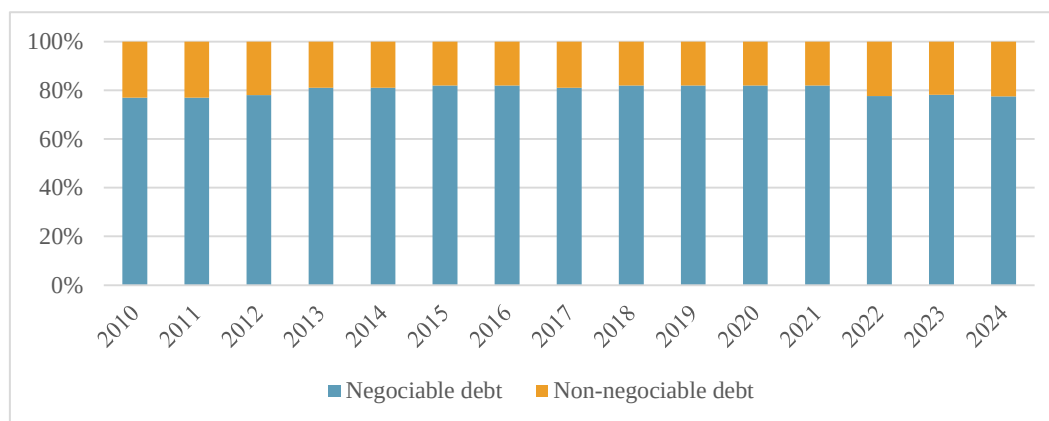
➤ **Structure by debt instrument**

Figure 4. Distribution of Treasury debt outstanding by instrument (2010–2024). **Source:** Created by author based on Ministry of Economy and Finance data

The evolution of Treasury debt outstanding distribution between negotiable and non-negotiable instruments over the 2010-2024 period (Figure 4) reveals remarkable structural stability. The share of negotiable debt has remained consistently within the 77-82% range throughout the entire period, indicating that the relative reliance on market issuances has not exhibited any upward trend. This stability suggests that the Treasury has maintained a consistent financing mix, composed of approximately 80% market-based issuances (negotiable debt) and 20% direct financing (non-negotiable debt).

The persistently high level of negotiable debt, hovering around 80%, reflects a deliberate strategic choice rather than a transitional phase. The share has remained confined within the 77-82% band without breaching these thresholds, demonstrating disciplined debt management.

The persistence of approximately 20% non-negotiable debt can be attributed to several factors. First, it reflects the existence of structural debt obligations, such as loans from Bank Al-Maghrib and certain bilateral debt arrangements, which constitute stable and predictable financing sources. These instruments serve as a safety net during periods of market stress, providing reliable liquidity when market conditions deteriorate. Second, this composition likely reflects a strategic allocation decision by the Treasury Department (DTFE), which deliberately maintains a diversified financing mix (approximately 80% market-based and 20% direct financing). This approach enables the Treasury to benefit from both the flexibility of market financing and the stability of direct funding sources, thereby reducing refinancing risk during periods of financial stress.

2.2.3. Treasury bill secondary market

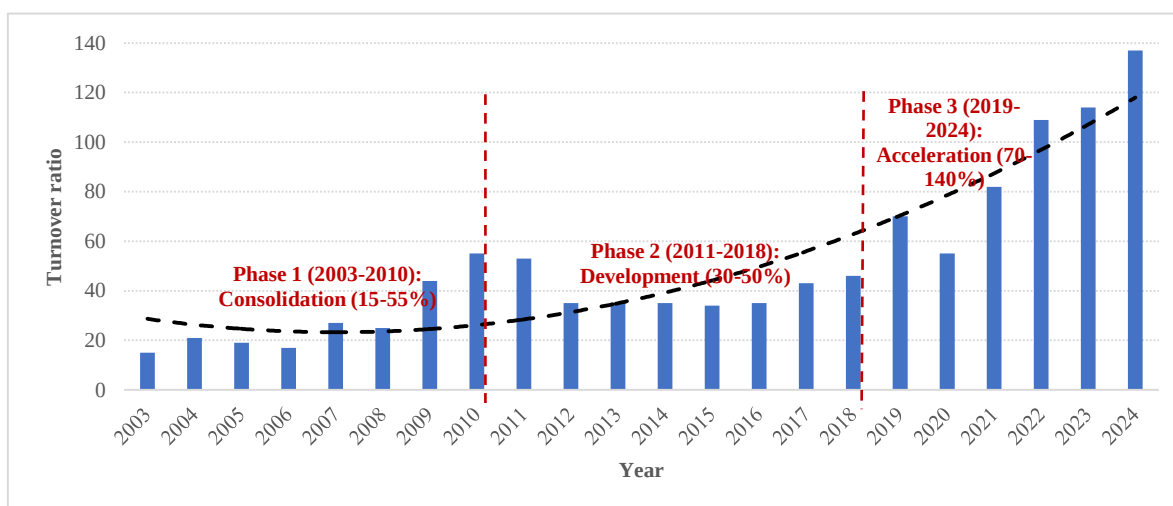


Figure 5. Evolution of the Treasury Bills secondary market turnover ratio (2003-2024). **Source:** Created by author based on Ministry of Economy and Finance data

The evolution of the Treasury Bills secondary market turnover ratio over the 2003-2024 period (Figure 5) reveals three distinct phases of market development. The first phase, spanning 2003 to 2010, corresponds to a **consolidation period** during which the turnover ratio fluctuated between 15% and 55%. This relatively low level of activity reflects a secondary market with limited liquidity, where debt instruments were predominantly held until maturity rather than actively traded.

The second phase, from 2011 to 2018, marks a period of **progressive development**, with the turnover ratio stabilizing within the 30-50% range. This improvement benefited from the structural reforms initiated by the Treasury Department, including the introduction of the electronic screen-based bidding system in 2009, the expansion of the primary dealers network, and the

establishment of a predictable issuance calendar. These institutional enhancements contributed to greater market transparency and participant engagement.

The third phase, beginning in 2019 and extending through 2024, is characterized by a **marked acceleration in market activity**. The turnover ratio experienced sustained growth, rising from 70% in 2019 to nearly 140% in 2024. This dynamic reflects a structural deepening of secondary market liquidity, driven by the increasing participation of institutional investors and continued improvements in market infrastructure. The polynomial trend line overlaid on the data confirms this inflection point around 2015–2016, with an increasingly steep upward slope thereafter, indicating a fundamental shift in market behavior and liquidity conditions.

➤ Transaction volume and average trade size

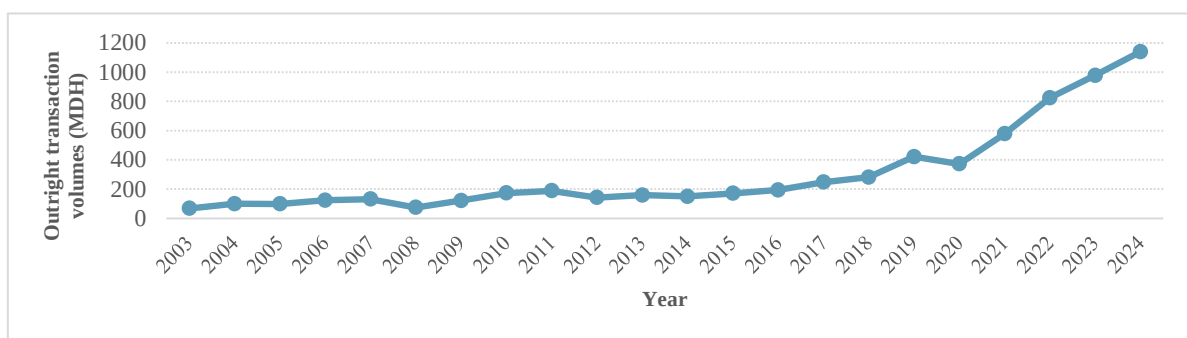


Figure 6. Evolution of outright transaction volumes (volume des opérations fermes) (2003-2024).

