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INCREMENTAL CASH FLOWS, INFORMATION SETS
AND CONFLICTS OF INTEREST

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Abstract

This paper attempts to make of the standard incremental cash flow model (SICFM) a functional vehicle for coping with conflicts of interest. After outlining the model, residual rights to cash flows are linked to residual risks. Then, the underlying information sets to cash flows are brought to light, stressing the nurturing factors behind conflicts of interest: bounded rationality, asymmetric information, opportunistic behavior and transaction costs. Next, decision rights and organization forms are included into the frame of the paper. Finally, the core subject section shows how incremental cash flows come in handy to root out conflicts of interest, firstly by disclosing the residual information sets that divide managers, stockholders and creditors and, secondly, by advocating the design of ex-ante restrictive covenants on the uses and sources of incremental expected cash flows.

JEL: G30, G32, G34

Key words: cash flow, conflict of interest, information set, residual rights

INTRODUCTION

The expression “conflict of interest” refers to such a broad semantic range that the Oxford Dictionary depicts it as “a situation in which there are two jobs, aims, roles, etc. and it is not possible for both of them to be treated equally and fairly at the same time”. In particular, Finance primarily deals with conflicts of interest that arise from environments in which at least two related parties nurture a disagreement that will evolve out of what they are expected to deliver into what one of them, at least, actually intends to deliver. Narrowing down the subject even more, it’s worth trying to understand those distinctive conflicts that take place in organizations, mainly between managers and finance providers.

For the last thirty years, Agency Theory (Ross, 1973; Jensen-Meckling, 1976; Fama, 1980) has been laying a fertile groundwork to analyze frequent types of conflicts of interest stemming from “principal-agent” relationships. There are other types of conflicts, however, that agency theory cannot handle successfully. For instance, when two blocks of stockholders are in conflict of interest, no enforceable agency relationship makes clear what is falling down between them. Different bond issues can bring about disparate bondholders constituencies with such divergent concerns that no straightforward linkage with agency would clear up a plausible explanation. Even among members of the Board of Directors, or in high management tiers, conflicts of interest come up without being related to agency issues, but stemming from a clash in personal agendas. Finally, the latest venture capital literature shows how multiple principal-agent environments make the agency approach not the most suitable one to give account of many pervading conflicts of interest (Gompers-Lerner, 1999). It is not surprising that complementary theoretical endeavors have evolved since the 70s to widen the scope and understanding of this subject, mainly the transaction costs economics (Williamson, 1996), the contractual point of view (Hart, 1995, 2001; Easterbrook-Fischel, 1991), the institutional approach (North, 1981, 1990), and the search of new foundations for Corporate Finance (Zingales, 2000).

On the other hand, for the last decade current textbooks in Corporate Finance have given plenty of room to the incremental cash flow model. (Benninga-Sarig, 1997; Damodaran, 1996, 2001; Ross et al., 1999), because it has come in handy for working out investment projects, financial assets, companies valuation, even corporate governance problems (Apreda, 2002).

This paper attempts to make the incremental cash flow model functional when dealing with conflicts of interest as long as the underlying information sets of participants may be brought to light. The proposal is set through five stages:

Section 1 will outline the standard incremental cash flow model. In section 2, residual rights to cash flows and residual risks are introduced and distinguished from each other. It is for section 3 to address the issue of residual rights and organization forms. Section 4 shows the conditioning of cash flows to their underlying information sets. Section 5 expands on conflicts of interests to be tracked from the standard incremental cash flow model and the underlying information sets that managers, stockholders and creditors put to use whenever they deal with each other, setting forth the convenience of restrictive covenants on the uses and sources of expected incremental cash flows. Last of all, conclusions will follow.

1.- THE STANDARD INCREMENTAL CASH FLOW MODEL

The so-called Standard Incremental Cash Flow Model (as from now SICFM for short) states that, for any period $[t ; t + 1]$, it holds true that incremental cash flows furnished by assets at the end of such period, are to be distributed between stockholders and creditors:

$$\mathbf{DCF}_t(\text{assets}) = \mathbf{DCF}_t(\text{creditors}) + \mathbf{DCF}_t(\text{stockholders}) \quad (1)$$

In other words, (1) brings forward that debt holders and stockholders have cash flows rights on the residual income of any company.

Remarks:

- The term " $\mathbf{DCF}_t(\text{assets})$ " stands for "change in cash flows from assets throughout the period $[t ; t + 1]$ ". By period we understand any length of time (either months, semesters or years) that becomes suitable for the analysis.
- Incremental cash flows may be either positive or negative.
- Cash flows valuation in (1) is ex-post, whereas ex-ante valuation will be handled later in (7).

Although (1) bears a resemblance to the accountancy identity between assets and liabilities, stress should be laid on two things: firstly, that it refers to flow and not stock variables as used in the balance sheet statement and, secondly, that changes in assets have a distinctive meaning rooted in financial assumptions that will be developed below. (Appendix 1 shows how to make explicit the linkage between the SICMF and the financial statements currently used in Accountancy).

To begin with, cash flows to debt holders are usually split down into the following components: (2)

$$\begin{aligned} \mathbf{DCF}_t(\text{creditors}) = & \text{interest}_t + \text{debt repayment}_t + \\ & + \text{debt repurchase}_t - \text{new debt issues}_t \end{aligned}$$

and cash flows to be passed onto stockholders exhibit this structure: (3)

$$\mathbf{DCF}_t(\text{stockholders}) = \text{dividends}_t + \text{stock repurchase}_t - \text{new stock issues}_t$$

It can be seen from (2) and (3) that cash flows directed either to creditors or owners are positive (outflows) and whenever the company finance itself with new issues cash flows become negative (inflows, from creditors or stockholders toward the company). Debt and stock buybacks, on the other hand, are positive since former claims are retired and cash flows delivered to claimants.

Remarks:

- If there were preferred shares, then (01) would be read

$$\mathbf{DCF}_t(\text{assets}) = \mathbf{DCF}_t(\text{creditors}) + \mathbf{DCF}_t(\text{ordinary stockholders}) + \mathbf{DCF}_t(\text{preferred stockholders})$$

- A nearly alike procedure holds for any outstanding lease, medium- and long-term bank loans, mortgages, convertible bonds, or preferred convertible stock. On these grounds, it seems more comprehensive to use "creditors" instead of "bondholders", although this latter term is sometimes favored in current textbooks. Background on stock and debt valuation is available either in Elton-Gruber (1995), or Damodaran (1996).

Cash flows from assets are the other side of the coin and breaking down its main components results in

$$\mathbf{DCF}_t(\text{assets}) = \mathbf{DCF}_t(\text{operations}) - \mathbf{DCF}_t(\text{working capital}) - \mathbf{DCF}_t(\text{fixed assets}) \quad (4)$$

while cash flows from operations are defined

$$\mathbf{DCF}_t(\text{operations}) = Ebit_t - taxes_t + depreciation_t \quad (5)$$

where $Ebit_t$ stands here for "earnings before interest and taxes", $\mathbf{DCF}_t(\text{working capital})$ for additions to working capital, and $\mathbf{DCF}_t(\text{fixed assets})$ for incremental capital spending. (Appendices 2 and 3 enlarge upon some issues relevant to the inner structure of cash flows from assets). It must be borne in mind that the SICFM assume that short-term finance is embedded into $\mathbf{DCF}_t(\text{working capital})$ since it performs like an incremental current liability, while interest payoffs of short-term debt get their place in $Ebit_t$, as a matter of course.

Although cash flows from operations (5) measure up free resources after meeting taxes and adding depreciation charges (which are not actual outflows), it would be nonsensical to distribute (5) without taking care not only of working capital but capital investment requirements as well. For instance, we must provision for inventories, receivables and payable accounts so as to cater for working capital needs in (4). Also, fixed assets maintenance, the selling of outdated or obsolete machinery, the buying of strategic fixed assets, are all investments that keep the company running or add up to its competitive edge. Therefore, (4) conveys the residual pay offs to be distributed, which leads to a meaningful query: how do final claimants endure the underlying risk that is at the core of cash flows from assets?

2.- RESIDUAL RIGHTS TO CASH FLOWS AND RESIDUAL RISKS

That cash flows rendered by assets exhibit a residual nature is thoroughly displayed in (4) and (5). On the other hand, contractual liabilities grant that creditors must be paid before the company addresses the owners' claims. Besides, when in financial distress the company may be forced to selling off its assets to pay creditors, and only if something remained it could be directed to owners.

Hence, *stockholders get access only to residual rights on cash flows from assets*. This can be seen in (1) by isolating the owners' rights to cash flows:

$$\mathbf{DCF}_t(\text{stockholders}) = \mathbf{DCF}_t(\text{assets}) - \mathbf{DCF}_t(\text{creditors}) \quad (6)$$

As a rule, it is up to stockholders to trade off ownership and voting rights against cash flows that are contingent by nature onto the company's performance. Nonetheless, they are entitled to residual rights of net cash flows for the life of the organization.

With regard to residual rights to cash flows, so far so good. But cash flows from assets in (4) are risky, because uncertainty in the world of business comes as a fact of life. This leads to a substantive matter: how do both creditors and owners partake in the risks of residual cash flows?

