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EMBEDDING MINSKY'S TAXONOMY OF CASH FLOWS INTO A CORPORATE FINANCE FRAMEWORK (THE MICROECONOMIC LINKAGE BETWEEN SPECULATIVE AND PONZI SCHEMES)

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EMBEDDING MINSKY'S TAXONOMY OF CASH FLOWS INTO A CORPORATE FINANCE FRAMEWORK

(The microeconomic linkage between speculative and Ponzi schemes)

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ABSTRACT

When Minsky put forward his financial instability hypothesis, he resorted – among other macroeconomic tools of analysis – to categories like income, balance-sheet, and portfolio cash flows, so as to cope with the successive stages of hedging, speculative and Ponzi schemes. This paper makes two contributions to the lively debate arousing from Minsky's ideas. Firstly, it embeds Minsky's taxonomy into the incremental cash-flow model that has become part and parcel of the modern approach to Corporate Finance. Secondly, and by means of the referred model, we set up a microeconomic linkage to financial instability, by showing how hedging, speculative and Ponzi devices actually break off the natural mutuality that binds together so effectively cash flows from assets – which create economic value – with those to be delivered toward both creditors and stockholders.

JEL codes: G32, G34

Key words: Minsky's taxonomy of cash flows; incremental cash flow model; financial instability; Ponzi scheme; speculative finance.

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INTRODUCTION

Hyman Minsky (1919-1996) was not only a distinguished macroeconomist; he also gained membership to that time-honored tradition of scholars concerned with political economics and government studies, who were outspoken critics of how both economic and public affairs were run in their own times. The credit crunch and meltdown that have been shattering the financial system so hard since 2007 elicited serious doubts about the soundness of the conventional wisdom lying in the fields of Economics and Finance[1].

It's not surprising that his ideas set into motion a thriving and wide-ranging discussion, to which this paper intends to make two intertwined contributions:

a) it will embed Minsky's taxonomy of cash flows into the realm of corporate finance, by taking advantage of the incremental cash-flow model;

b) it will bring forward a microeconomic connection between speculative and Ponzi schemes with any company's incremental cash flows.

Section 1 displays the basics of financial instability according to Minsky. Section 2 develops his taxonomy of cash flows. It is for section 3 to brief the incremental cash-flow model. Afterwards, in section 4, we avail ourselves of the cash-flow model so as to embed Minsky's taxonomy of cash flows into a Corporate Finance approach. Section 5 deals with the dynamics of speculative and Ponzi's schemes as drivers of financial instability within single companies.

[1] On this background, we refer the reader to Robert Barbera (2009), Michael Lewis (2011), Neil Ferguson (2009), and Rodolfo Apreda (2012a).

1. THE FINANCIAL INSTABILITY HYPOTHESIS

At variance with the mainstream standpoint that had attempted to explain financial disturbances through the mere agency of external shocks or news[2], Minsky's (1986) argued that financial markets are able to bring about internal forces which foster credit expansion and asset inflation, followed by credit contraction and asset deflation[3]. Two propositions provide the groundwork for his so-called Financial Instability Hypothesis:

- Capitalist markets mechanisms cannot lead to a sustained, stable-price, full-employment equilibrium.

- Serious business cycles are due to financial attributes that are essential to capitalism.

As Minsky asserted:

> The financial instabililty view makes much of the way in which ownership or operating control of capital assets are financed, something standard theory ignores. Further, the financial instability theory points out that what actually happens changes as institutions evolve, so that even though business cycles and financial crises are unchanging attributes of capitalism, the actual path an economy traverses depends upon institutions, usages and policies.(p. 194)

[2] A supportive advocacy of such frame of mind can be found in Mishkin (1999): '*Financial instability occurs when shocks to the financial system interfere with information flows so that the financial system can no longer do its job of channeling funds to those with productive investment opportunities. Indeed, if the financial instability is severe enough, it can lead to almost a complete breakdown in the functioning of financial markets, a situation which is then classified as a financial crisis'*. (p.6)

