Apreda, Rodolfo

Working Paper

The pricing of financial assets in the physical world of finance

Serie Documentos de Trabajo, No. 427

UNIVERSIDAD DEL CEMA
Buenos Aires
Argentina

Serie

DOCUMENTOS DE TRABAJO

Área: Finanzas

THE PRICING OF FINANCIAL ASSETS IN THE PHYSICAL WORLD OF FINANCE

Rodolfo Apreda

Agosto 2010
Nro. 427

ISBN 978-987-1062-56-0
Queda hecho el depósito que marca la Ley 11.723

www.cema.edu.ar/publicaciones/doc_trabajo.html
UCEMA: Av. Córdoba 374, C1054AAP Buenos Aires, Argentina,
ISSN 1668-4575 (impreso), ISSN 1668-4583 (en línea)
Editor: Jorge M. Streb; asistente editorial: Valeria Dowding <jae@cema.edu.ar>

Apreda, Rodolfo
The pricing of financial assets in the physical world of finance. - 1a ed. - Buenos Aires : Universidad del CEMA, 2010.
32 p. ; 22x15 cm.

ISBN 978-987-1062-56-0

1. Finanzas. I. Título
CDD 332

Fecha de catalogación: 17/08/2010

UNIVERSIDAD DEL CEMA

Center for the Study of Private and Public Governance
(Cegopp)

THE PRICING OF FINANCIAL ASSETS

IN THE PHYSICAL WORLD OF FINANCE

Rodolfo APREDA

Professor Apreda holds a Ph D in Economics (UBA) and a Master in Political Sciences (UCEMA). He is Director of the Ph D Program in Finance and also of the Center for the Study of Private and Public Governance, at the University of Cema.

E-mail: ra@cema.edu.ar Web Personal Page: www.cema.edu.ar/u/ra

ABSTRACT

The pricing of financial assets, this paper contends, it does not consist only in assessing a technical value from a valuation model and then calibrating such value by looking at the market. In order to sharpen up this complex process we are going to handle, firstly, a valuation procedure that stems from the temporal structure of rates of return adjusted for risk. Secondly, the concept of the physical world of finance is introduced just to move further onto the cost-profit structure of dealers and big players, highlighting the far-reaching role of transaction costs. Next, we work out both ask and bid references prices by linking technical values with spreads. Afterwards, prices in actual trading are contrasted with reference prices, hence bringing out the quasi-rents rates to which dealers earnestly seek for at the end of the day. Lastly, reference prices, spreads, and quasi-rent rates are compounded together quantitatively, so as to enhance the understanding and the practice of pricing in the physical world of finance.

Key Words: *physical world of finance; quasi-rents; cost-profit structure; bid and ask reference prices; financial assets valuation.*

JEL*: G10, G12, G20*

Institutional Disclaimer

Statements or opinions conveyed in this paper are attributable to the author only, and the University of Cema disclaims any responsibility for them.

INTRODUCTION

There are two realms for the pricing of financial assets: the one where models are worked out, and the one we are going to denote the ″physical world of Finance″. The healthier approach, extensively employed in good practice, consists in taking certain valuation model down-to-earth and ascertain whether it is a good companion to guide us in shaping up our decision-making or not. In the latter case, we send the model back to the original realm of modeling, whereas in the former instance, we would say ″it is a model with pragmatic consequences, albeit all the changes that must undergo in the painstakingly landing to planet Earth″. As Emanuel Derman (2009) compellingly put it:

The greatest danger in financial modeling is the age-old sin of idolatry. Financial markets are alive, but a model is a limited, human work of art. Although a model may be entrancing, we will not be able to breathe life into it, no matter how hard we try. To confuse the model with the world is to embrace a future disaster driven by the belief that humans obey mathematical rules.

In the ordinary run of things, a variegated set of financial intermediaries committed to valuation and trading, mainly dealers, market makers and bargain hunters[1] avail themselves of a valuation model so as to accomplish the task of setting prices to financial assets. But this is only the starting point of the process of pricing, although some people still seem to regard that it could also signal the final point as soon as the dynamics of markets magically moves on automatic pilot.

This paper premises the idea that price-setters in the physical world of finance must cope with four levels of active decision-making:

a) Getting a technical value that comes out of a valuation model.
b) Working out a cost-benefit structure to be linked with the technical value.
c) Taking advantage of market patterns of behavior at the time of the pricing.

[1] A well-known typology that was introduced by Jack Treynor (1967, 1999), about which further development will take place in section 5.

d) Realizing that pricing goes hand in hand with a quest for quasi-rents in contexts of asymmetric information.

In section 1, we expand on how to appraise the technical value of a financial asset profiting from the temporal structure of returns adjusted for risk. Section 2 brings forth the concept of "the physical world of finance". Next, in section 3, we delve into the cost-profit structure faced by dealers in their regular trading. Afterwards, section 4 addresses the subject matter of references prices and spreads. Section 5 sets out the pricing process as a quest for quasi-rents. Conclusions will follow.

1. ON THE TECHNICAL VALUE

As from the 60s in last century, academics and practitioners got used to carrying out valuation by means of a wide range of available tools. They could resort to the CAPM[2], the APT[3], Black-Scholes, Binomial Paths, stochastic equations, just to notice some outstanding methods of valuation. Almost all of these customary techniques have been applied so far against the background of the versatile model of discounted cash flows expected from the financial asset under analysis.

Early in the 80s, however, there was a financial innovation that allowed for a more down-to-earth valuation procedure. Some big players in the market, like Merryll Lynch and Salomon Brothers, started to offer and sell securities backed by Treasury Bills, Notes, and Bonds that had been pooled together in a trust fund. In the final analysis, investors were able to buy proxies of zero-coupon bonds, either to collect interest coupons or principals, in both cases at maturity dates. Shortly afterwards, albeit some queries and reservations raised by the Federal Reserve,

[2] Following Sharpe (1964) and Brennan (1999), by CAPM we mean here at least both the CML (capital market line) which is the place where efficient separation-portfolios lie, and the SML (securities market line) which is the place where expected returns of any financial asset or portfolios can be assessed so as to become instrumental in furnishing a technical value related to pricing.

[3] On this path-breaking contribution, see Ross (1976).

Treasury Strips[4] began to be issued and transacted, giving rise to a thriving market of zero-coupon bonds[5].

Among the many distinctive consequences of this new financial development, two of them were truly remarkable[6]:

- As from that time on, practitioners could have zero-coupon bonds whose maturities spanned from few days through thirty years (the longest maturity of the most recently issued T-Bond). In other words, practitioners and analysts were able to plot those bonds according to maturity and yield to maturity, a scatter diagram out of which the temporal structure of rates of returns was born.

- Once the temporal structure had been set up, an adjustment curve was determined to approximate and give account of the set of points in the temporal structure. This marked the starting date for the well-known yield curve.

