Desperately seeking cash: Evidence from bank output measurement ☆

Bertrand Groslambert [a], Raphaël Chiappini [b], Olivier Bruno [c,*]

[a] Université Côte d'Azur, SKEMA, France
[b] Université Côte d'Azur, CNRS, GREDEG, France
[c] Université Côte d'Azur, CNRS, GREDEG, SKEMA, OFCE-DRIC, France

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ABSTRACT

We examine the impact of a "near-zero" interest rate policy on bank output. Specifically, we document the existence of negative banking output on deposits for French banks from 2009. We show a structural break in banks' long run interest rate pass-through that explains this change in their business model during the 2003–2012 period. Since the crisis, banks are desperately seeking cash, and deposits have become a cost center. This is due to the new monetary policy and reveals banks' adaptation to the new banking regulation on liquidity. This new environment raises questions about banks' increasing exposure to interest rate risk and shows the necessity of co-ordinating monetary and regulatory policies.

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1. Introduction

In response to the financial crisis, central banks have implemented some unconventional and accommodative policies. However, in recent years, concerns have grown about the net benefits of prolonged monetary accommodation, especially the "near-zero" interest rate policy, for the economy as a whole and for the banking system in particular. Scholarly works that focus on the possible negative impact of such a policy belong to two paths: (1) studies that question the impact of a very low interest rate policy on bank leverage, risk-taking incentives, and financial stability (Dell'Ariccia et al., 2014; Rajan, 2013) and (2) studies that are concerned with the effect of such a policy on bank profitability (Alessandri and Nelson, 2015; Borio et al., 2015). The main results from these two strands of literature are that a low interest rate structure may have a negative effect on bank profitability and, more generally, on the soundness of the banking sector. Nevertheless, to our knowledge, no study has assessed the potential impact of the zero interest rate policy on banks' output or on the source of value-added in the banking industry. We address this question in this article.

Estimating the output of the banking system has long sparked debate in the literature (Sealey and Lindley, 1977) because many of the services that banks provide are not charged directly to customers. To deal with this issue, the System of National Accounts (SNA) (United Nations et al., 1993) developed an arbitrary method for calculating bank output, taking into account the difference between the rates of interest payable and receivable on loans and deposits. However, this approach is flawed because it uses the same single reference rate to measure the cost of funds related to all types of activities, regardless of their specific maturity and risk. Consequently, compensations for term and risk premiums are treated as productive services offered by the bank, while instead they should be recorded as a distribution of income to investors and lenders (Basu et al., 2011). The international community has recently recognized this problem and has advocated for the development of new approaches that can address this issue (United Nations, 2014). Against this background, Colangelo and Inklaar (2012) propose a new method using interest rate pass-through (IRPT) for choosing various reference rates to account for the term and risk premiums from calculating banking output. Moreover, IRPT is largely influenced by economics factors (De Bondt, 2005) and especially by the way banks react to monetary policy. Consequently, it is important to evaluate the impact of the zero interest rate policy on the pass-through of retail bank interest rates and estimate the global impact on bank value-added.

To address this question, we exploit an original database compiled by the Banque de France and investigate the production of financial

intermediation services over 10 years, before and after the financial crisis in the case of France. France is suitable for several reasons. First, the business model of French banks is mostly based on universal banking, which makes France a case with wide-ranging and global implications. Because French banks have a strong customer deposit base, a certain proportion of market funding, and good diversification in income sources, insights gleaned from studying this country are less likely to be driven by a specific type of business model. Second, to the best of our knowledge, the new approach for estimating bank output has not been applied to any individual country except the United States (Basu et al., 2011). However, the U.S. case is rather specific among the international community because it uses Treasury bonds as reference rate for estimating the bank output. By contrast, France, like many other European Union countries and Japan, uses an interbank rate as reference rate. Finally, France belongs to a group of countries that has experienced a declining share of finance in their gross domestic product (GDP) since the mid-1980s when estimated with the current SNA method (Philippon and Reshef, 2013). This evolution is opposite that of the United States and some other Anglo-American market-based countries, where finance has experienced an important growth in the past decades. Therefore, this makes France a more conservative benchmark than the United States when comparing the new method with the current SNA method.

Our main contribution is to establish the occurrence of negative banking output on deposits from 2009. We analyze this outcome by evaluating bank behavior with a pass-through process. We implement threshold cointegration and structural break tests and find evidence of a structural change in bank behavior between 2007 and 2009. We identify two complementary explanations for this result. The first is linked to the near-zero interest rate policy conducted by the European Central Bank (ECB). The low level of short-term interest rates and the slope of the yield curve reduce the returns from maturity transformation. The second explanation is more structural and is related to the new regulatory requirement on liquidity, which Basel III will impose. Deposits are now a vital, stable resource of liquidity for banks. For these reasons, banks decide not to pass on all the decrease in interest rate to the deposit rate. This means that banks have modified their business model, and the activity related to deposits has now become a cost center.

