Debt and Financial Sentiment. Early Keynes on Balance Sheet Effects of Asset Price Changes

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Summary: The paper explores the link between financial sentiment and private debt, using Keynes's *A Treatise on Money* as a conceptual backdrop. In responding to his critics after the publication of his *General Theory* Keynes famously talked about unexpected, violent changes in conventional asset valuations resulting from doubts with a life of their own boiling over onto the surface. Such doubts he argued influenced the size of what he called the *bear position*, which in his *Treatise on Money* he took to be an index of financial sentiment. Minsky also drew from Keynes's earlier work when he famously argued that optimistic future expectations raise asset prices, creating a margin that enables firms to access finance in the present. However, neither asset price speculation nor shifting financial sentiment over the business cycle received in his work the kind of attention they did in Keynes's *Treatise*. The focus of this paper is what Minsky left unexplored on financial sentiment and the balance sheet effects of asset price changes in the *Treatise*, which sheds light on when private debt can become excessive. The central insight is that financial sentiment begins to diverge when economic performance unexpectedly falls short, raising doubts that current asset prices are *excessive*. While the economy might be *debt-led* when financial sentiment is strong it tends to become *debt-burdened* as sentiment weakens.

Zusammenfassung: Das Papier untersucht den Zusammenhang zwischen finanzieller Stimmung und privater Verschuldung und verwendet Keynes' *A Treatise on Money* als konzeptionellen Hintergrund. In der Antwort auf seine Kritiker nach der Veröffentlichung seiner *General Theory* sprach Keynes bekanntlich von unerwarteten, gewaltigen Veränderungen bei der konventionellen Vermögensbewertung, wenn Zweifel an der Werthaltigkeit der Anlagen aufkommen. Solche Zweifel beeinflussten die Größe dessen, was er die Bärenposition nannte, die er in seiner *Treatise on Money* als Index der finanziellen Stimmung ansah. Auch Minsky schöpfte aus Keynes' früherer Arbeit, als er bekanntlich argumentierte, dass optimistische Zukunftserwartungen die Vermögenspreise erhöhen und eine Marge schaffen, die es Unternehmen ermöglicht, in der Gegenwart Zugang zu Finanzierungsmitteln zu erhalten. Allerdings erhielten weder Vermögenspreisspekulationen noch ein Umschwung der finanziellen Stimmung über den Konjunkturzyklus in seiner Arbeit die Aufmerksamkeit, die sie in Keynes' *Treatise* fanden. Der Schwerpunkt dieses Papiers liegt auf dem, was Minsky über die finanzielle Stimmung und

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die Bilanzwirkungen von Vermögenspreisänderungen in der *Treatise* unerforscht ließ, was Aufschluss darüber gibt, wann private Schulden übermäßig werden können. Die zentrale Erkenntnis ist, dass die finanzielle Stimmung zu kippen beginnt, wenn die Wirtschaftsleistung unerwartet niedrig ausfällt, was Bedenken aufkommen lässt, dass die aktuellen Vermögenspreise überhöht sind. Während die Wirtschaft durch Schulden vorangetrieben wird, wenn die finanzielle Stimmung hoch ist, neigt sie dazu, mit abnehmender Stimmung in die Überschuldung zu geraten.

1 Introduction

Traditional theory sees financial institutions as passive intermediators between creditors who hold the financial wealth and the ultimate borrowers whose desired expenditures require financing. The liabilities (debt) issued by borrowers are the very assets creditors hold, such that the two cancel out in the aggregate. Asset prices normally reflect fundamental values as *arbitrage* irons out any divergence between the two. A sanguine view of private debt then follows, suggesting that rising levels of private sector indebtedness is of little consequence. However, the view ignores the potentially uneven balance sheet effects of shifts in asset prices and expectations. Only when financial institutions are passive intermediators is it true that asset revaluations simply transfer purchasing power between borrowers and creditors without any significant effect on aggregate spending – unless, of course, the two had different saving propensities. But, financial institutions not only intermediate but also create credit, which varies with the changes in the length and composition of their balance sheets. As Adrian and Shin (2010) show, their net worth often spirals up or down with asset price changes. As higher (lower) asset prices raise (decrease) their net worth, their desired level of leveraged purchases of assets (and, thus, the overall credit supply) rises (falls), stoking destabilizing shifts in aggregate spending that push asset prices even higher (lower). In the meantime the higher (lower) asset prices appreciate (depreciate) borrowers' collateral, raising (lowering) their demand for credit and spending as well.