[3] Developments in Mathematics and Physics for the last fifty years have been giving heed and evidence that within non-linear dynamical systems not only external disturbances but also internal ones could nurture unstable trajectories through mappings that shape those systems as sources and targets, to the extent of unleashing chaotic behavior eventually. Mandelbrot (1971) still stands as a seminal paper on these topics, whereas Cuthberston (1996) seems a good starting point for applications to finance. Apreda (1999a) studied chaotic trajectories out of arbitrage gaps within capital markets.

In the aftermath of the latest financial crisis, some scholars and analysts took advantage of Minsky's Hypothesis to fathom out what had happened as well as to draw lessons for improving the world financial architecture. On this line of argument, I think that Davidson (2002) has made deep inroads in bringing down-to-earth what a financial system boils down to at the end of the day. On the other hand, Cooper (2008) has provided a savvy criticism about the failure of central banks when they resort to linear and narrow-minded policies to fight financial crisis, by forcefully advocating Minsky's standpoint to financial instability[4].

2. MINSKY'S TAXONOMY OF CASH FLOWS

It's worth outlining how Minsky ultimately itemized cash flows into three types[5]. In section 4, we are going to translate these categories into the language of modern Corporate Finance.

i) Income cash flows — they arise from any company production process: ordinary and extraordinary sources of income, overhead costs, wages and salaries, payments from one stage of production or trade to another, liabilities incurred to finance working capital requirements, and gross profits after taxes.

ii) Balance-sheet cash flows — although some of them are related to liabilities (interest and principal payments), we reach a broader perspective when focusing on three kinds of arrangements for these cash flows:

a) dated cash flows, for example home mortgages and cars loans for household units, discounted notes and bonds for companies;

[4] Apreda (2012b) expands on the relationship between financial instability and opaque governance.

[5] Minsky (1986), chapter 9.

b) demand cash flows, deposits at banks either under the guise of check and saving accounts, time deposits, or investment in other depositary institutions;

c) contingent or conditional cash flows, mainly related to common stock and different sort of insurance contracts.

iii) Portfolio cash flows they spring out of transactions in which capital and financial assets change hands, for example when a company buys (or sells) capital assets (non-current assets like fixed capital goods or intangibles) or financial assets issued by third parties (non-current financial assets).

In point of fact, financial instability stems from the dynamic relationships tying up income, balance-sheet and portfolio cash flows, which lead to three distinctive mechanisms that build up such cash-flow positions: ***hedge, speculative, and Ponzi financing***, which Minsky explains this way:

> If realized and expected income cash flows are sufficient to meet all the payment commitments on the outstanding liabilities of a unit, then the unit will be **hedge financing**. However, the balance-sheet cash flows from a unit can be larger than the expected income receipts so that the only way they can be met is by rolling over or even increasing debt; units that roll over debt are engaged in **speculative finance** and those that increase debt to pay debt are engaged in **Ponzi finance**. Thus, speculative and Ponzi financing units need engage in portfolio transactions, selling assets or debts, to fulfill their payment commitments, whereas units engaged in hedge finance can meet payment commitments on debts without portfolio transactions. Of course, hedge units may engage in portfolio transactions to acquire assets, but this is a business strategy and not the result of a shortfall of income cash flows relative to maturing payment commitments. (p. 226)

The message conveyed by the Financial Instability Hypothesis is crystal clear: when portfolio transactions are accomplished to meet balance-sheet cash-flow payments, then financial instability gets a tangible boost. It is not surprising that Minsky's contributions

have been discussed and contested all over the aftereffects of the last 2007-2009 financial crisis[6].

