

Towards a Subjective Theory of Risk

A Market Process Approach

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In recent years, many economists have realized the importance of the role of risk in the economic cycle. The business cycle theory put forward by Mises (1912) and Hayek (2008) has been modified to include explicitly the risk component in an economic system. These attempts include Garrison (1994, 2001), Cowen (1997), Young (2012) and Cachanosky (2014). However, these works don't explore thoroughly what it's meant by risk. Risk theory has not been grounded under methodological individualism and subjectivism which are the distinctive characteristics of the Austrian School. Furthermore, other approaches try to study risk within an equilibrium framework which causes an unnecessary friction between the two concepts. By these it's meant that traditional equilibrium analysis presupposes a market clearing set of prices where no additional variation of prices can exist. Whereas risk, conceive by financial management, focus on volatility or changes in the level of prices (mostly of interest rates and return rates). It follows that the theory of market process mainly developed by Mises (1949), Hayek (1968), Kirzner (2013) and Lachmann (1973) can offers valuable insights on the theoretical understanding of risk as these framework studies disequilibrium conditions where prices endogenously changes (hence volatility) in response to the alertness, judgment and expectations of the entrepreneurial function. Considering risk within the market process approach can contribute new lights in the development of the capital and interest theory, monetary theory, growth and development theory, and finally, the theory of institutions. This paper will try to expand and integrate explicitly the risk dimension to enrich all these areas.

INTRODUCTION

Macroeconomics has been centered in the studies of the three components of interest rates. In the beginnings of the 20th century the focus was the time preference component. Later, by the 70's with the rise of monetarism the focus was on inflation. Now, some attention has shifted towards the risk component of the interest rate. In words of Garrison (2001) *"...there has been no macroeconomic theory attempting to explain episodes of boom and bust by contrasting the market's allocation of risk-bearing and policy-induced distortions of risk-related market mechanisms. Except for relatively recent experience, such a theoretical formulation would have little if any application. But the macroeconomic experience of the 1980s and 1990s – and possibly beyond – might best be accounted for by just such a theory."*

This motivation grew after the Great Recession where past theories couldn't explain some features of the business cycle. In this spirit, the works of Garrison (1994, 2001), Cowen (1997), Young (2012) and Cachanosky (2014) have contributed to explicitly include risk as a relevant variable to explain the current crisis. However, these developments aren't grounded in methodological individualism and subjectivism. Most of these works don't explicitly define what they mean by risk. It can be assumed that they follow the standard definition provided by modern portfolio theory (Markowitz 1952) and financial management (van Deventer, Imai and Mesler 2013). This approach defines risk as volatility of returns, hence prices movement within an equilibrium framework. This can be contradictory at best, as equilibrium often means a set of prices that doesn't change. If change implies volatility, risk can't be explained in an equilibrium condition where prices don't move.

Arguably, the market process theory can be more suitable for explaining risk in the economy. This theory focus on disequilibrium conditions where prices changes as entrepreneurs seeks profits discovering unexploited opportunities. Also, risk manifests itself fundamentally in the financial markets where it's always in disequilibrium because every exchange generates profits and loss to market participants and where demand and supply are always changing sides (Lachmann 1978). Moreover, the market process approach also considers methodological individualism and subjectivism tractable to human action which is the minimum unit of analysis for the study of the social sciences (Mises 1949).

The addition of the risk component offers new insights to almost all the theme explored by the market process theory and the Austrian School of Economics. This paper will explain the foundations of a subjectivist perspective of risk. The first section shows a summary of the different treatments of risk in the economics literature. The next section elucidates the fundamentals of a theory of risk. Finally, the last section applies the subjective theory of risk to other areas of research.

AN OVERVIEW OF RISK THEORY

Risk theory in economics has been explored through various lenses. Different approaches stress important aspects of risk and how it can affect the decisions of economic agents. One view holds that risk and uncertainty is a condition of every human action. Another position studies risk as a psychological factor inherent in every human being. Maybe the most popular treatment of risk it's as a management tool for financial activities such as portfolio management or financial institution management. Lastly, economist maintains that the interest rate is composed by three components. One of them is risk.

