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A SHORT NOTE ON EXPECTED RISK ADJUSTED ELASTICITY AND CONSUMER THEORY

José P. Dapena[*]
UNIVERSIDAD DEL CEMA
2014

Brief

This short note is aimed to open discussion. Asset pricing models assume capital markets are competitive, but then my questions were: Why would a diversified investor be willing to accept a supposedly lower equilibrium risk adjusted rate of return in emerging markets (like Argentina), that the one sought from a foreign investor, being both comfortable with it? The second: Do the sale of securities and finance in general benefit from, applying concepts and tools borrowed from consumer theory and particularly demand theory? Finally: May companies benefit from some sort of market power when selling risk to investors in the form of securities (particularly shares), in the same way they may benefit from holding market power for their products and services?

The purpose of this short note is to share debate about the assumption of competitive markets in the determination of the equilibrium risk adjusted rate of return, which could become more interesting in emerging markets where lack of depth of capital markets, lack of information and lack of sophistication are more plausible to find giving rise to the possibility of sort of market power in the sale of risk, and to perhaps introduce some points of contact between the consumer theory -particularly demand and marketing (which holds for consumption of current products and services), to securities (particularly in this note herein shares) which are no more than packed rights for future consumption. However, concepts may apply to developed capital markets where companies want to promote not only their products and services, but also their shares.

JEL: F36, G11 G12.
Key words: Asset valuation, rate of return, competitive markets, price elasticity, consumer theory.

[*] The authors' views are personal and do not necessarily represent those of the Universidad del Cema.

I. Foundation

The purpose of this short note is to share discussion about the assumption of competitive markets in the determination of the equilibrium risk adjusted rate of return, which could become more interesting in emerging markets, where lack of depth of capital markets, lack of information and lack of sophistication[1] are more plausible to find giving rise to the possibility of the existence of some sort of market power in the sale of risk, providing the investor with another consumption good and to perhaps introduce some points of contact between the consumer theory -particularly demand and marketing (which holds for consumption of current products and services), to securities (particularly in this note herein shares) which are no more than packed rights for future consumption. The recent auction of Alibaba´s shares in the September´s IPO in NASDAQ may show that marketing, advertising and fashion may have a role to play in the sale of securities beyond the calculation of risk.

This article is aimed to open discussion. The questions were: Why would a diversified investor be willing to accept a supposedly lower equilibrium risk adjusted rate of return in emerging markets, like Argentina, that the one sought from a foreign investor, being both comfortable with it?

The seconds: Do the sale of securities and finance in general may benefit from applying concepts and tools borrowed from consumer theory and particularly demand theory?

Finally: May companies benefit from some sort of market power when selling risk to investors in the form of securities (particularly shares), in the same way they may benefit from holding market power for their products and services?

The article assumes the reader is familiar with the literature in finance (particularly portfolio theory) and microeconomics (consumer and demand theory). The organization starts with a basic introduction to the microeconomics of consumer theory, then I introduce as an example the basic the concepts for an asset pricing model taking as an

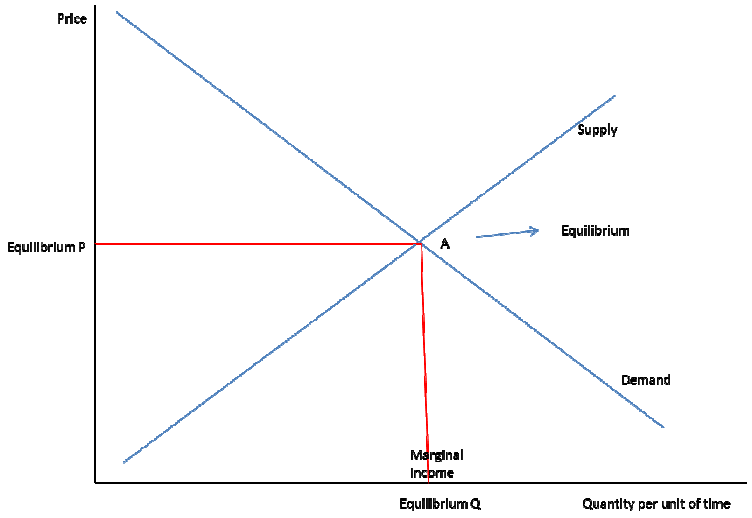
[1] See for instance the work by Bekaert G. and Harvey C. (1995) and (2000). Beakert (2011) proposes three factors, openness to foreign investors, local financial market development and measures of global risk premium.

example the capital asset pricing model (CAPM); in section IV I analyze a situation of deviation from competitive markets, and section V is for discussion. Many of the concepts are simplified to better focus on the idea.

