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FACTORING GOVERNANCE RISK INTO INVESTORS' EXPECTED RATES OF RETURN BY MEANS OF A WEIGHTED-AVERAGE GOVERNANCE INDEX

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Abstract

Although global investors have been paying more heed than ever to Corporate Governance for the last decade, the evolving premium risk stemming from variegated governance issues has not been factored yet into the expected return of any investor's portfolio. From a theoretical standpoint, this paper sets forth firstly a weighted-average index built up by choosing distinctive and relevant governance variables that go beyond provisions usually embedded in the founding charter. Afterwards, a measure of governance risk premium will be derived out of the index rate of change. Lastly, it will be introduced a multiplicative model of expected returns with a risk adjustment factor over the risk-free asset comprising systematic, nonsystematic, country and governance risk premiums.

JEL: G11, G34, G12

Key words: governance risk, governance index, governance rate, expected return, risk adjustment.

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Institutional disclaimer

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INTRODUCTION

For the last three decades, a storm of criticism about corporate bad practices, as well as managers' malfeasance, has been spreading all over the world[1]. Such apprehensions have been raised from many quarters, mainly from the side of lawmakers, financial institutions, stockholders, regulators, investment banks, bondholders, institutional investors, and gatekeepers.

At the root of the ongoing discussion is the extent to which any company might be able to devise, carry out and conclusively exhibit good governance[2]. The logic behind the above-mentioned concerns is predicated upon the following features:

Good corporate governance pays off, adds market value to the company, builds up reliable corporate practices, fosters better accountability among stakeholders, sharpens up transparency as well as more responsive covenants on behalf of creditors and other stakeholders.

In the meantime, global institutions like the World Bank and the IMF have been designing indexes of governance not only for countries but also for single companies in the private sector. On this line of research, an academic contribution has been provided by Gompers, Ishii and Metrick (2001), which seems worthy of being outlined at this place:

a) The authors chose 24 provisions regularly embedded in corporate charters, mainly related to takeover defenses and shareholders rights. Next, they searched for distinguishable patterns of behavior in those provisions along time, within a universe of about 1,500 companies listed in the USA stock market. Their major finding was an impressively positive relationship between governance and stock returns.

b) Each provision was given the value +1 whenever shareholders' rights were hampered by management entrenchment, and marked −1 otherwise. Companies clustered in the first decile of the sample qualified as members of the "management portfolio", whereas those

[1] It is for Appendix 2 to make explicit the underlying definition of governance taken for granted in this paper. On corporate bad practices and scandals, Enron is a case in point, which we have dealt with elsewhere (Apreda, 2002).

[2] A thorough discussion of corporate governance issues is to be found in Apreda (2007a, 2005a, 2006a, 2003b).

in the last decile qualified like firms belonging to the "shareholders' portfolio". This choice of variables and values amounts to an ordinal index based on qualities rather than on weighted averages, as it is the case with cardinal indexes.

c) Higher values of the index were found in companies with a powerful management, whereas lower values gathered around firms placed in the shareholders' portfolio. Therefore, this index intends to track down on the balance of power between shareholders and managers, against the background of pervading agency problems[3].

In this paper, we intend to handle a distinctive problem that arises in Corporate Finance and Portfolio Management: how could big investors in capital markets discount governance risk from the expected return they claim from their investment? To attain our purposes we are going to produce a cardinal index that measures up changes in a set of governance variables not necessarily included in the founding charter.

To start with, section 1 lays foundations for a weighted-average index of governance. Next, in section 2, the rate of change of the index will pave the way to a measure of governance risk premium. Lastly, it is for section 3 to factor the governance risk into a multiplicative model of expected returns.

1. A CARDINAL GOVERNANCE INDEX

How could we appraise the extent of governance performance? Among other available alternatives, one course of action may consist in setting up an index. Such yardstick would provide us with a numerical variable that evolves as time passes by, and whose rate of change, period after period, allows us to keep a record of how well the company meets governance standards.

So far, a variety of worldwide and well-known institutions have been developing governance indexes. Among such index-builders, we can

[3] In Appendix 2, we are going to handle an epistemological subject matter: how does an index become consistent with certain underlying definition of Corporate Governance?

point to the World Bank, the OECD, and risk-rating agencies[4]. But in practice, most of such indexes have been "qualitative" (ordinals)[5].

