

IKAM WORKING PAPER



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RISK ELASTICITY OF ECONOMIC AGENTS: CREDIT-FINANCING AND BUSINESS CYCLES

How credit-financing affects the overall real economy is unknown. The paper makes a humble attempt to fill the gap and tries to explain pathways of effect of credit-financing to the economy and how it causes business cycles through financial and economic decision-making of economic agents. In explanation of how credit-financing may lead to economic downturns in business cycles, the paper scrutinizes the ability of people **to take personal financial and economic risks**. Existing theories don't elaborate on how individuals make financial and economic decisions. It sheds a blind zone effect of individuals' financial and economic decisions. It sheds a blind zone effect of individuals' financial and economic decisions. By introducing the understanding of elasticity of individuals to anticipated personal financial and economic risks, the paper brings in the term **the risk elasticity factor which is derived from people's attitude to resources: income and wealth**. It sets the same impact factor to an individual as the investor and the customer. And the common line of financial and economic behavior of people was drawn based on review and analysis of the literature and empirical evidence. Then, the cause-and-effect analysis is applied in conjunction with firms' behavior, fiscal and monetary policies as they have impact factor one to another define financial and economic motions. This may provide a new purview to financial and economic phenomena.

Key words: Behavioral Finance Theory, Investor & Consumer Decision-making, Business Cycles, Macroeconomic Policy

1. Introduction DOI: http://dx.doi.org/10.26414/ikm002 Key understanding the financial market behavior to and economic motions and the overall cause factor of business cycles may lie in understanding the financial and economic decision-making behavior of human nature. Existing classical and neo-classical financial and economic theories provide patterns of individuals' financial and economic behavior. However, they are unable to draw a bigger picture of people's financial and economic decision-making. The paper puts an attempt to investigate the cause factor of business cycles and economic crises through ability of people to take personal financial and economic risks. Based on review and analysis of the literature and empirical evidences in the modern economy, finance, psychology sciences, it maps people's financial and economic decision-making with regard to ability of people to take personal financial and economic risks and brings in a term - the risk elasticity factor - to describe the phenomena of business cycles. The risk elasticity factor is derived from people's attitude to resources: income and wealth. The reason is that both have an impact on consumption and investment behavior of people.

The paper is review based and constructed in the following way. First, investors' financial decision-making and deficiency in the modern portfolio theory are elaborated. Second, the Maslow theory of hierarchy of needs is discussed as the general line of motivation factor for consumption and investment behavior of people based on empirical evidence. Third, people's attitude to income and wealth is examined based on empirical evidence. Fourth, risk elasticity factor in investment decision-making is scrutinized. And after deriving the key terms and assumptions, the common line of financial and economic behavior of people are drawn since individuals as the investor and the consumer are under the same impact factor. Fifth, empirical evidence is brought with regard to co-movement of monetary policy and the real economic activity. Finally, pathways of effect of credit-financing to the real economy and how it causes asset bubble formation, business cycles and as a result economic downturns is explained through application of the cause-and-effect analysis. In conclusion, the paper lays out the argument that the base for business cycles lies in a chain of factorial effect of one factor over another as result of change of financial and economic behavior of economic agents to unfolding financial and economic situation.

2. Investors' financial decision-making and deficiency in the modern portfolio theory

Investor's investment decision-making is elaborated in modern portfolio theory, which takes roots from the paper of Harry Markowitz of "Portfolio Selection" published in the Journal of Finance in 1952. The theory pioneering portfolio selection technique grounds on connection of statistical physics and utility factor, which is counted as the driving force in financial decision-making. It gave birth to the asset pricing theory known in the finance literature as the capital asset pricing model or more commonly the CAPM theory. Though, empirical tests (Merton, 1973, Perold, 2004, Fama and French, 2004) fail to prove the way of application of the CAPM.

Inability of existing theories and hypotheses to explain inconsistencies in the investor's decisions brought to life the behavioral finance theory. It grounds much of the explanation of individual's financial decision-making as an economic agent on the theory of rational choice. It again cannot draw the line where the boundary of the rationality lies, in other words, what is rational and what is irrational because one thing considered to be rational is considered by another individual as irrational. According to the axiomatic concept of rationality, it is a matter of being logically consistent within your preferences and beliefs. However, when it comes to financial markets, the behavior of markets is often described as a non-rational choice.

According to Markowitz's portfolio theory, an outcome of an investment decision is based on the investor's utility to be received from the investment he makes. Expected return is expressed via mean of return which is desired thing and risk via variance of return, which is undesired thing. Investor's choices are modeled with the expected utility functions. It is widely-used and first was introduced by Daniel Bernoulli in 1738 as an explanation for the St. Petersberg Paradox described by his cousin Nicholas Bernoulli in 17131. Though significant empirical and experimental evidence has shown that sometimes an individual's behavior is not consistent with the standard forms of the expected utility, it remains the base point for the many classical finance theories. The Expected utility maximization portrays a rational investor as always inclined to select an investment which maximizes his expected utility of wealth when faced with a choice among a set of competing feasible investment alternatives (Norstad, 1999). It was also Daniel Bernoulli who first introduced the principle of a diminishing marginal utility of wealth to resolve the paradox, which is widely used and accepted in finance and economy sciences. It states that "utility resulting from any small increase in wealth will be inversely proportional to the quantity of goods previously possessed"2.

The Markowitz portfolio theory and the Expected utility theory describe the investors as having homogeneous expectations. Investor's investment decision is modeled whether the invested capital increases his wealth or not and theoretically concludes that investment is accepted if the expected utility of wealth increases brings investor higher utility. Major shortcoming of the Markowitz portfolio theory is that the model does not describe the situation of what is going to be an investor's choice if he is facing a number of securities with the identical mean and variance of return in construction of his portfolio. This is theoretically and practically possible. **The Markowitz portfolio theory states that if two or more securities have the same value, then any of these or combination is good as any other3. The statement is true for the Markowitz theory as it is based on a mathematical model. But, the Expected utility theory cannot provide the same answer as it is not a mathematical model but can be referred as behaviorist theory. At the same time, the Expected utility theory does not provide any clue where the breaking point is in such a case. Then, both theories describe the general selection pro-**

2 Ibid, p. 7.

¹ Pennacchi, G. G. 2008. Theory of asset pricing. Boston: Pearson/Addison-Wesley, p. 5-6.

