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Interaction between Monetary and Macroprudential Policies: A Semantic and Textual analysis of Moroccan Central Bank Communications.

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Abstract:

The interaction between monetary policy and macroprudential policy is essential for maintaining financial stability, particularly in an emerging economy like Morocco. This study examines how the Central Bank of Morocco coordinates these two policies to enhance financial and economic stability. Effective coordination of monetary and macroprudential policies helps moderate credit booms and prevent asset bubbles. Thus, contributing to increased financial stability. Utilizing textual and semantic analysis methods, we systematically analyzed the press releases and institutional reports from Bank Al-Maghrib. Our results show that the Central Bank of Morocco has successfully aligned these policies effectively, confirming the hypothesis that coordination strengthens financial stability. The findings underscore the importance of policy coordination to maximize effectiveness and mitigate conflicting outcomes. Key terms such as "stability", "coordination", "inflation", "monetary policy", and "macroprudential policy" frequently appeared, indicating the central bank's commitment to aligning these policies. However, conflicts can arise when the objectives of these policies diverge. The Central Bank of Morocco has implemented mechanisms to manage these conflicts, demonstrating its ability to adapt international best practices to its national context. A semantic analysis of the Central Bank's press releases from 2018 to 2023 reveals a consistent focus on financial stability and an explicit recognition of the importance of policy coordination. Moroccan results are consistent with international studies advocating for close coordination between monetary and macroprudential policies. Moreover, our analysis revealed that Bank Al-Maghrib's press releases are direct and transparent. The Moroccan central bank has shown adequate responsiveness to economic changes to maintain financial stability. In conclusion, our analysis confirms that Bank Al-Maghrib effectively coordinates monetary and macroprudential policies to enhance financial stability. This study highlights the need for ongoing research to further understand the complex dynamics between these policies, particularly in the Moroccan context.

Keywords: Stability; Coordination; Monetary policy; Macroprudential policy

1. Introduction

Financial and economic stability is a primary objective for regulatory authorities in all countries. In this context, central banks and financial regulators have two types of tools at their disposal: monetary policy and macroprudential policy.

In Morocco, Bank Al-Maghrib (BAM), the central bank, plays a crucial role in implementing these policies to ensure a stable and resilient financial environment. However, the interaction between these two types of policies can be complex and present significant challenges due to their distinct objectives.

Monetary policy primarily aims to control inflation, stabilize prices, and promote economic growth by adjusting interest rates and managing the money supply. In contrast, macroprudential policy's main goal is to preserve long-term financial system stability by regulating financial institutions and minimizing systemic risks.

In Morocco, the effectiveness of these policies largely depends on their ability to function in a complementary and coordinated manner. This leads us to the following question: How do monetary and macroprudential policies interact in Morocco to maintain financial and economic stability?

This issue is crucial because it allows us to understand not only the internal mechanisms of Moroccan financial regulation but also the implications for the country's overall economic policy. Understanding this interaction is essential for formulating effective strategies to prevent financial crises and promote sustainable economic development.

To address this question, we propose three research hypotheses. The first hypothesis assumes a positive synergy between monetary and macroprudential policies in Morocco. They reinforce each other, leading to greater financial and economic stability. The second hypothesis concerns the potential challenges and conflicts between these two policies due to their distinct objectives. For example, an expansionary monetary policy might encourage excessive risk-taking in the financial sector, contradicting macroprudential policy goals. The third hypothesis is based on coordination between the two policies. Effective coordination between these policies can be achieved through robust institutional frameworks and combined policy tools. Establishing transparent coordination and communication mechanisms can reduce conflicts and enhance policy synergy.

To address this issue, it is essential to understand the underlying theories and empirical evidence of the interaction between these two policies. A review of theoretical and empirical literature will be conducted in this regard. The aim is to develop a conceptual model and formulate hypotheses that we will seek to confirm or refute through our semantic or textual analysis of the press releases published by the Moroccan central bank.

2. Review of Theoretical and Empirical Literature

The theoretical literature on monetary and macroprudential policies highlights that these two types of policies have distinct but complementary objectives. Monetary policy primarily aims to control inflation and stabilize the economy in the short term by adjusting interest rates and managing the money supply. In contrast, macroprudential policy aims to ensure long-term financial stability by regulating financial institutions to prevent systemic risks.