Zero-coupon bonds, the temporal structure of rates of return, and the yield curve entailed an improvement in the valuation methods available up to that moment. Cash flows were to be discounted henceforth by a financial combo comprising a Treasury Strip rate, plus country risk, plus credit risk of the company whose security has to be valued. Hence, the technical value grows out of actual rates available in the market, and the analyst need not to resort to any of the so-called

[4] That is to say, a coupon-bearing T-Bond or T-Note is stripped from their coupons of interest and principal, so that each of them can be traded separately and on their own.

[5] See, for instance, a practitioner's viewpoint about the market for U.S. Treasuries Strips in Gregory and Livingston (1992), while a broader analysis is addressed in Apreda (2010).

[6] Among other pragmatic consequences, we can point out to those linked to valuation of investment projects and the shaping of discounting rates adjusted for governance risks, as they have lately been engineered by Apreda (2010, 2009).

equilibrium models whose performance in the physical world of finance have become, to say the least, increasingly debatable[7].

This paper will benefit from such financial innovation by which the technical value stems from the following algorithm:

$$V(t) = \sum \frac{CF(j)}{[1 + s_{adj}(t;j)/2]^{days(t;j)/180}} \tag{1}$$

Remarks

a) **CF(j)** in (1) will stand for the cash flow we expect to collect at the end of period **(j–1;j)**. Throughout this paper, the period will be assimilated into a semester.

b) $s_{adj}(t;j)$ denotes the yearly nominal spot rate of return, adjusted for risk that will accrue from date **t** through date **j**, compounding along semesters. An increasingly used format is the following:

$$s_{adj}(t;j) = s_{US\ STRIP}(t;j) + \Delta \text{ country-risk rate }(t;j) + \Delta \text{ credit-risk rate }(t;j)$$

The spot rate adjusted for risk, hence, consists of a risk-free rate plus two adjustments that account, firstly, for a systematic-risk correction (country risk) and, secondly, a non-systematic-risk correction (credit risk[8]). It is worth noticing that far from being a constant rate, the spot rate becomes temporalized in this down-to-earth approach available from the 80s.

[7] On this point, the reader is referred to Shleifer (1999), Shleifer and Summers (1990), the witty approach to the dark side of valuation rendered by Damodaran (2009) and critical front-page articles from The Economist (July 18, 2009) in the aftermath of the sub-prime crisis.

c) **days(t; j)** counts the number of days in the whole span of the horizon that starts at date **t** and finishes at date **j**.

d) relationship (1) assumes that the compounding period be a semester. Otherwise, minor changes should furnish the general expression:

$$\mathbf{V(t)} = \sum \frac{\mathbf{CF(j)}}{\left[\mathbf{1 + s_{adj}(t;j) / \text{periods in the year}}\right]^{\mathbf{days(t;j) / \text{days in period}}}}$$

e) this viewpoint about valuation is not the only one that holds in the industry; in point of fact, there are alternative valuation techniques ready to use. More background on other methods of valuation can be found in Damodaran (2006). At this juncture, we should keep in mind what Frank Knight (1965, p. 63) warned us in his landmark book on risk, profit and uncertainty:

The fact of relativity is important, because easily and commonly lost sight of. Every valuation is a comparison; we have no conception of an absolute utility or an absolute standard of utility. The notion of value is meaningless except in relation to alternatives of choice.

2. THE PHYSICAL WORLD OF FINANCE

In the real world, things do not take place exactly as they are predicated upon by models, a not surprising feature since the latter have to make simplifying assumptions, even farfetched ones. That is why we contend that the following definition lays foundation to contexts of applications in Finance, making allowances for the facts and constraints of trading, markets, intermediaries, and regulations.

---

[8] Net of country risk, to avoid double-keeping.

Definition 1

The physical world of finance consists of the following components:

- *Financial markets and the variegated assortment of economic agents involved in the running of them, including single investors[9], banks, institutional investors, intermediaries in the broadest sense so as to include dealers, market makers, brokers and retail intermediaries.*

- *Governance structures, that is to say, the institutional matrices within which transactions are negotiated and executed, which include regulators and gatekeepers to overlook whether the rules of the game are duly enforced.*

- *Transaction costs[10] in the widest meaning, encompassing trading costs, information costs, taxes, financial costs linked to transactions, and the microstructure costs.*

Remarks

a) Definitions, within the scope of this paper, stand for a semantic and methodological vehicle on behalf of any considered reader who may ask himself: which is the meaning to be attached to such and such expression? Under no circumstances definitions will intend to be the best ones, still less the only ones to be adopted. Their only purpose is to constrain the meaning of the expression at hand for the sake of precision.

b) As a counterpart to this definition, and in the realm of models, I have set forth elsewhere the concept of transactional algebras (Apreda, 2006).

[9] We include here family units or small- and medium-sized companies, even corporations or state-owned companies, and the like.

[10] In next section, transaction costs will be treated at length.

In concluding this section, it must be noticed that most models still in use make unwarranted assumptions on transaction costs (regarded as non existent), intermediaries (they do not exist) and institutional arrangements (they do not account). Reversing this trend, last decades have witnessed an outpouring of realistic models and pragmatic viewpoints through worthy contributions[11] in the fields of market microstructure (Spulber, 1996, 1999); risk, uncertainty and profit (Knight, 1921, 1965); transaction costs (Coase, 1937; Williamson, 1979); corporate governance (Williamson, 1988); institutional economics (North, 1991); law and finance (Roe, 2003); asymmetric markets (Scitovsky, 1990); differential rates, residual information sets, and transactional algebras (Apreda, 2006); as well as the role intermediaries come to play in real exchanges (Demsetz, 1968).

3. THE COST-PROFIT STRUCTURE

A down-to-earth pricing process must cope with the cost-benefit structure on the side of dealers and other significant intermediaries; otherwise there would not be intermediaries of any sort. It was Oliver Williamson (1979, p. 233) who forcefully stressed this subject:

The new institutional economics is preoccupied with the origin, incidence, and ramification of transaction costs. Indeed, if transaction costs are negligible, the organization of economic activities is irrelevant, since any advantages one mode of organization appears to hold over another will singly be eliminated by costless contracting. But despite the growing realization that transaction costs are central to the study of economics, skeptics remain.

A minimal framework for such cost-profit structure has to single out three main components:

- fixed and variable costs (fvcosts);

[11] We are referring only to a few outstanding contributions as from which further background and sources might be directly attained.

- transaction costs (transcosts);
- survival profit (profit).

The cost-benefit structure brings about a wedge or spread between the technical value, on the one side, and the selling or buying prices, on the other. Here, we have to handle two distinctive spreads, according to which leg of the transaction a distinctive dealer is running on his business.