³ Markowitz, H. 1952. Portfolio selection. The Journal of Finance, 7(1), 77-91.

cess of the investments among many opportunities without giving an idea on possible other principles an investor can be ruled in investment decision-making.

In such a case, it is necessary to scrutinize the terms of risk averseness and risk appetite of investors widely used in the modern financial literature in order to understand an investor's decision-making in such a scenario. The financial literature doesn't give insights into what factors form risk averseness and risk appetite of an investor.

3. The Maslow theory of hierarchy of needs as the general line of motivation factor of individuals for investments and consumption

Command of people over resources comes in two forms: income is the flow of resources; wealth is a stock of resources. Both as resources define our consumption by which we fulfill our needs and affect the quality of our life from a material point of view that has an impact on our life satisfaction. If to benchmark sociology discipline, according to the modern social scientists, the social hierarchy has strong motivational effect to individuals in order the society be operational which is executed through placement of differential access to rewards4. So, to get to that scarce and privileged goods and services, people need to acquire professions to get earnings to reach those rewards, which makes the society



Figure 1: Maslow's Hierarchy of Needs

to function as through motivation individuals get specialization and commits to work or do some functions. Differential attachment of rewards to goods and services and availability of them makes them scarce with increase of attached to them rewards such as comfort and enjoyment, prestige and esteem, special rights and other privileges provide us a way by which people fulfill their needs of self-esteem and ego desires.

If to benchmark psychology science, in 1943 Abraham Maslow presented "A Theory of Human Motivation", which is known today as the Maslow's hierarchy of needs (Figure 1). The theory

argues that people fulfill their needs in an orderly and ascending fashion. It puts forward the idea that to pursue personal growth and development the basic needs to be met. It is as follows: physiological needs, safety & security, love and belonging, self-esteem, self-actualization.

The Maslow theory is criticized for a lack of supportive empirical research evidence (Wahba & Bridwell, 1976), presence of the conceptually and empirically not tested definition as self-actualization (Heylighen, 1992), validity of the concept. It also is regarded as being ethnocentric on Western approaches (Hofstede, 1984), and being drawn theoretically from writings on the analytical psychology of Carl Jung (Schott,1992). There is also some scientific evidence of differences of human needs during peace and wartimes (Tang & West, 1997, Tang & Ibrahim, 1998, Tang, Ibrahim, & West, 2002) and change of needs

⁴ Grusky, D. B. (2018). Social stratification: Class, race, and gender in sociological perspective. Routledge.

priority throughout lifespan (Goebel & Brown, 1981). Nevertheless, it remains the dominant theory that explains human needs and motivation. Major critics of the Maslow theory is around self-actualization, while there are psychologists (Rowan, 1998, Kiel, 1999, Hanley & Abell, 2002), who supportive of the theory and propose to amend the pyramid with other needs not mentioned, which again concentrate on self-actualization issue of the hierarchy of needs and a few on modification of esteem needs, thus physiological, safety and belonging & love needs is not questioned.

If to refer to the empirical evidences, the study conducted by Oleson (2004) in university-age cohort utilizing the Maslow theory confirm the strong relationship between the hierarchy of needs and money attitudes, between the psychological needs of human and their saving decision (Lee & Hanna, 2015), the importance of money in satisfying needs (Poduska, 1992). There is also evidence that money can buy satisfaction through increased financial security and satisfaction of physiological needs (Howell, Kurai, & Tam, 2012). Empirical evidence of Goebel & Brown (1981) indicate a slight decrease in need for self-actualization and increase in the influence of physiological and security needs in later adulthood. Diener, Horwitz & Emmons (1984) argue that money can help one's happiness and to some extent free individuals from worries as physiological and safety needs, and it has diminishing effect with increase of wealth. They assume it may be due to concentration of wealthier people on their other worries as well as events, prestige and self-esteem. They also conclude that it is probably activity leading to earning money rather than money that is responsible for the well-being of wealthier people.

As a sum-up, it is possible to conclude that physiological needs, safety & security needs, belonging & love needs are the basic needs and form common factors that affect every human regardless of ethnic, cultural or national background. Physiological needs form survival needs and require financial independence to pay bills to cover-up basic survival needs. Other needs also require financial ability to be fulfilled like to maintain a family, own property, to pay healthcare services, and others. Empirical evidence indicates a strong relationship between the Maslow theory and finances though needs of people may vary during peace and war times.

4. People's attitude to income and wealth: empirical evidences

According to empirical evidence (Ahuvia, 2008), for people at all income levels the desire to get more income has a powerful motivational factor. This is because many associate high income with greater happiness, though empirical evidence on income and subjective well-being indicate that high income has little or no lasting impact on happiness for the non-poor. People tend to overestimate the magnitude of the relationship between money and happiness. This especially concerns people of the lower income end of the social strata. Johnson & Krueger (2006) argue that the poor than anyone else are struggling everyday with difficulties of living in destitute conditions and money acts as a buffer from negative shocks. Moreover, one's perceived financial situation and control over life completely associated between wealth and life satisfaction. The reason is that people regard financial resources as protection of life satisfaction from environmental shocks and control over them appeared to act as a mechanism translating life circumstances into life satisfaction. And vice versa, reduction of wealth as a result of

unemployment and unmanageable debt reduce one's subjective well-being regardless of income (Clark & Oswald, 1994, Ahuvia & Friedman, 1998). Moreover, there are researches that indicate strong causal links of negative economic events and income loss with psychological health and changes of one's family environment which can alter an individual's life chances. Inglehart & Rabier (1986) registered decline in subjective well-being with decline of income in Belgium in 1979 cross country analysis of France and Belgium, and this pattern can be traced during economic stress periods like recessions (Aldwin & Revenson, 1986). Based on the analysis of the effect of the Great Depression of 1930 to family life, Liker & Elder (1983) have documented that economic hardship has substantially diminished the quality of married couples and can alter life chances of children as a result of household changes and adverse psychological changes. This is in line with other empirical evidences (Aknin et al., 2009), which indicate that people are engaged in hard work not because they are interested in increase of income but are able to maintain their current household income in order it does not decrease because of fear to face consequences of its loss. This supports the thesis of previous researches which state that losses have more impact than equivalent gains (Kahneman & Tversky, 1979, Baumeister et al., 2001).