RISK AS A CONDITION OF HUMAN ACTION

With his pioneering work, Knight (2006) distinguishes between risk and uncertainty. On the one hand, risk is associated with certain events that can happen to the members of a class or group. The events must obey a pattern which can be tractable by gathering enough samples of the members of a class. This is the condition which the events must comply. This information serves to compute the probability of occurrence of each event within that class or group. In this sense, estimation of the outcomes of the events which affects the members of a group or class is feasible. However, in an individual case of a member it cannot be predicted.

On the other hand, uncertainty is characterized by events which can't be measured or computed. Mises (1949), following Knight's definitions, adds that the market is the product of endless human actions so that there is an ineradicable uncertainty where each event is unique and unrepeatable. Furthermore, uncertainty for Mises is implied in every human action. If acting man knows the future, he will not act as cannot change the future state of affairs.

RISK AS A PSYCHOLOGICAL FACTOR

In contrast of the view which risk is a human action external condition, some economist views risk as psychological attribute inside every consumer or investor. This concept it's introduced in the neoclassical consumer theory where uncertainty prevails. Uncertainty in this model it's conceived as a finite number of outcomes assigned with a probabilistic distribution. The preference of the consumer or investor towards the probabilistic outcome it's modeled by different risk attitudes: Risk adverse, risk neutral and risk loving. This is mainly according to the consumer preference. Risk averse it's probably the most used assumption in the neoclassical theory and modern portfolio theory. A person that is risk adverse it's said to *prefer a deterministic outcome equal to the expectation of a risky outcome over that risky outcome* (Werner 2008).

The risk averse assumption, that it's usually a psychological factor applicable to investors, clashes with the praxeological view as uncertainty as a condition. This shape one of the principal arguments against the prediction of market prices assuming a probabilistic distribution behavior. As mentioned earlier, market phenomena (or in Mises words, complex phenomena) each event it's unique so there it's impossible to construct a probability distribution that follows a pattern or a characteristic of a particular class. Then again, if market phenomena can be submitted to a probabilistic function it will be reduced to a casino where entrepreneurial profit or loss it's a matter of luck. Also if uncertainty can be capsule like knightian risk in a probability distribution, it follows that entrepreneurs will succeed as long as the median of the distribution function yields a positive amount and make enough interaction. This view totally disconnect with the theory of subjective value exposed by Menger(2007) where market phenomena (hence prices) are determined by the consumers valuation which do not respond to an objective probability distribution. In addition, pure entrepreneurs which are alert to opportunities will act accordingly reducing profits (Kirzner 2013) altering the probability distribution of gain and loss. As Langlois (1994) putted it's not possible to to construct a probability distribution as "agents... are not capable of enumerating all possible contingencies..."

RISK AS A MANAGEMENT TOOL

The most common field where risk has been studied its financial economics and financial management. Nevertheless, the definition of risk isn't a homogenous one. It depends on the subject of study. This section explores the different angles that the concept of risk takes in the financial literature.

Risk in Financial Equilibrium Model

In the modern portfolio theory (MPT), Markowitz (1952) defines risk as the volatility (standard deviation) of the financial instrument being analyzed. The volatility it's measured using as variable the return of different securities that are considered in a portfolio. Investors have to choose from a combination of portfolios with different trade off between risk and return. An efficient frontier can be constructed illustrating the portfolio combinations which render the highest return possible for a given level of risk. This model is complemented with the Capital Asset Pricing Model (CAPM) pioneered by Sharpe (1964) which it's used to analyze the contribution of risk of an individual security to an already constructed portfolio. In order to these, the CAPM recognize two additional types of risks. Systematic risk (also known as market risk) and unsystematic risk (also called idiosyncratic risk or diversifiable risk). The systematic risk it's measured by β which indicates how sensitive it's a particular asset in comparison to the portfolio benchmark. An Austrian perspective of these theories can be found in Skousen (1994).

