Spring 2019

Financial Innovation and the Implications for Monetary Policy and Portfolio Hedging

John Flynn

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Thesis Submitted to Levy Economics Institute of Bard College

John Flynn

Annandale-on-Hudson, New York May 2019

Acknowledgements: I would like to thank my thesis advisor, Professor Jan Kregel, for the guidance and support he provided me with during my research. Thank you to the distinguished professors at the Levy Economics Institute of Bard College for providing me with greater knowledge and a deeper inspiration for economics.

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ABSTRACT

The focus of this thesis will be on three main components, namely, monetary transmission mechanisms, financial innovation and portfolio hedging. It will first discuss the different channels of monetary policy and how they affect economic and financial variables. Then, financial innovation will be analyzed from the perspective of Hyman P. Minsky and the effects on the financial system. Next, the relation of regulation to the changing financial landscape of the economy will be discussed. Finally, the use of financial derivatives will be reviewed, presenting their hedging function and speculative risks. Then, the impact of too big to fail banks and their inability to effectively hedge systemic risk will be discussed. A peculiar example, known as the JPMorgan London Whale Scandal, will illustrate the influence of too big to fail banks on their hedging activities and the repercussions for policy and future reform. Then, the difficulties these banks face in performing a macro hedge will be examined. Ultimately, financial innovation and too big to fail banks impede the influence of monetary policy.

Keywords: Financial Innovation, Too Big To Fail, Interest Rates, Financial Sector, Crisis, Debt Cycle, Economic Fluctuations, Inflationary Expectations, Monetary Instrument, Monetary Policy, Policy Effects, Central Banking, Lender of Last Resort, Macroeconomic Policy, Diversification, Risk Hedging, Deregulation, Financial Market Policy, Financial Regulation, Commercial Banks, Financial Intermediaries, Financial Risk.

JEL Classification: E31, E32, E40, E41, E42, E43, E44, E50, E51, E52, E58, E60, G11, G18, G21

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INTRODUCTION

Due to the profit seeking nature of too big to fail banks and financial innovation it impedes the affects of monetary policy. One example that illustrates this view is the JPMorgan London Whale Scandal. Essentially, this scandal was a result of the banks efforts to profit from a hedge of credit risk. However, in order to run an effective hedge the bank would have to sustain losses. Ultimately, this was unattractive to the bank and they proceeded to run a hedge that was profitable, up until a certain point. For banks that are considered to be too big to fail, it is nearly impossible for them to run a macro hedge. This is so because the banks are too large and too complex. Essentially, they would have to take up a huge portion of the markets share and have multiple counterparties in order to hedge systemic risk. Thus, as JPMorgan proceeded with attempting this impossible hedge, the management team was unaware of what was going on, and the balance sheet had become so large that they could not set up an effective hedge. Therefore, the market began to price against their position and the hedge became too costly, resulting in substantial losses. We can consider this example a type of financial innovation because JPMorgan was having difficulty controlling their balance sheet due to systemic risk and the size and nature of the hedging strategy.

However, with financial innovation the impact of policy and regulation used to limit the nature of too big to fail banks is weakened. Ultimately, due to the fact that unique and sophisticated financial instruments are used to hedge against their future downside risk such as, a credit stress event. Thus, as the economy developed into a complex capitalist system, innovators found ways to constantly evade regulation that was intended to control the construction of financial portfolios. However, throughout history, in examples such as, The Credit Crunch of 1966 and The Liquidity Squeeze of 1970, authorities are unable to completely control the business practices that triggered instability. In both cases, a financial instrument disturbed the structure of the economy and resulted in intervention by the Federal Reserve to help combat the fragility that was created. However, when "the Federal Reserve protects a financial instrument, it legitimizes the use of [that] instrument to finance activity" (Minsky 1986a). Ultimately, innovation is a result of the profit seeking nature of the bank, which transitioned the economic system to one where "financial crisis was unlikely into one that was vulnerable to crises" (Minsky 1986a). Economic structure continually adapts to financial innovation and contains the instability in the system. Minsky characterized the financial system

as one with periods of tranquility. During tranquil periods, financial innovation and more risky practices are undertaken pushing the system to greater instability even though profits are rising at the same time (Minsky 1986a). Essentially, "stability is destabilizing." Authorities' attempt to constrain recessions gives entrepreneurs the belief that their own profits will continue to increase. This is mainly caused by the lender of last resort intervention as well as a large government deficit, however, the apparent success leads to changes in the ratio of payment commitments on debt accounts to income flows, ultimately making policy interventions less effective when they are utilized (Minsky 1986b). Next, we can consider the role of monetary policy in the economy and look at how it attempts to influences these banks that are considered to be too big to fail. However, what we will discover is that the nature of these banks impedes the impact of monetary policy through the use of financial innovation.

Monetary transition mechanisms refer to the way in which monetary policy affects asset prices and general economic conditions such as GDP, employment and inflation. There are several monetary transmission mechanisms such as the interest rate channel, the credit channel and the exchange rate channel. The goal of monetary policy is to maximize employment while maintaining low and stable inflation. In turn the chosen policy will either spur or restrain growth for overall demand for goods and services. There are two main impacts of monetary policy. First, the Minsky impact shows that a change in interest rates will influence bank portfolios, which in turn impacts bank leading. Economist such as Frederic S. Mishkin believe, with contractionary monetary policy, interest rates will increase which in turn increases the cost of capital causing a decline in investment spending reducing aggregate demand and leading to a fall in output (Mishkin 1996). The transmission mechanisms of monetary policy represent the effects of monetary policy on the real economy. A Neoclassical approach, proposed by John B. Taylor shows that, "contractionary monetary policy raises the short-term nominal interest rate. Then, through a combination of sticky prices and rational expectations, the real long-term interest rate rises as well, at least for a time" (Taylor 1995). High interest rates then are expected to reduce investment and expenditure, which produces a decline in aggregate output. The second view is the traditional view, which states that a change in interest rates impacts investment through the multiplier effect of investment. In the case of expansionary monetary policy, a reduction in the Federal Funds rate leads to a decrease in the cost of borrowing for commercial banks at the Central Bank. The overnight rate, the rate at which banks lend to each other, would then start to decrease generating an expansion in the lending amongst banks. This generates

excess liquidity in the system, which is then used to provide more credit to the financial sector. The increased demand in the securities market puts upward pressure on the prices and requires a further reduction in nominal interest rates, which in turn reduces the real interest rate in a downward manner, holding inflation expectations unchanged (bankpedia 2009). As a result of expansionary monetary policy, an expansion of investment and consumption. As the price of financial assets rises, the value of assets held by households and firms increases in relation to the cost of capital, what is commonly referred to as Tobin's Q (bankpedia 2009). Due to the fact that the stock of wealth of households has increased this should increase private consumption, as well as increase investment by firms. This impact translates to the credit channel because in a monetary expansion, conducted by the Central Bank, commercial banks are made more liquid, increasing their reserves (bankpedia 2009). This is important in determining the supply of credit to the private sector. By affecting the expectations of market participants the Central Bank creates expectations on future prices and rates, which ultimately influences the yield curve. The more expectations can be influenced the better the authorities are able to create stability in the future, thus keeping the yield curve at its normal shape. Monetary policy is a critical component in helping control the interaction between lenders and borrowers. Banks that are considered to be too big to fail have found ways to innovate around the affects of monetary policy. Through financial innovation, too big to fail banks create instability within the financial system. Therefore, it is critical to first understand how monetary policy works.

CHAPTER 1: MONETARY TRANSMISISON MECHANISMS (ORTHODOX VS. HETERODOX)

Orthodox:

Monetary authorities use monetary policy to influence real variables such as GDP and inflation. There are many rates that can be used to transmit policy objectives to the real market such as exchange rates, long-term interest rates and short-term interest rate. Current policy is to influence the short-term interest rate. The Federal Funds rate is typically targeted because it is closely correlated to many of the other mentioned rates and it is the main rate used by monetary authorities in conducting policy. It is important to compare the mainstream approach with the Minsky view to see where the two differ.

Interest Rate Channel:

Essentially, the mainstream approach does not take into account the effects on bank portfolios and the various financial instruments that can be used to hedge against their interest rate risk. Monetary authorities attempt to affect real interest rates through changes in nominal rates. The relationship between real and nominal interest rates depends on the following two assumptions, "rational expectations and rigidities of wages and goods prices. An increase in the nominal interest rate will bring about an increase in the real interest rate if the rationally expected inflation rate does not increase by the same amount" (Taylor 1995). It is important to note that this adjustment does not happen instantaneously. The price of goods and services adjusts slowly due to the affect of rational expectations; increasing the nominal interest rate changes the real interest rate over the time period that it takes for prices and expectations to adjust (Taylor 1995). Due to this lag, in the long run the real interest rate will converge back to its point of equilibrium. Essentially, wages, the price of goods and services and real GDP adjust to their original equilibrium.

Many textbooks note that interest rates are affected by the actions of the Central Bank to change the supply of money in the economy. However this view is flawed and outdated for two main reasons: "first the money demand equations appear to be too unstable to yield a reliable estimated effect of a given change in the money supply. Second, Central Bank behavior is not accurately described by one time changes in the money supply" (Taylor 1995). It is necessary for the Federal Reserve to have a reaction function rather than relying on a fixed money supply. In order to achieve necessary movements in the Federal Funds rate more is necessary. Long-term interest rates are important when it comes to consumption and investment demand due to the fact that many of the decisions to invest in the future are based on the long-term rate. Therefore, the long-term interest rate depends on how monetary policy is conducted and transmitted. There is a key relationship between short-term and a long-term interest rates referred to as the expectations mode of the term structure. Essentially, the long-term rate is given by the expected weighted average of future short-term rates appropriate for the maturity of a long-term bond (Taylor 1995). For example, if the Central Bank is raising the short-term rate but market participants have the expectation that the short-term rate will return to its normal level in the future, then the long-term rate will increase less than the short-term rate. On the opposite side, if expectations are that the short-term rate will continually be increased in the future then the long-term rates will rise at a higher volume than the short-term rate. Further,

consider an increase in the real short-term interest rate and its affect on the long-term rate. This would raise the price of goods and services purchased in the current day resulting in a decrease in demand. Here, consumption and investment are negatively correlated with the real interest rate. Currently, we see the Federal Reserve utilizing their strategy of the dot plot, which follows a similar pattern to the previous examples regarding market participants' expectations.

Mishkin points out in the basic Keynesian IS-LM framework its main objective is the emphasis on the real interest rate rather than the nominal rate, which affects consumer and business decisions. The real long-term interest rate is viewed as having a major impact on spending, not the short-term interest rate (Mishkin 1996). The change in the short-term nominal interest rate by the Central Bank can affect the real interest rate on short-term and long-term bonds because of the assumption of sticky prices. Therefore, expansionary policy lowers the short-term nominal rate and also the real short-term interest rate. Furthermore, because the long-term interest rate is an average of the expected future short-term interest rates this would entail that the lower real short-term rate leads to a fall in the real long-term rate (Mishkin 1996). Due to the fact that real interest rates are the main concern, it is possible to have a case of a zero interest rate floor. However, during a deflationary episode monetary policy can still influence the economy. This is so because when nominal interest rates are zero an expansion in the money supply raises the expected price level and, therefore, expected inflation, lowering the real interest rate even when the nominal rate is at zero (Mishkin 1996). This results in a stimulation of spending through the interest rate channel.

However, the Keynesian IS-LM framework only focuses on the interest rate rather than other asset prices. Looking through a monetarist lens, when the money supply of the economy is increasing firms and consumers will try and reduce their holdings through an increase in spending (Mishkin 1996). From a Keynesian perspective a fall in the interest rate makes bonds become less attractive compared to equities, thereby, causing price of equities to rise. If we consider Tobin's Q, higher equity prices will increase Tobin's Q which is the market value of the firm divided by the replacement cost of capital, thus, resulting in higher investment spending (Mishkin 1996). Also, the increase in stock prices results in a wealth effect because the financial wealth of consumers increases, so the consumption of consumers should increase as well.

Credit Channel:

The credit channel of monetary transmission attempts to take asymmetric information into account, via the bank lending channel and the balance sheet channel. Banks play an important role in solving asymmetric information in credit markets. Mishkin points out that as long as there is no perfect substitutability for retail bank funds with other sources of funds then the bank-lending channel of monetary policy works (Mishkin 1996). As we will see, this is not always the case. The story Mishkin presents goes as follows, banks play a special role in the sense that borrowers will not have access to the credit market unless they borrow from them. The main argument is that expansionary monetary policy increases bank reserves and bank deposits. Hence, this increases the quantity of bank loans available. This is a Neoclassical view on the operations of how banks operate, which is flawed. Essentially, it following Say's law, when in reality deposits do not create loans, loans create deposits. The story then goes on to say that with the increase in loans banks will cause investment and consumption to rise. A few disputes arise from the idea that access to credit is not limited solely to banks. Traditional bank lending has recently declined and banks have been playing a less important role in credit markets. Also, regulatory restrictions requiring reserves to be held on certain financial instruments have been abolished, so it is easier for banks to make up for reserve losses if need be. The decline in the number of banks, and their sources of funds to make loans, reduces the capability to solve adverse selection and moral hazard problems in credit markets, causing a reduction in investment and a decline in economic activity (Mishkin 1996).

Balance Sheet Channel:

The balance sheet channel, also deals with the issue of asymmetric information in credit markets. Essentially, the lower the net worth of business firms, the more severe the adverse selection and moral hazard problems are in lending to these firms (Mishkin 1996). A low net worth means that the borrower has less collateral to pledge signaling that they are unable to meet their obligations and vice versa, the lender has less collateral for their loans. This increases the adverse selection problem leading to a decrease in lending. Essentially, moral hazard increases because the owners have less equity in their firms, which may cause them to engage in risky practices or investment projects, leading to a decrease in lending and investment spending because it is more likely that the lenders will not be paid back.