Senik (2014) argues that wealth and self-declared happiness have strong correlation. The main reason is that wealth has a positive impact on improving institutional quality, education, health, life satisfaction and provides a safety net of protection against loss of current and future consumption flows, which can be the result of negative income shocks. Smith et al. (2005) also confirm that wealth is more important during difficult times when they arrive and do not affect one's happiness in good times. Guillen-Royo et al. (2013) carried out a research on the relationship between basic needs in the theory of human needs, material wealth and happiness in seven regions of the south and north-east of Thailand with contrasting levels of access to services and to the market. Results of the research indicate that wealth has a significant and distinct link with happiness through meeting basics as it has a substantial effect on the quality of life. Moreover, wealth is also associated with psychological security, respect and greater so-cial participation. Landiyanto et al. (2011) in investigation of variables that affect happiness of people in Indonesia found that asset ownership under which is measured non-business assets like livestock, and jewelry, as well as asset ownership and ownership shares have strong correlations with one's well-being. The main cause is assumed that wealth provides security.

Some researchers also confirm that objective economic circumstances have a slight but greater impact on happiness and subjective well-being, which is statistically significant (Diener et al., 1999, Headey et al., 2004). Richins & Dawson (1992). It was documented that there is less life satisfaction for people who value money more highly than other goals. The same is argued by Diener & Biswas-Diener (2002), who marked that people placing more value on material goals than others have substantially less life satisfaction unless they are wealthy. Authors argue that there can be one explanation, which are human universal characteristics such as biological needs such as meeting these needs to facilitate subjective well-being. These needs are connected with homeostatic needs for food, water, thermoregulation and fulfillment of these needs as nourishing, clothing, and housing provides happiness. According to them, these needs can be extended beyond homeostatic ones and include others needs such as

self-respect, status, excitement seeking etc, which in addition also can provide security, developments one's abilities. This is in line with live-ability theory (Veenhoven & Ehrhart, 1995), which suggests that people seek fulfillment of inherent requirements, and income to certain degree can be used to facilitate fulfillment of these needs by purchasing things that can provide pleasure. This especially fits individuals and societal levels with low income levels. However, with regard to notion when income is invariant to the level of life satisfaction, Diener & Biswas-Diener (2002) refer to group of scientist led by Crawford et al. (2000), who argue that people's level of satisfaction has relation to fulfillment or non-fulfillment of their desires and their experiment demonstrated that life satisfaction and financial satisfaction are influenced by people's ability to meet their material goals. Schyns (2002) found positive correlation between income equality and subjective well-being, which disappear with effect of wealth. Earlier study of Schyns (2000) conducted on direct and indirect effects of income to subjective well-being based on analysis of Western Germany and Russia indicate that it has direct effect in poorer nations like Russia while its effects is indirect in wealthier nations such as Germany and comes from financial satisfaction. After study of correlation of life satisfaction and various life domains in the slums of Calcutta, Biswas-Diener & Diener (2001) came to conclusion that income is strongly correlated with life satisfaction and it has a large impact on lowest levels. The authors assume that these differences are related to differences in meeting universal basic needs for food and material resources, and through income have effects to other various domains concerned with "self" like morality, physical appearance, social relationships etc. Recent researches started to differentiate subjective well-being into two forms: emotional guality of life that individual experience in everyday life and life evaluation of thoughts that people refer to when they think about their life. Kahneman & Deaton (2010) found that emotional well-being rises with rise of income until to certain degree and correlates with health, caregiving, loneliness, while income and education are closely correlated to life evaluation. The authors conclude that money buys life satisfaction but not happiness. Less money is mediated with emotional pain, low life evaluation and low emotional well-being and it is highly connected with low income.

As a sum-up, we can conclude that both psychologists and economists alike confirm that desire for higher income is statistically significant for subjective well-being of individuals but in reality it has small effects. High income is associated with happiness and decrease of it with decrease of happiness. Low level of income is highly associated with economic stress and psychological pain. Wealth defines not only a degree of economic security but it is mediated with the notion of prestige, esteem, status and other ego desires. Diminishing effect of higher income and wealth can be due to many factors like effect of other life domains to life satisfaction or effect of social comparison which makes people strive for higher wealth. If to benchmark the Markowitz portfolio theory and the Expected utility theory, which describe investors as having homogeneous expectations, then this argument conforms to human inclination for higher wealth. However, empirical evidence indicates that losses have more impact than equivalent gains.

5. Risk elasticity factor in investment decision-making

Investments come not only with potential of gain but also with possibility to lose which can be total loss or partial depletion of value of a security. Since investments are the current consumption forgone for the future consumption, then any risks to it include downward shift in fulfillment of needs and have full range of real life negative consequences connected with it. As losses have more impact than equivalent gains, losses in investments cause psychological discomfort and pain which decreases psychological comfort and will have an effect on one's subjective well-being and life satisfaction. If we connect the risk factor to be associated with negative financial and economic events and trends that can come with total or partial loss of income and wealth, it can provide a more clear explanation of human financial and economic behavior. This may give us an argument to state that people are highly likely to avoid any unnecessary exposure of their income and wealth to threats to evade emotional pain associated with loss of wealth. From this point, it is possible to conclude that an investor may be led in an investment decision not only by his desire for higher return to satisfy his utility, but by whether he is satisfied with the expected return for the given level of risk factor his investment capital is exposed to. In that case, it is a risk factor that defines his choice of a security for his investments. Then from an investor's perspective of investing in one of the two and more securities having the identical mean and variance of return, he is highly likely to invest into the one which, according to his belief, has better growth prospects of saving the value of his wealth and providing better flow of earnings. If this is the case, his judgment doesn't only base on assessment of firms' financial profile but he takes into consideration a bigger picture. In such a case, the risk will be the degree of belief (scenario or trend of scenarios) of the investor on the performance of security in terms of saving the value of wealth and generation of new earnings. It is bound to other variables from micro- to macro level.

