

Horizontalists, Structuralists, and the Latest Global Financial Crisis: What Can Be Learned

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Any time an economic phenomena occurs as dynamic as the one that has endogenously and systematically gripped the American and global economies, it is always beneficial to attempt to make sense of what has happened and evaluate the current theory, updating deficiencies where deemed to exist. In the context of financial institutions this will allow for a better understanding of their normal operations, whether the time period being analyzed is a point in time, a day, or a business quarter. This, in turn, will allow for better policy formation and the ability to hone in on and track new developments in the future that may provide the impetus for other adverse events. Specifically, there are three reasons why this is necessary. First, it will allow economists to better understand how the private financial system operates and interacts with the central bank. Secondly, it will provide insight into how key economic variables-the various rates of interest and the supply of credit money-are determined. Lastly, it will permit the elucidation of a microeconomic theory of individual bank officer behavior, allow it to be aggregated to form a liquidity preference theory of an individual bank's portfolio construction, and how those portfolios change over time as banks interact with the Federal Reserve. This, in turn, can be used to view how it may affect other macroeconomic variables, which the world is currently witnessing. Hence, it is imperative to continually update theory in light of emerging facts.

In the post Keynesian literature, two different, yet interrelated, explanations exist for delineating how financial institutions operate. On the one hand, there is the Horizontalist or Accommodationist camp whose three essential premises¹ are that the supply of reserves is unlimited by the central bank in interest/reserve space, the supply of money is horizontal in interest/credit space at a markup predetermined by the lending institution over the federal funds overnight rate, and that the resulting yield curve representing the complex of interest rates is derived from application of the expectations approach to the determination of interest rates. Oddly, along this line of thought the usage of liquidity preference in explaining the rate of interest is oftentimes curiously absent. On the other hand, there is the Structuralist school which feels that the supply of reserves is limited by the central bank. As a result, banks compete for these funds which

¹ There are other aspects of the Horizontalist/Accommodationist school that will be delved into in other sections of the paper. The point of this brief summary is simply for ease of exposition; the same applies for the Structuralists.

endogenously creates upward pressure on the overnight rate of interest and can lead to financial instability if payment chains fail to be fulfilled. Thus, over time banks will engage in a practice known as liability management in which banks will attempt to decrease the absolute size of the funds subjected to a reserve ratio and can therefore increase the possible rate of return on their assets. Lastly, liquidity preference is still accepted as determining the rate of interest and the formation of the yield curve.

The structure of this paper is as follows. In Section I, both the Horizontalist and Structuralist positions will be examined in more detail as well as identifying any obvious deficiencies in the theory as exposed by the financial crisis. In Section II, the financial evolution of the last twenty-five to thirty years will be highlighted, emphasizing any characteristics that will be used in Section III to judge the analytical implications for both the Horizontalist and Structuralist schools that the events of the last few years have provided, which will serve as the concluding remarks.

Section I-Horizontalists and Structuralists

In comparing the Horizontalist and Structuralist schools, it is informative for the reader that the main points of contention are how the central bank reacts to the private financial sector's demand for reserves, how the magnitude of the endogenous credit money supply is established, and how this affects the determination of the yield curve. Against this backdrop, elaboration of the Horizontalist position may proceed.

First hinted at by Kaldor and later put forth more comprehensively by Moore in his *Horizontalists and Verticalists*, the primary hypothesis of the Horizontalists is that the money supply, or alternatively described as the credit supply, is flat or horizontal in money credit and interest rate space if one was to depict it graphically. This proposition is made possible by positing that the dominant type of financial relationship in the economy can be characterized as overdraft in which enterprises utilize preexisting lines of credit provided by banks up to a certain previously specified limit, assuming that the obligatory collateral and risk standards are met (Lavoie, 1985; Moore, 1985, 1986). Thus, upon advancing the credit to the enterprises, the various private financial institutions that do so necessarily must somehow acquire the required reserves pertaining to that particular newly created transaction deposit (Moore, 1989). As such, the central bank is seen as providing the level of required reserves to these institutions without

restraint; the central bank simply sets the overnight rate at which these funds may be obtained. Further, it is believed that the elasticity of substitution between borrowed and non-borrowed reserves is fairly elastic. As a result, the private financial sector is eternally indebted to the central bank due to its reserve requirements. In consequence, when lending to the overdraft clients, the private sector banks simply add a predetermined markup to the overnight rate and thus the quantity of bank loans and thus the bank deposits is determined by the demand for them while the Fed is forced to supply the level of reserves necessary to ensure that its overnight rate stays within the targeted band. Hence, Horizontalists characterize banks as price setters and quantity takers (Fontana, 2003). This characterization allows for a few brief points to be made.

First, especially in the work of Kaldor and Moore, it would seem that the supply of high powered money is endogenously determined *only* by demand due to bank needs (Lavoie; 2006). In turn, once loans have been extended, the reserves are competed for through various channels such as the certificate of deposit, repurchase, Eurodollar, and related wholesale markets (Moore, 1986).

