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Near-zero interest rate policy *versus* corporate financing structure and corporate investment

Polityka stóp procentowych bliskich zera a struktura finansowania i poziom inwestycji przedsiębiorstw

Summary of doctoral dissertation

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1. Reasons for selecting research topic

For many economies around the world, near-zero interest rate policy is a relatively new concept. Ever since the monetary authorities of many countries transitioned from controlling monetary aggregates to controlling interest rates, central bankers no longer need to consider the limitations associated with this instrument. Previously, with high interest rates in place, central banks were free to adjust them upward or downward depending on circumstances as they saw fit. The first signs of zero-bound interest rates becoming a real problem appeared in the 1990s when Japanese central bankers were forced to drastically cut their interest rate. The sense of peril caused by economies moving into the uncharted territory of negative interest rates sparked heated debates on the liquidity and deflation traps that had already been warned against years earlier. Other discussions focused on whether further interest rate reductions from what already became all-time lows would continue to be advisable and what tools could possibly replace the most commonly used instrument of interest rates. Prior to the outbreak of the global financial crisis of 2007-2009, near-zero interest rates remained a local phenomenon. The first time that the low-interest-rate environment (seen in this dissertation as analogous to near-zero interest rates) became a worldwide phenomenon was during the global economic collapse. The economic crisis accelerated interest rate reductions as central bankers rushed to employ them in a bid to keep their economies afloat and, in the long run, stimulate expansion and recovery. However, the sheer extent of the challenges faced by individual countries prevented the anticipated recovery and growth from supporting a shift from expansionary to restrictive policies. The near-zero interest rate policy gradually consolidated, creating a new environment in which monetary authorities, financial institutions, enterprises, and households had to operate. While more than a decade elapsed since the global financial crisis, many developed and emerging economies are still struggling with low interest rates. It therefore seems vital to ascertain whether the effects of previously identified mechanisms and relationships between macro- and micro-economic factors remain unchanged from the time central banks' interest rates were fairly high allowing them relative flexibility in pursuing monetary policies and enabling them to adjust their interest rates up or down as they saw fit.

One of the areas that monetary policy is expected to affect is the structure of corporate financing. Financing structure and the choice of corporate financing sources have been and still are a popular research area. For years, studies on this subject have focused on whether businesses should rely on foreign capital and what the benefits and consequences of such reliance might be. Previous studies have identified a number of factors that significantly impact corporate financing structure. The top two theories concerned with such financing, i.e. pecking order theory and static trade-off theory, postulate opposite impacts of a number of specific factors on corporate debt. It is worth noting that the predominant approach in related literature is microeconomic with authors pointing to numerous internal factors that strongly influence the financing decisions of businesses while ascribing lesser roles to monetary policy and other general macroeconomic factors. However, monetary transmission mechanism theory itself posits that monetary impulses significantly affect corporate financing structure. Even the fundamental claim whereby the interest rate cuts that lower the cost of foreign capital are likely to contribute to debt increases, illustrates the strong theoretical links that exist across the field. One may nevertheless wonder whether interest rate adjustments during the time of near-zero interest rates will support the theoretical postulate that a chain of causal relationships links monetary policy impulses with reactions in real economy.

The other area that is presumed to be influenced by monetary policy and that has been addressed by the author in this dissertation is corporate investment. Corporate investment is inherently complex due in part to the wide range of perspectives that can be adopted in researching it and the variety of different forms of investment that can be studied. Although Fisher, Keynes, Jorgenson, and Tobin and a number of other prominent economists have attempted to identify the drivers of corporate investment, their conclusions remain largely ambiguous. It should nevertheless be noted that corporate investment has always been associated with macroeconomic performance, including the use of monetary policy. As concerns financing structure, it is also in the case of investment that macroeconomic theories of the monetary transmission mechanism reveal direct and indirect relationships between monetary policy and the investment engaged in by all economic entities, enterprises included. Lower interest rates translate into cheaper capital and lower discount rates for investment projects, thereby presumably stimulating investment in the real economy. Again, however, one may wonder about the effectiveness of monetary impulses and the behavior of businesses in a near-zero-interest-rate environment.