In contradistinction to the ordinal approach, we advocate at this place a quantitative approach. Albeit a theoretical viewpoint, we hope econometricians and practitioners find it suitable for their research and applications. Our index works on three broad assumptions:

a) A cardinal governance index **G(t)** is available at date **t**. In fact, we are going to shape such an index in the following subsections.

b) At date **t**, and within a planning horizon **H = [t; T]**, we would also be able to assess the value of the index, $\mathbf{E_t\ [G(T)]}$ expected for date **T**, a suitable valuation for practitioners and analysts.

c) The index allows for a quantitatively weighted measure of governance performance. Broadly speaking, the higher its value the better.

The major points of this section are the following: firstly, we put up the index; secondly, a recursive algorithm brings to light the index dynamics; next, we expand on suitable governance variables; afterwards, we move on the weighting system; last of all, we undertake a balanced assessment of the index.

1.1 BUILDING UP THE INDEX

Let us imagine that certain organization, which we have called elsewhere a governance broker[6], agrees that the subsequent vector comprises explanatory variables for governance, at date **t**,

$$\mathbf{G = [\ G(1), G(2), \ldots \ldots \ldots \ldots, G(L)\ ]}$$

Moreover, the broker produces a weighting system, at date **t**, which arises from the vector

$$\mathbf{W = [\ w(1), w(2), w(3), \ldots \ldots \ldots \ldots, w(L)\ ]}$$

[4] References, at the end of this paper, provide the reader with web pages of some of these organizations.

[5] As it happens with the index produced by Gompers et al. (2001), which we have already discussed in the introduction.

[6] Apreda (2007b). To name but a few examples of governance brokers we could point to investment banks, risk-rating companies, financial consultants, law firms, research centers, capital-market analysts in stock exchanges.

The index should be defined out of a universe of available companies, also framed as a vector

$$\Gamma = [\ k_1 ; k_2 ; k_3 ;\ \ldots\ldots k_s\ ]$$

and to compute its vale at date **t**, for company **k**, we avail ourselves of the scalar product of vectors **G** and **W**:

$$\mathbf{G(k; t) =}$$

$$= \mathbf{[G(k; 1; t), G(k; 2; t), \ldots , G(k; L; t)] \,.\, [w(1), w(2), \ldots , w(L)]}$$

that is to say, the index springs up from the dated expression:

(1)

$$\mathbf{G(k; t) =}$$

$$\mathbf{= w(1) \,.\, G(k; 1; t) + w(2) \,.\, G(k; 2; t) + \ldots + w(L) \,.\, G(k; L; t)}$$

or, equivalently[7],

(1')

$$\mathbf{G(k; t) = \sum w(i) \,.\, G(k; i; t) \quad ; \quad i: 1, 2, 3, \ldots \ldots , L}$$

Therefore, for each organization **k**, and at any date **t**, there is a structure of explanatory factors and relative weights as it is shown in the table below.

Explanatory Factors	G(k; 1; t)	G(k; 2; t)	… G(k; i; t) …	G(k; L; t)
Weighting System	W(1)	w(2)	… w(i) …	W(L)

As we can see, governance variables do take specific values for each company, whereas weights are the same, at date **t**, for all the companies[8].

1.2 A RECURSIVE ALGORITHM FOR THE WEIGHTED AVERAGE INDEX

Recalling (1')

[7] When writing down **G(k; t)** we mean the value of the index at date **t** for company **k,** whereas **G(k; j; t)** stands for the value of the governance variable **G(j)** at date **t**, for company **k**.

[8] The updating of weights will be developed in section 1.4.

$$G(k; t) = \sum w(i) \cdot G(k; i; t) \quad ; \quad i: 1, 2, 3, \ldots \ldots, L$$

we are going to make explicit each governance variable by means of a recursive relationship[9]:

$$G(k; i; t) = G(k; i; t-1) + \varepsilon(k; i; t-1; t) \tag{2}$$

where

$$\varepsilon(k; j; t-1; t) = \begin{cases} \textbf{+ 1 (compliance}^{10}\textbf{ level)} \\ \text{if there is material evidence that the underlying variable has moved for the better over the valuation period.} \\ \\ \textbf{0 (neutral level)} \\ \text{if there is no conclusive evidence that any material change has taken place.} \\ \\ \textbf{– 1 (non compliance level)} \\ \text{if there is material evidence that the underlying variable has moved for the worse over the valuation period.} \end{cases}$$

Summing up, (2) defines each governance variable inductively. In other words, (2) conveys the idea of an accumulative process that holds for every company **k**. As time goes by, the process rewards compliance and punishes non-compliance, period after period.

