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Faculty of Social Sciences

Institute of Economic Studies

Bachelor Thesis

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THE FINANCIAL INSTABILITY HYPOTHESIS OF HYMAN P. MINSKY AND ITS APPLICATION TO THE CURRENT FINANCIAL CRISIS

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Prohlášení

Prohlašuji, že jsem bakalářskou práci vypracoval samostatně a použil pouze uvedené prameny a literaturu

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Abstract

This bachelor thesis deals with the financial instability hypothesis of Hyman P. Minsky and its application to the current financial crisis. The first part of the thesis summarizes the hypothesis, and it mentions works elaborating the hypothesis. The second part of the bachelor thesis applies the hypothesis to the current financial crisis. The whole thesis refers to the general discussion about relations of the Minsky's hypothesis to the current financial crisis and to the fall of the insurance company AIG Corporation. The second part concludes that many relevant parts of Minsky's hypothesis can be applied to the recent financial crisis but important differences of the current financial system to the system in Minsky's times should be awared of. There are two most important differences: changes in risk management and new financial instruments. At the end, the thesis discusses the implications of these differences for applicability of the hypothesis on the current financial crisis. The thesis regards the fact that the recent financial crisis is caused by rational behaviour of economic agents and not by exogenous forces as the most important lesson to learn from the financial instability hypothesis of Hyman P. Minsky.

Abstrakt

Tato bakalářská práce se věnuje hypotéze finanční nestability Hymana P. Minského a její aplikaci na současnou finanční krizi. První půlka práce shrnuje hypotézu finanční nestability a poukazuje na práce, které hypotézu dále rozvíjejí. Druhá půlka práce vztahuje hypotézu k současné finanční krizi. Práce se zde věnuje obecné diskusi o vztahu krize, Minského teorie a případu pádu pojišťovací firmy AIG a plyne z ní, že současná finanční krize vykazuje podstatné znaky Minského hypotézy až na několik důležitých odlišností soudobého finančního systému oproti době Hymana Minského. Těmi jsou hlavně změna v risk managementu a vznik nových finančních instrumentů. V závěru jsou důsledky obou odlišností pro současnou aplikovatelnost hypotézy diskutovány. Za hlavní poučení z Minskeho analýzy je považováno tvrzení, že novodobé finanční krize nevznikají exogenními silami, ale racionálním chováním ekonomických agentů a jsou tím pádem způsobeny endogenně.

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1. Introduction

„Within this theory, which I call the financial instability hypothesis, the recent behaviour of the capitalist economies is not an anomaly: these economies have been behaving the way capitalist economies with sophisticated financial institutions are supposed to behave once economic intervention prevents fragile financial relation from leading to debt deflation and deep depressions. Because the financial instability hypothesis leads to a different view of the normal functioning of the capitalist economies it has implications for economic policy that differ from those of the standard economic theory of our time."

(Minsky H. P., 1982, p. 90)

The 1960s were the turning point of the functioning of capitalist economy, from the Minsky´s view. As he wrote: "From the 1930s to early 1960s, no serious financial disturbances took place. Because of the financial assets and liquidity inherited from the World War II, the significantly larger size of the federal government (the result of the cold war and various transfer payment schemes), and some positive uses of fiscal policy to run deficits when needed, the United States [...] achieved a significantly closer approximation to full employment over a sustained period of time than they had ever achieved before." (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 44) The U.S. economy witnessed several mild recessions, but from the general view, twenty years after the World War II was a period of prosperity.

But in the mid-1960s, the economy gradually became unstable. In 1966, the credit crunch appeared, and other financial crises came very soon (1970, 1974-5, 1979-80 and 1982-3). Minsky also says we cannot return to the old tranquil times before the 1966. What could be witnessed by the time of credit crunch was the beginning of a new period of capitalism, when old policy measures do not work and when instability appears. About ten years after the credit crunch he wrote: "We are in the midst of three closely related crises in economics: in performance, policy, and theory." (Minsky H. P., 1982, p. 90)

By the crisis in performance, Minsky meant that economy was affected by inflation, financial disturbances, high unemployment rates or instability of international exchanges.

These unfavourable trends characterized not only American but also other developed economies.

But according to Minsky, the economies witnessed also ineffective fiscal and monetary policy. This point he labels as the crisis in policy.

The last crisis is in the economic theory, and from Minsky's point of view it has two aspects. Firstly, there are "devastating logical holes" (Minsky H. P., 1982, p. 91) in the mainstream theory; secondly, the conventional theory is not able to explain financial crises which have already occurred.

The problem of standard theory of Minsky's days was not only that there was lack of explanation of financial fragilities, but also that the conventional theory did not regard financial crises as a normal functioning result of the economic process. The aim (of the thesis) should be to find a theory, which would not regard a crisis as a problem caused by exogenous factors:

> "In an era when performance failures demonstrate the need for economic reform, any successful program of change must be rooted in an understanding of how economic processes function within the existing institutions. That understanding is what economic theory is supposed to provide [...] the way in which money and finance affect the behaviour of the system can be perceived only within a theory that allows money and finance to affect what happens." (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 3)

Minsky created the financial instability hypothesis as his answer to non-existing explanation of the financial fragilities since 1966. It is an attempt to find a theory which would regard a financial crisis as something that belongs to the capitalist economy and is caused by endogenous factors.

The aim of the B. A. thesis is to explore the Minsky's financial instability hypothesis and to find out whether the hypothesis provides a useful framework for current financial crisis, which began in 2007. At first stage, the financial instability hypothesis will be described (chapter 2), then the process of following and modelling the hypothesis will be briefly summarised (chapter 3). These two chapters are the first part of the thesis; they deal with the financial hypothesis itself. The second part is looking for an answer to the question whether the recent financial crisis can be interpreted using Minsky's hypothesis. The second

part consists both of general discussion about the crisis and the hypothesis (chapter 3.a) and of a case study of AIG corporation (chapter 3.b) which purpose is to explore the microeconomic aspects of Minsky's hypothesis.

It is important to note the financial instability hypothesis was elaborated in 70s and 80s when certain aspects of financial markets were different. In my opinion, the ambition to falsify or verify the hypothesis in its original formulation is useless because the hypothesis is built on institutional structure of Minsky's times, which has changed since then. Therefore, today the hypothesis cannot be reliable in its every single part. From my point of view, the differences do not deny the nature of the hypothesis, but it is important to explore which parts of the hypothesis can and which cannot interpret the current crisis. Hence, I decided to explore the story behind the fall of AIG Corporation to look at real and key microeconomic example to confront the Minsky's hypothesis with. At the end, the core of a hypothesis valuable for nowadays analysis of financial markets will be attempted to find or reinterpret.

2. Financial instability hypothesis

a. The financial instability hypothesis

The financial instability hypothesis is rooted in the Minsky's theory of investment and endogenous money[1]. In his theory of investment, he developed the investment theory of John Maynard Keynes and added new aspects to it. At first, a brief summary of Keynes's theory of investment will be made; afterwards, Minsky's theory of investment will be described. Secondly, the financial instability hypothesis will be discussed.

i. The theory of investment

1. Keynes's theory of investment

According to Keynes, the equilibrium level of employment and output is generated mainly by the aggregate level of effective demand. The aggregate level of effective demand is determined primarily by the level of investment. It is clear that the investment plays a crucial role in economy because through the aggregate level of effective demand, it determines the equilibrium level of output and employment.

The level of investment is determined by an interrelationship of two factors: marginal efficiency of capital and market interest rate. The causality goes as following: When the marginal efficiency of capital is higher than the interest rate, the investment is undertaken. In the opposite case, there would be no incentive to invest. Hence, the economy is in equilibrium when the marginal efficiency of capital equals the market interest rate.

Some authors regard this explanation as a simplified view of Keynes's theory of non-sufficient investment. For example, Wray and Tymoigne wrote: "While such exposition can be found in Keynes's book, this caricature does not come close to capturing Keynes's theory of investment. To really understand Keynes's theory, one must turn to chapter 17 of the General Theory – a rather complex exposition that is normally avoided by all but the most serious of his followers." (Wray & Tymoigne, 2008)

In the chapter 17, Keynes elaborated the theory of what is behind the marginal efficiency of capital. He states that every kind of capital asset must have its own interest rate which is different from the other assets. This interest rate emanates from the difference

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[1] (Fazzari & Papadimitriou, Financial Conditions and Macroeconomic Performance: Essays in Honor of Hyman P. Minsky, 1992) and (Raines & Leathers, 2008). Dymski and Pollin divide Minsky's model even into four parts: model of endogenous instability, theory of the endogenous money supply, analysis of the effects of fiscal and monetary policy and theory of investment (Dymski & Pollin, 1992).

between spot and market contracts and can be expressed in money. (Keynes, 1960). The expected return of holding the asset in terms of money can be calculated by following formula: $q - c + l + a$, (Wray & Tymoigne, 2008, p. 5) in which q is the asset's expected yield, c is carrying costs, l is subjectively evaluated liquidity-premium and a is expected price appreciations/depreciation. According to Keynes, instrumental or consumption capital may have negligible liquidity-premium (in such case, the expected total return consists only of: $q - c$). On the opposite there is money, in which case "its liquidity-premium much exceeds its carrying cost." (Keynes, 1960, p. 227) Money has negligible carrying cost, and its yield is nil.

One can see that in this structure of marginal efficiency of capital, the expectations play a significant role. Optimistic expectations about future economic development raise the asset's expected yield and decrease the need to hold liquid assets (optimistic expectations about future decrease the sense of danger and thereby decrease a liquid-premium l). According to Wray and Tymoigne, it leads to the situation when the marginal efficiency of capital relatively increases to the assets the return of which emanates from liquid premium l. (Wray & Tymoigne, 2008, p. 6) This will stimulate the production of capital assets and thereby the equilibrium level of output and employment. The growth will continue until "there is no marginal efficiency of any type of machine that exceeds the expected return on liquid, financial assets." (Wray & Tymoigne, 2008, p. 6) This causality can be reversed, and economy can move into downturn if the marginal efficiency of capital falls or expected return of liquid one's rises.

2. *The financial theory of investment by Hyman Minsky*

Minsky tried to extend the investment theory of Keynes and formulated his own financial theory of investment. He found Keynes's investment theory incomplete (Wray & Tymoigne, 2008, p. 6) because in Keynes's theory, an explicit theory dealing with boom and crisis was missing, except some hints. Keynes did not model any development of liability structure of financial institutions and firms, and "how the endogenous generation of money and money substitutes takes place". (Minsky H. P., John Maynard Keynes, 1975, str. 106)

Minsky´s interpretation of the Keynes´s investment theory is based on the chapter 17 of the General theory of Employment, Interest and Money[2].

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[2] Described in the previous chapter.

This is a very important point because Minsky does not agree with the concept that investments are mainly determined technologically by a productivity of capital[3]. Nevertheless, he does not deny the influence of the productivity of capital on determining the expected cash flow at all (Fazzari & Papadimitriou, Financial Conditions and Macroeconomic Performance: Essays in Honor of Hyman P. Minsky, 1992, p. 4); he simply considers the financial factors as more relevant. Hence, the theory is called the financial theory of investment[4]. He looks at the economy from the view of the "Wall Street". From this perspective, the economy is seen "as a complex network of cash flows involving both current economic production and liability structures that necessarily arise because investment has to be financed through money now in exchange for money in the future arrangements. From a Wall Street perspective, the economy is a financial paper world of commitments to pay cash today and in the future." (Raines & Leathers, 2008, p. 143) Minsky is interested in a cash flow of economic units. It means he looks at households, corporations or for example national government as if they were banks. Every economic unit has its own financial commitments – for example some debts which must be validated. From this perspective, "a decision to invest – to acquire capital assets – is always a decision about a liability structure". (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 172)

Before the financial theory of investment will be focused on, Minsky's price system should be mentioned. He distinguishes the prices of current output from the prices of capital assets. The prices of current output depend upon the mark-up over labour costs and include investment, consumption, government and export goods and services. They also reflect short-run or current consideration (Minsky H. P., 1982, p. 102). On the other hand, the capital assets are the key determinant of the level of investment which depends on the relation between the demand and supply price of capital assets. (Papadimitriou & Wray, 1999, p. 9) They reflect the long-run expectation.

In short, the business cycle is rooted in the movement of these two prices. When the prices of capital assets are higher than the prices of current output, the willingness to invest decreases and vice versa (Minsky's theory of cycle is described in the chapter 2.a.ii:The financial instability hypothesis).

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[3] By the marginal productivity of capital, we mean in this point the neoclassical, mainstream concept – not the Keynes view in the chapter 17. For the discussion, see for example (Fazzari & Papadimitriou, Financial Conditions and Macroeconomic Performance: Essays in Honor of Hyman P. Minsky, 1992).

[4] See for example (Bellofiore & Ferri, Financial Fragility and Investment in the Capitalist Economy: The Economic Legacy of Hyman Minsky, Volume II, 2001, p. 21)

Let's now move to the determination of the level of investment. The two-price system is linked by the investment goods because they are part of current output. The price of current output is the supply price of capital. The demand price of capital is determined by the prices of capital and financial assets.

