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Subprime Crisis and Instability of Global Financial Markets

Summary: In order to prescribe adequate remedies to treat the current financial crisis one has to understand what in the first place went wrong. An age ago, older generations wrote that disease could not be cured without an accurate diagnosis. In contrast to mainstream “efficient markets hypothesis” we argue that Minsky’s financial instability hypothesis gives numerous valuable insights into sources and possible consequences of current global financial crisis. Furthermore, two decades ago Hyman P. Minsky predicted possible developments and perils of ever growing process of securitization of illiquid assets.

Key words: Speculation, Debt, Financial instability hypothesis, Ponzi unit, Securitization.

JEL: E12, E44, G01.

“For Ponzi units, the cash flows from operations are not sufficient to fulfill either repayment of principle or the interest due on outstanding debts by their cash flows from operations. Such units can sell assets or borrow. Borrowing to pay interest or selling assets to pay interest (and even dividends) on common stocks lowers the equity of a unit, even as it increases liabilities and the prior commitment of future incomes...”

Hyman P. Minsky (1992), p. 7.

For decades now, mainstream academic circles [proponents of Eugen Fama’s (1970) “efficient markets hypothesis”], zealously supported by Wall Street high rollers, have been claiming that self-regulated markets led by Smith’s “invisible hand” are the optimal mechanism for rational and productive allocation of scant resources to the most productive uses. In this view, ups and downs (boom-bust episodes) are consequence of an exogenous shock (external to market processes), most frequently, unsuitable and clumsy public policy interventions. If unanticipated exogenous shock disrupted normal functioning of markets, corrective forces that at least in the long run restore market clearing conditions, would be activated. Naturally, because markets know best, there was no room for worry. The prescription for a stabile and rapid growth of the economy and living standards is pretty simple: deregulation and liberalization of financial flows and world trade, i.e. minimization of government control and market regulation.

However, seemingly suddenly, contrary to orthodox theory of efficient financial markets, in August 2007, reality brutally bit. Financial markets came to a sudden stop. Although the first signs of accumulated difficulties became visible in 2006 when house prices peaked, in March 2007 when debtors in subprime mortgage market started to declare bankruptcy, and in July 2007 when big banks found that they could not sell existing buyout loans, the “Minsky moment” (term coined by Paul McCulley 2008) finally arrived in August 2007. Monetary authorities and mainstream economists were stunned and surprised. Crisis erupted in subprime mortgage market and afterwards, as quick as lightning, it spread to other U.S. markets and the markets worldwide. Interest rate spreads soared and panic caught equity markets. (Charles J. Whalen 2007; Charles R. Morris 2008; George Soros 2008).

Today, when concerned voices ask themselves what went wrong desperately seeking financial help from government, and when irresponsible government officials wash their hands of responsibility, Hyman Minsky would not be neither stunned nor surprised. Minsky (1919-1996) was born in Chicago, and although, he specialized in theory of business cycles his economic thought was widely neglected during his life. As one of the most prominent followers of John Maynard Keynes, Minsky rejected Patinkin’s neoclassical synthesis and Smithian view of the world as invalid and, after all, harmful for those practitioners who uncritically embrace it. The Financial Instability Hypothesis (FIH) is the result of Minsky’s long and thorough studying of unbalanced development of closed developed capitalist economy. The goal of his research was to find answers to questions that bothered him for so long: Why were developed capitalist countries with sophisticated financial systems prone to depressions and why was the equilibrium only a temporary state? In order to find right answers, he confronted neoclassical world of risk and resurrected a neglected and wrongly interpreted Keynes’ theory of investment under conditions of fundamental uncertainty, as well as his uncompleted theory of business cycles.

1. The Great Depression and Keynes’ Speculative Financial Markets

Years following the end of the World War I were years of accelerated economic growth and development in developed western countries. However, after only two years of peace, the American economy was caught in a severe recession that fortunately ended in 1922. In next seven years, boom continued at a pace unimaginable until that very moment. Purchasing power of consumers, production, productivity, investment, profits and dividends grew continually and number of unemployed decreased drastically. Excessive optimism of market players was justified by fundamental changes in business environment, such as establishment of global free trade, technological inventions, increase in productivity, elimination of inflation etc. Widely accepted opinion in business and financial circles was that an era of stability was coming and that business cycles were only a matter of past. It seemed that no one was bothered with the fact that in the period between 1922-1929 financial markets grew twelve times faster than the real sector. That was an era of the brave new world of unlimited possibilities, an era of final victory of laissez-faire capitalism.