Concerns over the above issues are further exacerbated by the fact that they are relatively new and poorly researched. In addition, the observations appearing in non-serial publications and, even more commonly, in scientific journals, tend to be ambiguous and purely theoretical. Moreover, as the vast majority of the studies in the area of financing structure and corporate investment continue to focus on such highly developed markets as the United States and the UK, their findings are of limited relevance for developing economies, which are very differently structured.

All in all, the study was inspired mainly by the opportunity to research a relatively new and previously unexplored field and by the desire to empirically investigate issues of interest to the author on the basis of a rather unusual research sample.

2. Primary objective, component objectives and primary research hypothesis

The study's primary objective was to assess the impacts of near-zero-interest-rate policies on corporate financing structures and corporate investment based on a sample of listed companies in Poland, Germany, Greece, and Norway. The primary research objective was achieved by pursuing the study's secondary objectives, which were to:

1) Outline the evolution of the significance and perception of interest rates and identify the factors that influence interest rates;

2) Describe the monetary policy tools that are used by monetary authorities and changes in the toolsets of central banks;

3) Define the theoretical impact of monetary impulses on the real economy by providing a detailed discussion of transmission channels and the structural factors that affect the efficiency and significance of individual transmission channels in economies;

4) Define the near-zero interest rate and clarify the meaning of the zero bound on interest rates;

5) Identify the causes and implications of a low-interest-rate environment;

6) Analyze interactions between interest rates and corporate financing structures and between interest rates and corporate investment and outline key financing structure and corporate investment theories;

7) Assess the impact of corporate financing structure on investment decisions;

8) Assess the impact of interest rate adjustments by monetary authorities on corporate financing structure and corporate investment in high- and low-interest-rate environments.

The above objectives were used to verify the primary hypothesis of the study which stated that at a time of near-zero interest rates, such rates do not significantly influence the financing structure and investment decisions of public companies in Poland, Germany, Greece, and Norway.

3. Study type and research methods

The study relied on a combination of theoretical and empirical research. In its theoretical part, the dissertation presents basic monetary policy precepts, mechanisms, and instruments, and introduces the concept of low interest rates. It also examines basic corporate financing structure and corporate investment theories. By structuring basic corporate-finance-related assumptions, the author reveals model relationships between interest rates on the one hand and financing structure and corporate investment decisions on the other. Conclusions on particular research question are arrived at by way of deduction. The empirical part of the dissertation, which constitutes an outcome of the research, shows the results of panel regression modeling. The study examined companies in Poland, Germany, Greece, and Norway in a time series covering the period from the first quarter of 2001 to the third quarter of 2019 inclusive. The study was divided into two intervals referred to as high- and low-interest rate. The assessments covered six endogenous variables, of which five concerned financing structure and one concerned investment, five exogenous variables related to monetary policy, and a number of control variables.

4. Dissertation structure

The dissertation comprises seven chapters, an introduction, and an ending.

The introduction states the research assumptions, the reasons for selecting the dissertation topic, the research problem expressed as the primary study objective, secondary objectives, and the primary research hypothesis. The introduction also outlines the research scope and the methodology employed to address the research problem.

Chapter One focuses on issues directly related to monetary policy. Its Section One provides a synthetic presentation of monetary policy evolution highlighting the key changes in this area of economic policy, as observed over the years. Section Two offers a detailed discussion of interest rates, including specifically interest rate theories and factors that affect interest rates. The next subsection of this chapter is devoted to central bank tools. This section highlights direct and indirect instruments as well as a new category of non-standard instruments. The final section of the chapter concerns monetary transmission mechanisms with emphasis on delays in the transmission of monetary policy shocks and the impact of structural factors on the effectiveness of individual channels. Chapter One ends with a summary.

Chapter Two also discusses monetary-policy-related issues. However, the focus in this chapter is placed on the specific phenomenon of near-zero-interest-rate policies with which present-day economies are confronted. The chapter begins with an introduction of the concept of near-zero interest rates adopted for further investigation. Later in the chapter, an attempt is made to explain the essence of the zero bound on interest rates and the theoretical implications of falling into the low-interest-rate trap. The chapter continues with a discussion of the causes of near-zero interest rates, the main lines of arguments in related literature and the postulated adverse consequences of economies operating in a near-zero-interest-rate environment. Section Four tackles the outlook for economies facing near-zero interest rates. The chapter ends with a summary of conclusions from this part of the dissertation.