3. THE INCREMENTAL CASH FLOW MODEL

This long-established model deals with incremental cash flows[7]. That is to say, those cash flows that stem from, and are explained only, by events that take place along the planning horizon **H = [t; T]**. In other words:

*By the **incremental cash-flow model** is meant that the following relationship among incremental cash flows holds true*

(1)

$$\Delta CF(\text{from assets}) = \Delta CF(\text{to creditors}) + \Delta CF(\text{to stockholders})$$

The left hand of this equation points to the residual cash flow that is left to the company after meeting all costs, and reliable provisions were made for working capital and non-current assets. From this perspective, cash flows from assets signpost a measure of value creation to be expected over the planning horizon. It is for the right hand of equation (1) to explain how such economic value would be distributed among creditors and stockholders eventually[8].

How could we work out cash flows brought about by assets? Firstly, by availing ourselves of the information provided from the historical balance sheet at date **t** and the budgeted balance sheet at date **T**, as well as a forecast of the Income Statement for the above mentioned planning horizon. Secondly, by profiting from the following construct:

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[6] See, for example, The Economist (2011, 2010).

[7] An introductory rendering is supplied in Ross et al. (2009), whereas an inclusive treatment comprising conflicts of interests among different stakeholders for cash flows can be found in Apreda (2002, 2006).

[8] Analysts and practitioners fashion this model on an ex-ante basis, that is to say, they assess (1) at the starting date **t**. Although this is a truly financial construct, there is a strong relationship with another construct widely resorted to by accountants but on an ex-post basis: the statement of sources and uses of cash flows. The mathematical implications of this connections can be followed in Apreda (1999b).

(2)

ΔCF (from assets) = ΔCF (operating cash flows) –

– provisions for working capital – provisions for non-current assets

Splitting down operating cash flows, we can display the whole structure of cash flows actually stemming from the company's activities[9]:

(3)

ΔCF (from assets) = [EBIT – taxes + depreciation + amortization] –

– provisions for working capital – provisions for non-current assets

It goes without saying that only a fractional amount of economic value will be delivered to creditors and stockholders, because the remainder has been earmarked like provisions for required investment decisions along the planned horizon[10].

Once the analyst has figured out the internal arrangement of cash flows from assets, his next step consists in tracking down the final destination of economic value after provisions for investment decisions.

a) Cash flows addressed to creditors

This is a compact of four cash flows delivered to or received from creditors[11]:

[9] EBIT stand for Earnings before interest on non-current liabilities, and taxes. Depreciation comprises fixed assets, whereas amortization applies to intangibles.

[10] This remainder can also be interpreted as a consequence of having made provisions for retained earnings, an alternative of analysis that can be followed in Apreda (1999b).

[11] The makers and users of Corporate Finance take an opposite convention to the one followed by either the Treasurer or the Accountant in any company: cash outflows to creditors will carry a positive while inflows from creditors a negative sign. To all intents and purposes, the positive sign discloses the fact that we are distributing cash flows from assets.

Interest payments	they are contractual cash flows handed out to creditors.
Principal payments	they are also contractual cash flows.
Debt repurchase	the company can repay a bank loan in advance, or repurchase standing bonds before their maturity date, hence sending money to creditors.
New debt	by which creditors lend money to the company.

Hence, cash flows to creditors embrace the following composition:

(4)

$$\Delta \text{ CF(to creditors)} = \text{interest} + \text{principal} + \text{debt repurchase} - \text{new debt}$$

b) Cash flows addressed to stockholders

In the case of stockholders, the company will deliver cash flows to them under the guise of dividends or stock repurchase, whereas it will receive money out of new stock placements[12]. In other words,

(5)

$$\Delta \text{ CF(to stockholders)} = \text{dividends} + \text{stock repurchase} - \text{new stock}$$

[12] Whereas there is no principal for ordinary stock, some complex preferred stock like those with convertibility features so widely used by Venture Capital firms, include a maturity date and a principal to be reimbursed in case that the implicit call option were not exercised at all. When "preferreds" are issued, the incremental cash-flow model should be expanded this way:

$$\Delta CF(\text{from assets}) = \Delta CF(\text{to creditors}) + \Delta CF(\text{to stockholders}) + \Delta CF(\text{to preferred stockholders})$$

