

THE ROLE OF SHADOW BANKING IN THE BUSINESS CYCLE

ARKADIUSZ SIEROŃ

ABSTRACT: The aim of this article is to examine the impact of shadow banking on credit expansion and the business cycle. I focus on two main functions of the shadow banking system: securitization and collateral-intermediation. The former enables traditional banks to expand their credit activity, while the latter allows the shadow banks to create new money by themselves. Shadow banking shows that non-banking institutions can also conduct credit expansion and generate the business cycle. Thus, the Austrian business cycle theory should be extended to take into account the way in which shadow banking activity changed the conduct of credit expansion.

KEYWORDS: shadow banking, business cycle, credit expansion, Austrian business cycle theory, securitization, collateralization

JEL CLASSIFICATION: B53, E32, E51, G21, G23

The process of lending and the uninterrupted flow of credit to the real economy no longer rely only on banks, but on a process that spans a

Arkadiusz Sieroń (sieron.arkadiusz@gmail.com) is assistant professor of economics at the Institute of Economic Sciences at the University of Wrocław, Poland. The author would like to thank Harry David, Cassirer Colloquium participants, and anonymous reviewers for helpful comments and suggestions. The article is based on the third chapter of the author's doctoral dissertation entitled "The Effects of Money Supply Growth from the Perspective of the Cantillon Effect" and was partially made possible by a 2014 Summer Fellowship at the Ludwig von Mises Institute, Auburn, Ala.

network of banks, broker-dealers, asset managers, and shadow banks funded through wholesale funding and capital markets globally.

Pozsaret et al., 2013, p. 10

I. INTRODUCTION

According to the standard version of the Austrian business cycle theory (e.g., Mises, 1949), the business cycle is caused by credit expansion conducted by commercial banks operating on the basis of fractional reserve.¹ Although true, this view may be too narrow or outdated, because other financial institutions can also expand credit.²

First, commercial banks are not the only type of depository institutions. This category includes, in the United States, savings banks, thrift institutions, and credit unions, which also keep fractional reserves and conduct credit expansion (Feinman, 1993, p. 570).³

Second, some financial institutions offer instruments that mask their nature as demand deposits (Huerta de Soto, 2006, pp. 155–165 and 584–600). The best example may be money market

¹ I assume that the orthodox version of the Austrian business cycle theory is very well known among the readers of the *QJAE*. In short, commercial banks operating under the fractional reserve system can create circulation credit, which increases the money supply and lowers the market interest rate below the natural level determined by the social time preference. The expanded money supply and artificially lower interest rates result in the cluster of entrepreneurial errors or malinvestments. The initial boom inevitably leads to a bust, as consumer preferences did not change. See Hayek (1935), Mises (1949), Garrison (2001), Huerta de Soto (2006).

² To be clear, when I write about “credit expansion” I mean loans granted in excess of monetary savings available for lending. In other words, it is important to differentiate between “commodity credit” or “transfer credit” from “circulation credit.” According to Mises (1928, pp. 104–105), the former is credit “which a bank grants by lending its own funds or funds placed at its disposal by depositors,” while the latter is credit “which is granted by the creation of fiduciary media, i.e., notes and deposits not covered by money.” Hence, only an increase in circulation credit results in money creation and lowers interest rates, generating the business cycle. On the contrary, credit fully backed by reserves does not lead to such effects.

³ According to Palyi (1961, p. 138), “savings banks and associations do exactly what commercial banks do: they build a credit structure on fractional reserves.”

funds.⁴ These were created as a substitute for bank accounts, because Regulation Q prohibited banks from paying interest on demand deposits (Pozsar, 2011, p. 18 n22). Importantly, money market funds commit to maintaining a stable net asset value of their shares that are redeemable at will. This is why money market funds resemble banks in mutual-fund clothing (Tucker, 2012, p. 4), and, in consequence, they face the same maturity mismatching as do banks, which can also entail runs.⁵

Many economists point out that repurchase agreements (repos) also resemble demand deposits. They are short term and can be withdrawn at any time, like demand deposits. According to Gorton and Metrick (2009), the financial crisis of 2007–2008 was in essence a banking panic in the repo market ('run on repo').

This paper focuses on the effects of securitization and collateral-intermediation—two main functions of shadow banking—on the credit expansion and business cycle.⁶ The rationale for focusing solely on shadow banks is the quantitative unimportance of the saving institutions, whose assets possessed by them amount to only 7.55 percent of commercial banks' assets (Federal Deposit Insurance Corporation, 2014a, b), and the growing importance

⁴ There is a debate in the Austrian literature whether money market mutual funds should be considered money. Haymond (2000) argues that they are money substitutes, while Rothbard (1978), Salerno (1987) and Shostak (2000) disagree. Although the latter authors provide compelling arguments against treating money market mutual funds shares as money, they overlook that "money is what people consider as purchasing power, available at once or shortly" (Palyi, 1961, p. 137). Moreover, money market mutual funds filled the vacuum created by the cap on deposit insurance, which suggests that they act like demand deposits, hence they should be included in the money supply. A more detailed analysis of the definition of money supply is beyond the scope of this paper. Another example of demand deposit-like instruments, according to Huerta de Soto (2006, pp. 161–165 and 594–596), may be certain insurance companies that try to guarantee the immediate and complete availability of 'premiums' to the policyholder.

⁵ However, please note that new rules in force from October 2016 fundamentally changed the way that money markets funds operate. For example, they require a floating net asset value for institutional (but not for retail) prime money market funds (SEC, 2014). However, the detailed impact of that reform on money market funds is beyond the scope of this paper.