As we noted above, in an expansionary monetary policy environment, equity prices rise leading to higher investment spending and aggregate demand because this in turn reduces adverse selection and moral hazard problems (Mishkin 1996). Expansionary monetary policy also improves the firm's balance sheet by raising the firm's cash flow in nominal terms, which again reduces adverse selection and moral hazard problems. Here, the focus is on nominal interest rates instead of real interest rates because interest rates on short-term debt typically have a greater impact than long-term debt payments on a firm's cash flow; therefore the nominal rates affect the firm's cash flow more (Mishkin 1996). Similarly, in regards to adverse selection, expansionary monetary policy stimulating aggregate output involves credit rationing. Credit rationing results when borrowers are denied loans even when they are willing to pay a higher interest rate (Mishkin 1996). Mainly, those willing to pay a higher interest rate are ones with the most risky investment ideas. Mishkin says that higher interest rates increase the adverse selection problem while lower interest rates reduce it. He says that when interest rates are low, less risky borrowers will flood the market and more lenders will be willing to lend, increasing both investment and output. Next, we look at the price level effect of the balance sheet channel. Essentially, debts are contracted in nominal terms so when there is an unanticipated increase in the price level the value of the firm's liabilities in real terms decreases (Mishkin 1996). The unanticipated rise in the price level, therefore, raises real net worth which lowers the adverse selection and moral hazard problems, increasing investment spending and aggregate output.

Heterodox:

Minsky's view is more concerned with money managers and financial structures also known as, Money Manager Capitalism. Minsky was helpful in pointing out the fact that "financial conditions affect expenditure" (Fazzari 1999). Although, some of Minsky's work has been introduced into the mainstream approach there still remains differences between the two theories, especially, in dealing with the role financial institutions play in macroeconomic fluctuations. When Minsky was writing finance entered into economic models through the money demand function that provided the foundation for the LM curve in the IS-LM framework (Fazzari 1999). Financial variables were viewed as irrelevant in determining real economic variables and Minsky's work received little attention. Minsky noticed the "importance of financial factors for investment" prior to the middle of the 1990s when mainstream Neoclassicists began incorporating this into their theory (Fazzari 1999). Minsky and the

mainstream approach share the common belief that firms make investment projects to maximize the present value of expected cash flows that result from investment (Fazzari 1999). Minsky believed that a firm's financial structure was the most important part in determining investment whereas the mainstream approach believes that investment is independent from the access to finance or the cost of financing. The availability and cost of external financing depends on the firm's liability structure, which can be viewed as the history of payments that appear on a firm's balance sheet that result from past investment activity (Fazzari 1999). For Minsky, the cost of debt "exceeds the opportunity cost of internal cash flows by [an] amount that depends on the strength of the firms balance sheet and the prevailing conditions in the credit markets" (Fazzari 1999). Essentially, Minsky says that debt can exceed the amount of cash on balance sheets depending on the firm's ability to pay. Thus, they will be able to take on more debt as long as commitments are met.

Today, economic theories are created concerning an abstract non-financial economy when in reality we are living in an economy with complex financial institutions (Fazzari 1999). In financial markets asymmetric information presents a risk that lenders need to hedge against. However, if the lender is considered a bank that is too big to fail how will it run a macro hedge against their entire risk exposure? In the concept of asymmetric information the seeker knows more about the quality of the good than the buyer (Fazzari 1999). In credit markets firms know more about the quality of their credit than the lenders. Due to this, lenders will always be skeptical of who they are issuing loans to. Even if the borrower is a creditworthy borrower the lenders will charge a premium because there is a chance that the borrower is a risky debtor. Hence, those with sound investment projects may not be able to find the funds necessary to begin because they are being charged a premium rate, making the project undesirable. Therefore, the borrowers who are left when credit is being rationed will be the risky borrowers, and they will accept the premium rates because they are aware of the risk associated with their endeavors, but also, they will bear the reward.

Fazzari argues that, "asymmetric information is a fundamental characteristic of a decentralized economy, because decentralization inevitably leads to information differences" (Fazzari 1999). Therefore, asymmetric information is a necessary condition in modern economies for the presence of financing constraints on investment. Due to the cost of external financing in dealing with the problems of adverse selection and moral hazard, firms will prefer to finance from their internal cash flows because it has a lower cost than external finance.

Minsky also notes the importance of leverage and its ability to finance through a strong balance sheet. Depending on a firm's balance sheet condition, it will be able to acquire financing at a lower cost or higher cost depending on how indebted the firm is. This is so because, "a decision to take on debt now, raises future leverage and, other things equal, limits the firms ability to finance future projects with new debt" (Fazzari 1999). Ultimately, the firm's access to external credit is determined by the strength of the firm's balance sheet. For Minsky, leverage and balance sheet affects are mainly a result of uncertainty and the level of indebtedness a firm has, thus, increasing risk. The act of operating on the liability side of the balance sheet generates a greater potential for risk.

Much of mainstream theory seeks to describe how monetary policy affects the aggregate economy. However, mainstream models regarding market imperfections such as asymmetric information are not relevant to Minsky's work. The models that incorporate these imperfections from asymmetric information in real business cycle models are not intellectually common with Minsky's work. They affect investment through supply side forces. Minsky has a similar theory regarding the balance sheet channel in the sense that, mainstream research notices that firms must pay premiums for external funds depending on the state of their balance sheet, or its internal net worth, while highly leveraged firms will have to pay more for debt than a firm with little debt (Fazzari 1999). Minsky noticed that the cost and availability of debt depends on a firm's balance sheet. Minsky and the mainstream approach differ in the notion of where shocks to the financial system ultimately come from. Minsky believed that shocks are endogenous to the system. He believed that "instability is determined by mechanisms within the system, not outside it; our economy is not unstable because it is shocked by oil, wars or monetary surprises but because of its nature" (Fazzari 1999). The mainstream approach believes that shocks to the financial system are exogenous and that financial factors do not play a role in determining the source of the fluctuations. In Minsky's view investment today raises profits to generate cash flows, which are needed for future investment. This generates more cash flows but the system has its limits as the economy reaches its capacity. This is so because higher leverage ratios require margins of safety to be stretched making the economy more susceptible to shocks (Fazzari 1999). Essentially, this provides a ceiling to the expansion of the economy and ultimately results in a downturn of the economy.

Minsky's work has helped point out to the mainstream economist that there exists a link between financial instability and macroeconomic policy. Financial structure and the behavior of

financial institutions influence the transmission mechanisms of monetary policy. Monetary policy relies on "small interest elasticities of investment and consumption" (Fazzari 1999). Minsky understands that there is a need for monetary policy and the lender of last resort function in the economy but the transmission mechanisms of monetary policy do not fully solve the inherent instability found in the capitalist system. Minsky noted the importance of the lender of last resort function but he was also not naive of its failures. Essentially, this function allows large banks to be bailed out in times of difficulty making the moral hazard problem more severe as Central Banks validate risky practices (Fazzari 1999). The mainstream response is that it is an issue of intervention. Minsky agreed that the bailouts can make the system more fragile and lead to future instability but it is a better alternative than resulting to a debt deflation and causing a depression to happen again.

The impact of monetary policy to the real economy can be seen through a firm's user cost elasticity. This means, "the price sensitivity of business investment spending is a central element in economic analysis" (Chirinko, Fazzari, and Meyer 1996). The user cost elasticity helps determine how effective monetary policy is at transmitting its effects to the real economy. If the user cost elasticity is high, monetary policy can have a significant impact on business investment spending. On the other hand, a low user cost elasticity results in minimal effects from monetary policy. The user cost combines interest, tax and depreciation rates with relative prices. So, by way of the Neoclassical framework of the transmission mechanism of monetary policy, the user cost is affected by monetary authorities altering the level of bank reserves in the banking system, which in turn affects short-term interest rates and, thus, long-term interest rates (Chirinko, Fazzari, and Meyer 1996). It can be argued that firms response to monetary policy reduce financial innovation. Hence, I would argue that there exist a low user cost elasticity due to the weak nature of monetary policy and the motivation of firms to innovate around the barriers presented by authorities. Much of the economic research established presents the user cost elasticity as significant. However, Bernanke and Gertler (1995 Pg. 27) rationalize that "interest-sensitive components of aggregate spending have in fact had great difficulty in identifying a quantitatively important effect of the neoclassical cost-of-capital variable" (Chirinko, Fazzari, and Meyer 1996).

Furthermore, the paper titled, *What Do Micro Data Revel About The User Cost Elasticity*, estimates that the user cost elasticity is much lower than what it is often assumed to be. They find that it is around -0.25 with a standard error of 0.03 to 0.06. In many models they

assume the user cost of elasticity to be unity. However, the paper concludes that the user cost elasticity is much lower than what is assumed. Therefore, "models that rely heavily on prices to allocate capital, as seen in the real business cycle tradition, may be misspecified" (Chirinko, Fazzari, and Meyer 1996). The important conclusion to draw is that interest rates only have a modest effect on investment, which in fact weakens the traditional monetary transmission mechanism.

Orthodox Limitations:

Much of what we have seen is that the economy relies on low interest rates in order to affect the economy. Neoclassical theory relies on the assumptions that firms can sell what they want at their desired prices and financing for investment can be obtained for any project that is profitable (Fazzari 1993). Fazzari concludes that these Neoclassical models fail to look at the difference between sales or output growth from the cost of capital when determining investment decisions. Therefore, policy loses its effectiveness. Fazzari notes that interest rates have a small effect on investment because firms are more concerned with cash flow. Therefore, the belief that "higher interest rates will increase firms' cost of capital and therefore crowd out private investment is, for many economists and policymakers, the primary reason for cutting the federal budget deficit" (Fazzari 1993). Essentially, Fazzari concludes from his paper titled, *The Investment Finance Link*, "interest rates and the cost of capital play a small and uncertain role in the determination of investment when compared with the strength of firms' financial condition and the growth of their sales" (Fazzari 1993). For fast growing firms they are more concerned with economic growth, rather than, the effects of higher interest rates or capital costs. A deficit reduction would reduce economic growth and severely hurt rapidly growing firms. On the other hand, lower interest rates do not improve the level of investment related to the effects of economic growth.

Fazzari notes that investment is more responsive to the effects of taxation and spending initiatives to reduce the deficit of the overall economy than taxing or raising interest rates on the cost of capital. Policy to stimulate investment would need to be designed to directly put cash in the hands of investors. The dominant or Neoclassical view of investment is commonly used in deciding the impact of on economy. It states that there is a strong link between investment and the interest rates as well as taxation. Investment is affected by the market prices at which a firm sells it output that are not determined by anything else in a completely competitive market and

technology which decides the amount of output a firm will produce with its capital inputs (Fazzari 1993). Therefore, policy relies on impacting investment through relative prices. The models presented by Neoclassical theory are flawed because they assume that firms operate in completely competitive markets so that firms can purchase all their inputs and sell all the output at specified prices. Also, resources can be obtained if they do not have the funds necessary to pursue an investment project. They do this by issuing shares at fair market prices or by borrowing at prevailing interest rates. As we can see, in reality these assumptions do not hold because firms and large financial institutions use innovative techniques to innovate around these regulations and hedge their portfolio exposure against negative price adjustments in the markets. It is unrealistic to believe that the "only limitations firms perceive on their production arise from their technology and market prices" (Fazzari 1993). Fazzari notes that typically firms have some type of control over the price they charge and the sales they make are determined by the strength of demand for their products (Fazzari 1993). Therefore, future sales have an important impact on investment spending. This is known as the accelerator effect. If sales are high in the present and past then this will likely lead to the expectation of higher sales in the future and encourage investment spending. On the other hand, if sales are lower, then the firms will reduce investment. The accelerator affect is not necessarily a short-term phenomenon. It is assumed that the affects on investment are temporary because the economy will eventually converge to full employment equilibrium due to its natural adjustment mechanism (Fazzari 1993). Furthermore, the past performance of the economy does not dictate how the economy will perform in the future. Today, everyone is concerned with the deficit, however, there is little research that shows deficit spending hurts investment through the cost of capital channel due to government borrowing increasing interest rates and crowding out private investment (Fazzari 1993). Fazzari notes that deficit spending can stimulate the economy and lead to more investment through the accelerator effect, which has been shown in research.

Fazzari notes that we cannot rely on the natural stabilizing forces of the economy. The Neoclassical theory also relies on the assumption that financing can be obtained for any investment that is seen as profitable at a cost based on market interest rates. However, there exist financial constraints that limit investment besides the interest rate, taxation and technology. If a firm cannot internally fund an investment project they will have to seek external finance. However, there are financial costs associated with external financing because financial intermediaries have to make the deals and also cover their own costs, making a profit. These

costs can be expensive and the firm may not end up undertaking the project, or postpone it. Also, when credit is rationed interest rates do not equate supply and demand for loans, which can leave firms without finance and constraints to their investments (Fazzari 1993). However, firms have become innovative and found new ways to increase financing for investment spending. More so, they can reduce assets held to raise funds without having to issue stock or borrow at costly rates. This all depends on the firm's liquidity and its ability to generate cash flows even in times of a recession. If firms hold less liquid assets they will be affected the most in a downturn and become heavily indebted. As we can see, firms rely more on the strength of the economy and markets in dealing with their investment decisions. Interest rates do not have that large of an effect but a strong aggregate economy will improve the firm's ability to finance capital spending (Fazzari 1993). The effect is small because the sensitivity of investment to interest rates is small. Lower spending by the government decreases sales growth and the firm's cash flow. Also, more savings does not increase investment. This is an unreliable assumption because policy designed to increase savings could reduce investment in times of economic hardship. Thus, a deficit reduction is not the way to stimulate the economy. This is so because there would be weaker economic conditions and, therefore, less consumption leading and lower sales and profits.