From highlighted points, we can derive our basic terms and assumptions. Under the term risk for an investor, it can be formulated a degree of belief (scenario or trend of scenarios) of the investor on performance of security on preservation of the value of wealth and generation of earnings or new wealth. Under the term risk for a consumer, it can be formulated a degree of belief (scenario or trend of scenarios) on the possibility of happening event/s that can negatively affect his income and wealth and hence hamper ability to meet needs to be fulfilled through consumption. Negative environmental shocks to income and wealth come with negative effects on material and psychological condition. Risk factor can be referred to as a triggering mechanism between consumption and saving as well as between investments and saving because any factor arising in the horizon whether it is personal financial abilities or unfolding a negative economic situation may change behavior of an individual from consumption to precautionary saving. Since people tend to attach hire importance to income and wealth mediated with happiness and a buffer from environmental shocks, assessment of risk forms our risk elasticity, which is our ability to pass through periods of uncertainty produced by causal factor/s. This assessment comes in two forms: assessments of personal financial abilities and assessment of unfolding economic situations. Under the term of the risk elasticity can be defined degree of our belief in our ability to cope with loss to our income and wealth and giving up fulfillment of our current needs and desire to fulfill our future needs, which can be generalized as wants – the needs that we want fulfill but currently unable to do so because of our insufficient income and wealth level and it can be needs that can be non-material, but connected with wealth and with wealth generation. The risk elasticity also comes with our readiness to shift downwards in social competition, to suffer impact to qualitative components in fulfillment of our needs, etc. It also has a substantial psychological factor as wealth loss depending on size hampers our abilities to shift upward. If to remember with regard to loss that a bad event has greater power than good and the fact that according to researchers of Tversky and Kahenman (1992) the median coefficient of loss aversion is about 2.25, in other terms, losses hurt about 2.25 times more than equivalent gain awards, the risk factor connected with wealth loss can be considered as the key factor in an investor's decision-making.

As a sum-up, we can put forward an argument that the risk factor may play the key role in financial and economic decision-making of any individual. It can be noted that phenomena of rationality and irrationality under the risk elasticity factor in the economy science can be described as differences of people in assessment of the financial and economic risks as a result of having different levels of the risk elasticity. It allows us to lay out the argument that the market is rational and information has a signaling effect for consumption and investment behavior of individuals. From the highlights above, it is also possible to conclude the following assumptions:

1-assumption. An **investor makes investment decision** based on the fact whether the given level of return for the given level of risk factor/s satisfies his utility and his assumption that he can handle the given level of risk.

2-assumption. The risk elasticity parameters of an individual is set by many factors such as the **capital he is holding, personal backgrounds like family, social class, education, place of living, life & work experience, social consciousness,** etc. As it was mentioned, wealth attachment of parents has a wide range effect to further the life of their children and defines life chances. People's skills of information absorption and interpretation are the inherent part of the risk elasticity.

3-assumption. Wealth level plays one of key aspects in financial and economic decision-making. Higher wealth provides more opportunities for financial and economic maneuvering. Smaller pool of wealth doesn't provide such capacity making such investors risk averse.

4-assumption. In investment decision-making, an investor is subject to the information available in the market. Depending on skills to absorb and interpret information, investment decisions will be based on the investor's ability to assess the risks that the market environment is delivering through information, and depends on his risk-taking ability.

5-assumption. Market is heterogeneous, but consists of investors with different levels of risk elasticity that can form different groups of investors with **homogeneous risk-taking ability.**

6. Consumption under the Maslow theory of hierarchy of needs

There is empirical evidence that directly and indirectly constitute forward looking ability of consumers, and known in finance research literature under liquidity constraints factor. Based on study of consumption of durable goods and effect of liquidity constraints to consumption behavior of consumers Chah et al. (1995) confirm that consumers are forward looking and their horizon of smooth consumption depends on capital market imperfections. They have documented that consumers increase consumption of durable goods with receipt of news about increase in income. However, the same cannot be traced with consumption of non-durables as they cannot finance the increase. The same was documented by Flavin (1984) who, using the unemployment rate as a proxy for the proportion of the population subject to liquidity constraints found that liquidity constraints have direct and severe impact on consumption. He argues that the "Keynesian" consumption function is an incomplete model and liquidity constraints are an important part explaining excess sensitivity of consumption to current income. Wilcox (1989) has registered that large increase in social security benefits in the US increases consumption expenditure when they are paid and this especially concerns durable goods. Mishkin (1978) linked the consumer expenditure through a balance-sheet with aggregate demand in an approach to analyze the Great Depression of the 1930s. Being Keynesian in character and having much in common with the monetarist school, balance sheet approach explains at certain degree the Keynesian spending approach and the monetarist approach in explanation of the Great Depression. He comes to the conclusion that balanced-sheet changes were rather structural transmission mechanisms but not "cause" of a depression. Empirical research results have strong implication confirming that liquidity constraints have substantial effect on consumption to a significant fraction of population (Hall & Mishkin, 1980, Hayashi, 1985, Zeldes, 1989).