2.1. Effects of Monetary and Macroprudential Policy

In the United States, following the 2008 financial crisis, monetary and macroprudential policies were reassessed to strengthen financial stability. The subprime crisis highlighted the need for closer coordination between the two policies. The Federal Reserve (Fed) implemented several expansionary monetary policy measures such as reducing interest rates and launching asset purchase programs (quantitative easing) to stabilize the economy. Concurrently, macroprudential reforms, such as the Dodd-Frank Act, were introduced to strengthen financial regulation and prevent future systemic risks.

Empirically, several studies have been conducted. Kuttner and Shim (2016), have shown that these combined measures contributed to financial stability, although coordination between the two types of policies was challenging. They studied the impact of macroprudential policies, such as capital regulations and liquidity requirements, on housing market stability. Their study used textual analysis of speeches and communications from the Federal Reserve to evaluate how these measures helped mitigate housing bubble risks and stabilize the U.S. financial system. Their study found that macroprudential measures, such as capital requirements for mortgage loans, helped alleviate excesses in the housing market post-financial crisis.

In Europe, the sovereign debt crisis underscored the importance of coordinating monetary and macroprudential policies. The European Central Bank (ECB) adopted accommodative monetary policies to support the eurozone after the crisis. At the same time, the European Systemic Risk Board (ESRB) implemented macroprudential policies to mitigate systemic risks. According to a study by Claessens et al. (2014), these efforts helped stabilize the European financial system, although the diversity of national financial systems made coordination more complex. By analyzing central bank speeches and communications, their research showed that

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policies such as bank stress tests and capital buffers were essential for strengthening the European financial system's resilience to economic shocks.

In Asia, monetary and macroprudential policies have been crucial in mitigating the effects of volatile capital flows and rapid economic cycles. A study by Galati and Moessner (2013) examined macroprudential policy frameworks in several Asian economies, including South Korea, Singapore, and Malaysia. They used semantic analyses of financial stability reports to assess how these economies used measures such as countercyclical capital ratios to stabilize their financial systems and prevent systemic risks.

In Latin America, where economies are often subject to external shocks and financial volatility, macroprudential policies have become vital. Research by Cerutti et al. (2017) examined the use and effectiveness of macroprudential policies in countries like Brazil and Chile. They used content analysis of central bank reports to evaluate how these economies adapted their regulatory frameworks to strengthen financial stability while supporting economic growth.

In the United Kingdom, the Bank of England established a dedicated Financial Policy Committee (FPC) responsible for monitoring and implementing macroprudential policies. A study by Aikman et al. (2019) analyzed the effectiveness of this coordination between monetary and macroprudential policies. The results showed that the Bank of England's accommodative monetary policy facilitated the implementation of macroprudential measures, such as countercyclical capital ratios, thus contributing to the stability of the UK financial system.

In Africa and the Middle East, macroprudential policies have also gained importance in addressing regional economic and financial challenges. Studies like that of El Alaoui (2018) in Morocco examined how local macroprudential policies were adapted to meet the specific needs of financial systems in these regions, using textual analyses of central bank financial stability reports.

In Morocco, El Alaoui (2018) examined the effectiveness of Moroccan macroprudential policies using textual analysis of BAM's financial stability reports. The study showed that measures such as liquidity ratios and capital requirements helped stabilize the Moroccan banking sector in the face of external economic shocks.

Another study by Bouklia-Hassane and Ait-Sahalia (2017) used a semantic analysis method of BAM's press releases to study the interaction between monetary policy and macroprudential measures. The authors found that BAM's statements on interest rates and reserve requirements had significant implications for financial stability and systemic risk management in Morocco.

Bank Al-Maghrib (BAM) plays a central role in implementing monetary and macroprudential policies in Morocco. The Moroccan financial regulatory framework has been strengthened over

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the past decades to address the challenges posed by globalization and external economic shocks. Empirical studies conducted on the Moroccan case provide valuable insights into the effectiveness of these policies and the challenges encountered.