⁶ For discussion on the money market funds as the shadow banking institution and their connections with the securitization and collateral-intermediation, see Gorton, Metrick (2009) and Sanches (2014).

of shadow banks. Indeed, banking shifted “away from the traditional ‘commercial’ activities of loan origination and deposit issuing toward a ‘securitized banking’ business model, in which loans were distributed to entities that came to be known as ‘shadow’ banks” (Meeks et al., 2013, p. 5). This means that bank funding is based on capital markets to a larger extent than in the past and that banks are less dependent on traditional deposits (Loutskina, 2010).

According to the most common definition, shadow banking is “credit intermediation involving entities and activities outside the regular banking system” (Financial Stability Board, 2013, p. 1).⁷ Shadow banking is similar to depository banking also in that it transforms maturity and risk. In other words, shadow banks provide credit like traditional banks. However, they do not take retail deposits, but rely on wholesale funding and repo market. And as they lack access to a formal safety net and central bank reserves, they lend against collateral.

The two most important functions of shadow banking are securitization and collateral-intermediation. Securitization is “a process that, through tranching, repackages cash flows from underlying loans and creates assets that are perceived by market participants as fully safe,” while collateral-intermediation means “supporting collateral-based operations within the financial system, which involves the intensive re-use of scarce collateral” (Claessens et al., 2012, pp. 7, 14). Shadow banking is an empirically important topic because “in aggregate, the shadow banking system (non-bank credit intermediaries) seems to constitute some 25–30% of the total financial system and is around half the size of bank asset[s]” (Financial Stability Board, 2011, p. 8).⁸

⁷ Although the most common, this definition is far from being accurate, because not all entities with intermediate credit outside the banking system are shadow banks, and because many shadow banking activities operate within the regular banking system (Claessens, Ratnovski, 2014, p. 3).

⁸ “The US has the largest shadow banking system, with assets of \$25 trillion in 2007 and \$24 trillion in 2010” (Financial Stability Board, 2011, p. 8). According to Pozsar et al. (2010, pp. 7–9), the gross measure of shadow bank liabilities amounted to nearly \$22 trillion in June 2007, while total traditional banking liabilities were around \$14 trillion. Netted liabilities of shadow banking also were greater in comparison to traditional banking liabilities.

Therefore, the Austrian business cycle theory should take into account the significant impact of shadow banking on the credit expansion and business cycle and changes in the banking system. The contemporary banking system is largely market-based, in which origination of loans is done mostly to convert them into securities (instead of holding them in banks' balance sheets). There is a growing literature in mainstream economics about shadow banking and macroeconomic instability. However, there is lack of interest in this subject among Austrian economists, with the only exceptions being Gertchev (2009), and Giménez Roche and Lermyte (2016). This omission is a bit puzzling, given the Austrian school's concerns about the macroeconomic stability under the current financial system. Moreover, as far back as in 1935, Hayek ([1935] 2008, pp. 411–412) stated that banking is a pervasive phenomenon and, thus, traditional banking may evolve into other and less easily controllable forms with new forms of money substitutes. The aim of this article is to fill this gap, by showing how shadow banking impacts the credit expansion and, thus, the business cycle. The main findings are that securitization increases the traditional banks' ability to expand credit,⁹ while collateral-intermediation additionally enables shadow banks to create credit themselves. In both cases, shadow banks contribute to the credit expansion, further suppressing interest rates and exacerbating the business cycle.

The remainder of the paper is organized as follows. Section II analyzes the impact of securitization on the traditional banks' ability to create new loans and the course of the business cycle. Section III focuses on collateral-intermediation and examines how shadow banks can increase the supply of credit directly, by themselves. Section IV concludes.

⁹ Giménez Roche and Lermyte (2016) argue that only securitization within regulatory arbitrage exacerbates the business cycle, since "securitization *per se* as a simple 'originate and distribute' model does not display cycle amplifying effects in the Austrian sense," as "the scriptural credit that is securitized becomes a real credit through the transformation of deposits into investment." However, their conclusion depends on the assumption that purchasing securitized loans by the non-bank sector increases voluntary savings, while in reality it may merely change the composition of savings. A more detailed discussion of their interesting paper is, however, beyond the scope of this article.

II. THE IMPACT OF SHADOW BANKING ON THE TRADITIONAL BANKS' ABILITY TO EXPAND CREDIT

How does this securitization affect the credit expansion and business cycle? The first effect of securitization is to transfer the credit risk of the loans from the banks' balance sheets to the investors through asset-backed securities (Gertchev, 2009). This 'regulatory arbitrage' enables institutions to circumvent reserve and capital adequacy requirements and, consequently, to boost their credit expansion. This is because banks need to hold a minimum level of regulatory capital in relation to risk-weighted assets. When banks sell the pool of risky loans to a third entity, they decrease the amount of risky assets and improve their capital adequacy ratio. In that way, the transfer of loans increases banks' potential to create further loans without raising capital.¹⁰

The role of shadow banking in credit expansion may be illustrated by the fact that assets in the shadow banking system grew rapidly before the crisis, from \$27 trillion in 2002 to \$60 trillion in 2007, which coincided with sharp growth also in bank assets (Financial Stability Board, 2011, p. 8). Securitization creates, thus, the illusion that the activities of the commercial banks are less inflationary than they really are. In this way banks are able to grant as much in new loans as credits that have been securitized, which weakens the link between monetary base and credit supply, and, in consequence, the role of monetary policy. In other words, securitization expands the supply of credit by increasing the supply of pledgeable assets.