In general, whenever financial hybrids like preferreds, convertible bonds, even bonds with attached warrants, are issued, the working frame of the incremental cash-flow model turns out to be the following:

$$\Delta CF(\text{from assets}) = \Delta CF(\text{to creditors}) + \Delta CF(\text{to stockholders}) + \Delta CF(\text{to hybrid-assets holders})$$

Once such allocations have been wholly accomplished according to (4) and (5), as soon as we match them with cash flows from assets in (3), the model in (1) makes its way as a matter of course[13].

By far the most outstanding property of this model consists in the mutuality that establishes between cash flows from assets, on the one hand, with cash flows shifted to creditors and stockholders who provide the company with resources, on the other. Only when this steady cycle of cash flows is disrupted the company enters into financial instability. There are a variety of ways by which such disruption may take place, and this paper deals with two of the most notorious: speculative and Ponzi finance.

4. WHAT HAPPENS WHEN CORPORATE FINANCE HOLDS THE FLOOR

Corporate Finance is something of a misnomer. In point of fact, it does not only refer to the finance of corporations but also it cuts across any other sort of organizations. Hence, we adopt here an agnostic point of view that makes the expression functional to a wide spate of organizations, from single ownerships till complex corporations, also embracing limited partnerships, cooperatives, investment funds, financial institutions, limited liabilities companies, to name but a few.

In the pursuit of sorting out the cash flows set forth by Minsky, we are going to map the categories he devised onto their most suitable incremental cash flows.

a) Income cash flows

They consist of ordinary and extraordinary sources of income, netted out of the whole array of outcomes related to business activities. Therefore, they found their location into the block of cash flows from assets and should be closely intertwined through relationships (2) and (3).

[13] Apreda (1999b) offers a thorough derivation of the incremental cash-flow model.

b) Balance-sheet cash flows

This turns out to be a complex category composed of three distinctive components:

- ***dated cash flows***: here, we face either provisions to working capital in short-term investments, or provisions to non-current assets in medium- and long-term investments [as portrayed by (2) and (3)]. When any company borrows by placing bonds or getting bank loans, then incremental cash flows are submitted to creditors as we find out in (4).

- ***demand cash flows:*** they boil down to investments intended by the company, either short- or long-term varieties, which are merged into incremental cash flows set aside like provisions to working capital or to non-current financial assets, as shown in (2) and (3).

- ***contingent or conditional cash flows:*** they refer either to common stock, hybrid financials, derivative contracts, or insurance arrangements. Therefore, they could be plunged into cash flows to stockholders or creditors[14]. Minsky also distinguished derivative contracts as well as standard insurance arrangements to manage operational risks faced by the company. Derivatives, when they are expensed, must be accounted for above the Ebit line [see (3)], whereas insurance charges are being usually included into provisions to working capital [see (2)].

c) Portfolio cash flows

Broadly speaking, they apply to transactions that involve non-current-assets provisions, mainly fixed capital assets and non-current financial assets within relationship (2).

[14] Financial hybrids, mainly convertibles, are a sect of themselves. For the time being, in many countries preferred stock is still treated as belonging to equity, a practice that is increasingly regarded as out of date and deceitful.

It goes without saying that Minsky engaged himself in the macroeconomic analysis of financial instability, which he regarded as inherent in capitalist contexts. Therefore, features that are customarily related to corporate finance were kept beyond the scope of his research. However, the whole of his taxonomy can be easily included into the incremental cash-flow model, as we have done above. Nevertheless, such inclusion raises a question in the realm of Corporate Finance: how could we be insured that all the relevant components in the incremental cash-flow model finds a counterpart in the Minsky's taxonomy?