The answer will proceed in stages. Firstly, the risky nature of the incremental cash flow model is put forth. Secondly, residual risks are matched with stockholders' residual rights to cash flows.

a) Changes in cash flows are predicated along the whole period $[t ; t + 1]$. Therefore, the standard model gives way to both ex-post and ex-ante types of assessment. Most of the time, decision-makers in Finance resort to an ex-ante format, which turns the cash flows into random variables. If the valuation moment is date " t ", then expected cash flows values are:

$$E[\mathbf{DCF}_t (assets)] = E[\mathbf{DCF}_t (creditors)] + E[\mathbf{DCF}_t (stockholders)] \quad (7)$$

Since cash flows are risky, there will be discrepancies between expected values at the beginning of the period and the ones achieved in the end, namely

$$\begin{aligned} & \mathbf{DCF}_t (assets) - E[\mathbf{DCF}_t (assets)] = \\ & = \mathbf{DCF}_t (creditors) - E[\mathbf{DCF}_t (creditors)] + \mathbf{DCF}_t (stockholders) - E[\mathbf{DCF}_t (stockholders)] \end{aligned} \quad (8)$$

Remark:

- Risk can be appraised by means of the variance or standard deviation of the underlying stochastic variables in (1). If we did so, we would employ (8) to get

$$\begin{aligned} & \mathbf{s}^2 [\mathbf{DCF}_t (assets)] = \mathbf{s}^2 [\mathbf{CF}_t (creditors)] + \\ & + \mathbf{s}^2 [\mathbf{DCF}_t (stockholders)] + 2 \text{cov} [\mathbf{DCF}_t (creditors); \mathbf{DCF}_t (stockholders)] \end{aligned}$$

That is to say, cash flows from assets are risky firstly because so are the cash flows to debt holders and stakeholders and secondly, since there is a joint risk that they share eventually. And the same could be stated if we worked out the risk of cash flows from assets taking into account (4) and (5). More details and background on this matter can be found in Appendix 4.

b) Risk in cash flows to stockholders shows a distinctive financial feature that becomes apparent when matching (6) and (7):

$$\begin{aligned} & \mathbf{DCF}_t (stockholders) - E[\mathbf{DCF}_t (stockholders)] = \\ & = \mathbf{DCF}_t (assets) - E[\mathbf{DCF}_t (assets)] + \mathbf{DCF}_t (creditors) - E[\mathbf{DCF}_t (creditors)] \end{aligned} \quad (9)$$

Uncertainty seems inherent in cash flows brought about by assets, because we never now in advance, at date " t ", how well or badly the company will make through the planned investment horizon. On the other hand, payments to debt holders are less risky in general because they are contractual and more easily assessed. Having said that, failure in payment would take the company to reorganization, seizure by creditors, even to court or bankruptcy. This would be the

reason why creditors are to be paid to bear the risk of default, and their exposure matches up only with the amount of the loan (Posner, 1998). Hence and by (9):

*Stockholders are the ones to bear with the risk of the residual cash flows from assets, becoming so the **residual risk bearers**.*

To a greater extent, this feature proves to be a consequential matter in valuation, capital structure and corporate governance.

3.- CONDITIONING CASH FLOWS TO THEIR UNDERLYING INFORMATION SETS

If the valuation date is " t ", then the SICFM in (1) becomes translated by (7)

$$E[\mathbf{DCF}_t(\text{assets})] = E[\mathbf{DCF}_t(\text{creditors})] + E[\mathbf{DCF}_t(\text{stockholders})]$$

There are manifold applications of this format to Financial Analysis. In fact, this paper attempts to provide with a new one to get a handle on conflicts of interest.

Most of the time, changes in cash flows from assets are within the scope of managers' control. As soon as we let managers enter the cash flow model to join creditors and stockholders, a stage for conflicts of interest is set up, because the main actors are confronted with different purposes, expectations and ideas about the best way of dealing with cash flows, mainly their assessment, final distribution and risk bearing. It is precisely because their differences do matter that the notion of information set seems relevant.

*By **Information Set** for any economic actor " e " at date " t " is meant all the available information he can assess up to that date.*

We denote such set

$$\mathbf{W}(t; e)$$

and the fact that past information up to that date is stored in the current information set can be translated by the condition:

$$\mathbf{W}(t-j; e) \subset \mathbf{W}(t; e) \quad ; \quad j: 1, 2, 3, \dots$$

It goes without saying that "economic actor"(or agent) stands for both individuals and organizations.

Remarks:

- *If markets were efficient in Fama's sense, information sets would be identical for all economic agents. But this is not granted in the real world and, therefore, inefficient markets have become a worthy field of study (Shleifer, 2000).*

- *Contrasting an ideal economy where there is perfect information with another one endowed with imperfect information only, Goldman and Sosin (1979) established a simple and interesting measure of market inefficiency.*

When an economic actor turns to the cash flow model (7), he is only able to appraise a heap of expectations that are grounded on his information set at date " t ". That is to say, (7) is conditional to the economic actor underlying information set. Formally,

$$\begin{aligned} & E[\mathbf{DCF}_t(\text{assets}) ; \mathbf{W}(t; e)] = \\ & = E[\mathbf{DCF}_t(\text{creditors}) ; \mathbf{W}(t; e)] + E[\mathbf{DCF}_t(\text{stockholders}) ; \mathbf{W}(t; e)] \end{aligned} \tag{10}$$

Remark:

- *Sometimes, the conditionality of the variable X upon its underlying information set is denoted with a forward slash*

$$E[X \oslash \mathbf{W}(t; e)]$$

but it seems more helpful the vectorial notation, following a widespread usage in modern mathematics. (Apreda, 2000c)

In a world without conflicts of interest, stockholders, creditors and managers would agree on (10) outright. Furthermore, they would likewise assess how cash flows are produced and distributed. Moreover, all of them would pursue their self-interest, which will help each other to attain their own, in a sort of anonymously cooperative enterprise. Finally, any of them would regard contracts fully enforceable, costlessly designed and easily monitored. Unfortunately, this environment has invariably being contested in real world settings.

Having said that, what the economic agent actually reaches at date " t " is usually an imperfect information set:

$$\mathbf{W}(t; e)$$

that conveys four striking features in everyday life:

- i) both individuals and organizations get only restrained admittance to the available information;
- ii) two or more parties gain access to dissimilar information sets;
- iii) any economic agent may be enticed into trespassing relationships, contracts or legal constraints;
- iv) meaningful usage of information sets cannot be achieved unless the related parties endure and go through a great variety of costs embedded in their transactions.

To reach a discerning understanding of these four consequences, we have to delve into sensible explanations. They will be, namely, bounded rationality, asymmetric information, opportunistic behavior and transaction costs. (From here to the end of this section, we are going to take advantage of an earlier paper where we focused on what we called " the brokerage of asymmetric information " (Apreda,2001a)).

3.1. *Bounded Rationality*

As for gaining access to information sets, either time or effort spending seems unavoidable.

Bounded rationality refers to the manifold costs that arise whenever the economic actor looks for, finds out, gather, processes, organizes, evaluates, stores, makes meaning use of, or trades with information.

It was Herbert Simon (1947) the first to install this subject as academically relevant, giving rise to the Bounded Rationality Approach. Since models of bounded rationality are grounded on the idea of scarcity, they deal with human cognition like a scarce resource. Furthermore, deliberation about an economic decision is also a costly activity in which the decision maker tries to achieve a balance between the benefits of better decisions and the cost of additional allocation of effort to the decision-making process. (This topic is extensively developed in Conslisk, 1996).

The main concern with bounded rationality for the analysis of conflicts of interest lies on the fact that contracts are in practice not only incomplete but costly to monitoring and enforcement. In other words, drafted contracts are not able to foresee all the contingencies, courses of actions and consequences.

3.2. *Asymmetric Information*

While exchanging goods and services among them, economic actors and their intermediaries jointly engage in a twofold process (Apreda, 2001a):

- the actual trade of goods, services, securities, or derivatives contracts on goods and securities;
- a virtual exchange of smaller subsets of their information sets so as to bind both parties within the boundaries of their common knowledge.

This process leads to the issue of asymmetric information. In fact, let us suppose that agent "k" (the principal, a company owner for instance) is about to offer a contract to "s" (the agent, a manager for instance). In other words, they exchange compensation granted by "k" for effort, proficiency and a fiduciary role promised by "s". In order to do so, they share information, but only to a certain extent, as it is depicted in picture 1. That is to say:

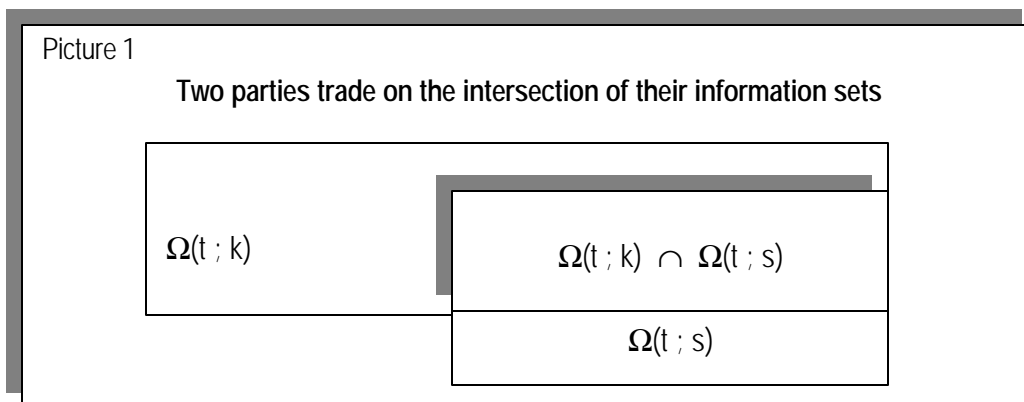
$$W(t; k) \neq W(t; s)$$

Although this feature should not prevent counterparts from rounding off their transaction, a new development arises. One of the parties may take advantage of not-shared information on behalf of his own interest to the extent of getting much more from his counterpart than it would have been the case if that private information had been shared.