Second, securitization can be conducted for the purpose of using the securities created as collateral with the central bank to obtain funding (Financial Stability Board, 2013, pp. 17–18). Banks can also

¹⁰ Banks also decrease the credit risk by credit enhancement. A more detailed analysis of how securitization enables banks to reduce their regulatory capital requirement may be found in Jones (2000), Jablecki (2009), or Giménez Roche and Lermyte (2016). However, the regulatory arbitrage is not the only motive for securitization. Commercial banks also engage in such an activity because securitized assets are more pledgeable than the opaque and idiosyncratic loans they originally retain on the balance sheet. Securitization can, thus, transform risk faced by the commercial banks, but also fulfill demand by outside investors for good collateral. It can also be used to obtain funding from the central bank. I cover these motives in the main text.

use these securitized assets as collateral for repo funding from private institutions. In this way, they can get funds more cheaply and in larger volumes than if they relied on traditional liabilities such as deposits (Claessens et al., 2012, p. 12). With these funds, the creation of credit may expand.

Third, securitization enables banks to better satisfy financial institutions' demand for safe assets, because it transforms relatively risky, long-term, illiquid loans into safe, short-term and liquid 'money-like' claims. This feature also enables commercial banks to expand their credit creation to a greater extent.

Fourth, shadow banking increases the vulnerability of the financial system and makes the busts more severe. Undoubtedly, securitization may reduce idiosyncratic risk through diversification,¹¹ but simultaneously raises the systemic risk by exposing the system to spillovers in the event of large and negative shocks (Claessens et al., 2012, p. 27). This is because securitization expands banks' balance sheets, makes the portfolio of intermediaries more similar, reduces screening and increases financial links among banks, while a negative asset price shock tends to reduce shadow banks' net worth, constraining the supply of collateral for the commercial banks, leading them to deleverage, which further suppresses asset prices (Meeks et al., 2013, p. 8).¹² Moreover, shadow banks are subject to runs, because they have assets with longer maturities than liabilities, while they do not enjoy coverage under a formal regulatory safety net.¹³ Additionally,

¹¹ However, the financial crisis of 2007–2008 exposed a potential flaw in the securitization process, as the associated credit risk was not really diversified, but concentrated in certain segments of the financial market (Jablecki, 2009).

¹² On the other hand, it may be argued that shadow banks can, in a way, smooth the business cycle because they often expand credit when traditional banks contract it (Meeks et al., 2013, p. 5). In consequence, the correction and reallocation of resources are postponed.

¹³ Although customers may be aware of this fact, it does not change the fact that shadow banks are subject to runs, which—through the fire sales—threatens the stability of the financial system. Actually, some economists believe that the maturity mismatch in the shadow banking was a key ingredient to the financial crisis of 2007–2008 (Brunnermeier, 2009). It may be argued that if shadow banks did not create money on the basis of fractional reserves, most runs would not happen. It is worth pointing out here that "Firms that finance themselves solely in the *capital* markets—with long-term (debt) or perpetual (equity) sources of

Adrian and Ashcraft (2012) cite the procyclical behavior of shadow bank leverage and countercyclical behavior of its equity. There is a positive relationship between leverage and asset prices, while negative between leverage and risk premium, contributing also to the instability of the financial system.

Fifth, shadow banking decreases the power of monetary policy (Estrella, 2002). This is partially because shadow banking is not regulated in the same way as traditional banks, but mainly because securitization insulates banks' lending activity from the funds obtained from the central bank (Gertchev, 2009). In other words, such banks' lending depends less on the funding from central banks or regulatory requirements on capital and more on the well-functioning capital markets, including shadow banking, and their demand for securitized assets. Therefore, securitization decouples the link between monetary base and retail deposits on the one hand and credit supply on the other, since credit creation shifts in a way from commercial banks to the market-based financial institutions that purchase banks' loans (Fawley and Wen, 2013).

Sixth, because banks transfer risks that they originated to other agents, securitization reduces banks' incentives to carefully monitor and screen borrowers (thanks to securitization, banks do not have to hold loans on their balance sheets). The laxer credit standards and looser screening of borrowers led to higher credit growth in the 2000s, exacerbating the subsequent financial crisis. The securitization may be also associated with adverse selection, as banks have superior knowledge about the quality of loans they originate. Thus, banks might take advantage of their information and securitize loans of lower quality. The separation of functions of a loan's originator and a bearer of the loan's default risks resulted in a lower average quality of borrowers and higher delinquency rates, following the collapse of the U.S. subprime bubble in 2007 (Keys et al., 2008; Purnanandam, 2010).

Finally, credit expansion with securitization entails a different pattern of income and wealth redistribution compared to traditional credit expansion because some loans are more welcomed by banks to be used in this process. This induces banks to grant

financing—are not vulnerable to runs. Such firms can *default* of course, but the concept of a run implies something more than just a default" (Ricks, 2011, p. 84).

certain loans more often than without securitization. These loans are mostly mortgages, but also collateralized debt obligations and debt backed by credit cards, automobiles, and student loans.¹⁴ It means that borrowers dependent on such credit benefit through this Cantillon effect (Cantillon, 1755). During the boom of the 2000s, issuance of non-traditional asset-backed securities (such as subprime mortgages and collateralized debt obligations) considerably outstripped the issuance of traditional asset-backed securities (such as auto, credit card and student loan-backed securities) (Stein, 2010, pp. 43–43). Thus, securitization contributed significantly to the housing bubble in the U.S., but also in Spain, prior to the financial crisis of 2007–2008 (Carbó-Valverde et al., 2011). In this respect, it is worth pointing out that real-estate lending lowers financial stability and typically leads to deeper recessions and slower recoveries (Jordà et al., 2014). Moreover, as financial sector is deeply involved in securitization, credit expansion with securitization seems to support this sector relative to the traditional credit expansion.

