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Capital intensities and international trade in banking services

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ABSTRACT

This paper examines the empirical implications of an international-trade-based view of the determination of banks' net export positions in the provision of lending and deposit services. This trade-based perspective on international banking emphasizes the importance of banks' expenses on labor and physical capital resources. Consequently, the theory indicates that relative abundances and intensities of these resources should play fundamental roles in influencing trade patterns in international bank loan and deposit markets. The paper focuses on the theory's implication that systematic relationships should exist between measured overall capital intensities of nations' banking systems and their net exports and imports of loans and deposits. Analysis of 2001–2012 data from 27 countries generally verifies the relationships predicted by the theory.

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1. Introduction

Traditionally, as discussed by [Aliber \(1984\)](#) and [Goldberg \(2009\)](#), the international banking literature has focused attention on foreign direct investment and international portfolio diversification as key elements influencing cross-border flows of banking services. Recent examples include [Buch \(2003\)](#), who applies to banks the theory of multinational firms and finds that both information costs and regulation play important roles in shaping the incentives to invest abroad, and [Buch and Lipponer \(2007\)](#), who find that in the case of German banks, foreign direct investment and exports of financial services are complements. These and other studies in the literature to date on international banking have emphasized long-term factors that shape the industry, such as the incentives to establish foreign subsidiaries rather than foreign branches and the effects of foreign direct investment on the net external position of banks.

The sharp volatility of international banking flows that has characterized the global crisis, particularly during the last months of 2008, has brought a renewed interest in the analysis of cross-country banking. Several studies that approached the problem have used the portfolio modeling strategy of finance theory, in which resource costs play no role. A recent relevant example is [Bruno and Shin \(2015\)](#), who develop a two-tier model of banking flows, in which both regional and global banks are described as pure financial assets whose portfolio choices are explained by means of the Vasicek model of loan portfolio value. In such a framework, as in others that follow similar approaches, banking flows are driven by supply-side impulses that define the degree of leverage of banks, while demand factors play a minor role. The crucial parameter influencing the allocation of the portfolio, the degree of leverage, and the share of assets allocated to foreign markets is the expected risk profile of the loan portfolio in different locations. In the case of [Bruno and Shin \(2015\)](#), currency movements generate changes in the risk profile of borrowers and thereby influence international creditors' incentives to lend. Bruno and

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Shin provide empirical support for the model by analyzing data from the Bank for International Settlements (BIS) on the cross-country exposure of banks relative to other banking sector counterparties.

In a similar vein, the empirical analysis performed by [Giannetti and Laeven \(2012\)](#), who use data on syndicated loans, suggests that international banks amplify international credit cycles as cross-country loans respond to the funding conditions of the countries in which the banks are domiciled. [Shirota \(2015\)](#) supports this view. Shirota studies BIS data on the banks' external claims vis-à-vis the banking and non-banking sectors by means of a Bayesian dynamic-latent-factor model. He finds that global and regional common factors explain close to 50% of the volatility in cross-country banking flows. Finally, [Kleimeier et al. \(2013\)](#) employ a BIS database on bilateral country-by-country banking flows. They estimate a gravity model with an aim to analyze the macroeconomic factors that drive these flows and to measure the impacts of crises on both cross-border loans and deposits. They find that deposits respond differently to alternative types of crises. Currency crises, they suggest, have a particularly strong impact on the market for loans, as cross-border loans rise significantly in response to the higher cost of domestic funding. Overall, [Kleimeier et al. \(2013\)](#) find that transactions costs, proxied by distance, have stronger effects on cross-country deposits than on loans.

Only a small portion of the literature has contemplated banking service flows from the perspective of international trade theory. Early theoretical work by [Sagari \(1989\)](#) provides an inter-industry, comparative-advantage-based perspective in which nations' international financial specializations reflect relative resource endowments and technological differences, with empirical analysis providing support for the importance of different technologies. A more recent analysis by [Niepmann \(2015\)](#) links a trade-based approach to the traditional international banking literature. Niepmann likewise concludes, however, that differences in relative endowments of tangible factor resources and in relative overall productive efficiencies of nations' banks should be important determinants of cross-border banking and finds that patterns in cross-country data are consistent with this prediction.

Other contributions have sought to apply essential implications of existing general models of international trade to evaluation of data on trade in banking services. For instance, [Moshirian et al. \(2005\)](#) seek to evaluate the Heckscher-Ohlin perspective on trade by examining the relative importance of nations' relative endowments of labor and physical and human capital and find supporting evidence in the data. [Wengel \(1995\)](#) and [Moshirian et al. \(2005\)](#) provide evidence favoring the relevance for banking services of more recent theories of intra-industry trade and economies of scale. These studies find evidence of considerable volumes of intra-industry trade in banking services and of a positive influence of economies of scale on these trading volumes.

This paper follows a different approach. We analyze international flows of bank loans and deposits from a perspective that explicitly takes into account the role of resource costs in banking. [VanHoose \(2013\)](#) has provided an explicit theoretical banking model that places international-trade incentives at the forefront. In contrast to prior work, this two-country, intra-industry-trade model allows for an individual nation's banks to emerge either as net exporters or importers of specific banking services, such as lending or deposit services. Within this framework, two sets of criteria influence which services banks export or import: (1) relative abundances of tangible factors, such as physical capital or labor, employed by banks in production of such services and (2) relative intensities of utilization of such factors. Thus, consistent with standard international trade analysis, but in contrast to the traditional international banking literature, this theory indicates that relative abundances and intensities of utilization of real resources should help to explain net flows of bank loans and deposits.

This paper offers a simple test of this international-trade-based perspective on international banking. We analyze the existing structure of the industry, without considering cross-border entry and exit decisions, and we focus on intra-industry competition across different countries. Our approach departs from the existing empirical literature, because we do not analyze the net external investment positions of banks. Instead, we examine the international competitive landscape for the provision of real-resource-intensive traditional banking services through loans and deposits. According to the theory, in fact, relative abundances and intensities of these tangible resources should play fundamental roles in influencing trade patterns in international bank loan and deposit markets.

We apply this basic theory to obtain a simple testable hypothesis that can lead to a clear empirical falsification or validation of the theory using available data from a multi-country setting. We do so by applying VanHoose's trade-based analysis to evaluate if variations in overall physical capital intensities of nations' banking systems are related systematically to those countries' observed net export or import positions of bank loans and deposits. In a multi-country setting, all bilateral positions are averaged across countries. Hence, we test the theory in a setting that is extremely challenging.

Examination of 2001–2012 data on net international lending and deposits positions and measures of overall physical capital intensities of banks from balance sheet data for 27 nations provides support for our hypothesized relationships. We find strong empirical evidence that loan and deposit exports respond to variations in bank capital intensity. In particular, we find that year-to-year changes in net exports of both loans and deposits decline when tangible capital intensities rise, indicating that cross-country differentials of resource availability and regulatory costs are important drivers of international flows of banking services. Our results on the influence of other macroeconomic variables on cross-border banking services are in line with the predictions of the theoretical model and support previous findings in the literature. For instance, like [Kleimeier et al. \(2013\)](#), we find that the size of the economy, the external balance, and interest rate differentials are significant explanatory variables.

The basic theoretical framework, which extends the theoretical approach developed by [VanHoose \(2013\)](#) to a multi-country setting, is discussed in Section 2. Section 3 presents the empirical model. Section 4 describes the construction of the database. Section 5 discusses the empirical results, and Section 6 concludes.

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