

## Shadow banking, relationship banking, and the economics of depression

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In the last thirty years, the qualitative and quantitative proliferation of securitisation has been central to the evolution of financial markets and its associated instability phenomenology (Kregel, 2011). Still, a theoretical consensus on the working of securitisation, not to mention its macroeconomic role (e.g. in terms of growth or inequality), is still lacking.

Securitisation consists in “the issuance of debt securities for which coupon or principal payments are backed by specified assets or by future income streams” (Eurostat, 2013, 5.104). Being collateralized by the cash flow produced by a predetermined pool of financial or non-financial assets (*ibid.*, 5.110, 20.260), these debt securities are called asset-backed securities (ABSs). The collateral, inasmuch as it is part of the originator’s assets and thus can conceivably be used to satisfy other creditors’ claims, is segregated into legally separate entities called financial vehicle corporations (FVCs) (*ibid.*, 2.90).

In surveying the pertinent literature, Gorton and Metrick (2012) conclude that the most basic questions in securitisation are still open, and recommend the study of securitisation as “an opportunity to examine some basic issues in financial economics and macroeconomics”. Not only economists but also accountants lagged their theories behind this epochal transformation in the financial system (Arnold, 2014). Recent events unveiled the need for new statistics to capture the working of actual financial markets (Borio, 2013; BOE, 2014). As it happens, shadow banking developed in a theoretical and accounting vacuum. The popularized myth was that securitisation provided diversification to issuers, flexibility to investors, and ‘democracy’ to borrowers (cf. Cowan,

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2003). This intriguing narrative supported shadow banking by indirectly discrediting the ‘oligarchic’ bias of relationship banking (credit constraints).

After the crisis, the idea of ‘predatory lending’ superseded the ‘democratic collateral’ myth and economists were forced to reconsider their conventional simplistic account of the macroeconomic role of financial markets. The macroeconomics of shadow banking is, however, still at an embryonic stage (Brunnermeier and Sannikov, 2014; Moreira and Savov, 2014; Pozsar, 2015). Many scholars draw inspiration from the minority reports of economic theory. In this sense, though not dealing with securitisation, the work of a number of staff economists at the Bank of England (BOE) deserves a special mention. McLeay *et al.* (2014) draw attention on bank deposits – by large the dominant medium of exchange in any modern economy – and suggest looking at their evolution as a consequence (indicator), not a premise (driver), of bank credit. The causality goes the other way round than the conventional doctrine pretends: lending creates deposits, not vice versa. Jakab and Kumhof (2015) trace a history of this unconventional doctrine and show that DSGE models with banks doing ‘finance through money creation’ (FMC) can predict changes in bank lending that are much more meaningful than those predicted by DSGE models with banks doing ‘intermediation of loanable funds’ (ILF).

In this workflow at the BOE, however, shadow banking is not an issue as yet: it’s all about ‘pure and simple’ banking. The present article comes to grips with the difference between shadow and relationship banking through a FMC perspective.<sup>1</sup> Here, relationship and shadow banking are restrictively interpreted as the originate-to-hold (OTH) and the originate-to-distribute (OTD) models of banking, respectively. Economists are used to consider OTH and OTD as models of credit risk management: banks are supposed to originate their own (illiquid) assets and either hold or distribute the associated *credit* risks (e.g. Brunnermeier, 2009; Bord and Santos, 2012). In the OTH model, banks

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<sup>1</sup> Werner (2014) verifies that that the minority FMC theory holds empirically, whereas the conventional ILF theory does not.

would originate loans and hold them, managing credit risk by screening and monitoring borrowers; in the OTD model, banks would originate loans whose credit risk is distributed through securitisation procedures (Gennaioli *et al.*, 2013).

I deem this perspective on OTH and OTD questionable: how could one originate (issue) his/her own *assets*? I rather argue that banks can only originate (issue) their own *liabilities*, e.g. deposits (OTH) or asset-backed-securities (OTD). Accordingly, the OTH and OTD approaches should rather be interpreted as alternative approaches to the management of the rise in liquidity risk associated with (inside) money creation (FMC).

Banks create money when purchasing the IOUs that borrowers originate. Of course, these obligations are worth the sum of principal and interest, with banks paying out no more than the principal. The critical feature of a FMC perspective is that banks do not disburse excess reserves but literally create their own funding out of nothing, by simply crediting a borrower's accounts of that principal. Inside money is created by the stroke of a pen and is progressively destroyed as the borrower's debt is repaid.

The fact that borrowers' issuance of IOUs lays the first stone of the bank lending process implies that (inside) money creation is driven by borrowers' demand for liquidity (debt supply): this concept is what the reference in the title to the 'economics of depression' hints at. Keynes ([1936] 1973) emphasised the role of the state of long-term expectations – confidence in *non-financial* investment opportunities (animal spirits) – as the key driver of macroeconomic dynamics. However, Keynes may have overplayed the role of meta-economic determinants as he insisted too little that animal spirits (“defeat the dark forces of time and ignorance which envelop our future”, p. 155) must be first and mostly considered in relation to the parallel state of confidence in *financial* investment opportunities (“beat the gun”, *ibid.*). This was conceivably due to the fact that his *General Theory* “omit[ted] express reference to *short-term* expectations” (*ibid.*, p. 50, italics in original).

This omission has had a tremendous impact on the birth and development of macroeconomics. Contemporary mainstream macro models

are essentially based on three equations: one for the demand side, one for the supply side, and one for the policy maker's behaviour. The demand side is typically encapsulated in the IS curve, which captures the way current expenditure affects aggregate output. When expenditure equals output, an equilibrium in the goods market is realized, so that planned investment ( $I$ ) equates saving ( $S$ ): that is how the IS-based approach implies the ILF theory of banking. The connection of this approach with the "efficient market" and similar hypotheses that let macroeconomists do macroeconomics-without-finance is only too obvious.

In a sense, this paper explores whether a FMC theory of banking implies a reconsideration of demand-side macro theory as well, which is why these pages heavily rely on accounting. Both the birth of macroeconomics and the spread of economic management principles in modern societies owe much to the movement of accounting expressionism (Suzuki, 2003). The "money view" of shadow banking (Mehrling, 2010; Mehrling *et al.*, 2013; Pozsar, 2014) draws on an accounting approach, too. Accounting is economists' *lingua franca*. The model presented here captures a simple sequential monetary circuit: the sequence is so devised as to put the opposition shadow vs. relationship banking to the fore, and thus it provides a simple methodological account of the working of financial markets and their impact on the economy. Here, this impact is considered from an *ex ante* perspective, that is why I adopt "changes in balance-sheet" (LX) accounts rather than financial accounts (flows of funds). LX accounts record changes in the value of assets and liabilities occurring in the accounting period, and aggregate the amounts recorded in the various accumulation accounts (Eurostat, 2013, 8.62).

## 1. Basics of the model

Let us assume a macroeconomic system in which:

- (i) a non-financial corporate sector operates production plans;
- (ii) a financial corporate sector finances production plans through money creation;
- (iii) the public sector does not change its fiscal and monetary stance;
- (iv) households operate consumption plans;
- (v) non-profit institutions and the rest of the world are irrelevant.