However, seemingly out of the blue, in October 1929, financial markets crashed and the Great Depression came to the scene. During the Great Depression all crucial macroeconomic variables significantly declined. All the way until the beginning of the World War II, western economies were in chains of impossible – high unemployment and idle resources. In his seminal book *The General Theory of Employment, Interest and Money* John Maynard Keynes, eminent English economist and philosopher, offered an answer to the question why modern entrepreneur and essentially monetary capitalistic systems are prone to crises and disruptive behavior. He rejected Say's Law, the (neo)classical theory of money neutrality, and the necessary (neo)classical tools aimed at proving the hypothesis that in the long run economic systems naturally strive to equilibrium. On the other side, in Keynes view, there is not such a thing as a stable equilibrium. Financially sophisticated economic systems move continuously through time and any state, whether it be a state of rest, expansion, boom, deflation or stagnation is transitional: "Since we claim to have shown in the preceding chapters what determines the volume of employment at any time, it follows, if we are right, that our theory must be capable of explaining the phenomena of the trade cycle. If we examine the details of any actual instance of the trade cycle, we shall find that it is highly complex and that every element in our analysis will be required for its complete explanation. ... By a *cyclical* movement we mean that as the system progresses in, e.g. the upward direction, the forces propelling it upwards at first gather force and have a cumulative effect on one another but gradually lose their strength until at a certain point they tend to be replaced by forces operating in the opposite direction." (Keynes 1936, pp. 341-342). Thus, in Keynes' world, modern financially sophisticated capitalistic systems of production, distribution, exchange and consumption are not perfect and stable self-correcting mechanism, but fundamentally flawed. As Keynes pointed out, the reason of its inherent instability lies in its structure and relations established between investments, financial markets, output and employment. Namely, asset valuation determinates investment path, which, on the other hand, crucially determines employment and output. However, due to fundamental uncertainty, i.e. unstable expectations and speculative orientation of uninformed agents, asset prices are liable to sudden and wild fluctuations. In that way, unnecessary investment projects might be undertaken, which, in the event of some unanticipated change, could be sufficient reason to trigger a crisis of confidence leading to a severe output and employment downturn.

In his dual price theory, Keynes defined conditions that will lead to new investments. Supply price of capital goods (price of capital goods that have not been produced yet) is based on short term expectations and is, consequently, stable. On the other hand, demand price of capital goods (price of existing capital goods given in the price of securities that represents legal right over profits that capital goods generate) is based on long run unstable expectations that go deep into uncertain, distant, vague, and misty future. In his concept of a fundamentally uncertain future, Keynes clashed with neoclassical theory by arguing that future is not preprogrammed and determined, and that our past experiences are not a reliable guide for making investment decisions. (Sheila C. Dow 2005; Donald Gillies 2005; Gay T. Meeks 2005; Jochen Runde 2005; Ognjen Radonjić 2007, 2009). In Keynes' opinion, there is no

such thing as a preprogrammed future, i.e. a future that is going to happen no matter what we, as participants do, and no matter which action we chose to take. Keynes criticized the classical and neoclassical assumption that expectations were "...given in a definite and calculable form. The calculus of probability ...was supposed to be capable of reducing uncertainty to the same calculable status as that of certainty itself." (Keynes 1937, pp. 212-213). Keynes' concept of fundamental uncertainty tells us that there is no future that is waiting to be discovered. In their economic activity, humans make choices and take different actions every day. In that way, agent's choices do matter, because we shape the future by making decisions and taking actions. The future is nonergodic, i.e. by making decisions and taking actions we create the future. In contrast to neoclassical and mainstream financial theory, Keynes argues that there is no way that we can at a present moment attach any numerical probability to infinite number of future outcomes we can imagine. What is more, many possible outcomes are unimaginable at the present moment. Necessary conditions for the realization of outcomes that we cannot imagine in present moment will be created at some future moment and result from our decisions. In real world, the kind of uncertainty that is essential in investment decision making is that about which "...there is no scientific basis on which to form any calculable probability whatever. We simply do not know." (Ibid, p. 214). He then asks, how we, faced with uncertain future, where our past experiences and statistical analysis of past data are not a reliable guide to the future, make decisions "...in a manner which saves our faces as rational economic men?" (Ibid, p. 214). In a dynamic business environment conventionally "...We assume that the present is much more serviceable guide to the future than a candid examination of past would show to be hitherto. ...We assume that the existing state of opinion as expressed in prices and the character of existing output is based on a correct summing up of future prospects, so that we can accept it as such unless and until something new and relevant comes into picture. ...Knowing that our individual judgment is worthless, we endeavor to fall back on the judgment of the rest of the world which is perhaps better informed." (Ibid, p. 214). Due to the fact that the exit from financial markets is (seemingly) always open and since the future is fundamentally uncertain it is rational for owners of securities to form short-term expectations and pursue capital gains, and because they do not have the needed information to make reliable forecasts, it is rational, although not optimal, to extrapolate the present situation into the indefinite future (the first two conventions): "It would be foolish, in forming our expectations, to attach great weight to matters which are very uncertain. It is reasonable, therefore, to be guided to a considerable degree by the facts about which we feel somewhat confident, even though they may be less decisively relevant to the issue than other facts about which our knowledge is vague and scanty. For this reason the facts of the existing situation enter, in a sense disproportionately, into the formation of our long-term expectations; our usual practice being to take the existing situation and to project it into the future, modified only to the extent that we have more or less definite reasons for expecting a change." (Keynes 1936, p. 188). Also, agents know that there is no predestined future, and that they create the future by forming expectations and taking actions in light of these expectations. In other words, financial markets are momentum driven and led by self-fulfilling processes.