The Central Bank can influence the monetary base, which is made up of currency and bank reserves. Monetary policy starts by first affecting these components by way of open market operations either by buying securities to increase the monetary base or selling securities to decrease the monetary base. Monetary policy affects the Central Banks balance sheet but the alteration to other financial institutions balance sheets may be minimal. Monetary policy works if the other financial agents in the game cannot offset the changing composition and quantity of their own liabilities. Therefore, "monetary transmission mechanisms must assume that there exist no privately issued securities that substitute perfectly for the components of the monetary base" (Ireland 2005). This can be an issue because through financial innovation, private institutions can issue liabilities that act as substitutes to the monetary base, having the characteristics of currency and or bank reserves. Therefore, if policy were conducted to move the nominal monetary base, then in order for the effects to move the economy, the nominal prices must not respond immediately to policy, otherwise the monetary base would remain unchanged (Ireland 2005). Hence, it must be assumed with models dealing with monetary transmission mechanism that some friction must be present so the nominal prices do not adjust

immediately and proportionately to the monetary base (Ireland 2005). Essentially, as nominal interest rates rise, other liquid assets become more attractive as short-term stores of value (Ireland 2005). Firms and banks decide to save their liquid holdings as they become more attractive in a rising rates environment. Therefore, when the price level does not fully adjust in the short run the Central Bank uses its monopolistic control over the nominal quantity of base money to influence short-term nominal interest rates. Thus, by increasing the monetary base through lending until there is a decline in the interest rate that is significant enough to encourage private agents to hold additional volumes of real base money (Ireland 2005).

There is close relationship between the interest rate and the monetary base in dealing with the effects of monetary policy. The authorities conduct policy today by setting a target rate for the short term nominal interest rate rather than setting the nominal supply of base money and letting the markets determine the Federal Funds rate. Thus, utilizing the Keynesian interest rate channel, "an increase in the short-term nominal interest rate first leads to an increase in longer term nominal interest rates, as investors act to arbitrage away differences in risk adjusted expected returns on debt instruments of different maturities, as described by the expectations hypothesis of the term structure" (Ireland 2005). This affect will cause real interest rates to adjust as well so the cost of borrowing will increase and firms will reduce their investment expenditure and households will also reduce their consumption. This framework is central to the Keynesian IS-LM model but has many flaws. Monetarist would argue that the short-term nominal interest rate does not exhaust the effects of monetary policy completely. Monetarists believe that "monetary policy actions impact prices simultaneously across a wide variety of markets for financial assets and durable goods" (Ireland 2005). In the bank-lending channel of monetary policy, banks play a special role in the sense that they do not just issue liabilities but they also hold assets, such as bank loans, where few alternatives exist (Ireland 2005). In particular, small banks use deposits as the principle source of funds for lending to small firms and theses firms use bank loans as the primary source of funds for investment. Therefore, contractionary open market operations will cause a contraction of the supply of reserves and a reduction in bank deposits which will cause banks who are reliant on their deposits to cut back on their lending and firms who are dependent on bank loans will have to cut back on their investment spending (Ireland 2005). Looking through the credit channel and the balance sheet channel it is important to note that a firm's cost of credit rises or falls with the strength of the firm's balance sheet. Therefore, an increase in the interest rate can directly affect a firm's

floating debt resulting in higher payments. Also, an interest rate increase can affect the value of firm's long-term capital assets. Therefore, the interest rate channel can work with a lag, which ultimately raises the cost of capital through the balance sheet channel.

I would argue that the affects of the lending channel are only significant to community banks and not those who are considered to be too big to fail. The monetary authorities should not be worried about the actions of community banks because they are the ones who are stimulating small firms and community businesses to fuel local economies. In order to reach banks that are considered too big to fail they will need to look at the recent financial innovation that has been taking place and determine how banks are using these instruments to hedge against the affects of monetary policy.

Mishkin notes that asset prices are significant in determining monetary policy and its transmission to the economy. However, not all asset prices should be targeted because it can lead to even worse economic conditions. In order for monetary policy to improve economic performance, the nature of the shock must be dealt with. A collapse in asset prices would damage the economy but targeting asset prices should not be the way to control bubbles in the economy. In reality, monetary authorities are unable to identify bubbles. For this to happen, the monetary authorities would have to have perfect information about the health of the economy. Essentially, "if the Central Bank has no informational advantage, then if it knows that a bubble has developed that will eventually crash, then the market knows this too and then the bubble would unravel and thus would be unlikely to develop" (Mishkin 2001). Therefore, "without an informational advantage, the Central Bank is as likely to mispredict the presence of a bubble as the private market and thus will frequently be mistaken, thus frequently pursuing the wrong monetary policy" (Mishkin 2001).

Monetary Transition Mechanisms and Financial Innovation:

Financial innovation breeds opportunity for profit seeking banks. It influences the structure of the market, the financial behavior of economic agents and types of financial products being traded. This adds uncertainty to the effectiveness of conducting monetary policy. This uncertainty can generate instability from innovative sources such as off balance sheet activities and the use of derivatives. Minsky notes that, the "innovative characteristics of banking and finance invalidates the fundamental presupposition of the Orthodox Quantity Theory of Money to the effect that there is an unchanging "money" item whose velocity of

circulation is sufficiently close to being constant: hence, changes in the money's supply have a linear proportional relation to a well defined price level" (Minsky 1992). He also noticed that when financing constraints present themselves firms would innovate. One-way firms are able to continually increase and secure the amount of debt they can take on is through financial innovation. However, as innovation occurs and the economy heats up the policy tools put in place by monetary authorities start to have a minimal impact on controlling the profit seeking nature of these firms.

Additionally, in the paper titled, *Inside the Black Box*, points out the connection between financial innovation and its impact on the channels of monetary policy in terms of balance sheet operations and profit opportunities. Here, it is noted that the bank-lending channel has been difficult to research because of the changes that have occurred due to financial innovation. Thus, the effectiveness of the bank-lending channel of the credit view has been reduced. Monetary policy affects "the external finance premium by shifting the supply of intermediated credit, particularly loans by commercial banks" (Bernanke and Gertler 1995). Otherwise, known as the bank-lending channel. Banks seek to provide credit and "specialize in overcoming informational problems and other frictions in credit markets" (Bernanke and Gertler 1995). As we can see, banks have a critical role in providing credit to borrowers therefore any disruption in the supply of bank loans can shut off borrowers from credit. However, in dealing with the bank-lending channel, "can monetary policy affect the supply (or relative pricing) of bank loans" (Bernanke and Gertler 1995)? Banks have deepened the markets and are able to raise funds through innovative means. Mishkin notes in his paper that, "the demand for banks' managed liabilities is not perfectly elastic" (Bernanke and Gertler 1995). His model found that "during tight-money periods, when open market interest rates rise, the prime rate rises by even more and credit terms become more onerous" (Bernanke and Gertler 1995). This correlation was found in a time period where monetary policy was restrictive. Therefore, the affects of financial innovation may not have been fully accounted for because as the economy evolved more financial techniques have been created to hedge against interest rate risk and the impact of reserve requirements. Mishkin reaffirms in his paper "the behavior of interest rate spreads and terms of lending are consistent with the bank lending channel" (Bernanke and Gertler 1995). However, both "financial deregulation and innovation have diminished the importance of the traditional bank lending channel (Bernanke and Gertler 1995). The balance sheet channel seems to have a more important impact because when interest rates rise this will lower the value of bank securities and

impair the banks capital making it harder for them to attract funds and hurt their ability to make loans (Bernanke and Gertler 1995). We will see how the profit motives of banks influence them to behave in risky ways and undertake speculative positions. Lastly, Mishkin notes that "in the United States, increased bank holdings of volatile securities and derivatives instruments may have increased the sensitivity of bank lending to interest rates via the balance sheet channel" (Bernanke and Gertler 1995).

We have previously seen, that monetary policy affects smaller institutions more than larger institutions. When monetary policy is conducted, the "agency costs of lending endogenously change with monetary policy" (Black and Rosen 2007). When there is a contractionary monetary policy action it will reduce the net worth of borrowers, which in turn increases the costs for borrowers, increasing the agency costs (Black and Rosen 2007). However, this is mainly a circumstance amongst the smaller firms and institutions because lenders look to invest in less risky firms and therefore look for safer alternatives, which are typically large, net worth companies. Here, the assumption is small firms are riskier than larger firms, but what should be considered is that monetary policy is not limiting the profit seeking nature of these financial institutions. It is only taking away the credit extended to smaller firms and institutions, Minsky argued that small community banks were necessary in establishing stability in the economy but monetary policy affects their lending habits more so than the large too big to fail banks who can easily dilute regulatory policy by way of innovation. Also, smaller banks could be seen to have weaker balance sheets because they have less access to liquidity and limited capitalization, therefore, during monetary contraction they reduce the supply of their loans (Black and Rosen 2007). Research using bank size and liquidity to differentiate banks argues, "the lending of small banks with illiquid balance sheets should be most sensitive to changes in monetary policy because raising wholesale liabilities is costly for them" (Black and Rosen 2007). In dealing with the balance sheet channel "banks reallocate their loan supply away from small firms and towards large firms when monetary policy is tight" (Black and Rosen 2007). This is known as a flight to quality. Essentially, what this means is that banks are looking to make safer loans during a time of monetary tightening because larger firms are deemed to be safer than smaller firms who have lower net worth, and therefore, higher agency costs. In the bank-lending channel the aggregate bank loan supply is reduced during periods of tight monetary policy, however, the balance sheet theory says that in tight monetary policy the bank loan supply is reallocated from small firms to large firms (Black and Rosen 2007). Small firms

are typically less diversified and have risker balance sheets, reducing the firms net worth. Large banks will choose to lend to larger firms in this case.

Further, banks can control the size of their portfolios by reducing or increasing the maturity on their loan obligations. Hence, a reduction in the maturity of its loan origination would reduce the length of time that its capital is invested in each project (Black and Rosen 2007). A reduction in the maturity of loans over time is the same as a reduction in the supply of bank loans due to tight monetary policy. However, when the sample is split by maturity they find that "banks tend to reallocate their loan supply from long-term to short-term loans. This indicated a move towards greater liquidity in their portfolio which could be due to the increased costs of bank financing" (Black and Rosen 2007). Reducing the maturity of loans over time will reduce the supply of loans, however, it is not necessarily limiting the profit motives of banks. They simply reallocate their positions around the effects of monetary policy until their stance on interest rates change, and then adjust their positions. Also, in times of tight monetary policy banks will simply reallocate credit away from small firms in favor of large firms (Black and Rosen 2007). Studies have shown that a bank's size is important in determining how sensitive its loan supply will be to monetary policy. In the article, it mentions that banks face lower costs to external financing then smaller banks do. In a study conducted by Kashyap and Stein, they found "the lending of large banks is not affected by monetary policy while the lending of small banks significantly declines when the nominal Federal Funds rate increases" (Black and Rosen 2007). Therefore, banks increase their lending to large firms by reallocating to short-term lending from small to large firms. What the authors found was that "within the credit channel of monetary policy, the bank lending channel causes banks to reduce the maturity of their loans and the balance sheet channel causes banks to reallocate their short-term lending toward large firms" (Black and Rosen 2007).

CHAPTER 2: FIANNACIAL INNOVATION

Evolution From Neoclassical Theory:

Up until this point, I have provided a comprehensive survey of the literature surrounding the mainstream approach to monetary policy. Financial innovation does not just refer to the development in financial securities; it also refers to the changes in markets and the structure of

institutions. Financial innovation modifies the way financial systems interact and influences interest rates in the transmission of monetary policy. Financial innovation can reduce the effectiveness of monetary policy by weakening the relationships between interest rates and monetary aggregates as well as the definition of money, the money supply and the demand for money (Akhtar 1983). Financial innovation has widened the access of funds and, therefore, presents significant changes in the way institutions fund their clients and their own operations. Throughout history there has been a large increase in the use of interest rate sensitive funds by banks and other financial institutions. The idea is that banks and other financial institutions can generate a profit by "borrowing in short term markets, to finance loan demand and other activities" (Akhtar 1983). This can be referred to the idea of liability management, in which, the traditional role of bank deposits are reduced and there is an increasing role of purchased funds in order to fund the activities of financial institutions. Further, banks offer various types of cash management strategies at the firm and household level. Essentially, as individuals or businesses become concerned about earnings in an inflationary environment they will seek interest-earning instruments for their money and try to economize at the same time on non-interest bearing transactions (Akhtar 1983). Also, as interest rates become more relaxed through regulation this allows banks to utilize interest sensitive funds. Financial institutions are concerned with the protection of their investments however they need to innovate in order to stay competitive. Therefore, "banks and other financial institutions have found it necessary to match increasing interest-sensitive liabilities by stepping up variable rate lending and by reducing the maturity of loan contracts" (Akhtar 1983). In order for investors to be attracted there most be a supply of securities that is competitive enough to provide the same type of criteria with respect to liquidity, risk and maturity (Akhtar 1983).

Minsky notes throughout the evolution of the economy banks and other financial institutions have adopted financial instruments, usages and behaviors that change the nature of the economy or evolve in response to perceived profit opportunities (Minsky 1985). The financial world has been changing rapidly but many of the techniques and methods used by policy makers have remained the same without taking into consideration the effects of newfound innovations. Minsky noticed that the Neoclassical assumption of exogenous money is still widely relevant in economic qualities. Hence, he argued that there was not a well-defined, exogenously determined money supply that the Central Bank can control effectively (Minsky 1985). The basis of Neoclassical theory does not take into consideration the profit maximizing

behavior of banks and other financial institutions. Monetary theory views banks as passive reactors that transform high-powered money into public money (Minsky 1985). However, in reality this is not true.

