Journal of Applied Economics, Vol. II, No. 2 (Nov 1999), 247-279

THE CASH FLOW MODEL WITH FLOAT: A NEW APPROACH TO DEAL WITH VALUATION AND AGENCY PROBLEMS

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In this paper we introduce a cash flow model with float to manage core issues in Corporate Finance. The float actually removes current hindrances pervading the standard cash flow model. To start with, we derive the float model and uncover its underlying financial engineering. After that, any investment decision is regarded as a synthetic portfolio made out of a revenue bond financing the investment, and a performance swap acting as a value driver. It is within the performance swap where the float lies and enhances value. Furthermore, extension to valuation is provided taking advantage of the former portfolio approach. Next, the float complex structure is displayed to proceed towards its sources and uses of cash flows. Last of all, we expand upon a normative model which makes the most of the float and spells out how an accountability precept should be functional in redressing agency problems.

JEL: G30 , G34 G32
Key Words: Cash Flow Float; Agency Problems; Arbitrage; Performance Swap; Revenue Bond

I. Introduction

The first comprehensive attempt to cope with agency problems among

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shareholders, bondholders and managers, within a financial framework, was that of Jensen y Meckling (1976). Ten years later, it was Jensen again (1986) who called attention on managers discretionary power when dealing with free cash flows. Several undertakings to provide empirical evidence to Jensen's statements have been advanced since: Mann-Sicherman (1991), Crutchley-Hansen (1989), Jensen (1997) and Apreda (1998,1999c). Research on financial contracts as a way of coping with agency problems was led by Barnea-Haugen-Senbet (1985); on the same track Anderson-Sundaresan (1996) proves useful. At the 1998 Eastern Finance Association Meeting, an empirical paper by Howton-Perfect (1998) highlighted relevant features not only about market responses after debt issuances, but also the consequences on free cash flows as well. On the other hand, lately books on Corporate Finance (see References) devote at least a chapter to the Cash Flow Model, a suitable tool for companies valuation, capital budgeting, and also financial assets valuation.

Jensen's approach was remarkable and conceptually deep, bringing about a model which frames relationships among Firm Theory, Management Behavior, Agency Problems, and Mergers-Acquisitions Issues. However, it didn't address operative and quantitative issues. It is our first objective in this paper to build up an operative model that we are going to call the "cash-flow float management model" or simply the "float model". A recent attempt to introduce a float model into Agency Theory can be found in Apreda (1998); either accountancy or financial related issues with the float model are dealt with in Apreda (1999a).

As regards as the standard Cash Flows Model, we feel that it actually fails to provide flexible mechanisms and procedures to decision making; not even displays the rich structure cash flows really have. It is our second objective in this paper to expand the standard Cash Flows Model so as to sort out those problems managers breed when arbitraging the float on behalf of their personal agendas.

II. The Standard Cash Flow Model

For any business firm it holds, at every moment "t",

$$\Delta CF_t \text{ (brought about by assets)} = \Delta CF_t \text{ (delivered to debtholders)} +$$

$$+ \Delta CF_t \text{ (delivered to stockholders)} \quad (1)$$

or, briefly,

$$\Delta CF_t \text{ (assets)} = \Delta CF_t \text{ (debtholders)} + \Delta CF_t \text{ (stockholders)} \quad (2)$$

the message this relationship conveys seems clear: incremental cash flows stemming from assets are carried over both debtholders and stockholders to be fully distributed between them. We will proceed to derive it from the incremental balance for cash flows.

$$\Delta \text{ Assets} = \Delta \text{ Liabilities} + \Delta \text{ Owners'equity} \quad (3)$$

Firstly, we recall that current and fixed assets main components, in terms of incremental cashflows can be stated as:

$$\Delta \text{ Assets} = \Delta \text{ Cash} + \Delta \text{ Marketable Securities} + \Delta \text{ Accounts Receivable} +$$

$$+ \Delta \text{ Inventories} + \Delta \text{ Other Current Assets} + \Delta \text{ Fixed Assets} -$$

$$- \text{ Depreciation (period)} \quad (4)$$

all variables in (4) are flows. Some of them come out of stock variables increments between valuations at the beginning and end of each period. Others are flow variables themselves, as it is the case of depreciation, for

instance. This remark also applies to some relationships hereinafter. In turn, liabilities and owner's equity amount to:

Δ Liabilities + Δ Owners'equity = Δ Current Liabilities +

+ Δ Long-term Liabilities + Δ Stock + Retained Earnings (period)

Next task consists of linking both retained earnings and earnings before interest and taxes, through net income from that period:

Retained Earnings (period) + Dividends(period) = Net Income =

= EBIT(period) - Interest(long-term debt period) - Taxes(period)

furthermore,

Retained Earnings (period) = EBIT(period) - Interest(long-term debt period) -

- Taxes(period) - Dividends(period) (5)

As the reader might have realized, Interest (long-term debt) is gross, exclusive of tax deduction. The Standard Cash Flow Model follows this procedure because interest is an outgoing cash flow to bondholders on a gross basis. At the same time, the company improves its cash flows from operations taking advantage of a tax deduction which it seems sensible to keep it, therefore, on the cash flows from assets. In the case of interest on short-term liabilities, the standard cash flow model leaves them above the EBIT line in the Income Statement.