We can frame the question of the financial sector's impact on the financial sustainability of a growth process through a simple yet far-reaching hypothesis: the financial corporate is the only sector to actively manage the *liquidity risk* pending on its own characteristic operations. This is a strong assumption, especially as far as the non-financial corporate sector is concerned.<sup>2</sup> It is important to be clear about the shortcomings of this assumption. When we assume that non-financial investors do not actively manage liquidity risk, we put aside a great deal of the prudential dimension in their actual behaviour. In particular, production processes are regarded as if they were instantaneous (firms are unconcerned with capital formation: all capital is circulating capital) and market output as if it was unusable in subsequent periods (the households sector is unconcerned with carrying real assets over upcoming periods). In general terms, both firms and households are unconcerned with the constitution and management of reserve funds. That is why, in such an artificial environment, we are allowed to pass over the accounting of non-financial assets and to focus on financial assets and liabilities.

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<sup>2</sup> Both the construction and the adjustment of productive capacity take time: at least temporarily, payments grow more than receipts. When commitments to non-financial activities grow, non-financial investors' capacity to *immediately* face unexpected claims – namely the liquidity (flexibility) of their position – temporarily deteriorates. This (il)liquidity characterizes all time-consuming operations in a monetary economy and is fundamental to Hyman P. Minsky's "Financial Instability Hypothesis". Minsky's point is that solvency risk goes hand in hand with liquidity risk – insolvency is less likely the more an entity is able to immediately pay for possible pitfalls: the more liquid an entity is, the less unchosen positions can force it to *refinance* its pre-existing debt positions (Mehrling, 2009).

The model also relies on the assumption that credit (inside money) is the only source of production finance. The non-financial corporate sector finances all production by issuing an amount  $D$  in IOUs, which the financial sector invests in, at cost  $(1 - d)D$ .

The values of  $D$  and  $d$  (the discount rate, a function of the interest rate charged on loans) are determined by animal spirits, i.e. entrepreneurs' confidence in the opportunity to start new production processes. The desiderata of a financier play an important role in the determination of  $D$  and  $d$ , yet the issuance of this kind of obligation is a decision in the borrowers' hands: no one can be forced to borrow against their will. The point that the debtor has the last word on the inception of a credit transaction highlights the general principle that, as far as financial items are concerned, one can only originate (issue) her own liabilities.<sup>3</sup>

However obvious, this simple principle is apostate from an ILF perspective. As a matter of fact, acceptance of the principle implies that, contrary to conventional wisdom, financial institutions do not originate loans: rather, banks *purchase* loans (borrowers' debt, worth  $D$ ) and pay for them by *originating*  $(1 - d)D$  in transferable deposits<sup>4</sup> (bank's debt/liability). There is no way to consider this loan-backed deposit as a liability banks originate to hold, though: borrowers borrow when in need of *immediate* expenditure capacity. One may rather consider this liability to be originated to be distributed. Be it as it may, here the OTH/OTD distinction is irrelevant.

Whether a financial institution's liability is originated to be held or distributed only becomes visible in the wake of the maturity mismatch

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<sup>3</sup> In a monetary economy, real (non-financial) liabilities cannot be originated at all. Yet, always and everywhere one can originate real assets (by self-employment of own labour).

<sup>4</sup> An anonymous referee alerts me that my accounts diverge from the standard literature on endogenous money and the monetary circuit in that loans, here, are not equivalent to the deposits originated to purchase them, whereas the effect on involved parties' net worth should appear only in a later phase of the circuit, as the flow of interests is paid. As far as I can see, this difference is due to the fact that the present model adopts the economic accounting framework (changes in assets/liabilities, or LX), not the financial one (uses/resources, or 'flow of funds'). However, in the present model I shall consider changes in *financial* assets/liabilities only.

implied by the loan purchase.<sup>5</sup> In terms of net worth, the financial sector is better off (by  $+dD$ ). However, it is in a less liquid position: its ability to meet unexpected liabilities (unanticipated downward risks) declines.<sup>6</sup> Thus, it may decide to sacrifice a portion of its change in net worth ( $+dD$ ) in order to move towards a more liquid position.

Traditional (relationship) banks can enhance the liquidity of their positions by originating liabilities of a different kind from the above-mentioned loan-backed deposits. Banks can issue a second kind of deposit fund (assumedly worth  $F$ ) that is backed by an amount  $(1 - f)F$  in liquid assets.<sup>7</sup> From a macroeconomic perspective,<sup>8</sup> the latter will be households' savings in the form of currency (or central bank reserves, but the present model abstracts from public facilities). As it happens, not only banks cannot prevent runs from taking place, they would rather see depositors not using ATMs at all. Until (relationship) banks consider the rise in liquidity risk associated to loans-backed-deposits adequately balanced by the increase in currency-backed-deposits, the latter type of deposits is indeed originated to be held. The alternative OTD scheme of liquidity risk management (hereafter LRM) is elicited in section 3.

Once it is understood that money creation must be complemented with a parallel procedure of LRM, one can indeed retain the intermediation notion censured by many advocates of the FMC approach (e.g. Jakab and Kumhof, 2015). Banks do not intermediate final credit into final debt positions; yet, the need to manage liquidity risk does situate them in an intermediate position between final debtors and final creditors. However, the standard view of the direction of the

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<sup>5</sup> The lender is left with an extra amount  $D$  in illiquid asset that is matched by a liquid liability worth  $(1 - d)D$ . For the individual bank, this liability is likely to be ephemeral; for the banking sector it is not. From a micro-perspective, it all depends on whether the workers' bank is the same as their employers'.

<sup>6</sup> The opposite applies to the borrowing sector: in terms of net worth, the non-financial corporate sector is worse off ( $-dD$ ); yet it is more liquid.

<sup>7</sup> Of course, the discount rate  $f$  is what determines the interest rate a bank grants to depositors. Often, the value of  $fF$  is paid in kind (services).

<sup>8</sup> From a micro perspective, households' deposits often consist of other (non-central) banks' deposit withdrawals; from a macro perspective, however, withdrawals and originations clear each other, so that the difference consists in central banks' liabilities, i.e. currency (outside money).

intermediation sequence must be reversed: final debt originated by non-financial firms is reflected as intermediate credit in banks' balance-sheets; the associated liquidity risk urges banks to originate an intermediate debt, which in turn implies a (households') final credit. The final debtor is the starting link (credit market) of the intermediation chain, the final creditor the final link (money market): final debt is a cause (FMC), not a consequence (ILF) of final credit. As opposed to the view implicit in Shin's (2010) specimens of intermediation chains, among others, the money market is a kind of credit market, not vice versa.

At this point, we need to make assumptions about the mechanism of expectations formation, in particular concerning the evolution of final debt. Let us assume that the debt originated by non-financial corporate borrowers first and foremost depends on shareholders' willingness to invest in non-financial ventures rather than in financial ones. Denote such willingness by  $\xi$  and let this be named, for the sake of simplicity, animal spirits.<sup>9</sup> When  $\xi$  grows (falls), the willingness to invest in non-financial ventures relative to the willingness to invest in financial opportunities raises (falls). Therefore, however elusive a relative measure of two sentiments may be, one can recognize the difference in income realized in a previous period by non-financial ( $\Pi$ ) and financial ( $R$ ) corporations as a possible index of the current state of animal spirits:  $\xi = \Pi_{-1} - R_{-1}$ . This index embodies a sustainability principle, too: as soon as non-financial corporate incomes exceed financial ones, not only the latter are paid off, but the groundwork for these to grow (in the footsteps of new debt and non-financial investment) is laid too.