Chapter Three reviews two main issues that are subject to further detailed analyses: corporate financing structure and corporate investment. Chapter Three begins by reviewing corporate financing structure, starting with a concise and simplified presentation of the sources of corporate financing followed by a more detailed discussion of the most prominent financing structure theories. The chapter ends with a discussion of the relationship between interest rates and financing structure. It then covers corporate investment in a similarly structured section starting with a brief discussion of investment and its various types. The chapter then goes into greater detail to describe corporate investment theories and looks at the relationship between interest rates and corporate tangible investments. Chapter Three also overviews links between financing structure and corporate investment, thoroughly examining the extent and complexity of the subject matter. As previous chapters, Chapter Three ends with a summary.

Chapter Four is an introduction to the empirical part of the dissertation. The chapter outlines the economies selected for the study. It begins by explaining the choice of Poland, Germany, Greece, and Norway for study purposes and discusses the adopted limiting criteria. A preliminary presentation of the selected countries is then provided with a focus on their general socio-economic characteristics. Later in Chapter Four, the focus shifts to the monetary policy of each of the selected countries to compare the strategies pursued by their central banks, the tools that they use and the principles they uphold in their operations. Section Three describes interest rates changes observed in the economies in question between 2001 and 2019. Chapter Four is devoted to structural conditions in the selected economies, which significantly affect the effectiveness and importance of individual monetary transmission channels. Chapter Four ends with a brief summary.

Chapter Five reverts to the primary objective and research hypothesis and presents the method used for empirical research. It then provides a detailed discussion of the temporal scope of the study with reasons for having chosen such scope, the data sources used and the research sample. Subsequently, the Chapter describes the endogenous, exogenous and control variables used in the study. The final section of Chapter Five outlines the models, which are then tested in Chapters Six and Seven.

Chapter Six constitutes the first empirical part of the dissertation. It examines relationships between interest rates and corporate financing structures. The chapter begins with a concise presentation of descriptive statistics concerning specific variables and economies, followed by a detailed discussion of the findings. In view of the large extent of the research, a summary of the findings is provided broken down by economy along with general conclusions and a comparison of the results obtained for each economy. Economy-specific summaries are provided at the ends of relevant sections while an overall summary concludes Chapter Six.

Chapter Seven forms the second empirical part of the dissertation. The chapter examines the relationships between interest rates and corporate investment. As Chapter Six, Chapter Seven begins with a concise presentation of descriptive statistics. It leaves out a description of macroeconomic variables due to their constant nature and the fact they are also described in Chapter Six. Chapter Seven then outlines and interprets the results of modeling. For each economy, its discussions follow the afore-mentioned pattern. As Chapter Six, due to the large extent of the research, Chapter Seven summarizes the findings for each economy followed by an overall summary and comparison of the results concerning individual economies. Each economy-specific summary is provided at the end of the relevant section. The overall summary concludes Chapter Seven.

The dissertation ends with general study conclusions. They refer to the research objectives and show whether and to what extent the objectives have been achieved. The dissertation ends with a verification of the primary hypothesis that calls into question the impacts of interest rate cuts during periods of near-zero interest rates. What follows is a presentation of the practical implications of study findings and suggested areas for further research that could help gain a more profound understanding of the effectiveness of near-zero interest rate policies and their impact on corporate financing structures and corporate investment decisions.