As from now, we will drop the "period" marker because it comes out directly from the context. On the other hand, liabilities and owners's equity structure can be broken out this way:

Δ Liabilities + Δ Owners'equity = Δ Accounts Payable +

+ Δ Short-term Notes Payable + Δ Other Current Liabilities +

+ Δ Net New Debt - Principal Repayments + Δ Net New Stock + EBIT -

- Interest(long-term debt) - Taxes - Dividends (6)

By net new debt, we mean:

Δ Net New Debt = New Debt Issues (during period) -

- Debt Repurchase (during period)

From a financial point of view, changes in stocks come from differences between new issues and stock repurchases along the period, that is to say:

Δ Net New Stock = New Stock Issues (during period) -

- Stock Repurchase (during period) (7)

subtracting the second line in (6) from the second line in (4), we attain the net change in working capital. After some arrangements among the components in (4) and (6) it follows that

EBIT + Depreciation - Taxes - Δ Working Capital - Δ Fixed Assets =

= Interest(long-term debt) + Principal Repayments - Δ Net New Debt +

+ Dividends - Δ Net New Stock (8)

There is broad agreement that the operative or disposable cash flows in the period is the remainder of EBIT after subtracting taxes expenses, and adding depreciation which, in fact, is not a real cash expense. For this reason, it is defined an incremental cash flow coming out of this remainder:

$$\Delta CF(operative) = EBIT + Depreciation - Taxes \quad (9)$$

However, these cash flows shouldn't be fully distributed between stakeholders. Otherwise, the company wouldn't be able to survive, because of lacking provisions either to replenish working capital or in granting the maintenance of his fixed assets. That's why the net operative cash flows, after such provisions, are the only real cash flows that all assets bring about. Hence, from (8) and dating the cash flows variables,

$$\Delta CF_t (assets) = \Delta CF_t (operative) - \Delta CF_t (working\ capital) -$$

$$- \Delta CF_t (fixed\ assets) \quad (10)$$

In the corporate valuation literature, these DCF_t *(assets)* are frequently called "free cash flows". We will expand on this issue later in Section XI. Working now with (9), we can pick up those items delivered to debtholders,

$$\Delta CF_t (debtholders) = \Delta CF_t (interest\ long\text{-}term\ debt) - \Delta CF_t (net\ new\ debt) +$$

$$+ Principal\ Repayments \quad (11)$$

by the same token,

$$\Delta CF_t (stockholders) = \Delta CF_t (dividends) - \Delta CF_t (net\ new\ stock) \quad (12)$$

this ends with the derivation of the so called Cash Flow Model, which states:

ΔCF_t *(brought about by assets)* $= \Delta CF_t$ *(delivered to debtholders)* +

$+ \Delta CF_t$ *(delivered to stockholders)*

as from now, we are going to give incremental symbols even to flow variables as this seems convenient to our further development.

III. The Cash Flow Model with Float

In a formal setting, the Cash Flow Model makes a claim in (1) that amounts to a complete and exhaustive allocation of cash flows from assets to debtholders and stockholders. Under this assumption, the model encompasses what seems to us a removable flaw that hinders its ability to come in handily with real problems. Let's go deeply into this issue, by making the following remarks:

- Distributing all resources to stakeholders is not desirable because such decisions uncover lacking of growth purposes and failure at hedging risk.
- It doesn't seem wise, as regards investing or financial innovation, to be left without any freedom to find out likely favourable chances in relevant markets.
- The Standard Model makes no room for core financial decisions: reorganization, incentives, mergers, acquisitions, financial risk management, new investments, research and development, credit risk management, and corporate governance .
- It is well known that managers could be tempted into committing executive decisions on behalf of their own personal agendas. In other words, bringing forth agency problems and costs.

Weighing up advantages and disadvantages of the standard model, we feel that there would be latitude for improvement if we introduced a float

cash flow model. As from now, we are going to deal with this expanded version, which will be called the ”Cash Flow Model with Float”.

$$\Delta CF_t \text{ (brought about by assets)} = \Delta CF_t \text{ (delivered to debtholders)} +$$

$$+ \Delta CF_t \text{ (delivered to stockholders)} + \Delta CF_t \text{ (float)} \quad (13)$$

It’s worth now focusing on (13) by giving attention to some details, because it is the starting point to provide the float with foundations. If we used the Standard Cash Flow Model as it were a Cash Flows Statement, on ex-post basis, the float should be obviously equal to zero,

$$\Delta CF_t \text{ (float)} = 0$$

but if we attempted to use the Standard Cash Flows Model on ex-ante basis, as needed in Corporate Finance, we would face five relevant facts:

(a) Cash flows from assets depend on growth rates to be forecasted item by item.
(b) Expected cash flows to existing debt and stock are easier to assess than those of assets, and we can take advantages of equilibrium valuation models as benchmarks for valuing financial assets.
(c) Therefore, cash flows from assets, and those to debtholders and stockholders, do not necessarily balance as required by the standard model.
(d) Unless there were neither value creation nor value destruction, the float should be significative, that is to say,

$$\Delta CF_t \text{ (float)} \neq 0$$

(e) It is with the float inclusion, on ex-ante basis, that cash flows balance by and large.

in the following sections we are going to develop the underlying financial engineering of the float model.

IV. Cash Flows from Assets: The Investment Decision

Let us consider any single investment decision as rendered by an investment project, which takes vectorial structure:

$$F = < - F_0 ; F_1 ; F_2 ; \ .....; F_N > \tag{14}$$

The initial component can be assimilated to the upfront cash deployment for the project, whereas the remaining components, in general, can be looked upon as positive. It's not so uncommon that some of the future expected cash flows might be negative. A sensible explanation is that time comes up when reinvestments, partial renewals, or maintenance expenses overtake incoming cash flows for that period. On the other hand, available techniques allow for changing cash flows patterns, by making investment periods shorter or longer along the chosen investment horizon. Hence, we can assume in (14) that cash flows are all positive, but for the initial one. If any cash flow remained negative, the matching vectorial component would take the negative sign eventually.