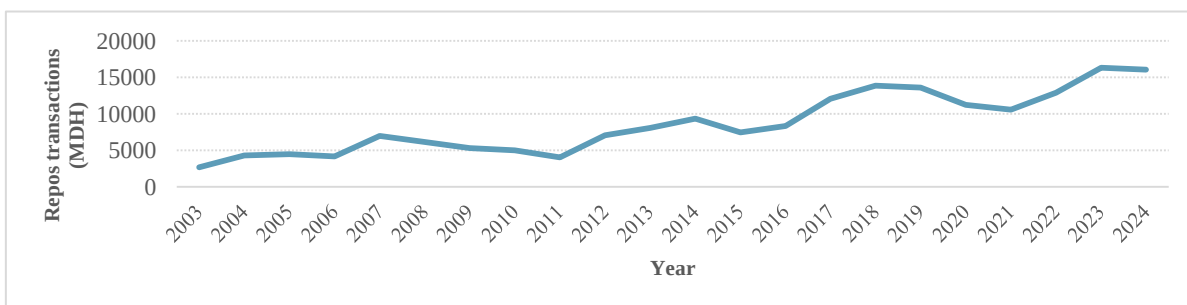


Figure 7. Evolution of repurchase agreement (repo) transaction volumes on the Treasury Bills secondary market (2003–2024). **Source:** Created by author based on Ministry of Economy and Finance data

The analysis of outright transaction volumes on the Treasury Bills secondary market (Figure 6) reveals remarkable growth dynamics, confirming the structural deepening of secondary market liquidity. Annual transaction volumes increased more than sixteenfold between 2003 and 2024, rising from approximately 70 million dirhams to nearly 1,150 million dirhams. This upward trajectory, characterized by progressive acceleration, exhibits two major inflection points: the first around 2010–2011, marking the onset of more sustained growth, and the second around 2018–2019, where the slope steepens significantly. This dynamic is perfectly consistent with the evolution of the turnover ratio (Figure 5), confirming that the improvement in secondary market liquidity results from structural market deepening rather than mere mechanical growth driven by increasing debt outstanding. The volume peaks observed in 2019, 2021, and 2024 coincide with periods of heightened market activity, potentially linked to the

2018 exchange rate regime reforms and the post-COVID-19 recovery, illustrating the growing resilience and maturity of the Treasury Bills secondary market.

Furthermore, the evolution of repurchase agreement (repo) transaction volumes on the Treasury Bills secondary market has experienced overall growth, rising from approximately 2.5 billion dirhams in 2003 to nearly 16 billion dirhams in 2024, representing a more than sixfold increase. Unlike outright transactions (Figure 6), which display a more linear trajectory, repo operations are characterized by greater volatility, with temporary contraction phases (2008–2011, 2019–2021) coinciding with periods of liquidity stress (the global financial crisis, the COVID-19 pandemic). This heightened sensitivity to market conditions reflects the inherent nature of repo operations, which institutional participants utilize for short-term treasury management and arbitrage purposes.

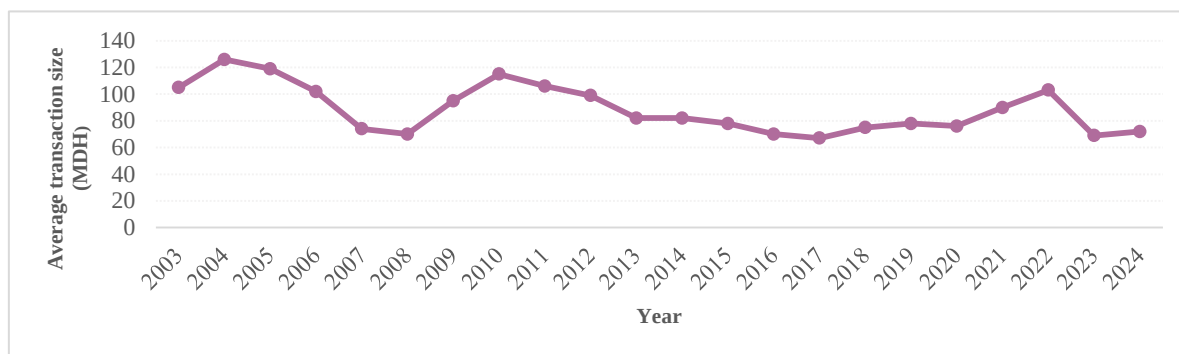


Figure 8. Evolution of average transaction size (2003-2024). **Source:** Created by author based on Ministry of Economy and Finance data

In contrast to transaction volumes, which experienced sustained growth (Figures 6 and 7), the average transaction size (Figure 8) exhibits a structural downward trend, declining from approximately 105 million dirhams in 2003 to around 72 million dirhams in 2024, representing a reduction of roughly 30%. This evolution suggests a progressive fragmentation of the market, driven by the increasing entry of smaller-scale participants - asset management firms, private investors, and medium-sized banks - operating alongside the traditional large institutional players.

The high volatility of this indicator, with peaks recorded in 2005 (approximately 125 million dirhams), 2010 (approximately 115 million dirhams), and 2022 (approximately 102 million dirhams),

reflects the sensitivity of transaction size to market conditions and economic cycles. The troughs observed in 2008, 2017, and 2023 correspond to periods of market consolidation or liquidity stress, during which participants adjusted their trading strategies in response to heightened uncertainty.

This fragmentation, occurring in parallel with the growth in total volumes and turnover ratio, indicates that the deepening of secondary market liquidity results more from an increase in the number of transactions than from a concentration in large-scale operations. This market structure can be interpreted as a sign of democratization of access to the secondary market, reflecting broader participation and enhanced market inclusivity.

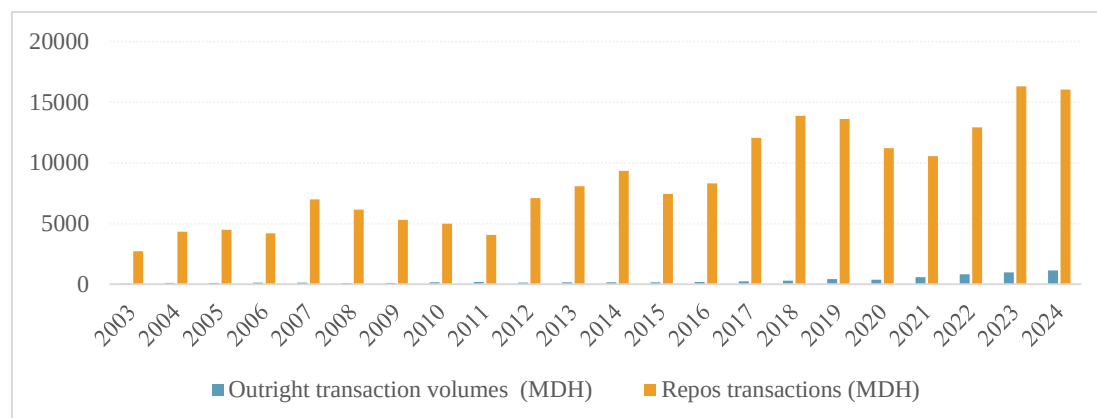


Figure 9. Evolution of transaction volumes on the Treasury Bills secondary market (2003-2024). **Source:** Created by author based on Ministry of Economy and Finance data

Figure 9 highlights the dominance of repo operations over outright transactions in terms of trading volumes. While outright transaction volumes grew modestly from approximately 70 million dirhams in 2003 to around 1,000 million dirhams in 2024, repo operations experienced a far more pronounced expansion, rising from approximately 2,500 million dirhams to 16,000 million dirhams over the same period. This structure indicates that the Moroccan secondary market prioritizes financing liquidity - where securities are lent with a repurchase commitment - over trading liquidity based on definitive sales. This configuration is consistent with a market where institutional participants, particularly banks

and insurance companies, primarily utilize Treasury Bills as collateral for short-term treasury management operations rather than for outright trading purposes.

Furthermore, the volatility observed in repo operations, particularly during 2008, 2017, and 2020, signals a persistent sensitivity to external liquidity shocks. These episodes of heightened volatility coincide with periods of systemic stress in global and domestic financial markets, underscoring the role of repo transactions as a barometer of liquidity conditions and counterparty risk aversion among institutional investors.

