



Assessing competition in the banking industry: A multi-product approach [☆]



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ABSTRACT

This paper investigates the competitive aspects of multi-product banking operations. Extending Panzar and Rosse's (1987) model to the case of a multi-product banking firm, we show that higher economies of scope in multi-product banking are associated with lower Panzar–Rosse measures of competition in the banking sector. To test this empirical implication and determine the impact of multi-production on market power, we use a new dataset on the Brazilian banking industry. Consistent with our theoretical prediction, we find that banks that offer classic banking products (i.e., loans and credit cards) and other banking products (i.e., brokerage services, insurance and capitalization bonds) have substantially higher market power than banks that offer only classic products. These results suggest a positive bias in the traditional estimates of competition in which multi-output actions are not considered.

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1. Introduction

The global banking sector has experienced enormous changes in recent decades. Marked growth in technological and financial innovation and strong deregulation in the sector have led to increased banking concentration and to the creation of large financial conglomerates (Bikker and Haaf, 2002).

Curiously, the theoretical and applied literature has paid little attention to the competitive effects of multi-product operations in banking conglomerates. These institutions may be defined as entities that offer financial, banking and insurance services using the same corporative structure (Freixas et al., 2007). Possession of a multi-product structure allows these companies to benefit from economies of scale and scope and provides greater opportunities for risk diversification when supplying this range of services as a package.¹ Indeed, conglomerations and multi-product

operations have become a characteristic feature of the banking sector in recent years and have even received special attention in the new banking regulations drafted in the aftermath of the recent international financial crisis (see for example Levine (2012)).

Some studies in the literature have analyzed the cost efficiency of financial conglomerates and universal banks vis-à-vis commercial banks. Allen and Rai (1996), for instance, estimate economies of scale and scope in financial conglomerates by investigating countries with and without universal banks. Vander Venet (2002) empirically analyzes the cost and profit efficiency of European financial conglomerates and universal banks. However, the only research that has addressed the effects of multi-product operations on banking competition is that of Berg and Kim (1998). Berger and Kim analyze the behavior of banks operating simultaneously in the retail and corporate banking loan segments. The results revealed asymmetries in the degree of competition, which may be related to the characteristics of the consumers in each of these segments. Although important, Berger and Kim's article is essentially descriptive and does not investigate the possible relationship between multi-production operations and competition in the banking industry.

This article aims to theoretically and empirically fill the gap in the literature on the relationship between multi-production operations and competition by studying the effects of a multi-product structure on the patterns of competition in the banking sector. The operating costs of multi-product banks should be lower than

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¹ A more detailed discussion of the economic justification for the development of conglomerates may be found in studies by Milbourn et al. (1999) and Dierick (2004).

those of specialized banks if integration allows for the realization of operational synergy. In addition, these institutions may exhibit superior performance if informational or other advantages produce positive spillovers to the traditional and non-traditional banking activities that these banks undertake. Because multi-product operations can significantly change a bank's cost structure, it may also have a significant effect on banking competition.

In this paper, we examine the behavior and conduct of multi-product banks that supply classic bank products (i.e., loans and credit cards) and other bank products (i.e., brokerage services, insurance and capitalization bonds) compared to those of banks that offer only classic bank products. Multi-product banks that jointly offer classic and other bank products may benefit from economies of scope and may therefore be more efficient than two separate entities that specialize in offering either classic or other banking products. The sharing of inputs such as labor, technology and information across multiple outputs constitutes the major source of such potential cost savings. As documented by Vander Venet (2002), multi-product banks are more revenue-efficient than their specialized competitors, and the degree of both cost and profit efficiency is higher for universal banks than for non-universal banks. As Vander Venet shows, economies of scope in multi-product banks are one of the main forces driving improvements in measures of cost efficiency.