The traditional theory discounts the possibility of sustained divergences of asset prices from their fundamental values, except temporarily. Since only profitable speculation is sustainable, its effect must be stabilizing for investors must have on average bought high and sold low (Fama 1970, Friedman 1953). Neither shifts in financial sentiment nor credit change much this fundamental result.[1] However, as the behavioral finance theorists have argued the presence of "noise traders" in financial markets can make it risky to bet against prices that are high (Shleifer and Vishny 1997). Facing such risks, well-informed rational speculators can profit from "riding the bubble", which leads to extended periods of destabilizing speculation (De Long et al. 1990a, 1990b). The argument that speculators' leveraged asset purchases can be destabilizing supports the idea that financial institutions' net worth can spiral up or down with asset price changes.

Keynes was a forerunner of this behavioral finance view (Erturk 2006a, 2006b). In his *Treatise on Money*, he argued that asset prices are determined by future expectations and financial sentiment rather than by supply and demand (for savings) the way consumer goods are. A typical business cycle expansion begins with optimistic future expectations that raise asset prices, creating a margin that enables borrowers to access finance in the present. Firms draw loans and issue liabilities to

1 The margin loans, for instance, enhance the stabilizing effect of speculation since borrowed funds makes it only easier for speculators to buy (sell) undervalued (overvalued) securities (Moore 1966).

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finance the purchase of long-lived real capital assets, the expected future earnings of which as the collateral. But, because firms' *true* future profitability is unknowable with any certainty changes in profit expectations are liable to give rise to abrupt shifts in asset prices. Just as rising profits validate past future expectations capitalized in asset prices unexpected shortfalls tend to invalidate them. Financial opinion and sentiment then diverges on whether they are *excessive* causing some investors to doubt if firms are riddled with too much debt.

The paper explores the uneven balance sheet effects of asset price changes using Keynes's business cycle analysis in his *Treatise* as a conceptual backdrop. The key component in Keynes's argument is the systemic divergence of market opinion about whether asset prices reflect their *true* values over the cycle. Section II summarizes Keynes's analysis, highlighting how shifts in sentiment and credit conditions over the cycle influence asset price changes. Section III focuses on the uneven balance sheet effects of asset price changes over the cycle, using the *loanable funds equality* condition. Section IV contrasts Keynes's argument with the other approaches on financial intermediation and bank lending. The paper ends with a brief conclusion.

2 Keynes's Treatise on Money in Context

This section briefly situates Keynes's early work within the tradition of monetary analysis that emanates from Wicksell (1906). Two central insights can be said to define Wicksell's approach: (i) the availability of bank credit frees investment from past savings and (ii) a monetary disequilibrium is the *dual* of any divergence between investment and savings (and thus between total expenditures and income). The latter follows from the logic of the *Quantity Theory of Money*. Any increase in the supply of money creates excess money balances with which agents bid up goods prices, which means that during the transition from one price level to a higher one total expenditures must exceed aggregate supply (income). Based on this logic, Wicksell held that a level of investment above (below) savings and thus total expenditures above (below) income implies an excess supply of (demand for) money. Wicksell also noted that the banks can extend credit to firms, and thus increase the money supply without limit when they acted in tandem. A cumulative process of credit expansion is set off whenever the rate of interest falls below the return on new capital, what he called the *natural* rate of interest. The process also works in reverse. A money rate of interest above the natural rate sets off a cumulative process of credit and price deflation.

Writing in the Quantity Theory tradition, Keynes's main contention in his *A Tract on Monetary Reform* was that price fluctuations over a business cycle are characterized not so much by shifts in the money supply but rather by those in money demand. He believed that the systemic changes in money demand were in turn tied to the investment and savings imbalances over the cycle. An implication of this view was that keeping the money supply steady could not keep prices stable over the cycle (Keynes 1973a, p. 69). That required instead changing the money supply as needed to compensate for the shifts in money demand. In his *Treatise*, Keynes disaggregated money demand by type of transaction to analyze how it varied over the cycle. He divided monetary circulation into two parts in relation to, respectively, the *industrial circulation* of goods and the *financial circulation* of assets. He argued that the money demand related to the former varies with the level of activity and expenditures on goods, while that related to the latter is mainly a function of investors' desire to remain more or less liquid – what he called, the *bear* position. The bear position, he observed, typically falls during business cycle expansions and rises before contractions.