2.2.4. Primary and Secondary Markets: combined analysis

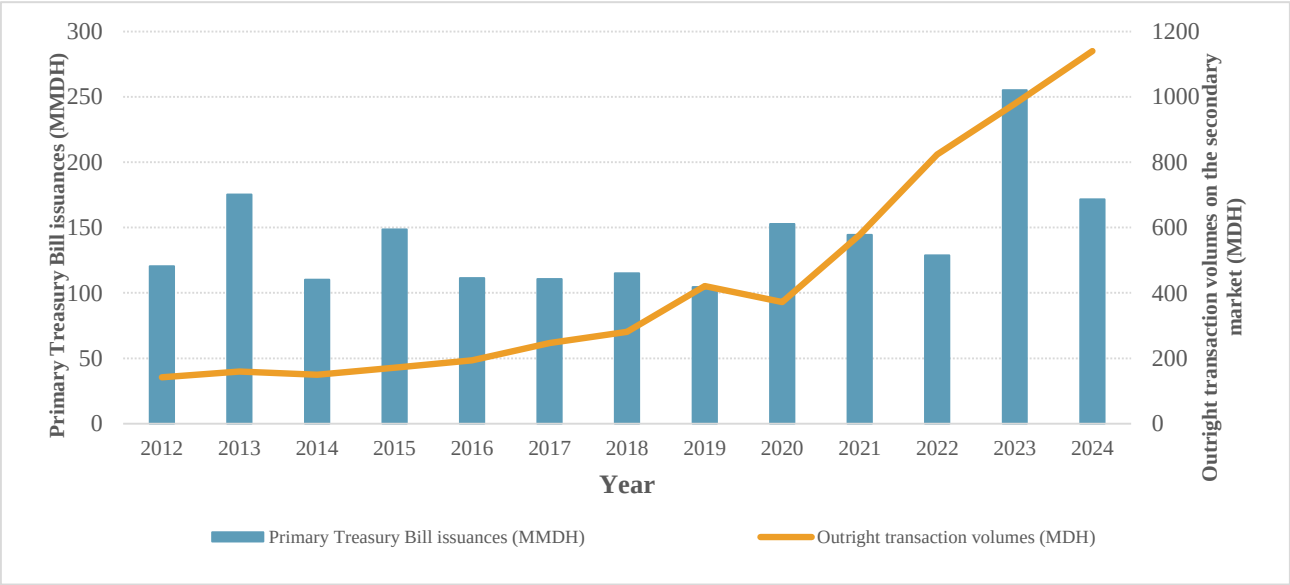


Figure 10. Joint evolution of primary issuances and outright transaction volumes on the Treasury Bills secondary market (2012–2024). **Source:** Created by author based on Ministry of Economy and Finance data.

The joint evolution of primary Treasury Bill issuances and outright transaction volumes on the secondary market over the 2012-2024 period (Figure 10) yields several empirical insights. A first key observation is **the divergence in trajectories** between the two markets. While primary issuances fluctuate without a clear directional trend, ranging between 104 and 255 billion dirhams, secondary market volumes exhibit sustained and accelerated growth, rising from 142 million dirhams in 2012 to 1,140 million dirhams in 2024. This divergence indicates that the deepening of secondary market liquidity does not result from a mechanical increase in primary issuances, but rather from dynamics intrinsic to the secondary market itself.

A second notable feature is the **post-2018 acceleration**. The graph reveals an inflection point around 2018–2019, where the slope of the secondary volume curve steepens markedly. This acceleration

coincides temporally with the exchange rate regime reforms and the increasing entry of institutional investors, suggesting a positive impact of these structural changes on secondary market liquidity.

Finally, the data demonstrate remarkable **resilience in the face of external shocks**. The year 2020 illustrates this clearly, with a temporary contraction in secondary volume (-11.6% compared to 2019) occurring simultaneously with a peak in primary issuances (+46%). This configuration reflects the impact of the COVID-19 crisis: the state increased its financing needs substantially, while investors temporarily reduced their trading activity. However, the strong recovery observed from 2021 onward (578 million dirhams) and the continued growth through 2024 (1,140 million dirhams) attest to the structural resilience of the Moroccan secondary market.

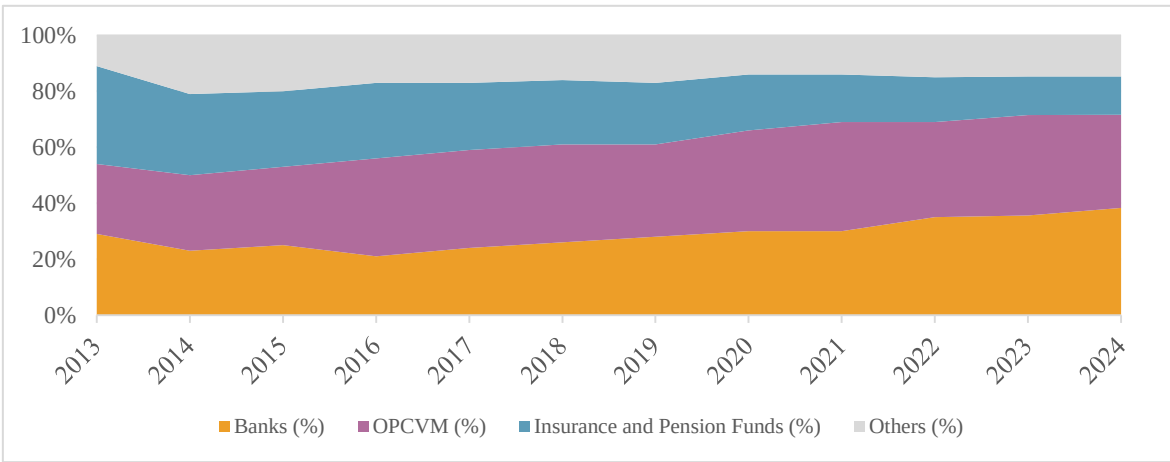


Figure 11. Distribution of Treasury Bill holders by investor category (2013-2024). **Source:** Created by author based on Ministry of Economy and Finance data

The evolution of Treasury Bill holder distribution by investor category over the 2013-2024 period (Figure 11) reveals a major structural transformation of the investor base, characterized by three distinct dynamics.

First, there is a growing concentration of holdings among banks and mutual funds (OPCVM³). The combined share of these two categories increased from 54% in 2013 to 71.6% in 2024, representing a rise of 17.6 percentage points. Banks have reinforced their dominant position (from 29% to 38.3%), while mutual funds have experienced significant growth (from 25% to 33.3%). This concentration reflects the central role of financial intermediaries in holding Moroccan sovereign debt, consistent with their function in maturity transformation and liquidity management.

Second, there is a marked decline in the share held by insurance companies and pension funds. This category's share dropped from 35% in 2013 to 13.7% in 2024, a reduction of 21.3 percentage points. This evolution raises questions about the diversification of the long-term investor base and its implications for market stability.

Third, the "Other" category has maintained relative stability, representing between 11% and 21% of outstanding debt over the period. This category encompasses marginal but diversified investors (private investors, public institutions, non-residents). Its relative stability indicates that investor base diversification, though limited, has not disappeared entirely.

This growing concentration among professional actors (banks and mutual funds) presents both positive and cautionary effects. On the positive side, these actors possess the technical capabilities and incentives to animate the secondary market, partly explaining the deepening observed in Figures 5 through 10. However, excessive concentration can amplify market movements during periods of stress, creating potential systemic vulnerabilities. This

³ Mutual funds, also known as Undertakings for Collective Investments in Transferable Securities (UCITS) in European regulatory framework, or Organismes de placement collectif en valeurs mobilières (OPCVM) in French.

configuration, characterized by majority holdings of Treasury Bills by banks and mutual funds, is compatible with the central role of financial intermediaries in the Moroccan financial system and may foster secondary market liquidity, as these actors have both the technical capacity and the motivation to facilitate trading activity.