Namely, if an agent thinks that the average agent thinks that the market will rise, in anticipation of an increase in securities prices, he will, in order to make profits, buy securities at that very moment when they are cheap. If other agents also form the same or similar expectation, they will all, in attempt to be one step ahead, on the try to buy securities on the simultaneous basis thereby pushing prices up. Financial markets are reflexive and it is utterly important to try to figure out what your competitors think because, in the end, expectations and expectations-based actions create the future course of development of markets. In a moment of brilliance, Keynes compared the process of decision-making in financial markets with beauty contests: "...professional investment may be likened to those newspaper competitions in which the competitors have to pick out the six prettiest faces from a hundred photographs, the prize being awarded to the competitor whose choice most nearly corresponds to the average preferences of the competitors as a whole; so that each competitor has to pick, not those faces which he himself finds prettiest, but those which he thinks likeliest to catch the fancy of the other competitors, all of whom are looking at the problem from the same point of view. It is not a case of choosing those which, to the best of one's judgment, are really the prettiest, nor even those which average opinion genuinely thinks the prettiest." (Ibid, p. 195). Consequently "...it is not sensible to pay 25 for an investment of which you believe the prospective yield to justify a value of 30, if you also believe that the market will value it at 20 three months hence." (Ibid, p. 194). Keynes warns that we should not believe that the valuation of securities created in this game of outwit between professional investors and speculators has any long-term validity because it is "...a game ... of Musical Chairs — a pastime in which he is victor... who secures a chair for himself when the music stops. These games can be played with zest and enjoyment, though all the players know ... that when the music stops some of the players will find themselves unseated." (Ibid, p. 195). This is, of course, Keynes' answer to question why are financial market's players prone to highly speculative activities.

Consistently, because in the environment of incalculable future we "simply do not know" our expectations and asset prices are "based on so flimsy foundation" (Keynes 1937, p. 214) and are consequently "subject to sudden and violent changes." (Ibid, pp. 214-215). On the other hand, changes in expectations change agent's liquidity preference. When agents anticipate some changes in environment, but "...are very uncertain as to what precise form these changes will take, then their confidence will be weak..." (Keynes 1936, p. 188) and their liquidity preference will rise sharply. Consequently, sudden and significant simultaneous shift of agent's funds from less liquid assets (financial assets, capital assets, land, real estate, arts etc.) towards money could cause aggregate demand deficit that may, if disequilibrium forces are activated, drag system down into a deep depression.

In Keynes' dual price theory, investments will increase when ratio of demand price and supply price of capital goods is above 1. It appears that Keynes (1936) implicitly assumed, as Tobin did explicitly in his q theory, that if ratio of demand price and supply price of capital goods is above 1, investments will be financed. Some questions that Keynes did not answer, and are in the focus of Minsky's FIH, are what determines state of expectations at any given time, and why do changes in expectations occur and how investment is financed?