What attracts attention is why should risk or volatility persist when investor have reach an efficient frontier. Given the preference of the investor, which in MPT and CAPM its assumed that all investors are risk averse, each investor choose the risk/return tradeoff that are more comfortable with its preference. Once each investor's portfolio reach the efficient frontier, no agent has the incentive to trade its securities so prices will have converge to one unique

price where there is no volatility or risk. This will implied that the returns and the standard deviation will tend to zero. This is what Mises (1949) establish that will happen in an evenly rotating economy (ERE).

Risk in Financial Management

Another field which has been studying risks mostly from a management perspective its risk financial administration. The private bank system jointly with Basel regulations has put forward different techniques and management guidelines to try to prevent more banking crisis. This effort started in the seventies. Ujemura and van Deventer (1992) follow the empirical and statistical approach provided by the MPT and CAPM to measure risk. Other variables like the interest rate or cash flow of business can also be used to compute the volatility. Often risk management practices classify risk by different types. The most common type its credit risk which is the probability of bankruptcy of a firm. Market risk is associated with the possible losses caused by variation of prices such as interest rate, exchange rates and commodity prices. Another important type of risk is liquidity risk which is the ability to obtain sufficient liquidity to continue normal business activities. Each type of risk it's measured by different techniques. For example, in market risk some of the most popular techniques are Duration analysis, Gap analysis, Value at Risk (see Dowd 2002). For credit risk the most common technique it's the Internal Based Approach (see Degryse, Kim, Ongena 2009). However, risk financial management its evolving to treat risk as one integrated concept and measure with the Heath-Jarrod-Merton Model (see Van Deventer, Imai and Mesler 2013).

RISK AS A COMPONENT OF INTEREST RATES

It has been accepted almost unanimously by economist that the interest rate it's composed by different components. Nowadays, financial economists have focus primarily on the shape of the yield curve. On the other hand, Austrian economists maintain the same components proposed by Mises (1949).

Risk in the Yield Curve

Three theories have emerged from financial economics and management to explain the relationship between the interest rate and maturities (Fabozzi 2012). This functional relationship is called the yield curve. First, the pure expectations theory tries to explain the shape of the yield curve reflects expectations of future interest rates. For example, for two investment alternatives within the same period of analysis must yield the same and hence the investor has to be indifferent between these two choices. One investment it's made for the whole period of the analysis while the other investment matures in shorter period and it's renewed for the residual time of the analysis. The interest rate would have to be the one which leaves the investor indifferent between these two investments options for a given period. The next theory is the liquidity premium which basically incorporates the element of pure expectations theory plus a market risk component to compensate for the increased sensitivity of the price of long-term investment to variations in the interest rate. Segmented market theory states that an interest rate exist to balance supply and demand of funds in each period.

Risk in the Misesian system

Mises in his famous treatise, Human Action, acknowledge that the interest rate (or the gross market rate of interest in his own terminology) is composed by different elements. First, by the time preference (or the originary interest) which is the discount of future goods as against of present goods. For Mises, time preference is a category inherent in every human action. It can never be eliminated. To illustrate this point, he uses the evenly rotating economy (ERE). In this imaginary construction, the originary interest is still active and indicates how resources have to be allocated in future periods of production. Abandoning the ERE, Mises analyses two more elements which only appears in a changing economy. One is the inflation component (or price premium) and the entrepreneurial component. The price premium is charge to maintain neutral the purchasing power of money from credit expansion. However, Mises recognizes that in a changing economy it's impossible to establish a neutral rate because agent's actions always lag in comparison how the economy is affected by monetary policies. This of course affects economic calculation in Mises view. Probably the most complicated part to understand in the Misesian paradigm is the entrepreneurial component of the gross market rate of interest. Mises seems to include in this component two elements: the entrepreneurial profit and the risk element. Mises often refers to three characteristics that determine the risk element of the interest rate: the duration of the credit contract, the creditworthiness of the debtor and the