By discounting cash flows vector components backwards to the valuation moment *("t=0")* we are led to the investment net present value:

$$NPV\,[F;\ \kappa] = \sum_{1 \le t \le N} \Delta CF_t \times < 1 + \kappa >^{-t} - F_0 \tag{15}$$

if the project present value were positive, the project should qualify to become elegible eventually. We can relate the net present value with cash flows from the assets involved in the project:

$$NPV\,[F; k] = \sum_{1 \le t \le N} \Delta CF_t\,(assets) \times < 1 + k >^{-t} - F_0 \tag{16}$$

V. Cash Flows to Debtors, Stockholders and Float

The investment decision funding involves an allocation of cash flows, either to dividends, interest or principal repayments, according to the debt-capital mix the company has finally chosen. Let us work a little with the financing cash flows in (11) and (12), so as to pave the way for an interpretation of net present value that will prove suitable for our aims. Starting with cash flows to debtholders, as in (11),

$$\Delta CF_t \text{ (debtholders)} = \Delta CF_t \text{ (interest long-term debt)} - \Delta CF_t \text{ (net new debt)} +$$

$$+ \Delta CF_t \text{ (principal repayments)}$$

we reach to,

$$\Delta CF_t \text{ (debtholders)} = \Delta CF_t \text{ (interest on investment debt)} +$$

$$+ \Delta CF_t \text{ (principal repayments on investment debt)} +$$

$$+ \Delta CF_t \text{ (other debtholders)} \qquad (17)$$

In this way, debt is broken down into interest and principal payments primarily engaged with the investment decision, whereas any other debt cash flows not engaged with the investment decision is kept apart. Let us take a closer look to cash flows committed with "other debts".

$$\Delta CF_t \text{ (other debtholders)} = \Delta CF_t \text{ (standing debt period, principal repayments)} +$$

$$+ \Delta CF_t \text{ (standing debt period, interest payments)} -$$

$$- \Delta CF_t \text{ (net new debt during period)} \qquad (18)$$

by "standing debt" we mean that debt which has nothing to do with the likely financing of the single project. Dealing with stocks in a similar way, we can start with (12) and proceed to,

$$\Delta CF_t \text{ (stockholders)} = \Delta CF_t \text{ (dividends)} - \Delta CF_t \text{ (net new stock)}$$

and this can be set forth as :

$$\Delta CF_t \text{ (stockholders)} = \Delta CF_t \text{ (dividends on investment)} +$$

$$+ \Delta CF_t \text{ (other stockholders)} \qquad (19)$$

those cash flows eventually forwarded to "other stockholders" can be framed as:

$$\Delta CF_t \text{ (other stockholders)} = \Delta CF_t \text{ (other stock dividends period)} -$$

$$- \Delta CF_t \text{ (net new stock)} \qquad (20)$$

VI. A Portfolio Approach for Valuing Financing Cash Flows and Float

Now, we are ready to exclude those cash flows which fund the investment decision from those that add economic value to the firm. Starting at (16):

$$NPV[F;k] = \sum_{1 \le t \le N} \Delta CF_t(\text{assets}) \times <1 + k>^{-t} - F_0$$

and using (13),

$$NPV[F;k] = \sum_{1 \le t \le N} \{\Delta CF_t(\text{debtholders}) + \Delta CF_t(\text{stockholders}) +$$

$$+ \Delta CF_t(\text{float})\} \times <1 + k>^{-t} - F_0$$

now we put (17) and (19) in this relationship to get,

$$NPV[F;k] = [\sum \{\Delta CF_t(\text{interest on investment debt}) +$$

$$+ \Delta CF_t(\text{dividends on investment debt}) +$$

$$+ \Delta CF_t(\text{principal repayments on investment debt})\} \times \langle 1+k\rangle^{-t} - F_0] +$$

$$+ \sum \{\Delta CF_t(\text{float}) + \Delta CF_t(\text{other debtholders}) +$$

$$+ \Delta CF_t(\text{other stockholders})\} \times \langle 1+k\rangle^{-t} \qquad (21)$$

further, we can match (21) with the net present value of the following portfolio:

$$P = \{ \text{revenue bond (RB); performance swap (PS)} \}$$

Cash flows in (21) are thus mapped to a pair of synthetic financial cash flow vectors. The first one is mapped to a revenue bond, the other one to a performance swap. That is to say:

$$\{ \Delta CF_t(\text{interest}) + \Delta CF_t(\text{dividends}) + \Delta CF_t(\text{principal}\} \Rightarrow RB$$

$$\{ \Delta CF_t(\text{float}) + \Delta CF_t(\text{other debt}) + \Delta CF_t(\text{other stock})\} \Rightarrow PS$$

as from now, we can ease the notation and, instead of writing down,

$$\Delta CF_t(\text{interest on investment debt}) \text{ or } \Delta CF_t(\text{other stockholders})$$

we will do it as,

$$\Delta CF_t(\text{interest}) \text{ or } \Delta CF_t(\text{other stock})$$

whenever the context leaves no room for vagueness. Briefly, we have defined a synthetic portfolio to duplicate the cash flow stemming from financing and floating.