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Two important insights followed from his approach. The first was the link between 'state of bearishness' and the expected changes in asset prices. Falling bearishness and monetary dishoarding is associated with rising asset price expectations (often during early expansions), while the opposite holds when asset prices are expected to fall. The second insight followed from the first. When bearishness varied over the cycle as a function of future expectations, so did the demand for securities. This meant that current prices of (claims on) investment goods, i. e., securities prices, could change with shifts in future profit expectations independently of the current *flows* of supply and demand for savings. In other words, the securities prices behaved differently than consumer goods prices. With a given supply price (cost of producing new investment goods), asset prices could be influenced by future profit expectations and the state of bearishness along with changes in banks' credit supply.[2]

Keynes argued that over the cycle optimistic expectations pushed up asset prices higher and gave rise to windfall profits, which increased the desirability of expanding the production of investment goods. The resulting higher production in the investment goods sector raised the demand for consumer goods in time, which with a constant level of savings and cost of production gave rise to windfall profits in the consumer goods sector as well. When the price of claims on investment goods fell below their supply price the process worked in reverse, resulting in falling asset prices that gave rise to windfall losses.[3]

Robertson (1931) had famously objected to Keynes's employment of two separate principles to determine, respectively, the investment and consumer goods prices, arguing that Keynes falsely associated savings with monetary hoarding (and a fall in savings with dishoarding) and that is why he could insulate the prices of claims on new investment goods from changes in savings. If instead of holding onto inactive money balances the savers demanded securities the security prices would not be unresponsive to changes in the *flow of* savings as Keynes held. Keynes's rebuttal (Keynes 1973c, pp. 219–36) relied in so many words on a basic principle of modern finance theory. Namely, it is the expected future prices that determine the current prices of financial assets when *large* stocks of them relative to the *flow* supply and demand are held by profit maximizing *agents*. Because, the sales from stocks when future expected price rises and purchases into them in the opposite case are then decisive. The impact of changes in the *flow* supply and demand on the current price is then only indirect, through their potential effect on the expected future price. In his *Treatise,* Keynes had already distinguished the decision to save in the sense of non-consumption and in the sense of how to dispose of what is not consumed. The latter decision about how savings are held he argued is part of the broader portfolio decision applicable to all financial wealth, not just to its increment on the margin. Even when all current savings are used to purchase securities, it is still much smaller than the total stock of financial wealth. Thus, changes in the expected future prices of assets give rise to broader portfolio decisions that are likely to overwhelm any effect from shifts in savings. Put differently, his argument held that the effect of changes in *stock* demand for securities, working often in the opposite direction, would likely overwhelm that of shifts in the *flow* demand from

2 This is the part of Keynes's argument that came to be known as "two price theory" after Minsky (1974) had picked it up.

3 As Leijonhufvud (1968, p. 23) remarks, this also led Keynes to reject the *Classical Dichotomy* since the very *modus operandi* of monetary expansion he thought involved changes in the relative values of capital and consumer goods. While the effect on financial claims is almost immediate the prices of consumer goods respond only in time, after the rising level of activity in the investment goods sector gradually increases demand for them. In stark contrast, macroeconomics came to be associated with one-commodity models after the *General Theory.*

savings. As further argued below, this was a crucial insight that invalidated the main conclusions of the *Loanable Funds Doctrine*.

Keynes drew an important implication from his insight about the divergent nature of securities and goods prices. Future expectations could be flimsy, and thus liable to change abruptly with shifting sentiment and credit conditions. Thus, Keynes held that what moved asset prices was not only new *information* but also shifts in financial *sentiment*, an idea the rise of behavioral finance theory brought into prominence in our day. When asset prices diverged from fundamental values, no automatic mechanism he argued exists in the short run to realign them. "If everyone agrees that securities are worth more, and if everyone is a 'bull' in the sense of preferring securities at a rising price to increasing his savings deposits, there is no limit to the rise in price of securities and no effective rise over time check arises from a shortage of money" (Keynes 1973b, p. 229). However, he recognized that changes in the bear position is one mechanism that would eventually check the price increase. Asset prices would remain unchanged if rising asset prices just offset any bullish sentiment but increase when security prices rose (fell) beyond this point. "… [I]n proportion as the prevailing opinion comes to seem unreasonable to more cautious people, the 'other view' will tend to develop, with the result of an increase in the 'bear' position …" (Keynes 1973b, p. 228–9). In Keynes's view, "it is astonishing … how large a change in the earnings bill can be looked after by the banking system without an apparent breach in its principles and traditions" (Keynes 1973b, p. 272). Yet, when financial sentiment falters during an expansion the banking system's ability to accommodate a rising level of production is typically impaired. When profit performance falls short of expectations the view that the market is overvalued begins to take hold. That, in turn, leads to "… the tendency of the financial circulation to increase, on the top of the increase in the industrial circulation [which] … break[s] the back of the banking system and cause it at long last to impose a rate of interest, which is not only fully equal to the natural rate but, very likely in the changed circumstances, well above it" (Keynes 1973b, p. 272). With the worsening terms and supply of credit asset prices stop rising, and the creditors begin to fear that the assets they hold (borrowers' liabilities) are overvalued. While *debt* might have been stimulating up to that point, it tends to turn into a burden as shifting market opinion begins to raise doubts about firms' continued profitability.