When production is instantaneous, rents – defined as per Eurostat (2013, 4.72) and consistently with the vertically integrated production that the present setting involves – are absorbed into the cost of labour,  $(1 - d)D$ . If we assume that at the end of each period the non-financial and financial corporate sectors distribute all incomes they realize to corporates' owners (the households sector), we can emphasize that the fundamental driver of the system's dynamics ( $\xi$ ) is a function of the structure of property incomes. Such structure is critically influenced by

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<sup>9</sup> On Keynes' notion of animal spirits, see Marchionatti (1999).



the effective demand expressed by households ( $C$ ), which in turn depends on the funds available to disboard  $((1 - f)F)$  and on current labour incomes and rents  $((1 - d)D)$ .

In conclusion, abstracting from the role of general government and the foreign sector, we emphasise the interdependences of:

- (a) variations in entrepreneurs' animal spirits, which in turn depend on the structure of property incomes distributed to owner households ( $\Pi$  vs.  $R$ );
- (b) financial institutions' strategies of liquidity risk management (OTH vs. OTD);
- (c) households' effective demand ( $C$ ), which can be financed not only by current labour incomes  $((1 - d)D)$  but also by pre-existing savings, in particular past property incomes.

The underlying idea is that fluctuations in property incomes ( $\Pi + R$ ), via their effect on expectations formation (animal spirits), lead to fluctuations in investment  $((1 - d)D)$  that in turn drive fluctuations in spending  $(C + D)$ . In such mechanism, savings  $((1 - f)F)$  are a consequence, not a cause of the macro-financial sequence. The accounting structure of the present model is so set as to focus on the liquidity shifts that characterize a simple monetary circuit, without taking into account changes in stocks that are inessential to the above-referred mechanism, e.g. trading in equities. The circuit thus consists of six steps, i.e. changes in sectorial balance sheets (LX):

**LX.1.** On the basis of the property incomes realized in the previous period ( $\Pi_{-1}$  and  $R_{-1}$ ), households determine both the non-financial and financial corporate sectors' willingness to invest. Given the state of confidence,  $\xi = \Pi_{-1} - R_{-1}$ , non-financial firms originate a stock of current debt ( $D$ ). This is purchased by the financial sector by creating ex nihilo  $(1 - d)D$  in deposits;

**LX.2.** Abstracting from rents, when production is instantaneous the principal  $(1 - d)D$  is wholly used to pay for the labour provided by households (compensation of employees);

- LX.3.** The financial sector manages the rise in liquidity risk associated to the new loans. This can be done following either an OTH (described in section 2) or an OTD approach (section 3);
- LX.4.** Households fix the aggregate amount  $C$  of effective demand;
- LX.5.** Both corporate sectors settle their own stocks of debt;
- LX.6.** The corporate sectors distribute property incomes to households. On the basis of a new state of confidence determined by the distribution of  $\Pi$  and  $R$ , the next period begins.

After each step, we will determinate the cumulative effects of the process in the following accounts:

$$\begin{aligned} \mathbf{LX.A} &= \mathbf{LX.1} + \mathbf{LX.2}; \\ \mathbf{LX.B} &= \mathbf{LX.A} + \mathbf{LX.3}; \\ \mathbf{LX.C} &= \mathbf{LX.B} + \mathbf{LX.4}; \\ \mathbf{LX.D} &= \mathbf{LX.C} + \mathbf{LX.5}; \\ \mathbf{LX.E} &= \mathbf{LX.D} + \mathbf{LX.6}. \end{aligned}$$

Notice that the proposed model is based on two causal sequences, an inter-period and an intra-period sequence.<sup>10</sup> The former is the causal relation going from property incomes to animal spirits: this constitutes the most fundamental driver of the system's dynamics and makes our approach one of economics of depression. The latter depicts the sequence of events taking place within a single period: borrowing (LX.1); compensation of employees (LX.2); liquidity risk management (LX.3); effective demand (LX.4); settlement of debt (LX.5); and distribution of property income (LX.6).

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<sup>10</sup> The double sequence is typical Hicks's approach to sequential analysis. On Hicks's general approach to dynamics see Bianco (2015); on his lesson for modern endogenous money theorists see Fontana (2004).

## 2. Relationship banking (OTH)

At the end of each period, households receive from non-financial and financial corporate sectors all property incomes produced during it: respectively  $\Pi_{-1}$  and  $R_{-1}$ . The state of entrepreneurs' confidence ( $\xi$ ) is here assumed have the same sign of the difference in the distributed property incomes in the previous period, i.e., simplifying,  $\xi = \Pi_{-1} - R_{-1}$ .

The current period starts with an act of borrowing. The stock of debt ( $D$ ) originated by the non-financial corporate sector in the current period is a positive function of  $\xi$ . When entrepreneurs borrow, they originate IOUs (loans) consisting in liabilities for the issuers (non-financial firms) and in assets for subscribers (banks). In the issuer's balance-sheet, the IOU is matched by a right to draw  $(1 - d)D$  from transferable deposits originated by the banks and credited to the borrower's account. Such right is an asset for final debtors (non-financial firms) and a liability for subscribers (banks). The LX.1 accounts below depict the quadruple stock variations entailed by issuance of final debt (borrowing).

Banks do *not* originate these deposits in view of holding them, though. Final debtors (non-financial firms) are meant to draw on them straight away: firms borrow  $(1 - d)D$  in order to finance non-financial ventures that are meant to eventually produce a cash inflow larger than  $D$ . Production being instantaneous, firms' expenditure ends in a corresponding increase in households' assets (labour incomes). The LX.2 accounts below assume that compensation of employees is executed via giro orders; and the LX.A accounts add LX.1 and LX.2 together.

Table 1 – LX.1 accounts (borrowing)

NON-FINANCIAL CORPORATE SECTOR		FINANCIAL CORPORATE SECTOR		HOUSEHOLDS SECTOR	
LX.1 borrowing		LX.1 borrowing		LX.1 borrowing	
changes in assets	ch. in liab. and n.w.	changes in assets	ch. in liab. and n.w.	changes in assets	ch. in liab. and n.w.
dep (1-d)D			dep (1-d)D		
	loan D	loan D			
	c.n.w. -dD		c.n.w. dD		

Note: in all tables, "dep" denotes deposits, and "c.n.w." change in net worth.