These findings reject standard formulation of the life cycle/ permanent income hypothesis, which states that consumers consider their lifetime resources in consumption decisions and individual consumption depends on net worth of current resources and anticipated future labor income. According to the theory, changes in spending should respond only to news about income. We can make the conclusion that these empirical findings confirm the forward looking ability of consumers in their spending and reject the rule of thumb of the Keynesian school in consumer expenditure.

If to benchmark empirical evidence, wealth expands with rise of income and people who have higher income are better able to acquire wealth producing assets as well as with rise of income increases rates of saving (Oliver & Shapiro, 1990, Lettau & Ludvigson, 2004). Carney & Gale (2001) also argue that the level of net worth and financial assets have statistically strong correlation with traditional factors such as income, age, education and marital status.

If to benchmark the Maslow theory of hierarchy of needs, people are engaged in fulfilling their basic needs before they proceed to satisfaction of psychological needs like esteem and self-actualization needs. The less capital the individual has, the lower he will be on the ladder of the hierarchy of needs. And vice versa, the higher capital the individual has, he seeks to fulfill his esteem needs and ego desires. It makes lower and middle income groups to have higher utility to fulfill their basic needs, which serves as a major motivational driving force that pushes them to have higher utility for consumption. Credit doesn't increase consumption of these two groups as it is constrained by the size of income, which is largely wage. So, credit allows the people of these groups to buy a good now that they are unable to buy with his current level of liquid wealth or being constrained as a result of other factors. This is the way how credit-financing opens the way to human wants. If to benchmark the risk elasticity factor, the lower and middle income groups of the social strata will be more risk averse due to a low level of income and wealth, while financial and economic behavior of people of high income and wealth classes of the social strata depends on effect of the impact factor to abilities to fulfill their needs.

If we look at individuals' behavior as a consumer through the prism of risk elasticity, then it explains why people change mode of consumption during negative trends of financial and economic outlook. As mentioned, negative financial and economic performance comes with two uncertainties: first, when this trend ends; second, personal financial abilities to pass uncertainty period, which is defined by level of income and wealth. If an individual saves the same mode of consumption then it may deplete his wealth before the end of this trend and he may end-up at the survival level if he is left unemployed as negative financial and economic trends also come with attached negative scenarios. Negative financial and economic outlook increases risks of being left in a constrained financial and economic environment in a struggling condition to find resources. For individuals, who have credit loans, debt load to income is to have a distinctive effect to his consumption behavior since part of his income goes for the servicing of his credit. So, credit may put a constraining effect to consumption behavior of consumers through affecting the risk elasticity in changing financial and economic environments. Substantial shocks may cause the paradox of thrift as a result of withholding wealth to secure it as well as consumption to pass a period of uncertainty.

6. Modeling investor behavior under the risk elasticity factor

Figure 2 illustrates a capital condition of an individual as the consumer and the investor, where capital level is illustrated under the 45-degree line. This illustration can be applied as to income and wealth level equally. It is to illustrate the risk elasticity factor effect to the individual's behavior, particularly, financial and economic decision-making of individuals as the investor and the consumer. The higher the capital the higher will be the ability of an individual to fulfill his needs, to generate new wealth, and the higher will be his social competitiveness and social & success status, the more ego desires he is able to fulfill. To understand better how the financial market and our economy operate under credit-financing, let's first model behavior of an individual as the investor.

Suppose there is an investor with a capital at the capital level 1 with no amount borrowed and theoretically assume he is able to secure a borrowing under zero-interest charge. He borrows the capital and invests. If his estimates at the time "t" were correct and things went well, he will receive his earnings at the time "t+1" and shift to the capital level 2. His shift from the capital level 1 to the capital level 2 will make him better off in terms of financial and economic abilities as it provides incremental improvement to his wealth. However, if his estimates at the time "t" were incorrect and things went bad, then at a time "t+1" he will lose invested money, and as a consequence he will shift to a lower capital level as he has to pay back the borrowed capital. Suppose he is unable to secure a loan under zero-interest charge and takes a loan under a minimum interest rate available in the market. If things go bad and he loses the capital, he will shift down along the capital line more than in comparison with the first case scenario as except for the principle of the loan he has to pay interest-charge accumulated during the failed investment period.



As it shown on Figure 2, a zero-interest charge loan " α D!" at a time "t" is equal to " α D!" to be paid at a time "t+1". While a loan under the fixed interest rate does not have such characteristics as except the principle the borrower has to pay also interest-charge over the borrowed capital accumulated over the borrowing period, in other terms, α D(Rf) $\neq \alpha$ ' D(Rf). And in case of a default, on the same graph but showing the change

in time, a debt level of the investor taken under a simple interest rate will rise on a straight line pattern, if a compounding - as a curve line creating for the lender additional α -s.

In both case scenarios of borrowing under the zero-interest charge and at the fixed interest rate, the second will be the worth case scenario. Loss of wealth and hampered financial abilities is to have a direct impact on individuals self well-being and life satisfaction. Default on credit-loan will be hampering an investor's ability to fulfill his current and future needs, including his investment ability, social competitiveness and affecting his social status and other ego desires such as prestige, esteem etc. Hence he will be receiving more psychological discomfort and pain with loss of investments and accumulation of debt as a result of credit-loan. In the first case scenario under zero-interest, even though the investor shifts down the capital line, the fixed amount of debt will not allow him to have such increasing psychological discomfort and pain.

At this point, the risk elasticity factor may better explain such phenomena as "the leverage effect". It can be viewed as mass leaving by investors of taken positions after receiving a major information signal from the market. Such behavior of the financial market can be result of several factors as effect of credit-loan to investor's behavior, leverage of the firm, which increases riskiness of its assets or change of investor's preference as a result of negative trends making him to look for better security in the investment horizon matching his risk elasticity.

As a sum-up, we can conclude that borrowing under interest-charge may have serious implications on investor's behavior. Hence, under the borrowed capital his risk elasticity will be shrinked. **Arrival of ne-**

gative news whether it is micro- or macro with regard to the risk profile of the security may change an investor's degree of belief on performance of his security.