To start with, we see that his treatment of what is called in Finance "cash flows from assets" is fairly accurate and complete. Let us bring a query instead about those cash flows the enterprise usually apportions to creditors and stockholders.

On the side of creditors, he takes into account interest, principal, and new debt placements, which turns out to be essential for his three mechanisms of financing, namely hedging, speculative, and Ponzi contrivances. Nevertheless, he seems to have disregarded the consequential role that repurchase of debt can play as a trigger for financial instability, a far-reaching subject we will handle in next section[15].

For the sake of our argument, let us highlight some properties that debt repurchase processes bring to light eventually:

- When cash flows from assets are plenty enough to repurchase debt, the company may move on to negotiate with banks the early termination of older credits, or to recall former bonds by purchasing them in the market.

[15] On the side of stockholders, he gave heed to dividends and new stock issuance by all means, but stock repurchase was rather neglected. To a lesser extent than debt repurchase, this also becomes noteworthy when speculative and Ponzi schemes ensue eventually.

- Repurchasing becomes a sensible alternative whenever market conditions enable the company to curb interest payments from old debt, or declining prices allow for redeeming the bonds by paying less than the contractual amount fixed as principal.

- The mechanism of debt repurchase also comes in handy when the company, rather than using cash flows from assets, issues new debt carrying over lower interest payments into the future, and fashioning better maturity dates.

These three features stand for the good side of repurchasing processes. In contrast, let us point out the other side of the coin:

- Even if the company had no positive slack provided by cash flows from assets, it could embark upon repurchasing older debt with new one in a systematic way, so as to write off expensive debt, mainly through the abusive employment of the "call provision" feature. This method adds up to the rolling over of standing debt for its own sake, but it can end up devising wash sales or cornering the market.

- When the company grows oblivious of the fact that debt repurchase must be a prudential practice, it crosses over the threshold beyond which we enter in speculative and Ponzi concoctions[16].

5. SPECULATIVE AND PONZI FINANCING

Let us recall the main components of the category "cash flows to creditors":

(6)

$$\Delta \text{ CF(to creditors)} = \text{interest} + \text{principal} + \text{debt repurchase} - \text{new debt}$$

It is for cash flows from assets to provide the resources that will pay off interest and principal commitments, leaving for the Board of Directors the granting of discretionary

[16] To all intents and purposes, this applies mainly to non-financial companies. We are going to discuss the case of financial companies later in next section.

power on debt repurchase[17]. On the other hand, investment requirements should be funded by means either of self-finance (retained earnings) or debt to be placed between banks or bondholders. To put this in other words, relationships (1), (4) and (5) lead to a suitable reframing on actual sources and uses of cash flows:

(7)

$$\textbf{ΔCF (from assets) + new debt + new stock =}$$

$$\textbf{= interest + principal + debt repurchase + dividends + stock repurchase}$$

The compact of cash flows related to creditors seems of paramount importance in a microeconomic approach to financial instability when we narrow down our inquiry to the single field of each company. Let us move onto three ensuing stages that spring out of Minsky's macroeconomic standpoint.

Stage 1: HEDGE FINANCING

In the world of business, any company meets their interest and principal contractual commitments out of cash flows from assets. In this way creditors receive money under the guise of interest and principal, on the one hand, and also when the company repurchase bank credits or standing bonds, on the other. By the same token, new debt issuance takes place whenever the company faces an investment decision that involves the acquisition of capital assets or technology. Cash flows to creditors and to stockholders are both a foregone conclusion in the life of capitalist economies all around the world. Needless to say, hedging finance is the main subject of any state-of-the-art textbook in Corporate Finance[18].