2. Financial Instability Hypothesis

In Minsky's words the FIH is a "model of capitalist economy which does not rely upon exogenous shocks to generate business cycles of varying severity." (Minsky 1992, p. 8). Minsky, as well as Keynes, rejected assumption that money is neutral, and in his theory the method used to finance positions in different assets is of critical importance. The world of economic relations is very complex and dynamic and consists of networks of mutually connected and dependent balance sheets of households, corporations, financial institutions and government. Balance sheets are composed of assets, liabilities, and cash flows that validate liabilities. When one party wishes to undertake some costly investment project it rarely has a sufficient amount of money to execute it on its own. It needs external funds and usually gets connected with bankers (or financial institutions in general), which are "merchants of debt" (Ibid, p. 6). The real problem is that at the moment when a lender (merchant of debt) and a borrower (party that buys capital or financial assets) get into a contract neither party, due to fundamental uncertainty, can be sure that the investment project will, in the future, generate sufficient cash flow to make good on debt that is used to finance investment. If the borrower fails, the lender, who now has some bad debt in its assets, might not be able to meet its obligations against other parties. In that way, a snowball of failures might be activated, which, in the absence of implementation of highly expansive fiscal and monetary policy, might end in deep economic depression, i.e. debt deflation episode.

The FIH consists of two theorems. The first is that a system can both be stable and unstable. The second is that during a prolonged period of prosperity, conditions emerge that cause a system to transition from an environment of stability towards environment of unstable financial relations. The core thesis of the FIH is that stability is destabilizing because, in an environment of fundamental uncertainty, ignorant human beings have no other choice but to extrapolate stability into infinity. Naturally, with calendar flow of time, when agents extrapolate stability into infinity they become more confident and, as their aim is to pursue ever higher profits, they become more and more willing to increase their liabilities relative to income. In that way, agents accumulate more risky debt structures.

On the basis of the margin of safety (the difference between expected cash inflow that an investment will generate and the sum of financing costs and operating expenses) Minsky (1986, 1992) explained the difference between three kinds of debt structures: hedge, speculative and Ponzi units. Net present value of hedge units is always positive. Speculative units are expected to generate cash flow that will not at any future moment be sufficient to pay out debt commitments. At some time in the future, generated cash flow will be sufficient to meet interest, but not the principal commitment. Finally, during most of the time or during whole period of life of the loan, the margin of safety of Ponzi units is non-existent. On the basis of euphoric expectations, Ponzi units get into debt today in expectation of high profits that will be realized in some, unknown future moment (high capital gains). Ponzi units are not able to meet its principle and interest obligations. To keep Ponzi units afloat, prices of assets must continue to rise. Refusal of emission of new short-term debt for financing existing debt obligations leads Ponzi units, in the short run, into bankruptcy.

According to the FIH, the higher the proportion of hedge units, the more stable the system. On the other hand, the higher the proportion of speculative and Ponzi units, the more that dominant forces will further destabilize system in the event of an endogenously or exogenously generated shock (example of endogenously generated shock is a failure of some prominent financial institution or corporation and of exogenous sudden switch to restrictive monetary policy by the central bank in order to constraint inflation). In a word, after a prolonged period of prosperity, the system becomes dominated by speculative and Ponzi units and is, consequently, fragile, i.e. less capable of absorbing shocks, so shocks are more likely to induce financial crisis. As debt increases and liquidity stretches, the maximum interest rate that the system is able to bear declines, and units become increasingly vulnerable to even a small increase in interest rates or/and unanticipated fall in profits.

Beside stability, competition among “merchants of debt” is another factor that induces agents to accept more and more risky behavior. Ruthless competition among financial institutions in their battle for potential clients ends in an eternal process of creating financial innovations. With proliferation of financial innovations, the available amount of finance goes up, which increases the demand for existing assets pushing up their prices. Because assets serve as collateral, rising asset prices allow even more debt to be emitted, thereby further increasing demand for finance. Therefore, financial markets are not mean-reverting, but momentum-driven (reflexive). A key concept of financial innovations is to find new ways to finance investment and speculative activity which are cheaper than existing ones. This implies that with the proliferation of financial innovation, in times of euphoria and expansion, part of the financial market that is under regulation of monetary authorities shrinks. In that way, moving of the system towards more fragile financial relations is supported by process in “which more traditional and benign borrowing is steadily replaced by borrowing that depends on new debt to repay existing loans.” (George Magnus 2007, p. 7).

3. Development of Financial Fragility

Minsky’s analysis of development of financial fragility with calendar flow of time starts in the period of recovery of the system after a financial breakdown that took place in not too distant past. This is the period when animal spirits are diminished, the level of investment and debt to equity are low whereas profit to interest cover and margin of safety are high. Risk premium and consequently risk aversion are high.