VII. Analysis of the Revenue Bond (RB)

Formally, we define the "revenue bond" , RB, as the cash flows vector:

$$RB = < RB_1 ; RB_2 ; ..... ; RB_N >$$

where the vector components, as from *"t = 1"* are

$$RB_t = \Delta CF_t(interest) + \Delta CF_t(dividends) + \Delta CF_t(principal) \qquad (22)$$

that is to say, this bond stems from revenues that the investment decision should provide for its own funding. In the case of debt it deals with interest and principal payments. As for stocks, it deals with the stream of expected future dividends which could be forecasted by some valuation model. The revenue bond net present value is given by:

$$PV(RB; k) = \sum RB_t \times < 1 + k >^{-t} = \sum \{\Delta CF_t(interest) +$$

$$+ \Delta CF_t(dividends) + \Delta CF_t(principal\} \times < 1 + k >^{-t} \qquad (23)$$

although these cash flows come from those generated by the whole set of assets, they are only devoted to the investment repayment. In this case, the cost of capital rate performs as the internal rate of return for the performance bond. Therefore, it follows,

$$PV(RB ; k) = F_0$$

In most capital markets there are, in fact, plenty of real revenue bonds

issued by municipal government, federal agencies and, to a lesser extent, corporations. It is for the issuers to grant debt payments with their own net revenues. Within an "asset-liability management" approach, it seems consistent to take the cash flows from a single investment project as a synthetic revenue bond. Topical applications and deep analysis on bond markets can be found in a recent book by Sundaresan (1997). The last component in the revenue bond deserves further qualification: we should add to the last expected dividend the expected terminal value of that dividend. Bearing in mind this remark, and by means of standard stocks valuation models, the whole revenue bond can be shaped as a floating rate bond eventually.

VIII. Analysis of the Performance Swap (PS)

By the same token, we define a "performance swap", PS, as the cash flows vector:

$$PS = < PS_1 ; PS_2 ; ..... ; PS_N >$$

this swap is defined by a contingency on the performance of the investment decision:

(a) If net present value in (16) were positive, then the swap pay-offs would amount to:

$$PS_t = \Delta CF_t (float) + \Delta CF_t (other\ debt) + \Delta CF_t (other\ stock) \qquad (24)$$

in this case, there should be economic value created by the investment project through that period.

(b) If net present value in (16) were negative, then the swap pay-offs ought to balance the gap between the financial side of the project and its net present value, that is:

$$PS_t = \Delta CF_t(assets) - RB_t = \Delta CF_t(assets) - \{ \Delta CF_t(interest)$$

$$+ \Delta CF_t(dividends) + \Delta CF_t(principal) \} \quad (25)$$

Hence, there would not follow any economic value added. In fact, this could convey actual destruction of company's value through that period. If (16) becomes negative, then the swap has to bridge the gap, by financing the investment project. But if (16) were negative it wouldn't follow that each component of its cash flow vector is less than zero. That's why it is convenient to highlight such a contingency straight down to components, period by period. If the investment decision is on the planning stage, the pay-offs could be zero. That means that the project is rejected. In this case, the swap would become assimilated to a single-period option that is not exercised.

From a financial engineering point of view, this performance swap takes after the customary interest rate vanilla swap, in which both counterstreams exchange floating indexes. The company and the investment project will play as counterparts. To conclude on this section, the swap present value comes as:

$$PV(PS; k) = \sum PS_t \times \langle 1 + k \rangle^{-t} = \sum \{ \Delta CF_t(float) + \Delta CF_t(other\ debt) +$$

$$+ \Delta CF_t(other\ stock) \} \times \langle 1 + k \rangle^{-t} \quad (26)$$

IX. Firm Valuation and Portfolio Approach

Through Sections VI to VIII, net present value was split up into present values coming from a revenue bond and a performance swap, for a given flat cost of capital rate. If we take into account the temporal structure of interest rates, we should need a vector

$$K = \langle k_1 ; k_2 ; k_3 ; ..... ; k_t ; ..... ; k_N \rangle$$

whose components stand for cost of capital rates, which can be assessed by temporal structure of rates of interest and credit risk premiums for bonds, and risk adjusting equilibrium model for stock. Hence, by means of (16), we reach:

$$F_0 = [\ \Sigma\ \{\ \Delta CF_t(interest) + \Delta CF_t(dividends) + \Delta CF_t(principal)\ \}\ \times$$

$$\times\ <1 + k_t>^{-t}] + \Sigma\ \{\ \Delta CF_t(float) + \Delta CF_t(other\ debt) +$$

$$+ \Delta CF_t(other\ stock)\}\ \times\ <1 + k_t>^{-t} \qquad (27)$$

The first summation symbol refers to the revenue bond inclusive of temporal structure of rates of interest. The second summation symbol conveys the performance swap inclusive of term structure as well. Both synthetic financial to be valued at t = 0. Next step consists of departing from the context of a single investment decision to reach to general case where the whole firm can be assimilated to a complex investment decision. Therefore, in the float model setting, the value of a firm V [E; k], comes up as:

$$V[E;k] = \Sigma_{1 \le t \le N}\ \ \Delta CF_t(assets)\ \times\ <1 + k_t>^{-t} \qquad (28)$$

and, by means of the float,

$$V[E;k] = \Sigma\ \{\ \Delta CF_t(debt) + \Delta CF_t(stock) + \Delta CF_t(float)\}\ \times\ <1 + k_t>^{-t}$$