In order to get the asked spread we must take into account fixed and variable costs, transaction costs, and the survival profit on behalf of the dealer, framed as rates of change. That is to say, for certain dealer $\mathbf{d_k}$, and at date $\mathbf{t}$[12]:

$$\mathbf{[\,1 + spread(\,d_k;\,t;\,a\,)\,] =} \tag{2}$$

$$\mathbf{= [\,1 + transcosts(\,t;\,a\,)\,] \times [\,1 + fvcosts(\,t;\,a\,)\,] \times [\,1 + profit(\,t;\,a\,)\,]}$$

By the same token, the bid spread comes as

$$\mathbf{[\,1 + spread(\,d_k;\,t;\,b\,)\,] =} \tag{3}$$

$$\mathbf{= [\,1 + transcosts(\,t;\,b\,)\,] \times [\,1 + fvcosts(\,t;\,b\,)\,] \times [\,1 + profit(\,t;\,b\,)\,]}$$

Spreads not only depend upon the date but also on any single dealer. In point of fact, each dealer bears his own cost-profit structure, although in some markets and along certain periods similarities could overtake differences. We move on to qualify the minimal framework required by a cost-profit structure.

[12] For ease of notation, the dealer′s identity will be dropped unless precision might be needed on this point.

a) Firstly, transaction costs[13] seem worthy of being split down in at least five components, namely trading costs[14], taxes, financial costs linked with the transaction at hand[15], microstructure costs[16] and information costs[17]:

for the selling position of dealer $\boldsymbol{d_k}$

$$\mathbf{[\ 1 + transcosts(t;\ a)\ ] = [\ 1 + trading(t;\ a)\ ] \times [\ 1 + taxes(t;\ a)\ ] \times} \tag{4}$$

$$\mathbf{\times [\ 1 + information(t;\ a)\ ] \times [\ 1 + financial(t;\ a)\ ] \times [\ 1 + microstructure(t;\ a)\ ]}$$

for the buying position of dealer $\mathbf{d_k}$

$$\mathbf{[\ 1 + transcosts(t;\ b)\ ] = [\ 1 + trading(t;\ b)\ ] \times [\ 1 + taxes(t;\ b)\ ] \times} \tag{5}$$

$$\mathbf{\times [\ 1 + information(t;\ b)\ ] \times [\ 1 + financial(t;\ b)\ ] \times [\ 1 + microstructure(t;\ b)\ ]}$$

By all means, there are alternative methodologies for measuring transaction costs. For instance, the one introduced by Collins and Fabozzi (1991).

---

[13] Further details as well as a comprehensive analysis of transaction costs in the real world of finance can be found in Apreda (2006, 2001, 2000). A insightful practitioner's guide to transaction costs is provided by Ananth Madhavan (2002).

[14] Those directly linked to the purchase or the selling of an asset.

[15] These costs arise whenever the dealer takes out a loan (mainly though banks) to finance a long position or, in short selling cases, they account for collaterals and the marginal accounts involved to carry out such mechanism in the inter-dealer market (contrast with footnote 23).

[16] This new branded category of costs includes not only what regulations establish under the guise of law and enforcement but also the statutes, bylaws or rules of stock exchanges and over the counter exchanges. In general they are linked to those costs dealers and big intermediaries must cope with to comply with "the rules of the game", even comprising the so-called market costs of entrance and exit. On the other hand, the expression "market microstructure" denotes *the study of intermediation and the institutions of exchange* (Spulber, 1996, p. 135).

[17] They stem from search costs, monitoring of competitors, financial engineering, arbitrage opportunities, information technology, competitors′ spread-discovery, customers advising, the management of inventories and their underlying risks, hidden costs arising from asymmetric information.

b) Whereas it would be highly desirable, on technical grounds, to apportion the rates of fixed and variable costs involved in any transaction, most accountants working in the intermediaries′ back office would still favor a global absorption procedure within the Statement of Earnings and Losses, a second-best procedure that ease painstaking workload, but hinders transparency, accountability and performance of each business unit in the dealer’s organization.

c) Last of all, the phrase ″survival profit″ has a variegated semantics in economics, and it deserves to be narrowed down to the scope of this paper.

Definition 2

For certain dealer d_k, at date t, by ″survival profit″ we mean the minimal rate of profit that he should claim after meeting his cost-structure, if he intends to keep up persistently doing business in his field of trade.

According to which transaction leg we are dealing with, there would be a pair of survival profit rates, namely **profit(t; a)** and **profit(t; b)**. If we wished to measure the whole rate of survival profit, we would have to solve

$$[\,1 + \text{profit}(t)\,] = [\,1 + \text{profit}(t; a)\,] \times [\,1 + \text{profit}(t; b)\,] \tag{6}$$

4. ABOUT REFERENCE PRICES AND SPREADS

In the physical world of finance, either costs, spreads, conveniences offered to investors (Scitovsky, 1990), profits and quasi-rents[18], as well as prices and asymmetric information, they all really matter at the end of the day. Also market

[18] *Quasi-rents arise from the difference between total revenue and total out-of-pocket costs, including those from running the business and those technically determined* (Minsky, 1986, p. 200-205). Section 5 will cast light on the quest for quasi-rents in the physical world of finance.

microstructure matters, because under certain protocols, exchanges may fail and large deviations between fundamental value and price usually come about[19].

Although any single economic agent in the lowest level of retailing ultimately may purchase or sell financial assets, he has to place buy-or-sell orders upwards to a retail intermediary performing like a broker who, in turn, puts in a bulk of buy-or-sell orders through wholesalers, qualified dealers.

Only big players with inventories and liquidity execute those orders to bring them into completion. They are the guys who set prices and returns, and it is by means of the top-bottom conveyor-belt of retailers and brokers, that single investors settle up their ultimate long or short positions. The whole mechanism of such hierarchical and manifold trading entails a profit motive that could be framed under the label of ″the quasi-rents pursuit″. Let us expand on such pertaining issues.

4.1. REFERENCE ASKED PRICE AND THE ASKED SPREAD

On the selling side, dealers as well as powerful intermediaries, will design a referential selling price that will result from compounding a technical value

$$\mathbf{V(\,t\,)}$$

with the spread that measures the cost-profit structure in (2)

$$\mathbf{[\,1 + spread(\,t;\,a\,)\,] =} \tag{7}$$

$$\mathbf{= [\,1 + transcosts(\,t;\,a\,)\,] \times [\,1 + fvcosts(\,t;\,a\,)\,] \times [\,1 + profit(\,t;\,a\,)\,]}$$

Next definition adds precision to this issue.