7. Asset bubble formation

Market is efficient unless all information is reflected openly. Asset bubble formation can be explained as herding of investors for security as a result of information signals delivered from the market whereby underlying factors leading to asset bubble formation cannot be picked up. If to benchmark the risk elasticity factor, collision factor that will definitely arise makes the bubble to burst as a collision factor is the change in policy of the central bank with regard to money supply. So, change of money supply causes a consequent change of supply-and-demand relationship of goods & services, and their relationship ends-up in a situation when there would be disparity making supply as oversupply with regard to demand. The reason is that under zero interest-rate based system people will be buying goods & services at their actual price, which is factored by production capacity and a size of income & wealth of individuals. And this makes adjustment of demand & supply relationship natural and gradual whether it is upward shift or downward shift. Many things are dependent on time lag in supply & demand relationship as supply relationship is factored by time. High demand doesn't necessarily mean low price if supply is lagging behind demand. So, until production capacity meets demand, there is less likeability in change of price to decrease unless there is fall in demand. And the reverse way, when there is high production capacity utilization, demand & supply relationships can adjust quickly. Credit-financing makes adjustment of supply & demand relationship non-natural and quick because availability of the easy credit balloons the price, especially in cases where production capacity cannot provide quick response to demand. Low level of supply will be driving the rise of prices if there is high demand. Since there is a high demand it drives supply, in other terms, production capacity. It will be attracting more investors. A case can be a housing bubble where a high demand drives up investors. So, the change of money supply causes: first, fall in number of those who was able to take a loan and people of the middle and lower income groups make up larger portion of consumers; second, fall in number due to the risk elasticity factor of those who was willing to buy but refuse from taking a loan because of being fearful to put into constrained condition fulfillment his other needs or to put them at risk. If to benchmark the risk elasticity factor, this is factor of quick change in demand, as by affecting financial and economic behavior through change of money supply it is cause the additional thrust that make demand to fall and make it fast. Though from economic point with decrease of demand supply should follow accordingly, but money supply change affects this change being sharp in demand leaving demand and supply relationship in great disparity. And sharp decrease of demand making supply as oversupply causes consequent fall of price of a good and consequently the asset. There already might be already oversupply as time lag between supply and demand relationships is always present since they are not in perfect equilibrium but tend towards equilibrium and it is a process taking time. Time lag is role to play, including through velocity of goods. There can be situations where ill assessment of future prospects of demand may drive supply first, and this has high likelihood for goods & services that is entering market as a due to technological revolutions and changes. But reassessment of demand after causal factor may bring prices down. Fall in prices of the asset that was rising and to which the investors were investing will cause the bubble to burst.

As a sum-up, we may conclude that credit-financing which make adjustment of demand and supply relationship in non-natural way making their relationship artificial. Hence, change of money supply may put their relationship in such disparity which by causing sharp fall in demand causes consequent sharp fall of prices. It is possible to conclude that **credit-financing is a major contributor to production and consumption misbalances. Credit-financing provides quick growth, but makes it in unsustainable in the long run.**

8. Co-movement of monetary policy and the real economic activity

Major tools of central bank's operation are interest rate, reserve requirement and buying & selling government bonds. Transmission mechanism of monetary policy includes interest rate, asset price changes, exchange rate, credit channel (Mishkin, 1995). The following notes should be taken into consideration.

If to go for the empirical evidence, the monetarists (Modigliani, 1971) confirm the strong correlation between the money supply and the consumption expenditure. In his study on the impact of monetary policy to household consumption in South Africa, Owusu-Sekyere (2017) has documented microeconomic effects of macroeconomic policy changes and confirms that monetary tightening affects the ability of households to borrow. The study also reveals that tightening monetary policy further worsens existing household debt, which would further undermine deteriorated household consumption expenditure. According to Subhanij's (2009) research of the household sector, the housing market and monetary policy in Thailand indicate the increased sensitivity of the household sector having debt to interest rate changes, who are more likely to respond to a rate hike by cutting the spending. The author believes that this is more likely because a large proportion of household assets in Thailand are illiquid assets, such as real estate, and household borrowing is dominated by housing loans. Domination of the housing structure in the household sector's balance sheet together with variable rate mortgages make the Thai economy particularly sensitive to interest rate and house price movements. This makes it difficult for the Central Bank of Thailand to achieve price stability just by targeting financial stability. Han & Ogaki (1997) argue that co-integration of consumption and income cannot be rejected. Flodén et al. (2017) have studied the correlation of household debt and monetary policy through the effect of the cash-flow channel in Sweden and found that monetary policy has a strong effect on the real economy when households are highly indebted. The same effect is found for leveraged households having adjustable rate mortgages when there is reported increase. Utilizing a Steindlian approach to consumer debt, Dutt (2006, a) has shown the effect of borrowing to the growth prospects. He argues that availability of borrowing by consumers helps avoid stagnation in the short-run, but in the long-run effects of consumers increased borrowing becomes ambiguous. Increasing consumer debt redistributes income towards the rich. He assumes that this might be a possible effect to aggregate demand and growth. Dutt (2006) also argues that consumption led by credit-financing isn't sustainable as via channeling wealth from debtors to creditors who having less inclination for consumption may be engaged in wealth accumulation, and it creates disturbances for consumption. To overcome the trend of macroeconomic contraction, government needs through demand-creating policies stimulate consumption via government expenditure and redistribution of wealth to the poor. After analysis of debt to consumption behavior of households being focused on Irving Fisher's approach of debt deflation impact to the real economy, King (1994) argues that debt deflation should be viewed as a real business cycle. He has documented that debt has a significant effect on consumer behavior as low ratios of new debt to income is characterized by high consumption growth and reverse way – high new debt ratios to income is linked to low consumption growth. He also argues that microeconomic data has more value to explain macroeconomic changes as debt deflation can multiply small shocks into potential large changes in aggregate demand and output since adverse shocks lead agents who had borrowed on the expectation of future income have propensity to consume less in order to repay debt.