The profit seeking nature of banks can lead to great instances of instability. The Federal Reserve has a goal of influencing the economy to achieve a desired level of economic and monetary control (Minsky 1985). However, as we have seen throughout history, the Federal Reserve lacks effective monetary control to create a stable economy. The Federal Reserve faces a problem, such that, it has used its interventionist powers to "defend the integrity of the financial system by assuring that the nominal commitments of financial institutions on their liabilities are fulfilled" (Minsky 1985). This action results in a conflict between the Federal Reserve and its ability to maintain economic stability and the actions undertaken through the lender of last resort. Essentially, due to Neoclassical theory, the monetary authorities that believe an equilibrium point exists in the economy are fooled into believing that a situation of instability cannot be endogenously generated within the system that would require lender of last resort intervention (Minsky 1985). In the Neoclassical models, used to formulate monetary policy, banks are not taken into consideration. As Minsky has noted, through financial innovation the liability structure of our economy has become complex. The financial instruments utilized and portfolio structures of institutions have become increasingly interdependent. Therefore, the Neoclassical theory is unable to calculate the risks associated with financial innovations in their models. Consequently, Minsky debates whether or not the Central Bank's lender of last resort function can effectively maintain economic stability.

What has been constituted as money in the past has rapidly changed throughout the evolution of the economy. Minsky noted that it is wrong to follow the view that money is exogenous and neutral. Money has evolved due to the profit seeking nature of banks and other financial institutions along with the income expenditure preferences associated with money issuing organizations (Minsky 1985). Minsky notes that the theory behind bank money has not changed but the way in which finance is acquired and assets are used has changed (Minsky 1985). This is in turn affects the portfolio construction of banks as they are now involved in handling these new innovative instruments. Therefore, increasing the instability within the markets and the need for the lender of last resort function. Mainly, because businesses utilize innovative techniques to take on large amounts of debt, thereby, increasing their leverage ratios

to validate profits that must be used to eventually repay back their debt commitments. Therefore, the portfolio structure of banks cannot be ignored.

Position-Making Instruments:

In a complex economy, capitalists "depend upon the pursuit of private incomes and wealth for the creation and maintenance of capital assets as well as for current production" (Minsky 1986a). Minsky views the economy as a system of "money in/money out transactions" (Minsky 1986a). Meaning, that each financial instrument "is a commitment to pay cash at some time" (Minsky 1986a). In order to meet these commitments financial institutions and intermediaries must have cash on hand to finance their debts. Accordingly, to obtain cash an institution can borrow, sell financial or physical assets, or use funds on hand from cash flows. However, banks and financial institutions can face shortages when they are required to make payments to service their debts. Well operating banks will "tend to hold cash or readily marketable assets, or will have some type of refinancing available" (Minsky 1986a).

If banks face a cash shortage they will borrow or sell a liquid asset to meet their obligations. This "act of acquiring cash to finance the assets essential to units business is called, following bank terminology, making a position, and the instruments used for such purposes is the position making instrument" (Minsky 1986a). Financial instruments that fall into this class are typically liquid and have a broad market with little volatility. When innovation occurs in the market, new instruments are created and used as position-making instruments, however, the nature of these instruments can generate complexity amongst balance sheets and complicate liability structures so that if one unit defaults many others obligations can be affected.

Financial Innovations:

In order for banks and other financial institutions to meet their obligations on debts, they must make positions within their portfolios to make payments. Financial innovation has added to the degree and complexity of position-making instruments. One of the earliest position-making innovations was the creation of the Federal Funds market. Minsky mentioned that the original position-making instrument, known as the Treasury bill, was no longer the primary position-making instrument. At the end of World War II the Treasury market was the primary position-making market. Banks were able to buy and or sell Treasuries in the market depending if they had excess cash or a cash deficiency, respectively. During the postwar period, the

position-making instruments class "evolved from the simplicity of the Treasury bill's monopoly as the position-making instrument to a complex situation in which a representative bank juggles its government security account or its Federal Funds positions, has large denomination certificates of deposits, repurchase agreements, Eurodollar borrowings (or sales) and borrowings at the Federal Reserve" (Minsky 1986a).

With more financial innovation comes a greater potential for instability and crisis. This is so because monetary policy is not able to affect the economy, as effectively when there are many options for banks to make positions. With the creation of the Federal Funds market banks were able to make positions by way of acting on the liability side of their balance sheets (Minsky 1985). As the amount of financial instruments used for position-making activity grows, liabilities increase and in a rising interest rate environment banks will begin to buy their liabilities creating a sensitive environment to operate in as they are subject to more volatility from making positions by placing liabilities (Minsky 1985). Hence, the profit-seeking nature of banks entices them to increase their leverage ratios and find new innovative profit earning techniques. Due to high levels of debt, in an increasing interest rate environment, households and firm are required to pay back their commitments on liabilities. Therefore, less money is being deposited into banks and less economic activity is taking place. Hence, bankers must finance their positions by paying for depositors in either cash or services (Minsky 1985). The expense of acquiring funds and the difference between interest receipts is the banks fund income (Minsky 1985). This can be affected by the volatility of rising interest rates due to the fact that firms and households may default on their payments, causing banks to reconsider their lending standards (Minsky 1985).

Commercial Paper:

One innovative development that emerged in the economy during the time of Minsky's writing was the commercial paper market. Minsky notes that around the late 1960s the circulation of commercial paper had increased significantly. Commercial paper is typically a short-term instrument that is backed by unused lines of credit at banks (Minsky 1985). This line of credit at a bank offers the banks a source of fee income while at the same time it is a way of facilitating finance to bank customers when the demand for credit increases (Minsky 1985). Therefore, banks can refinance positions of their clients, acting as a lender of last resort in times of need. As we can see, in the example of the Liquidity Squeeze of 1970, the innovation of

commercial paper brought complexity to the liability structure of organizations as banks were acting as the lenders of last resort to their clients through complicated refinancing arrangements.

The Eurodollar:

Another innovation that Minsky pointed out in his work was the creation of the Eurodollar. Essentially, this is the idea of international finance and the use of American dollars in foreign markets as the transaction currency involved in the financial agreements. Now, there exists a financial market that is internationalized so that banks abroad and other financial institutions are trading dollar denominated securities while they are not considered to be a part of the United States Charter Bank (Minsky 1985). Therefore, there exists a market that demands dollars, short-term government liabilities, and commercial paper all denominated in Untied States dollars (Minsky 1985).

There are three components which determine the way foreign banks can acquire United States dollars: First, the Central Banks dollar holdings, second, the swap arrangements between the Central Bank and the Federal Reserve, and third, the terms on which the Central Bank will make the United States dollar accessible (Minsky 1985). Therefore, the actions of the Federal Reserve directly affect the Central Bank of a foreign country and the way in which they can sell assets to member banks making the Federal Reserve the *de facto* lender of last resort to international banks (Minsky 1985). In foreign markets, assets of the United States are considered to be high-powered money and serve as a stabilizing factor to the foreign economies. So, because the Federal Reserve is the *de facto* lender of last resort to all dollar denominated markets, they have responsibilities in markets in which they have no control over (Minsky 1985). Therefore, if there is a run on the Central Banks of the foreign markets it will impact the banking system in the United States as well, which can lead to a collapse.

How does this innovation lead to instability? It comes down to the concept of debt financing. Dollars must be acquired by businesses to repay the debts owed to banks and other lenders. Minsky makes the distinction between investment and gross profits, which can be seen in much of Kalecki's work. For instance, if we assume that gross profits is equivalent to gross investment, and if profits decline, then businesses will not be able to fulfill their debts to the bank due to the fact that the fulfillment of payments requires that new debts are able to be booked (Minsky 1985).

Essentially, what emerged was a large increase in indebtedness by both domestic and foreign markets. Due to this, there was a higher rate of default on payment commitments. Essentially, if we assume that bank money is inflationary and the destruction of money is deflationary, then the more people default on their debts the higher the level of inflation will be, reducing the quality of bank money (Minsky 1985). Now, consider the situation the monetary authorities are left with. In an inflationary environment, the main policy tool that the Federal Reserve will use is to hike interest rates, resulting in large-scale unemployment and appreciation of the dollar (Minsky 1985). However, the appreciation of the dollar in the United States is very much linked to those dollar denominated markets in foreign countries, thereby, increasing the price level of their economies and potentially generating instability within the systems abroad.

Shadow Banks:

Another, financial innovation that led to instability in the economy was the growing number of "fringe" bank institutions or otherwise know as shadow banks. In this case, "money market banks are the lender of last resort to the fringe banks that operate on lines of credit" (Minsky 1986a). Indirectly, the Federal Reserve acts as the lender of last resort, due to the fact that the financial institutions are intertwined. These fringe banks weaken the financial system because they have similar portfolio structures compared to institutional banks so "some assets held by banks are weakened when the losses and cash-flow shortfalls of the fringe institutions become apparent to the market. Consequently, the already weakened portfolios of some banks are made even weaker when these banks act as the proximate lender of last resort to fringe institutions" (Minsky 1986a). The layering of financial institutions and financial innovation in position-making instruments increases the potential for financial crises and fragility of the economy.

Securitization:

In the economy, the actual owners of wealth do not own capital assets that are used in production, rather they own various financial instruments, which have claims on the financial instruments (Minsky 1986b). This adds another complex dimension into the economy because the financial structure evolves as bankers and businessmen seek profits by way of financial innovation in instruments, institutions and in liabilities (Minsky 1986b). Minsky had noted long before the recent Global Financial Crisis that securitization and the creation of commercial

paper was extremely likely to cause a financial crisis (Minsky 1987). Essentially securitization altered the way the market and financial institutions fund their investment. Minsky saw that securitization was a lagged response to monetarism (Minsky 1987). The monetarist way of fighting inflation would be to hike interest rates in order to affect the expectations of economic units in the economy. However, Minsky mentioned that this intervention generates profit opportunities for innovative financing techniques as banks are subsequently put at a competitive disadvantage (Minsky 1987).

This development began in the mortgage market in the United States. Securitization allows banks and shadow banks to create mortgages even when their funding capabilities are compromised (Minsky 1987). This innovation was a result of the costly nature of banking liability structure. Minsky noted that banks "seem to need a 450 basis point margin if fund income is to be the source of profits" (Minsky 1987). Essentially, this allows banks to deal with the costs of banking by supplementing fund income with fee income (Minsky 1987). What does securitization imply for the structure of the Economy? As we can see from the global financial crisis, securitization within the mortgage market led to a system wide collapse. Further, what securitization does is it lowers the obligation of the Central Bank and its commitment to protect the financial structure of the economy (Minsky 1987). This means that the holders of these securities need to protect the market value of their assets, otherwise, an increase in interest rates will result in holders having to make positions by selling positions, which can lead to a dramatic decrease in the value of the securities and result in a downturn or panic (Minsky 1987).

Effects Of Financial Innovation:

Everyone can admit that financial markets have grown and evolved overtime. Essentially, existing markets have expanded, new financial markets have emerged, and secondary markets for many instruments have developed (Akhtar 1983). New markets such as short-term money markets have been rapidly developing since around the 1970s. Also, the medium and long-term markets have been expanding. M.A. Akhtar shows that the United States expanded its domestic bond market by 106.7 percent of its total bonds outstanding around the late 1970s. Furthermore, in the United States we have seen the development of new markets for financial futures. This is also known as the development of secondary markets, and with these markets come new trading instruments and high trading volume. Further, the growth in marketable credit instruments means that the risk is that of the "ultimate lenders or owners of

claims and the liquidity [are] provided by the maturity of claims and secondary markets" (Akhtar 1983). With the development of marketable credit instruments it gave rise to direct financing through the markets instead of relying on financial institution intermediation.

Correspondingly, the rise of markets for financial futures, options and index stock futures "have brought higher liquidity and new ways to hedge risk but they have also increased speculative activity" (Akhtar 1983). The cost of speculating in financial markets is much less than doing so in the cash market. But how does this speculation become limited through the effects of monetary policy? As the financial instruments become more diverse the composition of portfolios will change. Financial innovation has made credit available to borrowers who may not have direct access to markets, and also, provides them with a source of funds. As financial change is occurring banks and non-banks have been competing against each other, utilizing electronic technology, seeking higher yielding assets and offering more sophisticated financial services (Akhtar 1983). Banks are also seeing competition from non-financial institutions and shadow banks that are offering near like financial services, typically offered by banks. This results in increased competition and banks are at a disadvantage due to rules and regulations, therefore, banks must circumvent regulation to stay competitive or policy makers relax regulation. However, when regulation does not limit the speculative activity of banks and the profit motive we end up in cases such as the Global Financial Crisis and the JPMorgan London Whale Scandal.

Financial innovation is important and significant because it makes it more difficult to measure or define monetary aggregates. This is so because it is difficult to determine the degree of monyness or means of payment and the liquidity of a wide array of financial instruments (Akhtar 1983). With rapid change and innovation the definition of monetary aggregates can be changing and difficult to measure. Essentially, this is the case because financial instruments that have both investment features (bearing market related interest rates) and transaction features are becoming very common (Akhtar 1983). This could be overnight repurchase agreements, money market mutual funds, Eurodollars and more. It is important to note that there is a wide array of financial instruments, which offer liquidity by way of secondary markets, and the shortening of maturities. This makes the definitions associated with monetary aggregates difficult to determine and sometimes meaningless. Financial innovation has also reduced transaction costs allowing for greater use and mobility of financial instruments. When transaction costs decline it widens the spectrum of financial instruments that can be used for making payments and or for

providing different grades of liquidity (Akhtar 1983). This makes the liquidity and degree of monyness of the financial instruments difficult to determine.