Keynes talks about two different configurations of the bear position in a typical business cycle expansion (Keynes 1973b, p. 226). During early expansion, the bear position typically falls as firms' expected profitability is thought to have risen faster than asset prices. He calls this phase a *bull market with a consensus of opinion* where most investors believe that security prices have not yet risen sufficiently. During late expansion, by contrast, the bear position typically increases as an increasing number of investors favor liquid assets believing that asset prices have risen above their fundamental values. He calls this latter phase the *bull market with a division of opinion*, characterized by a divergence in financial sentiment. The bulls who expect asset prices will continue to rise coexist with the bears who expect that they will fall.[4] All else being the same, the bull market is prolonged when bulls can access credit with ease, which depends on whether the banking system is "itself buying securities or if it takes advantage of the fact that *differences* of opinion exist between different sections of the public so that (…) the party on the 'bull' tack [is] in effect buying securities and borrowing money via the banking system from the party on the 'bear' tack" (Keynes 1973b,

4 The bear market during a downturn is likewise characterized by either a *consensus* or a *division of opinion* among investors. In the former the preponderance of market opinion holds that asset prices have not yet fallen sufficiently, while in the latter the bear position begins to fall as an increasing number of investors believe that prices have hit bottom.

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p. 251). "If one section is tempted by easy credit to borrow for the purpose of buying securities speculatively, security prices can be raised to a level at which another section of the public will prefer savings deposits" (Keynes 1973b, p. 251). In other words, given the increase in their net worth, banks' willingness to lend to speculators against overvalued collateral feeds the asset price increase.

3 Balance Sheet Effects of Shifts in Asset Price Expectations

Keynes's early work relied on the 'loanable funds' framework to turn the *Loanable Funds Doctrine* on its head. Given that the demand for loanable funds is equal to investment demand and changes in hoarding ($LF_D = I + \Delta H$), and its supply is equal to savings and new money creation ($LF_S = S + \Delta M$), the traditional doctrine states that the securities prices bring current investment and savings flows into equality – or, alternatively, that supply and demand for savings determine securities prices. That is a logical conclusion if one holds that the policy maker can fix the money supply at its desired level and that portfolio demand changes (hoarding and dishoarding) are insignificant. Accordingly, when optimistic (pessimistic) expectations raise (lower) the willingness to invest that would raise (lower) the supply of financial assets, lowering (raising) their prices. Many of Keynes's later critics who objected to his *paradox of thrift* argument based their argument on this logic. Similar to Robertson's criticism above, they relied on the *Loanable Funds Doctrine* to argue that an increase in saving would lower the interest rate by raising the supply of loanable funds, compensating thereby the negative effect of lower consumption on aggregate spending by stimulating a higher level of investment.

In the *General Theory*, Keynes's rejection of the *Loanable Funds Doctrine* took the form of discarding the whole loanable funds framework. In his *Treatise*, by contrast, the doctrine is shown not to hold because the changes in *stock* demand for securities (bearishness) and those in *stock* supply – caused by shifts in credit that alter the money supply – dominate the shifts in loanable funds' supply and demand. His frame is the divergence of investment from savings which asset price changes fail to realign, which highlights the variables the traditional doctrine ignores. The increased willingness of investment during early expansion in his argument is associated with rising rather than falling asset prices because of falling bearishness and credit expansion caused by optimistic expectations. Given the loanable funds equality condition,

$$(I - S) = (\Delta M - \Delta H),$$

an investment boom ($I - S > 0$) during early expansion triggers rising securities prices fueled by dishoarding ($\Delta H < 0$) and credit expansion that culminates in money growth ($\Delta M > 0$). The falling bearishness of households raises the stock demand for securities. As shown in Figure 1a, this shifts down the demand for loanable funds ($\Delta H < 0$) resulting in a lower rate of return, which more than compensates the effect of the upward shift in demand for loanable funds due to increased investment. Figure 1b shows the same result, except with the *price* on the vertical axis and *financial assets* (FA) on the horizontal axis instead. The two diagrams are essentially the same (at this level of generality) since demand for loanable funds is equal to the supply of financial assets, and the supply of loanable funds is equal to the demand for them, while price and return are inversely related. Figure 1b shows that dishoarding lowers the supply of financial assets more than the increase due to higher investment and pushes up their prices.