5. Research results and final conclusions

The results of the study in question demonstrate that its primary objective has been accomplished. Multivariate analyses show that during low-interest-rate periods, central banks' decisions to adjust base interest rates significantly affect the decisions to modify financing structures by listed companies in Poland and Greece, while having no effect or very little on such decisions in German and Norwegian businesses. Undertakings in developed economies are relatively unresponsive to monetary policy impulses, while companies in advanced developing economies readily react to monetary authority decisions. The study has also showed that the reaction of modifying financing structures in response to monetary policy impulses displayed by the surveyed Polish companies is consistent with the theoretical understanding of transmission mechanisms. However, in the case of Greek companies, this relationship is opposite to what the theory predicts. It was also noted that during high-interest-rate periods, the decisions to modify financing structure by Polish-based listed companies are more likely to be affected by the expansionary decisions of the National Bank of Poland than by restrictive policies. This changes when interest rates are low, which is when the choices of Polish companies to modify their financing structures are driven more strongly by restrictive rather than expansionary policy decisions. In the case of the financing structures of listed Greek companies, restrictive decisions by monetary authorities had more effect during low-interest-rate periods. Studies of the investment variable were found to be more challenging to interpret. However, it should be noted that during low interest rates, central bank decisions to change base interest rates significantly affect investments by listed companies in Poland and Germany, although their impact on German-based enterprises is less pronounced. During near-zero-interest-rate periods, investments by listed Greek and Norwegian companies remain relatively insensitive to monetary authority decisions. Furthermore, the investment responses to monetary policy impulses by Polish companies were observed to be contrary to what the model predicts. Meanwhile, German companies responded consistently with the theoretical transmission mechanism. As is the case of financing structure, it is also in the case of investments that expansionary policy decisions have more impact on Polish companies during high interest rate periods whereas restrictive decisions are the ones to affect such companies more powerfully when interest rates are low. The author also observed that Norwegian companies turned out to be relatively unresponsive to monetary authority decisions in both their financing structure and corporate investment. These findings support the claim that the Norwegian economy is both unique and distinctive.

The study and its findings did not clearly support or refute the primary hypothesis, which states that during near-zero-interest-rate periods, interest rates do not significantly affect the decisions of public companies in Poland, Germany, Greece, and Norway to modify financing structures or engage in investment. Polish and Greek listed companies were found to allow interest rates to significantly guide their financial structure decisions. This stands in contrast to German and Norwegian listed companies, which do not. In the realm of corporate investment, during near-zero-interest-rate periods, the interest rate was a significant factor for both Polish and German companies while their impact on German businesses was found to be less significant. At times of near-zero interest rates, Greek and Norwegian companies did not significantly guide their investment decisions by interest rates. It was also found that corporate responses were not always consistent with what theory predicted, i.e. did not always follow the expected monetary policy transmission mechanism.

These conclusions are of both practical and theoretical significance. Monetary authorities can use them to assess monetary policy effectiveness during periods of near-zero interest rates. The conclusions can also inspire further research. During this time of near-zero interest rates, it seems vital to assess the wisdom of using interest rates as a chief monetary policy tool. The need to search for alternative solutions has already been partially recognized by the world's central banks, which have been known to opt for non-standard instruments, especially since the global crash of 2007-2009. Such instruments are nevertheless used as mere temporary ad-hoc solutions. No revised monetary policy rules have been developed to date. The direct inflation targeting strategy and interest rate control remain monetary authorities' most commonly used tool.

In researching four relatively distinct economies, the author sought to emphasize the underlying structural factors behind monetary policy transmission mechanisms. This is of particular importance in attempts to transfer the lessons learned in highly-developed economies, such as the United States, to their developing counterparts. The cases of Germany and Greece showed that comparable monetary policy impulses do not necessarily elicit the same responses from economic actors operating in different economies. Hence an even greater need for continued research on monetary policy impulse transmission during near-zero-interest-rate periods.

The author is well aware of the limitations of this study. Without a doubt, one of them is that the study sample is comprised exclusively of listed companies. It would be both beneficial and reasonable to expand the sample to include not only non-public companies, but also to cover additional economies. It also seems potentially beneficial to extend the time series to include more observations from high-interest-rate periods. However, this would pose a number of challenges having to do with the eurozone. Going forward, the author intends to attempt to identify indirect relationships between interest rates on the one hand and corporate financing structures and corporate investment on the other and test her findings by other research methods. It appears that the subject matter of the study has not lost any of its significance. At the time the dissertation was being finalized, further significant developments were observed that again influenced the monetary policies of central banks. The unexpected spread of the Covid-19 pandemic has forced central banks to step up their expansionary efforts, further strengthening the near-zero-interest-rate stance. It seems, therefore, that the low-for-long scenario in which economists are heralding a low-interest-rate era, is bound to come true.