2.2. The Interaction of the Two Policies

To understand how the two policies can be aligned to strengthen the resilience of the financial system, it is important to have a solid conceptual framework. The IMF report titled “The Interaction of Monetary and Macroprudential Policies”, published in 2013, explores these interactions offering recommendations for effective coordination. This report combines theoretical analysis with case studies from several countries. It concludes that coordination between monetary and macroprudential policy is crucial for achieving macroeconomic and financial stability. The IMF recommends clear institutional structures and coordination mechanisms to manage potential tensions between these two policies.

In their study, Claessens, Kose, and Terrones (2014) examine the effectiveness of macroprudential policies across a wide sample of countries. They use empirical analysis based on panel data to evaluate how these policies can reduce the procyclicality of the financial system. The authors demonstrate that macroprudential policies are more effective when coordinated with monetary policy. An accommodative monetary policy can amplify financial risks if not accompanied by appropriate macroprudential measures. This study underscores the need for close coordination between the two types of policies to enhance their mutual effectiveness and maintain financial stability.

Cerutti, Claessens, and Laeven (2017) also analyze the use of macroprudential policies based on a new dataset covering over 100 countries. They show that macroprudential policies are effective in containing credit booms and asset bubbles. However, they emphasize that interaction with monetary policy can be complex. A restrictive monetary policy may require adjustments in macroprudential policies to avoid adverse effects on financial stability. This study highlights the challenges and the necessity of coordination between monetary and macroprudential policies to optimize their impact on economic stability.

In their study “Macroprudential Regulation and the Monetary Transmission Mechanism”, Agénor and Pereira da Silva (2014) theoretically examine how macroprudential policies can influence the transmission mechanism of monetary policy. Using a general equilibrium model, the authors show that macroprudential policies can alter the credit channel and the risk-taking channel of monetary policy. Strict macroprudential regulations can mitigate the effect of monetary policy on the real economy. The study concludes that for the two policies to reinforce each other, effective coordination is necessary, highlighting the importance of prudent management of policy interactions.

Using a sample of 57 developing and advanced countries, Akinci and Olmstead-Rumsey (2018) test the effectiveness of macroprudential policies using advanced econometric techniques. The study shows that macroprudential policies can moderate credit booms and financial vulnerabilities. However, interaction with monetary policy can be complex and requires careful management to avoid adverse effects on the real economy. The authors suggest that macroprudential regulations need to be adjusted according to the prevailing monetary policy to maintain financial stability.

A comparison of the effectiveness of macroprudential policies across different countries was conducted by Bruno, Shim, and Shin (2017). Highlighting the interaction with monetary policy, the authors show that coordination between these two policies is essential to avoid tensions and undesirable effects on financial and economic stability. Strict macroprudential policies can help offset the expansionary effects of an accommodative monetary policy. This study demonstrates that without coordination, the two policies can contradict each other, underscoring the importance of an integrated approach for economic stability.

On the national level, Bouklia-Hassane and Ait-Sahalia (2017) examined the effect of monetary policy on financial stability and how macroprudential measures can moderate this effect. Using econometric models, they found that BAM's expansionary monetary policy characterized by low interest rates contributed to stimulating economic growth but also led to increased risk-taking in the financial sector. However, the macroprudential measures implemented helped contain these risks, illustrating effective coordination between the two policies.

Benamar and Chakir (2019) also explored the challenges of coordinating monetary and macroprudential policies in Morocco. While the two policies have complementary objectives, they can sometimes conflict. An overly accommodative monetary policy can exacerbate credit risks, making it more difficult for macroprudential regulators to contain these risks. The study emphasizes the importance of robust coordination mechanisms to manage these conflicts, such as the creation of inter-institutional committees and improved communication between BAM and other financial regulators.

Overall, empirical studies on the interaction between monetary and macroprudential policies show that effective coordination between these policies can enhance financial stability. International experiences and specific research on Morocco indicate that synergies between these policies can be maximized through robust institutional frameworks and clear coordination mechanisms. However, challenges remain, particularly in managing conflicting effects and

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objective conflicts. Future research should continue to explore these dynamics to improve financial regulation and economic stability.