Figure 1a

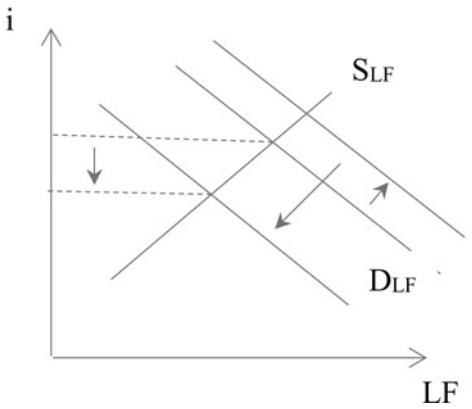
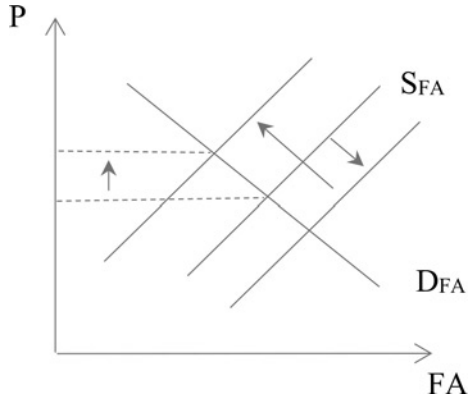


Figure 1b



We can also show the effect of these changes on balance sheets. If money supply consists of bank money only, money is created when banks swap liabilities with borrowers (firms), providing deposits D in exchange of securities (e_0) firms issue at a price equal to (p_0).

Table 1

Simple (Bank) Money Creation

Firms		Banks	
A	L	A	L
ΔD	$p_0 e_0$ +	$p_0 e_0$ +	ΔD +

During the first phase of expansion – in Keynes's *bull market with a consensus opinion* – the market opinion holds that the increase in security's price is less than the increase in firms' expected future profits. All else being the same, this implies an increase in firms' net worth. Firms issue liabilities (securities) to finance the acquisition of long lived real capital assets that raise their future earnings capacity. Their collateral (asset) against the liabilities (securities) they issue is thus the capitalized value of the increase in their future expected profits resulting from their real investment. When security prices and fundamental values always change in tandem the firms' net worth remains unaltered as their assets and liabilities change together. But, when asset prices rise less than fundamental values ($\Delta p e_0$), their liabilities increase less than the capitalized value of their future expected profits ($\Delta F \pi^e$), causing firms' implicit net worth to increase. According to Keynes, the consensus opinion in the market holds that this is typically the case during early expansion ($\Delta F \pi^e - \Delta p e_0 > 0$), which also explains why households become less bearish.

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Banks take the counter of households' trade in securities fulfilling a 'broker-dealer' function in Table 2.[5] As household demand for financial assets increases, the banks sell a portion of the firms' securities to households (αe_0) and keep the rest $(1-\alpha)e_0$ in their balance sheet. Assuming *mark to market* prices, the revaluation gain from the increased security price accrues in part to the banks (and the rest to the households), which raises their net worth by $(1-\alpha)\Delta p e_0$.

Table 2

Banks as Broker-Dealers

Firms		Banks		Households	
A	L	A	L	A	L
$\Delta F \pi^e +$	$\Delta p e_0 +$	$\alpha p_1 e_0 -$	$\Delta D -$	$\alpha p_1 e_0 +$	
		$(1-\alpha) p_1 e_0 +$		$\Delta D -$	

The increase in their net worth induces banks to raise their demand for securities, which causes credit and money supply to increase ($\Delta M > 0$).[6] As shown in Figures 2a and 2b, that reduces the interest rate (i) and pushes up the price of securities (P) yet again.

Figure 2a

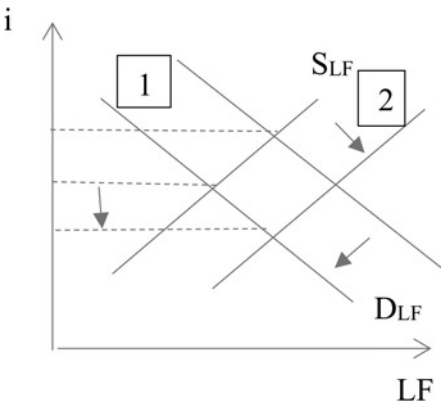
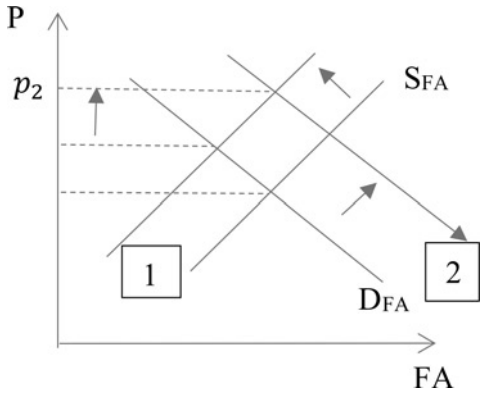