legal and institutional framework where the credit contract is held. Notice that these characteristics will always be present in every credit transaction. However, to treat this as an entrepreneurial component isn't the most suitable as profit and loss are best seen as an ex post magnitude of an action and because profits are exhausted through competition. Qualities such as duration, creditworthiness and institutional frameworks cannot be exhausted by competition. The entrepreneurial profit is the premium that the moneylender charges to the debtor.

Risk in post revival Austrian Economics

Following Mises (1949), modern treatments from the Austrian School such as Huerta de Soto (2006) and Garrison (2001), acknowledge that the interest rate is sum of three components: the time preference, the inflation premium and risk premium. Notice that these authors avoided the entrepreneurial component definition proposed by Mises and change it for the risk premium definition. In this regard, they avoided the problems described earlier. In spite of these, most of the work made by these authors in monetary, capital and interest theory, and Austrian Business Cycle Theory (ABCT) focus only primarily in the time preference and inflation component of the interest rate. The attention to risk was pointed by Garrison (1994, 2001) where he explicitly addresses the need to incorporate risk analysis within the ABCT framework. Following these lead, the work of Young (2012) and Cachanosky (2014) includes a variation of the model developed by Garrison adding risk in the ABCT. Both studies offers valuable insights such as risk is associated with time and more roundabout process of production inherently contains more risk. Another attempt to analyze the dynamics of risk in with a mix of the ABCT framework and modern financial theory is in Cowen (1997). Risky investments are defined by the following conditions: long-term, expensive to reverse, high and sensitive to future information returns. In contrast, little risky investments would be the opposite. However, some arguments are against the ABCT (see Barnett and Block 2006).

In summary, all of these developments consider risk as an instrumental concept without considering the foundations of what risk really is and what it is role in a in a market economy from a methodological individualism and subjectivism perspective.

BUILDING BLOCKS FOR A SUBJECTIVE THEORY OF RISK

As mentioned earlier, the past developments of risk theory have been incomplete at best and fail to integrate these phenomena with methodological individualism and subjectivism. This section will be the outline of different elements that constitutes a subjective theory of risk.

HUMAN ACTION AND PLANS

A theory has to be tractable to the minimum of its part in order to respect methodological individualism and subjectivism. This ultimate part in social science is human action (see Mises 1949, 1952). According to Mises, human action is the purposely behavior to pass from an unsatisfactory state to a more satisfactory state. An action it's composed by means and ends. Acting men values mean accordingly to the end that it wishes to accomplish. Actions can be seen as a coherent series of stages aiming at particular goal. This is called a plan (Huerta de Soto 2010). Actions and plans are always future oriented. The results of a plan or action cannot be known apriori. Uncertainty always it's present in human action. Action and plans can be engage in with other members of society or be autistic. The former will be named unilateral relationships and the latter bilateral relationship. This distinction it's useful to identify the elements that intervene in each relation.

UNILATERAL RELATIONSHIPS

Not all actions are made within exchanging with other members of society. In this situation, acting men only have to rely in his subjective valuations of means and ends. Choosing means often implies some technical knowledge of the laws of causality in the natural world. This technical knowledge can be subject to the procedures describes earlier in knightian risk.

BILATERAL RELATIONSHIPS

When acting men enters the realm of exchange with others member of society more elements appears in the analysis of choosing ends and means. Within this context, acting men not only relies on his own knowledge of the world but he can benefit from the knowledge of others members of society. Hayek (1945) described this condition as disperse knowledge. Hayek (2012) also qualitative distinguishes between two systems of retaining knowledge: organizations and spontaneous order. The former are systems where a leader or a group of leaders can obtain all the relevant knowledge to manage an organization. The latter no man (or groups of men) can handle all the relevant knowledge to organize a society.