Table 2 – *LX.2 accounts (compensation of employees) and LX.A*

NON-FINANCIAL CORPORATE SECTOR LX.2 compensation of employees		FINANCIAL CORPORATE SECTOR LX.2 compensation of employees		HOUSEHOLDS SECTOR LX.2 compensation of employees	
dep	$-(1-d)D$			dep	$(1-d)D$
c.n.w. $-(1-d)D$		c.n.w. $\emptyset$		c.n.w. $(1-d)D$	

  

NON-FINANCIAL CORPORATE SECTOR LX.A $LX.1 + LX.2$		FINANCIAL CORPORATE SECTOR LX.A $LX.1 + LX.2$		HOUSEHOLDS SECTOR LX.A $LX.1 + LX.2$	
dep	$\emptyset$	loan	D	dep	$(1-d)D$
c.n.w. $-D$		c.n.w. $dD$		c.n.w. $(1-d)D$	

We assume that only the financial corporate sector actively manages liquidity risk. As far as this risk is concerned, such sector's position has now worsened: the financial sector has financed an inflow of illiquid assets (loans) with an outflow of liquid liabilities (deposits). Thus, banks will be disposed to give up a part ( $fF$ ) of the expected interest inflow ( $dD$ ) in view of *holding*  $(1-f)F$  in additional liquid assets and thus reduce liquidity risk. The financial sector thus originates liquid liabilities (deposits) worth  $F$  in order to obtain from households  $(1-f)F$  in even-more-liquid assets, e.g. currency. The reason for banks *originate-to-hold* such liabilities is that liquidity risk is effectively reduced as far as depositors (households) do not withdraw their deposits. The LX.3 accounts depict this OTH-LRM operation; and the LX.B accounts add up LX.A and LX.3.

It is up to households to play their game, i.e. determining the final value of effective demand ( $C$ ). Let us assume that purchases of non-financial goods and services are settled by giro orders, and let us recall that our assumption on LRM implies that production is instantaneous and that the goods and services produced in the current period cannot be carried forward. As a consequence, the LX.4 accounts below depict effective demand; and the LX.C add up LX.B and LX.4.

Table 3 – *LX.3 accounts (liquidity risk management) and LX.B*

NON-FINANCIAL CORPORATE SECTOR LX.3 OTH-LRM		FINANCIAL CORPORATE SECTOR LX.3 OTH-LRM		HOUSEHOLDS SECTOR LX.3 OTH-LRM	
		curr (1-f)F	dep F	curr -(1-f)F	
				dep F	
	c.n.w.		c.n.w. -fF		c.n.w. fF

  

NON-FINANCIAL CORPORATE SECTOR LX.B = LX.A + LX.3		FINANCIAL CORPORATE SECTOR LX.B = LX.A + LX.3		HOUSEHOLDS SECTOR LX.B = LX.A + LX.3	
dep $\emptyset$		curr (1-f)F	dep (1-d)D + F	curr -(1-f)F	
	loan D	loan D		dep (1-d)D + F	
	c.n.w. -D		c.n.w. dD - fF		c.n.w. (1-d)D + fF

Table 4 – *LX.4 accounts (effective demand) and LX.C*

NON-FINANCIAL CORPORATE SECTOR LX.4 effective demand		FINANCIAL CORPORATE SECTOR LX.4 effective demand		HOUSEHOLDS SECTOR LX.4 effective demand	
dep C			dep C - C	dep -C	
	c.n.w. C		c.n.w. $\emptyset$		c.n.w. -C

  

NON-FINANCIAL CORPORATE SECTOR LX.C LX.B + LX.4		FINANCIAL CORPORATE SECTOR LX.C LX.B + LX.4		HOUSEHOLDS SECTOR LX.C LX.B + LX.4	
dep C		curr (1-f)F	dep (1-d)D + F	curr -(1-f)F	
	loan D	loan D		dep (1-d)D + F - C	
	c.n.w. C - D		c.n.w. dD - fF		c.n.w. (1-d)D + fF - C

All sectors having made their own characteristic decision(s), the cycle approaches an end with the settlement of all credit and debt positions (LX.5). This does not induce any change in net worth.

LX.D accounts (LX.C + LX.5) show that: (i) property income ( $\Pi + R$ ) is financed out of households' loss in net worth; (ii) its volume basically depends on effective demand ( $C$ ). Since households' loss in net

worth is balanced by property incomes,<sup>11</sup> no ‘paradox of profits’ seems to follow. The present model may rather be interpreted as an FMC version of the widow’s cruise à la Keynes-Kalecki-Kaldor (capitalists earn what they spend).

This accounting sequence can be useful to draw implications in terms of dynamics. Given our behavioural assumption about variations in animal spirits (expectations formation),  $\xi$  is non-negative, i.e. *non-depressive*, when  $\Pi - R \geq 0$ , that is

$$C - D \geq dD - fF. \tag{1}$$

Table 5 – *LX.5 accounts (settlement of debts) and LX.D*

NON-FINANCIAL CORPORATE SECTOR LX.5 settlement of debt		FINANCIAL CORPORATE SECTOR LX.5 settlement of debt		HOUSEHOLDS SECTOR LX.5 settlement of debt	
dep	-D	loan	-D	curr	(1-f)F
		curr	-(1-f)F	dep	-F +fF
		dep	-F +fF		
c.n.w. $\emptyset$		c.n.w. $\emptyset$		c.n.w. $\emptyset$	

  

NON-FINANCIAL CORPORATE SECTOR LX.D LX.C + LX.5		FINANCIAL CORPORATE SECTOR LX.D LX.C + LX.5		HOUSEHOLDS SECTOR LX.D LX.C + LX.5	
dep	C-D	curr	$\emptyset$	curr	$\emptyset$
		loan	$\emptyset$	dep	(1-d)D
				dep	+fF -C
		dep	fF -dD		
c.n.w. C-D = $\Pi$		c.n.w. dD -fF = R		c.n.w. (1-d)D+ w. +fF -C = - ( $\Pi$ +R)	

<sup>11</sup>  $C - (1 - d)D + fF = \Pi + R.$

Table 6 – *LX.6 accounts (distribution of property income) and LX.E*

NON-FINANCIAL CORPORATE SECTOR LX.6 distribution of property income dep $-\Pi$ <hr/> c.n.w. $-\Pi$	FINANCIAL CORPORATE SECTOR LX.6 distribution of property income dep $R$ <hr/> c.n.w. $-R$	HOUSEHOLDS SECTOR LX.6 distribution of property income dep $\Pi + R$ <hr/> c.n.w. $\Pi + R$
NON-FINANCIAL CORPORATE SECTOR LX.E $LX.D + LX.6$ dep $\emptyset$ loan $\emptyset$ <hr/> c.n.w. $\emptyset$	FINANCIAL CORPORATE SECTOR LX.E $LX.D + LX.6$ curr $\emptyset$ loan $\emptyset$ <hr/> c.n.w. $\emptyset$	HOUSEHOLDS SECTOR LX.E $LX.D + LX.6$ curr $\emptyset$ dep $\emptyset$ <hr/> c.n.w. $\emptyset$

Condition [1] implies that consumption must overshoot the cost of non-financial investment ( $D = \text{wages plus interest}$ ) by an amount not smaller than the financial sector’s net income ( $dD - fF$ ).<sup>12</sup>

When condition [1] holds, non-financial corporate incomes exceed financial ones, animal spirits heighten, and firms want to intensify production. In the following period, the non-financial corporate sector originates a larger stock of debt which reverberates on households’ confidence: rising labour incomes are likely to boost consumption plans and thus enhance, as far as money is concerned, the transactions demand ( $C$ ) relative to precautionary demand ( $F$ ). Since we assume that households do not actively manage liquidity risk, we can neglect this (easing) pressure, though. We are focusing on banks’ liquidity motive: when banks have no idiosyncratic motive to lean against this wind, by

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<sup>12</sup> In other terms, condition [1] implies that investment and consumption must be in a certain relation. The effective contribution of investment to effective demand depends not only on the quantity but also on the quality of investment. The issue more naturally arises in a model where production takes at least two phases (periods), one in which productive capacity is being built, and one in which it is used, so that producers *must* manage liquidity risk (the associated sequence of accounts is developed in Bianco, forthcoming), and the accounting of non-financial items *does* matter. In this more general case, a macro-foundation of learning is directly implied: new investment (innovation) is so managed as to pursue the inter-temporal co-ordination in costs (investment) and proceeds (effective demand). Our assumption on LRM set this issue aside; yet, condition [1] takes it back in: this is important as it provides the rationale for our hypothesis concerning the dynamics of animal spirits.

rising  $d$  and/or  $f$  beyond certain thresholds, the financial sector is likely to ease the turn of events. Since they constitute a prime factor in the dematerialization of liquidity (and hence credit) risk, the success of non-financial ventures is a major concern to the financial sector.<sup>13</sup> Condition [1] is therefore likely to self-fulfil.