Figure 2b



With the increased credit supply banks purchase the additional securities firms issue at a higher price p_2. Banks might again sell to households a portion of their acquisition depending on the strength of falling household bearishness. The net worth (NW) of both firms and banks increase in this phase of the expansion without any corresponding fall in that of households (Table 3).

5 Banks are the net sellers of securities over the expansion and net buyers in a contraction, while the opposite holds for households A more elaborate treatment would specify broker dealers that are market makers in financial assets, who raise their cash hoards when households' holdings of securities increase. For simplicity, we will assume that banks also fulfil broker dealer services.

6 Holding onto our assumption of bank money only, money supply (M) is equal to total deposits (D).

Table 3

Net Worth of Banks, Firms and Households

Firms		Banks		Households	
A	L	A	L	A	L
$\Delta D+$	$p_2\Delta e+$	$p_2\Delta e+$	$\Delta D+$		
	$NW+$	$\alpha p_2\Delta e-$	$\Delta D-$	$\alpha p_2\Delta e+$	
		$(1-\alpha)p_2\Delta e+$	$NW+$	$\Delta D-$	$N\bar{W}$

During late expansion, financial opinion begins to diverge. Some investors come to believe that the increase in security prices is excessive, i.e. question if $\Delta F\pi^e - \Delta pe_0 < 0$. As shown in Figures 3a and 3b, the rise in bearishness turns households into a net supplier of financial assets ($\Delta H > 0$), shifting the S_{FA} schedule down to the right. The negative effect on security prices can however be more than compensated if banks' demand for financial assets rises disproportionally more, such that the balance of the credit expansion and increase in hoarding remain positive: $\Delta M - \Delta H > 0$. However, firms might hold back issuing new securities since the price of any new liabilities they issue exceeds the present value of their future profit expectations ($\Delta F\pi^e - \Delta pe_0 < 0$). This suggests a fall in firms' demand for bank credit.

Figure 3a

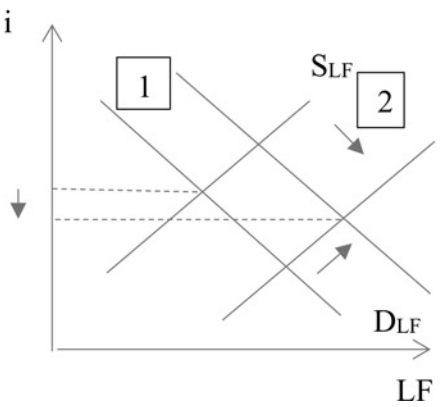
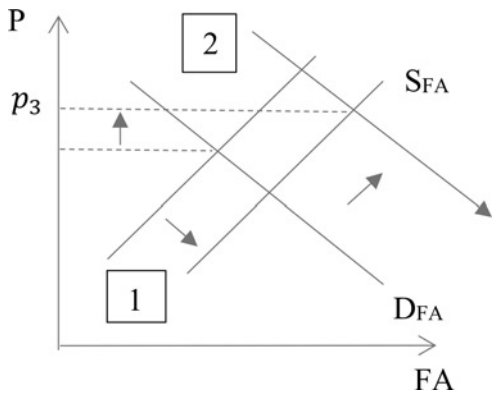


Figure 3b



On the other hand, the speculators who remain bullish might continue demanding credit to finance their asset purchases. The gap between asset prices and profits widens when bank credit supply shifts away from *industrial* loans towards *margin* loans. While speculation feeds the asset price bubble, the deceleration in firms' borrowing (and thus spending) slows down profit growth.

The balance sheet effects of these changes in a *bull market with a division of opinion* are shown below (Table 4). Firms' net worth takes a hit during this phase of the expansion because the value of their liabilities continues to increase ($\Delta pe > 0$) when their future profit expectations are stagnant ($\Delta F\pi^e = 0$). The higher asset prices raise banks' net worth by an amount proportional to their magnitude in their balance sheet ($(1-\alpha)\Delta pe$). The net worth of both the *bulls* and the *bears*, holding respectively τ and $(1-\tau)$ ratio of assets held by households, increase as well. *Bears* sell the

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assets they hold ($p_3\tau\alpha e$) to banks for deposits and banks make margin loans (ML) to bulls, who buy the assets bears sold to banks.