An outside shock to the system is necessary in order to shift from a track of slow to a track of accelerating economic and investment growth. The nature of an outside shock powerful enough to cause displacement of the system, and consequently dramatic change in profits horizons and expectations of agents, varies from one crisis to another (such a shock might be some revolutionary invention, some political event or unexpected change in monetary policy, sudden financial deregulation and liberalization, new exotic financial instruments, etc...). Be as it may, displacement shock initiates sharp rise in agent’s optimism, animal spirits are ignited, debt-financed investment activity and debt to equity ratio rise, an profit to interest cover and margins of safety fall. Risk premium and system liquidity falls whereas demand for money (credit) and, consequently, interest rates increase. The interest rate in-

crease is not significant, because part of the growing demand for money is covered by creation of financial innovations (spreading of financial innovations through the system causes rise in the velocity of money). Also, the inflow of fresh money into financial markets (from domestic and/or foreign sources) is dynamic ("merchants of debt" are now willing to increase supply of money because they share increased optimism of investors), prices of securities rise, the investment ratio rises, and the general level of financial speculation increases. In this phase of rising optimism as "...a recovery approaches full employment, the current generation of economic soothsayers will proclaim that the business cycle has been banished from the land and a new era of permanent prosperity has been inaugurated. Debts can be taken on because the new policy instruments - be it the Federal Reserve System or fiscal policy - together with the greater sophistication of the economic scientists advising on policy assure that crises and debt deflations are now things of the past." (Minsky 1975, p. 126). In that way, rising optimism evolves into excessive one.

Excessive optimism or euphoria in an environment of fundamental uncertainty is expected, because, according to Irving Fisher, although economic variables incline towards stable equilibrium "...exact equilibrium thus sought is seldom reached and never maintained. New disturbances are, humanly speaking, sure to occur, so that, in actual fact, any variable is almost always above or below the ideal equilibrium." (Fisher 1933, p. 339). As Fisher further concludes, excessive optimism and self-confidence might cause underestimation of investments risks leading to excessive indebtedness. In Fisher's opinion, over-investment, over-speculation and over-confidence are not a serious danger to stability per se, but in combination with over-indebtedness: "Thus over-investment and over-speculation are often important; but they would have far less serious results were they not conducted with borrowed money. ...I fancy that over-confidence seldom does any great harm except when, as, and if, it beguiles its victims into debt." (Ibid, p. 341). When the time comes, the created debt structure will not be justified by realized profits.

As time passes, euphoric expectations "beguiles its victims" more and more into debt. In time, debts begin to rise faster than profits. Among liabilities, the fastest growing items are short-term debts. Over-confident entrepreneurs are sure of growing profit rates, and prefer a short-term debt because it is cheaper than a long-term one. The debt to equity ratio rises further, the profit to interest cover falls, the margin of safety is melting, and in growing number of cases turns negative, the liquidity of the system is falling, and in the end the supply of credit and prices of securities increase exponentially. Due to decreased liquidity and devaluation of highly liquid debt instruments (optimistic agents are now more prone to risky investments) the interest rate rises. However, this rise does not decelerate boom, because in anticipation of high speculative capital gains (which far exceed prevailing interest rates), optimistic agents are more than willing to take on more debts. In other words, during the period of market euphoria, elasticity of demand for credit with respect to interest rate decreases. Furthermore, domination of highly speculative Ponzi units in later phases of market euphoria additionally put upward pressure on interest rates.

In time, as the period of euphoria continues, the system is becoming more and more fragile and speculative and Ponzi units are becoming dominant. In a word, fra-

gility emerges endogenously in an upward phase of the business cycle. In this situation, if restrictive monetary policy were implemented (which would rise interest rates) in order to constrain inflation, the number of speculative and Ponzi units would tend to increase in relation to hedge units. When the system is fragile, in an environment of monetary constraint "...speculative units will become Ponzi units and the net worth of previously Ponzi units will quickly evaporate." (Minsky 1992, p. 8). Also, if the rising of assets' prices stops, Ponzi units would not be able to increase their debt and would be forced to sell assets thereby activating downward asset prices spiral.

This state of euphoria and the market booming phase is, however, temporary. As Minsky argues, financing "...is often based upon an assumption 'that the existing state of affairs will continue indefinitely' (a quotation from Keynes, remarks by Minsky), but of course this assumption proves false. During a boom the existing state is the boom with its accompanying capital gains and asset revaluations. During both a debt-deflation and a stagnant recession the same conventional assumption of the present always ruling is made; the guiding wisdom is that debts are to be avoided, for debts lead to disaster. ...But in truth neither the boom, nor the debt deflation, nor the stagnation, and certainly not a recovery or full-employment growth can continue indefinitely. Each state nurtures forces that lead to its own destruction." (Minsky 1975, p. 126).