Secondly, it suggests that the monetary authorities only indirectly control the supply price of money and directly control the supply price of reserves as opposed to orthodox theory which posits that the central bank controls the quantity supplied of money (Moore, 1989). Subsequently, it can be concluded that the central bank's daily function is to provide the necessary level of high powered money demanded at the overnight rate it exogenously sets. Consequently, the Fed's actions are necessarily defensive in nature with the primary objective being to guarantee the smooth functioning of the payments system by supplying the amount of funds needed to hit the targeted overnight rate (Wray, 1998; Fullwiler, 2003). This leads to the conclusion that the only method the Fed possesses² in constraining the money supply is the overnight interest rate which indirectly affects the cost of borrowing from banks (Mosler, 2002).

Finally, it would appear that the primary function of a commercial bank is to make short term loans to familiar customers as opposed to becoming involved in securities markets which are differentiated from the former by two distinguishing

² It should be noted that other methods of indirectly constraining the money supply exist but the Fed does not readily exercise those abilities.

features. First off, the loans that a commercial bank agrees to are non-marketable in nature which arises from the fact that the credit status of the borrower is only fully disclosed to the lender, thus creating an information asymmetry (Moore, 1986). The second difference between commercial bank loans and securities markets is that bank loans can only be initiated at the borrower's request (Moore, 1986). These points will be returned to later in Section III.

The third aspect of the Horizontalist position is their respective approach to the determination of the yield curve. Using the Expectations Hypothesis argument first expounded by Hicks, Horizontalists believe that the short term or overnight rate is *exogenously* determined by the central bank when administering reserves to the banking system. Because of agents' ability to arbitrage among different time periods, the longer term rates must embody the actors' expectations of future central bank short term rates. Hence, the one month rate would simply be the compounded rate of the expected rate of one week from T₀, the rate expected from T₁ to T₂, and so on. As a result, the explanation of the yield curve can be seen as a deterministic one way street from an exogenously set central bank overnight rate to the varying levels of the longer term rates. (Moore, 1989, pg. 487)

The second theory attempting to explain these interactions among the Fed, private banking sector, and the complex of interest rates is that of the Structuralists, which was at first seen as a rival theory but over time has rightly come to be seen as complementary instead. This line of thought has two principal facets. First, it attempts to put forward a comprehensive framework that accounts for the interconnected financial system's configuration by looking at both the specific arrangements that the central bank engages in as well as the incessantly evolving market tactics of private banks, most notably the practice known as liability management. Secondly, it integrates the endogenous demand for credit with liquidity preference, unlike the expectations approach that the Horizontalists endorse (Dow, 2006). In meeting these two objectives, Structuralists endorse five main propositions.

First, Structuralists do not believe that the central bank will accommodate the demand for reserves as demanded by the private financial sector and thus quantity constraining the volume of reserves available, whether it be non-borrowed reserves or

borrowed reserves. Related to this proposition that will become essential in comparing the merits of Horizontalists and Structuralists in Section III is that the latter believe that in the eyes of banks non-borrowed reserves are not the same as borrowed reserves. As a result, the second proposition is formed, namely that banks engage in the practice of liability management in which banks innovate different financial products in order to reduce the magnitude of funds subject to reserve requirement ratios and thus are able to increase the prospective returns on existing funds. Third, as a result of quantity constraining the supply of reserves provided to banks, a situation is created in which there is inherently upward pressure on the rate of interest³ as competition takes place in the wholesale markets to acquire the requisite funds as well as from the costs of operating a liability sheet that necessarily must offer higher rates of return due to a situation in which the supply of reserve funds is finite (Pollin, 1991). Subsequently, when a bank executes its lending decisions, it can be graphically represented by an upward sloping credit supply function because the reserve quantity constraint unavoidably must be taken into account when constructing the various loan rates so as to still earn a sufficient profit for the bank (Pollin, 1991). Thus, in the eyes of this author, the money supply can be characterized by the Structuralists as weakly endogenous⁴ because the rate of the ‘endogeneity’ of the credit money supply depends on the rate at which banks can reduce their respective funds subject to a reserve requirement and therefore free up additional funds. Fourth, as a result of a situation in which banks are constrained with regard to the quantity of reserves, a situation can be endogenously created in which the existing supply of reserves is less than the supply needed to satisfy the demand for them which can create a liquidity crunch (Pollin, 1991). After all, there is no such thing as liquidity in the aggregate. Therefore, conditions can spontaneously be created in which monetary processes lead to financial volatility during which a debt deflation becomes possible as payment chains are broken. Lastly, Structuralists still endorse the actual levels of the complex of interest rates as being determined by the competition for various funds and

³ From a brief survey of the literature, it is not clear whether Structuralists believe that the rate of interest in question here is the overnight rate or another rate of longer duration. For the purposes here, it will be assumed that Structuralists are referring to the overnight rate. If this is a mistaken assumption, all apologies.

⁴ This would stand in contrast to the ‘full endogeneity’ of the Horizontalist position.

the relative demand for them originating from each individual bank that was first expounded by liquidity preference theory (Pollin, 1991).