To sum up, securitization does not allow shadow banks to create money and credit, because in this process they only pool, tranche, and sell loans marketed by traditional banks to investors. But they still significantly affect the transmission mechanism of monetary policy, credit expansion and the business cycle by enabling traditional banks to expand credit activity and affect the related Cantillon effect. In other words, securitization changed banks' business model from "originate and hold" to "originate and distribute," affecting their capacity to supply new loans and the quality of these new loans. The widespread use of securitization prior to the financial crisis of 2007–2008 increased the ability of banks to transfer risk, leading to more risk-taking and contributing to the subprime crisis. In the next section, I will discuss whether the shadow banking can create new credit.

¹⁴ "At the end of 2004, the larger sectors of [ABS] market are credit card-backed securities (21 percent), home-equity backed securities (25 percent), automobile-backed securities (13 percent), and collateralized debt obligations (15 percent). Among the other market segments are student loan-backed securities (6 percent), equipment leases (4 percent), manufactured housing (2 percent), small business loans (such as loans to convenience stores and gas stations), and aircraft leases" (Sabarwal, 2006, p. 259).

III. CAN SHADOW BANKING CREATE NEW CREDIT?

I have already analyzed how the shadow banks can indirectly affect the creation of new credit through securitization. Transferring loans from the traditional banks' books enables them to increase credit expansion, even with a constant monetary base. But shadow banks can also create credit directly through collateral-intermediation, which consists in multiple re-using collaterals.

As Singh and Stella (2012b) explain, "collateral that backs one loan can in turn be used as collateral against further loans, so the same underlying asset ends up as securing loans worth multiples of its value." In other words, thanks to rehypothecation, which means re-using the collateral pledged by the counterparty for its own use, collaterals can be re-used many times (Andolfatto et al., 2014, p. 2).¹⁵

The resemblance to fractional reserve banking is striking. Shadow banks have no access to central bank reserves, but they use collateral instead. Just as bank loans are a multiple of reserves, so, too, shadow bank loans are a multiple of collateral.¹⁶ At each round of bank lending, the ratio of broad money to reserves increases, although at a diminishing rate, based on the reserve ratio. Similarly, at each round of shadow bank lending, the ratio of loans to collateral increases, at a diminishing rate, based on the haircut. In both cases, deleveraging (and also runs) is possible. With traditional banks, this happens when loans are repaid, reserve diminishes, or the reserve ratio increases. With shadow banks, it occurs when collateral falls in value, the collateral chain shortens, or haircuts rise (Steele, 2014). One simply lends out the securities at the call for cash, and then makes loans or buys financial assets with a longer maturity (Tucker, 2012, p. 6).

Further, "if rehypothecation has occurred, the collateral taker is expected to return *equivalent* securities and not *exactly* the same

¹⁵ Therefore, rehypothecation should be differentiated from credit chains, which can be described as a "network of firms who borrow from, and lend to, each other" (Kiyotaki and Moore, 1997).

¹⁶ At the end of 2007, the *velocity of collateral*, i.e. the ratio of pledged collateral to underlying assets, was 3. This means that shadow banking system granted credit three times larger than underlying collateral (Singh, 2011, p. 15).

property initially received as collateral" (Singh, 2012, p. 6 n5). As with all deposits of fungible goods (also called irregular deposits), shadow banks are tempted to re-lend their clients' assets.¹⁷ Indeed, brokers and dealers, who should act as custodians by segregating securities in a client's account, repo securities for cash, and use the proceeds to finance their own businesses (Tucker, 2012, pp. 5–6). This is why multiple re-using of collateral does not merely facilitate the transfer of ownership of money, but instead increases the supply of credit.

Therefore, when the securities one party can call on demand are used to finance his broker's business, it is akin to the fractional-reserve banking and can explain why there are runs on shadow banks.¹⁸ Such activities of shadow banks were the source of instability for dealer banks in 2008, such as Bear Sterns, Merrill Lynch, and Lehman Brothers, contributing to the outbreak of the crisis (Claessens et al., 2012, pp. 16–17). Hedge funds that pledged collateral to Lehman Brothers were not able to retrieve it when Lehman went bankrupt because it had re-used it as its own collateral (Fender and Gyntelberg, 2008, p. 7).¹⁹

Perhaps the multiple re-using of collateral can be best understood by looking at institutions' financial statements: "Off-balance sheet item(s) like 'pledged-collateral that is permitted to be re-used,' are shown in footnotes simultaneously by several entities, i.e., the pledged collateral is not owned by these firms, but due to rehypothecation rights, these firms are legally allowed to use the collateral in their own name" (Singh, Aitken, 2010, p. 9). Importantly, this practice is legal and often, as in repo contracts, includes title transfer (Singh, 2012, p. 6 n5).²⁰ Andolfatto et al. (2014, p. 2)

¹⁷ Tangible assets, such as houses, cannot be rehypothecated because contractual rights limit third parties' appropriation of various assets such as residential property. However, securities can be repledged (Luttrell et al., 2012, pp. 35–36).

¹⁸ As in the so-called crisis of confidence that occurred after Lehman Brothers went bankrupt, confidence is so important in the modern banking system because it operates on fractional reserves, which simply cannot guarantee the fulfillment of the bank's commitments at all times. The same, perhaps, applies to re-using collateral.