When condition [1] does *not* hold, there is a depression of animal spirits. In the next period, firms are likely to downsize their production plans and the associated debt ( $D$ ) and investment  $((1 - d)D)$ . Since we are focusing on banks' liquidity motive, the fact that households are likely to boost the demand for money for precautionary motives ( $F$ ) relative to transaction motives ( $C$ ), is of no direct importance here. Yet, this indirectly reinforces the tendency for banks, in depressed conditions, to negotiate higher  $d$ s and impose lower  $f$ s, which is likely to exacerbate depression. The excess of consumption over investment that is necessary for condition [1] to hold, and thus reverse confidence dynamics, must increase relative to the preceding period.

An exogenous means to check this vicious circle is thus essential. In our setting fiscal policy cannot directly stimulate investment and consumption, hence what can be done amounts to reducing  $d$  and/or increasing  $f$ . Unfortunately, there is little room to increase  $f$ . It is the bank, not the depositor, to originate (to hold)  $F$ : banks have the final say on the conditions that apply to deposits. How feasible is it to make banks accept (deliberate) to pay more to manage liquidity risk, when depositors, given the assumptions concerning LRM, are likely to exert no pressure in this direction? However tricky, finding a way to reduce  $d$  would be more likely, provided that a role for the central bank and the general government is allowed for. Lacking this possibility by assumption, the impact of the financial sector managing liquidity risk under an OTH scheme must be recognized as pro-cyclical per se.

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<sup>13</sup> "Credit is the pavement along which production travels and the bankers if they knew their duty, would provide the transport facilities to just the extent it is required in order that the productive powers of the community can be employed at full employment" (Keynes, [1930] 1972).



### 3. Shadow banking (OTD)

The literature on shadow banking and securitisation only began developing upon the offset of the Great Financial Crisis. Macro approaches to shadow banking and securitisation are still embryonic and based on the ILF perspective on banking – and hence on shadow banking too (the notable exception by Jakab and Kumhof, 2015, is not explicitly concerned with shadow banking).

Having the FMC model of OTH banking in mind, I aim at presenting here an FMC perspective on shadow banking. Shadow banking is here interpreted as OTD banking, i.e. as an OTD approach to banks' liquidity risk management. This interpretation is intrinsically tied up with the basic mechanism of securitisation.

From a practitioner's perspective, the import of securitisation is that it allows "to immediately realize the value of a cash-producing asset" (Cowan, 2003). Credit monetization can be accomplished in two alternative ways: by selling the credit to a financial vehicle corporation (FVC), or by issuing (and selling) an ABS collateralized by that credit. In the former case, there is a liquidity risk transfer parallel to a credit risk transfer; in the latter case, there is a liquidity risk transfer only (with no transfer of collateral). Yet, this distinction is not relevant in a macro model with a financial sector: even in case of "true-sale" of a pool of loans (final debt) to an FVC, the pool (collateral) does not leave the financial sector's aggregate balance sheet.<sup>14</sup> Therefore, in macroeconomics, on-balance sheet securitisation is the relevant standard.<sup>15</sup>

Let us assume a bank, holding a pool of illiquid assets, be it loans or securities (as collateral). In the opening balance sheet (LS) below, the collateral facial (or expected) value is  $D$ . For clarity of exposition, let us

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<sup>14</sup> In a true-sale, "a securitisation corporation is created to hold securitised assets or other assets that have been securitised by the original holder, and issue debt securities collateralised by those assets" (Eurostat, 2013, 5.107).

<sup>15</sup> The distinction between off- and on-balance sheet securitisation may be relevant from a microeconomic perspective. Yet, even in that case a credit risk transfer does not necessarily take place: either way, securitisation consists in a scheme of liquidity risk transfer.

lay emphasis on the relation between an ABS issuer and an ABS buyer. This implies that the accounting sequence that follows rules out the cost of purchase of the collateral, which is precisely the source of liquidity risk the ABS issuer is managing. In doing OTD-LRM, the liabilities originated by banks consist in ABSs, not in deposits. Like in OTH banking, liquidity risk management is costly: the market applies a discount rate  $s$  on ABSs' facial values. The sequence reported in table 7 depicts the securitisation of a pool of assets worth  $D$ , i.e. the origination-and-distribution (LX.a) and subsequent settlement (LX.b) of a  $D$ -backed-security.

Let us assume that the buyer is a depository corporation (a bank or a money market mutual fund).<sup>16</sup> Debt settlement implies no change in net worth. However obvious, this point is particularly important when dealing with OTD banking, as it allows skimming through the complexity of securitisation procedures without losing essential information. Let us call the stock accounts resulting after the ABS is originated and distributed, but before it is cleared, the 'interim balance sheet' ( $LI = LS + LX.a$ ). The interim stock identity, reported in table 8, retains all essential (and persistent) information involved in a securitisation procedure: the pre-existence of the collateral, the origination-and-distribution of the ABS, the liquidity risk transfer (transaction in deposits) and, crucially, net worth equivalent to the closing accounts (cf. the LE accounts). Interim identities are thus suitable for evaluations of the ex ante impact of OTD banking.

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<sup>16</sup> If the buyer was not a depository entity, the accounts could be adapted with no substantial difference to the argument.

Table 7 – *Origination, distribution and settlement of an ABS*

ABS ISSUER		ABS BUYER	
<b>LS Opening balance sheet</b> assets                      liabilities & net worth		<b>LS Opening balance sheet</b> assets                      liabilities & net worth	
col	D	<i>(unaffected)</i>	
	n.w.                      D		
<b>LX.a ABS distribution</b> changes in assets      changes in liab. & n.w.		<b>LX.a ABS distribution</b> changes in assets      changes in liab. & n.w.	
dep	(1-s)D	dep	(1-s)D
	abs                      D	abs	D
	c.n.w.                      -sD		c.n.w.                      sD
<b>LX.b ABS clearing</b> changes in assets      changes in liab. & n.w.		<b>LX.b ABS clearing</b> changes in assets      changes in liab. & n.w.	
	dep                      D	dep	D
	abs                      -D	abs	-D
	c.n.w.                      Ø		c.n.w.                      Ø
<b>LX Net changes (LX.a + LX.b)</b> changes in assets      changes in liab. & n.w.		<b>LX Net changes (LX.a + LX.b)</b> changes in assets      changes in liab. & n.w.	
dep	(1-s)D	dep	D
	abs                      Ø	abs	Ø
	c.n.w.                      -sD		c.n.w.                      sD
<b>LE Closing balance sheet</b> assets                      liabilities & net worth		<b>LE Closing balance sheet</b> assets                      liabilities & net worth	
dep	(1-s)D	dep	D
col	D	abs	Ø
	n.w.                      (1-s)D		n.w.                      sD