There are two ways that the supply of money or liquidity is influenced. The first deals with changes in currency and the reserve ratios at a certain interest rate and the other are directly linked to interest rate movements (Akhtar 1983). Financial transformations have put upward pressures on the size of the money and reserve multipliers such that innovations are reducing the public's currency holdings and lower yielding transaction balances, relative to total deposits, or financial assets (Akhtar 1983). The "upward pressures on the money and reserve multipliers are also caused by the fact that the effective reserve ratio against any given category of deposits tends to fall as the public shifts funds into substitute investments with no reserve requirements or low reserve requirements" Such instruments have been noted above (Akhtar 1983). When investments are shifted to financial substitutes, such as money market mutual funds, it shows significant changes in the money and reserve multipliers underlying the broadest categories M3, or liquidity, compared to M1 (Akhtar 1983). What was found is that the multipliers of the broadest category, or liquid financial instruments, have risen faster than the multipliers of M1. What this means is that the "the supply schedules for both the narrow and broad monetary aggregates are tending to shift to the right, i.e. the financial system is willing to provide higher amounts of transactions and other balances at a given level of interest" (Akhtar 1983). With financial innovation it has become difficult to determine when these movements will occur because in the short-term, the currency and reserve ratio sizes are unpredictable.

As we noted before, the Neoclassical approach utilizes monetary policy to control the money supply, however, as the system becomes more competitive lending and borrowing rates can adjust more quickly. Therefore, the rate of interest has a very small effect on the money supply. Financial intermediaries issue credit based off the spread on interest rates charged on loans and paid to deposits (Akhtar 1983). Likewise, non-deposit financial instruments are responsive to the costs of raising funds relative to rates. Therefore, as rates adjust quickly there is little effect on the spreads, meaning that interest rates are more responsive to differences between borrowing and lending rates. However, innovation and competition can make the transmission of interest rates to financial behavior difficult. There are two main reasons why broader monetary aggregates are demanded over M1. First, the shift from lower yielding financial instruments to higher yielding financial instruments are putting upward pressure on the demand for those broader aggregates where higher yielding instruments are included (Akhtar

1983). Secondly, there is an increase of new financial instruments with market related interest rates outside those considered to be the broad monetary aggregates which, closely substitute for financial assets. Therefore, the demand for these financial instruments is putting downward pressure on the demand for the broad aggregates (Akhtar 1983).

It is important to note that these influences are unpredictable over time and can generate instability within the system, specifically in the short run. M.A. Akhtar notes that a large reason for this is due to financial innovation within the financial system, which has increased the instability of money demand. Basically, the demand for money has becomes less sensitive to interest rates in the economy. Essentially, monetary policy's interest rate transmission mechanism, which has been heavily relied on by Neoclassical and mainstream economists, is deteriorating. Now, there are many financial instruments that act as substitutes to other market related instruments. Thus, giving no incentive to shift in to or out of instruments whose returns are similar to those that move in line with the general level of interest rates (Akhtar 1983). The author mentions that "the increasing use of instruments with market related interest payments is making the demand for money, especially for broader aggregates, less sensitive to the general level of interest rates" (Akhtar 1983). In the Hicksian IS-LM model this would mean that the LM schedule is shifting to the right or the left unpredictably and the slope is becoming steeper (Akhtar 1983). Even the medium-term and long-term schedules are becoming more difficult to predict, due to financial innovation.

In dealing with the transmission mechanisms of monetary policy to the economy financial change has weakened the significance of this policy tool. As we noted before, monetary policy works through the interest rate channel or the credit channel. The use of credit rationing has weakened, due to the fact that there are many instruments with market related interest rates. M.A. Akhtar notes that the changes in interest rates tend to spread very quickly and the impact has increased, related to credit rationing. I would argue that financial innovation has allowed banks to hedge their portfolios against unfavorable movements in interest rates through the use of unique innovative instruments, like interest rate swaps. The author argues that over time, interest rate elasticities in the components of final demand will increase in the long run. This is so because as credit rationing declines, there is a stronger effect through the interest rate channel because the credit-rationing component limits credit to certain sectors and, therefore, protects them from price and interest rate effects (Akhtar 1983). However without the non-price credit-rationing channel in effect the interest rates would have to move substantially

in order to achieve any real impact in monetary change. Monetary policy is limited in its effect due to "the increased difficulties of identifying and measuring monetary aggregates, by the greater instability and unpredictability of the demand for money and of the money supply process in part reflecting the shifts in the currency and reserve ratios and by the declining interest rate elasticity of money demand" (Akhtar 1983). Further, as mentioned before, the unpredictable shifts in the money supply in the short-term make it difficult to target, and because interest rate elasticities are low, monetary policy has a limited significance in controlling the money stock. Hence, the Neoclassical approach utilized by many mainstream economists does not fully translate its significance to the real economy.

This unpredictability generates instability within the system because it becomes less clear as to how monetary policy is affecting the economy and in determining how monetary variables of the economy will react. The money demand functions have become unpredictable as a result of financial innovation. Now the use of financial instruments is vast and many banks and financial institutions are widely diversified making it difficult for monetary policy to influence the way they interact in the financial system. Financial innovation has also caused banks to stay competitive in order to keep up with other unregulated institutions. As pricing of financial securities become more accurate there exists lower spreads between obtaining funds and the lending rate, which will in turn generate instability, because at the low yielding rates, financial institutions are not earning enough. Therefore, they resort to further complicated techniques to satisfy their profit motives. This ties in nicely with Minsky's view of financial instability and Money Manager Capitalism.

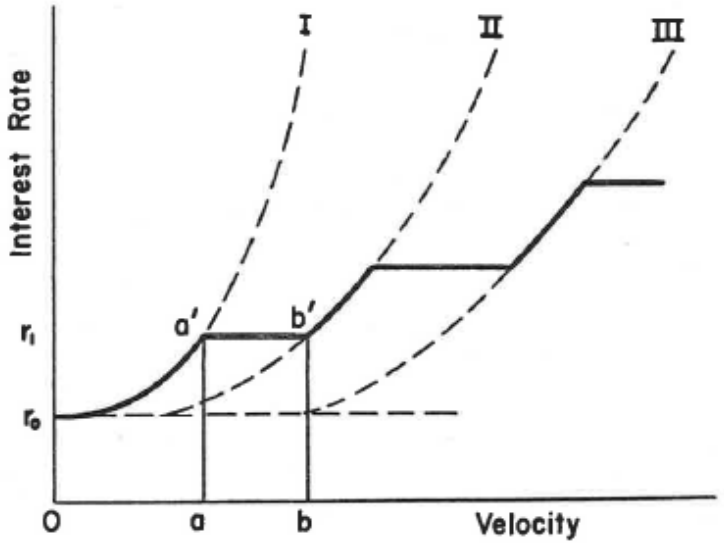
Institutional Innovations:

There are two ways in which financial institutions can evolve in the market. The first is through legislation, which is typically a result of some malfunctioning within the economy, and the other deals with innovations within the money market, as a way of generating profits (Minsky 1957). In dealing with financial innovation, Minsky emphasized that the reaction of policy to these innovations must be examined. We have seen throughout history that the markets and financial instruments being used have grown rapidly but the monetary authorities have done little to make any significant impacts in the way they control inflation and debt accumulation in the economy. In the time of Minsky, and to current day practices, financial innovations occur during times of rising interest rates, as the demand for finance outweighs the supply of finance

(Minsky 1957). Minsky disagreed that monetary policy was effective in controlling inflationary pressures and halting depression. Central Banks believe that an increase in bank loans would generate inflationary pressure, so instead, they constrain bank reserves resulting in higher interest rates (Minsky 1957). However, as we noted before, when interest rates are increased, this opens up innovative profit seeking motives by financial institutions in order to increase the supply of finance.

In a rising rates environment business and households typically become more conservative so there must be an increase in the velocity of loanable funds in order to offset the effects of tight monetary policy (Minsky 1957). With an increase in the velocity of loanable funds, there will be an increase in lending, therefore, tight monetary policy will be effective in a rising rate environment and the demand for financing will be restricted to the inelastic supply of funds (Minsky 1957). However, what is important to note is that higher interest rates impacts the lenders as well. In times of high interest rates, institutions will seek out new profit opportunities to finance their operations. As Minsky notes, the money market is highly competitive, hence, it is a more favorable environment for innovative ideas when interest rates rise and funds need to be generated (Minsky 1957). Thus, the institutional innovations during times of monetary constraints are those that increase velocity and shift the velocity-interest rate relationship to the right (Minsky 1957). Minsky defines the velocity-interest rate relation as "the sum of the effect of a change in interest rates within unchanging institutional arrangements and the effects of changes in institutions" (Minsky 1957). So, when there is an innovation present in the economy the net effect can be compared to a velocity curve that is infinitely elastic (Minsky 1957). This relationship can be depicted below in the following graph from (Minsky 1957).

Figure 1: Institutional Change and Velocity



Source: Hyman P. Minsky Archive. Paper 194

As we can see in the graph, the relationship between the velocity and the interest rate represents a step function. If we start at an interest rate point on the graph denoted by r_0, and then move up to a higher interest rate level denoted by r_1, the liquidity trap generated from the difference between the two will cause institutions to innovate, represented by the curve I, and eventually the innovation shifts the velocity-interest rate relation to curve II (Minsky 1957). Further, at the higher interest rate level, remaining constant, the movement shows the corresponding amount of lending associated with an increase in velocity from point a to point b, as institutional innovation begins to affect the market (Minsky 1957). In order for restrictive monetary policy to be effective, it must be able to "offset the rise in velocity by decreasing the quantity of reserves" (Minsky 1957). Therefore, constraints such as restricting the quantity of money will not be useful in preventing inflation. The Central Bank must act strongly in order to decrease the money supply; otherwise innovation will generate counteracting forces to the policy interventions. As velocity increases, the amount of money is not increasing, but institutional innovators find new substitutes to use as cash assets, ultimately, decreasing the liquidity of the economy (Minsky 1957). Essentially, the replacement of cash with liquid assets and debt increases the risk of the overall economy and can affect the solvency and liquidity of the financial institutions (Minsky 1957). Therefore, "if, during a long prosperity, monetary policy is used to restrain inflation, a number of such velocity-increasing and liquidity-decreasing

money-market innovations will take place" (Minsky 1957). As a result, liquidity is decreased and the money market begins to become unstable which can result in a financial crisis. As we can see from this argument, financial innovation has been used to reduce the impacts of monetary policy.

However, if banks are financing too much activity, the Orthodox approach to fixing the problem of too much lending would be to raise the Federal Reserves target rate (Wray 2010). Rates must rise sharply because borrowing is not very interest rate sensitive especially in an upswing (Wray 2010). Interest rate hikes are in opposition with the Federal Reserves goal of maintaining financial stability because they cause financial disruption (Wray 2010). Small rate hike targets allow for markets to have time to prepare and compensate for the effect, making the impact less. Therefore, rate hikes are not an appropriate way of controlling bank lending (Wray 2010).

As financial innovation takes place there is a wider range of risk that is spread out throughout the economy. It can be beneficial to transfer the risk to different parties but it also may be a source of instability. Hence, "the dispersal of risks throughout the system has benefits only to the extent that risks are shifted to parties that have the knowledge and wherewithal to bear them, not just that risks exit the banking sector" (Lumpkin 2009). Financial innovation gives market participants the belief that short-term profits are capable of being made. The issue is that these innovations tend to result in busts and are often the cause of the development of financial instability. This is something that Minsky has noted long before, that stems from the profit motives of financial institutions and the competitive nature of Money Manager Capitalism. Essentially, financial instability has "often been preceded by some form of market innovation that altered the nature of competition and gave rise to subsequent adverse consequences" (Lumpkin 2009). It is important that authorities are aware of the effects of financial innovation and the risks that come along with them. Market risks have changed as the economy has developed and balance sheets have become more complex. Therefore, more complex ways are been undertaken in order to hedge against the effects of increased trading activity and techniques of trade. We have seen in the past how innovations have led to certain crises and scandals, such as, the Global Financial Crisis and the JPMorgan London Whale Scandal both of which resulted in harmful courses of action for the economic system and for the financial industry. It is essential that there is a degree of oversight in dealing with financial innovation and an awareness of the harm these practices and new financial products can cause.

CHAPTER 3: REGULATION UNDER FIANCNAIL INNOVATION

Difficulties In Regulating Too Big To Fail:

Financial innovation is natural in the economy and is not necessarily a bad thing. Innovation has a positive aspect "by lowering the costs and broadening the menu of financial products and services available to ultimate savers, ultimate borrowers and other market participants" (Lumpkin 2009). Also, more individuals and companies have access to credit in the system through the new channels of distribution brought upon by financial innovation. Therefore, policy will not be effective in limiting the growth of financial innovation. Rather, there should be more supervision as to what is being developed, but the overall idea of innovation should not be stopped. Policy should help avoid systemic risk "preventing disruptions at individual institutions and markets from propagating and spilling over to disinterested third parties and the broader economy" (Lumpkin 2009). Preventing failures at financial institutions will then in turn help prevent failures in the market. The issue authorities have is deciding when to intervene and when not to. This is mainly due to a question of the size of the financial institution. Smaller institutions will be left to fail because it will not pose a threat to the overall system, however, when banks that are considered to be too big to fail are in serious trouble the government must intervene, like we saw in the Global Financial Crisis.

Essentially, when potential risks are present that threaten governments safety nets, the government must intervene and ultimately bail them out. But this action does not help teach the large institutions a lesson because they know that the government will be there to bail them out, causing them to be less prudent about what they are investing in. If large institutions are not allowed to fail abruptly then there will be excessive risk taking and then creditors will not withdraw their funds. If there is suspicion that improper behavior is being conducted, it can act as market discipline that is used to keep banks honest but, ultimately, minuscule when creditors know the government will bail them out (Lumpkin 2009). In order for the market discipline function to work properly, "participants must believe that it will be possible for institutions to fail, regardless of their size or degree of interconnectedness, with obvious negative consequences for creditors and investors" (Lumpkin 2009). Therefore, the too big to fail approach must be abandoned and the size of the large banks should be reduced to ensure that a failure by one institution will not bring down the whole system. It is important that the management and supervisors of these financial institutions are aware of the risks that they bear.