II. The basic microeconomic theory[2]

In microeconomics, there is demand and supply for a product or service, which is normally shown in the following manner:

Graph I



The interactions between buyers and suppliers set an equilibrium price and quantity per unit of time and market is cleared in an efficient way.

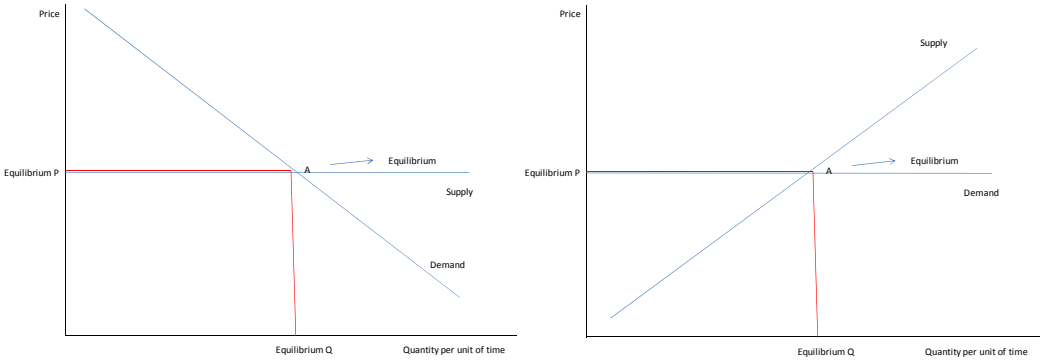
Both buyers and suppliers in competitive markets are assumed to have many options to compare and decide based on price, which means that individual price elasticity, defined as the sensitivity of the percentage change in the quantity demanded or supplied to a percentage change in the price:

[1]

[2] Mas -Colell A., et. al. (1995), Varian H. (1992).

is extremely high, hence buyers are extremely high price sensitive, and the observed price in the market is individually taken as given, deciding the transaction for a particular buyer or seller:

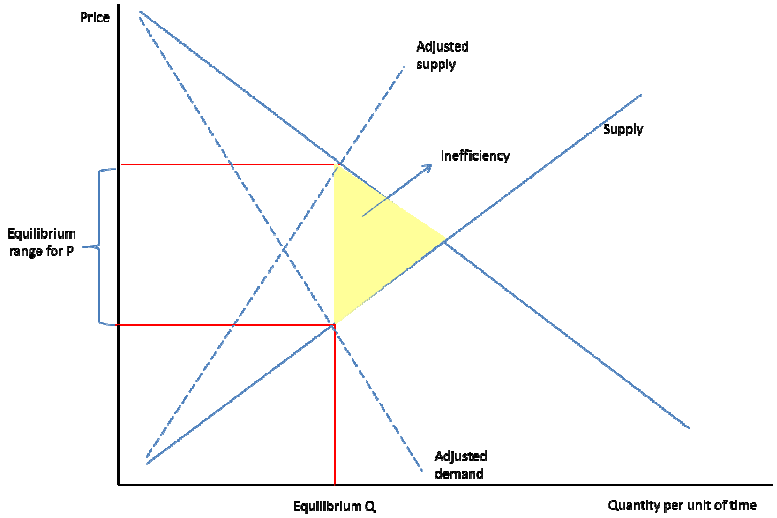
Graph II



a. Inefficiencies[3]

There may also be situations where inefficiencies arise, like transactions costs, agency costs, asymmetric information costs, externalities, etc. that introduce deviations form equilibrium both in demand or/and in supply, giving rise to deviations from efficiency:

Graph II



In these situations, equilibrium prices and quantities are not those of equilibrium.