Table 4

Bears Transfer Securities to Bulls in Late Expansion

Firms		Banks		Bears		Bulls	
A	L	A	L	A	L	A	L
$\Delta F\pi^e = 0$	$\Delta pe+$	$(1-\alpha)\Delta pe+$		$\alpha(1-\tau)\Delta pe+$		$\alpha\tau\Delta pe+$	
		$p_3(1-\tau)\alpha e+$	$\Delta D-$	$p_3(1-\tau)\alpha e-$			
				$\Delta D+$			
		$ML+$	$\Delta D+$			$\Delta D+$	$ML+$
		$p_3(1-\tau)\alpha e$	$\Delta D-$			$p_3(1-\tau)\alpha e+$	
						$\Delta D-$	
	$NW-$		$NW+$		$NW+$		$NW+$

During a recession investment falls below savings, which causes a fall in the supply of financial assets. Despite the positive effect of this on asset prices the net supply of securities rises, and prices fall because again *portfolio* changes overpower shifts in *flow* supply and demand. As shown in Figures 4a and 4b, rising bearishness leads to increased hoarding ($\Delta H > 0$), increasing the supply

Figure 4a

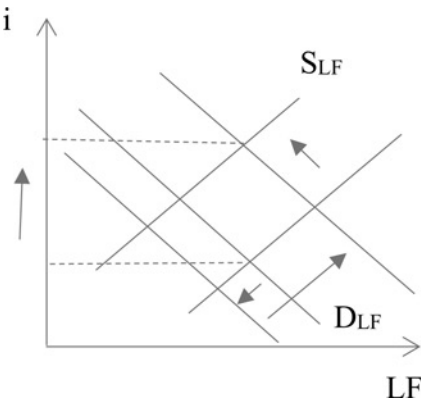
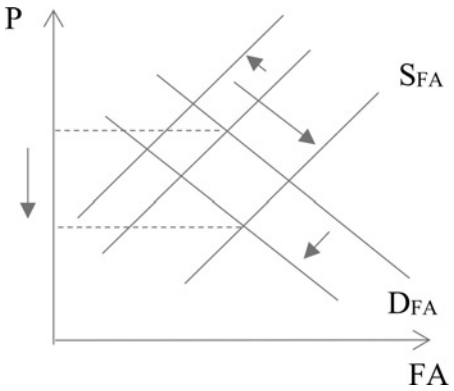


Figure 4b



of assets in a way that overwhelms the negative effect from falling investment, while credit contraction ($\Delta M < 0$), resulting from the decrease in banks' net worth shifts down asset demand. With falling asset prices bank net worth now spirals down, continuing to fall until market opinion eventually splits as to whether the fall in asset prices is overdone. When asset prices fall below the capitalized value of future expected earnings, firms' net worth begins to rise and the bear position begins to decrease – giving rise to a phase, Keynes called, a *bear market with a division of opinion* when firms' willingness to invest might revive. Any rebound in security prices becomes entrenched when banks experiencing improving net worth expand credit supply. In his *General Theory*, as well known, Keynes became skeptical that such a revival could always be counted on to happen on its own.

4 Three Views on what Constrains Bank Lending

The conventional view sees banks solely as intermediators, which implies that their main role is to transfer purchasing power rather than creating it. With a given level of income bank lending is constrained by deposits whose quantity depends mainly on reserves the central bank controls, and thus neither the changes in bank net worth nor financial sentiment are important. This view, which many prominent neo Keynesian economists such as Bernanke and Krugman share, ignores the effect of changes in bank net worth caused by asset price revaluations and the resulting changes in the size of bank balance sheets. At least under normal conditions, bank lending simply reallocates purchasing power where one party's asset is simply another's liability (Bernanke, 1995, 2014; Krugman et al., 1998). Rising levels of private debt is here of no concern because "one person's debt is another person's asset" (Eggertsson and Krugman, 2012), and "absent implausibly large differences in marginal spending propensities among the groups … pure redistributions should have no significant macro-economic effects" (Bernanke 1995, p. 17). The situation is similar with asset price inflation and shifts in financial sentiment, neither of which need matter for bank lending except in rare situations such as the Great Depression and Great Recession when normal economic rules can become, as Krugman calls it, 'topsy-turvy.' What makes these periods exceptional is the emergence of debt-deflation as a special problem under conditions of depressed aggregate demand (Eggertsson and Krugman, 2012).