1.3 ABOUT A SET OF GOVERNANCE VARIABLES

At this juncture, we have to render account of our choice of governance variables. They are sorted out in ***Exhibit 1***[11] under the headings of six broad categories, namely Board of Directors, Owners, Governance Architecture, Management, Creditors, Gatekeepers and Regulators. It goes without saying that, in actual practice, the analyst or econometrician laboring over this index may shorten the list of

[9] We assume that the variable "date at t" belongs to a denumerable set that stands for an index set. More background on recursive or inductive definitions can be found in Eccles (2004) or Block (2000).

[10] Compliance risk and compliance functions are newcomers in the governance parlance, since their introduction by the Bank of Basel like guidelines for financial institutions worldwide. The first extension of both notions to non-financial organizations was provided by Apreda (2007c).

[11] Further background on the semantics of the variables included in Exhibit 1 can be found in Apreda (2007a, 2007b, 2006a)

variables on the grounds of tractability, relevance, research costs, or statistical fitness.

Governance Variables	
Board of Directors Independent Directors CEO and Chair as separate functions Control and fiduciary duties Audit Committee Staggering appointments Compliance risk committee Compensation packages committee Self-dealing issues	**Management** Control and decision rights Tight-budget constraints Rent-seeking avoidance mechanisms Compensation packages Severance payments Anti-takeover provisions Compliance risk function
Owners One share, one vote Differential voting rights Pyramids and cross-holdings structures Minority protection rights Tunneling Capital structure	**Creditors** Control rights Protective covenants in bonds and bank's loans Financial hybrids and capital structure Banks influence in Boards Sinking funds provisions in bonds and bank's loans
Governance architecture Founding Charter Governance Statute Codes of Good Practices Reorganization provisions Design of accountability mechanisms Transparency procedures Private or public placements of securities	**Gatekeepers and regulators** Federal or state incorporation rules Design of open or closed organizations Auditor independence Credit risk ratings Compliance risk Corporate or Private Companies Laws

Exhibit 1
Some corporate governance variables

For the sake of illustration about how to use a governance variable included in the exhibit, let us pick "independent directors", from the set of variables related to the category "Board of Directors". In this case, we would denote the variable as:

$$G(k; i; t) = G(k; B1; t)$$

where **B1** stands for the statement "the first variable in the Board of Directors category" (see ***Exhibit 1***).

a) At the starting date, when company **k** is rated for the first time, only two alternative values are attainable from the up-to-date information:

$$\mathbf{G(k;\ B1;\ 0)\ =\ \begin{cases} +\ 1 \\ -\ 1 \end{cases}}$$

If the founding Charter established that at least one independent director ought to be appointed, + 1 would follow when **B1** becomes true, and – 1 would be the mark given if **B1** were disproved outright.

A similar rating would have been ensued if the statement had been embedded in the Governance Statute, instead of being a provision in the Charter. Likewise, if it had been compulsorily settled by the regulator.

b) As time passes by, let us assume that at date t_1, for instance, the company increases the number of independent directors. Therefore:

$$\mathbf{G(k;\ B1;\ t_1)\ =\ G(k;\ B1;\ t_1 - 1)\ +\ \varepsilon(k;\ B1;\ t_1 - 1;\ t_1)}$$

such that

$$\mathbf{\varepsilon(k;\ B1;\ t_1 - 1;\ t_1)\ =\ +\ 1}$$

Other plausible settings from which the chosen governance variable could deserve a mark of + 1 are the following:

- independent directors uphold their fiduciary duties in critical issues, like those involving self-dealing, soft-budget constraints, rent-seeking, tunneling, to the extent of forestalling or punishing those patterns of behavior[12];

- keeping record on how often independent directors vote for or against decisions that could conflict with commitments over which they will be held accountable for eventually.

[12] These topics are enlarged in Apreda (2004, 2007a, 2006a).

At the opposite extreme, let us imagine that the company reduces the number of independent directors or, making things worse, it suppresses their appointment to the Board. In that case,

$$\varepsilon(k; B1; t_1 - 1; t_1) = -1$$

By the same token, and among other examples that lead to the – 1 mark we can single out the following:

- likely malfeasance of independent directors;

- Board independence and their control rights are disregarded by management or blockholders;

- self-dealing and soft-budget constraints are neither monitored nor forestalled by independent directors;

- fiduciary duties are not fulfilled.