¹⁹ It confirms the key role of the properly protected private property in the appropriate functioning of the market.

²⁰ According to the law, "in the United Kingdom, an unlimited amount of the customer's assets can be rehypothecated and there are no customer protection

write that the rehypothecation right is explicitly stated in most brokerage agreements and is beneficial for clients who can pay lower interest rates on their cash loans. Thus, the debate between supporters and opponents of rehypothecation resembles the debate between supporters and opponents of fractional-reserve banking.

Regardless, credit creation via collateral chains is a major source of credit in today's financial system, contributing to the business cycle (Brown, 2013). At the end of 2007, about \$3.4 trillion in "primary source" collateral was turned into about \$10 trillion in pledged collateral—a multiplier of about three. By comparison, M2 (including the credit money created by banks) amounted to about \$7 trillion in 2007 (Brown, 2013; Singh, 2012). In consequence, rehypothecation has been one of the dominant drivers of the financial crisis of 2007–2008 and the 2011 failure of MF Global (Maurin, 2015).

One can doubt whether rehypothecation affects the quantity of circulation credit and, thus, the level of the interest rate and the business cycle. It can be argued that collateral used in this process is not equivalent to money and that its re-use, although it may cause financial instability, does not lead to the creation of money.²¹ These are important concerns I will discuss now.

My point is that the textbook view, in which banks mainly take deposits from households and create credit upon them, is no longer valid. In my previous article (Sieroń, 2015), I showed that banks can conduct credit expansion not only by granting loans, but also by purchasing assets. Following this logic, banks can also create short-term wholesale deposits by using repo transactions and rehypothecation. If Bank A pledges collateral with Bank B to

rules. By contrast, in the United States, Rule 15c3–3 limits a broker-dealer from using its customer's securities to finance its proprietary activities. Under Regulation T, the broker-dealer may use/rehypothecate an amount up to 140 percent of the customer's debit balance. The EU law does not establish a quantitative cap on the rehypothecation of collateral pledged to broker-dealers akin to that found in the U.S. SEC Rule 15c3–3 ... [In Continental Europe,] law permits the parties to strike their own bargain as to how much (if any) collateral may be subject to rights of reuse" (Singh, Aitken, 2010, pp. 4–5). On different types of rehypothecation contracts, see Monnet (2012, pp. 20–12).

²¹ I would like to thank both referees for pointing out the apparent need to be clearer in this matter.

borrow a collateralized deposit, then Bank B can re-pledge collateral with Bank C to borrow another collateralized deposit (Sławiński, 2015).²² In other words, rehypothecation enables banks to obtain and provide funding from borrowed securities, which widens the set of assets against that credit can be granted, increasing the potential of credit expansion (von der Becke and Sornette, 2014).²³

I do not argue that these wholesale deposits, or repo transactions, are money proper. However, the key is here to notice that in the contemporary economies there are many money-like assets (and distinct forms of money for different economic agents). I agree that short-term liabilities issued by shadow banks may not be immediately used as means of payment, but they may be converted on demand at par to money proper, hence they are a close substitute (Michell, 2016).²⁴ As Ricks (2011, pp. 79–80) pointed out,

For practical purposes, most money market instruments can be instantly converted into the ‘medium of exchange’ at virtually no cost. The combination of these instruments’ liquidity and their negligible price fluctuation makes them a close substitute for deposits from the standpoint of their holders. Tellingly, financial managers usually refer to these instruments, together with deposits, simply as ‘cash,’ and money market investors are referred to in the industry as ‘cash investors.’ Nor is this terminology just a matter of market convention. Unlike other debt instruments, money market instruments are designated as ‘cash equivalents’ under generally accepted accounting principles.²⁵

Moreover, these near monies indirectly add to the money supply, as they economize on money proper and are now the most significant source of market funding for banks.²⁶

²² Please note that banks can first create deposits by purchasing securities, which they can later use (and re-use) as collateral for repo funding.

²³ This is because “potential credit creation depends on the availability of assets qualifying as collaterals for loans” (von der Becke, Sornette, 2014, p. 19).

²⁴ As Sławiński (2015, p. 196 n.5) pointed out, “wholesale deposits are easily convertible into central bank money (cash and liquid reserves) because large investment and universal banks are among central banks’ primary dealers.”

²⁵ Indeed, according to Sunderam’s empirical analysis, investors treat short-term debt issued by shadow banks as a money-like claim (Sunderam, 2015).

²⁶ As Hayek (1935, p. 290) noted, “it is necessary to take account of certain forms of credit not connected with banks which help, as is commonly said, to economize

Among such near monies are repos, which are “a kind of money used by institutional investors and nonfinancial firms that need a way to safely store cash, earn some interest, and have ready access to the cash should the need arise” (Gorton and Metrick, 2010). They act like bank deposits, but are secured (they are limits on deposit guarantees which would mean unsecured exposure to the bank for large depositors). The bank takes the client’s funds and issues a collateralized promise to give them back in the future.²⁷ Now, it should be clear that since repos are collateralized, multiple re-use of collateral increases the liquidity and the supply of credit. In other words, credit creation in a “securitized banking” increases money supply not by issuing deposits, but by short-term loans among institutional investors (von der Becke and Sornette, 2014).