New financial products are often based on complex derivatives and rely heavily on market liquidity, which can make the balance sheet vulnerable in times of stress, like in the case of the JPMorgan London whale scandal (Lumpkin 2009). Therefore, these risk exposers are complex and can "affect both sides of an institutions balance sheet and cut across it constituent entities, such that aggregate risk for the entity as a whole can exceed the sum of the risk exposure of individual units" (Lumpkin 2009). Therefore, it is critical that it is clear what the risks are to the firm and how to hedge against those risks. Also, it is critical that the authorities are aware of the financial innovations being developed in order to understand what the ultimate risks are and to help prevent harm to the system. With innovation, regulation must adapt constantly. This is so because "there can be a considerable delay between the introduction of a new product and the emergence of problems. Thus, a determination that an existing policy approach is sufficient should be based on a sound analytical foundation" (Lumpkin 2009). However, overly detailed or too restrictive regulatory measures may limit the financial institutions to respond to changes in their composition, ultimately, leading them to become unprofitable and unsafe.

Bernanke saw the benefits and limitations of financial innovation. Financial innovation to him allowed for the "increasing sophistication and depth of financial market[s] promot[ing] economic growth by allocating capital where it can be most productive" (Bernanke 2007). Also, risk is more easily dispersed across the financial system allowing for the economy to strengthen and reduce the shocks it undergoes. When regulation is imposed it should "preserve the benefits of the financial innovation even as we address the risks that may accompany that innovation" (Bernanke 2007). Innovative techniques such as hedge funds and credit derivatives can be complex and have many characteristics. Therefore, a single class of financial instruments cannot be focused on, the objective of the financial innovation needs to be considered from a broad perspective and then a regulatory proposal can be used to effect the system as a whole. Large financial institutions are at the core of the financial system and regulators should provide supervisory authority to ensure that they manage their risks in a safe manner. Bernanke states that in order "to avoid moral hazard and to let market discipline work, investors must be allowed to bear the consequence of the decisions they make and the risk they accept" (Bernanke 2007). Financial innovation has made risk management easier by allowing risk to be sliced and diced, moved off balance sheets and hedged by a derivative instrument (Bernanke 2007). Risk is now capable of being shared and spread out more effectively but it poses some difficulties. For instance, the complexity of financial innovation "amplifies the difficulty of measuring risk, both

market risk and counterparty credit risk" (Bernanke 2007). Next, there is the issue of illiquidity because substantial market risk may be associated with holdings of illiquid instruments (Bernanke 2007). Next, the leverage that can be utilized with new financial instruments can make it difficult to manage risk. This also poses a threat to investors because they may not be able to assess the risk associated with the complex and intertwined financial instruments and strategies.

As history has shown, strict regulation and laws are not the most effective way of controlling financial innovation and conducting policy. We have seen that in high inflation environments, during most of the World War II period, high interest rates don't necessarily result in the appropriate response to economic issues. This is so because in that time there were rules and regulations put in place where "the yields that depository institutions could pay were limited by prohibitions or ceilings on the payment of explicit interest, and also by requirements to hold non interest-bearing reserves, which reduce the rate of return on the investment of deposit proceeds" (Board of Governors of the Federal Reserve System 1982). Also, long-term assets that are held by firms limit their ability to pay at prevailing interest rates because they were purchased when inflation levels were low, along with the interest rate. Therefore, "as the public has become increasingly sensitive to the earnings lost by holding non-interest bearing or low yielding deposits, they have become more adept at economizing on cash balances and more receptive to new kinds of financial innovation" (Board of Governors of the Federal Reserve System 1982). With this came a new demand and banks had to find new sources of liquidity which, ultimately, came from them operating on the liability side of their balance sheets. When regulation is too strict the opportunity for innovation is heightened as banks are constantly innovating around regulation to stay relevant. In the past, "the increased competition for savings of individuals has forced the financial regulatory authorities to accelerate the liberalization of ceiling rates on their small-denominated time deposits" (Board of Governors of the Federal Reserve System 1982). As innovation continues, the definition of money becomes harder to distinguish and, therefore, the ability of the monetary authorities to influence the economy and control the money stock is reduced. Commonly, financial innovation "has made the dividing line between money and other financial assets conceptually more arbitrary" (Board of Governors of the Federal Reserve System 1982). An example of an innovation that has reduced the impact of the Federal Reserves policy is, money market funds. One such example is the sweep account used by banks and financial institutions. These accounts allow "funds to move

automatically into or out of conventional transaction balances to investment accounts paying market rates of return" (Board of Governors of the Federal Reserve System 1982). Due to this, "they effectively remove transaction balances from the reserve requirements of the Federal Reserve" (Board of Governors of the Federal Reserve System 1982). As Minsky has noted, innovation and the profit seeking nature of banks and financial institution has increased the fragility of the financial system. Therefore, monetary policy is crucial to ensure the system runs efficiently and attempts to limit the impact of potential disaster.

One such disaster was the Global Financial Crisis that commenced during 2008. After this crisis, regulators had to find new approaches to make the system more stable. It was argued that banks had become too large and too complex, something that Minsky had highlighted in much of his writing on the financial system. In order to prevent another crisis, regulators required banks to go through stress tests. In this process, "the regulators deliberately did not communicate the exact things the banks needed to do for their plans to pass muster" (Eavis 2016). Essentially, every year, regulatory stress tests "assess how large banks would bear up under theoretical crashes in the markets and global economy" (Eavis 2016). When the banks fail the stress tests they are not allowed to distribute money to shareholders or buy back shares (Eavis 2016). Ultimately, this process keeps banks honest with the risks they are undertaking and the overall stability of their institution. Further, regulators utilized a strategy known as a banks living will, which is a component of the Dodd-Frank Act. It helps determine what is necessary for banks to survive if the economy undergoes another financial crisis. Another component of the Dodd-Frank Act is to seek out new risks within the financial system. However, as the financial system starts to stabilize, the regulators will begin to believe that the system is stable and that risks have been constrained, causing them to overlook new risks, something that Minsky would warn about in his writing (Eavis 2016).

Minsky's Perspective On Financial Regulation:

During the 24th Annual Hyman P. Minsky Conference on *The State of the US and World Economies* the panel discussed the future of financial regulation after the Global Financial Crisis and what needed to be done to regulate the financial institutions, and more importantly, banks that are considered to be too big to fail. Regulation is not capable of preventing the next financial crisis but it can help limit the damage. This is so because "banks carry an urge to evolve in a way that maximizes revenue" (24th Annual Hyman P. Minsky Conference 2015).

The result of regulation is that banks will come up with new risky instruments in order to generate a profit. As the cost of banking increases due to regulation, banks will try and evade the effects. Essentially, "expanded activity impacts the banks size and interconnectedness with other institutions, perpetuating the concern about being too big to fail and the *de facto* assumption of government support in future crisis" (24th Annual Hyman P. Minsky Conference 2015). Minsky noted that the financial system was complex and prone to instability that was created endogenously within the system which macroeconomic policy could not completely control. Minsky would have proposed that in order to enhance the financial system banks would have to be broken down into smaller units and, macro-prudential regulation must be dynamic to supervise and examine banks (24th Annual Hyman P. Minsky Conference 2015). Minsky advocated, limiting the profits of banks without promoting speculation by the banks. Essentially, it's crucial that banks "can earn competitive rates of return, but that also focus on financing capital development, not on big risks" (24th Annual Hyman P. Minsky Conference 2015).

In one of the speeches James Bullard notes a crucial aspect as to why policy needs to be dynamic and forward looking. In order to prepare for the next financial crisis, it is appropriate to start looking at policy now for the future because "there are lags in monetary policy, so you want to start moving now so that you are in a good position a couple of years from now" (24th Annual Hyman P. Minsky Conference 2015). Another panelist, Tomas M. Hoeing believes that regulatory relief should be provided on the basis of the complexity and activity of the banks rather than just strictly size. Essentially, "for the vast majority of commercial banks that stick to traditional banking activities, and conduct their activities in a safe and sound manner with sufficient capital reserves, the regulatory burden should be eased. For the small handful of firms that have elected to expand their activities beyond commercial banking, supported with the subsidies that arise from the bank's access to the safety net, the additional regulatory burden is theirs to bear" (24th Annual Hyman P. Minsky Conference 2015).

Elizabeth Warren also joined the discussion stressing the importance of government regulation within financial markets. Discussed, were two main principles she believed were crucial to the stability of the financial system. The first, deals with transparency between investors and what they are investing in. Basically, "markets work only if people can see and understand the products they are buying, only if people can reasonably compare one product to another, only if people can't get fooled into taking on far more risk than they realize, just so that some fly-by-night company can turn a quick profit and move on" (24th Annual Hyman P.

Minsky Conference 2015). Secondly, Warren believes that "financial institutions shouldn't be allowed to get the tax payers to pick up their risks" (24th Annual Hyman P. Minsky Conference 2015). Essentially, she is eluding the phenomena of the government bailing out these large financial institutions and preventing them from failing. Much of the speakers at the Hyman P. Minsky conference noted the problem with banks and their size. Warren notes that, "when small banks break the law, their regulators do not hesitate to shut down the banks, toss their executives in jail, and put their employees out of work" (24th Annual Hyman P. Minsky Conference 2015). This is not the case for large financial institutions. When these financial institutions are not punished for breaking the law they have no reason to change their actions and will continually do so. Even after the Dodd-Frank laws were passed we have seen scandals persistent in the financial system. For example, the JPMorgan London Whale Scandal utilized derivatives speculation to generate six billion dollars in losses on their balance sheet and the senior management alleged that they were unaware of what was going on. The reality is banks are still too big to fail and just as risky as they were even after the Dodd-Frank Act changed the financial landscape. Warren proposed to break up the biggest banks so that no bank is considered to be too big to fail. Regulatory solutions do not always work against banks that are large because the affects are "diluted over time with loopholes, carve-outs, and rollbacks each of which favor a few well connected firms over everyone else" (24th Annual Hyman P. Minsky Conference 2015). When banks are broken up they will be forced to bear the consequences of their risky actions which will allow the regulation of banks to be lessened because they will be less likely to put themselves in harms way when the government is not there to bail them out.

Minsky once noted, "an economy with capitalist institutions is fundamentally flawed in the sense that financial innovation will always be emerging to create instability" (24th Annual Hyman P. Minsky Conference 2015). During the conference Jan Kregel notes that regulation alone is not sufficient to prevent a serious financial crisis (24th Annual Hyman P. Minsky Conference 2015). He then referred to a concept of the two "Minsky Maxims." The first, echoes similarly to the previous panelists in the sense that regulation must be dynamic and adapt to innovation and the changing financial system, due to the fact that innovation is occurring alongside regulatory changes. Secondly, Kregel points out that the Central Bank should not be responsible for both financial stability and macroeconomic policy, rather the monetary authorities should focus on the stability of the system. Essentially, Minsky noted that in dealing with monetary policy, undertaken in response to changes in the real sector of the economy,

"could alter banks' business models, transforming the financial structure in the direction of greater fragility" (24th Annual Hyman P. Minsky Conference 2015). Kregel noted that higher capital requirements are not a suitable response to control the profit seeking nature of banks. Basically, they only make it more difficult for banks to earn a competitive return on their capital, leading to more heightened financial innovation and speculative activity, further, increasing the financial fragility in the system. Fundamentally, "these regulatory and monetary policies might increase stability for five or six years, eventually banks will be forced to resort to fragility-increasing activities to produce the returns on equity that would justify the higher capital ratios imposed on them" (24th Annual Hyman P. Minsky Conference 2015). Therefore, banks will only be able to raise more capital through more risky practices.

Further, Kregel noted that it is important to not just regulate the banking sector, but also, those institutions that create liquidity and leverage because these institutions operate outside of bank regulation by acting as shadow banks with similar activities. Randall L. Wray emphasizes this notion as Minsky's concept of Money Manager Capitalism where unregulated shadow banks heighten the financial fragility in the economy as the financial sector has an inability to finance the capital development of the economy (24th Annual Hyman P. Minsky Conference 2015). Wray noted the dangers lingering within our financial system. Specifically, there still are "systemically dangerous institutions (what others call "too big to fail") and worrisome off-balance sheet activities that are not being included in capital ratios" (24th Annual Hyman P. Minsky Conference 2015). Wray goes on to propose that capital ratios, living wills, and "skin in the game" are not sufficient enough to regulate financial institutions. What he believes is that banks must retain risk and be reoriented towards relationship banking (24th Annual Hyman P. Minsky Conference 2015). Bailouts are not a prominent response, rather, the lender of last resort function must be limited and tougher collateral requirements must be imposed, essentially, he advocates that the layering and leverage ratios in the financial sector must be reduced in order for the Central Banks to better supervise the system (24th Annual Hyman P. Minsky Conference 2015).

I believe that it is crucial for the banks considered to be too big to fail to be broken up into smaller banks and at the same time the Federal Reserve should open the discount window to financial institutions in order to supervise the books of banks and shadow banks more closely. This stance is one of Minsky's and one that I believe is critical in restoring financial stability within our economic system. Minsky discussed the changing relationships between businesses

and banks caused by the deregulation of financial intuitions and innovations in the markets. As the complexity of the financial system progresses, the role of monetary authorities and their policy tools become more important due to the fact that instability results from the profit seeking motives of these financial institutions. Therefore, the Central Bank's responsibilities of the lender of last resort and behaviors come into conflict due to the fact that they cannot allow large banks to firmly believe the government will protect them, support their operations and refinance them in times of crisis (Minsky 1985). These institutions have the ability to bias their asset and liability innovations toward instruments that compromise their liquidity and equity while still being protected by the government because they are considered too big to fail and a crash by one bank would result in system wide collapse (Minsky 1985). However, Minsky believed that the government should not be afraid to call the banks bluffs and allow them to default and wipe out the equity of shareholders and the depositors accounts (Minsky 1985). Yet, Minsky noticed that this was not practical due to the fact that these banks have grown so large and have intertwined portfolio structures that could lead to a run on many banks. Hence, he believed that banks should be reduced in size so that the Federal Reserve could allow the banks to fail with out generating a system wide collapse.

