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The determinants of net interest income in the Mexican banking system: An integrated model

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ABSTRACT

This paper analyzes net interest income in the Mexican banking system over the period 1993–2005. Taking as reference the seminal work by Ho and Saunders [Ho, T., Saunders, A., 1981. The determinants of banks interest margins: theory and empirical evidence. Journal of Financial and Quantitative Analysis XVI (4), 581–600] and subsequent extensions by other authors, our study models the net interest margin simultaneously including operating costs and diversification and specialization as determinants of the margin. The results referring to the Mexican case show that its high margins can be explained mainly by average operating costs and by market power. Although non-interest income has increased in recent years, its economic impact is low.

1. Introduction

One of the main functions of the financial system in general, and the banking system in particular, is to favor economic growth through efficient intermediation between the savings of depositors and the investment of those demanding finance. Given that the exercise of market power translates into high margins that act as a disincentive to both savings and investment, the banking sector must be both efficient and competitive.

This desirable situation of efficiency and competition does not correspond to the situation existing in many banking sectors, and particularly in the Mexican banking system. In relation to international standards, Mexico has high interest margins reflecting high intermediation costs, which in turn have a negative effect on the growth of savings, investment, employment and, consequently, the economic growth of the country. In this context, it is of great interest to analyze the determinants of the net interest margin, dedicating special attention to the importance of competition in banking markets.

The literature on banking has developed various models over the years explaining the behavior of the intermediation margin, and showing the importance of factors such as the degree of competition, credit risk, market risk, average operating costs, etc. In particular, the seminal study by Ho and Saunders (1981) models a bank as an intermediary between lenders and borrowers, and shows that the optimal pure spread depends on four factors: the degree of risk aversion, the market structure (proxy for competition), the average size of bank transactions, and the variance of the interest rate on loans and deposits (market risk).

Subsequently, the theoretical model by Ho and Saunders (1981) has been expanded by other authors: Allen (1988) considers various types of loans with interdependent demands; Angbazo (1997) incorporates credit risk and interest rate risk, as well as the interaction between these two types of risk; Maudos and Fernández de Guevara (2004) include average operating costs as a determinant of the intermediation margin and use the Lerner index of market power as a direct measurement of the degree of competition; Carbó and Rodríguez (2007) extend the model by incorporating the importance of "non-traditional" activities, proposing a multi-output model with the aim of analyzing the relationship between bank margins and specialization. The model by Ho and Saunders (1981) has also been estimated empirically for the US banking system and for six European countries by Saunders and Schumacher (2000); the European banking system has also

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been analyzed by Lepetit et al. (2008); and Latin American banking by Brock and Rojas (2000), Martínez and Mody (2004) and Gelos (2006).

In this context, the model of the determinants of the intermediation margin has not been estimated for the specific case of the Mexican banking system, and constitutes an interesting sector of analysis given that it has undergone continual structural changes in recent years[1]: liberalization of the sector through deregulation of interest rates, the abolition of coefficients of selective assignation of credit, and the elimination of the system of legal coefficients (1988–1989). Subsequently, between 1991 and 1992, the banks were re-privatized after being nationalized in 1982 and a gradual opening-up of this sector to foreign investment began with the North American Free Trade Agreement (NAFTA). There was also a sharp increase in private credit without effective risk control, thus causing deterioration in banking assets. The conditions of this sector worsened with the financial and exchange rate collapse of 1994–1995, which forced the Government to implement measures aimed at combating the high insolvency of the banks. Among them was the acceleration of the process of gradual opening-up to foreign investment (to inject capital) which, following the mergers and acquisitions that took place, led to the consolidation of this industry.