A firm can finance its investment by cash (and equivalent assets − for example treasury securities or commercial paper) which are not required by current operations, internal or external funds. A firm can get external funds by running into a debt or by issuing equities if internal funds are not sufficient. This is a crucial point of Minsky's analysis; a firm running into a debt has to fulfil some payments commitments in the future to repay debt. Therefore, it has implications for the firm's decisions about future investment which must provide sufficient cash flow.

A firm operates under the conditions of uncertainty[5]. Cash flow from internal funds depends upon the development of the economy. There is no guarantee that a planned cash flow (from internal funds) will be achieved. Hence, firms think over mixing the financing of investment from internal and external funds. This mix depends upon "the extent to which finance for the investment goods will be forthcoming from profits." (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 185) Lenders and borrowers of debts protect themselves against the element of uncertainty by the margin of safety (let's denote it by φ).[6] The margin of safety is dependent on expectations. If the performance of economy is good, the entrepreneurs will less fear of default; therefore, they will less secure themselves against the probability of default by lower level of margin of safety than before, and vice versa. In other words, they will invest more in the fixed amount of margin of safety in the situation of optimistic expectations and boosting economy (and the opposite in the case of pessimistic expectations).

A borrower has to face the so-called "borrower's risk". If he wants to be engaged in external financing, and his expectations are stable or fixed, he protects himself from default

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[5] „Uncertainty deals with that class of events for which the outcome of actions cannot be known with the same precision as the average outcome at a roulette table, or even of a mortality table, is known. In a word, uncertainty in economics does not deal with risks that are insurable or analogous to gambling risks." (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 185)

[6] Minsky works with this definition: "The margins of safety can be identified by the payment commitments on liabilities relative to cash receipts, the net worth or equity relative to indebtedness (the margin of stock market purchases), and the ratio of liabilities to cash and liquid assets, that is the ratio of payment commitments to assets that are superfluous to operations." (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 79) Definition of margin of safety from (Rutherford, 2002): "Total sales revenue minus breakeven point sales revenue"

by decreasing his demand price for capital assets(in case of changing expectations, the situation differs).The lowering of demand price for capital assets occurs if a borrower wants to rise his margin of safety; respectively, if he wants to increase the ratio of external to internal financing (he is in the situation when he can demand more investment only if he uses more external financing or runs down holding of financial assets which are superfluous to operations (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 191)). Simply, he wants to pay less for the capital assets than usual because he feels on his side there is probability to be on default ,and he wants to protect himself by lower price. This philosophy lays behind the fact that demand curve for capital assets D_I is sloping downward after reaching a certain point (see Figure 2-1). The amount of internal funds is determined by anticipated internal cash flow which is represented by curve Q_n. If the internal cash flows (or quasi rents) intersect the supply price of capital assets, the amount of investment covered full by internal funds is established (point I_i). Behind this point, a firm has a lower internal revenue than the supply price of investment, which means that a firm has to gain additional money to invest and therefore starts participating in external financing. After reaching a certain amount of debts, the borrower starts lowering his demand price as was described above.

At this moment, a supplier of investment is also in the situation when he wants to protect himself. He is worried about the default of his client if the client has not enough internal funds to fully finance investment and engage in external funding (raising debts). If a supplier feels a risk of default of a client, he raises a supply price of capital assets to ensure a margin of safety which would secure him some additional profits in case of default. This is the reason why supply curve of capital assets is sloping upwards (S_i). The optimal amount of investment is in the point where demand curve D_I intersects supply curve S_i (in Figure 2-1 shown as a point I^*). Total amount of external financing is expressed by interval (I_i,I^*). The investment takes place only if demand price of capital assets is higher than supply price.

For better clarity, the relation of margin of safety and the supply and demand price of investment can be formalized as such:

When $\frac{E}{I} > 0$ (E the is value of external financing and I is the value of internal financing) then $\varphi > 0$.

$$\frac{\partial \varphi}{\partial E} > 0 \qquad \frac{\partial P_D}{\partial \varphi} < 0 \qquad \frac{\partial P_S}{\partial \varphi} > 0$$

Where P_D is the demand price for investment and P_S is the supply price of investment.

The Figure 2-1 represents the situation of fixed expectations (the case of lowering demand price and rising margin of safety described above The Figure 2-2 represents the situation of changing expectations – if the economy is growing, and the expectations are optimistic, the demand curve D_I moves to D_I^2, and supply curve S_I moves to S_I^2 because borrowers and lenders are less afraid of default (or unpaid debts). Hence, they lower the level of margin of safety for the certain amount of investment. As a result, the level of investment is higher (I_I^*).

Figure 2-1 Determination of the level of investment (fixed expectations)
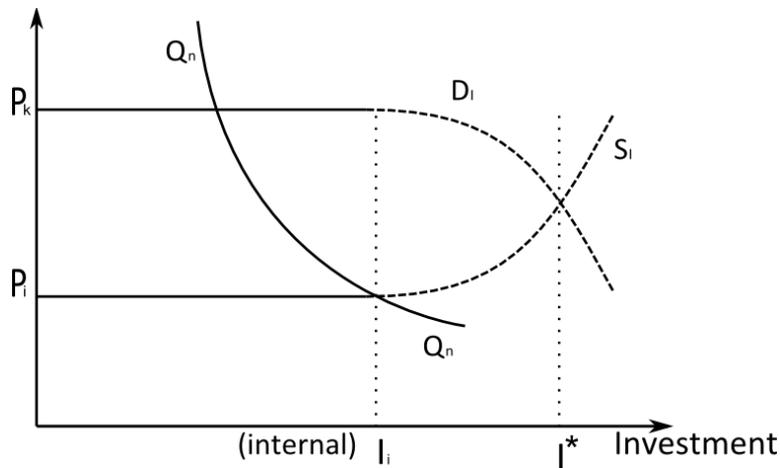
Source: (Minsky H. P., Stabilizing an Unstable Economy, 1986)

Figure 2-2 Determination of the level of investment (changing expectations)
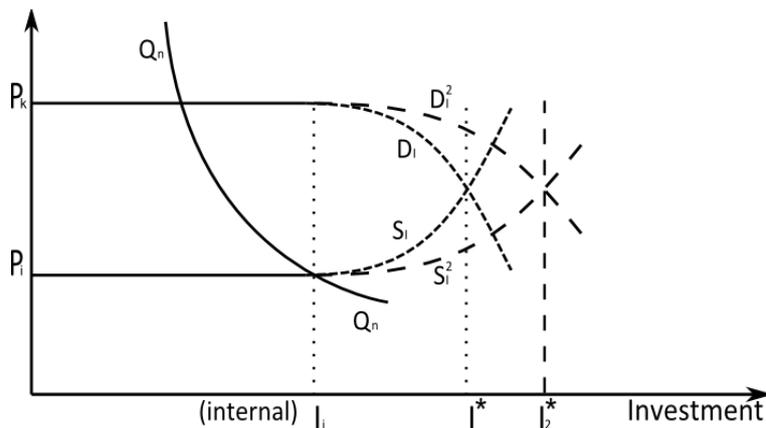
Source: (Minsky H. P., Stabilizing an Unstable Economy, 1986)

3. *The role of profits in the capitalist economy*

Another key building block of Minsky´s theory, which influences the level of investment, is profits. According to Minsky profits plays three roles in a capitalist economy (Minsky H. P., 1982, p. 104):

1) The cash flows that may (or may not) validate debts and the prices paid for capital assets
2) The mark-up on labour costs assuring that what is produced by part of the labour force is allocated to all the labour force
3) The signals whether accumulation should continue, and where the surplus should be used

A firm has to generate enough profits to validate debts (past financial commitments) to gain mark-up but also to have enough money for future or planned investments (future payments). "Profits are the critical link to time in a capitalist economy." (Minsky H. P., 1982, p. 104) because they affect the long-run expectation of business and bankers. If a firm has enough profit in present (because of successful today's investment), the past decision about investment and financing turned out to be right, and the firm has enough money to validate debts and also to invest in the future. Whether or not a firm has enough profits today depends on the level of "today's investment". However, the willingness of a firm to invest depends on the expectations about future. If managers are pessimistic about future economic development, they will invest less; therefore, they get less profit today, and their firm can hypothetically get into a trouble in case of very pessimistic expectations leading to a very low level of profits and inability to repay debts. In short, sufficient profits validate past decisions of a firm and enable external debt financing. A firm also has expectations about future development; these determine the level of future investment and thereby the level of future profits.

Obviously, "we are dealing with a capitalist economy with a past, a present and a future". (Minsky H. P., 1982, p. 104) A smooth functioning of capitalist economy depends on the investment generating profits. As Minsky said, "profits are the carrot and stick that make capitalism work". (Minsky H. P., 1982, p. 105)

The level of profits generates expectations. A firm's ability to fulfil financial commitments determines parameters of future financial conditions for other economic units[7]. If firms have problems to repay debts (generate enough profits), banks will be less willing to lend money (and vice versa) to all economic units. High profits are also a "carrot" for other companies to enter the prosperous industry.

It is clear that profits are the key factor for firm's investment decisions. It raises a question: how can a firm establish sufficient amount of profits; respectively, can a firm set prices of its product to gain enough profits? The ability to set prices depends on the firm's market power. Two cases can be distinguished. In the first one, firms have no market power, and prices are set by equality with marginal cost. However, as Raines and Leathers state: "[...] in modern capitalist economies, most markets are oligopolistic in varying degrees, with a relatively few large corporations possessing various degrees of market power. Those firms applying mark-ups to the sum of variable costs, fixed and overhead costs, ancillary costs, and financial commitments determine output prices." (Raines & Leathers, 2008, p. 145) These corporations can set prices and adjust level of output instead of price level of their products to shifts in demand for the outputs.

The question is, what exactly determines profit. In this case Minsky incorporated work of Michal Kalecki (1971). For Minsky, Kalecki's conclusion that "including the Big Government makes total gross profits – namely, the cash flows that firms draw upon to meet their cash commitments – a positive function of government budget deficits." (Bellofiore & Ferri, Financial Keynesianism and Market Instability, 2001, p. 12) was important. For Minsky's thinking, this is a crucial statement because it means that firms' profits can be sustained by government fiscal policy in case of business profits insufficient to fulfil financial commitments. Kalecki explicitly wrote: "It is the export surplus[8] and the budget deficit which enable the capitalists to make profits over and above their own purchases of goods and services." (Kalecki, 1971, p. 86) The role of government policy is described in chapter 2.a.iii The policy – role of government and central bank. Now let's move to the formalized determination of profits.

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[7] Under assumption that the certain firm has the importance to influence its environment (to affect the expectations). In case of small firms, it does not hold true.

[8] Minsky stressed more the effect of budget deficit than the effect of balance of trade. Probably because of importance of fiscal policy.

a. Kalecki's equations

Supposedly, workers spend all their income on consumption and profit receivers do not consume. An open economy, role of the government and taxation[9] are assumed. Then the gross national product *"GNP"*:

$$GNP = I + C + G + (X - M)$$

Where *I* are gross investment (only private, public are included in *G*), *C* denotes consumption, *G* are government expenditure on goods and services and (*X - M*) is the surplus of export over import. Kalecki assumes that "the total value of production is divided between capitalists and workers or paid in taxes" (Kalecki, 1971, p. 81). Kalecki constructs a balance sheet of the gross national product.

Table 2-1 Kalecki Equations

Gross profits (net of direct taxes)	Gross Investment
Wages and salaries (net of direct taxes)	Export surplus
Taxes (direct and indirect)	Government expenditure on goods and services
	Capitalists' consumption
	Workers' consumption
Gross national product	**Gross national product**

In the next step, Kalecki subtracts from both sides taxes. Because taxes are used to cover government expenditure and transfer payments, the total value of taxes is subtracted from both sides, and the transfers are added because the government does not take the money for them. Following balance sheet is got:

Table 2-2 Kalecki Equations

Gross profits (net of direct taxes)	Gross Investment
Wages and salaries (net of direct taxes)	Export surplus
	Budget deficit
	Capitalists' consumption
	Workers' consumption
Gross national product minus taxes plus transfers	**Gross national product minus taxes plus transfers**

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[9] Kalecki starts with determining the profits with basic model without government and international trade. Here it is skipped and "the general case" is focused on. See (Kalecki, 1971, p. 81). More precise and gradual constructing of profit equations is showed in the Appendix 5.a: Profit equations, where the deducing is taken over from (Minsky H. P., Stabilizing an Unstable Economy, 1986).

Now let's move to the determination of profits (deduced from the balance sheet above):

Gross profits (net of direct taxes)

$$= \text{Gross Investment} + \text{Export surplus} + \text{Budget deficit}$$
$$+ \text{Capitalists' consumption}$$
$$+ \big(\text{Workers' consumption} - \text{Wages and salaries (net of direct taxes)}\big)$$

Gross profits (net of direct taxes)

$$= \text{Gross Investment} + \text{Export surplus} + \text{Budget deficit}$$
$$+ \text{Capitalists' consumption} - \text{Workers' savings}$$

Seemingly, the relations in society (political, economic, social and psychological) are factor that influence independent variables in the equations. From Kalecki's point of view, technology is not the only one determinant of profits.