Minsky disagreed with the idea of increasing the required ratio of bank equity to bank assets. With increasing costs of acquiring funds, bank profitability becomes squeezed and banks yield lower returns on fee income (Minsky 1985). However, the notion that stricter capital requirements would reduce moral hazard in banking would be inefficient because banker would receive even lower profitability and the financial institutions need to be profitable in order to remain stable (Minsky 1985). If these requirements were put in place, banks would be forced to take on larger bets in order to stay competitive. Therefore, banks would innovate and increase risky practices. Therefore, Minsky recommended that the Federal Reserve shift away from open market operations and use the discount window as its main policy tool, opening it to other banks, so it can in essence, be the prime source of reserves. In doing so, "a shift to a greater use of the discount window as a normal source of bank reserves should diminish the destabilizing influences in our economy that are the result of too rapid an expansion of bank financing of business and asset holdings" (Wray 2016).

Directly after the Global Financial Crisis, Kregel noted that the problem of too big to fail banks was aggravated due to the fact that large banks were given government support while small and medium sized banks were resolved through the Federal Deposit Insurance

Corporation. Regulation intended to make the banks more safe, such as, liquidity requirements and increased capital requirements may be aggravating the too big to fail problem even more. Kregel notes three problems associated with the size of banks and the scope of reform in terms of reducing systemic risk. The first problem arises from multifunctional banking. Essentially, this has to do with the "inherent conflict of interest in serving the fiduciary interests of different clients" (Kregel 2009). Multifunctional banking takes away competition and generates fraudulent behavior because the best interest of the clients are no longer in the eyes of the banks who control the four distinct functions of banking which are commercial banking, trust and insurance, corporative underwriting and brokering (Kregel 2009). A second issue in regulating large banks deals with their concentration. Essentially, "banks concentration reduces the ability of market competition to ensure efficiency in providing banking services and allocating credit" (Kregel 2009). This leads to the problem of antitrust when banks control a large portion of the market due to their size. A third issue deals with the interconnectedness of banks. This is an issue that "has to do with the ability of the regulatory agency to rapidly resolve an institution that is exposed to a wide range of unrelated financial institutions operating in different financial markets" (Kregel 2009). This is closely related to the idea of multifunctioning banks where the large size of these banks is supposed to justify their existence.

Nevertheless, large financial institutions are not necessarily the best way to provide deep and broad markets. Kregel mentioned that this could be achieved by having numerous active and competitive financial institutions. Furthermore, "the support for a large number of financial intuitions is based on the idea that a multitude of buyers and sellers with diverse opinions is necessary in order to improve market efficiency in price discovery and provide market liquidity and stability" (Kregel 2009). Thus, a few numbers of financial institutions that are considered to be massive in size does not help contribute to the outcomes mentioned. Kregel mentions "multifunctional banking is the leading source of financial crisis, while large size contributes to contagion and systemic risk" (Kregel 2009). Therefore, he concludes that resolving large banks will not be sufficient to deal with the problem of multifunctional banks. Further, utilizing prior solutions like the 1933 Act in order to solve issues of the current financial system cannot be relied on. Instead, "the challenge is to provide solutions to the problems of multifunctional banking given the financial innovations and changes in banking practices since the beginning of deregulation in the 1970s" (Kregel 2009).

Chapter 4: Portfolio Hedging

Financial Derivatives And Innovation:

One main example that I will examine is the JPMorgan London Whale Scandal. This scandal can be used to show how complex hedging techniques with innovative instruments can cause the financial system to transform into a state of fragility due to the profit seeking nature of these banks that are considered to be too big to fail. The main financial instrument used in this scandal was a financial derivative. A derivative allows for an institution to hedge their exposure by transferring "a specific risk of the underlying security from the buying agent to the selling agent" (Vrolijk 1997). Essentially, as financial institutions are able to hedge their risks there are more opportunities for growth within the institution. Derivatives also can have adverse consequences within the markets. Essentially, price movements are amplified due to dynamic hedging and there is systemic risk present as well (Vrolijk 1997). As institutions try and hedge their entire risk exposure the failure of one dealer can generate a system wide collapse (Vrolijk 1997). Derivatives impact the way in which the traditional monetary policy transmission mechanisms reach the real economy. Hence, a derivative offers a new way to invest and save, ultimately, affecting the way in which traditional monetary policy impacts the economy. In dealing with the bank lending channel, we noted before that smaller firms will be impacted more so than larger firms due to the fact that larger firms have access to capital markets. Therefore, with the use of derivatives by firms and other financial institutions in the traditional bank-lending channel is reduced due to financial innovation. Edwards and Mishkin (1995) found that "from a high of 35 percent in 1974, bank lending fell to 22 percent of borrowing in 1994. In so far, derivatives contributed to financial innovation by providing additional funding avenues, derivatives have reduced the importance of the bank-lending channel (Vrolijk 1997).

In this case, it is clear that the effect of monetary policy through the bank-lending channel has been reduced. Essentially, lending can even now be acquired through the shadow-banking sector further depleting the role of monetary policy. As mentioned before, financial innovation makes it more difficult to define monetary aggregates. For example, derivatives can act as synthetic assets that are substitutes for real securities (Vrolijk 1997). For instance, "a portfolio containing a long bond position and short 3-month future on the bond is identical to a 3-month time deposit. However, since the portfolio, or synthetic time deposit can be traded, it is substantially more liquid than a regular time deposit" (Vrolijk 1997). Nevertheless, the synthetic

asset is not included in the monetary aggregate referred to as M3. The less liquid time deposit would be included in the monetary aggregate measurement even though the synthetic instrument is more attractive and more liquid in the market. Essentially, "this will lower the accuracy of the strictly defined broad monetary aggregates in estimating money, thereby reducing the logic of targeting broader monetary aggregates" (Vrolijk 1997).

Hedging and Speculation:

Derivatives can be useful in hedging against risk but can also be used to take on speculative risk. Derivative holdings are largely concentrated at banks. If banks are taking on similar derivative bets then the banking system becomes vulnerable (Gorton and Rosen 1995). Similarly, in terms of hedging, if everyone is diversified it may not be safe to say that risk is actually being effectively hedged because everyone would be holding similar positions. Interest rate swaps are particularly sensitive to movements in the interest rate and difficult to determine the risk associated with them. Therefore, other types of positions are entered into in order to hedge against this risk in swap value. Essentially, "until institutions are required to report the interest-rate sensitivity of their swap portfolios, swaps are an easy way to quickly and inexpensively alter the risk of a portfolio" (Gorton and Rosen 1995). Derivatives also result in information problems. Essentially, when financial organizations suffer losses due to speculation in derivative markets there stakeholders do so too. Thus, "a realized loss by one organization may be viewed as information about the portfolio position of other organizations" (Gorton and Rosen 1995). In dealing with solely banks, those who use derivatives generate a few problems. First, outside stakeholders may not be able to accurately determine the overall riskiness of the bank and secondly, there is systemic risk if all large banks are taking similar positions in derivatives so the failure of one bank may cause many to fail (Gorton and Rosen 1995).

What we see is that, due to the fact that banks are too big to fail, they speculate and hold un-hedged derivative positions. Therefore, it is important that banks are hedged against their interest rate sensitive derivatives because the risk exposure is highly concentrated at large banks (Gorton and Rosen 1995). Regulation such as the Too Big To Fail doctrine encourages speculation with these innovative instruments and generates a dangerous situation. Banks face substantial interests rate risk and the question that should be asked is, who is holding the risk from these derivative positions dealing with interest rate sensitive instruments? Essentially, "interest rate risk is non diversifiable, so if banks are hedging, then the risk which was

transferred to banks by customers is somehow being repackaged and possibly sold back to the same customers" (Gorton and Rosen 1995). In reality, in order to regulate the speculative nature of banks in dealing with derivatives, there needs to be more information as to what they are holding, specifically, with their derivative positions. This should require that banks calculate and estimate their exposure to interest rate movements more accurately. Further, the information that is needed to better assess banks and their holdings is not reported. Therefore, investors and society have to rely on regulators and examiners who have access to the information of the banks derivative positions. Also, "there is no inherent asymmetric information between banks and others about the risk of swap positions (except for concerns about credit quality)" (Gorton and Rosen 1995). Making this information public to investors would allow them to better asses the risk associated with the banks. Further, it is important that regulators monitor banks derivative positions because they can be used as vehicles for adding on more risk as the derivatives stop becoming profitable (Gorton and Rosen 1995). This was similar to the case of the JPMorgan London Whale Scandal.

Kregel mentions the difficulties and potential problems in using innovative techniques such as derivatives and swaps. First, there are many hedge funds and few pension funds that specialize in credit default swaps and other credit derivative instruments that are secretive and unregulated (Chilcote 2006). Therefore, these financial institutions do not accurately disclose their true risk to counterparties and they face risks that they are completely unaware about. Ironically, Federal Reserve Chairman Alan Greenspan argues "the development of credit derivatives has contributed to stability of the banking system by allowing banks, especially the largest, systemically important banks to measure and manage credit risk more effectively" (Greenspan 2005). Kregel notes a few issues that may arise from credit derivatives such as the potential for all hedge funds to fail simultaneously resulting in banks rushing to buy contracts to cover their exposures (Chilcote 2006). Further, a corporation who declares bankruptcy could have a substantial impact on the financial system. Essentially, in this scenario, the market could become illiquid, if there is a run on the assets of the troubled institutions holding contracts of the insolvent corporation (Chilcote 2006).

The JPMorgan London Whale Scandal:

A critical point in the JPMorgan London Whale scandal was the banks irresponsible use of the credit default swaps. As mentioned before, a credit derivative simply transfers risk

between parties. A credit default swap, "insure[s] pools of corporate bonds against credit losses" (Chilcote 2006). This contract is similar to a credit insurance policy where "the protection seller agrees to pay the protection buyer if some credit event, such as a default," takes place (Chilcote 2006). If default occurs, the party who agreed to bear the credit risk is required to pay the protection seller. Essentially, "the owner of the credit default obligation absorbs the loss" (Chilcote 2006). Further, as the risk of default is heightened this means that there will need to be a higher price paid for protection. Additionally, credit default swaps introduce counterparty risk. Further, the risk of a counterparty defaulting on their obligations increases systemic risk because if some counterparty fails there is a high chance that those around it will also fail (Chilcote 2006). This is similar to the idea of financial interconnectedness that we saw in discussing Minsky where all financial institutions are closely linked to their counterparties and other financial players.

With the JPMorgan London Whale example, I am essentially looking at the way in which too big to fail banks attempt to run a balance sheet hedge against systemic risk. Further, this event exhibits how banks respond to capital asset requirements through the use of innovative techniques. The London Whale Scandal at JPMorgan Chase was a trading strategy that started in early 2008 and collapsed in 2012. JPMorgan Chase had racked up $6 billion in trading losses on a specialized derivative portfolio designed to hedge risk. During the time of the trading scandal, JPMorgan's management team had broken many laws that were put in place to limit speculative trading by publicly insured banks. The trade was a position in derivatives initially authorized by senior management and was a partial response to the Third Basel Accord (Basel III) (Le Guyader 2015). This impacted the calculations that determined how much capital banks needed to hold measured against their risk-weighted assets. JPMorgan Chase was required to either increase the amount of capital it held or reduce its risk-weighted assets. They set out to reduce risk. The contracts for the trade were designed to generate gains as credit deteriorated in selected markets so it would appear that JPMorgan's balance sheet was being hedged (Le Guyader 2015). Essentially, what happened was the nature of the trade had switched form a hedge of balance sheet credit risk to a profit generating transaction once profits started to generate. The trades were executed without any oversight or trade limit on maximum gains or losses, so as the losses piled up they decided to take on even larger positions to cover their losses thinking the markets would rebound (Le Guyader 2015). When the losses continued, a liquidity problem emerged. The market was willing to sell more of what JPMorgan Chase

already held but was much less willing to buy back the product. Ultimately, the trading scandal resulted in a ponzi scheme and the hedging strategy was ineffective.

The contracts JPMorgan had created and issued in the market "resulted in a net short position, meaning the hoped-for gain could only be generated from a market downturn" (Le Guyader 2015). However, senior management claimed to not know what was going on and when they suddenly realized the trouble they were in they called for a liquidation of the entire Chief Investment Offices (CIO) position. Effectively, this meant that senior management wanted the traders to stop trading and sell out of the accumulated over the counter derivate contracts that were added to the balance sheet. Basically, when the markets became illiquid, loss avoidance was the main focus. However, "the market couldn't liquidate such a large amount in a single trade or even over a short period of time" (Le Guyader 2015). Counterparties of JPMorgan became concerned and requested additional collateral requirements further worsening the image of the bank and their valuation process. JPMorgan not only broke down in their management of internal controls but also in reporting fair value measurements in their accounting methods. One major issue was that the Chief Investment Office had two sets of books, which were used to report internal and external reports. The one kept at the trading desk allowed the Chief Investment Office team to "track the difference between reported and reliable prices" (Le Guyader 2015).