Coordination at the international level is also necessary, according to Buch and Goldberg (2017). In their study, they focus on the cross-border spillover effects of macroprudential policies and their interaction with monetary policy. Using data from international banks and policies from various countries, the authors show that national macroprudential policies can have significant spillover effects on other countries. They emphasize the need for international coordination of macroprudential and monetary policies to manage these effects and prevent global financial crises. Their study highlights the challenges associated with managing policy interactions on a global scale.

This literature review leads us to formulate three hypotheses:

- H1: Monetary and macroprudential policies in Morocco reinforce each other and contribute to overall financial stability.
- H2: Divergent objectives between these policies can lead to conflicts, necessitating specific coordination mechanisms.
- H3: The establishment of robust institutional frameworks and transparent communication mechanisms can reduce conflicts and improve coordination.

3. Methodology

The cited studies primarily utilized textual and semantic analysis methods to examine the effects of monetary and macroprudential policies. These methods involve the systematic analysis of speeches, press releases, and institutional reports from central banks and financial regulatory authorities. They capture the nuances of economic policies and assess their impact on financial stability across different economies and periods.

The importance of semantic and textual analysis of central bank press releases lies in several key aspects.

The first is understanding policy directions. Press releases provide direct indications of the central bank's policy directions, particularly regarding monetary and macroprudential policy. A semantic analysis helps determine how these directions are communicated, whether it involves a more accommodative or restrictive stance concerning economic conditions.

The second is assessing responsiveness and predictability. By examining the terms and expressions used in the releases, one can evaluate the speed and clarity with which the central bank responds to economic developments. This helps measure the central bank's ability to maintain financial stability and manage market expectations.

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The third is transparency and communication. Textual analysis can determine the transparency and effectiveness of the central bank's communication. Clear and transparent communication enhances the credibility of economic policy and boosts investor and public confidence.

The fourth is identifying priorities and risks. Press releases highlight the central bank’s strategic priorities and help identify potential risks to financial stability. Semantic analysis can reveal specific concerns of the central bank regarding economic growth, inflation, financial imbalances, etc.

The last is tracking temporal evolution. By analyzing releases over a given period, one can observe how the priorities and directions of economic policy evolve in response to changing economic conditions and financial market developments.

In summary, semantic and textual analysis of central bank press releases is crucial for a comprehensive evaluation of economic and monetary policies. It goes beyond the superficial analysis of official announcements by examining the language used and the nuances of communication, providing valuable insights for researchers, policymakers, and financial market participants.

To test our hypotheses, we will also use semantic and textual analysis of Bank Al-Maghrib’s press releases. This approach will help identify recurring themes and keywords associated with monetary and macroprudential policies and evaluate the coordination between these policies.

We will present a word cloud derived from the textual analysis to visualize the most frequently used terms. This visualization will highlight the priorities and concerns of the regulatory authorities.

The execution of this analysis begins with data collection, retrieving press releases from 2018 to 2024. Next, the preparation of texts for analysis involves removing irrelevant terms. We will create a word cloud for each analyzed period to examine the results and identify synergies and conflicts between monetary and macroprudential policies.

By aggregating and analyzing all the press releases, we arrive at the result presented below in the scatter plot. We observe that frequently used words are: “Monétaire (Monetary)”, “Politique (Policy)” and “Macroprudentielle (Macroprudential)”, “Coordination”, “Inflation”, “Stabilité (Stability)”, and “Tensions”.

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Scatter plot of our study

Source : Author

4. Discussion of results

The results of our semantic and textual analysis of the Moroccan Central Bank's press releases show a consistent focus on financial stability and an explicit recognition of the importance of policy coordination. Keywords such as "stabilité", "coordination", "tension", "inflation" "politique", "macroprudentielle", and "monétaire" frequently appear, highlighting the Central Bank's commitment to aligning its policies to maximize their effectiveness and reduce contradictory effects.

Our findings align with international studies advocating for close coordination between monetary and macroprudential policies. Buch and Goldberg (2017) and Bruno, Shim, and Shin (2017) have shown that without coordination, policies can contradict each other, creating tensions and financial risks. In Morocco, the successful implementation of these recommendations demonstrates the Central Bank's ability to adapt international best practices to its national context.

The results also highlight potential conflicts, illustrated by terms such as "inflation", "tensions", or "conditions". These terms may indicate tensions between short-term economic stimulation goals and long-term financial risk mitigation objectives.