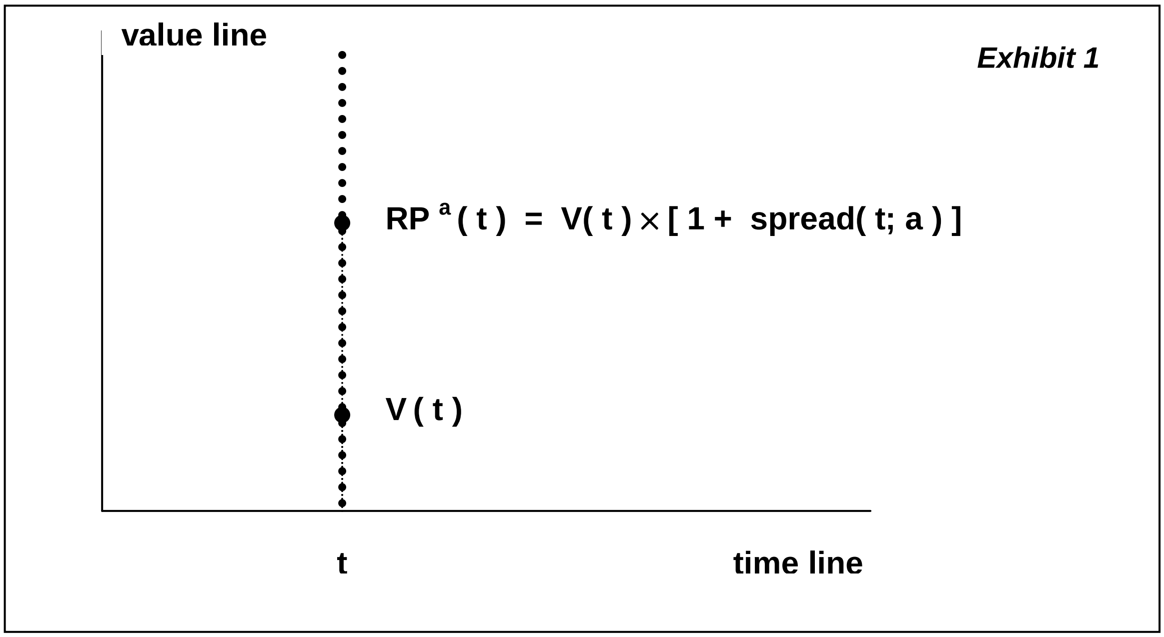
[19] See Madhavan (2002) on this subject.

Definition 3

For certain dealer d_k, at date t, by the reference price on the selling side of the transaction, it is meant the expression

$$RP^{a}(t) = V(t) \times [1 + spread(t; a)]$$

Exhibit 1 below intends to illustrate the ensuing argument.



What does **RP^{a} (t)** mean? To all intents and purposes, **RP^{a}(t)** plays the role of a budgetary break-even value, from which the dealer will cover his costs-profit structure. What kind of profit rate are we speaking about? It is the minimum level of expected profit that could grant the intermediary a survival edge (definition 2). That is why we must regard **RP^{a}(t)** as the lowest price at which the dealer keeps a break-even position, sells the financial asset, and makes a profit. But he knows that market pressures would bring about prices below or higher the reference asked-price[20].

[20] As we are going to argue later in section 4.4, reference prices are not to be mistaken with reservation prices.

4.2. REFERENCE BID PRICE AND THE BID SPREAD

Now, let us move on to figure out the bid reference price which must cover the cost-profit structure as the breakeven value that saddles such structure with the technical value:

$$\mathbf{V(t) = RP^{b}(t) \times [1 + spread(t; b)]}$$

Solving for the reference price, we get

$$\mathbf{RP^{b}(t) = \frac{V(t)}{[1 + spread(t; b)]}}$$

which brings about next definition.

Definition 4

For certain dealer d_k, at date t, by the reference price on the buying side we mean the expression

$$\boldsymbol{RP^{b}(t) = V(t) / [1 + spread(t; b)]}$$

Exhibit 2 below lends intuition to this definition and the discussion below.

4.3. THE GLOBAL SPREAD

At this juncture, we can gather up the outcomes discussed in sections 4.1 and 4.2, by means of a single global spread that ties together both the reference asked and bid prices.

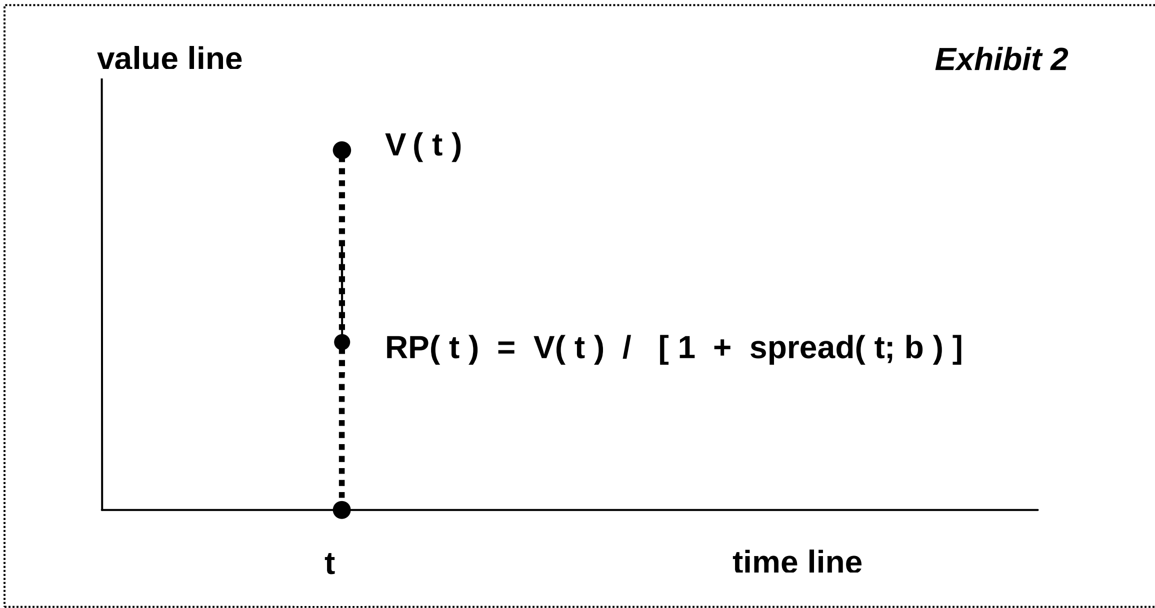


Exhibit 2

Taking advantage of definition 3

$$\mathbf{RP^{a}(t) = V(t) \times [1 + spread(t; a)]}$$

and applying definition 4, we get eventually

$$\mathbf{RP^{a}(t) = RP^{b}(t) \times [1 + spread(t; b)] \times [1 + spread(t; a)]}$$

Let us denote the global spread by **spread(t)**, and move on to qualify this concept (see Exhibit 3).