Now, one would ask whether the credit supplied by the shadow banking is backed by voluntary savings. I argue that not, since in rehypothecation the same collateral backs several transactions (each loan is backed only up to certain fraction of collateral’s worth), which leads to the disequilibrium between savings and investments. This is exactly the case of retail deposits under the fractional banking when the same amount of reserves backs several deposits (each deposit is backed only up to a small fraction).²⁸

IV. CONCLUSION

The identity of who injects new money into and creates credit in the economy really matters. Regardless of whether these differences are large, they exist and lead to different manifestations of the Cantillon effect. What is important is that not only commercial banks can conduct credit expansion, but also non-bank financial institutions, such as shadow banks. The effect of shadow banking is extremely substantial, because it significantly affects the volume

money, or to do the work for which, if they did not exist, money in the narrower sense would be required.”

²⁷ A more detailed analysis of how repos work can be found in Gorton and Metrick (2010) or Gabor and Vestergaard (2016).

²⁸ Indeed, we can say that almost all money on retail deposit is effectively rehypothecated to other entities. Alternatively, if gold warehouses lend out deposited gold, we may say that they rehypothecate bullion.

and quality of credit and, thus, the course of the business cycle. Securitization enables traditional banks to expand their credit activity thanks to bypassing capital requirements and to broadening the sources of funding. In particular, securitization of loans enables banks to expand credit as securities can be posted as collateral. Here is where securitization and collateral-intermediation connect with each other. Importantly, the latter activity allows also shadow banks for expanding credit by themselves. This is because they can create liquid IOUs that function as near monies and are used as collateral against credit. The re-use of this collateral amplifies the credit creation.

Therefore, it seems that the Austrian business cycle theory should be extended, to incorporate changes in the banking system since the time it was formulated. In the contemporary banking, origination of loans is done mostly to convert them into securities, thus commercial banks are less dependent on retail deposits or central bank funding. Moreover, commercial banks are no longer practically the only institutions that can create credit. All these developments affect the transmission mechanism of monetary policy, weakening the relationship between monetary base and supply of credit, emphasized by the Austrian school.

The analysis of shadow banking and its impact on credit creation and business cycle shows one more thing. The current definition of money supply is too narrow and not sufficient to understand the contemporary economy (Pozsar, 2014). According to Pozsar (2014), the monetary aggregates do not include the instruments that asset managers use as money, particularly repos. As far back as 1935, Hayek (1935, pp. 411–412) doubted whether it is possible to draw a sharp line between what is money and what is not, and noted that all sorts of ‘near-money’ had already existed in his time. Hence, economists should, perhaps, also include in their monetary analysis ‘shadow’ money and re-use of collateral (Singh, 2012, p. 14–16).²⁹

The importance of collateral for the shadow banking system is, perhaps, best illustrated by the growing importance of

²⁹ Adrian and Shin (2009) even argue that because the role of commercial banks diminished in favor of market-based institutions, market-based liabilities, such as repos and commercial paper, may be better indicators of credit conditions than traditional monetary aggregates.

securitization in the 2000s. Sanches (2014, p. 10) argues that decision to reduce fiscal deficits in the United States in the 1990s and early 2000s caused the shortage of government bonds, i.e., the standard collateral, and led to mortgage-backed securitization, which supported the real-estate boom, but aggravated the following crisis. This significance of collateral for the shadow banking system also explains, perhaps, why the quantitative easing did not significantly stimulate the economy. This program consisted in purchasing securities from the banking sector. In this way, the quantitative easing removed part of the collateral needed by the shadow banking system to create credit (Singh, Stella, 2012a).³⁰

Hence, the history of shadow banking development confirms Mises's thesis that each government intervention leads to some unintended consequences (Mises, 1949).³¹ Regulation Q led to the emergence of alternatives to bank deposits, such as money market funds and repos, while reserve and capital adequacy requirements encouraged the regulatory arbitrage through securitization. Later, the Fed's purchases of treasuries aimed to stimulate economy created a shortage of safe collateral, the very thing needed to create credit in the shadow banking system (Kessler, 2013).

REFERENCES

- Adrian, Tobias and Adam B. Ashcraft. 2012. "Shadow Banking: A Review of the Literature." *Federal Reserve Bank of New York Staff Reports*, No. 580, October.

³⁰ It is illustrated by the simultaneous growth of the money supply measured by the M2 and decline in the volume of private broad money (Pozsar, 2011, pp. 10–11). It confirms that monetary inflation does not neutralize monetary deflation, because it is highly unlikely that new money flows directly into the hands that lost it.

³¹ US inflationary policy in general leads to unintended consequences and is self-defeating, at least in regard to collateral, because increasing the money supply by the Fed causes the reserve accumulation by the foreign central banks, mostly in the form of US government guaranteed securities, leading to a lack of collateral (Pozsar, 2011, p. 17). Finally, we should not forget that "MBSs developed in the United States under the patronage of government-sponsored enterprises (GSEs) such as Fannie Mae and Freddie Mac that aim at creating a secondary market for home mortgage loans" (Gertchev, 2009). Indeed, the government-sponsored enterprises were the major contributors to the expansion of bank loan securitization (Loutsikina, 2010), which shows that the development of shadow banks resulted partially from the government intervention in the financial sector.