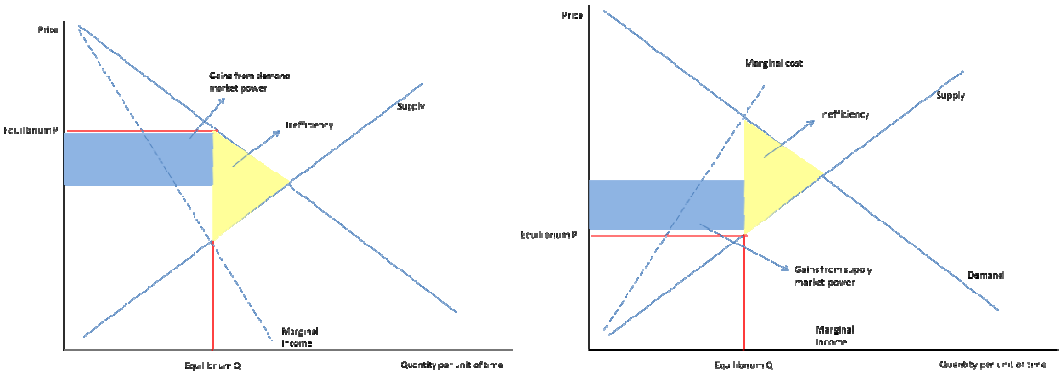
[3] Png I., (1998)

b. Market power[4]

Another deviation from competitive equilibrium arises when there is a situation of some degree of market power held by buyers or sellers. The competitive model shown in graph 1 assumes any participant can set a price different from that of the market, which is the same as saying that individually they are perfectly price elastic. They take the market price as given, and they have enough options to compare.

However it could be the case that a participant can set a price different and still sell or buy goods. If that was the case, we would have another deviation from the competitive market situation like the one in the following pictures, arising from buyers or sellers.

Graph III



In the first graph we see an extreme situation of market power exercised by a supplier and in the second graph the same for a buyer. In the first situation, there is a unique supplier who decides the price to her convenience and buyers have no options (by definition) but to adjust their consumption and pay the price. If that was the case, we say buyers are not perfectly elastic with respect to price in the sense of equation [1].

The situation where a supplier holds market power is sought by any firm because it can extract a rent surplus, exploiting the fact that the consumer has no choices but to buy their product or service. Leaving apart the case of a natural monopoly, companies seek to achieve this situation by investing in advertising, promotions and other mechanisms studied in consumer theory and particularly in marketing to differentiate themselves and make the consumer choose their products and services and hence reducing her options

[4] Png I. (1998).

and price elasticity (the consumer decides not only on price but including other attributes arising from differentiation or form lack of alternative choices).

Demand market power can arise from monopoly, from luck of depth in the market, lack of information, time or sophistication by buyers. The fewer the options the consumer has (or think she has), the more price- inelastic she becomes.

III. The standard asset pricing model

Consumer theory (and marketing) is generally applied to current or spot consumption, while finance is about future consumption packed in the form of securities. In the capital markets buyers and sellers exchange funds (current consumption) for securities (future consumption) using the return as the price that rewards for time and risk.

The expected risk adjusted equilibrium rate of return rate (or cost of capital) can be defined as the minimum expected return an investor seeks as a reward for time and risk, given the alternative investment opportunities she has. It can also be seen as the maximum expected return the investee is willing to pay according to the time and risk of the application of funds.

To point out the purpose of this note I shall use as an example the standard Capital Asset Pricing Model[5][6], which is the most widespread model used by practitioners to calculate the equilibrium rate of return[7]. In this model, the investor wants compensation and the seller pays for the cost of time plus a spread arising from the risk contribution of securities to the whole risk of a portfolio. The seller does not pay reward for idiosyncratic risk because it can be insured by appropriate diversification. Hence, investee only pays for systemic risk and investor is rewarded in the same way.

$$k = rf + \beta * (Rm - rf) + \varepsilon \qquad [1]$$

[5] Lintner J.(1965), Sharpe W. (1964), Markowitz (1987)
[6] In asset pricing model assuming competitive markets can be used as an example.
[7] I am fully aware about the limits and restrictions the CAPM have, for instance Markowitz (2005), or the better Three Factor Model by Fama E., and French K. (1993).