1.4 ABOUT THE WEIGHTING SYSTEM

Starting from the universe of available companies, conveyed by the vector

$$\Gamma = [\, k_1 ; k_2 ; k_3 ; \ldots\ldots k_s \,]$$

and taking into account the vector of governance variables

$$G = [\, G(1), G(2), \ldots \ldots \ldots \ldots, G(L) \,]$$

we can define a sample space suitable for our purposes as the cartesian product

$$G \times \Gamma = \{\, (G(i) ; k_j) \mid i : 1, 2, \ldots, L \;;\; j : 1, 2, \ldots, s \,\}$$

Afterwards, we define a boolean-valuation function, **Bool**, from the cartesian $G \times \Gamma$ on the set

$$\{\, (a_i^{\,j})_{L \times S} \mid i : 1, 2, \ldots, L \;;\; j : 1, 2, \ldots, s \,\}$$

of all real matrix of **L** files by **S** columns, in the following way:

$$Bool : \quad G \times \Gamma \quad \rightarrow \quad (a_i^{\,j})_{L \times S}$$

such that

$$\mathbf{Bool}\,[\,(\,G(i)\,;\,k_j\,)\,] \;=\; (\,\delta_i{}^j\,)_{L\times S}$$

where [13]

$$\delta_i{}^j \;=\; \begin{cases} 1 & \text{if company } \mathbf{j} \text{ is responsive to variable } \mathbf{i} \\ 0 & \text{if company } \mathbf{j} \text{ is non-responsive to variable } \mathbf{i} \end{cases}$$

Hence, from the sample space stems a matrix of coefficients, whose files stand for governance variables, and columns for companies, as shown below.

$$(\,\delta_i{}^j\,)_{L\times S} = \begin{pmatrix} \delta_1{}^1 & \delta_1{}^2 & \delta_1{}^3 & \ldots\ldots\ldots\ldots & \delta_1{}^s \\ \delta_2{}^1 & \delta_2{}^2 & \delta_2{}^3 & \ldots\ldots\ldots\ldots & \delta_2{}^s \\ \delta_3{}^1 & \delta_3{}^2 & \delta_3{}^3 & \ldots\ldots\ldots\ldots & \delta_3{}^s \\ \ldots\ldots\ldots\ldots & & & \ldots\ldots\ldots\ldots & \\ \ldots\ldots\ldots\ldots & & & \ldots\ldots\ldots\ldots & \\ \delta_L{}^1 & \delta_L{}^2 & \delta_L{}^3 & \ldots\ldots\ldots\ldots & \delta_L{}^s \end{pmatrix}$$

Being responsive for the company **j** to the variable **i**, means at least three things:

a) the variable becomes related to the company's governance in a distinctive way;

b) we can ascertain whether the company is performing well or badly, regarding that variable;

c) if the company **j** is unrelated to certain variable **i**, then there is no responsiveness and $\delta_i{}^j$ is zero.

[13] That is to say, the matrix is boolean and its coefficientes are Kronecker's deltas.

Looking up in Exhibit 1 again, let us take from the category Board of Directors, the variable "Audit Committee". To be responsive or not would mean that the company, for instance:

- it has an Audit Committee, either as a regulatory constraint, or as an outcome of its own discretionary governance;

- it enhances the committee by appointing independent directors;

- it reports no such committee on the grounds of its organizational nature, a feature often found in some cooperatives, certain kinds of foundations and mutuals, and most of medium and small family-owned companies.

We are going to take advantage of this matrix to set up the weighting system, by means of the cardinal number for the following finite set[14]:

$$\#\{\textbf{File (h)}\} = \#\{\ \delta_h{}^j = 1\ ;\ \ j\text{: } 1, 2, \dots, S\ \}$$

that is to say, we count the number of non-zero elements in such file.

Lastly, we reckon each weight, for any governance variable **h**, by solving

$$\mathbf{w(i)} = \#\{\ \textbf{File (i)}\ \} \ /\ \sum \#\{\ \textbf{File (h)}\ \};\quad \textbf{i: 1, 2, ... , L}$$

THE UPDATING ISSUE

As it usually happens with averaged indexes, the vector of weights is to be chosen at some conventional starting date, and it goes unchanged unless there are material evidence that some weights, at least, have to be updated eventually[15].

There are, however, two settings from which an updating decision turns out to be of necessity:

[14] For ease of notation, we follow the widely used symbol # {A}, that stands for "the cardinal number of the set A", where A is a finite set. Bloch (2000) or Eccles (2004) enlarge upon this subject matter by means of a basic and readable framework of analysis.