Section II-The Last Thirty Years of Financial Evolution

The last twenty-five to thirty years has seen significant change take place in the financial arena. It was in this era that financial institutions began to alter the composition of their portfolios which had been traditionally saturated with assets that had deep secondary markets, such as substituting U.S. Treasury securities for assets that were not as liquid yet offered higher prospective rates of return (Moore, 1986). The downside of this, of course, is that when periods of prosperity turn to periods of downtime the ability to make a position will be much more troublesome as compared to a period in which each agent possesses a plethora of Treasuries (Minsky, 1986). Indeed, that period saw an upsurge in new financial activity as a web of personal credit creation was initiated which, when added to the already booming corporate credit markets, led to a marked institutional change that resulted from banks' desire to create new profit seeking activities and be a first mover into a market (Minsky, 1986). This, in turn, caused waves of innovation which saw the emergence of the CD, Repurchase, and Eurodollar markets which, when aligned with the accommodating legislative documents, allowed an entire industry to transform itself from one that could be characterized by enterprises that were very risk averse to ones that were exceptionally risk prone. Thus, as U.S. Treasuries and other highly liquid assets became less important for financial institutions in making their respective positions, the prevalence of Money Manager Capitalism became all the more apparent as new instruments and organizations were invented and institutionalized due to increased profit margins resulting from raising the realized rates of return on investments and simultaneously decreasing the costs of liabilities.

Evidence of this is shown when viewing the declining ratio of vault cash plus Federal Reserve depository accounts to aggregate banking financial assets, implying that the instruments utilized for position making activities were increasingly done with new products that allowed bankers to function with lower absolute levels of cash and reserves. In their place were now products that allowed banks to economize on reserves by moving the assets off the balance sheet entirely or to a classification in which a lower percentage of funds were subjected to reserve requirements but that were also able to spawn new

flows of funds should the need for additional reserves come about (Minsky, 1986). Consequently, in the 1960's, liability management began to emerge as a readily practiced method of obtaining these ends, starting with certificate of deposit accounts. When these were successful, repurchase agreements and Eurodollar accounts were struck upon. In addition to removing funds from the base used to measure the reserve requirements, they had the added benefit of avoiding the then legislated interest rate ceilings on demand and savings deposits of Regulation Q (Minsky, 1986).

The proposals and the successes of the aforementioned developments is what gave rise to the dizzying array of financial products that now currently exist as banks found it increasingly profitable to engage in liability management. Indeed, the shift in banking ideology was predicated on the successes of these endeavors; once liability management was seen as a way of removing funds from being subjected to reserve requirements or a lesser percentage of reserves, other assets began cropping up that removed the assets from the balance sheet entirely. Thus, there was a shift in models of banking behavior in which the so-called 3-6-3⁵ model was no longer the only game in town. Instead, banks also engaged in the now infamous originate and distribute model in which funds were invested in assets that were off the balance sheet and thus avoiding the capital directives of regulatory authorities. This was performed by investing in a uniform class of assets such as auto loans and credit card receivables, yet still managing to believe sufficient diversification had been maintained. When that class of investments produced above average rates of return, other risk classes were entered into and subsequently securitized, which was believed to be stable enough for the time being to make a healthy profit because the quantitative risk analysis reflected the ability to provide these investments with heaps of praise⁶. Indeed, after the credit ratings agencies entered into the foray, these classes of assets received impeccable ratings⁷. As a result, originate and distribute came to be seen as a way of achieving a stable income flow through time via

⁵ The 3-6-3 model is just a succinct way of summarizing the way bankers had traditionally operated: pay 3% on deposits, earn 6% on loans, and hit the golf course by 3p.m.

⁶ Unfortunately, the due diligence of these investments as to what exactly each bank was holding was either performed very poorly or not at all.

⁷ It should be noted that while these developments seemingly occurred independently of one another, in reality it was largely a planned scheme in which the ratings agencies worked hand in hand with the banks to ensure that these products received the highest ratings possible, with many being proclaimed to be in the AAA category, which, of course, is the same as U.S. Treasury securities. See Wray 2007.

off balance sheet asset structuring as long as the investments paid a greater than normal risk adjusted rate of return (Wray, 2007). In addition, with the passing of the Financial Modernization Act, a financial system was arranged in which extremely large ‘too big to fail’ banks were created⁸.

Then the crash came. Increasingly, defaults on the debts that were responsible for providing these assets with their income streams began popping up and then were doing so at an increasing rate. Suddenly the payments chain had been broken and banks were, at first, unable to repay their irregular customers and later on their regular ones. In conjunction, these banks stopped lending to one another as a liquidity surge overtook the financial arena, driving down Treasury yields as investors flocked to the safest of assets. There was growing sentiment on Wall Street that certain financial institutions would no longer be able to maintain themselves as a going concern without federal intervention. As it turned out, those sentiments were correct, first with the auctioning off of Bear Stearns for \$2 USD per share which was followed approximately seven months later with the demise of Lehman Brothers. At this point, the Federal Reserve decided that it was necessary to pump liquidity into the system by supplying massive quantities of non-borrowed reserves into the overnight market and thus dropping the overnight target band for the Fed funds rate to 0%-0.25% while also providing borrowed reserves through third parties, most notably in the JP Morgan acquisition of Bear Stearns. At this point, some observations may be made which will later pertain to the Horizontalist/Structuralist debate.