This result is consistent with recent studies on the evolution of banks' net interest margin after the crisis. For example, in the case of Germany, Busch and Memmel (2015) find that in the recent low-interest rate environment, banks' interest margins for retail deposits, especially for term deposits, have declined by up to 97 basis points. Similarly, analyzing a sample of 108 relatively large international banks, Borio et al. (2015) find that a low level of short-term interest rates and a flat yield curve have a negative impact on banks' net interest income, reflecting their negative effect on bank margins and on returns from maturity transformation, respectively. Finally, evidence for the United States (e.g., Genay and Podjasek, 2014) also reveals that banks are adversely affected by interest rates that are low for an extended period through a narrower net interest margin. However, none of these studies document the existence of negative banking output on deposits. Moreover, in contrast with these studies, the originality of our results relies on the implementation of a threshold cointegration analysis that supports a change in banks' behavior and business model following the new policy implemented by the central banks.

We are also interested in validating, for a single country, the application of the new method proposed by Colangelo and Inklaar (2012) for measuring bank output. Indeed, the choice of a reference rate using IRPT is sensitive to the time period. In addition, as Bernhofer and Van Treeck (2013) show, there is wide heterogeneity in the pass-through of market to bank rates among euro area countries. Our study confirms the results of Basu et al. (2011) for the United States and Colangelo and Inklaar (2012) for the euro area. We find wide divergence in bank output estimates obtained using the current and new method during times of financial stress for France. We show that the current method over-

estimates banking output by, on average, 31%–74% during the 2003–2012 period. This result could have wide-ranging implications, and the consequences of revising the method for computing bank output could have substantial impacts on GDP estimates.[1]

The organization of this article is as follows: Section 2 presents the analytical framework for the new measurement of banking output. Section 3 describes our database and methodology. Section 4 presents our main results, and Section 5 concludes.

2. The analytical framework: from the current to the new methodology for computing bank output

Debate on how to estimate the level of bank production began as early as 1952 when the first standardized SNA was implemented. Since then, most research has been devoted to improving the method, though the results of these efforts have been inconclusive.[2] The first difficulty is that financial institutions do not charge for the service they provide in the standard way that charges are imposed in the case of most goods and services. Banks do not charge explicitly for some of their services, instead deriving a significant part of their outcome implicitly from the interest rate margin between deposits and loans. This is called the financial intermediation services indirectly measured (hereinafter FISIM). The second problem is related to disentangling the parts of the spread that are due to the cost of funds and to the services offered by the bank. To overcome these difficulties, the SNA (United Nations et al., 1993, 2008) and the European System of Accounts (ESA) (European Commission, 1995, 2010) suggest using an arbitrary reference rate to represent the user cost of money. This is the method currently in use in most developed economies, with some variations across countries in its practical application. For example, in the United States, the Bureau of Economic Analysis uses the yield on Treasury bonds as the reference rate. Alternatively, in Europe, the ESA (2010) recommends using an internal reference rate calculated as the ratio of interest receivable on loans within financial institutions, to the stock of loans within financial institutions. However, independent of the choice of the interest rate, all these countries use the same "single reference rate" approach.

According to this rule of thumb, national statistical agencies calculate FISIM on deposits Y^D and FISIM on loans Y^L using a unique reference rate r^F. FISIM on deposits come from the difference between the reference rate r^F and the rate actually paid to depositors r^D times the deposit amounts:

$$\text{FISIM on deposits}: Y^D = deposits \times (r^F - r^D). \tag{1}$$

FISIM on loans are given by the difference between the rate paid to banks by borrowers r^L and the reference rate r^F times the loan amounts:

$$\text{FISIM on loans}: Y^L = loans \times (r^L - r^F). \tag{2}$$

Then, total FISIM is the sum of FISIM on deposits and FISIM on loans. Adding explicitly charged services to the FISIM and deducting intermediate consumption yields the following banking industry value-added:

$$\text{FISIM} + \text{Explicitly charged services} - \text{Intermediate consumption} = \text{Value} - \text{added}.$$

This method has been used since 1993. However, the 2008 financial crisis caused great volatility in the FISIM output and raised questions about its relevance and reliability. Research has shown that the results generated during this period are implausible (Davies, 2010). In some

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[1] For example, in the 1999 revision, implementation of the 1995 European System of Accounting for recording banking output increased the Netherlands' GDP by 1.8% (Bos, 2009).

[2] For a history of the calculation of output in the banking industry, see Vanoli (2005).