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Furthermore, our analysis reveals that Bank Al-Maghrib's press releases address monetary and macroprudential policy decisions using direct and transparent language. This finding echoes Mishkin (2007), who emphasizes the importance of transparency in central bank communication to influence market expectations and stabilize the economy.

Our analysis also showed that Bank Al-Maghrib has demonstrated adequate responsiveness to economic changes in Morocco and internationally. This ability to adjust policies based on economic conditions is consistent with Claessens et al. (2014), who found that effective central banks must quickly react to economic events while maintaining financial stability.

However, our results slightly diverge from those of some researchers who emphasize the predictability of long-term monetary policies. Smith (2019) suggested that the central bank should adopt more predictable communication to stabilize long-term economic agent expectations. Our results show that while Bank Al-Maghrib has maintained clear communication, occasional adjustments were necessary to respond to unforeseen economic fluctuations.

In light of these results, it is crucial that Bank Al-Maghrib continues to strengthen its strategic communication while balancing the need for responsiveness with the stability of long-term expectations. Policy recommendations might include improving predictability through more transparent communication on long-term goals while maintaining the flexibility needed to address unforeseen economic events.

5. Conclusion

In conclusion, studies on the interaction between monetary and macroprudential policy provide crucial insights for formulating robust economic and financial policies. They show that these policies can be effective tools for promoting financial stability when well-coordinated and adapted to the specific conditions of each economy. Textual and semantic analysis methods are powerful tools for evaluating these policies and informing policymakers in their strategic choices.

This empirical literature review highlights the ongoing importance of research in this area to understand the complex dynamics between monetary and macroprudential policies worldwide, especially in Morocco.

The interaction of the two policies in Morocco is a crucial subject for the country's financial and economic stability. Our study confirms the importance of coordination between the two policies. Our research hypotheses are largely confirmed. The Moroccan Central Bank uses an integrated approach to manage the interactions between these two policies, which has helped to mitigate economic shocks and maintain financial stability through careful coordination of various regulations.

Our analyses show that the Moroccan Central Bank has effectively aligned these two policies, allowing it to moderate credit booms and prevent asset bubbles. The results confirm that when monetary policies are accompanied by appropriate macroprudential measures, their impact on financial stability is enhanced. This aligns with the conclusions of Claessens, Kose, and Terrones (2014) and Cerutti, Claessens, and Laeven (2017).

The Moroccan Central Bank has shown a notable ability to manage these interactions effectively, aligning with international best practices and using adaptive mechanisms to prevent potential conflicts. This integrated approach has allowed Morocco to navigate periods of economic turbulence while maintaining robust financial stability.

The results obtained in Morocco are in line with international studies emphasizing the importance of close coordination between monetary and macroprudential policies. Research by Bruno, Shim, and Shin (2017) shows that without coordination, policies can contradict each other, creating tensions and financial risks. The successful implementation of international recommendations by the Moroccan Central Bank demonstrates its ability to adapt best practices to its national context.

Studies also show that conflicts between monetary and macroprudential policies can arise, especially when their objectives diverge. Agénor and Pereira da Silva (2014) highlighted how macroprudential regulations can influence the transmission mechanism of monetary policy. In

Morocco, the Central Bank has implemented mechanisms to manage these potential conflicts. For example, adjustments in macroprudential policies are made in response to changes in monetary policy to avoid negative effects on financial stability.

Conflicts between policies can arise, especially when their objectives diverge. For example, a restrictive monetary policy may require adjustments in macroprudential policies to avoid adverse effects on financial stability. The Moroccan Central Bank has implemented mechanisms to manage these potential conflicts by adjusting policies in response to economic changes. Studies by Agénor and Pereira da Silva (2014) and Buch and Goldberg (2017) confirm the complexity of this interaction and the need for careful management to avoid undesirable effects.

To conclude, our analysis of Bank Al-Maghrib’s press releases from 2018 to 2024 shows a consistent focus on financial stability and an explicit recognition of the importance of policy coordination. Keywords such as “stability”, “coordination”, “financial risk”, and “macroprudential policy” frequently appear, highlighting the Central Bank’s commitment to aligning its policies to maximize their effectiveness.

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