It is a very dynamic look on economy. Turbulences in expectations and therefore in investment affect the level of profits and in consequence, they affect the ability of a firm to validate its debts or not. A few steps remain to the Minsky's theory of cycle. Before getting there, it is necessary to describe the last important building block –possible financial positions of a firm which influence a liability structure of firms.

4. *Financial positions*

a. Hedge finance

An economic unit is involved in hedge financing if it has enough cash flow to validate its financial commitments at every moment. It means that such economic unit is resistant to fluctuations of price of capital assets to some extent.

b. Speculative finance

The speculative finance position is characterized by rolling over a debt due to expected cash flows not covering financial commitments in every period. This unit has to take a loan to cover usually rather a short period. In a long run, the unit expects its cash flow will grow sufficient to cover all debts (for example, it expects its income flow will rise, but at this moment, it needs external financing). The key characteristic is that in case of speculative

financing, the unit does not enlarge its debts (i. e. it has still enough money to cover interest payments).

c.   Ponzi finance

A Ponzi financing is similar to speculative one, but there is an important difference. A unit involved in Ponzi financing does not have enough money even to cover interest payments. The unit's debt burden is rising. This unit must usually increase its debts to cover existing financial commitments.

ii.   The financial instability hypothesis

Now the Minsky's theory of cycle should be introduced. As said before, the movement of price of current output and capital assets ("two-price system") creates a cycle. Firstly, the mechanism will be described on the example of boosting economy.

A tranquil, boosting period

If an economy experiences a tranquil period, it experiences also positive expectations about future. Most of the firms are involved in hedge financing and expect future rise of their profit flows. Consequently, the demand price for investment is rising because of higher expected profit of firms, and because they want to invest more. Another reason for rising demand price of investment is that firms are lowering their margin of safety because of positive expectations about future (debtors expect lower borrower's risk). Accordingly, the supply price of investment starts falling because of lowering margin of safety (bankers expect lower lender's risk). Banks now lend money to more risky firms than before. The situation of rising demand price and lowering supply price of investment enlarges the gap between these two prices; hence, firms invest more.

The boosting periods are also characterized by rising profits. They attract other firms to enter the industry or to extend their activities (they invest more) and lower circumspection. In this situation, firms take more debts to expand and move their liability structure to more fragile state. A firm's willingness to run into debt more than before is followed by financial innovations on the banker's side. Banks are trying to maximize their profit and developing new financial products:

> "As profit-seeking financial institutions invent and reinvent 'new' forms of
> money, substitutes for money in portfolios, and financing techniques for various
> types of activities, financing of investment becomes easier. Each new financial

instrument that is introduced or old one that is used to a greater extent results in the financing of more investment in the form of additional capital and financial assets. That results in higher prices of assets, which, in turn, raises the demand price for current investment and increases the demand for more financing of investment, creating more inducement for financial innovations by lenders."

(Raines & Leathers, 2008, p. 153)

New financial products create additional demand for investment that would not occur without them. In consequence, profits are rising. Because of that, the price of capital assets rises, the demand price of investment also becomes higher etc.

An economy in consequence moves beyond the state of full employment[10].

Creation of financial crisis

During the period of boom, many firms involved in hedge financing become speculative because of the willingness of taking loans rising. The same shift in liability structure affects also the units originally involved in speculative financing – they become Ponzi units. This is the consequence of shifting liability structure into more fragile one due to optimistic expectations. Firms become more vulnerable to changing economic conditions and movements of interest rates.

What creates a crisis is the change of expectations (from optimistic to more pessimistic). This does not necessarily mean there is an objective economic problem (for example, huge speculative so-called bubble). The term "expectations" means shift in general expectations in economy, and the causes can be also of more psychological than economic nature. In all cases, as a result market expects more pessimistic times, market agents lower profit expectations about the future. The consequences on the "investment market" are obvious. The demand price of capital decreases because of rising margin of safety[11]. As the margin of safety rises, the supply price of capital reacts by rising as well. As a result, the supply price of capital may be higher than the demand price of capital (see Figure 2-3 where the extreme case is illustrated). This situation ("change of long-run expectations about profits

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[10] "The ongoing processes tend to rupture a full-employment equilibrium in an upward direction; that is, once full employment is achieved and sustained the interaction among units tends to generate a more than full-employment speculative boom." (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 177)..."Full employment is a transitory state because speculation upon and experimentation with the liability structures and novel financial assets will lead the economy to an investment boom. An investment boom leads to inflation, and, by processes still to be described, an inflationary boom leads to a financial structure that is conducive to financial crises." (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 178)

[11] See „2.a.i.2 The financial theory of investment by Hyman Minsky" for logic behind the causality.

and desirable financing structure" (Minsky H. P., 1982, p. 109)) leads to crisis and distortion of an investment process. Capitalists now expect fewer profits which are crucial for validating debts. The more pessimistic expectations, the more falling profits and the higher probability for entrepreneurs of being unable to fulfil financial commitments made in past (profits are falling but the value of debts are nominally fixed). There is no guarantee that the fall will immediately end – pessimistic expectations cause falling profits; that causes falling investment and attempts to reduce costs (falling wages, production etc.). This can lead to even more pessimistic expectations about future etc. Eventually, a firm may not have enough money to fulfil its financial commitments and may end in bankruptcy. As a firm wants to keep from its own bankruptcy, it sells out positions. This leads to lowering asset prices[12]. As a result, the way to deep recession is established.

Figure 2-3 The extreme case of expectation changes
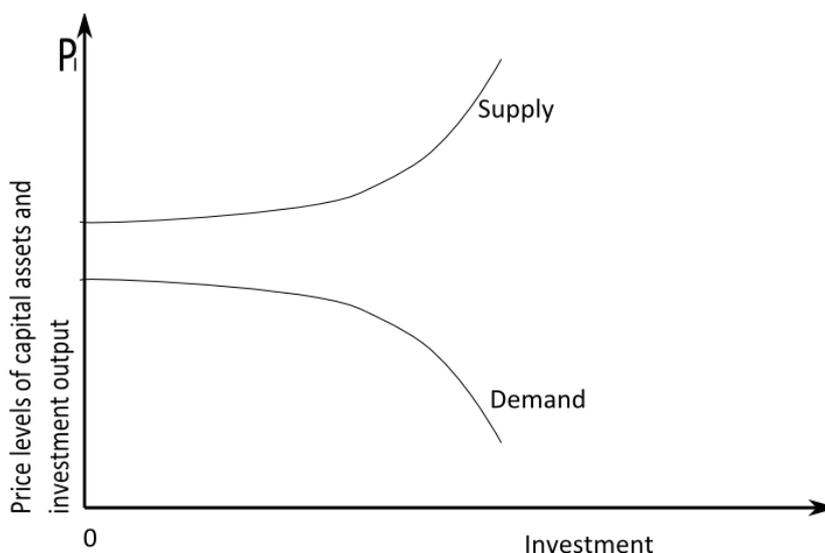
Source: (Minsky H. P., Stabilizing an Unstable Economy, 1986)

iii. The policy – role of government and central bank

Government and central bank policy can serve as the countercyclical force. Minsky argued that the reason why financial crisis had not occurred during the twenty years after the World War II was the "big government" and the central bank. If a recession is at the beginning, a government can run a deficit and help entrepreneurs maintain their profit. A central bank as the lender of the last resort prevents banks from falling down and provides them cash flow through loans.

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[12] It is situation of Fisher´s debt-deflation process. See (Fisher, 1933).

Unfortunately, these countercyclical policies have "the other side of the coin". Government spending and investment creates inflation which generally helps borrowers to repay their debts; but, as Minsky wrote:

"The floating off debt through inflation is a game that can be played only a number of times; the propensity to expand into a boom will be atrophied as bankers become wary of Ponzi schemes. Alternatively, government intervention to sustain investment can become co overpowering that the 'sharp pencils' needed to assure that investment yields real rather than nominal, social rather than private, benefits become blunted...once the doctrine of salvation through investment becomes deeply ingrained into our political and economic system, the constraints on foolish investments are relaxed."

(Minsky H. P., 1982, p. 112)

Huge, uncontrolled government spending and lenders of the last resort policy can emit different message than was originally intended. Entrepreneurs or banks can consider the signal as the validation of their past decisions instead of warning and as a chance to consolidate their business and cash flow policy, even if their decision were bad, and their positions are fragile and on the way to bankruptcy.

The policy of a central bank has another effect. If a central bank regulates the financial market, banks and other player on financial market try to avoid it. A bank is also maximizing his profit and it "is always trying to find new ways to lend, new costumers, and new ways of acquiring funds, that is, to borrow; in other words, [it] is under pressure to innovate." (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 237) The result of the innovation and the attempts to get away from the control of the regulatory authority is that new non-regulated instruments or financial companies come into being. New instruments are more sophisticated to avoid the regulation, and for this reason are also much less controllable. The more regulations a central bank issues, the more non-regulated instruments and players appear on the financial markets. This can cause serious problems because the financial market can be less controlled than before and can shift into a more fragile structure much faster and without any ability of regulatory authorities to intervene to prevent the financial crises.

Clearly, the regulation has no straightforward effects. On one hand, Minsky regulation, according to Minsky, stabilizes policy and is therefore necessary. However, on the

other hand, the regulation can be counterproductive. The virtue of regulation is to find sufficient level of state intervention that does not send unwanted signals towards the market, but Minsky does not offer precise solution of this dilemma. He personally prefers policies which stimulate the consumption production of consumer goods, because according to his skeletal model, the "output of consumer goods is deflationary"[13] and is therefore countercyclical. Another Minsky's important point is the simplification of financial instruments and the financial structures generally in order to gain better control and transparency of the market.

b. The followers of Hyman P. Minsky

The work of Hyman P. Minsky was not in the centre of interest of the mainstream economics. Even though he was ignored by orthodox economists (Wray & Tymoigne, 2008, p. 2), the heterodox scholars (especially post-Keynesians) have been elaborating Minsky's work to this day. The recent financial crisis has made the Financial instability hypothesis more popular, and it has reached "at an all time peak." (Wray & Tymoigne, 2008, p. 2)

The financial instability hypothesis is very rich in institutional and microeconomical aspects. Therefore, with a certain level of simplification, two general attitudes towards the Minsky's hypothesis will be observed.

The first opinion states that Minsky's theory is standing out against straightforward mathematical formalizing. Some basic aspects of Minsky's hypothesis can be modelled but rigorous models "lose most of the richness of Minsky's account in the translation to mathematical language." (Foley, 2001, p. 54) The explanation of the hypothesis is provided mainly in plain text in order not to lose qualitative aspects of the theory. A good example of this attitude is Fazzari & Papadimitriou (Fazzari & Papadimitriou, Financial Conditions and Macroeconomic Performance: Essays in Honor of Hyman P. Minsky, 1992) where the majority of text and explanation of Minsky's theory can be dealt with without any signs of algebra. Michael Carter (1989) extended Minsky's idea through new financial innovations, which had not appeared during formulating the financial instability hypothesis. Isenberg

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[13] This emanates from the equation,

$$\frac{W_C}{P_C} = \frac{Q_C}{N_C + \mu N_I}$$

where W_C is the wage rate in the production of consumer goods, P_C is the price of consumer goods, N_I and N_C are employments in the production of investment and consumer goods and μ is the ratio of wages in investment goods production to wages in consumption goods production $\frac{w_I}{w_C}$. Under the assumption of fixed wages, the rise in Q_C is followed by declining of P_C (deflation) to sustain the equation. For more details see Appendix B in (Minsky H. P., Stabilizing an Unstable Economy, 1986).

(1988) tested the relevance of the Financial instability hypothesis in consumer durable goods' sector during 1920s in the U.S. Mehrling regards Minsky as a representer "of continuation of the American institutionalist tradition of monetary thought, a tradition deeply influenced by roots in American progressivism." (Mehrling, 1999, p. 129) Another clear example of this sort of work is working papers by Papadimitriou & Wray (1999), Whalen (2001) or Wray & Tymoigne (2008).

Such scholars also exist who try to deal with the financial instability hypothesis by a rigorous mathematical apparatus. They are aware of complexity of Minsky's theory but regard an adequate simplification by mathematical modelling as useful[14]. The first and the most important step was done by Taylor & O'Connell (1985), who modelled only macroeconomic aspects of Minsky's theory because numerous details of the theory are "beyond the reach of mere algebra." (Taylor & O´Connell, 1985, p. 871) An interesting rigorous work is the one by Santos (2005) who regards Minsky's model as what he calls "formal Minskyan literature"; that is, a specific case of "stock-flow consistent accounting framework".

Other authors tried to build Minskyan model on the base of Goodwin model (Goodwin, 1967). Keen incorporates "prototypal real finance sector" (Keen, 1995, p. 614) into Goodwin model. After the change, the model may tend into instability instead of the original stability. In another work, Keen's (1998) model was extended also by incorporating the impact of a variable price level, and inflation-dependent rates of interest. Yet another author modifying the Goodwin model is Toichiro Asada (1989), who added monetary sector and Keynesian investment function into the former model. He called his model "Keynes-Goodwin model of the growth cycle" (Asada, Monetary stabilization policy in a Keynes-Goodwin model of the growth cycle, 1989, p. 146) [15].