There are several reasons which can explain the relevance and "uniqueness" of the Mexican case: (a) it is a banking system which, over the period analyzed, has been subject to important structural changes. The events described above were accompanied by substantial changes in the banking regulation; (b) the income structure of the Mexican banking system has changed as the non-interest income has become more important; (c) the majority of the papers have analyzed empirically the determinants of interest margins in developed countries, whereas the Mexican case is characterized by a low level of bancarization (measured by bank's assets to GDP); (d) the evolution of the net interest margin and the macroeconomic (and financial) conditions have been quite unstable during the last two decades, making Mexico a good laboratory in which to analyze the relationships between these two variables; and (d) given that the interest margin still remains at a high level, it is essential to analyze what causes this. Among the reasons usually given is the low level of competition, where there is evidence that monopolistic practices exist in some important markets (Avalos and Hernández-Trillo, 2006). It is therefore of great interest to explore how competition affects the evolution of banking margins. The model estimated serves to explain and quantify the importance of these (income structure, macroeconomic conditions, etc.), and other variables on the evolution of the interest net interest margin in Mexico. Given the importance of analyzing how the measures implemented have affected the evolution of Mexican banks' margins, the objectives and novelties of the paper are as follows. First, it models theoretically the determinants of the intermediation margin, incorporating both the seminal study by Ho and Saunders (1981) and subsequent individual contributions, which include both average operating costs and non-traditional activities as determinants of the intermediation margin (Allen, 1988; Angbazo, 1997; Maudos and Fernández de Guevara, 2004; Carbó and Rodríguez, 2007). Second, our study estimates for the first time the determinants of Mexican banks' net interest income and their economic impact over the period 1993–2005, a period of deregulation, liberalization and consolidation of the sector. Third, in line with the assumptions of Carbó and Rodríguez (2007) that banks need to match the random deposit supply function and the random demand for lending and non-traditional activities across periods, we estimate a dynamic model in order to capture the inertia in the evolution of banking margins. Finally, we analyze whether the growing importance of non-financial activities[2] has caused a reduction of the net interest margin, as has occurred in developed countries.

The results obtained indicate that the greatest economic impact on the net interest margin is determined by operating costs and market power. The results also show that, in general, the expected signs are obtained in the coefficients of the variables considered in the literature explaining the intermediation margin. Thus, we find a positive relationship between the intermediation margin in the Mexican banking system and variables proxying market power (Lerner index), operating cost, volatility of market interest rates, implicit interest payment; and a negative relationship with the quality of management and non-interest income. This last negative effect may reflect a strategy of cross-subsidization with traditional activities in line with the findings of Carbó and Rodríguez (2007) and Lepetit et al. (2008). In other words, since banks engage in different non-lending activities, these other activities may influence the pricing of loan products due to cross-subsidization of bank products. However, its economic impact is insignificant.

The model estimated serves to explain the evolution of net interest income in Mexico. The decreasing trend of the margin up to 1996 is compatible with the increase of credit risk and the volatility of market interest rates given that the effect of these variables is counteracted by the fall in market power and in operating costs. Subsequently, the margin presents an increasing trend until 1999 as a consequence of the increase in the Lerner index and in operating costs. The margin decreases from 2000–2003. This effect is explained by the fall in 2000 and 2001 (2002 and 2003) of average operating cost (market power), credit risk, and implicit interest payments which counteract the increase in market power (average operating costs). Finally, in the last two years of the period analyzed, market power increased which caused a rise in the intermediation margin.

From a financial stability perspective, the reasons behind the margin evolution in Mexico predominantly emanate from the micro level. Therefore, one of the main implications of economic policy deriving from the results obtained is the need to implement measures which are aimed at increasing competition and efficiency in the Mexican banking system, given the high economic impact of market power and of the average margin costs. In the first case, the evidence contributed by other works (Avalos and Hernández-Trillo, 2006; Solís and Maudos, 2008) shows that monopolistic practices exist in some important markets. Thus, it is necessary to prioritize measures aimed at increasing competition (such as decreasing the legal barriers to some products and fostering coordination between anti-trust authorities and regulators). In the second case, it is important that the Mexican banking system increases its levels of efficiency in costs, which will lower margins and benefit consumers.

In the current context of the international financial crisis, results from the study allow us to shed light on some of the possible effects on banking margins. The Mexican banking system is one of the sectors of the economy which has most suffered because of the successive crises that the country has gone through over the years (such as in 1995). The deterioration of macroeconomic conditions with the consequent increase in bad loans can pressure bank margins to rise caused by the greater risk premiums that banks will demand.

The structure of the rest of the paper is as follows. Section 2 reviews the literature that analyzes the determinants of the intermediation margins. Section 3 models the intermediation margin integrating into a single model the various extensions made to

[1] See Hernández-Murillo (2007).

[2] Specifically, net banking commissions represented 0.5% in 1993 of total assets, increasing to 1.1% in 1995, to 1.5% in 2001 and to 2.0% in 2005.