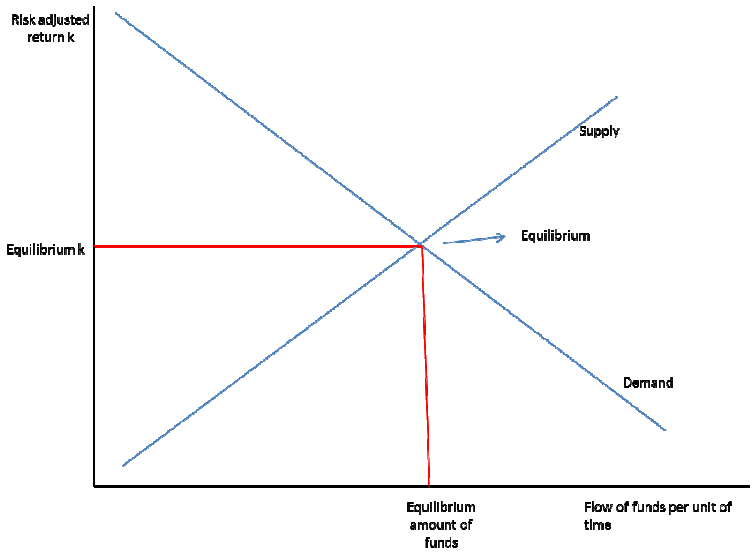
where k is the risk adjusted rate of return, rf is the price of time, the second term in the right hand side shows the systemic risk, and ε stands for idiosyncratic risk.

The third term in the right hand side disappears by diversification, and we are left with:

$$E(k) = k = rf + \beta * (E(Rm) - rf) \qquad [2]$$

This equilibrium price calculation shows three main components, the price of time, the amount of risk and the main alternative investment the investor has to compare (a market index). In a graph, we define in the vertical axis the expected return and in the horizontal axis the amount of funds traded in the market. In this depiction, institutional investors, private investors and companies can act both as suppliers are demanders. As the adjusted expected return goes up, the amount offered increases, and vice versa for the amount demanded.

Graph IV



a. The inclusion of country risk in the CAP model for emerging markets[8]

[8] For discussion and references of the use of CAP model and equity returns in emerging markets, see Ross (1977), Erb C.B. et al (1996), Gianneti M. and Koskinen Y. (2010), Harvey (1995) and other references, and from a practitioner point of view Damodaran A. (2012).

When the model is applied to value securities in emerging markets, the literature and practitioners tend to make adjustment for the fact that there is an extra risk, arising from institutional and political matters and weaknesses.

In this case, the most common used adjustment is to incorporate in the CAP model an extra spread coming using as a proxy the country sovereign risk. The way this country risk is includes varies according to different interpretations.

$$E(k) = k = rf + \beta * (E(Rm) - rf) + \sigma \qquad [3]$$

The model shown in the previous graph remains the same where the risk adjusted rate of return now also accounts for country risk premium (there can also be other adjustments as liquidity, etc.). It can be applied to all securities; however I shall focus only on shares.

b. Competitive capital markets

This model has a very strong assumption related to structure of the market, in this case capital markets. It assumes capital markets are in perfect competition, and the price of the market (in this case the expected return) rewards time and systemic risk. In the terms of what we have shown before, it means that the buyer of risk has many securities to compare, and has a method to standardize risk and compare securities that were originally in different risk classes. This could be the case in developed markets, and also in some emerging markets, where secondary markets play a very important role.

The beauty of the model is that allow to compare securities which in the first place are different (they are in different risk classes) by providing a methodology to adjust for risk, hence making comparison feasible. The CAP Model provides a framework for investors and investees to compare different securities adjusting for risk, in a matter that makes them comparable even if they are in a different asset class, so assets which previously cannot be compared, by the use of the model become comparable, then investors and investees can choose among them. The there is a risk adjusted market expected return for the equilibrium, and this is the variable that decides transactions.

However and again, a very important feature of the model is that the consumer (or investor) has many securities (or the market index) to compare and choose.

IV. Deviations from competitive market equilibrium and introduction to expected risk adjusted rate of return elasticity

One of the assumptions of the CAP Model (also used in other models as well) is that in all cases investors and investees can compare and have alternative investment choices by means of the "equalizing differences process" of the model.