Financial institutions play an important role being intermediaries in the financial market and depository institutions as banks play a special role because through the depositary system they make loans. Since money supply grows in the system via fractional reserve lending, change of money supply has an effect on risk management of financial institutions. If to go for empirical evidences, researchers and policy makers name at least two ways on how interest rates affect banks' risk-taking (Altunbas et al. (2010)): first, banks change risk policy as low interest rate impacts measurement of risk since it affects valuations, incomes and cash flows; second, low interest rate make banks to search for yields, especially this can be applied to cases when nominal return targets are set. Based on analysis of more than 1,100 banks in 16 countries between the period of 1998 and 2008, the researchers confirm that banks' risks were increasing because of short-term low interest rates over an extended period of time. loannidou et al. (2009) have studied the impact of monetary policy on bank risk-taking and pricing in Bolivia between 1999 and 2003 as during that period the boliviano was pegged to the US dollar and there was high dollarization of the financial system of the country. They found that decrease by US federal funds rates increases riskiness of banks and default of individual banks. It was a consequence of increase of risky loans as well as banks reducing rate of charge from the riskier borrowers relative to less risky borrowers. Moreover, they found that banks with more liquid assets and less funds were especially vulnerable when there were relaxed monetary policy with regard to US federal funds rates. These banks were taking more risks and less concerned ex-ante on charging for the additional risk-taken. Adrian & Shin (2009) have documented that repos and commercial papers can serve as a better indicator of credit conditions that affect the economy. The authors state that when the financial system as whole holds long-term liabilities, financing it with liquid assets of short-term liabilities increases riskiness of the system as any shock that results in pullback of leverage will show up somewhere in the system. While some may hold such pressure by adjusting balance sheets, the highly leveraged institutions will be the ones which will be pinched and when short-term funds dry up they face liquidity crises. Nicolo et al. (2010) argues that monetary policy easing causes rise of risk-taking by banks, but not for less capitalized banks. They also admit that this may differ across countries and time, and much to depend on local banking market conditions and factors affecting those conditions as a business cycle. The authors raise an issue if this is the case how to integrate macroprudential regulation into the framework of macroeconomic policy since there is a tradeoff between two confronting objectives that cannot be dealt simultaneously. Easing monetary policy in an environment of low inflation leads to excessive risk-taking, while there is a tightening it may reduce risk-taking but affect aggregate economic activity. After analyzing correlation of credit and business cycles based on the historical perspective of Italian economy from 1861 to 2013, Bartoletto et al. (2015) found that there is low correlation in the short and medium-term periods, though both overlap during crisis periods. However, co-movement of credit and business cycles are strong when sovereign bonds held by banks are taken into account. After study of sovereign bond holdings by 20,000 banks in 191 countries and 20 sovereign default episodes over 1998-2012, Gennaioli et al. (2018) have documented that holding of government bonds have serious implications to allocation of risk-weights and lending. Developed economies of OECD countries hold fewer government bonds during normal times and this ratio increases in banks' portfolios during crises. This fact is more clearly observable in less financially developed countries whose holdings of government bonds in their portfolio is relatively higher than in comparison with developed economies. Holding of government bonds has a negative correlation with banks lending for both economies, but for the emerging economies it also contributes to the sovereign default.

Referring to correlation of credit cycle with business cycle the following notes should be taken into consideration. As it was illustrated that people with different levels of risk elasticity may react differently for the same information, so is business entities depending on size they react to economic risks differently. So, businesses also shouldn't be viewed in aggregate. While big companies and corporations have risk management systems in-place and due to bigger market share also have more endurance to economic recessions and financial tensions, small and medium companies have less such capacity. If to refer to empirical evidences, studies of researchers (Asea & Bloomberg, 1998, Lown & Morgan, 2006, Gertler & Kiyotaki, 2010) confirm causal connection between financial market and macroeconomics and effect of credit frictions to the real economy as well as tightening of lending is a slowdown signal. Evidences suggest that monetary policy highly correlates with the small firms' activity (Meltzer, 1960, Gertler & Gilchrist, 1994; Oliner & Rudebush, 1996, Thorbecke, 1997, Bernanke, Gertler & Gilchrist, 1999) as with the increase of interest rate banks start declining loans to small firms and increase lending to the larger ones as well as small firms are discriminated by banks during tight monetary policy and their investment are more sensitive to monetary policy. Change of banks lending in the long-run causes credit tension that can depress the economy. Kashyap et al. (1992) shows that monetary contraction leads to reduction of banks lending and an increase of commercial paper. Bernanke (1990) has documented that federal funds rate provides more informative forecasters on real variables than nominal interest rate. Tighter monetary policy results in sell-off of bank's security holdings in the short-run with little-effect on loans but not in the long-run. Bernanke & Gertler (1995) have documented a strong effect of monetary tightening to firm's balance sheet as the rise of interest rate slows firm's cash flow and increases short-term borrowing and housing investments is found to be sensitive for changes of monetary policy though the long-term interest is controlled to some degree. With regard to sensitivity of the housing market to interest rate changes, the authors refer to research of Boldin (1994) who have documented strong connections between housing demand and the condition of consumer balance sheet, particularly, the ratio of mortgage payments to income for median new home buyers. Mortgage payments itself is found to be in close positive correlation with federal funds rate and nominal interest rate rise as the latter causes fall of household income. The effect of monetary policy is explained through such variables as the mortgage burden and mortgage terms like down-payment, up-front-payment as closing cost, "points", and etc.

As a summary, we can take notes of several facts. First, empirical evidence confirms that co-integration of consumption and income cannot be rejected. Second, indebted households are sensitive to the changes of monetary policy and those microeconomic effects have impact on macroeconomic changes. Third, relaxing monetary policy has positive effects to growth in the short-run but its effects in the long-run are indefinite because indebtedness of households affects consumption which can cause large macroeconomics changes. Monetary policy adjustments cause consequent changes in risk-managements of banks. Relaxing of monetary policy leads to excessive risk-taking which may be due to the effect of interest rate to valuations and/or because of search of financial intermediaries for higher yields. Tightening of monetary policy leads to reduction of risk-taking by financial intermediaries which tighten the credit policy and reallocate their assets for more secure investments as governments bonds. Empirical evidence also indicates that tightening of credit policy slows down the real economic activity through credit friction and small firms are discriminated against the most.