In another view held by many post Keynesian economists, firms' credit demand is seen as the primary limiting factor in aggregate bank lending. "Loans make deposits and deposits make reserves" (Lavoie, 1984), which suggests that central banks have little power to fix bank reserves. In this view banks can accommodate almost all loan demand from the non-financial sector provided they act in tandem, reversing the direction of causality assumed in the conventional theory. With money and credit supply thus endogenous, the central bank can make reserves more expensive but cannot deny banks the additional reserves they need when their lending increases. Even then, profit opportunities induce banks to innovate around existing regulatory restrictions to lower their dependence on reserves (Minsky 2008; Palley, 1996, 2012; Wray, 2007). This suggests a perfectly elastic credit supply, where bank lending is constrained only by the negative effect of higher price of credit on credit demand, whether it is pushed up by rising risk perceptions or central bank policy. When banks swap liabilities with firms, intermediation and credit creation are intertwined. The act first creates new purchasing power (by an amount equal to the expansion of their balance sheets) which is then transferred to borrowers in other sectors. The banks' total claims on *others* equal the claims on them at every point and yet total expenditures in the economy can exceed previous income because the new money created in the system raises aggregate demand.[7]

A third view closer to Keynes's *Treatise* builds on Bernanke and Gertler's 'financial accelerator' where credit is seen to move endogenously over the cycle as banks' willingness to lend varies with both borrowers' and their own net worth (Bernanke, Gertler, & Gilchrist, 1999). In an extension, Adrian and Shin (2008, 2010, 2014) focus on how credit supply responds when bank net worth is altered with asset price changes. They show that when higher asset prices raise their net worth (and reduce their leverage ratio), financial intermediaries (especially investment banks) respond rapidly

7 Keen (2014) whose accounting assumptions has at times been at the center of controversy argues basically this point, that the growth of debt liabilities (of the non-financial sector) is itself a source of aggregate demand (p. 12). Strictly speaking, it is not the expansion of debt *per se* but the creation of new purchasing power reflected in the expansion of bank balance sheets that disrupts the expenditure – income equality.

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by raising their lending (expanding their balance sheet), relying on the active management of short-term debt on the liability side to avoid any excess capital (capacity), which feeds back positively on asset prices.[8] They look at the growth of bank balance sheets from the 'asset' side, associating it with an increase in 'aggregate liquidity' rather than creation of new money.[9] But, otherwise, the pro-cyclical macroeconomic implications they draw from their analysis does not fundamentally differ from Keynes's *Treatise* and its rendition in loanable funds terms above. As in Keynes, shifting financial sentiment is what disrupts the financial structure over the credit cycle. Once sentiment turns and asset prices fall, balance sheets that were thought to be robust become ridden with excessive debt, causing credit, spending, and eventually incomes to contract.[10]

5 Conclusion

When financial institutions are passive intermediators, asset price changes, shifting financial sentiment and rising levels of private sector indebtedness are of little consequence. However, in the real world we live in asset revaluations have significant effects on aggregate spending because banks are but passive intermediators. As a burgeoning new literature shows banks' net worth can spiral up or down with asset price changes, altering their willingness to lend. As higher asset prices raise both banks' net worth and borrowers' creditworthiness, credit expansion and spending rise further pushing up asset prices. Keynes's *Treatise on Money* provides a fruitful conceptual framework to put in perspective the findings of this literature, helping us conceptualize the macroeconomic effects of asset price revaluations. In the *Treatise,* banks' balance sheet decisions determine the credit supply, where their willingness to lend depends primarily on the size of their net worth. The dual of investment and savings divergences are the changes in monetary hoarding by households and shifts in bank credit supply. Higher expected profits during early expansion culminate in net dishoarding fueling asset price inflation, which stimulate in turn bank lending. Thus, the uneven balance sheet effects of rising asset prices stoke destabilizing shifts in aggregate spending, which are eventually checked by shifts in financial sentiment that make indebtedness a drag on the economy.

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8 See also Panetta et al., 2009, who show that the value of collateral is positively correlated with the business cycle.

9 Conceptually, the broad money supply *is* the banking sector's total liabilities, and the credit supply the sum of its assets. While these two magnitudes must equal each other *ex-post* and move together over time, financial deregulation and the growth of non-bank lending have severed the empirical link between them at the aggregate level since the mid-1990s (Ozgur and Erturk 2013). What then matters is the *endogeneity of finance* rather than the *endogeneity of money.* See Palley (1996, ch. 8).

10 Shin (2012) explores the global effect of asset price changes, focusing on the international bank credit supply and the role shifting sentiment had on the financial crisis. Along similar lines, see, also, E. V. Borio & Disyatat (2011).

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