In the end, in an environment of fundamental uncertainty where we have no other choice but to extrapolate stability, disappointment is inevitable. Due to euphoria, investments are "...prompted by expectations which are destined to disappointment" (Keynes 1936, p. 348). Consequently, as agents notice that expectations were over-optimistic and as realized profits are disappointing, they start to protect their position by attempting to raise their liquidity. To increase liquidity, financial mediators are forced to reduce the supply of credit to hedge and speculative units (in that case speculative units tend to transform into Ponzi units) and to stop revolving short-term credit to Ponzi units. Risk aversion and, resultantly, cost of capital rise sharply. Existing and newly established Ponzi units (which emerged as a consequence of transformation of speculative units) will, in attempts to meet their debt commitments, decrease production in order to cut expenses, decrease inventory, sell their product at a significant discount, lay off workers, and "make position by selling out position" (selling of various assets and physical capital in possession; Minsky 1992). The intensified selling of assets by Ponzi units (securities, real estate, arts, land, commodities, etc.) causes at first a steadiness of prices (the rise is stopped), immediately followed by a sharp fall in prices of securities, real estate, arts etc. The markets have gone down. If in this downward movement, authorities do not implement expansive fiscal and monetary policy, debt-deflation will come to the scene.

4. Postwar Calm, Securitization and Fall of Ponzi Subprime Market

In order to prevent crises similar in magnitude to the one that hit developed countries at the end of the 1920s, the US Government put in place numerous measures aiming at purging speculator out of the system and, consistently, regaining the power of pro-

ducers and consumers. Also, developed countries established the Breton Woods system of fixed exchange rates and rigorous capital controls trying to preserve financial stability after the WWII. In the next two decades, system was stable and seemingly prosperous. Market players and government officials were optimistic and confident because, once again, they thought, due to the Government's fine-tuning policy, crises were unlikely to take place. However, at the end of the 1960s, the system revealed the first signs of distress. Considerable power concentrated in hands of Big Government, Big Labor and monopolies, fueled a cost-push inflation. Naturally, an environment of high and persistent inflation, in which big players expected bailing-out in case of financial difficulties, encouraged debt financing of investments. In an environment of positive interest rates, the loan business was profitable, and consequently, merchant of debts were stimulated to search for new and unregulated methods of investment financing. Securitization was one of them, and Minsky was well aware of this process. Seeds of destruction had been sown into a seemingly stable environment. Money rentiers rode again.

Around two decades ago, in his Memo on Securitization Minsky had recognized potential perils of the securitization process. There are three hallmarks of his view on securitization:

- “That which can be securitized, will be securitized.” (Minsky 1987, p. 2).
- “Securitization lowers the weight of that part of the financing structure that the central bank is committed to protect.” (Ibid, p. 3).
- “The investment banker hires ‘econometricians’ or financial economists to demonstrate that the risks of default on interest and principle of some class of the securities it proposes to issue are so small that these instruments deserve to have an investment rating that implies a low interest rates.” (Ibid, p. 4).

In Minsky's opinion, securitization was a response of highly regulated financial institutions, such as banks and thrifts, to the restrictive monetary policy of Fed chair Paul Volcker, which was aimed at permanent termination of inflation in early 1980s. A high fed funds rate put into subordinated position the financial institutions which were subjected to interest rate ceilings (Regulation Q). They could not attract new funds and make profits on the basis of the difference between earnings on assets and deposit interest rate obligations. Also, Minsky calculated that, in order to survive, banks and other regulated financial institutions should reach a required profit margin between interest rates earned on assets and interest rate paid on liabilities of about 450 basis points. In other words, due to the fact that they were subjected to reserve and capital adequacy requirements and due to costly relationship banking, regulated financial players became not only institutions that generated low profits, but institutions that were at the verge of bankruptcy. In order to survive and compete with unregulated low cost financial players (those that were not subjected to restrictive regulations and did not practice costly relationship banking), regulated financial institutions found a way out in securitization, i.e. an originate-and-distribute banking model. Namely, banks create mortgage loans and then pull them together and sell them to investment bankers, who further, on the basis of the pooled mortgages, create different exotic debt instruments (mortgage backed securities, collateralized debt

obligations), slicing them into different risk tranches to suit investors' needs. In that way, regulated financial institutions moved mortgages off their balance sheet, and replaced interest earnings as primary source of profits with fee incomes generated in the business of originating loans, assessing risks and, if necessary, servicing the mortgages. In that way, a hazardous incentive structure had been created. Because banks, thrifts, and mortgage brokers moved mortgages off their balance sheets, they were not interested in quality of loans, i.e. the future solvency of borrowers. Because they earned fee incomes, they were primarily interested in through-put, never mind the solvency prospects of the borrower. (Randall L. Wray 2007; Jan Kregel 2008a, b; McCulley 2009; Eric Tymoigne 2009a, b).

