Journal of Banking & Finance 37 (2013) 5329–5345

Contents lists available at SciVerse ScienceDirect

Journal of Banking & Finance

journal homepage: www.elsevier.com/locate/jbf

Cross-country effects of regulatory capital arbitrage

Stanimira Milcheva *

University of Reading, Henley Business School, Department of Real Estate and Planning, Whiteknights, Reading, UK

ARTICLE INFO

Article history:
Received 4 July 2012
Accepted 5 May 2013
Available online 16 May 2013

JEL classification:
C15
E17
G18
G24

Keywords:
Global VAR
Counterfactual
Regulatory arbitrage
Capital requirements
Broker-dealer assets
Basel Accord
SEC net capital rule

ABSTRACT

One reason for the recent asset price bubbles in many developed countries could be regulatory capital arbitrage. Regulatory and legal changes can help traditional banks to move their assets off their balance sheets into the lightly regulated shadows and thus enable regulatory arbitrage through the securitized sector. This paper adopts a global vector autoregression (GVAR) methodology to assess the effects of regulatory capital arbitrage on equity prices, house prices and economic activity across 11 OECD countries/regions. A counterfactual experiment disentangles the effects of regulatory arbitrage following a change in the net capital rule for investment banks in April 2004 and the adoption of the Basel II Accord in June 2004. The results provide evidence for the existence of an international finance multiplier, with about half of the countries overshooting U.S. impulse responses. The counterfactual shows that regulatory arbitrage via the U.S. securitized sector may enhance the cross-country reallocation of capital from housing markets towards equity markets.

1. Introduction

Financial liberalization frequently leads to an expansion of credit and to asset boom–bust cycles in emerging countries. The attempt of institutions to lower the burden of financial market regulation may have led to a surge in capital inflows and to 'regulatory capital arbitrage' resulting in the emergence of asset price bubbles even in countries with well developed financial markets. The recent global financial crisis showed that, while originating in the U.S. subprime mortgage market, it was not limited to the U.S. economy but spread through the financial markets worldwide. Due to the international integration of financial and credit markets, changes in regulation in one region can drive investors to reallocate capital into less regulated financial markets and lead to cross-country arbitrage. Regulatory arbitrage is resulting from a different treatment of capital requirements between the banking systems of different countries/regions or between the traditional and the shadow banking system. Lightly regulated financial intermediaries open the door for traditional banks to escape tight capital requirements, as the former require less or no regulatory capital. Kim and Mangla (2012) explain the excessive flow of investment into the shadow banking sector with the 'too tight' regulation of the traditional financial intermediaries. Off-balance-sheet activities of banks can then free funds held as reserves against losses and increase credit provision. Bakk-Simon et al. (2012) show that the interconnection between the shadow and the traditional banking sector has increased in both the euro area and the U.S. and argue that a significant share of bank financing came from the shadow banking sector. According to Shin (2012), foreign global banks increasingly engaged in the U.S. shadow banking system, financing themselves through the U.S. wholesale market. Therefore, the important role played by the shadow banking system is not limited to the U.S. economy but may have an impact on foreign asset prices and economic activity, elevating the importance of financial market and economic spillovers across countries.

The objective of this paper is to assess the cross-border effects of regulatory capital arbitrage on domestic and foreign asset prices and economic activity. It contributes to the existing literature in two respects. First, the transmission of a U.S.-specific financial market shock to a broad sample of OECD countries/regions is assessed within a GVAR framework. Second, a counterfactual experiment, following the procedure developed in Pesaran et al. (2007), is employed in order to quantify the cross-country effects

* Tel.: +44 (0)118 378 8175; fax: +44 (0)118 378 8172.
E-mail address: s.milcheva@reading.ac.uk

0378-4266/$ - see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.jbankfin.2013.05.011

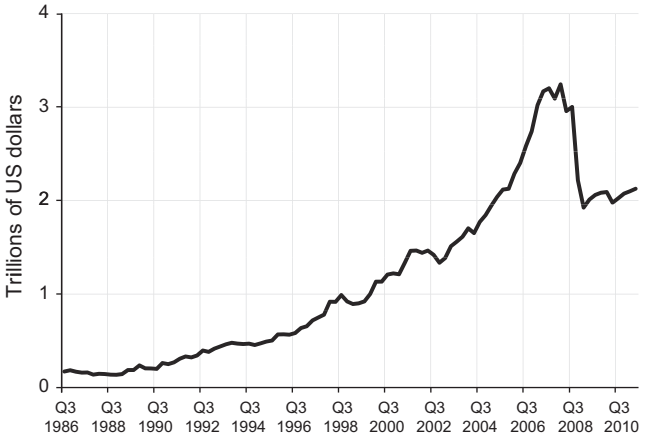

Fig. 1. Total assets of security broker-dealers in the U.S.

on asset prices and economic activity associated with two particular changes in financial market regulation in 2004.