- Andolfatto, David, Fernando Martin, and Shengxing Zhang. 2015. "Rehypothecation and Liquidity," *Federal Reserve Bank of St. Louis Working Paper*, No. 2015-003B, May.
- Brown, Ellen. 2013. "QE3 and the Shadow Banking System," *Counterpunch*, July 23, 2014. Available at <http://www.counterpunch.org/2013/07/23/qe3-and-the-shadow-banking-system/>.
- Brunnermeier, Markus K. 2009. "Deciphering the Liquidity and Credit Crunch 2007-2008," *Journal of Economic Perspectives* 23, no. 1: 77-100.
- Cantillon, Richard. 1755. *Essay on the Nature of Trade in General*. London: Frank Cass and Co., 1959.
- Carbó-Valverde, Santiago, David Marqués-Ibáñez, and Francisco Rodríguez Fernández. 2011. "Securitization, Bank Lending and Credit Quality: The Case of Spain," *European Central Bank Working Paper Series*, No. 1329, April.
- Claessens, Stijn, Zoltan Pozsar, Lev Ratnovski, and Monmohan Singh. 2012. "Shadow Banking: Economics and Policy," *I.M.F. Staff Discussion Note*, No. SDN/12/12.
- Claessens, Stijn and Lev Ratnovski. 2014. "What Is Shadow Banking," *IMF Working Paper*, WP/14/25.
- Estrella, Arturo. 2002. "Securitization and the Efficacy of Monetary Policy," *Economic Policy Review*, Federal Reserve Bank of New York, May.
- Fawley, Brett W. and Yi Wen. 2013. "Low Inflation in a World of Securitization," *Economic Synopses*, Federal Reserve Bank of St. Louis, No. 15.
- Federal Deposit Insurance Corporation. 2014a. *Statistics on Depository Institutions Report: All Savings Institutions*. Available at <http://www2.fdic.gov/SDI/main4.asp>.
- . 2014b. *Statistics on Depository Institutions Report: All Commercial Banks*. Available at <http://www2.fdic.gov/SDI/main4.asp>.
- Feinman, Joshua N. 1993. "Reserve Requirements: History, Current Practice, and Potential Reform," *Federal Reserve Bulletin*, June. Available at <http://www.federalreserve.gov/monetarypolicy/0693lead.pdf>.
- Fender, Ingo and Jacob Gyntelberg. 2008. "Overview: Global Financial Crisis Spurs Unprecedented Policy Actions," *BIS Quarterly Review*, Dec., 1-24.

- Financial Stability Board. 2011. "Shadow Banking: Strengthening Oversight and Regulation: Recommendations of the Financial Stability Board." Available at http://www.financialstabilityboard.org/publications/r_111027a.pdf.
- . 2013. *Global Shadow Banking Monitoring Report* 2013. Available at: http://www.financialstabilityboard.org/publications/r_131114.pdf.
- Gabor, Daniela and Jakob Vestergaard. 2016. "Towards a Theory of Shadow Money." *Institute for New Economic Thinking Working Paper*, April.
- Garrison, Roger. 2001. *Time and Money: The Macroeconomics of Capital Structure*, New York: Routledge.
- Gertchev, Nicolai. 2009. "Securitization and Fractional-Reserve Banking." Available at: <https://mises.org/library/securitization-and-fractional-reserve-banking>. Accessed June 29, 2014.
- Giménez Roche, Gabriel A. and Jason Lermyte. 2016. "Securitization and Regulatory Arbitrage within the ABCT Framework," *Review of Austrian Economics* 29, no. 1: 67–84.
- Gorton, Gary B. and Andrew Metrick. 2009. "Securitized Banking and the Run on Repo," *NBER Working Paper Series*, No. 15223.
- . 2010. "Haircuts," *Federal Reserve Bank of St. Louis Review* 92, no. 6: 507–519.
- Hayek Friedrich A. 1935. *Prices and Production*. In Joseph T. Salerno, ed., *Prices and Production and Other Works*. Auburn Ala.: Ludwig von Mises Institute, pp. 189–329, 2008.
- Haymond, Jeff. 2000. "Are MMMFs Money?" *Quarterly Journal of Austrian Economics* 3, no. 4: 53–68.
- Huerta de Soto, Jesús. 2006. *Money, Bank Credit, and Economic Cycles*. Auburn, Ala.: Ludwig von Mises Institute.
- Jablecki, Juliusz. 2009. "The Impact of Basel I Capital Requirements on Bank Behaviour and the Efficacy of Monetary Policy," *International Journal of Economic Sciences and Applied Research* 2, no. 1: 16–35.
- Jones, David. 2000. "Emerging Problems with the Basel Capital Accord: Regulatory Capital Arbitrage and Related Issues," *Journal of Banking and Finance* 24, nos. 1–2: 35–58.

- Jordà, Òscar, Moritz Schularick, and Alan M. Taylor. 2014. "The Great Mortgaging: Housing Finance, Crises, and Business Cycles," *NBER Working Paper Series*, No. 20501, September.
- Kessler, Andy. 2013. "The Fed Squeezes the Shadow-Banking System," *Wall Street Journal*, May 23. Available at: <http://online.wsj.com/news/articles/SB10001424127887323628004578456991962372414?mg=reno64-wsj&url=http%3A%2F%2Fonline.wsj.com%2Farticle%2FSB10001424127887323628004578456991962372414.html>.
- Keys, Benjamin J., Tanmoy Mukherjee, Amit Seru, and Vikrant Vig. 2008. "Did Securitization Lead to Lax Screening? Evidence from Subprime Loans," *EFA 2008 Athens Meetings Paper*. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1093137.
- Kiyotaki, Nobuhiro and John Moore. 1997. "Credit Chains," Mimeo, London School of Economics.
- Loutskina Elena. 2010. "The Role of Securitization in Bank Liquidity and Funding Management," *Journal of Financial Economics* 100, no. 3: 663–684. Available at SSRN: <http://ssrn.com/abstract=677001>.
- Luttrell, David, Harvey Rosenblum, and Jackson Thies. 2012. "Understanding the Risks Inherent in Shadow Banking: A Primer and Practical Lesson Learned," *Federal Reserve Bank of Dallas Staff Papers*, No. 18, November.
- Maurin, Vincent. 2015. "Re-Using Collateral: A General Equilibrium Model of Rehypothecation," European University Institute, February.
- Meeks, Roland, Benjamin D. Nelson, and Piergiorgio Alessandri. 2013. "Shadow Banks and Macroeconomic Instability," *Bank of Italy Working Paper*, No. 939, November.
- Michell, Jo. 2016. "Do Shadow Banks Create Money? Financialisation and the Monetary Circuit," *UWE Economics Working Paper Series*, No. 1602.
- Mises, Ludwig von. 1928. *Monetary Stabilization and Cyclical Policy*. In Percy L. Greaves Jr. ed., *The Causes of the Economic Crisis and Other Essays before and after the Great Depression*, Auburn, Ala.: Ludwig von Mises Institute, pp. 53–153.
- . 1949. *Human Action: A Treatise on Economics*, Scholar's Edition, Auburn, Ala.: Ludwig von Mises Institute, 1998.