Consequently, the subprime mortgage market bloomed. Borrowers with less documentation required (low doc loans), without necessary documentation (no doc loans), the ones who lied about their incomes and assets (liar loans) and finally borrowers with no income, no job, no assets (NINJA loans), all of a sudden, became eligible customers. Edward Chancellor (2008) argues that subprime borrowers simply could not refuse lenders' generous offer. Namely, in terms of options, lenders were selling call options to insolvent people (credit contracts with low initial payments and interest rate and low or non-existent down payment) for free, on assets expected to rise in value. With rising house values, borrowers were able to increase their debt. At the same time, lenders sold put options to insolvent borrowers for free, so that if the value of a house falls, borrower could put back the house to the lender. McCulley (2008) suggests that borrowers with no documentation, no incomes, no down payment, with teaser interest rates are borrowers who are one level above Ponzi units. He calls them Ponzi squared units, because they are not only incapable to cover their principal and interest rate obligations out of their cash flow, but also, they do not have any stake in this kind of contract.

At the same time, mortgage officers were stimulated to lie and deceive potential customers, because they were richly rewarded if they succeed to push loans with unfavorable terms, which increased value of mortgage backed securities. (Wray 2007). In that way, financial innovations with low or no down payment found their way to ignorant and, often, deceived borrowers – “interest-only” loans and “option adjustable rate” mortgages (option ARMs) with initially low “teaser” interest rates but with very high reset rates later. (Ibid). And of course, as long as prices of houses keep rising (collateral) and/or interest rates are kept low, a Ponzi unit lives and increase its debts (for instance to refinance mortgage loans or rises in home equity loans).

On the other hand, investment banks had been buying pools of subprime mortgages massively, and then, by securitizing them, were selling great number of various exotic mortgage backed securities to profits hungry big financial institutions. To find buyers for junk, investment banks were forced to apply financial alchemy, or, in other words, credit enhancement strategies.

Firstly, on the basis of pools of subprime mortgages they created securities that belonged to different tranches in order to meet different risk-return preferences of investors. For example, if historical analysis of, we must emphasize, unrepresentative data during housing boom showed that loss ratio on subprime mortgages was no

more than 10%, securities that were backed by subprime mortgage pool would be divided into AAA or senior tranche (70%), mezzanine or junior tranche (20%) and subordinated tranche (10%). Now, owners of AAA tranche would be paid first from income that was generated by underlying pool of mortgages, i.e. if some borrowers default, owners of subordinated and BBB tranche would be first to feel it. In that way, thanks to “overcollateralization”, it appeared, that AAA or senior tranche were quite safe securities and consequently suitable investment for big financial players like insurance companies and pension funds. (Wray 2007; Michael Mah-Hui Lim 2008). What is more, thanks to short historical experience with nonconforming loans, booming markets and low rates of default of subprime borrowers, it appeared that junior tranche securities (owners of junior tranche securities would be paid only if owners of senior tranche were fully serviced) were also fairly safe and could be sold for high prices to unregulated financial players like hedge funds.

Secondly, investment banks, as Minsky predicted, hired respectable credit rating agencies to grant investment grade status to overcollateralized senior tranches, disregarding the fact that underlying assets were junk. Due to conflicts of interest (because they were heavily paid for providing rating services to investment banks) and the fact that the credit agencies used the calculations of their customers (investment banks) to assess potential default risks, junk was easily and smoothly transformed into rather safe securities, with high prices and low interest rates.

Thirdly, the insurance institutions were, beside credit raters, the key players that provided seemingly unlimited liquidity to junk mortgage backed securities and collateralized debt obligations. The big insurance companies with tiny capital bases massively insured junk securities (nominally investment grade securities) and helped to validate high rating status assigned by the credit raters. Similarly, the health of the insurers was assessed by the credit rating agencies. By providing insurance for investment grade securities (junk actually), insurers at the same time satisfied necessary conditions to acquire high credit ratings. Consequently, when subprime borrowers started to default massively, agents began to suspect the credit rating status of nominally investment grade securities assigned by the credit raters. At the same time, they became aware that higher rate of default than predicted could put insufficiently capitalized insurers into difficulties. Consistently, credit raters downgraded the credit ratings of insurers. Now, the insurance of mortgage backed securities became worthless, because health of insurers had been called into question. In that way, mortgage backed securities lost their investment grade status and panic emerged. (Wray 2007).