First, during the boom, the largely non-regulated financial institutions that were responsible for creating the debt chain that served as the basis for providing the collateralized debt obligations with their payment streams seemingly had zero liquidity preference since the intent of these institutions was to secure the acquisition of a loan⁹ only then to turn around and sell it to an investment bank to make a profit. At the same time, the investment banks had overdraft arrangements with their regular customers and a low degree of liquidity preference for their irregular customers and new borrowers.

⁸ It should be noted that many of the arguments presented here pertain to wholesale finance markets. The contentions posed here may not apply to smaller ‘Main Street’ banks that primarily operate within neighborhood retail markets.

⁹ It is these institutions that were responsible for the shockingly low loan standards that existed for borrowers, such as the infamous NINJA loans (No Income, No Job, No Assets).

However, with the existence of these mega banks, the prevailing states of affairs of most customers were well-known to the lender. On the other hand, small neighborhood banks that primarily engaged in retail markets were much more risk-averse due to a reluctance and/or apathetic approach towards engaging in the securitization boom that created the CDOs. As a result, they would not suffer from the over-exposure to toxic assets that the mega banks were prone to. Lastly, it would appear during this period that non-borrowed reserves were favored over borrowed reserves. Since the discount rate is ordinarily set at a markup over the upper bound of the federal funds rate target, the difference in the two rates would act as an unnecessary cost on borrowing banks if one was to choose to acquire funds from the former rather than the latter, thus seeming to validate the claims of the discount rate as a 'frown cost'.

Conversely, during and after the crash, the liquidity preference of the mega banks increased mightily, even to the point of restricting lending with familiar lenders who at one point may have been entitled to overdraft arrangements. This situation was the outcome of an inability for the lender to gauge the borrower's market exposure as well as the market exposure of the lending institution itself! In addition, the degree of general uncertainty that surrounded the financial and real sectors of the economy made many potential borrowers question prior estimates of cash flows and thus unable to reasonably gauge the possibility of meeting their own cash commitments. Consequently, the mega banks became reluctant to extend credit to any customers at all. As the threat of a liquidity crisis turned into the threat of an insolvency crisis, the elasticity of substitution between non-borrowed and borrowed reserves became much more elastic as the Fed stepped in and began injecting massive quantities of liquidity into the money markets and set up special term lending programs with specific banks which can, in essence, be seen as an extension of the discount window function with the exception that these deals were oftentimes done behind closed doors and not openly publicized (Baker, 2009).

Thus, it would appear that liquidity preference cannot be abandoned, *especially* with regard to banks and the creation of their portfolios. The empirical observation that over time the composition of balance sheets evolved based on the rate of return/access to liquidity tradeoff cannot be ignored. During the boom, this was not as evident because higher than normal risk adjusted rates of return were being earned and thus liquidity was

much of an afterthought. However, with the economy's crash and subsequent slump, it is fairly obvious that liquidity is at a premium when deciding how to allocate funds among various investments. The drop in U.S. Treasuries yields coupled with the rush to the dollar were two obvious examples of this. Consequently, the liquidity preference of banks and how it changes must be seen as a vital component in the explanation of how financial institutions operate, both at a point in time and over time.

Secondly, this implies that the shape of the money supply curve is continually varying in that it can change both its intercept and its slope with any new development in either the financial or real economy. In fact, it may not be continuous at all, but that is another matter altogether. The point of interest here is that as a bank's liquidity preference function changes shape, so too must the shape of the money supply curve. In addition, with regard to the financial markets, the shift may be created endogenously via, say, the development of a new financial product, or exogenously through new Federal Reserve policies such as increasing the federal funds target. The notion of bank liquidity preference will be returned to subsequently when the analysis is conducted concerning how an individual loan officer's behavior with regard to regular and irregular customers can be used to construct a theoretical model for the creation of a bank's portfolio decisions which culminated in the aggregate shape of the money supply as well as how this determines the shape of the yield curve. First, however, it is necessary to construct a theory of how bank reserves are generated, as this will affect the explanation of the above point.

From the discussion above concerning the developments over the last thirty years of bank behavior regarding the creation of new financial products, it is evident that banks engage in liability management over time yet the Federal Reserve somehow manages to hit its Fed funds target band in the Fed funds market-as distinct from the money market-by changing "the supply of reserve balances in the system, and by affecting the supply of balances the Fed can create upward or downward pressure on the Fed funds rate" even though "Fed funds transactions neither increase nor decrease total bank reserves. Instead, they redistribute bank reserves and enable otherwise idle funds to yield a return" (NewYorkFed.org). This is done, as should be well known, by buying and selling short term Treasury instruments until the loan transactions among member banks are being

conducted within the target band the Fed desires. Thus, in a boom, when the Fed funds target is most likely non-zero, the quantity of non-borrowed reserves can be constrained in a closed interval meaning that if drawn up graphically the right hand limit would be included in the range. If the quantity of non-borrowed reserves provided in the Open Market Operation is in fact greater than the quantity necessary to implement its desired target band, the Fed will have provided excess non-borrowed reserves and the targeted Fed funds band will be missed on the low side, theoretically dropping to zero. Thus, if the target band for the Fed funds rate is non-zero, the quantity of non-borrowed reserves is not unlimited; instead, it is unlimited to that point at which the right hand limit representing the maximum quantity of non-borrowed reserves the target band can sustain- i.e. without falling lower- has been reached.