3. Term structure of interest rates in Morocco: A Descriptive Empirical Analysis

3.1. Data and methodological approach

In the Moroccan context, the theoretical frameworks discussed earlier must be adapted to account for several structural specificities. First, the secondary market for Treasury Bills remains relatively illiquid, generating significant liquidity premiums, particularly at longer maturities. Second, public debt holdings are highly concentrated among domestic institutional investors (commercial banks, mutual funds, and insurance companies), creating maturity segmentation consistent with the preferred habitat theory. Third, Bank Al-Maghrib exercises tight control over the short end of the curve through its weekly open market operations (7-day advances and repurchase agreements), while long-term rates are more influenced by Treasury financing needs and macroeconomic expectations. Finally, unlike in developed markets where yield curve inversions are frequent and considered reliable recession signals, the Moroccan yield curve has never experienced inversion during the study period, reflecting structural rigidity and a systematically positive term premium.

The empirical analysis presented in this section relies on annual average secondary market yields for Treasury Bills across six representative maturities: 13 weeks, 26 weeks, 52 weeks, 2 years, 5 years, and 10 years. These data cover the 2004-2025 period, enabling us to trace twenty-two years of evolution in the Moroccan term structure. We identify seven distinct phases characterized by specific yield curve configurations. These phases are analyzed in light of Bank Al-Maghrib's monetary policy decisions, major domestic macroeconomic shocks (the 2013 banking liquidity crisis, the 2018 exchange rate regime reform), and international disruptions (the 2008 global financial crisis, the 2020 COVID-19 pandemic, the 2022-2023 inflationary shock), as well as structural developments in the Moroccan bond market.

3.2. Results: seven Phases of Yield curve evolution

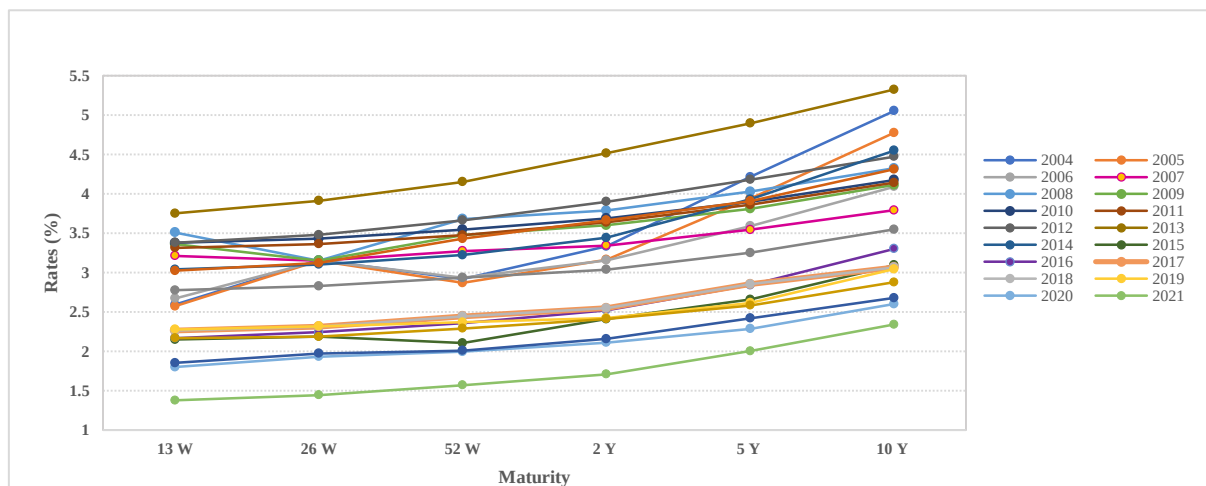


Figure 12: Evolution of Moroccan Treasury Bill interest rates (2004-2025). **Source:** Created by author based on Bank Al Maghrib data

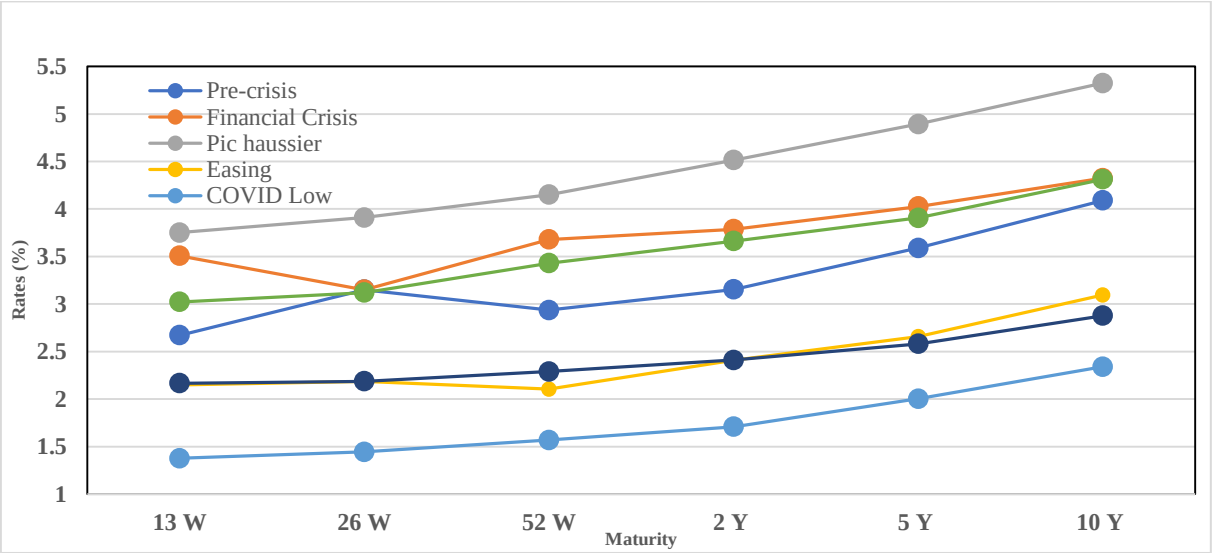


Figure 13. Yield curve shapes across seven key years (2006, 2008, 2013, 2015, 2021, 2023, 2025). **Source:** Created by author based on Moroccan Treasury data.

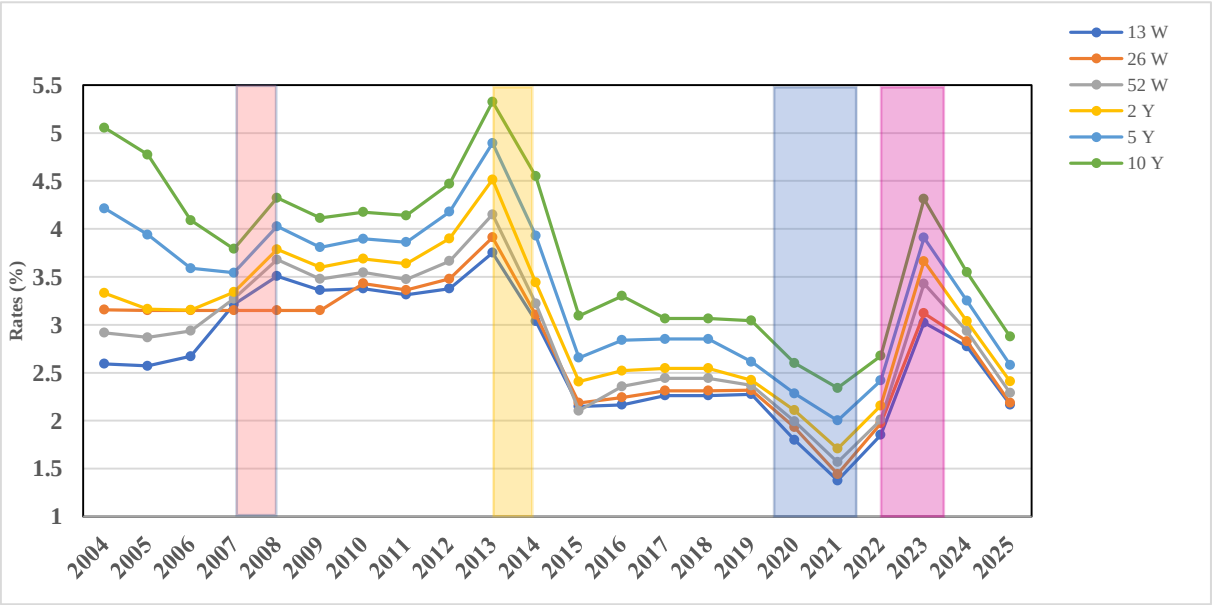


Figure 14. Evolution of Moroccan Treasury Bill interest rates by maturity (2004-2025). Shaded areas indicate periods of crisis or monetary policy regime changes. **Source:** Created by author based on Bank Al Maghrib data