All in all, vicious circle was created: exotic innovations expanded supply of funds, banks were able to emit new loans as they moved pools of mortgage loans off their books, new loans increased demand for houses, pushing prices of houses up. Increased prices of houses justified the increased size of loans required and ever rising leverage ratio (debt to equity), since, in booming market, houses could always be refinanced or sold at inflated prices if Ponzi unit faced difficulties.

With the benefit of hindsight now, everything else is history. The speculative frenzy ended when, because of the increased risks of subprime defaults, interest rates rose and house prices stopped rising. The subprime market crashed and crisis immediately spread to other domestic and foreign markets.

Last but not least, it is important to notice that the new banking model of originate-and-distribute adds very important novelty to the dynamics of Minsky's FIH. Namely, in the new "originate-and-distribute" deregulated environment, with obvious incentive problems, a prolonged period of prosperity might not be needed for Ponzi units to be created and become dominant. In this new banking practice, loan originators and credit rating agencies were not motivated to properly screen potential borrowers and new credit enhancement strategies (overcollateralization and subordinated debt) became widely used techniques for the production of investment grade structured financial instruments out of junk assets. In this way, it is possible that domination of Ponzi units may take place from the very beginning of an expansion phase. The only thing that is necessary is favorable trend for prices of the assets that are object of Ponzi-style speculation.

5. The Grasshopper and the Ant Apologue

Inevitably, one should answer the questions of how we should react if a crisis erupted, and how episodes of uncontrolled speculation should be avoided in the future? There is no simple answer to these questions and, for the time being, due to the limited space, we cannot go deeper into debate. In order to give a more intuitive than definite answer, we decided to start with Jean de La Fontaine's fable "The Grasshopper and The Ant": A grasshopper gay sang the summer away, and found herself poor by the winter's first roar. Of meat or of bread, not a morsel she had! So a begging she went, to her neighbor the ant, for the loan of some wheat, which would serve her to eat, till the season came round. "I will pay you", she says, "on an animal's faith, double weight in the pound ere the harvest be bound." The ant is a friend (and here she might mend) little giver to lend. "How spent you the summer?" said she, looking shame at the borrowing dame. "Night and day to each comer I sang, if you please." "You sang! I'm at ease; for it is plain at a glance, now, ma'am, you must dance."

Clearly, the grasshopper represents unscrupulous financial managers, while we should find regulatory authorities to act as a queen of ants, whose task is to protect honest and diligent citizens from different kind of abuses. We firmly believe that if the government had allowed failure of the ones who speculated and earned enormous amounts of money, while, at the same time, transferred risks to other market participants, future generations of financial managers would have been very cautious and reluctant to get into this kind of game. However, in that case, contrary to La Fontaine's fable, due to high complexity of the financial system and complicated networks of mutual debts, the grasshopper is not the only one sentenced to death. A great number of ants would die as well (as experience of the Great Depression showed). On the other hand, if the queen of ants decides to save the grasshopper, it is very likely that, while her subjects work very hard in order to survive, it will continue singing and enjoying its leisure time in the future. In other words, a continual policy of interventionism stimulates moral hazard, i.e. sends bad signals to the market participants that risky and irresponsible behavior is being rewarded, because, no matter what happens, authorities would not let depression come to the scene. In a word, socialization of losses increases moral hazard in future and induces ever riskier behavior of market participants. But, on the other hand, if the system is on the verge

of crisis, abolition of rogue corporations and financial institutions is the only possible way to avoid deep depression. That is why, in time, after each new bailout episode, crises tend to erupt more frequently and tend to be more severe. The cure is in continual and, as much as possible, timely updating of financial markets regulation rules and regulating practices. Monetary authorities should be, if possible, only one step behind creative financial engineers. Corporative model of capitalism solved the problem of financing, but not the problem of managing. An open question looking for an answer is how to bind tight financial markets to the real sector. If we continue to go this way, we can expect more crises yet to come, new disruptive episodes, a rise in uncertainty and insecurity and more inequality in distribution of wealth. As Keynes warned us seven decades ago, if financial markets lose ground in the real sector and start behaving in a casino manner, the job is likely to be ill done.

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