9. Explanation of credit-financing as the cause factor of business cycles

The risk elasticity factor of people as consumers is formulated in the modern economic science under the term of consumer confidence and used to lesser degree in the modern finance science under the term of investor perceptions. If to view individuals' behavior as consumers and as investors and firms behavior through the prism of the risk elasticity factor to unfolding financial and economic situations, the source of business cycles and economic crises can be viewed credit-financing. But it is caused not through direct impact of money-multiplier effect because of credit-financing but impact of one factor to another as a result of reaction of economic agents to information with regard to unfolding financial and economic situations.

To give a more solid explanation to business cycles, let's model a situation when the economy is heading for another recession. To stimulate the economy, the government addresses its fiscal policy to induce confidence to the market. Increased tax cuts and government spending release liquidity to consumers and businesses. As the government starts stimulating the economy through the fiscal policy and with increased consumer spending firms start getting liquidity, which was in shortage as a result of downward trend due to the contraction period of the previous business cycle. The process is supported by the central bank's monetary policy, which adjusts interest rate, reserve requirement and bond operations accordingly to support the economic growth. Fiscal and monetary policy measures give impulse to economic expansion. Firms start hiring again giving positive effect to lowering the unemployment as with increase of business operations increases liquidity of businesses. All these positive changes have an effect on the growth prospects that is transferred to economic outlook and having impact to the consumers' confidence results in an increase of aggregate consumption. Increased consumption impacts the return of investor confidence as it affects businesses, which start increasing business operations and start new investment projects. Low interest rate drives economic growth as it stimulates consumers. Increased business operations will result in overall decrease of unemployment over the growth period of the cycle and increases consumer spending. However, due to the impact of money-multiplier effect of credit-financing central bank has to adjust its monetary policy throughout the cycle period. Government fiscal policy changes throughout the cycle period as well. However, low interest driving demand and supply make their adjustment artificial and quick. But such situations cannot be sustainable as constraining factors like inflation make change of money supply unavoidable as easy credit may lead to overheating of the economy.

As mentioned in empirical evidence, changes of central bank's policy with regard to money supply over the growth period of the cycle will cause consequent change of the credit policy of banks, which affect the credit profile of consumers and businesses. Particularly, it results in risk adjustment of banks' lending practices and banks start giving fewer loans in comparison with the start of the peak. Increased interest rates expressed in bank's charge for risk premium also affect consumer behavior through the risk elasticity factor. So, tightening monetary policy will be positively correlated with consumer spending, which consequently affects businesses by slowing down their cash flow. Changes in consumer spending will take time, which forms a time lag effect to aggregate demand. As a result of these changes the economic outlook changes as well. Changes in financial and economic environment as access to the loans, slowdown of business operations, changes in macroeconomic variables, etc in general give rise to financial and economic risks, which causes further subsequent changes of consumers' and investors' behavior, including businesses. Slow down of business operations and cash flow of businesses, changes in macroeconomic data by sending negative signals cause investors to search for safe-haven. So, this will spur the second part of the cycle. Consumers and businesses will start experiencing problems with getting new loans and fulfilling their debt obligations with increased interest rates and increasing shortage of liquidity closer to the peak of the cycle. These processes are repetitive. Risks caused by changes of financial and economic situation by affecting the risk elasticity makes people switch from mode of consumption to precautionary saving mode. Businesses also adjust to the changing financial and economic environment, including through jobs cuts. Increased equity financing at the beginning of the growth cycle at the peak switches to safer securities, which provide safe-haven.

The following facts should be noted. First, the interest rate is a minimum rate provided in the market and it is small in number. So, depending on calibration of money supply changes caused by the money-multiplier effect will be small and incremental, but steady. Time lag is to play a role. Second, business cycles periods depend on debt accumulation and recovery speed, which itself depends on several factors: calibration of monetary and fiscal policies, regulations, employment, job force, etc. The other factors that define the trajectory of the business cycle can be also the level of financial inclusion of people to the finance system, debt level of households, distribution of wealth, consumption capacity of eco-

nomy, connectedness of it with other markets, etc. Third, as indicated by empirical evidence, businesses shouldn't be viewed in aggregate because they react to negative financial & economic events and trends differently. Small & medium businesses play an important role in all economies because they are the key generators of employment. At the same time, due to their size small & medium businesses have less endurance in handling crises in comparison with large companies and corporations. Fours, central bank policy with regard to money supply, government decisions on fiscal policy and regulations and behavior of economic agents should be viewed as interconnected mechanisms having cause-and-effect relationship in a chain effect manner to each other.

10. Conclusion

In conclusion, the risk elasticity factor, which is drawn by benchmarking psychology, social psychology with regard to people's attitude to resources represented by income and wealth, may provide a more solid explanation for the general line of financial and economic behavior of individuals as consumer and investor. Combining the empirical evidence on correlation of monetary policy and the real economic activity and mapping behavior of economic agents through the risk elasticity factor based on the cause-and-effect relationship gives us the argument allowing to state that economic crises are caused by credit-financing. The key driving force of financial and economic motions is argued to be the risk elasticity of people which define their financial and economic security or insecurity in unfolding financial and economic situations. The key factor that causes change of financial and economic environment is argued to be credit-financing through monetary policy and have factorial effect to behavior of financial intermediaries, firms and individuals to each other. It is possible to constitute defectiveness of the principle time-value of money as it does not save people from hoarding of wealth. Wealth is being highly associated with happiness, security, positive self well-being and life satisfaction make it the nature of humans to have propensity to accumulate wealth and to protect it from negative shocks, including to secure consumption.



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