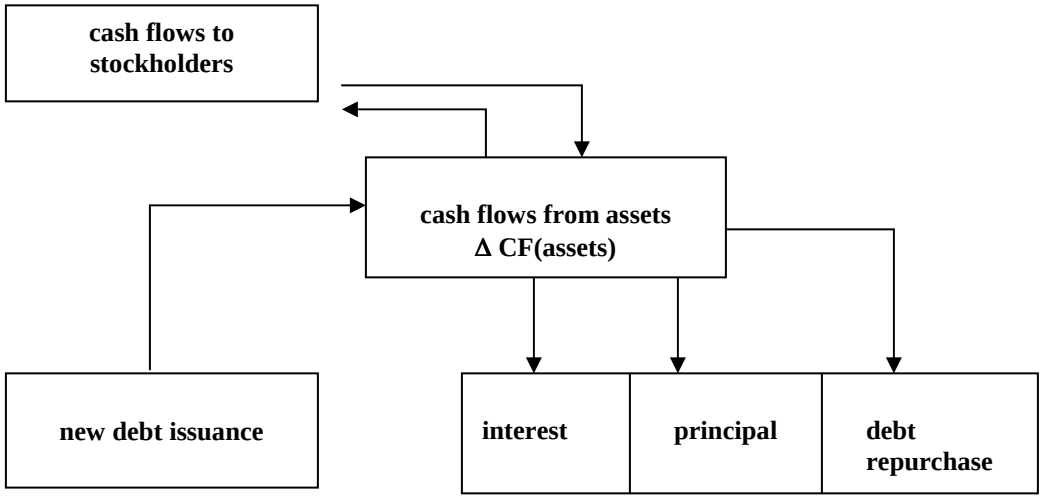
But, and this holds mainly for non-financial companies, new debt issuance should be justified on the grounds of true investment in capital assets to keep the company growing. Figure 1 brings into view how this stage evolves: investment decisions are

[17] This is a key concern for Corporate Governance of any company, and can be followed in Apreda (2005, 2002).

[18] The list of contents in the well-known textbook by Ross et al. (2009) bears witness of what I am saying.

financed with debt issuance, whereas cash flows from assets build up residual cash flows to meet old and new debt commitments[19].

Figure 1



Whereas the above remarks come out of necessity for non-financial companies, distinctions arise when we deal with financial companies[20], the most striking of which lie in their balance sheets. Let us expand on this issue further.

a) As regards the side of assets, their main components consists of cash flows loaned to non-financial companies and households.

b) When considering the side of liabilities, the main providers of cash flows are depositors, bondholders, or general investors. We must keep in mind that, almost by definition, financial companies carry out an unbalanced

[19] We are interested in the mutuality of cash flows from assets with cash flows to creditors mainly. At this stage, cash flows to stockholders are kept beyond the argument, albeit at stage 3 this block will also be captured by the Ponzi scheme.

[20] By financial companies is meant any sort of organization that make their full-time job the borrowing of money from or selling of securities to external investors, with the purpose of lending money to or purchasing of securities from external debtors. Under this broad format of meaning, regulated banks, investment funds, and institutional investors are embraced like financial companies.

business that evolve from borrowing in short-term conditions to lending in medium- or long-term maturities.

c) Be that as it may, debt repurchase and new debt are the name of the game played by these companies. Not surprisingly, financial instability firstly wakens up and stem from the financial companies balance sheets.