This paper departs from Panzar and Rosse's (1987) model to derive a theoretical model that explicitly analyzes the behavior and conduct of a representative multi-product bank that enjoys economies of scope in supplying classic and other banking products. Panzar and Rosse (1987) develop a model that allows for a distinction between perfect competition, monopolistic competition and monopoly. Panzar and Rosse's test procedure became prevalent in the literature largely due to the low level of information required about the sector under investigation. The level of market competition may be inferred using simple restrictions on the values of input price elasticity in the revenue equation. Panzar and Rosse show how the effects of variations in input prices on revenues in the banking sector are influenced by market power. The test statistic (H) for the level of competition is given by the sum of the elasticities of revenue in relation to input prices. A monopoly situation would be consistent with an H value less than or equal to 0 because the company would always operate in the elastic part of the demand curve. However, equilibrium with perfect competition would mean that H is equal to 1. In this market environment, a rise in input prices would lead to a proportional increase in both marginal costs and income within the sector. Finally, intermediate values of H that lie between 0 and 1 would be typical of monopolistic competition.²

We begin by extending the original Panzar and Rosse (1987) model to the case of a multi-product bank with economies of scope and computing the multi-product Panzar–Rosse H -Statistic. Second, we show how economies of scope at multi-product banks affect the H -Statistic. In particular, we find that greater economies of scope at multi-product banks are associated with a lower Panzar–Rosse H -Statistic. This relationship exists because a multi-product bank that supplies classic and other banking products benefits from economies of scope. Economies of scope reduce a bank's marginal costs for every product and therefore increase its price–cost margin (i.e., mark-up) in the banking and non-banking markets. Consequently, a multi-product bank will have a higher

mark-up than banks that supply only classic bank products. Finally, we develop an econometric strategy that allows us to test those theoretical predictions.

To test for such empirical implications, we must consider the multi-product dimension intended in our empirical analysis. Therefore, the dataset must be adjusted to include the accounting information of banking conglomerates instead of single institutions in some cases. This strategy is data-heavy because we must identify the final products and the individual institutions that compose a given banking conglomerate. In our empirical analysis, we used information on the Brazilian banking industry. Brazil is an ideal testing ground for the effects of multi-product banking using Panzar and Rosse's (1987) measure of competition for several reasons.

First, Brazilian regulatory authorities release accounting statements that include information for every banking conglomerate and the individual institutions that compose each banking conglomerate in Brazil. This fact is important in the present context because attempting to build accounting statements by simply aggregating individual records will produce misleading results. For example, intra-group credit operations, which could be miscalculated in an aggregation procedure, are already considered in the consolidated statements. In addition, regulatory authorities provide information on the final products offered by each individual institution. This information allows us to identify which bank products are supplied by which banking conglomerates and which accounting statements come from which banking conglomerates. These findings are crucial for testing the empirical implications described above and enable us to generate a new and complete dataset using account data for Brazilian individual banking institutions and banking conglomerates from 2001Q1 to 2012Q4.

We begin by estimating a cost function to evaluate the existence of global economies of scope in Brazilian banking system. The results suggest the occurrence of economies of scope, supporting the theoretical channel proposed in this article and the subsequent empirical analysis. Moreover, an individual banking-level measure of economies of scope is created and included in Panzar and Rosse's (1987) test. The results support the theoretical model's suggestion that economies of scope increase multi-product banks' market power.

Based on the extension of Panzar and Rosse's (1987) empirical test to the case of a multi-product banking firm, we infer the impact of multi-production operations in the banking sector on market power. We find that banks that offer classic products (e.g., loans and credit cards) and other products (e.g., brokerage services, insurance and capitalization bonds) have substantially greater market power than banks that offer classic products only. Therefore, Panzar and Rosse's (1987) test reveals that market power is underestimated when multi-product information is not considered.

To identify which of these other banks acquire increases in market power through multi-product banking, we estimate the market power of banks that offer the following products: (i) classic and other financial banking products (such as brokerage and currency exchange services), (ii) classic and other non-financial banking products (such as insurance, life insurance, capitalization bonds and reinsurance) and (iii) classic, financial and non-financial products with the banks that offer classic products only. Our estimates show that banks that offer any of these three product profiles enjoy greater market power than banks that offer only classic products. These results indicate that either financial or non-financial banking products may increase a bank's market power.

To summarize, our theoretical and empirical results suggest that empirical models that do not consider the multi-product

² Shaffer (1982, 1983) explores the relationship between the H -statistic, the conduct parameter proposed by Bresnahan (1982) and a firm's demand elasticity. In a recent paper, Bikker et al. (2012) show the implications of Panzar and Rosse's (1987) interpretation of the test, which uses specifications with price equations and includes firm scale controls.

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