In this frame, in order to be successful acting men have to be aware of the plans of the others members of society. Hayek (1945) critiques the definition of equilibrium of neoclassical economics on the grounds that the orthodox model of perfect competition already assumed the relevant knowledge that the market seek to solve. In his words *“is thus not merely a problem of how to allocate “given” resources—if “given” is taken to mean given to a single mind which deliberately solves the problem set by these “data.” It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know.”* For this reason he reframed the equilibrium as compatibility of plans. Plans of acting men will be affected by other plans made by other members of society. In this sense, acting men will have to form expectations about the plans of others members of society will be and make a plan accordingly. In the Misesian paradigm, this part was assisted with understanding or *Verstehen* of the acting man. Equilibrium is reach when ex ante expectation which the plan was constructed coincides with ex post situation.

Nevertheless, some problems arise with this position. First, plans cannot be completely stated with absolutely every detail. Plans are in this sense incomplete (Lewin 2011). Second, the disperse knowledge condition makes this very difficult. Following Lachmann (xxxx) expectations aren’t in function of nothing else. This statement probably was the responsible to originate the equilibrium-disequilibrium debate between Kirzner (1992) and Lachmann (1976a) in the post revival period of Austrian Economics. How can a market economy generate prosperity if resources which are channel through plans of acting men that depends on expectations that aren’t in function of nothing else? This theme brought by Keynes and has been treated by post Keynesians like Shackle and Minsky. To resolve this problem, Austrian Economics turn its emphasis on how institutions can help in order to deal with expectations and uncertainty.

INSTITUTIONS AND CHANGE

Vaughn (1994) trace back the themes of the Austrian school of economics from its founding father Carl Menger (2007). This school of thought have centered and studied the time, knowledge (disperse and tacit), ignorance, uncertainty, unintended orders, process and complex phenomena. These explain the emergence of institutions such as:

- Money and markets (exchange of private property) to make economic calculation and rational resource allocation possible (see Mises 1949)
- Endogenous rules and law that maximize freedom (see Hayek 2012)

These institutions help acting men to deal with uncertainty. An interesting analysis of how institutions interact with each other can be found in Lachmann. One of his main findings is *“Our main conclusion is that it is impossible for all institutions to change at the same rate, and that the relative immutability of some institutions is always a necessary prerequisite for the relative flexibility of the rest.”* (Lachmann 1971, pp. 14). In spite of these claim, latter work on Austrian Economics haven’t explore how these changes exactly takes place. Most Austrians, including Lachmann takes change exogenously. For example, Lachamann refers to these as “unexpected change”. Mises use the words “changing economy”. The focus has been the profit and loss mechanism to study changes in the economy (Mises 1949 and Kirzner 2013). However, profits and loss are always an ex post indicator which we always lag in comparison to construction of plans but it serves as a feedback mechanism for future plans. Following this train of thought, the role of the component of risk can shed some light in the construction of plans as an ex ante indicator.

RISK AS FLEXIBILITY OF PLANS

As studied earlier, plans are pursued in order to accomplish a particular goal. Plans are not rigid and can change or be adaptable to new situations. This characteristic of plans has been referred by Austrian Economist. For example, Kirzner (2010) states that capital as unfinished plans. Lachmann (1971) and Lewin (2011) make allusion to plan contingencies.

These insights are match perfectly with the dispersed knowledge assumption (Hayek 1937) where the entrepreneur knows beforehand that the perceived profit opportunities (Kirzner 2013), not all will be successful because the action plans of other individuals are not known in disequilibrium. Furthermore, the plans and expectations of the individuals change with the new information the market process itself generate (Lachmann 1973 and Huerta de Soto 2009). This is best embodied by Lachmann's famous phrase "*As soon as we permit time to elapse, we must permit knowledge to change.*" Lachmann (1976b) . The individual will be interested in studying which action is more adaptable to new plans of other individuals that may arise in the market. In this sense, entrepreneurial function not only take into consideration those actions where economic calculation more profitable (wider spread between prices and costs) but also contemplate which plan will provide greater flexibility to adapt to possible changes in the course of action of the other individuals who were not originally intended.