Asymmetric Information refers to the advantage one party can enjoy by having different information than his counterpart, so as to improve either from the trade or the relationship for his own benefit.

Picture 1 conveys the main idea. Both agents share some information for sure, as we can see in the subset of common knowledge $\Omega(t; k) \cap \Omega(t; s)$, but they also have information that remains hidden or non-accessible to each counterpart. In this case, we can point at two subsets that are private information regions: agent “k” keeps nonshared information for himself, and the same can be predicated on the agent “s” likely behavior.

Why would the economic agent take profit of nonshared private information, rendering in that way conflict of interests? The answer lies on opportunistic behavior.



3.3. *Opportunistic Behavior*

It is a tenet of Economic Analysis that agents behave so as to fulfill their self-interest (Adam Smith, 1777).

*When we think that agents perform their goals in a world of future commitments and uncertainty, the concurrence of self-interest and the likelihood of breaking promises to deliver goods, services, efforts or payments in the future, both lead to **Opportunistic Behavior**.*

If one party knew something that the other did not, that party may willingly distort, misrepresent or not disclose such information on his own benefit, what amounts to self-interest with guile. Opportunistic behavior can follow even without asymmetric information (pilfering and shirking at the workplace being current examples), albeit asymmetric information often seems a driver for opportunism.

Asymmetric information does, in fact, provide with advantage to its holder, and explains a lot of things about market intermediaries (see, for instance, Demsetz, 1968 or Spulber 1996). Arbitrageurs and speculators, for instance, take profit in markets from their superior information sets, without necessarily impairing counterparts' property rights or fostering conflicts of interest. This example proves that asymmetric information is not a sufficient condition for opportunism. Smart economic actors playing in the markets grab opportunities and reap the gains of the trade without becoming opportunistic eventually.

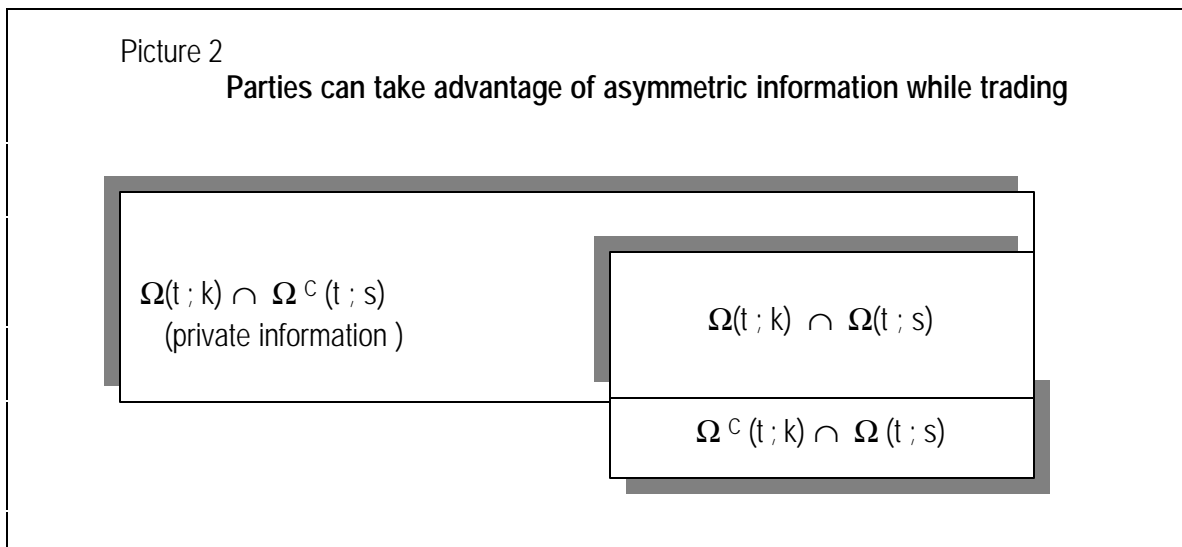
To make precise the boundaries between “smart” behavior of well informed economic actors and “opportunistic” behavior, Williamson and others add to the latter a further qualification by means of the phrase “with guile”, that is, the use of clever but dishonest behavior in order to deceive other people.

Picture 2 deploys the fact that, if opportunistic behavior were to take place, it would come out of the “private domains” within those information sets that each actor keeps under wraps:

- i. for the economic agent “k”, it is the subset $\Omega(t ; k) \cap \Omega^c(t ; s)$, which reads as “ the points in the information set $\Omega(t ; k)$ not shared by the set $\Omega(t ; s)$ ” (background on this set operation is given in Appendix 5)
- ii. for the economic agent “s”, it is the subset $\Omega^c(t ; k) \cap \Omega(t ; s)$, which reads as “ the points in the information set $\Omega(t ; s)$ not shared by the set $\Omega(t ; k)$ ”.

Summing up, the region where most of conflicts of interest arise consists of both information sets excluding their intersection. This amounts to what in Mathematics is called the “symmetric difference set” (See Appendix 5 for a reminder). That is to mean:

$$W(t ; k) \ominus W(t ; s) = [W(t ; k) \setminus W^c(t ; s)] \dot{\cup} [W^c(t ; k) \setminus W(t ; s)]$$



Remarks:

- It can be argued that one party may even perform opportunistically in the intersection of both information sets. Although this event is a likely one, for instance when one party behaves in a stupid way, bounded rationality would rule out this outcome most of the time.
- Mathematical foundations for the structure of information sets, based on rings and algebras of sets, can be found in Apreda (2000c).

Generally speaking, we must bear in mind that some of these single and private subsets, may convey information not relevant for the trade. It is what remains of those subsets, however, that nurtures different kinds of knowledge pertaining any trade, as represented in picture 3:

- i. Not every piece of information included in the information set of the agent "k" is actually needed for a particular transaction. Hence, we can isolate at date " t " pieces of information not relevant for the trade:

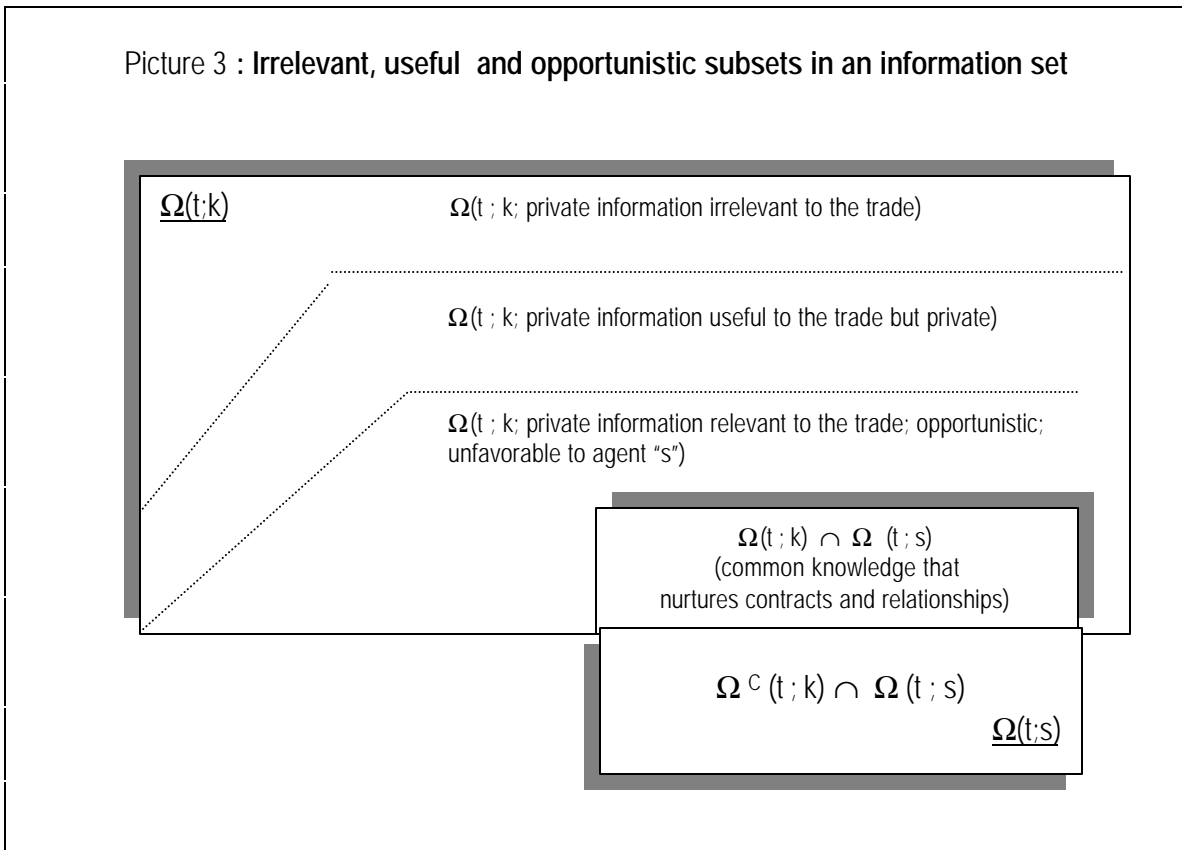
$$\Omega(t ; k; \text{irrelevant to the trade})$$