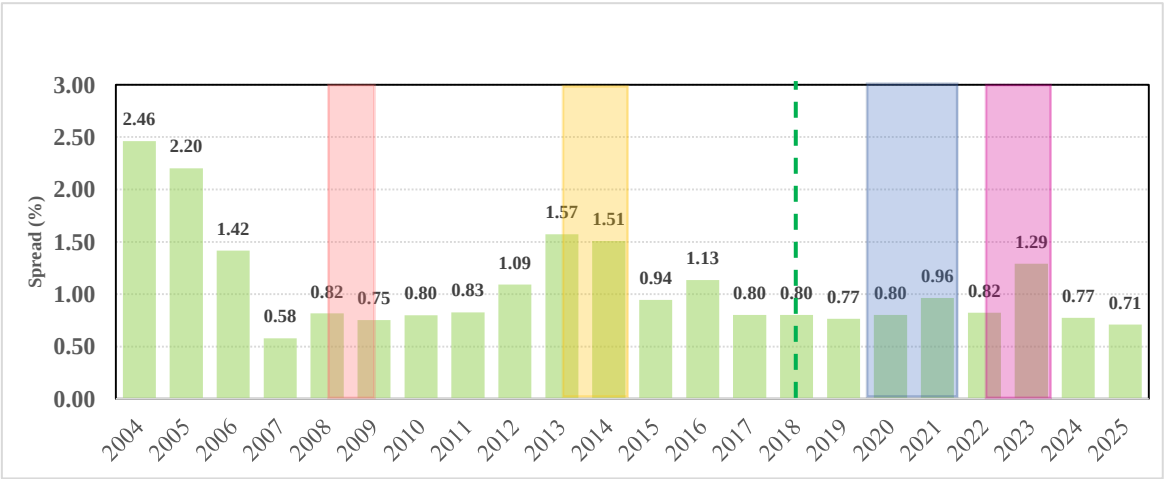


Figure 15. Evolution of the 10-year to 13-week spread (2004-2025). This synthetic indicator of the yield curve slope reflects monetary policy expectations and term premiums. **Source:** Created by author based on Moroccan Treasury data.

Phase 1 (2004–2006): Steep normal curve and high term premiums

The 2004–2006 period corresponds to the initial development phase of the Moroccan Treasury Bill market in its modern configuration, following the structural reforms initiated in the early 2000s. This phase is characterized by a normal and steeply sloped yield curve, with the 10-year to 13-week spread reaching 2.46 percentage points in 2004, then 2.20 points in 2005, before gradually narrowing to 1.42 points in 2006. In 2004, the 13-week rate stood at 2.59%, while the 10-year rate reached 5.05%, reflecting a substantial term premium. This configuration aligns with the predictions of the expectations theory enriched by Hicks's (1946) liquidity premium: investors demand increasing compensation with maturity to offset interest rate risk and secondary market illiquidity.

The macroeconomic context of this period is marked by sustained economic growth (averaging 5.5% annually between 2004 and 2006) and controlled inflation (around 2% on average). Short-term rates, directly influenced by the central bank's weekly refinancing operations, remain relatively stable and low. In contrast, long-term rates incorporate several risk factors specific to the Moroccan market: first, uncertainty regarding the future trajectory of monetary policy in a context of progressive financial liberalization; second, the Treasury's significant financing needs, as it regularly issues long-maturity securities to fund public investments; third, the low liquidity of the secondary market, which constrains institutional investors to adopt buy-and-hold strategies, consistent with Modigliani and Sutch's (1966) preferred habitat theory.

Analysis of Figure 13 reveals that in 2006, the yield curve exhibits a typical concave shape, with a steep slope between 13 weeks (2.67%) and 2 years (3.15%), followed by a more moderate slope between 2 years and 10 years (4.09%). This configuration indicates that expectations of short-term rate increases are concentrated over the 1-to-2-year horizon, while long-term rates incorporate a relatively stable term premium.

The progressive flattening of the curve between 2004 and 2006 (spread reduction from 2.46 to 1.42 points) is explained by several factors. On one hand, the fiscal consolidation undertaken by the Moroccan government reduces Treasury financing needs and alleviates pressure on long-term rates. On the other hand, the improvement in secondary market liquidity, driven by the broadening of the institutional investor base (notably bond mutual funds), compresses liquidity premiums. Finally, long-term inflation expectations stabilize around 2%, anchoring long nominal rates at more moderate levels. This phase illustrates the central role of structural and institutional factors in determining the term structure in an emerging market like Morocco, where market imperfections (illiquidity, segmentation, information asymmetries) generate significant risk premiums.

Phase 2 (2007–2009): Sharp flattening and limited transmission of the global financial crisis

The 2007–2009 period is marked by a sharp flattening of the Moroccan yield curve, in a context of unprecedented global financial crisis. The spread (10-year to 13-week) compresses dramatically, falling from 0.58 points in 2007 to 0.82 points in 2008, then 0.75 points in 2009. This compression reflects a convergence of short- and long-term rates, an atypical phenomenon

in a crisis context where one would generally observe a flight to quality and curve steepening in advanced economies. In 2008, the year of Lehman Brothers' bankruptcy and the crisis peak, the 13-week rate stood at 3.51% and the 10-year rate at 4.32%, yielding a spread of only 81 basis points, a historically low level for the pre-2010 period.

Analysis of this phase reveals limited and asymmetric transmission of the global financial crisis to the Moroccan interest rate market. Unlike advanced economies, where central banks massively lowered their policy rates (the U.S. Federal Reserve bringing its rate to zero in December 2008, the European Central Bank reducing it to 1% in May 2009), Bank Al-Maghrib adopted a cautious stance, maintaining its policy rate at 3.5% in 2008 and only reducing it to 3.25% in 2009. This relative stability of Moroccan monetary policy is explained by several factors: first, the Moroccan banking system, with limited exposure to toxic structured products and international financial markets, did not experience a solvency crisis; second, domestic inflation, fueled by rising commodity prices (oil and food products) in 2007–2008, reached 3.7% in 2008, justifying the maintenance of a relatively restrictive monetary policy.

The curve flattening in 2007–2009 results primarily from a decline in long-term rates, which fell from 4.09% in 2006 to 3.79% in 2007, then 4.32% in 2008 (a temporary rebound linked to inflationary tensions), before dropping to 4.11% in 2009. This dynamic reflects a downward revision of long-term growth expectations and a reduction in term premiums, in a context of global macroeconomic uncertainty. Figure 14 clearly illustrates this rate convergence, with a narrowing of the gap between different maturities. Figure 13 shows that in 2008, the yield curve exhibits a relatively flat shape, with a moderate slope and low curvature, a configuration typical of a transition period where monetary policy expectations are uncertain.

Lutz's [1940] expectations theory suggests that a flat curve reflects expectations of stable future short-term rates. In the Moroccan case, this interpretation must be nuanced: the 2007–2009 flattening reflects less expectations of stability than the combined effect of a cautious monetary policy (maintaining short-term rates at relatively high levels) and a downward revision of term premiums on long maturities (reduced uncertainty regarding the long-term growth and inflation trajectory). This phase illustrates the specificity of emerging markets, where the transmission of international financial shocks is filtered by the structural characteristics of the domestic financial system (low financial integration, capital controls, exchange rate anchoring) and by the economic policy preferences of the authorities (priority to stability over growth).

Phase 3 (2010–2013): Progressive rebound and 2013 historical peak

The 2010–2013 period is characterized by a progressive steepening of the yield curve, culminating in the historical peak of 2013. The spread (10-year to 13-week), which had stabilized around 0.80 points between 2010 and 2012, jumped to 1.57 points in 2013, the highest level observed since 2005. The year 2013 constitutes a major inflection point in the recent history of the Moroccan interest rate market: the 13-week rate reached 3.75%, while the 10-year rate peaked at 5.32%, reflecting exceptional tension across the entire maturity spectrum.