Table 8 – *LI accounts (interim balance sheet)*

ABS ISSUER				ABS BUYER			
LI		Interim balance sheet		LI		Interim balance sheet	
assets		lia bilities & net worth		assets		lia bilities & net worth	
dep	$(1-s)D$					dep	$(1-s)D$
col	D	abs	D	abs	D		
		n.w.	$(1-s)D$			n.w.	sD

ABS originators have a special interest in distributing low-discounted ABSs: the lower  $s$ , the lower the cost to immediately realize the collateral's facial value (i.e. to monetise the credit). The discount rate  $s$  is a measure of buyers' liquidity premium. ABSs are not as liquid as money and are typically purchased by other shadow banking units (FVCs). The fact that ABSs are typically not distributed out of the financial sector is due to the fact that securities other than ABSs allow greater economic and legal safeguards. ABSs are usually held until maturity by other FVCs that employ them as collateral to continue the liquidity transformation process, originating ABS-squared (also known as CDOs), ABS-cubed (CDO-squared), etc. Continuous liquidity transformation, while being a clear ingredient of liquidity risk management, was a key factor in the inflation in size, complexity, interconnectedness and layering of pre-crisis financial markets.<sup>17</sup>

Let us sketch an approximation of a full-fledged shadow banking sector by abstracting from variations in the discount rate  $s$  down the  $n$  layers of the liquidity transformation process.<sup>18</sup> Let  $\psi$  ( $0 \leq \psi \leq 1$ ) be

<sup>17</sup> On the micro-structural complexity of the shadow banking system, see Pozsar *et al.* (2010).

<sup>18</sup> Constancy of  $s$  is not only unrealistic but also prejudicial of a consideration of the role of credit risk transfer instruments (CDS, IRS, and other derivatives) or liquidity enhancement strategies (most importantly maturity transformation), whose crucial role is to check discount rates, i.e. the originators' cost of managing liquidity risk. It is worth noticing that maturity transformation in shadow banking has an opposite effect relative to relationship banking: in the latter case, maturity is typically lengthened; in the former, it is shortened. A model of ABSs markets liquidity crises (sudden stops) in which maturity transformation plays a key role can be found in Bianco (2014). That work deals with the

the fraction of total cash flow from illiquid assets that is used as collateral. To keep things simple, let us also assume constancy of  $\psi$  down the  $n$  layers. This double assumption lets us set up a tidy benchmark model to evaluate how differently OTH and OTD banking impact on macroeconomic dynamics.

Financial corporations hold  $D$  in illiquid assets corresponding to liabilities originated by the non-financial corporate sector, purchased by originating  $(1-d)D$  in deposits. The associated liquidity risk is managed with an OTD approach: FVC<sup>1</sup>s issue ABSs for a facial value amounting to a fraction  $\psi$  of  $D$ . In distributing ABSs, FVC<sup>1</sup>s cash  $(1-s)\psi D$  in liquid assets financed by liabilities of FVC<sup>2</sup>s. FVC<sup>2</sup>s manage the associated liquidity risk by originating  $\psi^2 D$  in ABS<sup>2</sup>s (CDOs) so to cash  $(1-s)\psi^2 D$  in liquid assets, and so on. Table 9 shows this ‘creative wave’.

It is further possible to capture what happens down the  $n$  layers with a set of interim balance sheets, as shown in table 10. Supposing (for the sake of simplicity) that the final ABS<sup>n</sup>s (CDO<sup>n-1</sup>s) are held until maturity by the households’ sector, the interim balance sheet for the shadow banking sector as a whole would be as represented in table 11.

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fragility of the shadow banking sector; the present one with its macro-financial sustainability.

Table 9 – The ‘creative wave’ ( $ABS$ ,  $ABS^2$ ,  $ABS^3...$ )

<b>FVC1</b>			
<b>LS - Opening balance sheet</b>			
col	D	dep (1-d)D	
		n.w. dD	
			<b>FVC2</b>
<b>LX.a - Changes in balance sheet</b>		<b>LX.a - Changes in balance sheet</b>	
dep (1-s)ψD	dep (1-d)D	abs ψD	dep (1-s)ψD
	<b>abs ψD</b>		c.n.w. sψD
	c.n.w. -sψD		
<b>LI - Interim balance sheet</b>		<b>LS - Opening balance sheet</b>	
dep (1-s)ψD	(1-d)D	abs ψD	AF.2 (1-s)ψD
col	D		n.w. sψD
	<b>abs ψD</b>		
	n.w. (d-sψ) D		<b>FVC3</b>
<b>LX.a - Changes in balance sheet</b>		<b>LX.a - Changes in balance sheet</b>	
dep (1-s)ψ <sup>2</sup> D		abs <sup>2</sup> ψ <sup>2</sup> D	dep (1-s)ψ <sup>2</sup> D
		c.n.w. -sψ <sup>2</sup> D	c.n.w. sψ <sup>2</sup> D
<b>LI - Interim balance sheet</b>		<b>LS - Opening balance sheet</b>	
dep (1-s)ψ <sup>2</sup> D	dep (1-s)ψD	abs <sup>2</sup> ψ <sup>2</sup> D	dep (1-s)ψ <sup>2</sup> D
abs ψD		n.w. sψ(1-ψ)D	n.w. sψ <sup>2</sup> D
<b>LX.a - Changes in balance sheet</b>		<b>LX.a - Changes in balance sheet</b>	
dep (1-s)ψ <sup>3</sup> D		abs <sup>3</sup> ψ <sup>3</sup> D	dep (1-s)ψ <sup>3</sup> D
		c.n.w. -sψ <sup>3</sup> D	c.n.w. sψ <sup>3</sup> D
<b>LI - Interim balance sheet</b>		<b>LI - Interim balance sheet</b>	
dep (1-s)ψ <sup>3</sup> D	dep (1-s)ψ <sup>2</sup> D	abs <sup>3</sup> ψ <sup>3</sup> D	dep (1-s)ψ <sup>2</sup> D
abs <sup>2</sup> ψ <sup>2</sup> D		n.w. sψ <sup>2</sup> (1-ψ)D	n.w. sψ <sup>2</sup> D

Table 10 – *The ‘creative wave’: the interim-disaggregated perspective*

<b>FVC1</b>		<b>FVC2</b>	
<b>LI</b>	<b>interim balance sheet</b>	<b>LI</b>	<b>interim balance sheet</b>
dep	$(1-s)\psi D$	dep	$(1-s)\psi^2 D$
sec	$D$	sec	$\psi D$
	<b>sec</b>	<b>sec</b>	<b><math>\psi^2 D</math></b>
	$(1-d)D$	n.w.	$s\psi(1-\psi)D$
	$(d-s\psi)D$		
		...	
<b>FVC3</b>		<b>FVCn (n&gt;1)</b>	
<b>LI</b>	<b>interim balance sheet</b>	<b>LI</b>	<b>interim balance sheet</b>
dep	$(1-s)\psi^2 D$	dep	$(1-s)\psi^n D$
sec	$\psi^2 D$	sec	$\psi^{n-1} D$
	<b>sec</b>	<b>sec</b>	<b><math>\psi^n D</math></b>
	$s\psi^2(1-\psi)D$	n.w.	$s\psi^{n-1}(1-\psi)D$