- ii. Next, useful information for the party but not harmful towards the counterparts interest (namely, know-how, expertise, professional qualifications, customers and advisers networks, reputation) is found in the subset

$$\Omega(t ; k; \text{useful to the trade but private})$$

- iii. Finally, useful information for the party, but the sort of which conveys impairment or damage to the counterpart's interest is included in

$$\Omega(t ; k; \text{relevant to the trade; opportunistic; unfavorable to agent "s" })$$



3.4.- *Transaction Costs*

The Transaction Costs Approach matches bounded rationality with self-interest-seeking, even to the extent that rules or contracts might be trespassed, often with guile. It also recognizes that any time economic agents behave opportunistically they may disclose information only to their own advantage, by selecting and distorting it within broad contexts of personal agenda and agency misdeeds.

Williamson (1996) defines transaction costs this way:

"The ex-ante costs of drafting, negotiating and safeguarding an agreement and, more especially, the ex-post cost of maladaptation and adjustment that arise when contract execution is misaligned as a result of gaps, errors, omission, and unanticipated disturbances. Also it refers to the costs of running the economic system."

Nevertheless, to regard the economic agent behavior as the main source of transaction costs may be misleading, because institutions and technology have a conclusive say in the ultimate size of transaction costs (North, 1990). Hence, a broader outline should include intermediaries (Spulber, 1999) and also encompass important cost components like trading, information, taxes, financial and microstructure costs (Apreda, 2000a, 2000b)

4.- **DECISION RIGHTS, AGENCY PROBLEMS AND ORGANIZATION FORMS**

Focusing on contracts has allowed economists to understand much better how decision-making, organization forms and residual rights may be joined together. It seems relevant for the purposes of this paper to outline firstly the separation of decision rights and, secondly, the linkage between organization forms and the allocation of residual rights. In between, agency problems are briefly reviewed because they amount to a pervasive by-product of organization design and decision rights allocation.

4.1. *Separation of management and control decision rights*

The advantage of breaking decision rights into managerial and controlling rights to explain the survival of organizations, was a key point widely researched by Hart (1995,2001), Williamson (1996), Fama and Jensen (1983b). As a matter of fact, it was predicated that decision-making processes in organizations go through four stages:

- *Initiation*: proposals are set forth about the best ways of using available resources and designing contracts.
- *Ratification*: proposals are chosen for implementation
- *Implementation*: those proposals that were ratified are brought forth into execution
- *Monitoring*: it comprises following up, auditing, appraising, rewarding or punishing decision-makers upon their performance

While initiation and implementation fall under the scope of managers (endowing them with management rights), ratification and monitoring are kept within the boundaries of decision controlling committees (hence granted with control rights, and fiduciary duties as with the Board of Directors). As soon as the complexity of an organization makes advisable to deal this way with the allocation of decision rights, it is said that management and control are separated.

In the life of corporations, control in the hands of shareholders through the Board of Directors seems the key to the protection of their residual rights. However, as Zingales (2000) points out, organizations in general, and corporations in particular, may be currently evolving toward a new format of control by which the protection of residual rights turns out to become not only a concern to shareholders, but to other stakeholders in the organization as well (employees, creditors, government, communities, suppliers and even customers)

4.2. *Agency Problems*

Agency relationships stand out among the major determinants that shape the structure of any organization and their distribution of decision rights. They consists of the following features:

- i. there are two parties: a principal (one or more) and an agent (one or more);
- ii. the agent commits effort and proficiency so as to work on behalf of the principal's interest;
- iii. the principal promises a compensation and incentives for the agent to fulfill his commitment;
- iv. the relationship is grounded on a contract, either formal or informal.

A wide variety of sources can bring about problems to this relationship, usually labeled "agency problems". Particular stress must be laid on the following sources:

- Incomplete and costly contracts that arise from bounded rationality and transaction costs.
- Drafting, enforcement and monitoring tasks that are hindered by asymmetric information and opportunistic behavior.

Within for-profit organizations, agency problems are rooted in conflicts of interests among owners, managers and creditors that evolve from the normal running of the company to the extent of financial distress (background on this subject in Jensen-Smith, 1985).

In the basic setting, we find the shareholders expecting that their agent managers (officers and directors) service the firm's debt and set up a growing residual value for its owners. Creditors, on their own, have lower risks linked to their property rights than owners. Managers have contractual duties to creditors but fiduciary duties toward their principals (where the term fiduciary stands for acting on behalf of the interest of the principal as if agents were promoting their own interests). But if a company became financially distressed and insolvency threatened, managers' fiduciary duties would shift away from value enhancement owed to shareholders, toward preserving value for creditors. In this environment, corporate assets are regarded as a trust fund for the benefit of the creditors.

4.3. *Organization forms and residual rights*

The restrictions that contracts, bylaws, and internal rules of the game, impose to holders of residual rights actually hinge on which organization forms are available to them. Furthermore, residual rights also depend on the law and legal conventions of each nation within which companies run their operations.

The main examples of the relationship between organization forms and residual rights are outlined in the table below.

| ORGANIZATION FORMS AND RESIDUAL RIGHTS | |
|---|--|
| Form | Features |
| <i>Single Proprietorship</i> | The entrepreneur is at the same time his manager and the owner, bearing all the residual risks and losses. What is more, he faces unlimited liability for his debts, but enjoys all his gains. |
| <i>Limited Liability Company</i> | Shareholders are liable only to the extent of the face value of the shares they own. Size and capital structure will shape the breadth of shareholders residual rights. It is a well-established organization form among firms of small and medium size around many countries and from the 90's in the United States. It blends features found both in limited corporations (limited liability) and partnerships (tax pass-through). (Bainbridge, 2001) |
| <i>Open Corporations</i> | They issue common stock, with limited liability. Stockholders become residual risk bearers, with a claim on residual rights to cash flows, and voting rights. Those claims are the least restricted: they become easily traded, have unlimited life, and stockholders do not have to perform any duty within the organization. It is said that corporations are legal fictions, distinctive and separate from their owners, having rights, duties and privileges of an actual person. There is a clear separation of management and control decision rights. (Easterbrook-Fischel, 1991) |
| <i>Closed Corporations</i> | The main difference with an open corporation is that here residual claims are largely restricted to internal decision agents. So, there is much less separation between management and risk bearing with control than in open corporations. In general, they have relatively few managers and they are usually the largest residual claimants. (Easterbrook-Fischel, 1991) |
| <i>Limited Partnerships</i> | Some partners' liability is limited to their contribution to capital, and they usually are not engaged with the running of the business. However, liability of other partners is unlimited, and they become working partners. Limited partnerships are registered and have limited life. Examples are found either in venture capital investment firms, research and development partnerships, and real estates companies. (Demirag, 1998; Gompers-Lerner, 1999; Klausner-Litvak, 2001) |
| <i>Professional Partnerships</i> | Residual claims are restricted to partners whose tasks bring about services to their customers, as it happens with those engaged in the law, accounting, business consulting, and medicine fields. Professional partnerships are seldom registered. (Fama-Jensen, 1983a, 1983b) |
| <i>Financial Mutuals</i> | Here customers are the residual claimants. For instance, they can be shareholders of mutual funds, or policyholders in mutual insurance companies. Also, they usually do not take part in the internal affairs of those companies. (Fama-Jensen, 1983a, 1983b) |
| <i>Not-for-profit Organizations</i> | In general, there are no residual claims on net cash flows from the side of donors. It is the case of churches, universities, museums, classical music institutions, hospitals and other charities. Most of them have tax privileges, and all of them face a non-distribution contract (they are not allowed to disburse profits). People who fund a non-profit are not residual claimants (an updated account in Glaeser, 2002) |
| <i>Franchise Companies</i> | Here we have some units owned by the company and others that are franchised. Franchisees purchase a residual claim for their units, while franchisors earn a proportion of sales revenues as a franchise fee, keeping for themselves some decision rights (building design, menu selection, lease of assets, advertising, training, legal and accounting advice, public relations). The central company monitors for product quality, budget control, contract renewal and termination. (Brickley-Dark, 1987) |

Posner (1998) highlights a distinctive feature by which corporations may supersede other organization forms:

" Firms in which the inputs are primarily labor rather than capital often are partnerships or individual proprietorships rather than corporations. The corporation is primarily a method of solving problems encountered in raising substantial amounts of capital."

From now on, we are going to be concerned with corporations, either open or closed, albeit much of what follows should be predicated on other organization forms as well.