If we profit from our development in Section VI, by using relationships [26]

$$V[E;k] = \Sigma\ \ \{\ \Delta CF_t(interest) + \Delta CF_t(dividends) +$$

$$+ \Delta CF_t(principal)\ \}\ \times\ <1 + k_t>^{-t} + \Sigma\ \{\ \Delta CF_t\ (float) + \Delta CF_t\ (other\ debt) +$$

$$+ \Delta CF_t\ (other\ stock)\ \}\ \times\ <1 + k_t>^{-t}$$

but here further qualifications have to be made on “other stock” and “other debt”. As we face the whole firm, we must bear in mind that now the cash flows directed to “other debt” reduces only to cash flows directed to “net new debt”:

$$\Delta CF_t \text{ (other debt)} = - \Delta CF_t \text{ (net new debt)} \tag{29}$$

This is easy to understand if we recall (18) for a single investment decision. In the context of the whole firm, payments and interest from standing debt allocate in the revenue bond because they are, as investment decisions, “assets-in-place”. Doing likewise with “other stockholders” and recalling (20):

$$\Delta CF_t \text{ (other stock)} = - \Delta CF_t \text{ (net new stock)} \tag{30}$$

summing up, we have:

$$V[E\,;\,k] = \sum \{\, \Delta CF_t \text{ (interest)} + \Delta CF_t \text{ (dividends)} +$$

$$+ \Delta CF_t \text{ (principal)} \,\} \times \langle 1 + k \rangle^{-t} + \sum \{\, \Delta CF_t \text{ (float)} -$$

$$- \Delta CF_t \text{ (net new debt)} - \Delta CF_t \text{ (net new stock)} \,\} \times \langle 1 + k_t \rangle^{-t} \tag{31}$$

in this way, the company’s value comes up as the net present value of both a revenue bond and a performance swap. In the first place, the bond’s present value measures the value from those actual cash flows which actually finance the company’s assets in place.

$$PV(RB\,;\,k) = \sum \{\, \Delta CF_t \text{ (interest)} + \Delta CF_t \text{ (dividends)} +$$

$$+ \Delta CF_t \text{ (principal)} \,\} \times \langle 1 + k \rangle^{-t} \tag{32}$$

In the second place, the performance swap measures the value from future investment projects that strategic decisions bring about through the float

management, and those cash flows going to other debt and other stock.

$$PV(PS\,;k) = \sum \{\ \Delta CF_t(float) - \Delta CF_t(net\ new\ debt) -$$

$$-\Delta CF_t(net\ new\ stock)\ \} \times \langle 1 + k_t \rangle^{-t} \qquad (33)$$

At this point, a reference to the Economic Value Added (EVA) model seems unavoidable, although among scholars there are mixed feelings about EVA qualifications. To get a picture on this issue, it sounds advisable to split up EVA's likely contributions into two directions: firstly, as a performance measure model, it provides managers with a suitable benchmark which has been successfully used, and abused, by them. Therefore, whether EVA's is good or bad becomes a matter of personal choice and convenience eventually. Secondly, as a valuation model, there is strong criticism from the scholars' field. Professor Damodaran (1999) acts as a remarkable representative of them when states in his paper "Value Creation and Enhancement" that EVA would convey nothing more valuable or innovative than cash flows valuations hadn't taken into account earlier.

X. Float Structure and Corporate Governance

As we established elsewhere, Apreda (1998, 1999a) the float exhibits a complex structure:

$$\Delta CF_t(float) = \Delta CF_t(sunk\ costs) + \Delta CF_t(strategic\ investments) +$$

$$+\ \Delta CF_t(fixed\ assets\ replacement) + \Delta CF_t(tight\ budget\ constraint) +$$

$$+\ \Delta CF_t(incentives) + \Delta CF_t(rate\ of\ interest\ risk) +$$

$$+\ \Delta CF_t(foreign\ exchange\ risk) + \Delta CF_t(commodities\ risk) +$$

$$+\ \Delta CF_t(credit\ risk)\ ) + \Delta CF_t(bonds\ covenants) \qquad (34)$$

Let us highlight its most important features, because they amount to corporate governance issues:

A. Sinking Fund for Sunk Costs: ΔCF_t (Sunk Costs)

Because sunk costs coming from any investment project are not incremental cash flows for that project, they should not be taken into account for that project valuation. How are sunk costs then financed? In recent Corporate Finance textbooks, we find this sort of statement as a rule of thumb: "it is the firm which funds any investment project sunk costs with the net present value from the succesful investment projects". It is the float the most suitable place to allocate this sinking fund.

B. Strategic Investment Decisions: ΔCF_t (Strategic Investments)

Strategic investment cash flows convey a manifold structure whose main components are:

$$\Delta CF_t \text{ (strategic investments)} = \Delta CF_t \text{ (future diversifications)} +$$

$$+ \Delta CF_t \text{ (future mergers and acqusitions)} + \Delta CF_t \text{ (future reorganizations)} +$$

$$+ \Delta CF_t \text{ (future capital investments)} + \Delta CF_t \text{ (going private decisions)} \quad (35)$$

All these items bring pressure to bear on strategic decisions and it is for the float to deal with them. The float, eventually, shows itself as the key for value enhancement. The "going private decisions" component means three main alternative choices: private placements of debt and stock, "delisting" standing debt or stock and, eventually, leveraged buy-outs. A useful discussion on private placements in the United States seems to be Carey et al. (1993).