The 2013 peak is explained by an unprecedented domestic banking liquidity crisis, resulting from the convergence of several structural and cyclical factors. First, the Moroccan Treasury's financing needs increased sharply following the Arab Spring shocks of 2011: the government had to increase spending on energy and basic food price subsidies, widening the budget deficit to over 7% of GDP in 2012. Second, the current account deficit worsened, reaching 9.5% of GDP in 2012, depleting foreign exchange reserves and constraining Bank Al-Maghrib to maintain a restrictive monetary policy to defend the dirham parity. Third, the Moroccan banking system experienced a structural liquidity crisis, with commercial banks massively increasing their lending to the economy (10% annual growth between 2010 and 2012) without sufficient stable resources, forcing them to rely intensively on Bank Al-Maghrib refinancing.

In this context, Bank Al-Maghrib maintained its policy rate at 3% throughout the March 2012–June 2014 period, refusing to lower it despite the economic slowdown (3% in 2012, 4.5% in 2013), in order to preserve exchange rate stability and contain inflationary tensions. Short-term rates, directly influenced by the central bank's refinancing operations, increased mechanically due to strong bank liquidity demand. Long-term rates experienced an even more marked increase, reflecting several factors: increased Treasury security supply (massive issuances to finance the budget deficit), upward revision of sovereign risk premiums, and increased liquidity premiums (institutional investors, facing balance sheet constraints, demand higher compensation to absorb new issuances).

Figure 15 dramatically illustrates the spread (10-year to 13-week) rebound between 2012 and 2013, rising from 0.83 to 1.57 points. This brutal curve steepening reflects anticipation of future monetary policy normalization (markets anticipate that Bank Al-Maghrib will eventually have to lower its rates to support growth once macroeconomic imbalances are absorbed), combined with increased term premiums on long maturities (compensation for refinancing risk and sovereign risk). Figure 13 shows that in 2013, the yield curve exhibits a steeply sloped and concave shape, with a 13-week rate of 3.75%, a 2-year rate of 4.51%, a 5-year rate of 4.89%, and a 10-year rate of 5.32%. This configuration is typical of a period of financial stress, where investors demand high risk premiums across the entire maturity spectrum, with particularly marked steepening in the 2-to-10-year segment.

This phase illustrates the vulnerability of the Moroccan interest rate market to domestic liquidity shocks and macroeconomic imbalances. Unlike the 2008 global financial crisis, which had limited impact on Morocco due to low financial integration, the 2013 crisis is endogenous in origin and directly affects the term structure. It highlights the central role of fiscal policy and banking liquidity management in determining interest rates, as well as the limits of monetary policy transmission in a context of multiple macroeconomic constraints (budget deficit, current account deficit, pressure on foreign exchange reserves).

Phase 4 (2014-2019): Great easing and progressive normalization

The 2014-2019 period marks a phase of prolonged easing and progressive normalization of the Moroccan yield curve, following the 2013 peak. The spread (10-year to 13-week) narrowed from 1.51 points in 2014 to 0.77 points in 2019. Interest rates declined

across the entire maturity spectrum: the 13-week rate fell from 3.75% in 2013 to 2.15% in 2015, then oscillated between 2.26% and 2.28% between 2016 and 2019; the 10-year rate dropped from 5.32% in 2013 to 3.09% in 2015, before stabilizing between 3.04% and 3.30% over the 2016–2019 period. This generalized rate decline reflects a substantial improvement in macroeconomic and financial conditions, as well as a progressive easing of Bank Al-Maghrib's monetary policy.

The macroeconomic context of this period is marked by several favorable developments. First, the Moroccan government undertakes ambitious fiscal consolidation, progressively reducing the budget deficit from 7.2% of GDP in 2012 to 4% in 2016, notably through the reform of the compensation system for prices and transfers from Moroccans residing abroad. Third, domestic inflation remains very low, oscillating between 0.2% and 1.6% annually between 2015 and 2019, due in particular to the decline in imported commodity prices.

In this favorable context, Bank Al-Maghrib lowers its policy rate from 3% to 2.5% in December 2014, then maintains this level until March 2016, before reducing it again to 2% in March 2020. This accommodative monetary policy aims to support economic growth, which remains moderate (averaging 3.5% annually between 2014 and 2019), and to facilitate economic financing in a context of low inflation.

Figure 14 clearly illustrates the generalized rate decline over the 2014–2019 period, with progressive convergence toward historically low levels. Figure 13 shows that in 2015, the yield curve exhibits a normal and moderately steep shape, with a 13-week rate of 2.15%, a 2-year rate of 2.41%, a 5-year rate of 2.66%, and a 10-year rate of 3.09%. This configuration reflects expectations of short-term monetary policy stability, combined with a moderate term premium on long maturities.

A major event of this period is the Moroccan exchange rate regime reform, initiated in January 2018. Bank Al-Maghrib widens the dirham fluctuation band from $\pm 0.3\%$ to $\pm 2.5\%$ around a central parity defined relative to a basket composed of 60% euros and 40% U.S. dollars. This reform, prepared over a long period with International Monetary Fund support, aims to increase exchange rate flexibility and strengthen monetary policy autonomy, consistent with the Mundell-Fleming trilemma. Although the reform was implemented gradually and prudently, it has important implications for the term structure of interest rates: by reducing the constraint of defending the dirham parity, it expands Bank Al-Maghrib's room for maneuver to adjust its policy rate according to domestic macroeconomic conditions, thereby strengthening monetary policy transmission to short-term rates. Figure 15 shows that the 10-year to 13-week spread remains relatively stable around 0.80 points between 2017 and 2019, suggesting that the exchange rate reform did not have an immediate impact on the curve's slope, with markets anticipating progressive implementation and monetary policy continuity.

This phase of great easing illustrates the central role of fiscal consolidation and macroeconomic stability in determining the term structure of interest rates in Morocco. The reduction in Treasury financing needs, combined with improved banking liquidity and lower sovereign risk premiums, enables significant compression of long-term rates. Simultaneously, Bank Al-Maghrib's accommodative monetary policy anchors short-term rates at low

levels, contributing to a generalized decline in the curve's level. This period foreshadows the phase of historical lows in 2020–2021, marked by the COVID-19 pandemic and ultra-accommodative monetary policy.

Phase 5 (2020-2021): Historical lows and “ultra-accommodative” monetary policy

The 2020-2021 period constitutes a major rupture in the history of the Moroccan term structure of interest rates, with historical lows reached across the entire maturity spectrum. In 2021, the 13-week rate stood at 1.38%, the lowest level ever observed since the creation of the Treasury Bill market in its modern configuration, while the 10-year rate reached 2.34%, also a historical minimum. The 10-year to 13-week spread remained at 0.96 points in 2021, after being 0.80 points in 2020, reflecting a relatively flat curve in a context of extremely low rates. This exceptional configuration results from the economic policy response to the COVID-19 pandemic, which struck Morocco starting in March 2020 and caused a historical recession (GDP contraction of 6.3% in 2020, before a rebound of 7.9% in 2021).

Faced with this unprecedented shock, Bank Al-Maghrib adopted ultra-accommodative monetary policy, lowering its policy rate in two stages: from 2.25% to 2% in March, then to 1.5% in June 2020, a historical floor level. Simultaneously, the central bank implemented a set of unconventional measures to support banking liquidity and facilitate economic financing, including massive liquidity injection through long-term refinancing operations, easing of collateral conditions, full release of the reserve account for banks, and support for refinancing of participatory banks and microcredit associations. These measures are part of a global movement of accommodative monetary policy: the U.S. Federal Reserve and the European Central Bank brought their policy rates to zero and launched massive asset purchase programs (quantitative easing), while central banks in emerging economies also eased their monetary policy to mitigate the pandemic's impact.

The decline in Moroccan short-term rates in 2020-2021 directly reflects the transmission of Bank Al-Maghrib's accommodative monetary policy. The 13-week rate fell from 2.28% in 2019 to 1.80% in 2020, then to 1.38% in 2021, a cumulative decrease of 90 basis points. This rapid and complete transmission illustrates the effectiveness of the monetary policy interest rate channel on the short end of the curve, consistent with macro-financial model predictions. Long-term rates also experienced a significant decline, but of lesser magnitude: the 10-year rate fell from 3.04% in 2019 to 2.60% in 2020, then to 2.34% in 2021, a cumulative decrease of 70 basis points. This more moderate long-term rate decline is explained by several factors: first, increased Treasury financing needs (the budget deficit jumped to 7.6% of GDP in 2020 due to economic support spending and the collapse of tax revenues) increases long-term security supply and exerts upward pressure on rates; second, long-term inflation expectations remain at moderate levels (around 2%), limiting the decline in long nominal rates; third, term premiums remain positive, reflecting uncertainty regarding the future trajectory of monetary policy and economic growth.