The main assumption in the model is that investors and investees decide in markets where they have enough choices and hence the expected risk adjusted rate of return drives their decisions, so we introduce the expected risk adjusted rate of return elasticity:

$$e_k = \frac{\Delta F/F}{\Delta k/k} \qquad [4]$$

where the buyers and seller of risk are perfectly sensitive to the expected risk adjusted rate of return if markets are competitive, securities (shares and in the case of CAPM) are perfectly comparable, hence no investors or investees have any kind of market power, and information flows fluently. In terms of microeconomics theory, investors and investees are perfectly elastic with regard to the risk adjusted rate of return and both investors and investees face enough alternative risk adjusted choices.

The question and concern arises if we ask:

What if capital markets for securities were not perfectly competitive?

a. The case of CAPM

If markets were not perfectly competitive and there is some sort of market power in the purchase or sale of risk, then investors and investees would not then face enough

alternative investment choices. In this situation, there would be some effect of market power, and the risk adjusted expected rate of return in [3] shall introduce a concept:

$$E(k) = k = rf + \beta * (E(Rm) - rf) + \sigma + \text{effect of market power} \quad [5]$$

where the main issue is that the last term **can be either positive or negative** depending on who holds the market power. This means that if the supplier of securities (both in primary or secondary markets) holds market power, then the buyer or investor has no many alternative investment choices and she will be willing to accept a lower expected risk adjusted rate of return than predicted by the model. The expected risk adjusted rate of return elasticity may differ from investor to investor according to their possibilities frontiers, real or perceived.

b. The state contingent price model

The intuition may also be seen from another approach. A state-price security, also called an Arrow-Debreu security or a pure, elemental or a primitive security (from its origins in the Arrow-Debreu model -1954- also referred to as the Arrow-Debreu and McKenzie -1959- or ADM model) is a contract that agrees to pay one unit of a numeraire if a particular state occurs at a particular time in the future and pays zero numeraire in all the other states.

We denote π_i the current price of insuring a unit of numeraire in time one of state i. Markets are complete if there is a pure asset for each state of the nature (which for instance requires that there is collateral in every state of the nature), which ensures the existence of a risk free asset.

The basic assumption in the model is that the prices π_i´s are formed in competitive markets (for example there is no monopoly in the ownership of the collateral). The purpose of this paper is to share the question: “What if there is some sort of market power in the sale or in the purchase of an Arrow Debreu security?”

c. Real or perceived market power

Whether companies in consumer theory exercise real market power with respect to their products sometimes is a matter of perception. Companies spend tons of money to differentiate and convince buyers that their product is unique and suited to their needs; the money spent with that purpose is supposedly repaid with better margins or larger market shares. Companies spend to make buyers have the perception that they have “no alternative choice”.

The same intuition may apply to capital markets. There could be market power not because there are not enough alternative choices but because the investor does not know about them, does not have the tools to analyze them, or does not have the time; in all cases it becomes the same.

For instance, in the case of investing in an emerging market like Argentina, where there is both capital flow and exchange rate control, a foreign investor would compare the expected risk adjusted rate of return of investing in such a country by introducing a sovereign risk, which increases the rates she seeks, because she can decide freely where to invest and has choices. However if the investor is from Argentina and lives there, she perhaps cannot send freely the funds abroad, and perhaps she has to accept a lower expected risk adjusted rate of return given the real or perceived lack of choices, so in the end we are set with two expected risk adjusted rate of returns which finds no support on risk, but on the structure of the market, existence of choices and transactions costs.

One example I had the choice to see of market power came from loans offered at incredibly high interest rates. When digging into the components of the rates, I was able to see they were not rewarding default risk, but exercising market power from the fact the potential borrowers had no alternative choices and hence were highly inelastic to the expected rate of return.

In this context, both the situation of having no alternative investment choices or such a perception due to the lack of information work in the same way, introducing a concept of demand or supply expected risk adjusted rate of return elasticity.