New Keynesian economists created also endogenous business cycle theories. Some of them cite Minsky and take inspiration from Minsky's work. Some of them do not bear on

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[14] „We appreciate the descriptive accounts and recognize that important aspects of these accounts may be lost in a mathematical model. A formal model, however, can illuminate the dynamic implication of interactions between variables more rigorously than is possible in purely descriptive models. For example, Minsky asserts that boom conditions lead to an increase in the ratio of debt to income. But because the boom causes both the numerator and the denominator of this ratio to rise, it is not obvious from a descriptive account alone whether the debt-income ratio rises or falls. A formal model is a natural vehicle for addressing this kind of issue. (Fazzari, Ferri, & Greenberg, Cash flow, investment, and Keynes-Minsky cycles, 2008, p. 556)

[15] For more recent modification of Goodwin model by Asada see for example (Asada, Stabilization policy in a Keynes–Goodwin model with debt accumulation, 2006) or (Asada, Dynamic analysis of policy lag in a Keynes–Goodwin model: Stability, instability, cycles and chaos, 2007)

Minsky; they are inspired by his work only in some parts[16]. And other are based on his work and focus on modeling Minsky's world[17].

Minsky's financial instability hypothesis inspired many other models, for example Fazzari et al. (2008), Chiarella et al. (2001) or Charles (Charles, A Post-Keynesian Model of Accumulation with a Minskyan Financial Structure, 2008) who also works on Kaleckian models (Charles, Corporate debt, variable retention rate and the appearance of financial fragility, 2008). Speaking about followers of Hyman Minsky who tried to model the financial instability hypothesis, The Levy Economics Institute of Bard College[18] should be mentioned;, Minsky was there a distinguished scholar. Many authors (for example Dimitri B. Papadimitriou, L. Randall Wray or Jan Kregel) working at the institute elaborate Minsky's work.

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[16] For example (Gatti, Gallegati, & Gardini, 1993)
[17] For example (Gatti & Gallegati, 2001)
[18] http://www.levy.org

3. The contemporary financial crisis

This chapter is looking for an answer to the question whether the current financial crisis can be explained by Minsky's financial instability hypothesis. The first part of the chapter 3 explores general discussion whether the crisis can be explained by Minsky. Commentators often use term "Minsky moment" which refers to the point in which expectations change (further explanation is offered in the following chapter 3.a); they also try to state whether the crisis fulfil or does not fulfil the criteria of "Minsky moment". The second part of the chapter 3 leaves the general discussion behind and focuses on the story behind the fall of the American International Group, Inc. (AIG) to examine whether and which parts of Minsky's hypothesis fit to some real example of collapsing financial institutions.

a. The discussion about "Minsky moment"

The term "Minsky moment" was coined by Paul McCulley, the Managing Director at Pimco[19] in 1998 during the Russian crisis (Lahart, 2007). The term became quite popular and can be often read in newspaper or financial journal comments concerning the financial and sub-prime mortgage market crises which occurred in 2007[20].

According to George Magnus,[21] "Minsky moment" occurred "when lenders become increasingly cautious or restrictive, and when it isn't only over-leveraged structures that encounter financing difficulties. At this juncture, the risks of systemic economic contraction and asset depreciation become all too vivid." (Magnus, The Credit Cycle and Liquidity: Have we arrived at a Minsky Moment?, 2007, p. 7) Magnus defines Minsky moment as "the point where credit supply starts to dry up, systemic risk emerges and the central bank is obliged to intervene" (Magnus, What this Minsky moment means, 2007); that appeared.

The term Minsky moment is sometimes used very confusedly with the meaning that differs from Magnus's definition as quoted above (Vercelli, 2009). The Minsky moment is sometimes also connected with the debt-deflation process describing which the Ponzi schema collapses. Therefore, the "Minsky moment" (the certain point in time – Magnus definition

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[19] The Pacific Investment Management Company

[20] See for example (Magnus, The Credit Cycle and Liquidity: Have we arrived at a Minsky Moment?, 2007), (Magnus, What this Minsky moment means, 2007), (Magnus, The Credit Cycle: Getting Closer to a Minsky Moment?, 2007), (Magnus, Is there time to avert a Minsky meltdown?, 2008), (Cassidy, 2008), (Chancellor, 2007), (McCulley, 2007), (Wolf, In a world of overconfidence, fear makes a welcome return, 2007; Wolf, Keynes offers us the best way to think about the crisis, 2008)

[21] George Magnus is Senior Economic Adviser at UBS Investment Bank.

above) and "Minsky process" (process or chain of events where occurs the collapse and debt-deflation, which is started by Minsky moment) should be distinguished.

Edward Chancellor (2007) stresses the fact that the best place for comparing Minsky´s hypothesis with reality is the U.S. residential real estate market. The behaviour fitting to Minsky's hypothesis can be seen there; because of the boom of housing market, the households ran into debts, and the lending standards were lowered. "The margin of safety has declined both for borrowers and lenders." (Chancellor, 2007) But according to Chancellor, these behavioural patterns were not only limited to the housing market: "A deflationary bust was avoided by the authorities in 2002. But the very success of central bankers' easy-money policies has encouraged people to play with fire. Debt has escalated. Competition among financial institutions has contributed to looser lending standards. New entrants into the credit markets and financial innovations have eroded the power of old regulations to protect the credit system. In many financial transactions the margin of safety has been whittled away." (Chancellor, 2007)

For Paul McCulley "the explosion of exotic mortgages – sub-prime; interest only; pay-option with negative amortization, et al. – in recent years, has been textbook examples of Minsky's speculative and Ponzi units." (McCulley, 2007, p. 3) As he points out, this boom cannot last forever and must reach its end. Holders of Ponzi units will get into financial troubles and will have to sell out of position to survive. According to McCulley, this is what could be seen on the financial market during the financial crisis.

Some commentators stress Minsky's ideas about the stabilization policy of avoiding the financial market inclination to fragility. For example, John Cassidy advises: "Rather than waging old debates about tax cuts versus spending increases, policymakers ought to be discussing how to reform the financial system so that it serves the rest of the economy, instead of feeding off it and destabilizing it." (Cassidy, 2008)

It is obvious that commentators link the current financial crisis together with the Minsky's financial instability hypothesis. However, the connection is not so straightforward as it looks at first sight. "The commentators were right to draw attention to the fact that the current crisis has all the attributes of a Ponzi financing scheme that risks turning into a full-scale debt deflation. However, it is clear that the crisis is not the result of a traditional endogenous Minsky process in which narrowing margins of safety lead to fragility." (Kregel, Minsky´s Cushion of Safety, 2008, p. 21) The problematic of margins of safety should be

focused on because the important difference between the Minsky's hypothesis and the events happening during the crises lays there.

According to Minsky, the crises occur because of the lowering margin of safety that becomes inadequate. This is caused by optimistic expectations about the future which are based on the successful present experiences. What Kregel suggests is that the present fragility is not rooted in declining margins of safety but in the way of credit evaluation. According to Minsky, bank evaluate borrower's credit history and bank officers' good experience with a borrower leads to the reduction of the margin of safety because they expect sufficient past experiences to persist also in the future. The collapse occurs when expectations about future worsen, and the margins of safety become insufficient because they were linked to different conditions in the past. Kregel points out that nowadays, the way of credit evaluation is different. Credit evaluation is no longer taken by banks (in the U.S.), but is taken by the credit rating agencies. Kregel states that "this system has produced a new form of bank operations now known as "originate and distribute," in which the bank seeks to maximize its fee and commission income from originating assets, managing those assets in off balance-sheet affiliate structures, underwriting the primary distribution of securities collateralized with those assets, and servicing them. Under this system, the banker has no interest in credit evaluation, because the interest and principal on the loans originated will be repaid to the final buyers of the collateralized assets" (Kregel, Using Minsky's Cushions of Safety to Analyze the Crisis in the U.S. Subprime Mortgage Market, 2008, p. 4) This is a crucial difference from Minsky's analysis; in his times, banks were interested in the credit evaluation because they were also the holders of the loans. In this new system, banks generally let credit agencies do risk management instead of them. If we realize banks are also not holders of the various assets (mortgages etc.) – they sell them to final owners –, it is more comprehensible why they give up credit evaluation and let credit agencies do the job. It means banks also do not bear risk which is linked to the holding of problematic assets.

If the process of credit evaluation itself is focused on, there is also an important distinction. Credit rating agencies do not look into the borrowers' history and do not have any personal knowledge about the borrower. According to Kregel, "bank assets are no longer represented by 'trust' but by a number, generated by an algorithm that represents the statistical probability that the borrower will have the same creditworthiness as other borrowers with the same score." (Kregel, Using Minsky's Cushions of Safety to Analyze the Crisis in the U.S. Subprime Mortgage Market, 2008, p. 5) Banks statistically analyze time

series which do not represent an individual borrower's credit history but represent the credit history of previous borrowers from a certain group to predict future behaviour of a borrower.

The margins of safety were simply insufficient from the very beginning. The credit rating done by credit rating agencies did not take into account the credit history of the borrowers; therefore, the credit evaluation was from the beginning very vulnerable to the unexpected events. According to Kregel, "the fragility and insufficient safety margin had always been present." (Kregel, Using Minsky's Cushions of Safety to Analyze the Crisis in the U.S. Subprime Mortgage Market, 2008, p. 11) The crisis just revealed the true conditions.[22]

Although there is a different process behind the deterioration of margin of safety than in case of the Financial instability hypothesis, Minsky provides an important inspiration for understanding the current financial crisis. Minsky stresses the fact that any stability is destabilizing the whole system through speculative or less careful behaviour which occurs during the time of euphoria.

If the real estate market is looked at, one can analyse financial positions of borrowers (takers of mortgages), whose sustainability relied on the expectations that prices of their houses would only rise. This was the situation of the mortgages with an adjustable rate. They were fixed at low rate only for the first few years. Then, the rate of these mortgages was assessed by market. . The borrower appeared in the Ponzi schema because if he wanted to repay the loan, he would have generally three possibilities. At first, his income would have to rise in order to balancing the movements of the adjustable rate in future. Secondly, the rates would have to remain at sufficiently low level, which would enable a borrower to repay the debt with respect to the level of income at the moment of taking loan. Finally, the last possibility would be that the price of the property would be during the existence of mortgage so high, that in case of default the borrower would be able to sell the property in order to fulfilling his financial commitments. In all cases, borrowers speculate about future development and do not know at the moment of taking loan whether they would be able to repay it in the future. This is just an example of adjustable mortgage rates. Description of other types of financial assets (derivatives etc.) are provided among others by Wray (2008).

Generally, the Financial instability hypothesis help us explain why the financial crisis occur so suddenly. Nobody expected it to happen because the market with securitized

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[22] Very interesting description about the behaviour of rating agencies offers David Einhorn (2007).

mortgages and other financial assets were rising. Minsky explains it is the boom or the euphoria that prepares the crisis to come; it is the period when businesspersons are lowering their cautiousness (therefore, lowering margins of safety); when financial institutions are innovating and creating new and more difficult financial instruments to avoid regulation and gain the maximum profit. It is important to realize that this sort of behaviour is from their point of view not only an example of headless speculation but also of rational behaviour. They do not know what is going to happen in the future, and the past experience validates their present decisions (to engage in more speculative positions, to avoid regulation etc.).

Therefore, it can be heard from many commentators and economists that the boom of financial instruments and their innovation is an example of Ponzi scheme,[23] and why Jan Kregel states that they were right with the connection of the Minsky´s hypothesis and the current crisis.

In the next session, general and abstract discussion about Minsky moment will be left behind, and the story behind the problems of the American International Group, Inc. (AIG) will be focused on. The selection of AIG is not random; AIG was a key player during the financial crisis due to the systemic risk which was concentrated especially in its subsidiary the AIG Financial Product Corporation (AIGFP). This entity was heavily engaged in trading new innovative financial instruments (mainly Credit default swaps).

The purpose of the next chapter is not to falsify or verify the Financial instability hypothesis of Hyman Minsky on the example of AIG. Certain hypothesis can be falsified by statistical tests, but Minsky's theory is too complex (and also narrative) to use rigorous tests. Therefore, examining AIG in the form of case study was chosen to see the story of the insurance company more complex and to discover which parts of Minsky's hypothesis of endogenous creation of a financial crisis can be found there. The story of AIG until its government bailout will be described. Events following state intervention will not be in the centre of my concern because they refer to the policy of dealing with the crisis, not so much to its creation.

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[23] As did for example Paul McCulley (2007) who was cited above.

b. The case of AIG

"If there is a single episode in this entire 18 months that has made me more angry, I can't think of one other than AIG. AIG exploited a huge gap in the regulatory system, there was no oversight of the financial-products division. This was a hedge fund basically that was attached to a large and stable insurance company and made huge numbers of irresponsible bets, took huge losses."