5.- CONFLICTS OF INTEREST AND INCREMENTAL CASH FLOWS

It is time to bring together the main building blocks that have already been set forth in the paper. For certain, there is a wide range of conflicts of interest that can be handled by means of the incremental cash flows model. But in order to draw from this model as much as possible, three changes in its simplest format (1) must be undertaken beforehand.

a) Introduction of Managers Pay Package

Firstly, we recall from (4) that

$$\mathbf{DCF}_t(\text{operations}) = \text{Ebit}_t - \text{taxes}_t + \text{depreciation}_t$$

and secondly, that Ebit_t can be broken down into two components:

$$\text{Ebit}_t = \text{Ebit}_t (\text{excluding managers pay package}) - \mathbf{DCF}_t (\text{managers pay package}) \quad (11)$$

or, briefly:

$$\text{Ebit}_t = \text{Ebit}_t (\text{net}) - \mathbf{DCF}_t (\text{managers pay package})$$

That is to say, $\text{Ebit}_t (\text{net})$ means earnings before interest and taxes excluding outflows to managers. The expression "managers pay package" refers to what in fact amounts to a portfolio whose most distinctive components are: cash, bonuses, fringe benefits, stock options, stock appreciation rights, phantom stock, restricted stock, preferred convertible stock, and convertible bonds. (Background on managers pay packages is given in Murphy (1998)).

Therefore, (5) can be blended with (11) to deliver

$$\begin{aligned} \mathbf{DCF}_t(\text{operations}) &= \text{Ebit}_t (\text{net}) - \text{taxes}_t + \text{depreciation}_t - \\ &\quad - \mathbf{DCF}_t (\text{managers pay package}) = \\ &= \mathbf{DCF}_t (\text{operations; excluding managers pay package}) - \mathbf{DCF}_t (\text{managers pay package}) \end{aligned} \quad (12)$$

while (4) will be changed by (12) into

$$\begin{aligned} \mathbf{DCF}_t(\text{assets}) &= \mathbf{DCF}_t(\text{operations; excluding managers pay package}) - \\ &- \mathbf{DCF}_t(\text{managers pay package}) - \mathbf{DCF}_t(\text{working capital}) - \mathbf{DCF}_t(\text{fixed assets}) \end{aligned}$$

All this lead up to

$$\begin{aligned} \mathbf{DCF}_t(\text{assets}) &= \\ &= \mathbf{DCF}_t(\text{assets; excluding managers pay package}) - \mathbf{DCF}_t(\text{managers pay package}) \end{aligned} \tag{13}$$

Plugging (13) into (1), we can translate the standard incremental cash flow model under this guise:

$$\begin{aligned} \mathbf{DCF}_t(\text{assets; excluding managers pay package}) &= \mathbf{DCF}_t(\text{assets; net}) = \\ &= \mathbf{DCF}_t(\text{creditors}) + \mathbf{DCF}_t(\text{stockholders}) + \mathbf{DCF}_t(\text{pay-offs portfolio to managers}) \end{aligned} \tag{14}$$

Henceforth, and for ease of notation, we are going to rewrite (14) this way:

$$\mathbf{DCF}_t(a; \text{net}) = \mathbf{DCF}_t(c) + \mathbf{DCF}_t(s) + \mathbf{DCF}_t(m)$$

b) Introduction of Cash Assets

The following equation exhibits the main current assets components:

$$\begin{aligned} \mathbf{DCF}_t(\text{current assets}) &= \mathbf{D}_t(\text{cash}) + \mathbf{D}_t(\text{short-term investments}) + \\ &+ \mathbf{D}_t(\text{inventories}) + \mathbf{D}_t(\text{accounts receivable}) + \mathbf{D}_t(\text{other items}) \end{aligned}$$

We break down the expected cash balance change into two components:

- cash required for normal operations, $\mathbf{D}_t(\text{cash for operations})$, which should be included in working capital provisions for the daily running of a business;
- cash non-required for normal operations in the period, $\mathbf{D}_t(\text{cash not-for-operations})$, which actually perform as a stock of excess liquidity.

Furthermore, $\mathbf{D}_t(\text{short-term investments})$ do not need to become out-flows in the period. On the contrary, this is the place where many companies should set up and manage financial assets portfolios. Main short-term investments include stocks and bonds not issued by the firm, government bonds, term-deposits at banks, derivatives assets, investment in mutual funds and promissory notes. (A full discussion can be found in Appendix 2)

As from now, we will call "cash assets" to both D_t (*cash not-for-operations*) and D_t (*short-term investments*)

$$D_t (\text{cash assets}) = D_t (\text{cash not-for-operations}) + D_t (\text{short-term investments}) \quad (15)$$

Recalling the incremental the equation (4) in the incremental cash flow model (1), we can reshape the cash flows from assets so as to give room to (15):

$$\begin{aligned} DCF_t (\text{assets}) &= DCF_t (\text{operations}) - DCF_t (\text{cash assets}) - \\ &- DCF_t (\text{working capital excluding cash assets}) - DCF_t (\text{fixed assets}) \end{aligned}$$

All this leads up to

$$\begin{aligned} DCF_t (\text{assets}) &= \\ &= DCF_t (\text{assets; excluding cash assets}) - DCF_t (\text{cash assets}) \end{aligned} \quad (16)$$

By using (16) jointly with (1), we get

$$\begin{aligned} DCF_t (\text{assets; excluding cash assets}) &= DCF_t (\text{assets; net}) = \\ &= DCF_t (\text{creditors}) + DCF_t (\text{stockholders}) + DCF_t (\text{cash assets}) \end{aligned} \quad (17)$$

c) The Standard Incremental Cash Flow Model with managers pay package and cash assets

The procedure followed to obtain firstly (14) and secondly (17) could have been undertaken at the same time. In that case, the final outcome would have been:

$$\begin{aligned} DCF_t (\text{assets; excluding cash assets and managers pay package}) &= DCF_t (\text{assets; net}) = \\ &= DCF_t (\text{creditors}) + DCF_t (\text{stockholders}) + DCF_t (\text{cash assets}) + DCF_t (\text{managers pay package}) \end{aligned} \quad (18)$$

To ease notation, we can rewrite (18) this way:

$$DCF_t (a; \text{net}) = DCF_t (c) + DCF_t (s) + DCF_t (m) + DCF_t (\text{cash})$$

This is the most suitable extension of the cash model to analyze conflicts of interest. The message that (18) conveys is clear:

Conflicts of interest among stockholders, debt holders, and managers lay open to view by the way net cash flows from assets are to be distributed in the first place, and how one or more claimants can eventually expropriate cash flows from the others, in the second place.

We are going to focus on conflicts arising from two current environments: in the first place, the relationship between creditors and managers and, in the second place, the relationship between managers and owners. Finally, conflicts of interest and the standard incremental cash flow model will be linked with the purpose of showing how the latter can contribute to lessen the impact of the former, to the benefit of finance providers and desirable levels of transparency in capital markets.

5.1. *Conflicts of interest between bondholders and managers*

Two illustrations are to be developed below. One pertains to a situation where no financial distress seems likely, the other to a situation where creditors are smart and their information sets prove to be more endowed than what was expected by managers.

- a) Case 1: Here, we are going to deal with a simple context, in which there is absence of financial distress. In the normal running of the business, debt holders follow up their expected cash flows with this likely format:

$$E[\mathbf{DCF}_t(c); \mathbf{W}(t; c)] = E[\text{interest}_t; \mathbf{W}(t; c)] + E[\text{debt repayment}_t; \mathbf{W}(t; c)] \quad (19)$$

whereas the managers expectations amounts to another kind of assessment:

$$\begin{aligned} E[\mathbf{DCF}_t(c); \mathbf{W}(t; m)] &= \\ &= E[\text{interest}_t; \mathbf{W}(t; m)] + E[\text{debt repayment}_t; \mathbf{W}(t; m)] + \\ &+ E[\text{debt repurchase}_t; \mathbf{W}(t; m)] - E[\text{new debt issues}_t; \mathbf{W}(t; m)] \end{aligned} \quad (20)$$

As we see by contrasting (19) with (20), managers take advantage of private information to the extent that outside debt holders cannot foresee internal decisions, mainly regarding debt repurchase and new debt issues. Assuming that services on debt interest and repayment were common knowledge, then any impending conflict of interest would be measured out of the difference

$$E[\text{debt repurchase}_t; \mathbf{W}(t; m) \zeta \mathbf{W}^c(t; c)] - E[\text{new debt issues}_t; \mathbf{W}(t; m) \zeta \mathbf{W}^c(t; c)] \quad (21)$$

because any decision-making concerning these cash flows could improve or worsen the creditors' portfolios not only in market values but in their risk profiles as well.

The subset depicted in (21)

$$\mathbf{W}(t; m) \zeta \mathbf{W}^c(t; c)$$

must be regarded as a residual information set and discloses the source of asymmetric information that allow managers the pursuing of their goals in the normal running of the company. Up to this point, their behavior could be neutral as regards the creditors' interest. (Residual information sets and differential rates of return are thoroughly addressed in Apreda, 2002).

However, if managers acted opportunistically, their goals would be at variance with the ones held by creditors, even by stockholders. For instance, a new issue of bonds can damage the market value of the older ones still alive, since the new bonds may convey competitive covenants, higher contractual interest rates or better maturity conditions. Still worse, debt holders may find it is hard to gain access to information about refinancing, repurchase, mergers and acquisitions, or outright default, while such detrimental happenings might be waiting in the pipeline. There being a chance of contesting creditors' expectations, the size of the gap out of (19) and (20) widens at their expense, eventually.