Figure 14 strikingly illustrates the generalized rate decline in 2020–2021, with a narrowing of the gap between different maturities. Figure 13 shows that in 2021, the yield curve exhibits a normal and moderately steep shape, with a 13-week rate of 1.38%,

a 2-year rate of 1.71%, a 5-year rate of 2%, and a 10-year rate of 2.34%. This configuration reflects expectations of continued accommodative monetary policy in the short term, combined with a moderate term premium on long maturities.

Analysis of this phase reveals several important lessons about monetary policy transmission in Morocco. First, the policy rate decrease transmits rapidly and completely to short-term rates, confirming the effectiveness of the interest rate channel on the short end of the curve. Second, transmission to long-term rates is more limited and depends on structural factors (Treasury financing needs, term premiums, inflation expectations), underscoring the importance of coordination between monetary and fiscal policy. Third, Bank Al-Maghrib's unconventional measures (liquidity injections, collateral easing) contribute to improving market liquidity conditions and reducing liquidity premiums, thereby facilitating monetary policy transmission.

Phase 6 (2022-2023): Monetary tightening and inflationary shock

The 2022-2023 period marks a brutal reversal of Moroccan monetary policy, in response to an inflationary shock of unprecedented magnitude since the 2000s. The inflation rate, which had remained below 2% between 2015 and 2021, jumped to 6.6% in 2022, then remained at 6.1% in 2023, fueled by rising energy and food prices following the war in Ukraine and global supply chain disruptions. Faced with this inflationary surge, Bank Al-Maghrib initiated a monetary tightening cycle, raising its policy rate from 1.5% to 2% in September 2022, then to 2.5% in December 2022, and finally to 3% in March 2023, a cumulative increase of 150 basis points in less than a year. This tightening cycle is part of a global movement of monetary policy normalization: the U.S. Federal Reserve raised its policy rate from 0.25% to 5.5% between March 2022 and July 2023, while the European Central Bank increased it from 0% to 4.5% over the same period.

Bank Al-Maghrib's monetary tightening transmits rapidly to short-term Treasury Bill market rates. The 13-week rate rose from 1.38% in 2021 to 1.85% in 2022, then to 3.02% in 2023, a cumulative increase of 164 basis points, slightly higher than the policy rate increase. This rapid and complete transmission confirms the effectiveness of the monetary policy interest rate channel on the short end of the curve. Long-term rates also experienced a significant increase: the 10-year rate rose from 2.34% in 2021 to 2.68% in 2022, then to 4.31% in 2023, a cumulative increase of 197 basis points, higher than that of short-term rates. This more marked long-term rate increase reflects several factors: first, upward revision of long-term inflation expectations (markets anticipate that inflation will remain durably above Bank Al-Maghrib's implicit 2% target); second, increased term premiums, with investors demanding higher compensation for the increased interest rate risk in a context of macroeconomic volatility; third, increased Treasury financing needs (the budget deficit widened to 5.2% of GDP in 2022 due to energy and food price compensation spending), exerting upward pressure on long-term rates.

The curve steepening in 2022-2023 is particularly marked. The spread (10-year to 13-week) fell from 0.96 points in 2021 to 0.82 points in 2022 (temporary flattening due to faster short-term rate increases at the beginning of the cycle), then jumped to 1.29 points in 2023, the highest level since the 2013 peak. This steepening

reflects expectations of future monetary policy normalization: markets anticipate that Bank Al-Maghrib will eventually have to lower its rates once inflation is controlled, which translates into more moderate increases in anticipated future short-term rates and therefore curve steepening. Figure 15 clearly illustrates this dynamic, with a spectacular spread rebound in 2023. Figure 13 shows that in 2023, the yield curve exhibits a steeply sloped and concave shape, with a 13-week rate of 3.02%, a 2-year rate of 3.66%, a 5-year rate of 3.91%, and a 10-year rate of 4.31%. This configuration is typical of a monetary tightening phase, where short-term rates increase rapidly in response to policy rate hikes, while long-term rates incorporate expectations of future normalization and high term premiums.

Analysis of this phase reveals several important lessons about monetary policy transmission in Morocco in an inflationary context. First, transmission of monetary tightening to short-term rates is rapid and complete, confirming the effectiveness of the interest rate channel. Second, transmission to long-term rates is amplified by upward revision of inflation expectations and increased term premiums, underscoring the central role of expectations in determining the term structure. Third, the curve steepening in 2023 reflects expectations of future monetary policy normalization, consistent with Lutz's (1940) expectations theory.

Phase 7 (2024-2025): Normalization and progressive easing

The 2024-2025 period corresponds to a phase of normalization and progressive easing of the Moroccan yield curve, following the 2023 tightening peak. The spread (10-year to 13-week) narrowed from 1.29 points in 2023 to 0.77 points in 2024, then to 0.71 points in 2025, returning to levels close to those observed before the 2022 inflationary shock. Interest rates declined across the entire maturity spectrum: the 13-week rate fell from 3.02% in 2023 to 2.77% in 2024, then to 2.17% in 2025; the 10-year rate dropped from 4.31% in 2023 to 3.55% in 2024, then to 2.88% in 2025. This generalized rate decline reflects improved macroeconomic conditions and progressive easing of Bank Al-Maghrib's monetary policy.

The macroeconomic context of this period is marked by inflation deceleration, which fell from 6.1% in 2023 to 0.9% in 2024, thanks to declining energy and food prices on international markets and the delayed effect of the 2022–2023 monetary tightening. Economic growth remains at a moderate level (3.8% in 2024), supported by sustained domestic demand and exports. The budget deficit progressively narrows, falling from 5.1% of GDP in 2022 to 3.9% in 2024, thanks to fiscal consolidation and tax revenue recovery. In this favorable context, Bank Al-Maghrib initiates a monetary easing cycle, lowering its policy rate from 3% to 2.75% in June 2024, then to 2.5% in December 2024, and finally to 2.25% in March 2025, a cumulative decrease of 75 basis points.

The decline in short-term rates in 2024–2025 directly reflects the transmission of Bank Al-Maghrib's accommodative monetary policy. The 13-week rate fell from 3.02% in 2023 to 2.77% in 2024, then to 2.17% in 2025, a cumulative decrease of 85 basis points, slightly higher than the policy rate decrease. This rapid and complete transmission confirms the effectiveness of the interest rate channel on the short end of the curve. Long-term rates experienced an even more marked decline: the 10-year rate fell from 4.31% in 2023 to 3.55% in 2024, then to 2.88% in 2025, a cumulative decrease of 143 basis points, significantly higher than that of short-term rates. This more marked long-term rate decline is

explained by several factors: first, downward revision of long-term inflation expectations (markets anticipate a durable return of inflation toward Bank Al-Maghrib's implicit 2% target); second, reduced term premiums, with investors revising downward the interest rate risk in a context of restored macroeconomic stability; third, reduced Treasury financing needs (thanks to fiscal consolidation), alleviating pressure on long-term rates.

The curve flattening in 2024–2025 is particularly marked. The spread (10-year to 13-week) fell from 1.29 points in 2023 to 0.77 points in 2024, then to 0.71 points in 2025, returning to levels close to those observed in 2020 and 2009. This slope compression reflects expectations of future monetary policy stability: markets anticipate that Bank Al-Maghrib will maintain its policy rate at moderate levels (around 2.25%) in a context of controlled inflation and moderate growth, which translates into convergence of anticipated future short-term rates toward the current policy rate and therefore curve flattening. Figure 15 clearly illustrates this dynamic, with a spectacular spread decline in 2024–2025. Figure 13 shows that in 2025, the yield curve exhibits a normal and moderately steep shape, with a 13-week rate of 2.17%, a 2-year rate of 2.41%, a 5-year rate of 2.58%, and a 10-year rate of 2.88%. This configuration reflects expectations of short-term monetary policy stability, combined with a moderate term premium on long maturities.