Federal Reserve Chairman Ben S. Bernanke during his testimony in the Senate on March 4. 2009 (Torres & Harper, 2009)

Ben S. Bernanke has had a reason to be irritated if he hass been thinking about AIG, because the government had to pay the "AIG bill". The company got into the liquidity crisis, and on September 16, 2008, The United States Federal Reserve System had to intervene by providing 85 billion USD to prevent AIG from bankruptcy. (Board of Governors of the Federal Reserve System, 2008). The total cost of government support is 182.5 billion (Sjostrom, 2009) because of additional lending support. As Bernanke mentioned, the company had found a way to avoid regulation. The key part of this effort, which will be focused on, is the AIG Financial Product Corporation (AIGFP) selling the financial derivates credit default swaps

i. AIG Financial Product Corporation

The AIG Financial Product Corporation was established in 1987 when Howard Sosin, Randy Rackson and Barry Goldman offered a joint venture to AIG executives (O'Harrow Jr. & Dennis, 2008). They planned to create a company dealing with financial instruments (especially derivatives) if this company would have been "secured" by AIG's money and its AAA rating. The fact would have made money lending much cheaper, and customers would have been provided a feeling of credibility guaranteed by the worldwide known insurance company[24].

From today's point of view, the 1998 key decision of AIGFP is the beginning of trading with credit default swaps. The credit default swap (CDS) is a derivative which is privately negotiated and traded over-the-counter. This instrument was originally invented by the J.P. Morgan bank (Philips, 2008) and traded to provide insurance. In case of CDS, party A

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[24] "AIG has issued unconditional guarantees with respect to the prompt payment, when due, of all present and future payment obligations and liabilities of AIGFP arising from transactions entered into by AIGFP." (American International Group, Inc. 2008 Annual Report.)
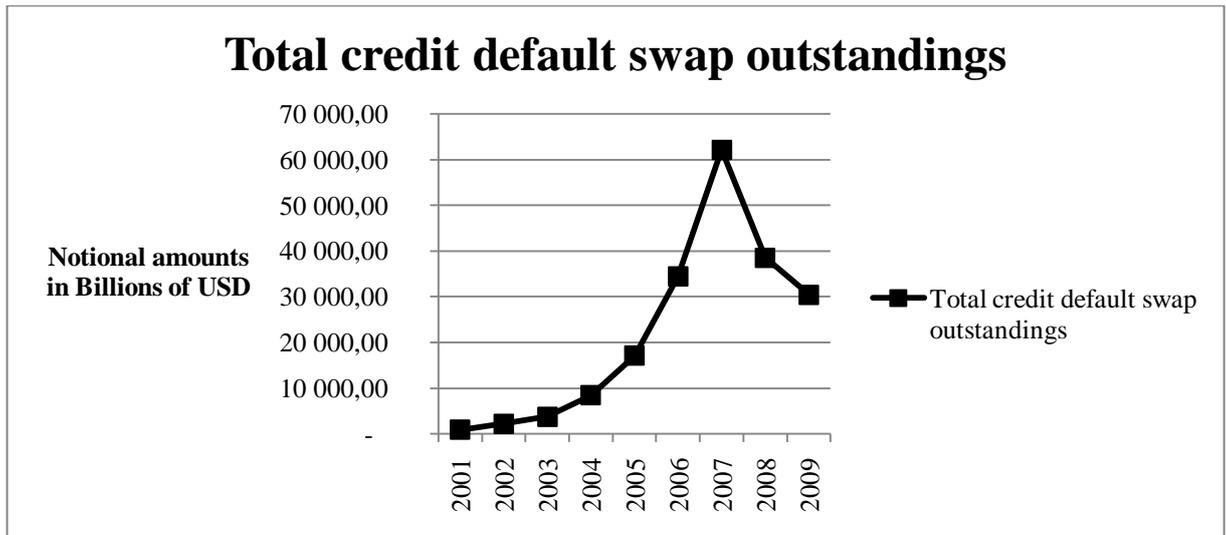
(protection buyer) wants to insure against the inability of party B (reference entity) to provide contracted payments to party A. Party A makes a deal with party C (protection seller) that Party A will make regular payments (or one-off premium (Choudhry, 2006)) to Party C for certain time, but if a credit event occurs (the failure of Party B to make payments), Party C has to pay Party A a certain amount of money. "Credit events are typically a failure to make payments when due, bankruptcy, debt restructuring, change in external credit rating, or a rescheduling of payments for a specified reference asset." (Kolb & Overdahl, 2003) The CDS is terminated if a credit event occurs (the protection seller has to fulfil its financial commitments to the protection buyer) or if no credit event appears, and the protection buyer makes the last obligatory payment. Because the CDS is traded over-the-counter and is privately negotiated, there is no regulation as in the case of regular insurance. This provides great advantage for both sides and especially for the protection seller which does not have to hold obligatory financial reserves. What is innovative on CDS is also the fact that the protection buyer does not have to hold debt of the reference entity; it simply does not have to be in relation with it. The protection buyer can just bet on the fulfilling of financial commitments by a reference entity. These types of CDS are called "naked" CDS[25].

CDS has become very popular financial derivative. As seen on the Figure 3-1, the amount of contacted CDS was steadily rising until the financial crisis in 2007[26]. The notional amount rose from 919 billion of USD in 2001 to outstanding peak in value of more than 62 trillions of USD in 2007 worldwide.

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[25] For more detailed description of the credit default swap see (Choudhry, 2006), (Kolb & Overdahl, 2003) or (Rajan, McDermott, & Roy, 2007).

[26] ISDA provides data for CDS only since year 2001.

Figure 3-1 Total credit default swap outstandings

Total credit default swap outstandings

Notional amounts in Billions of USD

(Chart showing values rising from near 0 in 2001 to a peak above 60 000,00 in 2007, then declining to about 30 000,00 in 2009. Legend: Total credit default swap outstandings. X-axis: 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009. Y-axis: -, 10 000,00, 20 000,00, 30 000,00, 40 000,00, 50 000,00, 60 000,00, 70 000,00)

Source: ISDA Market Survey 1987-Present

According to Philips (2008), CDS were at the beginning used to stimulate investors to invest in emerging markets; an example is Russia where the investments were regarded as quiet risky. Several bankruptcies during the years 2001 and 2002 (Enron, Worldcom etc.) increased investors' consciousness to hedge their credit exposure (Rajan, McDermott, & Roy, 2007), and they used more CDS to hedge their positions than before. The derivative became popular also because it was regarded as a very safe instrument. About CDS one can read for example the following:"After most major bankruptcies (WorldCom, Delphi, Delta Airline etc.), settlements caused only a minimal level of dispute. Overall, the experience so far has enhanced the robustness of the product and the enforceability of the contract." (Rajan, McDermott, & Roy, 2007).

Before the trading with CDS, AIGFP was known for its successful risk management, and at the beginning of experiments with CDS trades, they still wanted to minimize risk (also because they protected AIG triple A rating which gave them credibility). AIGFP regarded selling CDS as a very safe business and according to their mathematical model, the chance that they –as the protection seller – will never pay to protection buyer was 99.85%. Words of Tom Savage, the Financial Product president, illustrate the atmosphere: "'The models suggested that the risk was so remote that the fees were almost free money,' Savage said in a recent interview. 'Just put it on your books and enjoy the money.'" (O'Harrow Jr. & Dennis,

2008). Under the direction of Tom Savage, the CDS trades were still a small part of AIGFP business[27].

The turning point came when Tom Savage left the company and was replaced by Joseph Cassano, one of the first founding employees of AIGFP. Until the replacement of Tom Savage, Cassano had initially worked as firm's chief financial officer and then led the Transaction Development Group. He was in favour of experimenting with CDS during the debate in AIG; therefore, AIGFP under his direction were more encouraged to CDS deals that were also riskier. According to O'Harrow and Dennis, the AIGFP was a "$1 billion operation with 225 employees working on a multitude of derivatives deals for clients, involving hundreds of billon of dollars in obligations" (O'Harrow Jr. & Dennis, 2008) at the moment of replacement. Under the presidency of Joseph Cassano, the trades with derivates started to boost. If we AIG's Annual Reports (see Figure 3-2)[28] are looked upon, the rise of the importance of the Financial Services (AIGFP) is noticeable until the financial crisis. The rise of revenues and operating income of AIGFP went hand-in-hand with the boom of market with CDS (Figure 3-1) until 2005 which was the year of the peak of the boom.

Figure 3-2 Total Revenues and Operating Income for AIG and operating segments

Total Revenues (millions USD)	2003	2004	2005	2006	2007	2008	2009
AIG	79,421	97,666	102,729	106,926	103,632	6,896	96,004
Financial Services	6,242	7,495	10,525	7,777	-1,309	-31,095	9,576
General Insurance	33,833	41,961	45,174	49,206	41,162	34,731	35,039
Life Insurance & Retirement Services	36,678	43,402	47,376	50,878	49,984	-2,975	44,303
Operating Income (millions USD)	2003	2004	2005	2006	2007	2008	2009
AIG	11,907	14,845	15,213	21,687	8,134	-106,53	-13,648
Financial Services	1,182	2,18	4,276	383	-9,515	-40,821	517
General Insurance	4,502	3,177	2,315	10,412	10,175	-2,451	169
Life Insurance & Retirement Services	6,807	7,925	8,904	10,121	8,422	-38,280	2,042

Source: Data taken from Annual Reports of AIG for years 2005-2009.

What helped Cassano to boost his AIGFP was a new form of financial innovation. Here, CDS were used as an insurance of collateral debt obligations (CDOs). CDO is a type of asset-backed securities and is backed by other types of debt (it can be for example hedge fund

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[27] The statement about the value of CDS business is taken form (O'Harrow Jr. & Dennis, 2008). AIG provides annual reports publicly only since 2005; therefore, AIGFP data about notional value of CDS could not be reached. Official explanation got from AIG is the following: "AIG restated its financial statements in 2005 for prior years. Therefore, we do not distribute financial data including the Annual Reports prior to 2005." Susan Davidson, AIG Investor Relations.

[28] Data for years until 2003 are missing. See note 92.

obligations, bonds, loans, other CDOs, asset backed bonds etc.)[29]. Debts are at first collected, then sorted into different tranches which are sold as CDOs. The higher is the tranche, the safer is the investment in CDO because a higher tranche gets money sooner than a lower one. Payments from debts are redistributed to tranches under the rule that the highest tranche gets money first, and the worse gets what remains. This rule secures the highest tranche (so called super senior) will get money even if some debtors are in default because there should be debtors enough to pay their bill. This is the reason why the highest tranches were regarded so safe that they were ranked as AAA. The AIG insured by CDS so-called "multi-sector CDO" that was CDOs "whose underlying assets consist of tranches of asset-backed securities with underlying pools of assets from multiple sectors such as residential mortgage loans, commercial mortgage loans, auto loans, credit card receivables, and other similar assets." (Sjostrom, 2009). In fact, these CDSs provided an insurance of CDOs plus subprime mortgages. Holders of these CDOs could therefore feel much safer and did not have to worry too much about a real financial situation of borrowers.

This was from AIG point of view a very safe and prosperous business. The company sold CDSs only for super senior tranches of CDOs. Their Annual Report says: "The threshold amount of credit losses that must be realized before AIGFP has any payment obligation is negotiated by AIGFP for each transaction to provide that the likelihood of any payment obligation by AIGFP under each transaction is remote, even in severe recessionary market scenarios." (American International Group, Inc. 2006 Annual Report) Even several months before bailout AIG materials declare that "AIGFP defines "Super Senior" risk as a risk where there is no expected loss at contract inception, even under its stress scenario assumptions." (American International Group, Inc., Conference Call Credit Presentation, 2008). The AIGFP portfolio of credit derivatives was rapidly rising to outstanding 533.143 billion USD in 2007 a part of which was also 78.205 billion USD of multi-sector CDOs. The business with innovative instruments looked like a money machine; according to mathematical models, there was nearly zero risk of default (remember the AIG mathematical model noted above) and profits were rising. Although Cassano's subsidiary created enormous exposure, there was probably an idea that AIGFP (AIG respectively) would never pay the whole bill. What also played a role was the housing boom which caused another rising of demand for insuring CDOs. Therefore, Cassano could boost the trades with derivatives to such a high notional value. A standard insurance company has to put some money aside as reserves because of

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[29] For more details and description see (Tavakoli, 2008).

regulation but this was not the case of AIGFP. They could provide "insurance" without posting reserves because of non-regulation of the innovative credit default swaps. The innovative instruments (CDOs and CDSs) had seemed to have only advantages, but at the end they showed the other side of the coin.

Figure 3-3 The notional amounts of AIGFP's credit derivatives portfolio (including the super senior transactions) in Billions USD

| 2005	2006	2007	2008	2009
387.2	483.6	533.143	302.201	183.526

Source: AIG Annual Reports

Problems began in 2005 when AIG started to be investigated by New York Attorney General Eliot L. Spitzer because of suspicious accounting. The investigation involved even the AIG chairman and CEO Maurice R. Greenberg[30], who resigned on March 14, 2005 because of the investigation (Oxford Analytica, 2005). What is important from our point of view is not the investigation itself, but the fact that rating agencies since March until June lowered rating of AIG several times[31]. As a consequence, the money lending was more expensive for AIG, and the company also had to post an additional collateral. Whether or not a company must post an additional collateral depends on the credit rating. When AIG had triple A, AIGFP could make CDS deals without posting huge amount of collateral. However, when the rating was downgraded, an additional collateral was needed[32]. According to AIG Annual Report 2005, the company had to post additional 1.16 billion USD as the collateral. Figure 3-4 shows that year 2005 broke the trend of rising AIGFP revenues and operating income. The situation in 2006 was not disastrous; the subsidiary was still in "black numbers", but the downgrades and investigations visibly affected trade.