C. Sinking Fund to Capital Assets Replacement: ΔCF_t (Fixed Assets Replacement)

It is a widespread practice to allow for fixed assets consumption by writing off periodic amounts from books as depreciation charges against each period. When the replacement time comes up eventually, it is assumed that a new investment project must be undertaken. Against the conventional wisdom, we should manage a sinking fund to match on due schedule any replacement need. Where may those resources come from? From the float, and by means of a portfolio of financial assets built up with float allocations. These cash flows, however, have nothing to do with the cash flows provisions to fixed assets for each period that the standard model requires as a way of planning maintenance of fixed assets in the realm of tactical decisions. Instead, we are interested here in strategic decisions regarding future capital budgeting.

D. Sinking Fund for Tight Budget Constraint: ΔCF_t (Tight Budget Constraint)

This is quite a sensitive float component to agency costs because managers may allocate their positive balances to substandard projects so as to avoid dividends distribution or, still worse, to get rid of the capital markets monitoring just in case good prospective projects were to be financed by debt issues. On the other hand, it would be a mistake to assimilate these strategic cash flows to those the standard model leaves aside to meet working capital needs for any period. A remark, likewise that we made on fixed assets replacement, seems sensible here. Furthermore, this sinking fund can be built out of a portfolio of financial assets.

Latest academic work highlights the consequences of soft budget constraint in corporate finance and mainly in newly privatized companies around the world, which bring about plenty of interesting agency problems. For instance, Lin-Tan (1999), Maskin (1999), work with transitional economies; Rajan and Zingales (1998) on the governance of the new

enterprise, also Apreda (1999c) on capital market and corporate governance in Argentina.

E. Sinking Fund for Management and Directors' Motivation through Issuance of Financial Assets: ΔCF_t (Incentives)

This item conveys a sensitive political meaning in corporate finance governance, mainly when the Board of Directors work on behalf of the CEO. Financial Engineering is frequently used to provide management with incentives. The main instruments are warrants over stock, convertible bonds, or selling of stock contingent upon performance. Still a good point for this issue is Barnea, Haugen and Senbet (1985). On corporate governance, Monks-Minow (1995) seems still to be the best from the active stakeholders' side. A provocative analysis on independent directors is provided by Clutterbuck and Waine (1994).

F. Risk Management: ΔCF_t (Interest Rate Risk), ΔCF_t (Commodities Risk), ΔCF_t (Credit Risk), ΔCF_t (Foreign Exchange Risk)

Either transactional or economic risk profiles threaten companies all around the world. This is a growing concern and commits huge volumes of traded financial derivatives to hedge financial risks. Awareness on risk management has been broadening as long as the economy becomes global and interdependent; a good source is Smith-Smithson-Willford (1995). Credit risk ought to be definitely regarded as a float component because likely changes in credit ratings can backfire on the company's expected cash flows.

G. Sinking Fund for Bonds Covenants: ΔCF_t (Bonds Covenants)

Covenants usually draw a boundary to management power, by limiting their decision making. We can give some examples to show the way this can

be accomplished: the company is not able to buy or sell certain assets, it can't enter in merger or acquisitions processes, it must keep some financial ratios within predetermined strips of values, it ought not to issue new bonds, it must not improve the incentives system, and so on. All these limitations hold true until bonds maturity, and are contingent upon debtholders further agreements. A useful survey on this subject is Smith-Warnes (1979). For the last two decades, private placements and institutional investors activism have included sinking funds when issuing bonds, aimed to play on the investors' safest side. Good research on private placement is to be found in Carey et al. (1993).

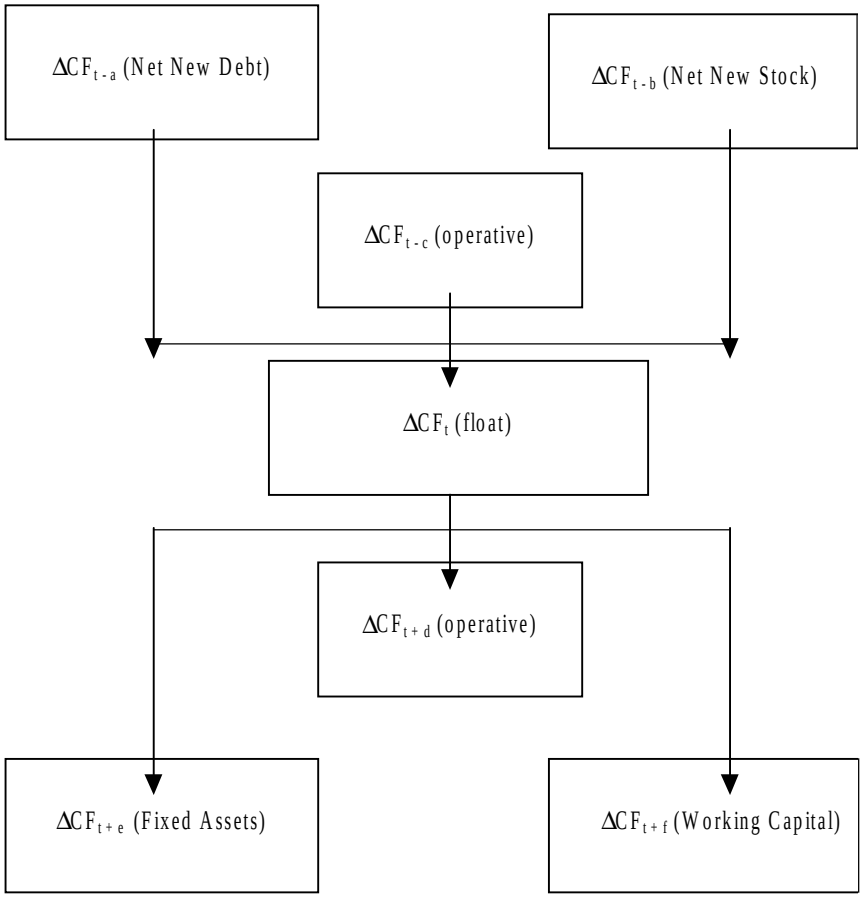
XI. Float Sources and Uses

Where do float components come from? Where do float components go to eventually? To uncover this dynamics we suggest to look upon the float as a strategic decision-making centre. As such, the float manages its own sources and application of cash flows, on intertemporal basis. Let us pick up an example, supposing we need to sink funds to meet a future asset replacement:

a) Cash flows from assets, exclusive of cash flows already committed to stakeholders, may provide us with resources to set aside for installments. That is to say, we would build up a sinking fund.
b) If that were not possible, we would draft a future allocation of resources by means of new debt or new stock issuances.

Last of all, there are many ways of building up floats. Two fully developed examples can be found in Apreda (1999a). Next figure shows the float sources and uses.

Figure 1. Float Sources and Uses



So as to include intertemporal features, some remarks must be made here on the notation used:

- t - a, t - b, t - c : they mean that ΔCF_t (float) could have been nurtured by decisions made in earlier periods. In case they were taken in the current period "t", we would have a = b = c = 0.

- $t + d$, $t + e$, $t + f$: they mean that ΔCF_t (float) could nurture decisions and assessments to be made in later periods. In case they were taken in the current period "t", we would have $d = e = f = 0$.

In latest valuation books, by free cash flows is meant a concept that defines "the amount of cash flows that the firm can distribute to security holders" (Benninga, page 36, 1997). This translates to cash flows brought about by assets, as (01) showed in the standard cash flow model from Section II:

$$\Delta CF_t \text{ (brought about by assets)} = \Delta CF_t \text{ (delivered to debtholders)} +$$

$$+ \Delta CF_t \text{ (delivered to stockholders)}$$

The internal structure of cash flows from assets were dealt in (10):

$$\Delta CF_t \text{ (assets)} = \Delta CF_t \text{ (operative)} - \Delta CF_t \text{ (working capital)} -$$

$$- \Delta CF_t \text{ (fixed assets)}$$

That is to say, free cash flows are what remains of cash flows from assets after making provision for working capital and fixed assets current requirements. This is the usual meaning as in up-dated valuation methodologies. Still others, like Bennett Stewart (1991), on the side of Economic Value Added (EVA) representatives, defines "free cash flows" as "cash from operations that are available or attributable to both lenders and shareholders". It's very close to the valuation analysts' meaning, if we make accurate amendments to working capital and fixed assets provisions. But it was Jensen (1986) the first to call attention to free cash flows as vehicles of agency problems. His definition amounts to "free cash flows are those cash flows in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital".

It's time to draw a comparison among these points of view and the cash float model with float:

- In the first place, Jensen spells out not the single period standard cash flow model but the intertemporal multi-stage standard cash flow model. In Benninga and Stewart approaches both the single and the multiperiodical model are suitable. As for the float model, we have seen it is well suited to both frameworks.
- In the second place, Jensen means not only assets-in-place but also future forecastable investments; these issues are not so clearly depicted in Benninga or Stewart, but quite well developed in Damodaran's latest papers and books (see References). Nowadays, it is broadly agreed that we need assess the value of the firm with these two dimensions in mind. As for the float model, the revenue bond takes care of assets-in-place, whereas the performance swap does its own job with not only forecastable investments fut other core decisions in corporate finance. Further, our portfolio approach allows for quantitative grounds on Jensen's free cash flows.
- Last of all, the cash flow model with float has a broader structure than those frameworks which were brought about within the standard cash flow model. On balance, if we closely look at (34) we will see that there is more leeway there so as to deal with governance issues than in the three approaches already surveyed.

XII. Agency Float and Arbitrage against the Model

From the preceding section, we know that the float sources are wider than those only provided by free cash flows which come out from operative cash flows. Taking the matter further, it seems sound as from now to call "agency float" any float managers set up revealing opportunistic behavior on behalf of their own interests. Although there is a wide variance in the

ways managers bring about their agency floats, we are going to show the most direct one, through the following float components as in (34):

$$\Delta CF_t \text{ (sunk costs)} + \Delta CF_t \text{ (fixed assets replacement)} + \Delta RM_t \text{(rate of interest)} +$$

$$+ \Delta RM_t \text{ (foreign exchange)} + \Delta RM_t \text{ (commodities)} \quad (36)$$

because their amounts are likely to be swapped with the following components:

$$\Delta CF_t \text{ (strategic investments)} + \Delta CF_t \text{ (tight budget constraint)} +$$

$$+ \Delta CF_t \text{ (incentives)} \quad (37)$$

in this way, the managers' float becomes eventually:

$$\Delta CF_t \text{ (agency float)} = \Delta CF_t \text{ (strategic investments)} +$$

$$+ \Delta CF_t \text{ (tight budget constraint)} + \Delta CF_t \text{ (incentives)} \quad (38)$$

Remembering here the internal structure of strategic investments cash flows as stated in (35), we can foresee the variety of agency problems this item really conveys:

$$\Delta CF_t \text{ (strategic investments)} = \Delta CF_t \text{ (future diversifications)} +$$

$$+ \Delta CF_t \text{ (future mergers and acqusitions)} + \Delta CF_t \text{ (future reorganizations)} +$$

$$+ \Delta CF_t \text{ (future capital investments)} + \Delta CF_t \text{ (going private decisions)}$$

It should be borne in mind that we have chosen only one representation of the agency float, among a broad set of likely choices, which stem firstly

from items in (34), to be included in (36) and secondly from new debt or stock sources.