Stage 2: SPECULATIVE FINANCE

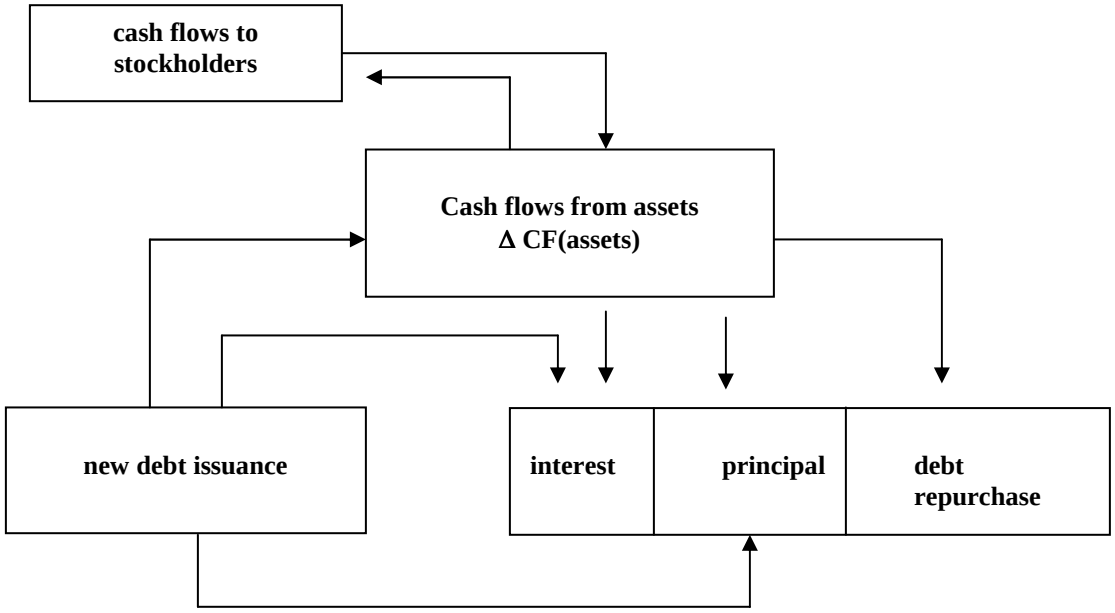
The standard procedure for carrying out a sound Corporate Finance is predicated upon the assumption that timely and suitable amounts of cash flows from operations are left available to pay banks and bondholders. However, in the daily life of business, companies often meet strictures or contingencies in the short-run that hinder their capacity to cancel interest payments at due times, even the reimbursement of principal now and then. If such were the context, the usual path followed by financial managers would be to issue new short-term debt (commercial paper, for instance) to handle interest payments or, when the schedule of those payments spreads beyond one semester[21], even to roll over old debt with new one, looking for a more advantageous schedule of interest and principal outlays. (See Figure 2)

STAGE 3: PONZI SCHEME

This is the stage in which the compact of cash flows related to creditors becomes self-defeating and severs its mutuality with cash flows from assets. As from this point, the compact turns out to perform like a micro-bank within the company, borrowing from new investors to pay for former liabilities.

[21] Semesters are customary periods for bonds, albeit months are more suitable for bank loans and mortgage-like bonds.

Figure 2



As time passes by, investors and banks will claim higher and higher rates of return so as to shelter them from the perceived risks in going on lending the company through new issues of short-term commercial paper, medium-term notes, and long-term bonds, as well as rolling over of older bank credits. The process takes an unstable life of its own, that compound risk with increasing mistrust, up to the point when investors stop lending and call for outright refunding.

The Ponzi scheme involves a collapsing dynamics, which from a corporate finance standpoint, amounts to the annihilation of the block of cash flows to creditors, that is to say:

(8)