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[30] For more details about investigation see (Elkind, 2005), (Brady & Roberts, 2006) or (The Associated Press, 2006)

[31] For more detailed description of rating agencies actions see (American International Group, Inc. 2006 Annual Report, p. 14).

[32] "The amount of future collateral posting requirements is a function of AIG's credit ratings, the rating of the reference obligations and any further decline in the market value of the relevant reference obligations, with the latter being the most significant factor." (American International Group, Inc., Quarterly Report, September 2008, p. 120)

Figure 3-4 Total Revenues and Operating Income of AIGFP
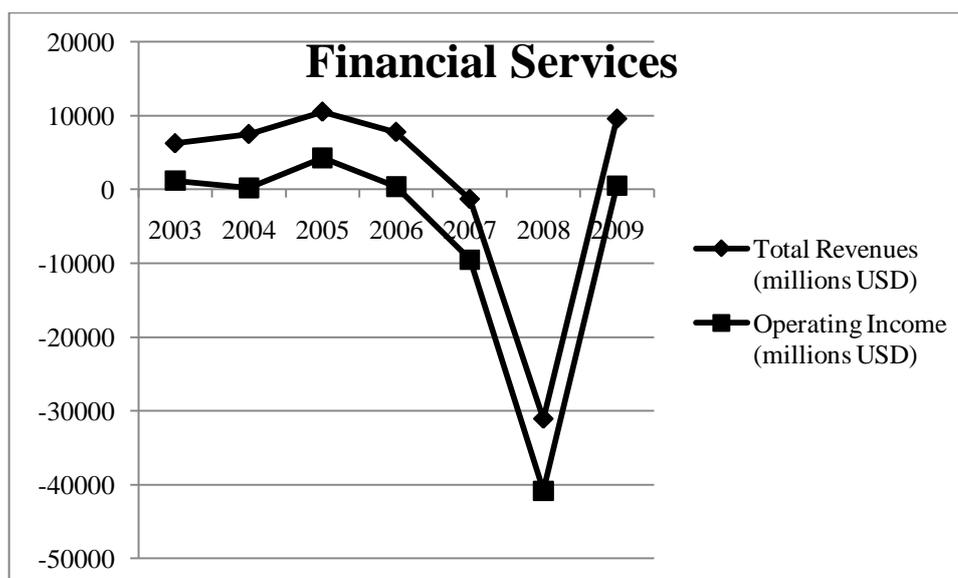
During the year 2005, AIGFP probably realized problems with condition of subprime mortgages backing multi-sector CDOs, due to what they stopped insuring new ones. On December 5, 2007, Gary Gorton (Finance Professor from the Yale School of Management, the inventor of AIG mathematical models) explained the firm's decision from 2005 to investors in following words: "We stopped writing this business in late 2005 based on fundamental analysis and based on concerns that the model was not going to be able to handle declining underwriting standards." (Zuill, 2009) Despite the fact, AIGFP created enormous exposure to this instrument in the value of approximately 80 billion USD[33].

The crisis in housing market in 2007 showed how vulnerable these obligations are. According to (American International Group, Inc. 2007 Annual Report), the AIGFP's net notional amount of multi-sector CDO's in super senior credit default swap portfolio was 78.205 billion USD. Important is how AIG computed posted collateral. The formula was "based on the difference between the net notional amount of such transaction and the market value of the relevant underlying CDO security." (American International Group, Inc., Quarterly Report, September 2008, p. 119) It simply meant that the less market value of the mortgages, the higher collateral AIG has to post. Therefore, problems in residential mortgage and credit markets caused AIGFP unrealized market valuation losses in the value of 11.472 billion USD of the super senior CDS portfolio. The beginning collapse of housing market also

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[33] Data about the notional value of multi-sector CDOs until 2007 are not publicly available. Therefore the statement about year 2005 is taken from (O'Harrow Jr. & Dennis, 2008)

led to downgrading mortgage securities. Many banks, such as Goldman Sachs, held mortgage securities insured by AIG's CDSs and demanded AIG to post additional collateral. In August, Goldman Sachs wanted AIG to put 1.5 billion USD but AIG agreed to give only 450 million USD as a collateral to them. Another collateral call from Goldman came in October followed by AIG providing 1.5. billion USD (Mollenkamp, Ng, Pleven, & Smith, 2008); other financial institutions soon followed Goldman Sachs with collateral calls to AIG. Another warning came from AIG's auditor, the Pricewaterhouse Coopers, which found "material weakness" in its risk management of the swaps (Son & Westbrook, 2008), (Kiel, 2008). The year 2007 ended with AIG weaker than before; the financial result of the fourth quarter 2007 was not in black numbers, AIG suffered net losses in value of 5.29 billion USD (American International Group, Inc., Earnings Press Release Fourth Quarter 2007).

As the ship started sinking, the captain left the boat. Joseph Cassano resigned on March 31, 2008, only a month after the company announced 7.81 billion USD first-quarter loss (American International Group, Inc., Earnings Press Release First Quarter 2008). He walked away with 280 million USD in salary, 34 million USD in bonuses and a new consulting contract worth of 1 million USD a month[34].

The cocktail of deterioration of housing market, downgrading CDO securities and demands for additional collaterals was too strong for AIG. The company turned into losses (see Table 3-1 or Figure 3-5). Looking at operating income/losses by segments of AIG, it is clear that most losses were taken by Financial Services (see Table 3-2 or Figure 3-6). According to the Annual Report, AIG suffered from "unprecedented strain on liquidity" (American International Group, Inc. 2006 Annual Report) because of two main reasons. The first one was the collateral calls; the second one was "demands for the return of cash collateral under the U.S. securities lending program" (ibid.).

Table 3-1 Net AIG's income (losses) by quarters (in billions USD)

2007				2008			
1st	2nd	3rd	4th	1st	2nd	3rd	4th
4.13	4.28	3.09	-5.29	-7.81	-5.36	-24.47	-61.7

Source: Earnings Press Release Quarters for years 2007 and 2008 of the American International Group, Inc.
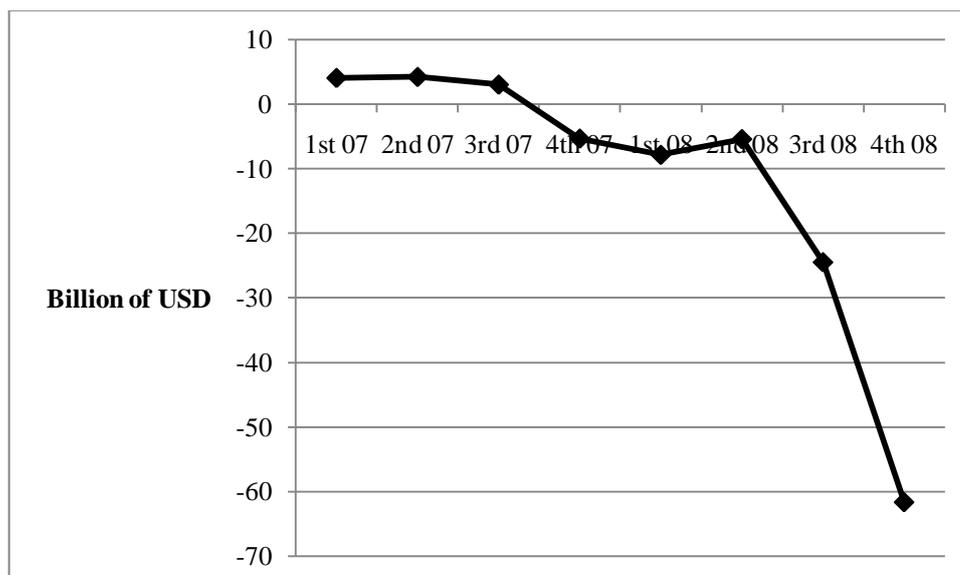
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[34] The consulting contract was cancelled soon.

Table 3-2 Operating income/loss before net realized capital gains (losses) by operating segments and quarters (in billions USD)

|	2007				2008			
	1st 07	2nd 07	3rd 07	4th 07	1st 08	2nd 08	3rd 08	4th 08
Financial Services	0.444	0.512	0.307	-10.25	-8,55	-5.88	-8.35	-17.6
Life Insurance and Retirement Services	2.54	2.9	2.49	2.66	2,54	2.61	1.01	0.742
General Insurance	2.98	3.04	2.51	2.11	1,61	1.39	-0.899	-2.8

Source: Earnings Press Release Quarters for years 2007 and 2008 of the American International Group, Inc

Figure 3-5 Net AIG's income (losses)

Source: Earnings Press Release Quarters for years 2007 and 2008 of the American International Group, Inc.

Figure 3-6 Operating income/loss before net realized capital gains (losses) by operating segments and quarters (in billions USD)
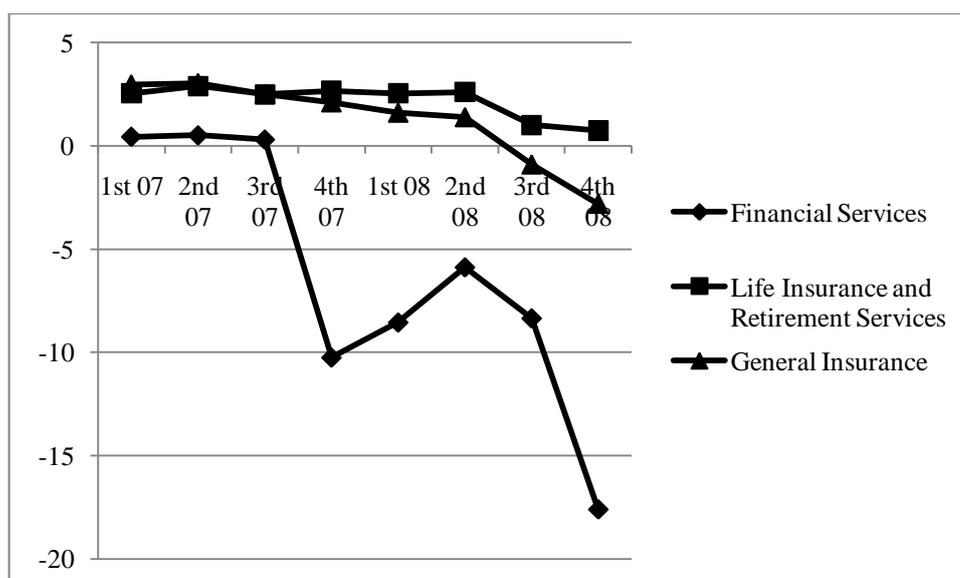
Source: Earnings Press Release Quarters for years 2007 and 2008 of the American International Group, Inc.

Securities lending activities were operated by AIG Investments (not by AIGFP). The AIG loaned securities to other financial institutions and received cash collateral which was invested to debt securities to earn spread[35]. This program was monitored by Eric Dinallo, an Insurance Superintendant for New York State, who negotiated and cooperated with AIG to wind the program down. However, before the program could be stopped, a run on AIG Security lending program appeared, and borrowers wanted to give their cash collateral back. According to Dinallo, the run appeared because of AIGFP crisis (The United States Senat: Committee on Banking, 2009). AIG could not sell all securities bought because there were also some mortgage securities among them, and the federal government had to help with the liquidity. Although the lending program required billions USD, according to Dinallo, it would not have caused the collapse of AIG; the company would have suffered from losses but would have been able to get enough assets to meet its financial commitments – according to him, the guilty party was AIGFP.

The situation became unsustainable on September 15 when AIG suffered from credit rating downgrades[36]. AIG now had to post an additional collateral in value of more than 20 billion USD. AIG tried to gain money from private banks (Goldman, Sachs & Co. and J.P.Morgan) but did not succeed. On September 16, it was clear that private sector is not able to help AIG with getting any additional collateral quickly, and the government decided to intervene. The Federal Reserve Board and the Treasury Department provided AIG a loan up to 85 billion USD through the Federal Reserve Bank of New York. The U.S. government got 79.9 percent equity interest in AIG in exchange (Board of Governors of the Federal Reserve System, 2008)

ii. Is there a connection to Minsky´s hypothesis?

According to Minsky, the crisis is created during the process of boosting economy. Entrepreneurs are greedy for profits and lower margins of safety, take too many debts and in consequence they are unable to meet its financial commitments when expectations about future change. The story of AIG looks the same at first glance, but there are some differences to discuss.