Acting man analyzes the plans that can be modified later to fit more easily in the transition to a new Hayekian equilibrium (Hayek 2007). It is noteworthy that the equilibrium is not a point but a direction as Rizzo and O'Driscoll argues (1996). Perceive subjective difficulty of adapting to changes in plans of other individuals it's what we call risk.

RISK AS AN INDICATOR OF CHANGE AND EXPECTATIONS

In opposition to the paradigm that prices are only magnitudes that adjust to clear markets, Hayek (xxxx) pioneered the idea that prices convey knowledge and markets are best viewed as a network system that transmits it. As presented earlier, if risk is one of the components of interest rate and this price have been essential to macroeconomics study, it beg the question of what is this role that the risk component accomplish? What knowledge is the risk premium transferring to market participants?

The component of risk in the interest rate can be best seen as indicator of change and expectations. Market participants will express their subjective appraisal of the flexibility or adaptability of a particular plan in the component of risk in the interest rate on credit markets. As mentioned earlier, the flexibility will be determined by the expectations of the plans of other members of society. Change it's also captured by the risk component of the interest rate. Higher risk implies that the plan evaluated its introducing a higher degree of change within the market system. Low risk means that the plans introduce a low degree of change.

APPLIED THEORY

In this section the developments of the subjective theory of risk will be applied to specific fields where their impacts are most relevant.

MONETARY THEORY

It's well known that money in a market economy accomplish very important functions. Probably the function that connect more with the idea of risk as flexibility of plans is the "Bearer of options" proposed by Anderson (1917). Money, by definition, is the generally accepted medium of exchange. Money is the most tradable asset in the market. This implies holding cash is the plan that provides acting man the greatest flexibility to participate in future market transactions. In some way, money as an institution can be interpreted as a Hayekian equilibrium as there is a compatibility of plans that are all made against money. All goods and service are traded against money. That's why money its present in every market and doesn't have a market of its own (Horwitz 2000). In this sense, money occupies a central position in the subjective theory of risk because its serve as a benchmark of the degree of

flexibility or adaptability of all other plans in the market economy. In contrast to the risk free asset view, money can be seen as the lowest riskiest asset in the economy offering the highest degree of flexibility to market participants.

The inflation premium can be included as a component of risk as described earlier. Price premium will be the amount charge from the moneylender to the borrower in order to maintain the same purchasing power and flexibility of the plan. Of course, the analysis must take into account cases of hyperinflation. When this happens, is a sign that the economy is switching (or in a transition) to another currency. If hyperinflation it's caused by monetary policies induced by a central bank, the Lachmann's conclusion of institutional change doesn't hold. In this case, two institutions are affected. On the one hand, money it's changing to another currency and markets cannot perform economic calculation as well as before (see Horwitz 2000).

CAPITAL AND INTEREST

Usually plans can take the form of contract like bonds, commercial paper, equity, options, future, forwards and other derivatives in terms of money. These contracts are traded in financial markets. Capital can be allocated through financial markets via the instruments describe before or directly. The valuation of these securities will depend on the following factors:

1. Interest rate composed by the three components: time preference, inflation premium and the risk component
2. Expected cash flows
3. Duration
4. Substitution and complementarity
5. Legal and institutional context

All these elements also coincide with the degree of flexibility of capital plans.