Table 11 – *The ‘creative wave’: the interim-aggregated perspective*

FINANCIAL CORPORATE SECTOR — OTD approach to LRM			
<b>LI</b>	<b>interim balance sheet</b>		
dep	$(1-s)\sum_{1..n}\psi^i D$	dep	$(1-d)D + (1-s)\sum_{1..n-1}\psi^i D$
sec	$\sum_{1..n-1}\psi^i D$	sec	$\sum_{1..n}\psi^i D$
		n.w.	$(d-s\psi^n)D$

The net worth of a full-fledged OTD financial corporate sector is limited by the amount of interests  $dD$  paid by final debtors. The aggregate (interim) balance sheet lets us consistently compare our description of OTH and OTD banking. Notice that, relative to the previous sequence of accounts, the only critical variation takes place in LX.3, as shown in table 12.

Table 12 – *The accounting sequence with OTD banking*

<table border="1"> <thead> <tr> <th colspan="2">NON-FINANCIAL CORPORATE SECTOR</th> <th colspan="2">FINANCIAL CORPORATE SECTOR</th> <th colspan="2">HOUSEHOLDS SECTOR</th> </tr> <tr> <th colspan="2">LX.1 borrowing</th> <th colspan="2">LX.1 borrowing</th> <th colspan="2">LX.1 borrowing</th> </tr> </thead> <tbody> <tr> <td>dep</td> <td><math>(1-d)D</math></td> <td>loan</td> <td><math>D</math></td> <td>dep</td> <td><math>(1-d)D</math></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>c.n.w.</td> <td><math>-dD</math></td> <td>c.n.w.</td> <td><math>dD</math></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>c.n.w.</td> <td></td> </tr> </tbody> </table>	NON-FINANCIAL CORPORATE SECTOR		FINANCIAL CORPORATE SECTOR		HOUSEHOLDS SECTOR		LX.1 borrowing		LX.1 borrowing		LX.1 borrowing		dep	$(1-d)D$	loan	$D$	dep	$(1-d)D$									c.n.w.	$-dD$	c.n.w.	$dD$					c.n.w.		<table border="1"> <thead> <tr> <th colspan="2">NON-FINANCIAL CORPORATE SECTOR</th> <th colspan="2">FINANCIAL CORPORATE SECTOR</th> <th colspan="2">HOUSEHOLDS SECTOR</th> </tr> <tr> <th colspan="2">LX.2 compensation of employees</th> <th colspan="2">LX.2 compensation of employees</th> <th colspan="2">LX.2 compensation of employees</th> </tr> </thead> <tbody> <tr> <td>dep</td> <td><math>-(1-d)D</math></td> <td>dep</td> <td><math>-(1-d)D</math></td> <td>dep</td> <td><math>(1-d)D</math></td> </tr> <tr> <td></td> <td></td> <td></td> <td><math>+(1-d)D</math></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>c.n.w.</td> <td><math>\emptyset</math></td> <td>c.n.w.</td> <td><math>(1-d)D</math></td> </tr> </tbody> </table>	NON-FINANCIAL CORPORATE SECTOR		FINANCIAL CORPORATE SECTOR		HOUSEHOLDS SECTOR		LX.2 compensation of employees		LX.2 compensation of employees		LX.2 compensation of employees		dep	$-(1-d)D$	dep	$-(1-d)D$	dep	$(1-d)D$				$+(1-d)D$					c.n.w.	$\emptyset$	c.n.w.	$(1-d)D$	<table border="1"> <thead> <tr> <th colspan="2">NON-FINANCIAL CORPORATE SECTOR</th> <th colspan="2">FINANCIAL CORPORATE SECTOR</th> <th colspan="2">HOUSEHOLDS SECTOR</th> </tr> <tr> <th colspan="2">LX.A LX.1 + LX.2</th> <th colspan="2">LX.A LX.1 + LX.2</th> <th colspan="2">LX.A LX.1 + LX.2</th> </tr> </thead> <tbody> <tr> <td>dep</td> <td><math>\emptyset</math></td> <td>loan</td> <td><math>D</math></td> <td>dep</td> <td><math>(1-d)D</math></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>c.n.w.</td> <td><math>-D</math></td> <td>c.n.w.</td> <td><math>dD</math></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>c.n.w.</td> <td><math>(1-d)D</math></td> </tr> </tbody> </table>	NON-FINANCIAL CORPORATE SECTOR		FINANCIAL CORPORATE SECTOR		HOUSEHOLDS SECTOR		LX.A LX.1 + LX.2		LX.A LX.1 + LX.2		LX.A LX.1 + LX.2		dep	$\emptyset$	loan	$D$	dep	$(1-d)D$									c.n.w.	$-D$	c.n.w.	$dD$					c.n.w.	$(1-d)D$
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(continues)

NON-FINANCIAL CORPORATE SECTOR LX.C <i>LX.B + LX.4</i>		FINANCIAL CORPORATE SECTOR LX.C <i>LX.B + LX.4</i>		HOUSEHOLDS SECTOR LX.C <i>LX.B + LX.4</i>	
dep	C	dep	$(1-s)\sum_{1..n}\psi^i D$	dep	$\frac{(1-d)D}{+(1-s)\sum_{1..n}\psi^i D}$
	loan D	l+s	$\sum_{0..n-1}\psi^i D$	sec	$\sum_{1..n}\psi^i D$
	c.n.w. C - D		c.n.w. (d-s $\psi^n$ )D		c.n.w. $\frac{(1-d+s\psi^n)}{D-C}$
NON-FINANCIAL CORPORATE SECTOR LX.5 settlement of debt		FINANCIAL CORPORATE SECTOR LX.5 settlement of debt		HOUSEHOLDS SECTOR LX.5 settlement of debt	
dep	-D	loan	-D	dep	-D
	loan -D	sec	$\sum_{1..n-1}\psi^i D$	dep	$\sum_{1..n}\psi^i D$
	c.n.w. $\emptyset$	sec	$-\sum_{1..n-1}\psi^i D$	sec	$-\sum_{1..n}\psi^i D$
			c.n.w. $\emptyset$		c.n.w. $\emptyset$
NON-FINANCIAL CORPORATE SECTOR LX.D <i>LX.C + LX.5</i>		FINANCIAL CORPORATE SECTOR LX.D <i>LX.C + LX.5</i>		HOUSEHOLDS SECTOR LX.D <i>LX.C + LX.5</i>	
dep	C - D	dep	$\frac{(2-s)\sum_{1..n}\psi^i D}{+(1-s)\psi^n D}$	dep	$\frac{(1-d+s\psi^n)}{D-C}$
	loan $\emptyset$	sec	$\emptyset$	sec	$\emptyset$
	c.n.w. C - D		c.n.w. (d-s $\psi^n$ )D		c.n.w. $\frac{(1-d+s\psi^n)}{D-C}$
	= $\Pi$		= R		= - ( $\Pi + R$ )
NON-FINANCIAL CORPORATE SECTOR LX.6 distribution of property income		FINANCIAL CORPORATE SECTOR LX.6 distribution of property income		HOUSEHOLDS SECTOR LX.6 distribution of property income	
dep	-(C - D)	dep	(d-s $\psi^n$ )D	dep	$\frac{C}{-(1-d+s\psi^n)D}$
	c.n.w. -(C - D)		c.n.w. -(d-s $\psi^n$ )D		c.n.w. $\frac{C}{-(1-d+s\psi^n)D}$
NON-FINANCIAL CORPORATE SECTOR LX.E <i>LX.D + LX.6</i>		FINANCIAL CORPORATE SECTOR LX.E <i>LX.D + LX.6</i>		HOUSEHOLDS SECTOR LX.E <i>LX.D + LX.6</i>	
dep	$\emptyset$	sec	$\emptyset$	dep	$\emptyset$
	loan $\emptyset$	loan	$\emptyset$	sec	$\emptyset$
	c.n.w. $\emptyset$		c.n.w. $\emptyset$		c.n.w. $\emptyset$