In Minsky's world, the firms seek to keep out from regulation. The more regulation established, the more search for new ways of getting profits. This is exactly what AIGFP did,

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[35] For more details see (American International Group, Inc. 2008 Annual Report, p. 166)
[36] For details see (American International Group, Inc. 2008 Annual Report, p. 4)

having found a hole in regulation and starting using CDSs as insurance. The new innovative "insurance instrument" CDS offered insurance without tough state regulation. AIGFP did not have to put so much money aside as a reserve as in situation of common, regulated insurance. The collateral was the function of credit rating of the company and also depended on the negotiated contract (see above the AIG formula for posting collateral). It was not a coincidence that the fall of the company was caused on the non-regulated market. AIGFP provided insurance but without rules which bind regular insurance business. [37]. The regulatory environment is only one side of the coin; the second one is a voluntary willingness of the company to create reserves even in the situation when they are not obligatory. Although AIGFP sold financial instruments (CDSs) which were by customers regarded as insurance, the subsidiary did not post any significant reserves because it simply did not want to. In fact, they behaved as a hedge fund which used all advantages of triple A rating of AIG Corporation. In other words, AIGFP behaved as a player in casino who bets only on the victory and does not count with the loss (respectively, he does not put any money aside as reserves). AIGFP used CDSs also as speculative instrument (naked CDS). The behaviour of the subsidiary led to an outstanding exposure to financial commitments in times of AIGFP having not enough financial reserves to withstand the collateral calls in 2007 and 2008.

AIGFP moved itself into a strange "potential Ponzi scheme": The subsidiary had not enough money to fulfil all financial commitments but they expected the run never to occur and the whole bill never necessary to be paid. This is a difference from Minsky's Ponzi schema; Minsky counted on the situation of a normal debt in which the debtor must soon or later pay. However, CDS exposed AIGFP to financial commitments with a high probability of subsidiary never forced to fulfil (AIG counted with probability 98.85%). What is also clear upon the example of AIG is the belief that the future will be the same as the past. At the end of the year 2007, Joseph Cassano illustrated self-confidence of AIGFP by his speech to investors at New York's Metropolitan Club on December 5, 2007: "It is very difficult to see how there can be any losses in these portfolios." (Voreacos & Smith, 2008) Although there were losses at the end of 2007 (see Table 3-1), Cassano in Metropolitan Club stated that: "losses will come back."(ibid)

Before the year 2007, there was no need to doubt the CDS market. The notional amount of the market was steadily growing until 2007; there was the peak (Figure 3-1). There

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[37] Attempts of lobbyists to avoid the regulation of derivative market can be also traced. For description of "Wall Street" lobbying, see for example (Taibbi, 2009).

was no bad experience destabilizing the whole market. The decision of AIGFP to be involved in the instrument and to be exposed to potential financial commitments was self-confirmed by the prosperous past experiences; hence, the behaviour of AIGFP to be involved in potential Ponzi schema was rational. This was illustrated by Rohan Douglas, Director of Global Credit Derivatives Research at Salomon Brothers and Citigroup in 1990s: "These structures were such a great deal, everyone and their dog decided to jump in, which led to massive growth in the CDS market." (Philips, 2008)

Everything changed in 2007 as housing market bubble began to deflate and bad CDO's under-writing standards were uncovered. Expectations about future changed; the value of assets began to fall, and AIG had problems to sell out of position to survive. The moment when trading partners gave back securities and demanded cash is clearly visible from AIG lending program, but AIG invested with the cash to financial assets and had problem to sell them, because there were many CDOs between them that were falling on the value.

The run on the lending program may have been sustainable but the financial commitments of AIGFP sunk the whole ship. Because of the changed expectations, the financial commitments and Ponzi scheme were potential no more, and AIGFP (AIG respectively) had to pay the bill for its bets.

An important part of Minsky's hypothesis was the declining margin of safety reducing money reserves for cases of defaults or changes in market. It is problematic to make a statement that this exactly happened to AIG. There goes a discussion that the fact that the risk model of AIG was wrong (Mollenkamp, Ng, Pleven, & Smith, 2008) means that the margin of safety was insufficient from the beginning. It is the same debate as abovementioned by Jan Kregel (Kregel, Using Minsky's Cushions of Safety to Analyze the Crisis in the U.S. Subprime Mortgage Market, 2008). This is an important difference from Minsky. He supposed that during the initial period of business cycle, the margins of safety are well set, but the discussion about recent financial crisis shows that risk management standards were probably generally insufficient from the beginning.

Reserves could be regarded as the margin of safety in insurance business but as the market with derivatives was not regulated, there was no obligation for reserves. The innovation enabled AIGFP to keep from setting any margins of safety. This was the important advantage of the CDS insurance market making the insurance cheaper for both sides

It can be stated that the fall of AIG makes a parallel to the key parts of the Minsky's financial instability hypothesis. AIGFP tried to keep out of the regulation to maximize its profits because the subsidiary could sell CDS on the non-regulated market as an insurance and speculative product without obligatory reserves. The AIGFP sold an outstanding amount of CDSs due to the positive expectations about future (the derivatives market was boosting, and they thought they will never have to pay the bill). Their decisions about investments into derivatives were validated by successful previous decisions and the boosting market. Therefore, it was a rational choice to be involved heavily in selling CDS. As a result, the company's exposure to commitments was too high, and as the expectations changed, the company did not have collateral enough to withstand the situation. The main differences are two. The first is the suspicions of margin of safety having been insufficient from the very beginning; in such case, AIG would not be an example of Minsky's mechanism of declining margin of safety during the boom period. The second is that AIGFP was not exposed to loan or regular debts in comparison with Minsky's hypothesis. AIGFP moved into an unsustainable exposure to financial commitments; however, it occured by promising potential payments dependent through the quasi-insurance or speculative instrument called CDS.

4. **Conclusion**

From the general discussion about connecting Minsky's hypothesis to financial crisis (chapter 3.a) and from the case of AIG (chapter 3.b) it is obvious that today's financial crisis is not a textbook example of the Minsky's financial instability hypothesis. Compared to Minsky times, there are two most important differences: changes in risk management and new, innovative financial instruments (as for example CDS).

The changes in risk management described in the chapter 3.a indicate that the margins of safety were inadequate from the beginning. Therefore, the mechanism of declining margins of safety cannot be applied at least on AIG and other financial institutions dealing with credit evaluation in the United States of America.

The new financial instruments raise an issue of redefining the Ponzi schema. The Ponzi financial position refers to economic entities involved in regular debts but the current financial crisis has raised a question whether the definition of financial commitments (regular debt) is not too narrow. People taking mortgages with an adjustable interest rate got involved in financial commitments and bet on the prediction that the market would behave favourably for them (see chapter 3.a for a description of their expectations). There was a problematic fact that they did not have any sufficient reserves for case of different (respectively: unfavourable) market development; still, they were in a situation when the interest rate was determined by market after a short fixed period. In addition, AIGFP bet on the assumption that they would never have to pay the promised payments in CDSs, and therefore they had not put money aside as reserves. Both cases are examples of entities with exposure to financial commitments which are unable to fulfil their financial commitments if necessary (they had no sufficient reserves), but their commitments are not regular debts.

Therefore, one may claim that the Minsky's Ponzi scheme needs a general reformulation to fit better to contemporary financial environment. The Ponzi scheme can be reformulated as follows: Ponzi schema is a financial situation of an economic agent in which the subject is exposed to too many financial commitments; the subject is not able to fulfil them if necessary. Therefore, the subject relies on its expectation about the future market behaviour and about his latter ability to fulfil the commitments (this is an example of people taking mortgages with adjustable interest rate) or about having never to fulfil them (the example of AIGFP). The subject does not have enough financial reserves for case of default because it is not able to put money aside (the subject does not have sufficient amount of

money), or it does not consider it necessary. The subject is fundamentally dependent upon expectations about the future market behaviour.

Despite of the two differences between Minsky's hypothesis and present, the roots of the financial instability hypothesis are claimed to provide a very useful framework to understand the current financial crisis. The most important and serious lesson from Minsky's analysis is that the behaviour of market agents which leads to financial fragility is rational. If AIG is looked at, it must be admitted that from their point of view, their behaviour on the market with derivatives was logical. The market with CDSs was non-regulated and legal, hence it was rational to be involved in it. The market was boosting; there were no serious signs of default in CDS trades until the crisis of AIG; the CDS could also be legally and without regulation traded for speculative purpose. In conclusion, it was rational to use the CDS market as a casino (in case of naked CDS). Both sides bet they would win; AIGFP bet that it would never have to pay the bill and buyers of CDSs bet on the default of someone's default. This is a very unfavourable conclusion, and it raises the key question whether it is possible to manage the market rationality. Are people able to find and set rules which would minimize such behaviour which leads to fragility? It is a question of an institutional change which would canalize the profit-seeking behaviour of market agents into the performance that is less fragile, and at the same time rational.

5. Appendix

a. Profit equations[38]

i. The simplest case

Workers producing consumer and investment goods are assumed to spend all their income on consumption; so, none of profit income is saved. The sum of the realized mark-ups on the technologically determined direct labour and material cost of producing and distributing consumption goods equals the wage bill in investment goods production (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 144). Because all wages of workers are spent on consumption and not all profit income is spent in this way, relation "profits equals investment" is got. Now let us focus on the determination of profits.

Let's denote P_C the price of consumer goods and Q_C the quantity of consumer goods[39]. W_C denotes the money wage rate in the production of consumer goods and N_C the employment in the same sector. Similarly, W_I is the money wage rate in the production of investment goods and N_I the employment in the sector. Therefore, $P_C Q_C$ is the total consumption, $W_C N_C$ a wage bill in the production of consumption goods and $W_I N_I$ a wage bill in the production of investment goods. These wage bills are equal to labour costs connected to technology. The cost of overhead labour is not included in this model (overhead labour or labour not directly related to the production of consumer and investment goods are not considered).

Reminding our assumption that workers spend all their income on consumption and profit receivers do not, the equation goes as such:

$$P_C Q_C = W_C N_C + W_I N_I$$

Companies running a business in consumer goods have a cost expressed only in wage bill in the production of consumption goods $W_C N_C$. $W_I N_I$ refers to the cost in the production of investment goods. According to the assumption that all workers spend their income in consumption, following profit in consumer goods π_C is got:

$$\pi_C = P_C Q_C - W_C N_C = W_I N_I$$

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[38] Taken from (Minsky H. P., Stabilizing an Unstable Economy, 1986, chapter 7)
[39] Same notation as Hyman Minsky's is used

The demand for investment goods is $P_I Q_I$, where π_I is the profits in investment goods production and $W_l N_l$ are costs (the wage bill in the production of investment goods).

$$P_I Q_I = \pi_I + W_I N_I = I$$

The following relation of investment and profit can be derived:

$$I = P_I Q_I = \pi_I + W_I N_I = \pi_I + \pi_C = \pi$$

From the following equation one can see that investment depends on the expectations of future profits. Because future profits depend on the future investment, the today investments are undertaken only if investment in the future is supposed.

ii. Adding another factors

The government

At this moment, other variable will be included into the simple model – the government. Our primary assumption of workers spending all their wages on consumption and profit receivers spending none of theirs has to be discarded. The government now taxes wages. Let's denote $\overline{W_G N_G}$ the indirect and direct wage bill of government, T_r transfer payments, T_w the tax rate on wage income, T_π the tax rate on profits, π_G the profits earned in producing for the government (money which government should give for ordered goods – all type of goods, not only consumer) and finally D_f the budget deficit.

Let's start again by the determination of total consumption:

$$P_C Q_C = W_C N_C + W_I N_I + W_G N_G + T_r - T_w(W_C N_C + W_I N_I + \overline{W_G N_G})$$

Equation 1

The budget deficit is D_f:

$$D_f = \overline{W_G N_G} + \pi_G + T_r - T_w(W_C N_C + W_I N_I + \overline{W_G N_G}) - T_\pi(\pi)$$

Equation 2

If the equation of budget deficit (Equation 1) is substituted by the equation of total spending (Equation 2), following relation appears:

$$P_C Q_C = W_C N_C + W_I N_I + D_f + T_\pi(\pi) - \pi_G$$

$$\pi_C = W_I N_I + D_f + T_\pi(\pi) - \pi_G$$

At the end, after-tax profits are got:

$$\dot{\pi} = I + D_f \, ^{40}$$

Obviously, the government can substitute falling investment and income through increasing its deficit.

The foreign trade

Now, the foreign trade will be included in the model. Let's denote $P_X Q_X$ as exports, $P_M Q_M$ as imports, $W_X N_X$ as the wage bill in this sector, $BTDf$ as balance-of-trade deficit. At the end of computation, there is: [41]

$$\dot{\pi} = I + D_f - BTDf$$

Trade deficit decreases profits as long as trade surplus has the opposite effect.

Consuming out of Profits and saving out of wages

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[40] From the former case it is already known that:
$$\pi_I = I - W_I N_I$$
So:
$$\pi = \pi_C + \pi_I + \pi_G = (W_I N_I + D_f + T_\pi(\pi) - \pi_G) + (I - W_I N_I) + \pi_G = D_f + T_\pi(\pi) + I$$

After-tax profits are:
$$\dot{\pi} = \pi - T_\pi(\pi) = \pi_I + \pi_C + \pi_G - T_\pi(\pi) = D_f + I$$

[41] The computation (in similar logic as previous case) described in detail in (Minsky H. P., Stabilizing an Unstable Economy, 1986, p. 150).