The Arbitrage against the Model:

The agency float really conveys an arbitrage against the model. In fact, when managers hold the floor and contrive the cash flow model with float on behalf of their own interests, they are setting up a synthetic portfolio with the following features:

a) No up-front personal investment is required.
b) In the very short-term, risk is kept negligible.
c) Positive returns are expected from that portfolio, conditional on the agency managers currently picked up.

But this is a conditional-expectations financial arbitrage, as in Goetzmann (1998). In other words, agency problems which arise when dealing with cash flows floats can also be regarded as a process of arbitrage against the float model. By matching the normative float in (34) with the agency float in (38) the gap can be operationally handled. Such is the task the normative model will address.

XIII. The Normative Float Model

We have got the float model so far and it's time then to make it work on operative grounds. We should build up a device to deal with agency problems. The float model will provide the benchmark from which to measure the gap between the agency float with the float model. Furthermore, we require a procedure to curb the arbitrage against the model the managers might successfully have boiled down. We are going to call "normative float model" the following system:

A. The Cash Flow Model with Float.
B. The Accountability Precept
C. A twofold negotiation process

The float model has already been fully developed. Let's go to the rules for an accountable behaviour on the managers side.

B. The Accountability Precept:

We propose this precept as a way of including a set of requirements to be met by managers when planning and submitting to the Board of Directors their strategic and operational expected cash flows for incoming periods.

- Definition of the planning horizon and valuation periods must be advanced. Furthermore, each variable coming into the cash flows should be specified and fully explained.
- Relevant information might be provided to Directors and appointed consultants, in order to reproduce and analyse all the assessed cash flows.
- Assumptions and computation methodology of cost of capital, cost of debt and expected stockholders return should be developed and made explicit.
- Valuation models chosen by managers have to be identifiable and their assumptions uncovered.
- Strategic and planning goals should hold true not only by a judicious use of financial forecasting models but by full disclosure of managers conditional expectations on future cash flows.
- Agency relationships should be duly tested within the framework of goals consistency, competitive purposes and budget feasibility.

C. The Twofold Negotiation Process:

Who should set up the normative model? The Board of Directors, definitely. However, it seems a sound procedure to strenghten its implementation with the help of an arbitrator. The role of an arbitrator should be laid on auditing firms, financial consultants, notaries, law firms, or some regulatory agency.

Managers' arbitrage against the model triggers off negotiations between the Board of Directors and the Management alongside two stages.

Stage 1: Board of Directors ex-ante negotiations with the management

The float structure is agreed on ex-ante basis with the management. It must be a careful process, taking into account that real life contracts are unavoidable incomplete. Furthermore, as participants handle imperfect information and their behavior becomes opportunistic, moral hazard, adverse selection and signalling are likely to arise at this stage.

Stage 2: Board of Directors ex-post negotiations with the management

As time passes by, any discrepancy between the Normative Model and the agency float as used by managers, ought to be explained:

i. Either from sound and reliable decisions which managers may have taken after the first stage finished. These events would convey noncontestable changes in the Normative Model.
ii. Or by agency allocations of cash flows on behalf of managers interests, and this should trigger off unavoidable negotiations with management. Further action may include arbitrator performances, preventive safeguards, stockholders activism, perhaps brinkmanship between the Board and the managers, and full conflict eventually.

X. Conclusions

The prevailing Standard Cash Flow Model shows an inherent flaw: it claims that the whole of cash flows from assets should be distributed between debtholders and stockholders period after period. Unless we could remove such apparent shortcoming, we wouldn't be able to deal with core financial decision making, such as incentives, future investments, reorganization, sunk costs, capital assets replacement, risk management, mergers and acquisitions, just to give a short account from the many items usually involved.

The Cash Flow Model with Float overcomes such a flaw, bringing leeway to cope with core financial decision making, within an intertemporal framework. The model shows how any investment decision (and to a further degree, any company valuation) can be regarded as a portfolio built upon a revenue bond and a performance swap. The revenue bond cares for the investment decision financing. The performance swap lies behind the likely value enhancement provided by the project. When addressing firm valuation the revenue bond takes charge of assets in place and the swap is a value driver. It is within the performance swap where we have showed that the float handles value enhancement and deals with agency problems.

We have exhibited the complex structure that the float conveys so as to make easier the task of dealing with facts and figures. In the paper, the float shows itself as a decision making centre, managing an active dynamics between sources and applications of expected cash flows.

To spell out the consequences on float cash flows from managers' decisions, a normative float model is presented which blends the float model with a normative accountability principle. It is when we compare those cash flows produced by the managers' opportunistic behavior with the cash flows stated by the normative float model, that we can make explicit the managers' financial arbitrage against the float model. Agency costs are diminished when direct negotiations take place between the Board of Directors (or appointed trustees, or external mediators) for one side, and managers for the other.

They must attempt to bridge the gap between both agency and normative floats.

Last of all, auditors, analists, Investment Banks, Risk Rating Agencies, and control agencies, also can diminish agency costs by means of capital markets disciplinary mechanisms. By using this model, operative bond covenants might be drafted either in public or in private offers.

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