Figure 14 illustrates the generalized rate decline in 2024–2025, with a return toward levels close to those observed in 2019, before the COVID-19 pandemic. This progressive normalization of the yield curve reflects the return to macroeconomic equilibrium after the successive shocks of the COVID-19 pandemic (2020–2021) and the global inflationary shock (2022–2023).

Analysis of this phase reveals several important lessons about monetary policy transmission in Morocco. First, transmission of monetary easing to short-term rates is rapid and complete, confirming the effectiveness of the interest rate channel. Second, transmission to long-term rates is amplified by downward revision of inflation expectations and reduced term premiums, underscoring the central role of expectations in determining the term structure. Finally, the curve flattening in 2024–2025 reflects expectations of future monetary policy stability, consistent with Lutz's (1940) expectations theory.

3.3. Structural specificities of the Moroccan market and implications for monetary policy transmission

The historical analysis of the Moroccan yield curve over the 2004–2025 period highlights several structural specificities that distinguish the Moroccan market from developed markets and have important implications for monetary policy transmission. These specificities must be taken into account in term structure analysis and monetary policy design.

The first major specificity is **the absence of yield curve inversion throughout the entire study period**. Unlike developed markets, where curve inversions (negative spread between long- and short-term rates) are frequent and considered reliable signals of imminent recession, the Moroccan curve has remained systematically positive, with the 10-year to 13-week spread varying between 0.58 points (2007) and 2.46 points (2004). This absence of inversion reflects several structural factors. First, Bank Al-Maghrib's monetary policy has never been sufficiently

restrictive to push short-term rates above long-term rates: the policy rate varied between 1.5% and 3.25% over the period, moderate levels by international comparison. Second, term premiums on long maturities have remained systematically positive and significant, reflecting high liquidity premiums (illiquid secondary market), sovereign risk premiums (credit rating lower than that of developed countries), and interest rate risk premiums (macroeconomic volatility). Third, market segmentation, with captive holding of long-term securities by domestic institutional investors (banks, mutual funds, insurance companies), limits arbitrage between maturities and maintains positive term premiums, consistent with Modigliani and Sutch's (1966) preferred habitat theory.

This absence of inversion has important implications for interpreting the curve's slope as a leading indicator of economic activity. In developed markets, curve inversion generally signals imminent recession, as it reflects expectations of future short-term rate declines in response to economic slowdown. In Morocco, the absence of inversion suggests that the curve's slope primarily reflects term premiums rather than recession expectations, thereby limiting its predictive power for economic activity. This specificity must be considered when using the yield curve as a macroeconomic forecasting tool.

The second major specificity is **the captive holding of public debt by domestic institutional investors**. Commercial banks, bond mutual funds, and insurance companies hold virtually all outstanding Treasury Bills, with a maturity distribution reflecting their asset-liability management preferences: banks favor short- and medium-term maturities (13 weeks to 2 years) to manage their liquidity and meet regulatory liquidity requirements; bond mutual funds favor medium-term maturities (2 to 5 years) to optimize the risk-return tradeoff; insurance companies favor long-term maturities (5 to 10 years) to match their long-term liabilities. This maturity segmentation creates preferred habitats in the sense of Modigliani and Sutch (1966), limiting arbitrage between maturities and generating segment-specific term premiums.

This captive holding has important implications for monetary policy transmission. It limits the sensitivity of long-term rates to policy rate adjustments, as institutional investors only gradually reallocate their portfolios in response to monetary policy changes. It also generates structural demand for public securities, which supports prices (and therefore reduces rates) on maturities favored by institutional investors. Finally, it creates Treasury dependence on domestic institutional investors for public debt financing, limiting diversification of funding sources and increasing vulnerability to domestic liquidity shocks.

The third major specificity is **Bank Al-Maghrib's dominant role on the short end of the curve through its weekly open market operations**. The central bank organizes weekly auctions of 7-day advances and repurchase agreements, which constitute the main refinancing channel for commercial banks and determine the interbank money market rate. These operations enable Bank Al-Maghrib to tightly control short-term rates and anchor monetary policy expectations. Analysis of Figure 14 reveals that 13-week and 26-week rates closely follow policy rate variations, confirming the effectiveness of this transmission channel. In contrast, long-term rates (5 and 10 years) are more influenced by Treasury

financing needs and macroeconomic expectations, and react more slowly and incompletely to policy rate adjustments.

This transmission asymmetry between short- and long-term rates has important implications for monetary policy conduct. It suggests that Bank Al-Maghrib has tight control over the short end of the curve, but more limited influence over the long end. To strengthen transmission to long-term rates, the central bank can employ complementary measures: forward guidance to anchor long-term monetary policy expectations; long-term refinancing operations to influence medium-term rates; public security purchases on the secondary market to reduce term premiums.

The fourth major specificity is **the term structure's dependence on Treasury financing needs**. Unlike developed markets, where sovereign security supply is relatively stable and predictable, Moroccan Treasury Bill supply varies significantly according to budget deficit financing needs and maturing debt refinancing. Periods of high budget deficit (2012-2013, 2020, 2022) translate into increased security supply, exerting upward pressure on rates, particularly on long maturities where supply is concentrated. Conversely, periods of fiscal consolidation (2015-2019, 2024-2025) translate into reduced security supply, exerting downward pressure on rates. This term structure sensitivity to Treasury financing needs underscores the importance of coordination between monetary and fiscal policy to ensure macroeconomic and financial stability.

These four structural specificities of the Moroccan interest rate market have important implications for monetary policy transmission and term structure modeling. They suggest that theoretical frameworks developed for developed markets must be adapted to account for market imperfections (illiquidity, segmentation, information asymmetries), institutional constraints (captive holding, prudential regulation), and interactions between monetary and fiscal policy.

4. Conclusion and policy implications

This study provided a descriptive empirical analysis of the term structure of interest rates in Morocco over the 2004-2025 period, utilizing secondary market data from Bank Al-Maghrib and the Treasury Department. The findings demonstrate that the Moroccan yield curve exhibits distinct structural characteristics that diverge significantly from the patterns typically observed in advanced financial markets.

Four major structural specificities emerged from the analysis. First, the yield curve remained systematically positive throughout the study period, with no instances of inversion. The 10-year to 13-week spread consistently ranged between 0.58 and 2.46 percentage points. This absence of inversion reflects moderate policy rates, persistent term premiums driven by liquidity constraints and sovereign risk, and market segmentation, rather than serving as a reliable predictor of economic recession. Second, the market is characterized by the captive holding of public debt by domestic institutional investors. Aligning with the preferred habitat theory, banks, mutual funds, and insurance companies target specific maturities to manage their asset-liability profiles. This segmentation limits cross-maturity arbitrage and generates maturity-specific term premiums. Third, monetary policy transmission is highly asymmetric. BAM effectively anchors short-term rates through weekly open market operations, whereas long-

term rates (5 to 10 years) are predominantly driven by macroeconomic expectations and fiscal dynamics, reacting slowly to policy rate adjustments. Finally, the term structure is highly sensitive to the Treasury's financing needs. Fluctuations in bond supply, driven by budget deficits or consolidation efforts, exert direct pressure on yield levels, particularly at the long end of the curve.

These findings carry significant implications for monetary policy design and financial market development in Morocco. The limited predictive power of the yield curve for economic activity suggests that policymakers should not rely on it as a standalone leading indicator of recessions, as its slope primarily reflects term premiums rather than growth expectations. Furthermore, the captive nature of domestic demand and the asymmetric transmission mechanism indicate that standard policy rate adjustments are insufficient to influence long-term borrowing costs. To enhance transmission to the long end of the curve, BAM could employ complementary tools, such as forward guidance to anchor long-term expectations, targeted long-term refinancing operations, or secondary market interventions to compress term premiums.

From a theoretical perspective, this study highlights that standard term structure models developed for advanced economies cannot be directly applied to emerging markets like Morocco without adjustments for market imperfections, institutional constraints, and fiscal-monetary interactions. Future research should build upon this descriptive foundation by employing advanced econometric models to quantify the exact magnitude of term premiums and to test the causal impact of specific monetary policy shocks on the Moroccan yield curve.

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