- Monnet, Cyril. 2011. "Rehypothecation," *Business Review*, Federal Reserve Bank of Philadelphia, Q4.
- Palyi, Melchior. 1961. *An Inflation Primer*. Chicago: Henry Regnery.
- Pozsar, Zoltan, Tobias Adrian, Adam Ashcraft, and Hayley Boesky. 2010. "Shadow Banking," *Federal Reserve Bank of New York Staff Reports*, No. 458.
- . 2011. "Institutional Cash Pools and the Triffin Dilemma of the U.S. Banking System," *IMF Working Paper*, No. WP/11/190.
- . 2013. "Shadow Banking," *Federal Reserve Bank of New York Policy Review*, Dec. Available at <http://www.newyorkfed.org/research/epr/2013/0713adri.pdf>.
- Pozsar, Zoltan. 2014. "Shadow Banking: The Money View," *Office of Financial Research Working Paper*, No. 14-04, July 2, 2014.
- Purnanandam, Amiyatosh K. 2010. "Originate-to-Distribute Model and the Subprime Mortgage Crisis," *AFA 2010 Atlanta Meetings Paper*. Available at SSRN: <http://ssrn.com/abstract=1167786>.
- Ricks, Morgan. 2011. "Regulating Money Creation after the Crisis." *Harvard Business Law Review* 1, no. 1, pp. 75–144.
- Rothbard, Murray N. 1978. "Austrian Definitions of the Money Supply." In Louis M. Spadaro, ed., *New Directions in Austrian Economics*. Kansas City: Sheed, Andrews and McMeel, pp. 143–156.
- Sabarwal, Tarun. 2006. "Common Structures of Asset-Backed Securities and Their Risks," *Corporate Ownership and Control* 4, no. 1: 258–265.
- Salerno, Joseph T. 1987. "The True Money Supply: A Measure of the Supply of the Medium of Exchange in the U.S. Economy," *Austrian Economics Newsletter* 6, no. 4: 1–6.
- Sanches, Daniel. 2014. "Shadow Banking and the Crisis of 2007–08," *Business Review*, Federal Reserve Bank of Philadelphia, Q2.
- Securities and Exchange Commission. 2014. "SEC Adopts Money Market Fund Reform Rules." Available at: <https://www.sec.gov/News/PressRelease/Detail/PressRelease/1370542347679>.
- Shostak, Frank. 2000. "The Mystery of the Money Supply Definition," *Quarterly Journal of Austrian Economics* 3, no. 4: 69–76.

- Sieroń, Arkadiusz. 2015. "Disaggregating the Credit Expansion: The Role of Changes in Banks' Asset Structure in the Business Cycle," *Quarterly Journal of Austrian Economics* 18, no. 3: 247–271.
- Singh, Manmohan and James Aitkien. 2010. "The (Sizable) Role of Rehypothecation in the Shadow Banking System," *IMF Working Paper*, No. WP/10/172.
- Singh Manmohan. 2011. "Velocity of Pledged Collateral: Analysis and Implications," *IMF Working Paper*, No. WP/11/256.
- . 2012. "The (Other) Deleveraging," *IMF Working Paper*, No. WP/12/179.
- Singh, Manmohan and Peter Stella. 2012a. "Money and Collateral," *IMF Working Paper*, No. WP/12/95.
- . 2012b. "The (Other) Deleveraging: What Economists Need to Know about the Modern Money Creation Process." Available at: <http://www.voxeu.org/article/other-deleveraging-what-economists-need-know-about-modern-money-creation-process>.
- Sławiński, Andrzej. 2015. "Shielding Money Creation from Severe Banking Crises: How Useful Are Proposals Offered by the Alternative Reform Plans?" *Bank and Credit* 46, no. 3: 191–206.
- Steele, G. R. 2014. "Casting a Shadow on Banking," Institute of Economic Affairs. Available at <http://www.iea.org.uk/blog/casting-a-shadow-on-banking>.
- Stein, Jeremy C. 2010. "Securitization, Shadow Banking and Financial Fragility," *Daedalus* 139, no. 4: 41–51.
- Sunderam, Adi. 2015. "Money Creation and the Shadow Banking System," *Review of Financial Studies* 28, no. 4: 939–977.
- Tucker, Paul. 2012. "Shadow Banking: Thoughts for a Possible Policy Agenda," *European Commission High Level Conference*, Brussels, April 27.
- Von der Brecke, Susanne, and Didier Sornette. 2014. "Toward a Unified Framework of Credit Creation," *Swiss Finance Institute Research Paper*, No. 14-07. Available at: <https://ssrn.com/abstract=2395272>.