- b) Case 2: Another context worthy of being outlined is the one where the creditors become more demanding, as it is the case with banks, insurance companies, institutional investors, or market analysts. Better-informed investors can follow up their expected cash flows by resorting to the incremental cash flow model (7) and setting forth their assessments by means of

$$\begin{aligned} E[\mathbf{DCF}_t(c); \mathbf{W}(t; c)] &= \\ &= E[\mathbf{DCF}_t(a); \mathbf{W}(t; c)] - E[\mathbf{DCF}_t(s); \mathbf{W}(t; c)] \end{aligned} \quad (22)$$

to be jointly used with (19) to expand on the cash flows expected from their investments.

On their side, managers can take a stand against this much better informed investor by using (14) and resorting to residual information sets

$$\begin{aligned} E[\mathbf{DCF}_t(a; net); \mathbf{W}(t; m)] &= E[\mathbf{DCF}_t(c); \mathbf{W}(t; m) \text{ } \mathcal{C} \text{ } \mathbf{W}^c(t; c)] + \\ &+ E[\mathbf{DCF}_t(s); \mathbf{W}(t; m) \text{ } \mathcal{C} \text{ } \mathbf{W}^c(t; c)] + E[\mathbf{DCF}_t(\text{managers pay package}); \mathbf{W}(t; m) \text{ } \mathcal{C} \text{ } \mathbf{W}^c(t; c)] \end{aligned} \quad (23)$$

jointly with (13) and (20) to expand on their own forecasts about debt holders cash flows.

As we see from this perspective, asymmetric information is greater here to the advantage of managers, since the outsider finds out that in (22) is much harder to look into cash flows components and information about the pay package is often unattainable. Finally, any stronger information impairment can be tracked on capital investment and working capital provisions in (4)

$$\mathbf{DCF}_t(\text{assets}) = \mathbf{DCF}_t(\text{operations}) - \mathbf{DCF}_t(\text{working capital}) - \mathbf{DCF}_t(\text{fixed assets})$$

that could be kept under wraps by the management, a thorny issue which mingles with free-cash flows in the sense of Jensen (1986). (Appendix 6 deals with this matter).

Remarks:

- *This type of conflict is usually predicated on debt holders against managers, albeit most of the time it seems a conflict between the whole firm and debt holders, provided that managers perform on behalf of the company's owners.*
- *But the conflict might directly develop between creditors and stockholders whenever managers set up their hidden agendas and favor creditors to the detriment of the owners. Also they can impair debt holders and owners' interests at the same time, as it seems to be the case in some leverage-buy-outs attempts, and also in many instances of corporate control contests. (More background on this in Holmstrom-Kaplan (2001)).*

5.2. Conflicts of interest between stockholders and managers

Two illustrative examples will be followed up here. The first one assumes stockholder blocks and a fairly efficient Board of Directors ready to work on behalf of owners, making every effort to prevent managers from deflecting the company's net income towards their pockets.

The second one is a more down-to-earth environment that shows a mixed ownership, where some groups of stockholders are older (internal claimants) while others are younger like institutional investors, financial institutions or minority groups (external claimants). In this case we also suppose that the Board may have entrenched interests with the incumbent management (often through executive directors) and managers hold sway over most of the decision-making within the firm. Let us deal with each context in turn.

- a) Case 1: When in the first alternative, the stockholder assessment of expected cash flows comes out of

$$E[\mathbf{DCF}_t(s); \mathbf{W}(t; s)] = \tag{24}$$

$$E[\text{dividends}_t; \mathbf{W}(t; s)] - E[\text{new stock issues}_t; \mathbf{W}(t; s)]$$

while managers profit from

$$E[\mathbf{DCF}_t(s); \mathbf{W}(t; m)] = E[\text{dividends}_t; \mathbf{W}(t; m)] + \tag{25}$$

$$+ E[\text{stock repurchase}_t; \mathbf{W}(t; m)] - E[\text{new stock issues}_t; \mathbf{W}(t; m)]$$

The line of discussion here will closely follow the environment faced by creditors in (19) and (20). But a striking difference lies on the unpredictability of dividends streams in (24), in contrast with the contractual future cash flows delivered to creditors.

The impending conflicts of interest between managers and stockholders will evolve out of the managers' opportunistic behavior as long as they can calibrate their assessments from (25) by means of the following format with residual information sets:

$$E[\mathbf{DCF}_t(s); \mathbf{W}(t; m)] = E[\text{dividends}_t; \mathbf{W}(t; m) \mathcal{C} \mathbf{W}^c(t; s)] + \\ + E[\text{stock repurchase}_t; \mathbf{W}(t; m) \mathcal{C} \mathbf{W}^c(t; c)] - E[\text{new stock issues}_t; \mathbf{W}(t; m) \mathcal{C} \mathbf{W}^c(t; c)]$$

- b) Case 2: Now we make for a more complex environment, the one by which smart stockholders (for instance, institutional investors or large stockholder blocks) demand better and accurate information, and their forecasts not only are grounded on (24) but in net cash flows from assets as well:

$$E[\mathbf{DCF}_t(s); \mathbf{W}(t; s)] = \tag{26}$$

$$E[\mathbf{DCF}_t(a); \mathbf{W}(t; s)] - E[\mathbf{DCF}_t(c); \mathbf{W}(t; s)]$$

The countervailing assessment on the side of managers can be measured in stages, by looking over their realized and expected cash flows deliverable to stockholders.

- i. At date "t + 1", hence ex-post it holds:

$$[\mathbf{DCF}_t(s); \mathbf{W}(t+1; m)] = [\mathbf{DCF}_t(s); \mathbf{W}(t+1; s)] + \tag{27} \\ + [\mathbf{DCF}_t(s); \mathbf{W}(t+1; m) \mathcal{C} \mathbf{W}^c(t+1; s)]$$

- ii. At date "t", hence ex-ante, the expected value of these cash flows must have been

$$E[\mathbf{DCF}_t(s); \mathbf{W}(t; m)] = E[\mathbf{DCF}_t(s); \mathbf{W}(t; s)] + \tag{28} \\ + E[\mathbf{DCF}_t(s); \mathbf{W}(t; m) \mathcal{C} \mathbf{W}^c(t; s)]$$

- iii. Subtracting (28) from (27) we get the discrepancies between expected and realized cash flows for managers and stockholders.

$$\mathbf{Dm} = [\mathbf{DCF}_t(s); \mathbf{W}(t+1; m)] - E[\mathbf{DCF}_t(s); \mathbf{W}(t; m)] = \tag{29} \\ = [\mathbf{DCF}_t(s); \mathbf{W}(t+1; s)] - E[\mathbf{DCF}_t(s); \mathbf{W}(t; s)] + \\ + [\mathbf{DCF}_t(s); \mathbf{W}(t+1; m) \mathcal{C} \mathbf{W}^c(t+1; s)] - E[\mathbf{DCF}_t(s); \mathbf{W}(t; m) \mathcal{C} \mathbf{W}^c(t; s)]$$

- iv. It is when the absolute value of the difference

$$\mathbf{Ds} = [\mathbf{DCF}_t(s); \mathbf{W}(t+1; s)] - E[\mathbf{DCF}_t(s); \mathbf{W}(t; s)] \tag{30}$$

increases that can be assumed managers might have profited from their asymmetric information.

- v. By the same token, it is when the absolute value of the difference

(31)

$$D_{gap} = [DCF_t(s); W(t+1; m) \text{ } \zeta \text{ } W^c(t+1; s)] - E[DCF_t(s); W(t; m) \text{ } \zeta \text{ } W^c(t; s)]$$

decreases that can be assumed managers have taken advantage of their asymmetric information, and are able to reduce this gap between realized and expected discrepancies with respect to stockholders valuation.

Remark:

- The implicit risk in (30) and (31) is embedded into the variance of (29) - see Appendix 4 for a reminder - leading to:

$$s^2[Dm] = s^2[Ds] + s^2[Dgap] + 2 cov[Ds; Dgap]$$

5.3. Conflicts of interest and the incremental cash flow model:

The lesson from the foregoing discussion lies in the asymmetric information that favors managers (or the whole company) when dealing with incumbent or prospective creditors on the one side, and owners, on the other side. The residual information set

$$W(t; m) \text{ } \zeta \text{ } W^c(t; c)$$

fosters managers' opportunistic behavior and may lead to outright wealth expropriation of finance providers.

In order to prevent this from happening, there are two problem-solving procedures in which creditors and owners should engage themselves, grounded on the design of suitable covenants.