Finally, workers will be allowed to save some money from their wages ($s\dot{W}$) and profit receivers to consume some part of it ($c\dot{\pi}$). It changes the equation of demand for consumer goods: $P_C Q_C = W_C N_C + W_I N_I + W_G N_G - T(W) + c\dot{\pi} - s\dot{W}$

To simplificate, $T(W)$ denotes all taxed wage bills.

Equation 3

It is known:

$$W_I N_I = I - \pi_I$$

Equation 4

$$P_C Q_C = W_C N_C + \pi_C$$

Equation 5

$$W_G N_G = D_f - \pi_G + T(W) + T(\pi)$$

Equation 6

$$\pi = \pi_C + \pi_I + \pi_G$$

Equation 7

Equation 4, Equation 5, Equation 6 and Equation 7 are substituted into Equation 3[42] and following equation of pre-tax and after-tax profits is got:

$$\pi = I + D_f + T(\pi) + c\dot{\pi} - s\dot{W}$$

$$\dot{\pi} = I + D_f + c\dot{\pi} - s\dot{W}$$

42

$$P_C Q_C = W_C N_C + (I - \pi_I) + (D_f - \pi_G + T(W) + T(\pi)) - T(W) + c\dot{\pi} - s\dot{W}$$
$$= W_C N_C + \pi_C$$

$$I + D_f + T(\pi) + c\dot{\pi} - s\dot{W} = \pi_C + \pi_G + \pi_I = \pi$$

6. **Bibliography**

American International Group, Inc. *2005 Annual Report.*

American International Group, Inc. *2006 Annual Report.*

American International Group, Inc. *2007 Annual Report.*

American International Group, Inc. (2008, May 9). *Conference Call Credit Presentation: Financial Results for the Quarter Ended March 31, 2008* .

American International Group, Inc. 2008 Annual Report.

American International Group, Inc. *2009 Annual Report.*

American International Group, Inc. (2007). Earnings Press Release First Quarter 2007.

American International Group, Inc. (2008). Earnings Press Release First Quarter 2008.

American International Group, Inc. (2007). Earnings Press Release Fourth Quarter 2007.

American International Group, Inc. (2008). Earnings Press Release Fourth Quarter 2008.

American International Group, Inc. (2007). Earnings Press Release Second Quarter 2007.

American International Group, Inc. (2008). Earnings Press Release Second Quarter 2008.

American International Group, Inc. (2007). Earnings Press Release Third Quarter 2007.

American International Group, Inc. (2008). Earnings Press Release Third Quarter 2008.

American International Group, Inc. *Quarterly Report, September 2008.*

Asada, T. (2007, March). Dynamic analysis of policy lag in a Keynes–Goodwin model: Stability, instability, cycles and chaos. *Journal of Economic Behavior & Organization , 3* (62), pp. 441-469.

Asada, T. (1989). Monetary stabilization policy in a Keynes-Goodwin model of the growth cycle. In W. Semmler, *Financial Dynamics and Business Cycles* (pp. 145-162). New York: M.E.Sharpe.

Asada, T. (2006). Stabilization policy in a Keynes–Goodwin model with debt accumulation. *Structural Change and Economic Dynamics* (17), pp. 466–485.

Bellofiore, R., & Ferri, P. (2001). *Financial Fragility and Investment in the Capitalist Economy: The Economic Legacy of Hyman Minsky, Volume II.* Edward Elgar.

Bellofiore, R., & Ferri, P. (2001). *Financial Keynesianism and Market Instability.* Edward Elgar.

Board of Governors of the Federal Reserve System. (2008, September 16). *Press Release 9:00 p.m.* Board of Governors of the Federal Reserve System.

Brady, D., & Roberts, D. (2006, March 27). Hank Greenberg At War. *Businessweek* .

Carter, M. (1989, September). Financial Innovation and Financial Fragility. *Journal of Economic Issues , 3* (23), pp. 779-793.

Cassidy, J. (2008, February 4). The Minsky Moment. *The New Yorker* .

Dymski, G., & Pollin, R. (1992). Hyman Minsky as Hedgehog: The Power of the Wall Street Paradigm. In S. Fazzari, & D. B. Papadimitriou, *Financial Conditions and Macroeconomic Performance: Essays in Honor of Hyman P. Minsky.* M.E.Sharpe.

Einhorn, D. (2007, October 19). David Einhorn´s Prepared Remarks. *17th Annual Graham and Dodd Breakfast* . Helbrunn Centre for Graham and Dodd Investing.

Elkind, P. (2005, March 7). More Bad News for AIG´s Greenberg? *Fortune* .

Fazzari, S., & Papadimitriou, D. B. (1992). *Financial Conditions and Macroeconomic Performance: Essays in Honor of Hyman P. Minsky.* M.E.Sharpe.

Fazzari, S., Ferri, P., & Greenberg, E. (2008). Cash flow, investment, and Keynes-Minsky cycles. *Journal of Economic Behaviour and Organization* (65), pp. 555-572.

Fisher, I. (1933, October). The Debt-Deflation Theory of Great Depressions. *Econometrica , 4* (1), pp. 337-357.

Foley, D. K. (2001). Hyman Minsky and the dilemmas of contemporary economic method. In R. Bellofiore, & P. Ferri, *Financial Keynesianism and Market Instability: The Economic Legacy of Hyman Minsky, Volume I* (pp. 47-59). Cheltenham, UK / Northampton, USA: Edward Elgar.

Gatti, D. D., & Gallegati, M. (2001). Financial instability revisited: aggregate fluctuations due to changing financial conditions of heterogeneous firms. In R. Bellofiore, & P. Ferri, *Financial Fragility and Investment in the Capitalist Economy: The Economic Legacy of Hyman Minsky, Volume II* (pp. 185-200). Cheltenham, UK / Northampton, USA: Edward Elgar.

Gatti, D., Gallegati, M., & Gardini, L. (1993). Investment confidence, corporate debt and income fluctuations. *Journal of Economic Behavior and Organization* (22), pp. 161-187.

Goodwin, R. M. (1967). A Growth Cycle. In C. H. Feinstein, *Socialism, Capitalism and Economic Growth* (pp. 54-58). Cambridge: Cambridge University Press.

Chancellor, E. (2007, February). Ponzi Nation . *Institutional Investor* .

Charles, S. (2008). A Post-Keynesian Model of Accumulation with a Minskyan Financial Structure. *Review of Political Economy , 3* (20), pp. 319 — 331.

Charles, S. (2008). Corporate debt, variable retention rate and the appearance of financial fragility. *Cambridge Journal of Economics* (32), pp. 781–795.

Chiarella, C., Flaschel, P., & Semmler, W. (2001). The macrodynamics of debt deflation. In R. Bellofiore, & P. Ferri, *Financial Fragility and Investment in the Capitalist Economy* (pp. 133-184). Cheltenham,UK / Northampton,USA: Edward Elgar.

Choudhry, M. (2006). *The Credit Default Swap Basis.* New York: Bloomberg Press.

Isenberg, D. L. (1988, December). Is There a Case for Minsky´s Financial Fragility Hypothesis in the 1920s? *Journal of Economic Issues , 4* (22), pp. 1045-1069.

Kalecki, M. (1971). The Determinants of profits. In M. Kalecki, *Selected essays on the dynamics of the capitalist economy.* Cambridge University Press.

Keen, S. (1995). Finance and economic breakdown: modelling Minsky´s financial instability hypothesis. *Journal of Post Keynesian Economics* (17), pp. 607-635.

Keen, S. (1998). The Nonlinear Dynamics of Debt Deflation. *Complexity international* (6).

Keynes, J. M. (1960). *The General Theory of Employment, Interest and Money.* London: Macmillan and Company Limited.

Kiel, P. (2008, November 14). AIG's Spiral Downward: A Timeline. *ProPublica* .

Kolb, R. W., & Overdahl, J. A. (2003). *Financial Derivatives.* Hoboken, New Jersey: John Wiley & Sons, Inc.

Kregel, J. (2008). Minsky´s Cushion of Safety. *Public Policy Brief* , *No. 93*.

Kregel, J. (2008, Spring). Using Minsky's Cushions of Safety to Analyze the Crisis in the U.S. Subprime Mortgage Market. *International Journal of Political Economy , 1* (37), pp. 3–23.

Lahart, J. (2007, August 18). In Time of Tumult, Obscure Economist Gains Currency. *The Wall Street Journal* , A1.

Magnus, G. (2008, October 13). Is there time to avert a Minsky meltdown? *The Financial Times* .

Magnus, G. (2007, March 6). The Credit Cycle and Liquidity: Have we arrived at a Minsky Moment? *Economic Insights – By George* . UBS Investment Research.

Magnus, G. (2007, July 3). The Credit Cycle: Getting Closer to a Minsky Moment? *Economic Insights – By George* .

Magnus, G. (2007, 08 22). What this Minsky moment means. *The Financial Times* .

McCulley, P. (2007, March). The Plankton Theory Meets Minsky. *Global Central Bank Focus* .

Mehrling, P. (1999, June). The vision of Hyman P. Minsky. *Journal of Economic Behavior & Organization , 39*, pp. 129-158.

Minsky, H. P. (1975). *John Maynard Keynes.* New York: Columbia University Press.

Minsky, H. P. (1986). *Stabilizing an Unstable Economy.* New Haven and London: Yale University Press.

Minsky, H. P. (1982). The Financial Instability Hypothesis: A Restatement. In M. Hyman, *Can "It" Happen Again? Essays on Instability and Finance.* New York: M.E.Sharpe.

Mollenkamp, C., Ng, S., Pleven, L., & Smith, R. (2008, October 31). Behind AIG's Fall, Risk Models Failed to Pass Real-World Test. *The Wall Street Journal* .

O'Harrow Jr., R., & Dennis, B. (2008, December 29). What Went Wrong: The Beautiful Machine. *The Washington Post* .

Oxford Analytica. (2005, March 17). Greenberg Resignation's Wider Significance. *Forbes* .

Papadimitriou, D. B., & Wray, L. R. (1999, July). Minsky´s analysis of financial capitalism. *Working Paper No. 275* . The Levy Economics Institute.

Philips, M. (2008, September 27). The Monster That Ate Wall Street: How 'credit default swaps' - an insurance against bad loans—turned from a smart bet into a killer. *The Newsweek* .

Raines, J. P., & Leathers, C. G. (2008). *Debt, Innovations, and Deflation: The Theories of Veblen, Fisher, Schumpeter, and Minsky.* Edward Elgar.

Rajan, A., McDermott, G., & Roy, R. (2007). *The Structured Credit Handbook.* Hoboken, New Jersey: John Wiley & Sons, Inc.

Rutherford, D. (2002). *Routledge Dictionary of Economics - Second edition.* London and New York: Routledge.

Santos, C. H. (2005, Summer). A stock-flow consistent general framework for formal Minskyan analyses of closed economies. *Journal of Post Keynesian Economics , 4* (27), pp. 711-735.

Sjostrom, W. K. (2009). The AIG Bailout. *Washington and Lee Law Review , 3* (66), pp. 943-991.

Son, H., & Westbrook, J. (2008, February 11). AIG Falls on Concern Losses May Have Been Understated. *Bloomberg* .

Taibbi, M. (2009, March 22). The Big Takeover: How Wall Street Insiders are Using the Bailout to Stage a Revolution. *Rolling Stone* .

Tavakoli, J. M. (2008). *Structured Finance and Collateralized Debt Obligations.* Hoboken, New Jersey: John Wiley & Sons, Inc.

Taylor, L., & O´Connell, S. A. (1985). A Minsky Crisis. *The Quarterly Journal of Economics* (100), pp. 871-885.

The Associated Press. (2006, September 6). Two charges against AIG's Greenberg dropped. *www.msnbc.com* .

The United States Senat: Committee on Banking, H. a. (2009, March 5). Hearing on "American International Group: Examining What Went Wrong, Government Intervention, and Implications for Future Regulations".

Torres, C., & Harper, C. (2009, March 4). Bernanke's AIG Blast May Mean More Curbs on Risk, Concentration. *Bloomberg* .

Vercelli, A. (2009, October). A Perspective on Minsky Moments: The Core of the Financial Instability Hypothesis in Light of the Subprime Crisis. *Working Paper No. 579* .

Voreacos, D., & Smith, E. B. (2008, November 26). Cassano's Statements on AIG Probed by Prosecutors, People Say. *Bloomberg* .

Whalen, C. J. (2001, December). Integrating Schumpeter and Keynes: Hyman Minsky's Theory of Capitalist Development. *Journal of Economic Issues , 4* (35), pp. 805-823.

Wolf, M. (2007, August 15). In a world of overconfidence, fear makes a welcome return. *The Financial Times* .

Wolf, M. (2008, December 24). Keynes offers us the best way to think about the crisis. *The Financial Times* .

Wray, L. R., & Tymoigne, É. (2008, September). Macroeconomics Meets Hyman P. Minsky: The Financial Theory of Investment. *Working Paper No.543* . The Levy Economics Institute.

Wray, R. L. (2008). Financial Markets Meltdown: What Can We Learn from Minsky? *Public Policy Brief No. 94* (The Levy Economics Institute of Bard College).

Zuill, L. (2009, September 28). FACTBOX: Cassano/AIG: Key comments at critical presentation. *Reuters* .