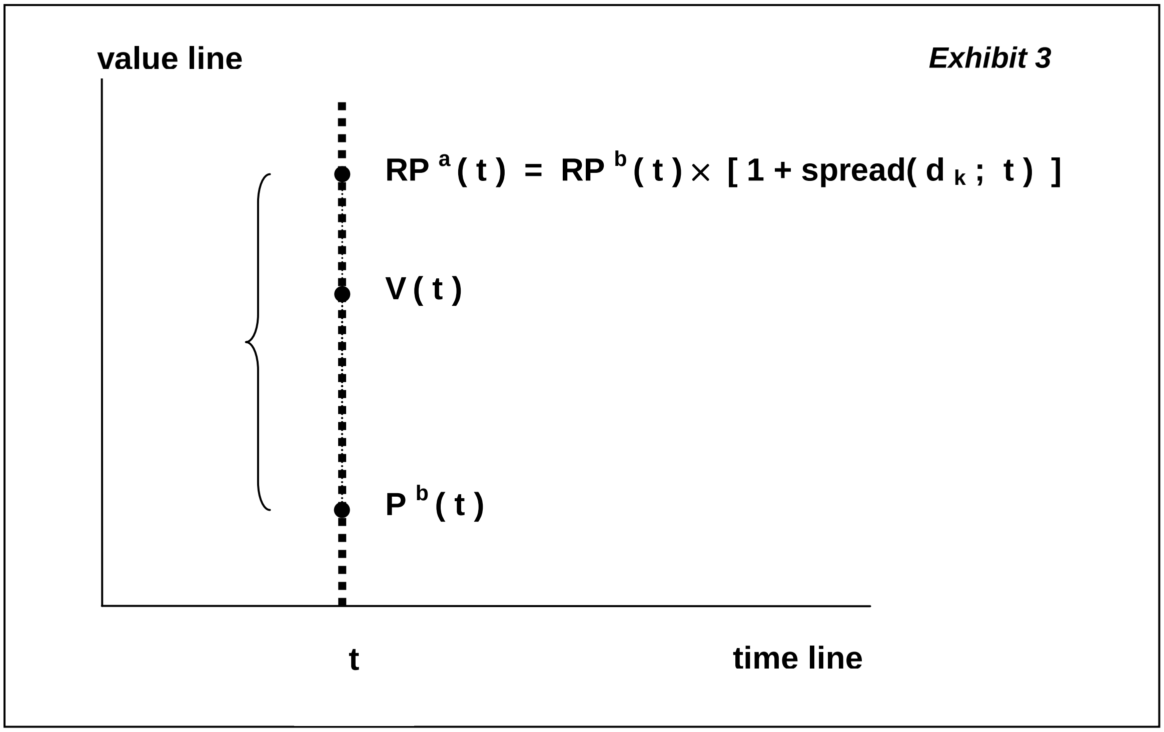
Definition 5

For a certain dealer d_k, at date t, by the global spread it is meant

$$\boldsymbol{1 + spread(d_k;\ t) = [1 + spread(t; b)] \times [1 + spread(t; a)]}$$

Now we can link the referential asked-price with the referential bid-price, by means of a comprehensive rate for the spread.

$$RP^{a}(t) = RP^{b}(t) \times [\, 1 + spread(d_{k};\ t)\,] \tag{8}$$



4.4 REFERENCE PRICES ARE NOT THE SAME AS RESERVATION PRICES

By reservation price it is usually meant the biggest price a buyer is going to pay for a good or service, or the smallest price at which the seller is going to dispose of a good or service. As a matter of fact, the underlying decision-making points to ceilings or floors that investors set up when putting their orders to brokers, intended to signpost their disposable income, information available to them about substitute goods or services, their risk-return preferences, and the time-value of liquid balances.

It does not come as a surprise that on the dealers' side, when speaking about reference price there could be an overlap with the notion of reservation price, as long as they run their business as single investors. However, there is a striking difference between these values because, in contradistinction to reservation prices, it is for reference prices to perform basically as a budgetary break-even point to cover the dealer′s cost-profit structure.

5. PRICING IS ALSO THE QUEST FOR QUASI-RENTS

Down-to-earth practices show that intermediaries cannot be regarded in a mere fictional profile or like robots out of this world. They intermediate, by all means, but most of them do so because, at the root of their job, they behave as quasi-rent seekers.

5.1 THE PLAYERS

Dealers are a sect of themselves just because they keep, to their own risk, plentiful inventories of financial assets as well as cash-flow balances at the reach of their hands for the convenience of their customers[21]. However, both the notion and scope of the word “dealer” proves to be elusive and fuzzy.

It seems a matter of agreement that the key function of any dealer encompasses the carrying out of three defining and complementary tasks[22]:

a) Whenever a buyer requests from him certain financial asset, he must provide it in the shortest time. It is this commitment that allows the dealer to match the **demand for immediacy** triggered off by buyers.

b) Whenever a seller offers certain financial asset to be purchased by the dealer, it is for the latter to deliver cash to his customer in the shortest time in what is called the **supply of liquidity**.

[21] Scitovsky (1990) delivered a very provocative analysis of conveniences in asymmetric markets.

[22] More background on this issue in Demsetz (1968), Spulberg (1996), Treynor (1995), Shleifer (1999), Apreda (2001, 2006).

c) To meet either immediacy or liquidity needs of investors, he must build up a variegated inventory of financial assets and hold a stand-by balance of cash flows or, by default, extremely liquid assets. Furthermore, dealers must get access to short-term credit mainly through banks, since many of their transactions happen to be highly leveraged[23].

Sometimes, the dealer′s role is regarded as if it were a passive one, by which he patiently expects the arrival of sell and buy orders at his trading desk. Nothing could be farthest from the truth.

To fully accomplish their tasks, dealers engage in permanent arbitrage, since they have to find out which assets are cheaper than they should be, so as to buy them at that date, and sell them later, and which are more expensive than it should be expected, so as to sell them at that date, and repurchase them later. If the financial asset **A** can be regarded as cheaper or expensive, from the viewpoint of a certain dealer $\mathbf{d_k}$, at date **t**, it will depend upon the contrasting analysis of market values $\mathbf{P^a(A; t)}$ and $\mathbf{P^b(A; t)}$, reference asked and bid prices $\mathbf{RP^a(A; t)}$ and $\mathbf{RP^b(A; t)}$,, as well as technical values $\mathbf{V(A; t)}$.

But the search of either cheaper or expensive assets does not end by figuring out reliable values from the former decision-makers variables. Dealers must ascertain whether they are meeting a single arbitrage opportunity or, in contrast, the fact remains that what they actually face is a buyer′s or a seller′s market. It goes without saying that such endeavors amount to information costs, mainly under the guise of hidden costs of trading which are pervasive and not easily quantified. Let us expand on this matter a little further.

[23] As Hyman Minsky (2008, pp. 228-229) put it:

A firm with a liability structure can be conceived of as a cash-flow machine earning quasi-rents from its operations and making payments to the holders of its debts. Whereas the payment commitments (both principal and interest) are given by contract and are known, especially if they are dated, the quasi-rents are inherently conjectural and subjective.

When a dealer trades with an approaching investor he likely confronts a challenging and risky setting:

a) He may be smarter than the investor as regards information about the asset and, therefore, he will be able to set the final price, providing the customer either with liquidity or the requested asset, without delay. In the best scenario, some of his investors might be very anxious, in the sense depicted by Treynor[24] (1967) and hence the dealer will earn higher quasi-rents.

b) But there are investors with a hidden agenda, who are smarter than the dealer, and wish to buy or sell financial assets if and only if they ultimately set the price. In this opposite event, his counterpart will likely undergo a decline or a sheer loss in his quasi-rents. Some of those investors are professionals with an outstanding skill in valuing financial assets, regularly outpacing dealers; they were called ″bargain hunters″[25] by Treynor.