First, the risk premium contain in the market interest rate, will indicate the extra amount of money in relation to the capital invested that it's require to carry out a capital plan. This adjusts and regulates change in the capital structure of the economy. A high risk premium will imply a high degree of change within the existing capital order of the economy. This can be seen as an opportunity or warning in the lenses of the investors. For example, a new business like the disruption innovator *a la* Schumpeter will have a higher risk premium than existing firms because it's introducing change and it's not yet compatible with the existing networks of plans or capital structure. If the new business it's successful and gains profit, it will serve as a feedback mechanism to other investor and risk premium will start to decreased. In this case, the risk premium has gone from a higher level to a lower level. The opposite can happen. An unsuccessful business the risk premium will start to get from lower to a higher level. This also implies change as the capital and factors of production of the unsuccessful firm will have to be reallocated to another part of the capital structure. The risk premium also affects the amount of capital that it's invested in each plan. In the creative destruction example, the capitalist will have the incentive to inject a small amount of capital in the new project. This helps the economy to make change as smooth as possible respecting the Lachmann clause of institutional change.

Expected cash flows are also important for determining the flexibility of capital plans. Some securities have certain cash flows establish by the terms of contracts (like most fixed income securities) and others are more uncertain (equities, variable interest bonds, derivatives and so on). Certain cash flow will have less risk and greater flexibility.

The flexibility of capital plans depends directly of its duration. If a capital plan contemplates a shorter maturity, it means that it have lower risk premium as cash flow are recovered earlier. This implies that money is restored in earlier periods gaining more flexibility. The reverse will be true. If capital plan have a long maturity, it will imply higher risk as money is restored in remoter periods. From these it can be asserted that as the economy saves and adopts more roundabout process of production will imply more risk. Nevertheless, as stated by *Lachmann* "A progressive economy is not an economy in which no capital is ever lost, but an economy which can afford to lose capital because the productive opportunities revealed by the loss are vigorously exploited."(1978 pp.18).

Lachmann (1978) often refers to substitution and complementarity as properties of capital. The flexibility of capital will also depend on these characteristics. It will be normal to assume that when a capital plan is can substitute, replace or complement other parts of the capital structure; the risk premium will be lower.

Legal characteristic of the securities such as collateral and ranks of payments will provide more flexibility to the plan. Finally, changes in the institutional arrangements can affect legal and property rights of capital plans which affect the value and flexibility

BUSINESS CYCLE THEORY

When the typical boom phase starts, the credit expansion causes recurrent decreases in interest rates (see Hayek 2008, Huerta de Soto 2006 and Garrison 2001). However, an expansive monetary policy doesn't only affect the time preference component of the interest rate. Risk premium can also be affected and the signals explained before can be distorted. This section analyze how central banks policies affect private banks strategies in choosing plans or investment with more risk than others.

Maturity mismatch strategies

Bagus (2010) explores the incentives and disincentives mismatch with and without the central bank. His analysis centered in the feasibility of mismatch strategies that depends on the actions of the competitors in the market. The effectiveness of the mismatch depends on the strategic behavior of the competition. Nonetheless, the study in this section will try to show that the incentives affect the banking system as a whole.

With this policy, the central bank has created an artificial profit opportunities for private banks. The banks that decide to mismatch its assets maturities with its liabilities maturity will experiment an increase of its capital position and profits. In detail, banks who borrow in a short term and lend in a long term will benefit because as short term debt reach its maturity date, it will be renewed with a lower interest rate. In the same way, as assets are placed long term, it will not suffer the lower interest done by the central bank. Following these arguments, with the credit expansion, banks pay less for its funds and gain more for its investments provoking an increase in its profits or net interest income. Capital also gains in value as long term investment are discounted with a lower rate of interest in the market. Also, as more leverage has the bank, more profitable it is. As more risky plans are carried out, banks system as whole loose flexibility to react to an increase of interest rates led by inflation pressures or discretionary policies of central banks. In this stage, the bust phase begins. In these respect, its pertinent to cite Hayek (2008) *"why do the forces tending to restore equilibrium become temporarily ineffective and why do they only come into action again when it is too late?... One instance of these disturbances in the price mechanism, brought about by monetary influences—and the one which is most important from the point of view of trade cycle theory—is that putting out of action of the "interest brake" which is taken for granted by the trade cycle theories..."*.