Creditors Covenants

Whenever creditors are able to include suitable covenants in any debt contract, they can put restraints in the expected incremental cash flows, mainly those that belong to the private information held by managers as shown next, by matching distinctive incremental cash flows with their most usual covenants (far from intending a complete list, we only provide some examples):

| | |
|---|---|
| <i>dividends_t</i> | stating restrictions on dividends, till new debt maturity |
| <i>DCF_t (managers pay package)</i> | covenants on stock options, stock appreciation rights, phantom stock, restricted stock |
| <i>DCF_t (working capital) + DCF_t (fixed assets)</i> | limiting incremental provisions to working capital and fixed capital, mainly the selling of old assets or purchasing of new ones coming up when restructuring the company |

| | |
|--|--|
| <i>new debt issues</i> $_t$ + <i>new stock issues</i> $_t$ | vetoing new issuances of debt or stock unless explicit creditors's consent |
| <i>debt repurchase</i> $_t$ + <i>stock repurchase</i> $_t$ | disallowing debt and stock repurchases |
| <i>depreciation</i> $_t$ | claiming for sinking funds to build up replacement value and avoid discretionary applications to free cash flows |

That is to say, the whole structure of the incremental cash flow model (see picture 4 below) watchfully track the numbers making the managers' information sets more accountable, while creditors improve their own information sets eventually. Although good groundwork has been done in the subject matter of bond and bank loans covenants since Smith' survey paper (Smith, 1979), only recently they have been linked to the standard incremental cash flow model (Apreda 2002a, 2000c).

Stockholders Covenants

Finally, we turn to the stockholders (see picture 4 below). Whereas covenants to bank debt or bonds are embedded in their issuance contracts outright, protective restrictions on behalf of stockholders may be found at least in three institutional vehicles: the company's charter, the company's bylaws and restrictions drafted in specific issuance contracts. Such sources provide with a manifold approach that allow shareholders and the Board of Directors to curb ex-post discretion from the managers' and even creditors' side, by writing down covenants on incremental cash flows, as depicted in the following examples.

| | |
|--|--|
| <i>DCF</i> $_t$ (<i>cash assets</i>) | monitoring both cash and the investment portfolio to avoid these resources to be deflected toward managers empire building or personal agendas |
| <i>DCF</i> $_t$ (<i>managers pay package</i>) | design of incentives to management through stock options, stock appreciation rights, phantom stock, restricted stock, bonuses |
| <i>DCF</i> $_t$ (<i>working capital</i>) + <i>DCF</i> $_t$ (<i>fixed assets</i>) | setting tight budget constraints |
| <i>new debt issues</i> $_t$ + <i>new stock issues</i> $_t$ | vetoing new issuances of debt or stock unless explicit Boards or stockholders consent |
| <i>debt repurchase</i> $_t$ + <i>stock repurchase</i> $_t$ | disallowing debt and stock repurchases |

Picture 4

The Structure of the Incremental Cash Flow Model

i. Model Setting

$$\mathbf{DCF}_t(\text{assets}) = \mathbf{DCF}_t(\text{creditors}) + \mathbf{DCF}_t(\text{stockholders})$$

ii. Inner Structure Expansion

$$\begin{aligned} \Delta\text{CF}_t(\text{assets; excluding cash assets and managers pay package}) &= \Delta\text{CF}_t(\text{assets; net}) = \\ &= \mathbf{DCF}_t(\text{creditors}) + \mathbf{DCF}_t(\text{stockholders}) + \mathbf{DCF}_t(\text{cash assets}) + \mathbf{DCF}_t(\text{managers pay package}) \end{aligned}$$

iii. Main Components on the Creditor's Side

$$\begin{aligned} \mathbf{DCF}_t(\text{creditors}) &= \text{interest}_t + \text{debt repayment}_t + \\ &+ \text{debt repurchase}_t - \text{new debt issues}_t \end{aligned}$$

iv. Main Components on the Stockholder's Side

$$\mathbf{DCF}_t(\text{stockholders}) = \text{dividends}_t + \text{stock repurchase}_t - \text{new stock issues}_t$$

v. Structure of Incremental Cash Flows from Assets

$$\mathbf{DCF}_t(\text{assets}) = \mathbf{DCF}_t(\text{operations}) - \mathbf{DCF}_t(\text{working capital}) - \mathbf{DCF}_t(\text{fixed assets})$$

$$\mathbf{DCF}_t(\text{operations}) = \text{Ebit}_t - \text{taxes}_t + \text{depreciation}_t$$

CONCLUSIONS

The standard incremental cash flow model (SICFM) exhibits a functionality that goes beyond valuation issues. This paper shows that the SICFM can help to understand conflicts of interest. It does so by firstly disclosing the information sets that underlies the cash flows and, secondly, by assuming that economic agents (individuals and organizations) always face and are affected by bounded rationality, asymmetric information, opportunistic behavior and transaction costs.

We have argued that the internal structure of incremental cash flows from assets, as well as those of the incremental cash flows to creditors and stockholders, convey different information that is contingent on who assesses the cash flows, at variance with symmetric assumptions currently held in valuation theory and practice. It is at this point that conflicts of interest drive a wedge between what one party is expected to deliver and what he actually delivers. Not to be surprised, the divide usually damages the relationship among creditors, stockholders and managers, from impairing most of the time the company value enhancement, to the extent of destroying value eventually.

Last of all, it has been shown how, by means of a careful design and embedding of covenants in debt contracts, stock issuances, and the company's bylaws, most of the private information in the hands of managers or companies that could damage the agency relationships with creditors and owners, can be tracked down from the incremental cash flow model. This would contribute to strengthen the accountability, value enhancing and performance appraisal of the company in the eyes of finance providers.

APPENDIX 1 Incremental Cash Flow Model and Financial Statements

From the balance sheet items and the income-loss statement, the incremental cash flow it will be derived below in stages.

Stage 1: Shaping the main items in a balance sheet under the guise of incremental variables, we get (A1-01)

$$\Delta CF_t(\text{working capital}) + \Delta CF_t(\text{fixed assets}) + \Delta CF_t(\text{cash assets}) + \Delta CF_t(\text{cash}) = \\ \Delta_t(\text{net new debt}) + \Delta_t(\text{net new stock}) + \Delta CF_t(\text{retained earnings})$$

By cash assets it is meant short-term and long-term financial assets held by the company as investment portfolios. On the other hand, by "net new debt" and "net new stock" it is understood namely:

$$\Delta CF_t(\text{net new debt}) = \text{debt repurchase}_t - \text{new debt issues}_t$$

$$\Delta CF_t(\text{stockholders}) = \text{stock repurchase}_t - \text{new stock issues}_t$$

Stage 2: Recalling the sources of retained earnings, (A1-02)

$$\Delta CF_t(\text{retained earnings}) = \text{change in non-distributed dividends}_t = \Delta CF_t(\text{nd-dividends})$$

Stage 3: Relating non-distributed dividends with cash flows from operations: (A1-03)

$$\Delta CF_t(\text{operations}) = \text{Ebit}_t - \text{taxes}_t + \text{depreciation}_t = \text{interest}_t + \text{dividends}_t + \text{nd-dividends}_t$$

By plugging (A1-03) firstly in (A1-02) and lastly in (A1-01), rearranging it holds that

$$[\Delta CF_t(\text{operations}) - \Delta CF_t(\text{working capital}) - \Delta CF_t(\text{fixed assets})] = \\ = [\text{interest}_t + \Delta_t(\text{net new debt})] + [\text{dividends}_t + \Delta_t(\text{net new stock})] + \Delta CF_t(\text{cash assets}) + \Delta CF_t(\text{cash})$$

But the left-side of this relationship amounts to cash flows from assets, while the first pair of square brackets lead to cash flows to be sent to creditors, and the second pair of square brackets to cash flows to be sent to stockholders. Hence:

$$\Delta CF_t(\text{assets}) = \\ = [\Delta_t(\text{creditors}) + \Delta_t(\text{stockholders})] + \Delta CF_t(\text{cash assets}) + \Delta CF_t(\text{cash}) \quad (\text{A1-04})$$

This is the more general setting for the incremental cash flow model. In particular, by subsuming the non-cash assets and the remaining cash into the incremental working capital, the standard format of the model would follow, as in (1), section 1 of the paper.

This last relation (A1-04) will be functional in Appendix 6, when the free cash flow issue is going to be dealt with.

APPENDIX 2 Working Capital Adjustments

The following equation exhibits the main current assets components:

$$\begin{aligned} \Delta CF_t (\text{current assets}) &= \Delta_t (\text{cash}) + \Delta_t (\text{short-term investments}) + \\ &+ \Delta_t (\text{inventories}) + \Delta_t (\text{accounts receivable}) + \Delta_t (\text{other items}) \end{aligned} \quad (\text{A2-01})$$

We break down the expected cash balance change into two components:

- cash required for normal operations, D_t (*cash for operations*), which should be included in working capital provisions for the daily running of a business;
- cash non-required for normal operations in the period, D_t (*cash not-for-operations*), which actually perform as a stock of excess liquidity.

Furthermore, D_t (*short-term investments*) do not need to become out-flows in the period. On the contrary, this is the place where many companies should set up and manage financial assets portfolios. Main short-term investments include stocks and bonds not issued by the firm, government bonds, term-deposits at banks, derivatives assets, investment in mutual funds and promissory notes.

As from now, we will call "cash assets" to both D_t (*cash not-for-operations*) and D_t (*short-term investments*)

$$\Delta_t (\text{cash assets}) = \Delta_t (\text{cash not-for-operations}) + \Delta_t (\text{short-term investments})$$

It seems worthy of being remarked here that Damodaran (1996) and Benninga (1997) were among the first to point out the need of taking cash assets away from working capital provisions.