In order to assess the effects of regulatory capital arbitrage, I look at the variations associated with changes in the balance sheets of broker-dealers, i.e. investment banks (see Fig. 1).[1] Broker-dealers make markets for tradable assets by originating new securities and producing derivatives.[2] With the increasing role of securitization, the capital market has partially substituted the less flexible retail deposits as a source of bank borrowing, thus strengthening the role of broker-dealers for credit supply (see Altunbas et al. (2009), Tucker (2010) and Gambacorta and Marques-Ibanez (2011)). According to Adrian and Shin (2010a), broker-dealer balance sheets "serve as a barometer of overall funding conditions in a market-based financial system" because they channel the ultimate supply of securitized credit to the real economy.[3] Such funding conditions depend mainly on fluctuations in regulatory capital ratios or haircuts. As far as regulatory arbitrage is associated with the possibility of domestic and foreign banks to move into the lightly regulated shadow sector, thus enabling them to escape tight regulatory capital ratios, variations of broker-dealer assets can be a good indicator of changes in the funding conditions and financial regulation.[4]

The effects of regulatory capital arbitrage associated with two regulation changes in 2004 for commercial and investment banks, are disentangled by a counterfactual experiment. One event, which could have affected the growth in broker-dealer assets is the adoption of the Basel II Accord in June 2004. Kroszner and Strahan (2011) describe the Basel process as one that "encouraged firms outside the regulatory umbrella to engage in activities traditionally done by those under the umbrella", thereby leading to the emergence of balance sheets of lightly regulated investment banks.[5] Investment banks received short-term funding from money-market funds in form of repurchase agreements (repos), collaterized by securitized assets, which, as Kroszner and Strahan (2011) argue, without regulatory arbitrage would have stayed on commercial bank balance sheets. In fact, investment banks increased their assets from 5% in 1990 to 25% in 2007 of those held by commercial banks, and about the half of them were financed through the repo market (Gorton and Metrick (2012)). Moreover, the adoption of the Basel II Accord could have contributed to procyclical capital provision and leverage by setting capital requirements based on asset quality instead of type and on their valuation using mark-to-market pricing (Agenor et al. (2009), Brunnermeier et al. (2009)). Shivdasani and Wang (2011) argue that the Basel II Accord created incentives regarding tranching in securitization and enabled banks to sell risky assets with high capital requirements via the issuance of collateralized debt obligations (CDOs). In turn they could invest in senior tranches, which require less capital, thus converting this regulatory framework into a key driver of excessive leverage in the securitized sector (see Morgan (2007)).

The other event, which is considered as a driving factor of the increase in balance sheets of investment banks in the last decade, is the change of the 1975 net capital rule for large broker-dealers in April 2004 by the Securities and Exchange Commission (SEC). The SEC decision allowed the big investment banks to apply for an exemption from the net capital rule, which required them to value their securities at market prices and to apply a haircut.[6] As a consequence of the regulatory change, the five biggest broker-dealers – Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley – were designated by the SEC as 'consolidated supervised entities' and could apply computer model simulations as in the Basel Accords to estimate their capital requirements. Several scholars, among them Ferguson (2008), Coffee (2008), Blinder (2009), Stiglitz (2009) and Hendershott and Villani (2012), have argued that, as a consequence, investment banks were able to increase the limits of their leverage from a maximum leverage ratio of 12% prior to the reform to more than 30% afterwards. An increase in the leverage can free funds held as a cushion against losses and be used for the purchase of securitized assets from banks, thereby increasing asset prices. Stiglitz (2009) describes the SEC decision in 2004 as a meeting "attended by virtually no one and largely overlooked at the time, to allow big investment banks to increase their debt-to-capital ratio so that they could buy more mortgage-backed securities, inflating the housing bubble in the process". Furthermore, Hall (2011) argues that the removal of the limits on the amount of leverage financial intermediaries can adopt following the SEC rule change was "the reason that Lehman was able to do what it did, which proved so destructive". Therefore, both regulation changes could have contributed to the creation of regulatory arbitrage and boost the demand for CDOs, leading to the unprecedented increase in the balance sheets of broker-dealers since 2004.

Most of the existing studies on the role of financial market regulation look at variations in regulatory capital requirements derived from a theoretical model (see Covas and Fujita (2010), Devereux and Yetman (2010), Gerali et al. (2010), Berka and Zimmermann (2011),

[1] The assets of broker-dealers increased strongly since the second quarter of 2004, consistent with the launch of two regulations. Between 2004 and 2007 broker-dealer assets have doubled, increasing from $1.6 trillion in the second quarter of 2004 to $3.2 trillion in the third quarter of 2007.

[2] See Pozsar et al. (2012) for a description of the credit intermediation through the shadow banking sector including broker-dealers.

[3] Broker-dealer assets are also a good indicator of the growth in the repo market, as they are financed to a large extent by repos (Gorton and Metrick (2010)).

[4] Adrian and Shin (2010b) show that the sizable increase in broker-dealer assets in the last decade was accompanied by a strong build-up in their leverage, with leverage growth positively related to asset growth along the 45-degree line. This implies that the adjustment in leverage takes place primarily through balance-sheet variations rather than through changes in equity. An increase in broker-dealer assets can thus be a sign of eluding tighter bank capital regulation or benefiting from looser shadow market regulation.

[5] According to Kroszner and Strahan (2011), the regulatory arbitrage and the resulting strong growth of the securities market besides to the Basel framework, which treated all loans to businesses equally, may be also due to the subsidized securitization by government sponsored enterprizes (GSEs), and the emergence of the asset-backed commercial paper market creating off-balance sheet conduits.

[6] "Under the SEC regulations, a broker-dealer must satisfy a minimum net capital ratio based either on a calculated ratio of capital to indebtedness (liabilities) or capital to customer-related receivables. Under the basic (or aggregate indebtedness) method, the capital a broker-dealer is required to maintain must be the greater of $250,000 or 6–2/3 percent of aggregate indebtedness (generally all the liabilities and/or obligations of the broker-dealer). The basic method is generally used by smaller broker-dealers. Under the alternative method, a broker-dealer is required to maintain capital equal to the greater of $250,000 or 2 percent of the total amount of customer-related receivables (money owed by customers and certain other market participants to the broker-dealer)." in GAO (1998, p. 55); see also the table in GAO (1998, p. 132).