Lowering credit standards

A pervasive incentive that central bank policy induces it's the lowering of credit standards for private banks. As more liquidity it's injected to the economy though the central bank in the boom phase, banks have to lower credit requirements and increase limits exposure to lend more money to segments of the markets that couldn't enter before. In addition, by lowering interest rates and providing unlimited liquidity to private banks, credit risk and liquidity risk it's miscalculated by entrepreneurs by having a lender of last resort.

Another point made by ABCT is that malinvestments will appear after a credit expansion. Banks can't be immune to this effect. Also, the mismatch strategy gives an additional incentive to place more loans or investments into the market in a longer term increasing the credit risk exposure. With increasing the maturity of the assets, the financial health of the firm which has been granted the loan can change and no longer be compatible with the original capital structure. In other words, the financial conditions that the company that passed the filter of risk controls of the bank may be affected as time goes by. Banks try to mitigate this risk by requiring collateral. However, the market value of the collateral becomes more uncertain as in longer-term time horizons. In this regard, the bank funding costs will increase because creditors will demand a higher return for the greater risk they are taking. In this sense, if interest rates rise, the bank's capitalization level is reduced. This can be exacerbated by central bank policy to

increase the interest rates to stop inflation. Therefore, the possibility that the bank will not honor its debt increases because it has fewer resources to deal with its creditors.

GROWTH, DEVELOPMENT AND INSTITUTIONAL ANALYSIS

In this final section the role of institutions will be explored and how risk reacts with it. Hayek (2012) studied how institutions are formed. In this work, he identifies a conflict between an organization based society in compare to a spontaneous order society (or the Open Society in Poppers terminology). Hayek stated that the former can only take advantage of the knowledge of the leader (or group of leaders) that manages society. In return, the latter is a bottom-up approach that can benefit of the dispersed knowledge of all members of society that are coordinated through institutions as markets, money, law and language. These institutions evolve through time in a process of trial and error that never ends.

However, inclusively in an Open Society (or Great Society), the State can turn the institutions once made by spontaneous order to an organization based society through the law. With these in mind, Hayek (2011) proposed the properties that the law must comply in order to not intervene with the natural evolution of institutions. These characteristics that the law must respect are:

- Law always negative
- Law must be general and predictable
- Law cannot be retroactive
- Equality before the law

These conditions are necessary to maintain the rule of law. However, developing countries suffer from the fulfillment of these requisites. These debilitate the setting which economic plans are adopted. It is true that uncertainty condition prevails in both developing and developed countries but the difference is that developed countries handle uncertainty in a more orderly way. Developing Markets manage uncertainty in a more chaotic way with institutional framework changing more often (Acemoglu 2012). Markets punish this behavior by demanding a higher risk premium to the plans that involves exposition in developing countries. This explains why interest rates are always higher in developing countries in compare to developed countries. These generate all the effects describe in the capital section. Large amount of investments are not attracted by the high risk profile of a developing country. This can be seen as constraints to growth and development.

Another advantage that developed financial markets have is that the market interest rate provides knowledge to market participants of how to allocate capital. It also serves as a feedback mechanism to make revision of capital plans. In developing countries as financial markets are not so developed and liquid so making economic calculations is more difficult. Also, the feedback mechanism is weaker as fewer operations are conducted through financial markets.

CONCLUSION

So far the role of risk within has been mostly neglected in neoclassical and Austrian economics. This paper has tried to analyze how risk affects plan formations which can be tractable to human action and coherent with individual methodologist and subjectivism. Taking into account the market process perspective, risk can be best seen as flexibility of plans. This flexibility it's taken into account through the money, which is the most flexible asset in an economy. The degree of flexibility of plans can be signal through the risk component of the interest rate that has been unanimously acknowledged by the economist profession. This work has found theoretically the implications the subjective theory of risk conceive in the allocation of capital, business cycles, institutions and economic development.

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