On the other hand, non-cash assets follow from (A1-01) and consist of changes in inventories, accounts receivable and other current assets. In this way, current assets may be translated as

$$\Delta_t (\text{current assets}) = \Delta_t (\text{cash assets}) + \Delta_t (\text{cash for operations}) + \Delta_t (\text{non-cash assets})$$

and this singles out the actual amount of current assets that should be provisioned:

$$\Delta CF_t (\text{net current assets}) = \Delta_t (\text{cash for operations}) + \Delta_t (\text{non-cash assets})$$

Hence, net working capital will be understood as net current assets minus current liabilities.

$$\Delta CF_t (\text{net working capital}) = \Delta CF_t (\text{net current assets}) - \Delta CF_t (\text{current liabilities}) \quad (\text{A2-02})$$

Unless we assume cash assets amount to zero, changes in working capital should be assessed by means of relation (A2-02). Otherwise, we would be mixing up actual cash flows with items that do not convey outflows by themselves.

APPENDIX 3 Fixed Assets Adjustments

In order to shape the fixed capital provisions in a realistic way, we start with the usually used format in the standard cash flow format (Ross, 1999):

$$\Delta CF_t (\text{fixed assets}) = \text{gross fixed assets} (t) - \text{gross fixed assets} (t - 1) \quad (\text{A3-01})$$

which is, along the holding period, equivalent to:

$$\Delta CF_t(\text{fixed assets}) = \text{fixed assets purchases } [t-1; t] - \text{fixed assets sales } [t-1; t]$$

On the other hand, from the incremental balance sheet we have:

$$\Delta CF_t(\text{net fixed assets}) = \text{net fixed assets } (t) - \text{net fixed assets } (t-1)$$

Splitting down net fixed assets into its main components, we get

$$\begin{aligned} \Delta CF_t(\text{net fixed assets}) &= [\text{gross fixed assets } (t) - \text{accumulated depreciation }_t] - \\ &\quad - [\text{gross fixed assets } (t-1) - \text{accumulated depreciation }_{t-1}] \end{aligned}$$

and by means of (A3-01) we are led to

$$\Delta CF_t(\text{net fixed assets}) = \Delta CF_t(\text{fixed assets}) - \text{depreciation }_t$$

reaching thus the usual way of assessing the cash flow from capital expenses:

$$\Delta CF_t(\text{fixed assets}) = \Delta CF_t(\text{net fixed assets}) + \text{depreciation }_t$$

Whenever improvements or maintenance expenses are fractionally or fully activated to enhance the value of assets in place, we could write

$$\begin{aligned} \Delta CF_t(\text{fixed assets}) &= \text{fixed assets purchases } [t-1; t] + \\ &\quad + \text{improvements and maintenance } [t-1; t] - \text{fixed assets sales } [t-1; t] \end{aligned}$$

APPENDIX 4 Variance Analysis in the Incremental Cash Flow Model

It is a tenet of the standard incremental cash flow model, as it was seen in section 1 under the guise of relationship (1) in this paper, that

$$DCF_t(\text{assets}) = DCF_t(\text{creditors}) + DCF_t(\text{stockholders})$$

from which it follows that cash flows expected in the horizon $[t; t+1]$ and assessed at date "t" are stochastic variables contingent on the information set $\Omega(t; e)$ where "e" denotes the economic agent who acts as a decision-maker. The variance of the cash flows from assets turns out to be:

$$\begin{aligned} s^2[DCF_t(\text{assets})] &= E[DCF_t(\text{assets}) - E[DCF_t(\text{assets})]]^2 = \\ &= E[DCF_t(\text{creditors}) + DCF_t(\text{stockholders}) - E[DCF_t(\text{creditors}) + DCF_t(\text{stockholders})]]^2 = \\ &= E[\{DCF_t(\text{creditors}) - E[DCF_t(\text{creditors})]\}^2 + \{DCF_t(\text{stockholders}) - E[DCF_t(\text{stockholders})]\}^2 + \\ &\quad + 2 \cdot (DCF_t(\text{creditors}) - E[DCF_t(\text{creditors})]) \cdot (DCF_t(\text{stockholders}) - E[DCF_t(\text{stockholders})])] \end{aligned}$$

Finally,

$$\begin{aligned} s^2[DCF_t(\text{assets})] &= s^2[DCF_t(\text{creditors})] + s^2[DCF_t(\text{stockholders})] + \\ &\quad + 2 \cdot cov[DCF_t(\text{creditors}), DCF_t(\text{stockholders})] \end{aligned}$$

By the same token as above, we can also establish the risk measure of cash flows from assets by means of (4):

$$DCF_t(\text{assets}) = DCF_t(\text{operations}) - DCF_t(\text{working capital}) - DCF_t(\text{fixed assets})$$

getting at the last:

$$\begin{aligned} s^2 [DCF_t(\text{assets})] &= s^2 [DCF_t(\text{operations})] + s^2 [DCF_t(\text{working capital})] + \\ &+ s^2 [DCF_t(\text{fixed assets})] + 2 \cdot \text{cov} [DCF_t(\text{operations}), DCF_t(\text{working capital})] \\ &+ 2 \cdot \text{cov} [DCF_t(\text{operations}), DCF_t(\text{fixed capital})] + 2 \cdot \text{cov} [DCF_t(\text{working capital}), DCF_t(\text{fixed capital})] \end{aligned}$$

APPENDIX 5 Operations on sets

Given a space or universe X , non empty, a subset E of X will be defined as a set such that:

$$(\forall x): x \in E \Rightarrow x \in X$$

The set built up with all the subsets of X will be denoted as $P(X)$ and it comes defined as:

$$P(X) = \{ A : A \subseteq X \}$$

When dealing with sets of sets, it is rather preferred to speak about families of sets. Then, $P(X)$ is a family of sets. Let us take two arbitrary subsets A and B in X . The following operations between them build up new sets.

Union of two sets:

$$A \dot{\cup} B = \{ x : x \in A \text{ or } x \in B \}$$

Intersection of two sets:

$$A \dot{\cap} B = \{ x : x \in A \text{ and } x \in B \}$$

Complement of a set:

$$A^c = \{ x : x \notin A \}$$

Difference of two sets:

$$A - B = \{ x : x \in A \text{ and } x \notin B \}$$

Hence, by the definition of complement we can write, as it was done in the paper,

$$A - B = A \dot{\cap} B^c$$

Symmetric difference of two sets:

$$A \dot{\Delta} B = \{ x : x \in A - B \text{ or } x \in B - A \}$$

APPENDIX 6 About the Free Cash Flows Issue

In a classical paper Jensen (1986) defined free cash flows in a format that has lately undergone some changes so as to make them functional, but adding some confusion not only to its original meaning but also to the extent that they could unequivocally claim being free outright.

Starting with Jensen's definition, free cash flows mean

"cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital."

Later, he adds: "Conflicts of interest between shareholders and managers over payout policies are especially severe when the organization generates substantial free cash flow. The problem is how to motivate managers to disgorge the cash rather than investing it at below the cost of capital or wasting it on organization inefficiencies"

Current textbooks on Corporate Finance and in Valuation tried to embed this concept within the framework of the incremental cash flow model. Let us follow up some examples.

a) For instance, Benninga-Sarig (1997) and Damodaran (1996) define free cash flows this way:

$$\begin{aligned} \text{Free Cash Flows}_t &= \\ &= \text{Ebit}_t - \text{taxes}_t + \text{depreciation}_t - \Delta \text{CF}_t(\text{working capital}) - \Delta \text{CF}_t(\text{fixed assets}) \end{aligned}$$

that is to say, free cash flows are identified with cash flows from assets. Hence:

$$\text{Free Cash Flows}_t = \Delta \text{CF}_t(\text{assets})$$

b) In a recent textbook on Corporate Finance, written by Damodaran, (Corporate Finance Theory and Practice, Wiley, 1997), we find these remarks about Jensen's notion of free cash flows:

"Free cash flows represent cash flows made on operations over which managers have discretionary spending power; they may use them to take projects, pay them out to stockholders, or hold them as idle cash balances."

to conclude in a caption that Free Cash Flows (Jensen's) are the operating cash flows after taxes but before discretionary capital expenditures, which does not match the assimilation of free cash flows with cash flows from assets.

c) Copeland-Koller-Murray, in a well known book on Valuation that is widely used by practitioners and MBA students (Valuation, Wiley, 1995) deal with free cash flows this way:

$$\text{Operating Free Cash Flow}_t - \text{Cash Flow from Non Operating Investments}_t = \text{Cash Flows available to Investors}_t$$

This format amounts to saying that

$$\Delta \text{CF}_t(\text{assets}) = \Delta \text{CF}_t(\text{to be directed to investors})$$

and it would be a synonym of the standard incremental cash flow model SICFM.

d) It seems more unequivocal how Ross et al. (Fundamentals of Corporate Finance, Irwin, 1995) cope with this issue. Firstly, they remind what are free cash flows in the sense Jensen gave to such phrase:

"Suppose a firm has some excess cash after selecting all positive Net Present Value projects (this type of excess cash is frequently referred to as free cash flows)" (page 512)

Secondly, they define **cash flows from assets** as **"the total of cash flows to creditors and cash flows to stockholders, consisting of the following: operating cash flow, capital spending and addition to net working capital"**.

Therefore, one thing are Jensen's free cash flows and quite another cash flows from assets. The difference coming up from distinctive sources by and large.

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