Some authors regard bargain hunters as a sort of market makers and not dealers. Nonetheless, this is relative, and we find in practice that a dealer could also behave as a bargain hunter or a market maker, or the two latter as a dealer, since their final behavior is context-dependent.

The role of market makers goes beyond the expertise and duties of a dealer, however. It will be a considered judgment if we look upon them with a broader mind, as Paul Davidson pointed out in his book *Financial Markets, Money, and the Real World* (2002, pp. 75-76):

In a world where the future is uncertain, in order to assure an orderly market, an institution known as a ″market maker″ must exist. A market maker is defined as an institution that publicly announces

[24] Whereas there are authors that call them noise traders, others use the term non-informed traders, albeit with contrasting shades of meaning.

[25] They also are referred as informed traders or bottom-fishers.

a willingness to act as a residual buyer or seller to assure orderliness and continuity if an abrupt disruptive change occurs on either the demand or supply side of the market. […] the market maker requires a buffer stock of the asset being traded in the market plus a significant stock of money (and/or immediate access to obtain additional money when required).

Summing up, the word “dealer” is polysemic. That is to say it conveys manifold and distinctive meanings, depending on the field of application the analyst is focusing on at a certain date.

5.2 THE QUEST FOR QUASI-RENTS

Traders will find out that actual prices could match the following alternatives (see Exhibit 4):

$$\mathbf{P^{a}_{2}(t) \;\langle\; RP^{a}(t) \;\langle\; P^{a}_{1}(t)} \qquad (9)$$

In point of fact, the cost-profit structure could be inflexible to changes in the very short run. What (9) tells is that whenever the dealer gets a better price than the reference one, **he will earn a quasi-rent return rate**

$$\textbf{quasi-rent}_{\mathbf{1}}\mathbf{(t; a)},$$

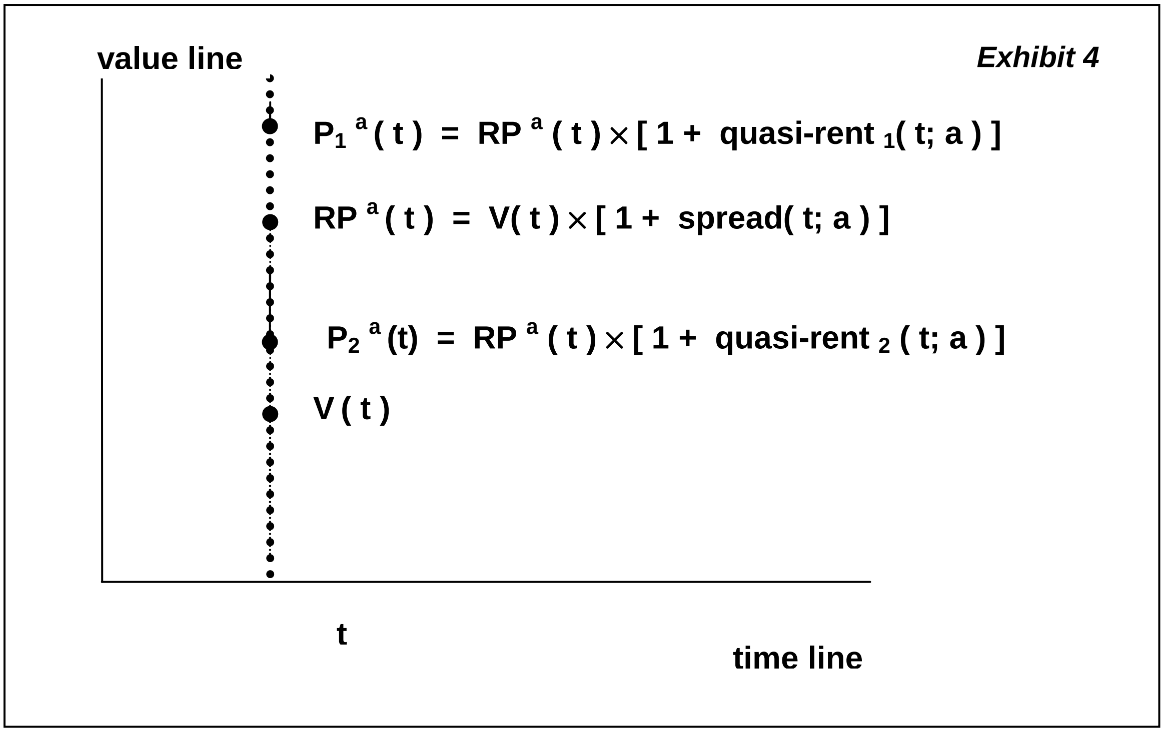
whose value is worked out by solving

$$\mathbf{P^{a}_{1}(t) = RP^{a}(t) \times [\,1 + \textbf{quasi-rent}_{1}(t; a)\,]} \qquad (10)$$

and from (9) it holds that

$$\textbf{quasi-rent}_{\mathbf{1}}\mathbf{(t; a) \;\rangle\; 0}$$

On the contrary, market values below the benchmark-value, could not only deteriorate the profit rate but could even fail to cover the cost structure. In this case, the dealer sells at a cut price, and would face an adversary quasi-rent return rate.



(11)

$$P^{a}_{2}\ (t) \ = \ RP^{a}(t) \times [\ 1 \ + \text{quasi-rent}_{2}\,(t; a)\ ]$$