This implies that the Fed cannot actually control the supply price of non-borrowed reserves because “fed funds rate is determined by market participants, and is not actually "set" by the Fed” (NewYorkFed.org). Instead it can only hope to provide a quantity of non-borrowed reserves sufficient so that member banks will begin loaning overnight non-borrowed reserve quantities at the targeted Fed funds rate which admittedly happens almost all of the time. At the same time, there is a much larger entity that provides non-borrowed reserves to the member banks that can greatly affect the fed funds rate: the U.S. Treasury. When a government spends it credits members’ bank accounts, thus placing downward pressure on the fed funds rate¹⁰. If these excess non-borrowed reserves are not removed, the Fed will miss its targeted band by a wide margin which is why the Fed and Treasury oftentimes coordinate daily fiscal and monetary policy¹¹. At the same time, it must be recognized that the size of the funds the Treasury credits to the banking system is finite, even though in theory and potential reality the quantity of Treasury spending can be unlimited. Consequently, as long as the Fed funds rate is non-zero the quantity of non-borrowed reserves is limited. It is only unlimited until the Fed hits its overnight target band. As a last note, during a boom the quantity of borrowed reserves is theoretically unlimited as well, although in practice it is limited due to the existence of

¹⁰ If unfamiliar with this process, see Wray 1998.

¹¹ For an excellent discussion of how the Treasury interacts with Special and General Depositories see Bell’s “Do Taxes and Bonds Finance Government Spending?” from 2001.

‘frown costs’ and a much more inelastic relationship between borrow and non-borrowed reserves at that point in the cycle.

In a bust, things necessarily change. If the Fed funds targeted band rate becomes zero then it implies that the quantity of non-borrowed reserves being provided to the system is potentially unlimited. Therefore, in this instance, at least one of the two reserve constraining variables is no longer constrained so that now the supply of non-borrowed reserves can be characterized as a horizontal line that may or may not have a right hand limit to the interval. Furthermore, the quantity of borrowed reserves is unlimited in theory and can be in practice although this variable will always most likely be more constrained than non-borrowed reserves due to the decreased profit margins associated with ‘frown costs’. Nonetheless, the elasticity of substitution will become more elastic between the two.

To summarize, as long as the Fed funds rate is non-zero the supply of non-borrowed reserves is limited to a point at which any quantity greater will result in the Fed funds rate falling below the lower limit of the target band. If the Fed funds rate is zero, the supply of non-borrowed reserves is potentially infinite or at least great enough to sink the rate to zero among member lending institutions. In contrast to the boom, the supply of borrowed reserves is potentially limitless in which the Fed will set its supply price at a markup from the non-borrowed reserve targeted rate band. In actuality, since the markup acts as an indirect tax on acquiring the funds, the non-borrowed reserves will be preferred, more so in a boom when financial institutions are not as desperate for liquidity and/or solvency.

Liability management must be discussed further. From an overview of the banking system of the last thirty years, as noted above, it is without doubt that financial institutions engage in liability management. Indeed, this even gave rise to an alternative banking ideology, the so-called originate and distribute model. Thus, due to firms’ desire to be first movers into additional markets to secure above average risk adjusted rates of return once other markets have become saturated, financial innovations are created. This results in liability management and the innovation generates changes in the interest rate complex or yield curve. Hence, while the pace of innovation and liability management no doubt occurs at a more rapid pace during the boom, it is the rescue during the bust and

slump that provides legitimacy to these instruments (Minsky, 1986). In other words, during the boom the new financial instruments, which are oftentimes largely unregulated, circulate as less liquid monetary forms in the same way as ownership in Yahoo and pets.com were both once thought (by some) of as good investments. It is only after the technology bust and subsequent slump that Yahoo was found to be sustainable and pets.com was not. In the same way, the rescuing of the financial equivalent of pets.com legitimates the very existence of it as a feasible investment opportunity. If not, why save it or its investors¹²?

In addition, during the slump there is a change in the financial institutions functions, as mergers and acquisitions and decreased competition due to insolvency provides a firm with new abilities that it previously did not possess¹³. Consequently, now a greater centralization of funds has occurred which permits those financial institutions to engage in additional research and development of new products in the future which may be profitable in the next boom or to enter into other markets that were previously excluded to them. Hence, as noted above, with every introduction or slight modification of the array of financial products available, the liquidity preferences of the lending financial institutions change and consequently so too does the shape of the aggregate money supply curve, which may be delved into at this time.