The lesson of this sequence of accounts is that the only difference between OTD and relationship banking (OTH) is in the aggregate financial corporate sector LRM cost function – with  $s\psi^n D$  appearing in place of  $fF$ . Given our behavioural hypothesis ( $\xi = \Pi_{-1} - R_{-1}$ ), under a

full-fledged shadow banking financial regime, animal spirits are non-depressive when:

$$C - D > (d - s\psi^n)D \quad [2]$$

When condition [2] applies,  $C > (1 + d - s\psi^n)D$ . Let  $\bar{C} = (1 + d - s\psi^n)D$  be the level of effective demand that is necessary to avoid depressing animal spirits. Once all possibilities to exogenously increase  $C$  are ruled out by assumption, and abstracting from  $s\psi^n$ , the discount rate  $d$  emerges as a key variable in determining the elasticity of animal spirits to current performance. It is safe to assume a negative relation between  $\xi$  and  $d$ : when the current performance is such that animal spirits are positive,  $\bar{C}$  declines (net of the effect of  $\xi$  on  $D$ ) and the condition to sustain confidence is easier to meet. On the contrary, when the performance is depressive to animal spirits,  $d$  is likely to increase and the condition to reverse depression becomes even harder to fulfil.

The inherent role of shadow banking is depicted by the OTD-LRM cost function ( $s\psi^n$ ). The volume  $\bar{C}$  of effective demand that needs be realized in order to avoid depressing animal spirits is a negative function of  $s\psi^n$ : the higher  $s\psi^n$ , the lower  $\bar{C}$ , i.e. the less likely the current performance is depressive to animal spirits. Rising (decreasing) OTD-LRM aggregate costs,  $s\psi^n$ , have a positive (negative) impact on the dynamics of the whole system: high  $s$  or  $\psi$  and low  $n$  are positive; while low  $s$  or  $\psi$  and high  $n$  have a negative impact. The analytical implications are straightforward:

- 1) a high (low)  $\psi$  is good (bad) for growth: this highlights that, in a financial sustainability perspective, securitisation is not bad per se, as it is from a financial fragility perspective (Bianco, 2014);
- 2) a high (low)  $s$  is good (bad) for growth: this implies a reversed take on the popular view that a healthy shadow banking system (where discount rates are low) must have a positive impact on the economy to the extent that it contributes to reduce  $d$  (the cost of credit for non-financial borrowers). As a matter of fact, condition [2] shows that reducing  $s$  can trespass into so-called *predatory lending*, that is

a pathology in risk pricing that lies at the heart of the subprime mortgage crisis;<sup>19</sup>

- 3) that a high (low)  $n$  is bad (good) for growth implies that the financial structure ‘layering’, what Shin (2010) refers to as “long intermediation chains”, should be checked: from a financial sustainability perspective, the impact of the CDOs industry is negative, as it is from a financial fragility perspective.

On the whole, securitisation does not have a negative impact per se; the present model suggests that its overall effect depends on two elements. First, market confidence in the liquidity of ABSs/CDOs, with which discount rates are in a negative relation; second, the size ( $n$ ) of the CDOs (re-securitisation) industry. An obvious approach to check both  $s$  and  $n$  is to enhance the costs of using credit risk transfer instruments,<sup>20</sup> e.g. through financial regulation. Current experience is showing how difficult such reform is (Montanaro and Tonveronachi, 2011; Tonveronachi, 2012).

Finally, it is worth noticing that the peculiar form of our behavioural hypothesis ( $\xi = \Pi_{-1} - R_{-1}$ ) does not affect the implications of the model concerning the impact of relationship and shadow banking: these apply whenever we assume a general form of expectations formation based on property incomes, such as  $\xi = \xi(\Pi_{-1} - R_{-1})$ .

#### 4. Conclusions

In the years to come, macroeconomic theory will take into account the essential role of the financial sector in determining the business cycle. This applies not only to the role of traditional relationship banking, but also to the shadowy role of the modern market-based banking practices. I devised here a simple accounting model based on a Keynesian take on economic dynamics, in which the OTH and the OTD models of banking are reduced to a similar analytical structure. As it turns out, as far as

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<sup>19</sup> However, see Niccoli and Marchionne (2012).

<sup>20</sup> Credit default swaps, interest rate swaps, etc.

macro-theory is concerned the essential difference in the growth impact of the two models of banking lies in the form of the LRM cost function for the financial sector as a whole.

In their macro model of shadow banking, Moreira and Savov (2014) rightly point out that shadow banking actually consists in a liquidity transformation process and underline that the conventional (Basel) capital scarcity view (fragility arising out of a shortfall in capital) conceals the actual role of intermediaries' liabilities as the essential link between the financial system and the macro-economy. Their "liquidity view" is based on households' liquidity motive; here, this motive is inherent to financial firms.

A sense of contradiction between shadow banking and economic growth, financial resiliency and distributive justice is getting increased attention in the theoretical literature. As far as financial stability is concerned, for example, Luck and Schempp (2014) find that fragility is determined by the relative size of the shadow banking sector: the bigger this sector, the more fragile it is. A similar argument, with an emphasis on maturity transformation, is derived in Bianco (2014). As far as economic growth (financial sustainability) is concerned, extant literature has focused less on shadow banking. In general terms, Cecchetti and Kharroubi (2015) argue that by draining resources and skilled labour from the real economy, the growth of the financial sector results in a drag on real growth, in particular for financially dependent and R&D-intensive industries. In the present model, the financial sector has no employees, yet a behavioural assumption about the evolution of animal spirits provides a macro-foundation to a draining effect that applies to both relationship and shadow banking along diversified channels.

A Kaleckian take on investment funding<sup>21</sup> inspires our inter-period behavioural assumption: with some amendments, one may account for more refined distributive questions. The conflict underlying the present model, however, is not one à la Piketty (2014), of labour versus property

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<sup>21</sup> The effect of labour incomes on animal spirits is only indirect (via consumption), and the allocation of investment expenditure between financial or non-financial ventures mirrors the distribution in proprietary incomes.

incomes, but one of financial property incomes versus labour and non-financial property incomes.

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