and also from (9) it holds that

$$\text{quasi-rent}_{2}\,(t; a) \ \langle \ 0$$

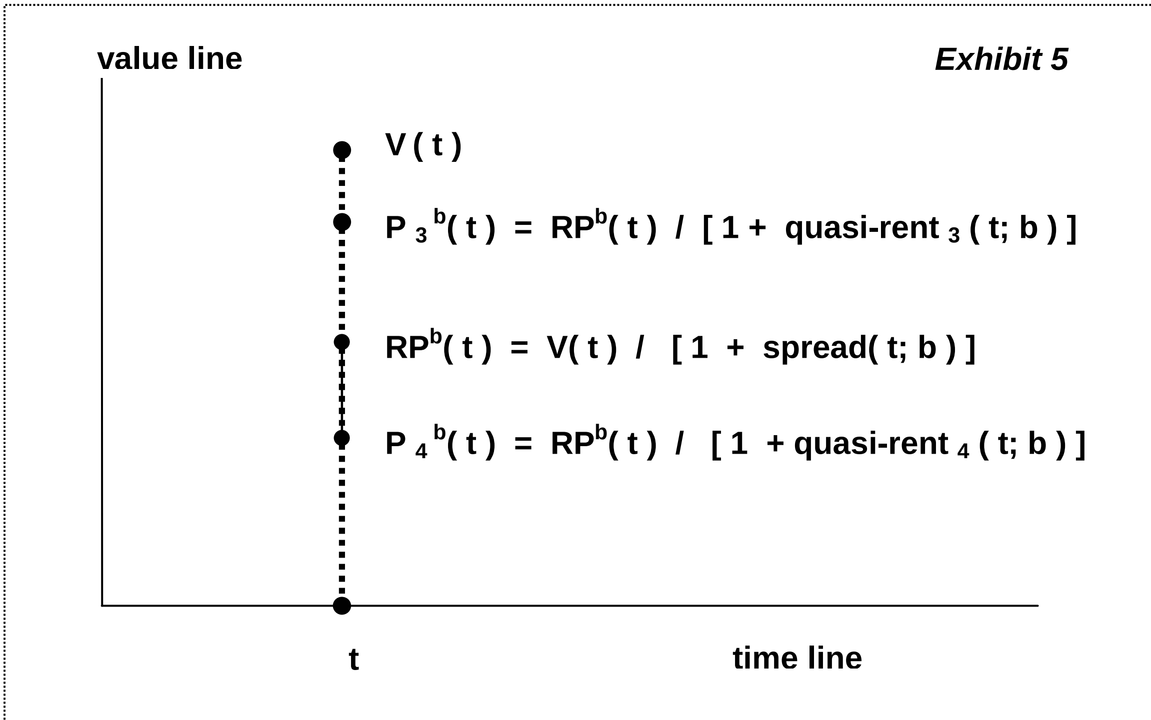
In a down-to-earth approach, the argument that linked asked prices with the reference asked price holds in its entirety for bid prices and its reference value (see Exhibit 5):

(12)

$$P^{b}_{4}\ (t) \ \ \langle \ \ RP^{b}(t) \ \ \langle \ \ P^{b}_{3}\ (t)$$

What (12) tells is that when the market allows the dealer to get a better price than the reference one, runnng at a superior profit because **he gets access to a quasi-rent rate**,

$$\textbf{quasi-rent}_{\,3}\,\textbf{(t; b)}$$



whose value is solvable from the following equation:

(13)

$$P^{b}_{\;3}\,(t) \;=\; RP^{\,b}(t)\;/\;[\;1 + \text{quasi-rent}_{\,3}(t;b)\;]$$

And, again from (12) it holds that

$$\text{quasi-rent}_{\,3}(t;b) < 0$$

and this entails that the dealer buys the financial asset without covering his cost-profit structure; in point of fact, he pays off more money that the reference price entitles him to do eventually.

In contrast, market values below the benchmark value widen the differential on behalf of the dealer, since he pays still less than the reference price. In this case, the dealer would run at a profit, what means facing a positive quasi-rent rate.

$$P^{b}_{4}\ (t) = RP^{b}(t)\ /\ [\ 1 + \text{quasi-rent}_{4}(t; b)\ ] \tag{14}$$

and from (12) he mikes a higher profit than the budgeted one:

$$\text{quasi-rent}_{4}(t; b) > 0$$

5.3 ON INTERNAL AND EXTERNAL SPREADS

The line of argument followed in sections 5.1 and 5.2 uncovers the linkage that arises out of quasi-rent rates earned or lost in contradistinction to market prices.

- A first step in the pricing of a financial asset consists in getting a technical value by means of a valuation model. In this paper, we took advantage of a model grounded in the temporal structure of rates of return adjusted for risk.

- Next step for the price-setter involves the design of a cost-profit structure which stands for a budgetary break-even point to back up his trading, by means of what we have called reference prices.

- Afterwards, dealers, market makers, and bargain hunters get down to business in a dual decision-making background:

a) they trade physical objects, called financial assets, but at the same time
b) they actually run their trading by contesting the underlying information sets of their counterparts[26].

[26] Such duality has been thoroughly examined in Apreda (2006).

In other words: in real markets, intermediaries and smart investors go beyond the buying and selling of assets; the name of the game seems to be the manifold stakes bet upon asymmetric information.

The quantitative expressions for these causal implications are easily obtained by using the outcomes of section 5.2.

Firstly, taking advantage of relationship (10)

$$\mathbf{P^{a}(t) = RP^{a}(t) \times [\,1 + quasi\text{-}rent\,(t;\,a)\,]} \tag{15}$$

and substituting definition 3 for the reference price:

$$\mathbf{P^{a}(t) = V(t) \times [\,1 + spread(t;\,a)\,] \times [\,1 + quasi\text{-}rent\,(t;\,a)\,]} \tag{16}$$

By the same token, from (13):

$$\mathbf{P^{b}(t) = RP^{b}(t)\,/\,[\,1 + quasi\text{-}rent\,(t;\,b)\,]} \tag{17}$$

and substituting definition 4 for the reference price:

$$\mathbf{P^{b}(t) = V(t)\,/\,(\,[\,1 + spread(t;\,a)\,] \times [\,1 + quasi\text{-}rent\,(t;\,b)\,]\,)} \tag{18}$$

Now we look for a direct link between (16) and (18) getting:

$$\mathbf{P^{a}(t) = P^{b}(t) \times [\,1 + spread(t;\,a)\,] \times [\,1 + quasi\text{-}rent\,(t;\,a)\,]}$$

$$\mathbf{\times\; [\,1 + spread(t;\,a)\,] \times [\,1 + quasi\text{-}rent\,(t;\,b)\,]}$$

By coalescing spreads and quasi-rents into global expressions:

(19)

$$P^{a}(t) = P^{b}(t) \times [1 + \text{spread}(d_k; t)] \times [1 + \text{quasi-rent}(d_k; t)]$$

Relationship (19) furnishes with a precise frame that allows for a clear distinction between internal and external spread.

- By internal spread (also technical, or budgetary spread)

$$\text{spread}(d_k; t)$$

we mean the measure of the cost-profit structure.

- Whereas the external spread comes out of the expression:

$$[1 + \text{external spread}(d_k; t)] =$$

$$= [1 + \text{spread}(d_k; t)] \times [1 + \text{quasi-rent}(d_k; t)]$$

The external spread is the lever by which any dealer adjusts his own inventories and weighs up his quasi-rents. For the sake of illustration, let us see how (19) becomes functional to such adjustment in three key examples.

Case 1: market prices are set by the dealer

In this scenario, prices are discretionally handled but the spread is constant, at least in the very short-time. The dealer reaps his benefit by adjusting the quasi-rents so as to balance the relationship

$$P^{a}(t) = P^{b}(t) \times [1 + \text{spread}(d_k; t)] \times [1 + \text{quasi-rent}(d_k; t)]$$

It goes without saying that he stands to gain or to lose eventually.

Case 2: bargain hunters set market prices which remain under their control.

The dealer works out his quasi-rent in the relationship above, either standing to lose most from the intended transaction, rejecting doing business for the time being because he forestalls that bargain hunters could be disguising the superior asymmetric information on their side.

Case 3: the market place becomes more uncertain.