In a financial system as advanced as the American one, it is to be expected that overdraft facilities eventually would be developed. As such, a pre-approved line of credit is extended to certain regular borrowers who draw upon them as seen fit once approved by a loan officer. Thus, for these clients, the money supply can be characterized as horizontal in interest money space. Developments such as this are made possible because the absolute quantity of these pre-approved lines of credit are well within the bank's normal operating rate. In other words, these loans are made possible because the bank knows that on a regular operating basis it will be able to secure sufficient non-borrowed and/or borrowed reserves in order to meet the requisite reserve ratio. As a result, it is a convenient way of doing business and earning a sufficient profit margin while doing so.

¹² On this point, the Marxists would surely have something to say and it is duly noted. It is not central to the overriding point, however.

¹³ Examples of these would be Bank of America's acquisition of Merrill Lynch, JP Morgan's acquisition of Bear Stearns, or JP Morgan's purchase of Washington Mutual's assets.

On the other hand, however, when an irregular, first time, or questionable borrower requests a loan, the bank loan officer does not have familiar relations with the individual. As a result, even after careful scrutiny of the investment plan and its objective(s) and possibly consulting with management, the loan officer will most likely still not believe the customer to be as trustworthy as the regular customers who have a track record of paying back the bank. Consequently, the prospective borrower will be offered a higher borrowing rate and that rate will vary given different quantities of funds that the borrower may request. The increased lending rate is the result of two different factors. First, the prospective borrower presents an increase lenders' risk as opposed to a normal overdraft customer. As such, a higher interest rate is necessitated because the lending officer is taking a bigger risk for the bank that jeopardizes the ability of the lending institution to remain a going concern more than if only overdraft customers were lent to. Secondly, an increase in lending will require a higher actual capacity utilization rate as pertaining to the bank's funds, which will necessitate the need for an increase in reserves in excess of that which it is normally accustomed to acquiring. As such, since during times of non-zero fed funds rates the quantity of non-borrowed reserves is limited, the bank will be competing for these additional sums. As a result, in order to validate the loan, the bank officer must earn an above average rate of return for the bank. Consequently, if this analysis is extended to the various bank loan officers, the bank's loan portfolio as characterized can be seen as a proxy for the liquidity preference of the bank.

One note is worth mentioning here. This would seem to imply that liability management techniques are utilized to cope with a limited supply of funds so that a lending institution may economize on its reserves; financial innovation is introduced by a desire to make additional profits by being a first mover into a market. Later, once the increased profit rates have been realized, these funds allows for the generation of income streams that, over time, provide a bank with sufficient funding to extend its loan portfolio to otherwise questionable borrowers once the demand for credit has exceeded the normal capacity¹⁴. However, at a point in time, new financial instruments cannot be

¹⁴ This is done so that the firm can gain increased control over its environment so as to implement growth strategies which acts as a means to ensure survival and remain a going concern.

instantaneously relied upon to provide these benefits, and thus the liquidity preference of the bank is the determining factor. Conversely, over time, this is no different than supposing that when actual utilization rates exceed normal utilization rates that an increased markup will be built into the profit margin so that investment plans may be formulated and implemented to move to the higher level of capacity utilization and thus able to earn higher profits (Kregel, 1973).

In a slump, these relationships are altered, however. When the bank's liquidity preference rises, non-core lending will cease. Instead, only the most trustworthy borrowers will pass the scrutiny of the loan officer and even some extremely profitable ventures may be declined if they are irregular customers. This is because while liquidity is an attribute for a specific individual or group of individuals, liquidity in the aggregate is impossible; someone always has to be holding the asset. It should be obvious to the reader that this is *the* major problem the U.S. currently faces. Consequently, during a crisis a liquidity shortage will emerge as asset values drop and a debt deflation cycle sets in as agents attempt to sell their best assets to prevent the downside effects of heavy leveraging ratios. This causes a drop in the velocity of new loan issuance while both loans being called in and margins increase. Thus, during a debt deflation the Fed necessarily must add liquidity to the system and act as a Lender of Last Resort or face the consequences of a collapsing banking industry once a liquidity crisis transforms into the threat of a solvency crisis.

Common observation will lend itself well to the next discussion of this paper. When looking to invest, there are a multitude of money rates of interest that one is confronted with that, if they have equal credit ratings, can have their various yields plotted against their dates of maturity to form what is known as the yield curve. Thus, it would serve economists well if they could understand what makes the yield curve shift, i.e. do short term rates alter long term rates, do long term rates determine short term rates, or is there no relation at all. Many theories have been purported to be able to explain the line of causality and how the yield curve will shift as a result. Here two of these theories will be discussed.

For a long time, the dominant hypothesis regarding the determination of the range of varying rates of interest over time is Hicks' expectations theory in which the long term

rate of interest can be decomposed into a series of the shortest term rates possible followed by a succession of expected forward rates. From here, he posited that an investor can invest in that shortest term rate and then reinvest the proceeds in the subsequent shortest period again, thus earning a compound return, assuming that the expected future short rate will be greater than the current short spot rate. Since long term rates will have to remain competitive with the possibility of simply investing in short rates, they will rise until the return from investing long is equal to the compound rate from investing short (Kregel, 1996). As a result, the yield curve is upward sloping in normal conditions for Hicks except when expectations are such that the expected future short rates will be lower than the current short spot rate, in which case the yield curve will become inverted (Kregel, 1996).