The extreme situations are those where there is only one supplier of a risk class or only one demander for it. Without falling in this extremes, the fact that are not sufficient suppliers (or alternatively, that demanders do not know and get in touch with enough suppliers of funds which in practice becomes the same) introduces and inefficiency in the capital market which is not reflected in the CAP model, and the law of one price breaks down, and also gives rise to arbitrage opportunities.

d. Return elasticity and a marketing approach

The second element to point out is that if prices of securities are not only affected by the price of time and the risk, and there is differentiation beyond these elements, then companies may not only sell products and services using consumer theory and marketing tools but they can also sell securities by means of the same concepts. This could be the case of companies willing to sell their environmental behavior, where investor buy not only their products and services but also the securities issued by them[9]. In this case there could be investors that invest only in companies who are "socially responsible" or "environmentally friendly" for instance because they want to show such a behavior. If that was the situation, investors focus their decisions not only on the basic components of finance (risk, return, liquidity and maturity) but also on the consumption of other goods which are important to them and that could give rise to another component in [3], and would be willing to accept a lower expected risk adjusted rate of return, because they are buying another "product or service".

The same applies to any seller of securities (institutional or private investors in the secondary market from the sell side). It can also be seen that an investor can exploit market power by reputation, capturing extra rent from buyer´s market power, so securities differentiation beyond risk can play a role in the price of them, moreover when markets have no depth, and there is lack of information or lack of sophistication.
It could be the case that these situations were exploited not from real market power, but from asymmetric information issues. If that was the case, the perceived market power comes from lack of information, in work in the same way as in consumer theory.

[9] There may be a clientele effect. See Allen and Gale (1994).

Hence if sellers of risk spend money to advertise their securities (where full disclosure and transparency is intended in that sense but as a consequence of regulation), they can benefit from extra rent. If that was the case, the theory of finance has much to borrow and benefit from tools and concepts from consumer theory and advertising, where differentiation may play a role[10], because consumer theory and advertising apply to current consumption and finance to future packed consumption. A very interesting example about this is an investment opportunity in Argentina, where the investor pays some money, and receives in exchange a perpetual rent in the form of bottles of good wine. This investment opportunity combines both the financial side plus a consumption opportunity in the form of customized bottles of wine.

V. Discussion

The asset pricing models (in the case of this note CAPM or the ADM model) provide tools to compare alternative investment by adjusting for risk, under the assumption that capital markets are competitive and investors and investees have alternative choices, meaning there are perfectly elastic to the expected risk adjusted rate of return an risk is traded fairly.

The assumption of competitive markets suits better for developed markets. In emerging markets it could be the case that by means of lack of depth of the capital market, specially the secondary one, lack of information or/and lack of sophistication[11], the risk adjusted rate of return elasticity for buyers and sellers is lower than suggested by the model, implying the agents do not have many alternative investment options, giving rise to some sort of real or perceived market power in the sale or in the buy of risk. The situation reduces the availability alternative investment options investors and investees

[10] One example of this could be a bond offered by the main oil company in Argentina. Given inflation, it was offering an annual return of 20% plus a contingent payment upon increase in production. At the same time, time deposits were yielding 21%, and the share of the oil company had risen by 50% in the last months. So the better trade was to keep a high percentage of funds in the time deposit, and allocate a percentage to buy the share. However, some investors may have seen the investment in the bond as a way of helping the company and the country (given it has been recently nationalized) and were willing to buy it. This situation has nothing to do with risk, but with consumer theory, marketing advertising aimed to appeal to other elements.

[11] Beakert (2011) proposes three factors, openness to foreign investors, local financial market development and measures of global risk premia.

may have, giving rise to the chance of having another component in the determination of the cost of capital or risk adjusted expected rate of return not related with time or risk (a "fashion" component for instance).

The literature of applying CAP model to international capital markets shows there could be equity segmentation[12] which is a typical consumer theory concept. In the case that home bias holds[13], this would strengthen the situation we introduced for discussion in this note, because the set of alternative investment choices is reduced.

If that was the case, the concepts and tools from consumer and demand theory can be applied to understand the real expected risk adjusted rate of return at which both buyers and seller are willing to trade risk. Companies may sell not only products and services to consumers but also (including any equity seller in the secondary market) they may sell risk to investors and hold market power from it, with some sort of extra return (in the sense of higher prices or better volume) for their securities.

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[12] See for instance the work by Bekaert G. and Harvey C. (1995) and (2000).
[13] In the sense of French K. and Poterba J. (1991).

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