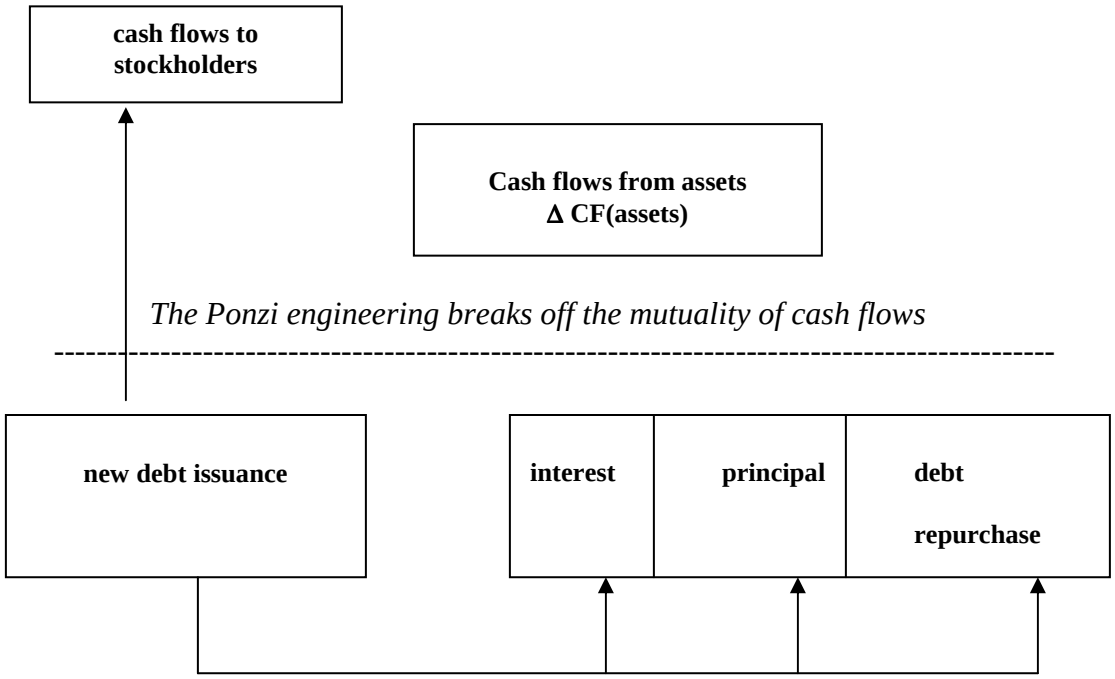
$$\Delta \text{ CF(to creditors)} \Rightarrow 0$$

or, equivalently,

$$\text{interest} + \text{principal} + \text{debt repurchase} \Rightarrow \text{new debt}$$

Figure 3 contrasts sharply with figures 1 and 2, because it translates the collapsing dynamics in Ponzi schemes. Indeed, it shows forth how the development is brought into completion when the block of cash flows to creditors is wholly cut off from cash flows from assets. We must also notice, in passing, that Ponzi schemes may include another perversion to their deviant and fraudulent behavior, delivering dividends to stockholders out of new debt[22].

Figure 3



It could be argued that banks replicate a similar path to what is called a Ponzi engineering, but such statement would entail a misplacement of facts as well a rather suspicious logic. Contrariwise, financial companies in general play the following game:

a) they countervail their commitments with funding, that is to say

[22] There are plenty of examples about this illegal, even criminal financial engineering, among which it stands out the outrageous Bernard Madoff 's concoction, reviewed in great detail by Arvedlun (2009). For examples of the so-called Special Purpose Vehicles carrying out regrettable roles, the following references provide insightful understanding: the Basel Bank Reports (2009, 2011), Coval et al. (2009), The Economist (2012), Shin (2009), and Apreda (2012b).

Δ CF(from loans and financial services) + new debt =

= interest + principal + debt repurchase

b) new debt is backed with new depositors or older ones that reinvest again an again, or with bond issues.

It is only when financial companies set about worsening the trade-off between loans and new debt, by casting themselves on a frantic funding to repay former debts and disregarding the assets side of their balance sheets, that they enter the trapping path that unleashes the Ponzi scheme.

CONCLUSIONS

The findings of this paper are twofold. Firstly, it showed forth how Minsky's Financial Instability Hypothesis also allows for a microeconomic viewpoint focused on the corporate finance of any single enterprise.

Secondly, an by means of the incremental cash-flow model we are able to shape the hedging, speculative, and Ponzi stages of finance into a meaningful development for each company, through transactions embracing income, balance-sheet and portfolio categories which can be embedded into incremental cash flows.

The final outcome of this line of argument points out that speculative and Ponzi scheme break off the healthy mutuality between cash flows from assets with those ones to be addressed to creditors and stockholders.

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