This scandal resulted from the actions of JPMorgan and a trader named Bruno Iksil who had been making large bets in the derivatives market. There were three main parts to the trading strategy of JPMorgan. First, JPMorgan "purchased credit default swaps on high-yield bonds in which JPM would make money if high-yield bonds went down" (Rimkus 2012). Second, they "wrote substantial amounts of CDX.NA.IG.9, which is a basket of CDS on investment grade bonds from 121 different issuers" (Rimkus 2012). The third component was that JPMorgan had bought credit default swaps on the investment grade bonds. The first part of the trading strategy was designed to act as a hedge but once the economy improved the trades were not in favor of Iksil's position. Therefore, part two was created in order to hedge against the effects of part one. Essentially, "writing CDS on investment grade bonds is intended to take advantage of the improving economy that Iksil thought he recognized" (Rimkus 2012). However, the markets had gone against his strategy for part two and he decided to try and make up for his losses by implementing part three rather than unwinding his position in part two. Iksil faced a substantial amount of basis risk and liquidity risk. The trade he made in part two, writing CDX.NA.IG.9

index contracts, "was so large that his trading activity created a material gap between the price of the index and the sum of the prices of the underlying CDS" (Rimkus 2012). Hedge funds were the ones taking the opposite sides of his trades and were angered by the adverse movements created by the London Whale, who they referred to as Iksil. Essentially, what happened was the nature of the trade had switched form a hedge of credit risk to a profit generating transaction.

Hedging Failure:

JPMorgan failed in hedging their overall credit exposure and claimed that the trading strategy was a poor judgment call. JPMorgan initially sought to design a hedge that would "protect the bank from an anticipated decline in the value of its corporate bond holdings, or in any of its other global portfolio hedging activities" (Kregel 2012). Kregel noted a few major problems that caused the failure of this macro hedge. First, "the banks top managers were unable to monitor and assess the inherent risks in an activity of a unit that responded directly to them" (Kregel 2012). Ultimately, this was a result of the banks size. The bank was too large and complex to monitor and regulate effectively. Kregel mentioned how the bank attracted deposits due to its too big to fail nature and the fact that the bank survived the Global Financial Crisis because of its size and protection by the government. JPMorgan Chase had a mandate for their Chief Investment Office, which states that the bank was tasked to invest the excess reserves "in such a way as to hedge its exposure to portfolio holdings of high-risk corporate debt" (Kregel 2012). These deposits were apparently in excess of the required reserve requirements and instead of investing them in safe assets, like government securities, they decided to construct a complicated hedging strategy. Essentially, they extended their exposure to risky corporate debt and collateralized debt obligations suggesting that they were using the banks own funds on top of the excess deposits to create hedge positions (Kregel 2012). Banks that are considered too big to fail are profit seekers and they look to maximize the reward for themselves and shareholders. Therefore, JPMorgan could not resist the attempt to "earn income from selling credit insurance on the same kinds of assets whose losses it was attempting to limit" (Kregel 2012).

Kregel believes that going back to the Glass-Steagall act would restrict the banks size so that regulation would be effective and the management of the banks would have a better idea as to what their activities and risk exposures truly are (Kregel 2012). However, not only do banks have to be smaller but also, they have to be monitored as to what activities they are engaging in.

Bankers should be concerned with generating growth in the economy not solely its shareholders and owners. Minsky believed that Glass-Steagall helped direct investment towards productive activities that would help generate future income and employment (Kregel 2012). When banks are faced with earning a profit based off the change in prices from assets held in their portfolios, it does not help generate economic growth or employment (Kregel 2012). Therefore, banks are making bets on their assets rather than investing in growth generating and employment creating ventures. Further, Kregel mentions that, the banks that are too big to fail are engaged in the wrong risks and types of investments, ones that do not provide capital development for the economy (Kregel 2012).

Kregel states that the nature of hedging is not a bad development. However, it should not be profitable. In an article by Dmitri B. Papadimitriou labeled *Another London Whale Shocker*, he refers to Kregel's argument that "a true hedging unit only generates profits when a bank's bets on its primary investments are unexpectedly wrong" (Papadimitriou 2013). Therefore, hedging is not the issue at stake. It is only an issue when it is becoming consistently profitable. This is so because a well ran hedge means that the predications made by the investment institution are accurate when the hedge is not profitable. A hedge helps the investor reduce his or her fear of uncertainty and losing a potential return. Thus, when the investor is performing well, the hedge will run losses indicating that the investor's predictions were accurate. In much of Kregel's work he stresses the issue with insured banks, there is a risk when they engage in proprietary trading and the banks are too big to regulate.

As the regulatory landscaped changed after the Global Financial Crisis JPMorgan's Chief Investment Office was not able to come up with a clear mandate and achieve its prior goals that were developed in the era of lessened regulation. Therefore, they were unable to "create profits from short credit hedges, adjust to improving credit conditions by reducing short hedges, and reduce the gross positions of the portfolio to reduce risk weighted capital charges of the CIO" (Kregel 2013a). In order to solve this issue of not being able to reach their goals they decide to expand "its notional portfolio of long and short CDS index positions" (Kregel 2013a). Essentially, this created a ponzi-financing scheme because the position grew too large. Then, the losses soon piled up and the unit collapsed. Kregel contends that the Chief Investment Office collapsed not only because it was involved in a ponzi financing strategy or proprietary trading, but also, because the bank was to large and intertwined with other aspects of banking to run an adequate macro hedge. A major issue that Kregel points out in the Chief Investment Offices

mandate is the fact that the hedging unit "was remunerated on the basis of profitability" (Kregel 2013b). Overall, the bank undertook shadow-banking function, which generated a ponzi-financing scheme. The CEO Jamie Dimon claims that the massive debacle was due to the incompetence of the trading unit. However, the size and complexity of the organization created evidence that the institution was too big to manage and too big to regulate (Kregel 2013b). The Chief Investment Office had a large exposure to credit due to the operations of the bank and thus needed to find ways to manage this exposure while complying with Basel II. We have seen how regulation, such as, risk weighted capital ratios encourage banks to innovate in order to stay competitive taking on even more risky positions. Further, in order to hedge the risks associated with these risky investments complex hedging strategies were introduced. However, deregulation on the other hand has led to the issue of banks becoming too large to manage effectively and regulate. Additionally, this "allows banks to grow to a size that is much too large for this type of granular monitoring of the credit risk of a bank's borrowers" (Kregel 2013b).

What we have learned from the JPMorgan London Whale scandal is that large banks considered to be too big to fail cannot effectively run a macro hedge nor would they want to try and run a micro hedge. Essentially, a micro hedge is used to hedge individual potions, which would not be profitable for a large bank. It is more suitable for them to try and hedge their overall exposure because large banks would not be able to find instruments necessary to hedge each individual position and the basis risk for each position is much smaller and would generate a more costly approach to hedging (Kregel 2013b). A macro hedge can be implemented if "you expect the economy to underperform, you also expect a policy response of monetary easing, leading to lower interest rates. Therefore, a long position in government bonds provides a hedge against possible worsening in the conditions of corporate borrowers" (Kregel 2013b). This is a typical instrument to hedge with. However, in a macro environment characterized by low interest rates and quantitative easing, the use of government securities was not sufficient for the Chief Investment Office to hedge against a credit stress event. This is where financial innovation and the complex instruments are introduced to generate periods of instability, like we have seen in much of Minsky's work. Essentially, what happened in the JPMorgan London Whale Scandal, was that management noticed this phenomenon and, therefore, decided that the branch should move "into more complex products to hedge the expanding, ever-more-complex holdings of the bank" (Kregel 2013b). Essentially, the bank would only be earning 25 basis

points if they were to hedge using government securities, which would not be sufficient to cover their costs.

Traditionally, when a bank has excess reserves they hold them in what is called secondary reserves, which is characterized by "liquid, low-risk Treasury investments that would provide liquidity and flexibility to the bank as economics and business conditions changed" (Kregel 2013b). However, in order to take on excess reserves this means that the bank would have acquired more liabilities through the increase in loans. In a state of deleveraging this was highly unlikely and therefore, the bank was using its clients deposits to invest in derivatives such as credit default swaps and credit loan obligations. The main problem with the trading strategy of the Chief Investment Office was that "the more income it generated from the long positions, the higher the probability of having to pay off on a default" (Kregel 2013b). This was so, because traders were providing credit protection on the same assets. In the end, the hedge designed to profit from credit weakness "turned into a system to generate income to put on a hedge and, given the increase in the size of the notional long positions, produced only minimal impact on [risk weighted averages]" (Kregel 2013b). Once investors realized how large the positions had become they decided to take the other sides of the trades and made it impossible for JPMorgan to liquidate their positions at a favorable price.

Overall, the scandal of JPMorgan attempted to evade regulation and hide the risky nature of its synthetic credit portfolio. The bigger issue is the systemic risk associated with these institutions that are considered to be too big to fail. Derivatives are not the problem to be concerned with here. The way in which they are used is the main issue. The changing nature of the banks mandate resulted in an ineffective and problematic way of trying to run a macro hedge on the banks entire credit exposure. Principally, "the problems that arose at JPMorgan Chase were due to the use of derivatives to create the equivalent of a shadow bank that provided the funding of the unit's short positions" (Kregel 2013b). Also, the profit seeking nature of the Chief Investment Office lead them to believe that they could profit while running a macro hedge at the same time. However, this can't be done because "hedging can only be undertaken at a cost that is either an outright expenditure on positions taken that generate actual losses, or in terms of an offset to income on profitable positions being hedged." The last problem that can be uncovered deals with the banks actions to engage in proprietary trading. Under the Volcker rule, proprietary trading is prohibited but the public bank decided to engage in this speculative activity. Hedging activity is considered to be proprietary trading, thus, "hedging and basis risk

will make it impossible to judge when such hedging is adequate to cover perceived risks or is excessive and thus concealed speculative trading" (Kregel 2013b). This made the public bank act as if it were a shadow bank. Ultimately, pursing profits from speculation in hedging activities and using their customer's deposits to fund their speculative activity. These large banks must be supervised and have clear reporting standards as to what they are invested in, something that Minsky advocated for. Financial innovation can be beneficial, however, when it is used to reduce the effects of the policies imposed by regulators, in search of profits, we end up with cases such as the JPMorgan London Whale scandal and thus, our economy becomes increasingly fragile.

CONCLUSION

The profit seeking nature of banks can lead to great instances of instability. As innovation occurs and the economy heats up the policy tools put in place by monetary authorities start to have a minimal impact on controlling the profit seeking nature of these firms. Financial institutions are concerned with the protection of their investments however they need to innovate in order to stay competitive. Therefore, the profit motives of banks influence them to behave in risky ways and undertake speculative positions. Minsky noted that the financial system was complex and prone to instability that was created endogenously within the system which macroeconomic policy could not completely control. Through Minsky's work we can see that the financial system and structure of the economy is changing and evolving through innovative behavior. The financial innovations discussed by Minsky have destabilizing effects on the economy. When innovation occurs, it reduces the impact monetary policy has on the economy. Further, when the economy is progressing well, the negative effects of the innovative behavior from profit seekers are not taken into consideration. Therefore, the monetary authorities will only intervene when it is too late. Essentially, each crisis is different from the last and liquidity will be stretched to the point of causing a collapse in a boom (Minsky 1957). Any type of constraints imposed on the system will result in innovative behavior and liquidity will continue to be stretched until instability is present. The role of the Central Bank "is to act as the lender of last resort and therefore, to limit the losses due to the financial crisis which follows from the instability induced by the innovations during a boom" (Minsky 1957). Minsky noted

that the lender of last resort function is the main function of the monetary authorities, rather than to stabilize the economy. However, when financial institutions and banks considered to be too big to fail are just simply bailed out in the time of a crisis it does not help prevent the risky practices and innovations being utilized and further validate their uses. The Central Bank must act strongly if it is going to effectively conduct monetary policy. It is important that the management and supervisors of these financial institutions are aware of the risks that they bear. Therefore, the too big to fail approach must be abandoned and the size of the large banks should be reduced to ensure that a failure by one institution will not bring down the whole system. With innovation, regulation must adapt constantly. Further, financial innovation has added to the degree and complexity of position-making instruments. It is essential that there is a degree of oversight in dealing with financial innovation and an awareness of the harm these practices and new financial products can cause. In a rising rates environment, innovation will generate counteracting forces to policy interventions. Ultimately, innovation is a result of the profit seeking nature of the capitalist, which transitioned the economic system to one where "financial crisis was unlikely into one that was vulnerable to crises" (Minsky 1986a).

When innovation occurs in the view of the profit seeking nature of these firms the ability to manage risk becomes more complicated and intense. Firms must protect their balance sheets from risk but as the system becomes more complex it becomes more difficult to price risks and allocate the necessary resources to ensure that the balance sheet is being properly hedged. This leads to inefficiencies in the market and can lead to great build ups of stress in the system and ultimately lead to market inefficiencies, like we saw in the Global Financial Crisis and the JPMorgan London Whale Scandal, essentially through the build up of leverage and high accumulation of complex assets. When risk models are mispricing the actual risks of a financial institution it is easy to say that their exposures are sufficiently hedged, when in reality, they are poorly estimated. With the JPMorgan London Whale Scandal complex hedging techniques with innovative instruments caused the financial system to transform into a state of fragility due to the profit seeking nature of these banks that are considered to be too big to fail. Essentially, what happened was the profit seeking nature of the Chief Investment Office lead them to believe that they could profit while running a macro hedge at the same time. The Chief Investment Office collapsed not only because it was involved in a ponzi financing strategy or proprietary trading, but also, because the bank was to large and intertwined with other aspects of banking to run an adequate macro hedge. Ultimately, this was a result of the banks size. The bank was too

large and complex to monitor and regulate effectively. Overall, the scandal of JPMorgan attempted to evade regulation and hide the risky nature of its synthetic credit portfolio. The bigger issue is the systemic risk associated with these institutions that are considered to be too big to fail. Derivatives are not the problem to be concerned with here. The way in which they are used is the main issue. However, the complexity of the system and high degree of leverage makes the chance of error or mistake more common and, thus, magnifies crises that emerge. Ultimately, financial innovation and too big to fail banks impede the influence of monetary policy.

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