For instance, competitors launch a challenge by adjusting their spreads, or the management of inventories becomes riskier. In such a case, the dealer might resort to (19) with a three-tier approach:

- He can change the spread, by charging a higher rate of information costs (search becomes more hazardous), but also by appraising a higher rate of microstructure costs (since keeping inventories turns out to be more expensive and volatile).

- Otherwise, he could narrow down the quasi-rent rate, to the extent of making it null or even negative, constraining himself to get a survival profit at the most.

- Also, he may sensibly hold up any sort of transaction for the time being.

CONCLUSIONS

This paper claims that the pricing of financial assets in the physical world of finance entails the management of four tiers of decision-making:

- Getting a technical value that comes out of a valuation model.
- Working out a cost-benefit structure to be linked to such technical value.

- Taking advantage of market patterns of behavior at the time of the pricing.
- Realizing that pricing goes hand in hand with a quest for quasi-rents in contexts of asymmetric information.

Running through the threads of this four-tiered approach, we have derived a set of relationships to establish causal and quantitative connections between reference prices, spreads, trading prices and quasi-rents.

Far from being unexpected facts, quasi-rents neither come out of the blue nor out of sheer luck. Intermediaries run their trading sometimes at a profit and other times at a loss, which entails positive or negative quasi-rent rates, respectively. Quasi-rents stem from the gap between actual out-of-pocket prices and the reference prices.

But their choices are meaningful when they carry out their business so as to overcome the break-even point level required to hedge the cost-profit structure, in their risky pursuit of benefit.

Bringing back the well-known Treynor″s insight, by embedding the quest for quasi-rents into the analysis, we have tried to add up meaning, accountability and transparency to his savvy metaphor about ″the only game″ to be played in town.

REFERENCES

Apreda, R. (2010) *Devising a Non-Standard Convertible Zero-Coupon Bond to Enhance Corporate Governance*. Working Paper Series, University of Cema, number 421. (downloadable from www.cema.edu.ar/publicaciones and www.ssrn.org)

Apreda, R. (2009) *A Two-Tiered Approach to the Valuation of Investment Projects Adjusted for Governance Risk*. Working Paper Series, University of Cema, number 392. (downloadable from www.cema.edu.ar/publicaciones and www.ssrn.org)

Apreda, R. (2006) *Differential Rates, Residual Information Sets and Transactional Álgebras*. Nova Science Publishers, New York.

Apreda, R. (2001) *The Brokerage of Asymmetric Information*. Working Paper Series, University of Cema, number 190.
(downloadable from www.cema.edu.ar/publicaciones and www.ssrn.org)

Apreda, R. (2000) *A Transaction Costs Approach to Financial Assets Rates of Return*. Working Papers Series, University of Cema, number 161.
(downloadable from www.cema.edu.ar/publicaciones and www.ssrn.org)

Brennan (1999) *Capital Asset Pricing Model*. The New Palgrave Dictionary of Money and Finance. McMillan Co., London.

Coase, R. (1937) *The Nature of the Firm*. Economica, volume 4, pp. 386-408. (This paper is also included in *The Firm, the Market, and the Law*. The University of Chicago Press, Chicago.)

Collins, B. and Fabozzi, F. (1991) *A Methodology for Measuring Transaction Costs*. Financial Analysts Journal, march-april, pp. 27-36. (downloadable from www.ebsco.org)

Damodaran, A. (2009) *The Dark Side of Valuation*. Financial Times, London, second edition.

Damodaran, A. (2006) *Damodaran's on Valuation*. Wiley, New York, second edition.

Davidson, P. (2002) *Financial Markets, Money and the Real World*. Edward Elgar, Cheltenham, United Kingdom.

Derman, E. (2009) *Models*. Financial Analysts Journal, January-February, pp. 28-33.
(downloadable from www.ebsco.org)

Demsetz, H. (1968) *The Cost of Transacting*. Quarterly Journal of Economics, volume 82, number 1, pp. 33-53. (downloadable from www.ebsco.org)

Gregory, D. and Livingston, M. (1992) *Development of the Market for US Treasury Strips.* Financial Analysts Journal, April, pp. 68-74. (downloadable from www.ebsco.org)

Knight, F. (1921) *Risk, Uncertainty and Profit*. Harper Torchbooks, 1965 edition, Harper and Row, New York.

Madhavan, A. (2002) *Market Microstructure: A Practitioner's Guide*. Financial Analysts Journal, September-October, pp. 42. (downloadable from www.ebsco.org)

Minsky, H. (1986) *Stabilizing an Unstable Economy*. Mc Grow Hill, 2008 edition, New York.

North, D. (1991) *Institutions*. Journal of Economic Perspectives, volume 5, number 1, pp. 97-112. (downloadable from www.jstor.org)

Roe, M. (2003) *Political Determinants of Corporate Governance*. Oxford University Press, New York.

Ross, S. (1976) *The Arbitrage Theory of Capital Asset Pricing.* Journal of Economic Theory, volume 13, pp. 431-460. (downloadable from www.ebsco.org)

Scitovsky, T. (1990) *The Benefits of Asymmetric Markets*. Journal of Economic Perspectives, volume 4, number 1, pp. 135-148. (downloadable from www.jstor.org)

Sharpe, W. (1964) *Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk.* Journal of Finance, volume 19, number 3, pp. 425-442.
(downloadable from www.jstor.org)

Shleifer, A. (1999) *Inefficient Markets*. Oxford University Press, New York.

Shleifer, A; Summers, L. (1990) *The Noise Trader Approach to Finance*. Journal of Economic Perspectives, volume 4, number 2, pp. 19-33.
(downloadable from www.jstor.org)

Spulber, D. (1996) *Market Microstructure and Intermediation*. The Journal of Economic Perspectives, vol. 10, number 3, pp. 135-152. (downloadable from www.jstor.org)

Spulber, D. (1999) *Market Microstructure, Intermediaries, and the Theory of the Firm.* Cambridge University Press.

The Economist (2009, July 18) *What went wrong with economics*, pp. 11 – 12. *The other-worldly philosophers*, pp. 65 – 67. *Efficiency and Beyond*, pp. 68 – 69.

Treynor, J. (1999) *Dealers in Securities*. The New Palgrave Dictionary of Money and Finance. McMillan Co., London.

Treynor, J. (1995) *The Only Game in Town*. Financial Analysts Journal, January-February, pp. 81-83. (downloadable from www.ebsco.org)

Treynor. J. (1967) *The Economics of the Dealer Function*. Financial Analysts Journal, November-December, pp. 27-34. (downloadable from www.ebsco.org)

Williamson, O. (1979) *Transaction-Cost Economics: The Governance of Contractual Relations*. Journal of Law and Economics, vol. 22, number 2, pp. 233-261. (downloadable from www.ebsco.org)

Willliamson, O. (1988) *Corporate Finance and Corporate Governance*. Journal of Finance, volume 43, number 3, pp. 567-591. (downloadable from www.jstor.org)