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A perspective on the symptoms and causes of the financial crisis

Ricardo Cabral*

University of Madeira, Department of Management and Economics, 9020-105 Funchal, Portugal
 Centro de Estudos de Economia Aplicada do Atlântico (CEEApIA), 9501-801 Ponta Delgada, Portugal

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ABSTRACT

Prior to the 2007–2008 financial crisis, banking sector profits were very high but the profitability of financial intermediation was poor. Using a novel model of banking, this article argues that the high profits were achieved through balance sheet expansion and growing default, liquidity, and term risk mismatches between assets and liabilities. As a result, large banks' financial leverage rose as they became less liquid, setting the conditions for a systemic banking crisis. This article argues that the increase in financial leverage was possible due to misguided changes in the regulatory framework, specifically, the Basel I capital accord and reductions in reserve requirements. Finally, this article overviews and assesses the policy response in the aftermath of the crisis.

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1. Introduction

In the years leading up to the 2007–2008 financial crisis (also known as Global Financial Crisis or GFC), banking systems in the western world reported high profits, strong balance sheets, and high Basel capital ratios. Even following the onset of the crisis, during the first half of 2007, the OECD,¹ the EC, the IMF, the Federal Reserve, and the ECB, among others, appraised the financial stability outlook and the overall economic prospects favorably, though sometimes noting downside financial risks.

Yet, a crisis that was initially thought to be contained in the “subprime market”² expanded rapidly to affect the world's largest financial institutions. By late 2008, several of the leading US and European banks would have failed but for massive government and central bank intervention in their support. This article contrib-

utes to the growing body of literature on the GFC. It focuses on two research questions.

The first research question, notoriously framed by the Queen of the United Kingdom,³ is “why did nobody notice [the financial crisis]?” The balance of evidence available prior to 2007 provided few clues to the impending banking sector crisis and, to the contrary, it suggested a healthy banking system. However, there were non-obvious symptoms of severe stress in banking sector activity that forewarned of the storm to come. This article identifies two banking paradoxes that might explain why the crisis caught so many by surprise.

The second research question I address in this article is “what were the causes of the GFC?” Some view accommodative US monetary policy during 2003–2005 as one of the main causes of the crisis (Taylor, 2009; Allen and Carletti, 2010). Others believe that the lack of regulatory oversight of the “shadow banking system” and lax lending standards in the sub-prime mortgage market were key contributing factors to the crisis (Adrian and Shin, 2009). Gorton and Metrick (2012) argue that a run on the repo market was the proximate cause of the GFC. Pozsar et al. (2010) suggest that the crisis occurred because the shadow banking system, in

* Tel.: +351 291 705 049; fax: +351 291 705 249.

E-mail address: rcabral@uma.pt¹ Hereafter, please refer to the List of Acronyms (Table 1) in Appendix B.² For example, Ben Bernanke, Chairman of the Board of Governors of the Federal Reserve System, stated “The impact on the broader economy and financial markets of the problems in the subprime market seems likely to be contained” (Prepared remarks, testimony before the US Congress Joint Economic Committee, March 28, 2007).³ “The Queen asks why no one saw the credit crunch coming,” The Telegraph, November 5, 2008.

contrast to the traditional banking system, lacked access to central bank lender-of-last resort liquidity. Kane (2009), in contrast, argues that this was a regulation-induced financial crisis. Unsustainable and non-transparent regulatory subsidies led to bad lending decisions (capital misallocation) and loan losses. Regulatory forbearance and financial deregulation facilitated the transfer of the losses to the taxpayer. Another line of thinking argues that the financial crisis is the consequence of large global (current account) imbalances (Allen and Carletti, 2010). Borio and Disyatat (2011) and Shin (2011) argue instead that the crisis was the result of “excess elasticity” in the international monetary and financial system. Global cross-border banks were able to increase financial leverage and global liquidity leading to an unsustainable boom.

The explanation advanced in this article focuses on the roles of the traditional banking system and its regulatory framework. It argues that the proximate causes of the crisis were low bank capital and a “vulnerable liquidity structure.” The first issue means that even low levels of losses would have rendered several large banks technically insolvent. The second issue means that, relative to the overall level and composition of liabilities, banks had insufficient levels of liquid assets (Gorton and Winton, 2003). As a result, some of the world’s largest banks could be brought to the brink of failure by relatively small bank runs.⁴

How, under the existing regulatory framework, were banks able to reach such dangerous positions? The short answer advanced here is that regulatory changes in the late 1980s and early 1990s likely allowed banks to reduce capital and reserve ratios. Specifically, the Basel I capital accord (Jackson et al., 1999; Jones, 2000; Allen, 2004) and lower minimum reserve requirements in advanced economies (Feinman, 1993; O’Brien, 2007), created incentives that led (large) banks to increase financial leverage and to reduce liquid asset ratios. Thus, similarly to Kane (2009), this article argues that a misguided regulatory framework was the most important contributor to the financial crisis. However, this article also supports the view of “excess elasticity” of the existing monetary and financial regimes (Borio and Disyatat, 2011; Shin, 2011), i.e., the financial regulatory framework imposed insufficient constraints on financial leverage growth by large global banks.

The paper is organized as follows. Section 2 introduces a novel model of banking. Section 3 investigates why the crisis caught so many by surprise. Section 4 looks into the causes of the financial crisis. Section 5 describes and evaluates the policy response to the crisis. Section 6 discusses the main results and policy implications.