In his seminal article “Some Notes Concerning Liquidity Preference”, Kahn critiques with Hicks, and with good reason. He argues that the long rate may in fact move with increases in the short rate, but that does not necessarily imply that the expectations hypothesis is correct; it simply means that they moved in the same direction (Kahn, 1954).

Central to his refutation of Hicks is the distinction of bulls and bears. A bull is an individual who supposes, with his strongest although not perfect conviction, that the rate of interest is expected to fall, or, conversely, that the prices of securities are expected to increase. On the contrary, a bear is someone who expects the opposite to occur. Hence, an individual will be supposed to be indifferent between the short and long rate if s/he expects the long rate to increase at a rate equal to the difference between the long rate and the short rate so therefore the loss in capital value on the long term bond is offset by the increase in the interest spread between the long and short rates (Kahn, 1954). Therefore, Kahn proposes that what actually matters in determining the movement of the long rate relative to the short rate is how the margin shifts between investors who initially were indifferent towards the long term rate and short term rate and then subsequently become either bullish or bearish about its movements¹⁵. If the margin shifts to a situation in which bulls dominate- possibly because the central bank sold more long bonds, then the

¹⁵ The analysis of bulls versus bears and how the margin shifts with changing expectations can be applied to the short rate as well for Kahn.

long rate will rise *even if the short rate falls*. To illustrate this, Kahn's example will be used. Suppose that the central bank sells more long term bonds and changes the structure of the public's wealth by simultaneously buying short term bonds. This would result in the long rate increasing while the short rate would decrease (Kahn, 1954). Thus, as opposed to Hicks' theory, Kahn's explanation has been proven to be more plausible as sometimes the long and short rates will even move in opposite directions, thereby implying that rate movements are not based solely upon short term expectations. Hence, in order to explain the slope of the yield curve an alternative explanation is necessary. For this, Keynes' conception of liquidity preference and duration must be brought back into the discussion.

To remind the reader, duration is a measure of time that identifies the breakeven point on a bond in which an increase (decrease) in reinvestment earnings just offsets a decrease (increase) in its capital value (Kregel, 1998). Furthermore, for the purposes here, the distinction between income risk averse investors and capital risk averse investors must be made as well as exactly where the margin falls that demarcates the preferences of both or, in other words, how strongly they hold their convictions.

At very low rates of interest, such as 2%, 3%, or 4% the duration is 51 years, 34.33 years, and 26 years, respectively, as given by the formula $D = (1+r)/r$. Therefore, the amount of time required to reach the breakeven point and thus recover the loss in capital values is larger the lower the rate of interest, hence a liquidity trap is more likely at lower rates of interest (Kregel, 1998). Should the interest rate increase by an absolute value greater than the square of itself- Keynes' R-squared rule of the *General Theory*- then at an initial interest rate of 2% which rises to 2.04% will lower duration from fifty-one years to a little greater than fifty years, which is hardly comforting considering that the portfolio's capital loss (assuming made of identical instruments) will take half a century to recover. At the same time, suppose the initial interest rate was 20% in which duration becomes only six years. This means that if the interest rate was to increase to 24%, duration would still be five years and about two months. If this was a one time occurrence, these events would most likely create a liquidity panic. However, if this rate volatility is normal and these movements fall within the range of two standard deviations from the average of rate changes in the past, then the margin may not react as violently

(Kregel, 1998). This, in turn, reflects that it is expectations of future bond prices that are responsible for the slope of the yield curve.

In light of the above discussion, the theoretical construction of a positively sloping yield curve can be made possible. When evaluating various investment decisions of differing maturities, fixed income instruments that entail longer durations necessitate a longer period of time until the increase (decrease) in investment income will offset a fall (rise) in capital values should its interest rate increase (decrease) by greater than the absolute value of its square. Therefore, assuming investors desire capital gains, the risk of changes in capital values is higher the longer the duration and thus the greater the variance of their capital values. As a result of the increased variance, a larger premium is necessary to protect investors from adverse price movements. In turn, a positively sloped yield curve can be derived which involves the projection of long bond yields (Kregel, 1998).

So, as it can be seen, it is not just as simple as claiming that long rates will move in conjunction with expected rises in the short rate to preserve equality between the two. Instead, the liquidity preferences of investors must be taken into account when differentiating between the decisions to buy highly liquid or extremely illiquid assets while employing duration to compare the relative movements of yields pertaining to a specific risk class of those assets with the same liquidity premiums. It has already been shown above how duration and expectations affected those investors who were capital risk averse by having the prices of their securities collapse over the span of a few months. Likewise, in Keynes' analysis, he usually assumed that the capital risk averse investors dominated the margin over the income risk averse investors, as is also done in the above pedagogical explanation of a positively sloping yield curve. The merits of the Horizontal and Structuralist theories may now be evaluated in light of the evidence provided.