2. Model specification

In the Industrial Organization (IO) type banking model developed in this article, banks have two categories of revenues. The first is fee and commission revenues charged by banks for the different services and transactions carried out for their customers, which fall under what is the financial brokerage function of banks.

⁴ Contrary to the general perception, anecdotal evidence suggests that the required (emergency) liquidity was small relative to banks’ balance sheet size. For example, Tim Congdon points out that in Jun. 2007, UK banks had less than £19.2bn of the most liquid forms of assets (cash and Treasury Bills), or about 0.6% of their total sterling liabilities (see “Pursuit of profit has led to risky lack of liquidity,” *The Financial Times*, Sept. 10, 2007). In fact, in the UK, the banks RBS and HBOS had to be saved through secret emergency loans by the Bank of England. These loans reached a combined £62bn at the peak of the crisis, or about 2% of these banks’ combined balance sheets (see “Bank of England reveals secret £62bn loans used to prop up RBS and HBOS,” *The Guardian*, Nov. 23, 2009). In the US, the bankruptcy court examiner report finds that the Lehman Brothers failure was the result of insufficient liquidity and lack of confidence by lenders and counterparties (Valukas, 2010). Lehman Brothers declared bankruptcy on Sept. 15, 2008, since it faced a cash shortage of \$4.5bn on that day, i.e., less than 1% of its \$700bn balance sheet (Valukas, 2010, Footnotes 37 and 48).

The second revenue category is related to the financial intermediation function of banks (Gorton and Winton, 2003; Allen and Santomero, 2001; Pozsar et al., 2010).

Financial intermediation is defined in this article as the managing and selling of different types of asset and liability balance sheet mismatches. It occurs if and only if the financial intermediary uses its balance sheet to intermediate between the financial claims of agents from whom it receives funds (“savers”) and the financial claims over the balance sheet of third party agents to whom it supplies funds (“borrowers”). Specifically, financial intermediation occurs when an institution accepts default, liquidity, and maturity risk mismatches between assets and liabilities, in exchange for an interest rate spread.^{5,6} Thus, financial intermediaries have a risk management function (Allen and Santomero, 2001).⁷ Moreover, this perspective expands the concept of financial intermediation (Shin, 2010). Specifically, proprietary trading, market making, and securitization businesses of investment banks and other non-bank financial intermediaries rely on balance sheet mismatches. Thus, they constitute financial intermediation activities.⁸

Consider first the default (or credit) risk. Banks derive a part of their net interest revenues (interest revenues less interest payments) from a default risk interest rate spread. This spread arises from the mismatch in the default risk of bank assets and liabilities.⁹ Under normal conditions, on average, banks have a lower default risk on their liabilities than the clients to whom the banks provide credit (Gorton, 2010; Pozsar et al., 2010).¹⁰ As a result, the default risk premium on bank liabilities is lower, on average, than the default risk premium on bank assets.¹¹ The pure default spread is the difference between the pure default risk premium the bank charges its borrowers less the pure default risk premium it pays its own creditors. This spread remunerates banks for the additional default risk they incur by extending a loan.

A second source of net interest revenues is the liquidity mismatch between bank assets and liabilities (Hull et al., 2005; Gorton

⁵ The terminology used in this article is based on Angbazo (1997), who identifies three main types of risk: default (or credit) risk, liquidity risk, and interest rate (or maturity) risk (see also Pozsar et al., 2010).

⁶ This approach has some similarities to earlier models. For example, Moore (1989) points out that banks earn profits through interest rate spreads between interest received on assets and paid on liabilities. Hannan and Berger (1991) develop a model where banks are price takers on the interest rate received on assets, but have some market power in defining the deposit interest rate. Drehmann et al. (2010) develop a model to estimate the impact of asset and liability portfolio repricing mismatches caused by credit and interest rate shocks on bank economic value and profitability.

⁷ Economic theory justifies the existence of financial intermediaries on the grounds of market imperfections – specifically, asymmetric information and transactions costs (Gorton and Winton, 2003; Gorton, 2010). Despite much improved information technology, which likely results in lower transaction costs and better access to information, the role of financial intermediaries has grown. Allen and Santomero (2001) argue that this fact can be interpreted as suggesting that market imperfections do not explain the existence of financial intermediaries.

⁸ These transactions involve the purchase and sale of financial assets. The assets are held temporarily on the balance sheet. Capital gains remunerate the financial intermediary for the asset-liability mismatch risks incurred on the transaction. Thus, trading revenues and some types of fee and commission revenues (often categorized as non-interest revenues by regulators) are a form of financial intermediation revenues.

⁹ Throughout the article, “interest rate spread” or simply “spread” refers to the difference between the interest rate “premium” received on assets and paid on liabilities (Moore, 1989). Interest rate premia refers to the gross interest rates on assets and on liabilities. For example, a bank which charges a default premium of 2 percentage points (p.p.) on its assets, while paying a 0.5 p.p. default risk premium on its liabilities, has a 1.5 p.p. default risk interest rate spread.

¹⁰ There are several possible explanations as to why banks may have lower default risk premia than their customers. First, banks are required by law to have significant capital ratios, which bear first losses. Banks also demand collateral from borrowers, which enhance the value of bank assets. Moreover, banks benefit from deposit insurance and implicit government guarantees, as well as from government supervision and regulations (Gorton, 2010; Pozsar et al., 2010).

¹¹ The pure default risk premium compensates the claim holder for the possibility that the loan or accrued interest will not be fully paid at maturity.

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