Section III-Implications for Theory

With regard to the Horizontalist position, five comments can be made. First, the supply of high powered money is not simply demand determined by the banks in acquiring their reserves. Such a position would not only neglect the actual process of how a government spends-by crediting bank accounts with high powered money-but also would fail to recognize the constraining action that the Fed uses in setting its overnight

rate, assuming that the Fed funds lower target is non-zero. Hence, it would appear that the Structuralists are more accurate in claiming that the quantity of reserves is limited, assuming that a non-zero lower bound is the target. On the other hand, if the targeted lower bound is zero, then it is fully plausible that the supply of reserves is entirely demand determined and the proposition of the Horizontalists is confirmed, assuming of course the role of government spending is ignored¹⁶.

Secondly, the preceding discussion refutes the idea that the money supply curve is horizontal in money interest space. While this is true for overdraft arrangements, once the influence of banks' liquidity preferences is considered it is shown that for less creditworthy borrowers that an increased margin is built which would result in an upward sloping money supply curve. At the same time, it should be noted that aggregation of the various loan compositions may not even be able to be aggregated so that construction of an aggregate money supply curve may not even be possible. It has only been employed in the preceding paragraphs as a pedagogical refutation of the conception of the money supply curve as being horizontal.

Third, the elasticity of borrowed and non-borrowed reserves has been shown to vary over the business cycle. During the boom, the preferred method of obtaining reserves is through the overnight market. On the other hand, in periods of crisis, the need to secure reserves overtakes any preferential treatment of non-borrowed reserves to borrowed reserves. Thus, the relationship becomes far more elastic in times of crash. Consequently, it would seem that the Horizontalist position on the elasticity between borrowed and non-borrowed reserves is correct in times of crisis while the Structuralist position is closer to reality in times of prosperity.

The next point is one of clarification. While it is true that banks still primarily specialize in making loans, in the last thirty years there has been more position making activity in the stock market. Hence, while banks specialize in loans, there has been an increasing emphasis on profits from securities trading which was spawned by the transformation of loans from mostly non-marketable entities into extremely marketable ones through securitization. Therefore, as banks increase in size through the Financial Modernization Act, the weighting of investments has moved into others sectors not

¹⁶ In any case the Treasury and Fed always coordinate activities.

associated with traditional loan origination, one of which was the drive to turn non-marketable assets into marketable assets. Hence, the Horizontalist position that banks are only concerned with loan origination is found to be lacking in substance which, presumably, was a product of the era in which it took its intellectual foundation. Moreover, the idea that bank loans are made solely at the demand of the borrower is very primitive. While it is true that loans must always ultimately be a product of the demand for the funds, the recent crash has shown that lending institutions have developed very advanced marketing schemes in order to originate new loans. In fact, studies have shown that loan officers pushed customers to take out higher sums with the advantage of the teaser rate for the first few payments. This would allow them to increase their commissions while openly admitting that no background check would be performed or that it was not necessary to have any net wealth (NINJA loans). Thus, while it is certainly true that ultimately the borrower signs the papers, the lenders were able to develop plans of attack that almost ensured that a loan would be originated that day¹⁷.

Lastly, from the discussion of the determination of interest rates, the Horizontalist conception of the yield curve is less than adequate. For a reason foreign to this author, adherence to the Expectations Hypothesis is persistent yet unfounded. In addition, there is no room for differing degrees and desires for liquidity of banks when making investment and lending decisions. Instead, it renders the analysis very static and deterministic, thereby removing a central role for short and long run expectations which is fundamental to any explanation of economic activity. Indeed, the concepts of liquidity preference and duration should be retained when explaining how the yield curve is determined.

Structuralists, for their own part, do not get the story entirely correct either. First, it is presumed that liability management occurs to provide banks with the needed reserves due to loan allocation. This is not entirely accurate. First, liability management is done primarily to be a first mover into markets where above average risk adjusted rates of return can be reaped. Secondly, liability management is practiced to indirectly *eliminate* the need for reserves, not to procure more. This is why banks are continually inventing

¹⁷ The fact that the real wage has been nearly constant for approximately forty years certainly aided the demand for funds which allowed lending institutions to begin fields of specialization in lending to the middle and lower classes for consumption purposes.

products that are subjected to a lower reserve percentage instead of only relying on demand deposits. Hence, while it provides banks with *funds* with which to invest, they may not necessarily be for the explicit purpose of *reserves*.

Secondly, the supposed upward pressure on interest rates due to quantity constraining is not what leads to innovation. In fact, the causality is reversed. Instead, it is the innovation that causes changes in the rates of interest. This is fundamental essence of liquidity preference theory; that all prices of assets-and therein rates of return- will adjust until they reflect the equilibrating desire to hold wealth in its various liquid or illiquid forms. Consequently, it is the desire to be a first mover into a market that causes the changes in interest rate structure, not the inherent upward pressure on interest rates that provides the impetus for liability management.

In conclusion, both schools shed light onto a problem that required investigation. Though it is a tedious task, members of both factions have proposed their own internally coherent theories. Hence, in light of the recent economic troubles, it was possible to conduct an analysis of these two theories and their relative merits. It would appear that the issue of time can not be ignored, for it is the position within the business cycle that will determine whether the Horizontalist or Structuralist argument holds more water.

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