[15] By the way, this is the usual updating process that well-known indexes undergo now and then, like the SP500 (New York), FT100 (London), Bovespa (Brazil) or Merval (Argentina).

a) this could be the case, for instance, when we find out that, for certain company $\mathbf{k_j}$, at date **t**, there is a new governance variable

$$\mathbf{G(k_j; i; t)}$$

for which the company starts to be responsive; hence, there is a positive change in $\#\{\mathbf{File\ (i)}\}$. On the opposite side, the company stops being responsive to the governance variable, bringing about a decrease in $\#\{\mathbf{File\ (i)}\}$. An example for the former setting could be when a company decides to have independent directors, while the latter setting would be illustrated when the company gets rid of the rule "one-share, one vote" (see ***Exhibit 1***).

b) another needful situation for updating changes hinges upon new companies gaining either entrance into the starting universe

$$\Gamma = [\ k_1; k_2; k_3; \ \ldots\ldots k_s\ ]$$

or exit from such universe, as it happens with older and failing companies.

1.5 ASSESSMENT

Our weighted average index exhibits some noticeable features:

- It encompasses relevant governance variables, most of them not embodied like provisions in the founding charter.

- The recursive process depicted in (3) accounts for increases or decreases of the variable's performance along time.

- In contradistinction to Gompers' index, which is framed out of open companies listed in stocks, our index also pertains to closed and family-owned companies, which are so widespread in governances around the world not fitting into the Anglo-Saxon paradigm.

- Being a blend of governance variables, not all of them included as provisions in the charter, the index also comprises regulatory governance prescriptions, discretionary decision-making and choices subsumed under the company's bylaws or its Governance Statute, as well as institutional constraints[16].

[16] Mark Roe (2003) furnishes with an impressive empirical and theoretical rationale about several key issues in Comparative Governance. A comprehensive analysis of

- Last of all, as we are going to develop in next section, the rate of change of our index surveys governance performance, while their discount counterpart will factor a measure of governance risk premium into the investor's expected return.

2. THE RATE OF GOVERNANCE AND THE MEASURE OF GOVERNANCE-RISK

Let

$$\mathbf{r_k\,(governance)}$$

be the rate of change that will gauge the company **k** 's performance on governance issues, which comes defined as:

(4)

$$\mathbf{1 + r_k\,(governance) = G(k; T) / G(k; t)}$$

If this rate attained a positive value, governance would be improving on the whole, but if negative it would stand to signal that corporate governance is worsening (see ***Exhibit 2***). As we need a rate of change to adjust the governance risk of the underlying financial asset, the rate $\mathbf{r_k\,(governance)}$ in (4) must contribute to shape a discount rate

$$\mathbf{\Delta\ govrisk_k}$$

but this is easily attained by means of a basic theorem in financial mathematics stating that for any ex post rate of change of a financial variable, there exists an ex ante rate of discount that matches the former[17], so that it holds:

(5)

$$\mathbf{< 1 + r_k\,(\ governance) > .\ < 1 - \Delta\ govrisk_k > \ = \ 1}$$

---

the Charter Compact as the mainstay of Corporate Governance has recently been carried out by Apreda (2007d).

[17] Cutting down to essentials: in the context of financial mathematics, the theorem holds that

$$\mathbf{(\ 1 + i\ ) .\ (\ 1 - d\ )\ =\ 1}$$

which stands for the statement "the final value of a unitary capital, that is **(1 + i)**, when discounted by the rate **d**, attains a present value of **(1 – d)**." The enlargement to rates of change in financial or economic variables is derived outright. On the other hand, it is a well-known mechanism for arbitraging rates of interest in money markets. It can also be expanded to carry out arbitrage of financial assets in the capital markets, and also in foreign exchange transactions [on foundations and applications see Apreda (2006b, 2005b, 2003a, 2001)].

GOVERNANCE PERFORMANCE SYSTEM

- **GOVERNANCE EXPLAINING FACTORS**
- **WEIGHTS FOR THE GOVERNANCE FACTORS**

↓

GOVERNANCE INDEX

$$G(k, t) = w(1) \cdot G(k, 1,t) + w(2) \cdot G(k, 2,t) + \ldots + w(L) \cdot G(k, L,t)$$

⇩

RATE OF CHANGE OF THE GOVERNANCE INDEX

$$1 + r_k(\text{governance}) = G(k, T) / G(k, t)$$

↓

RATE OF GOVERNANCE RISK

From $< 1 + r_k(\text{governance}) > . < 1 - \Delta\, \text{govrisk}_k > = 1$

we get

$$\Delta\, \text{govrisk}_k = \frac{r_k(\text{governance})}{< 1 + r_k(\text{governance}) >}$$

↓

EXPECTED RETURN OF A FINANCIAL ASSET

ADJUSTED BY GOVERNANCE RISK

$$1 + E[R_k] = < 1 + \Delta\, \text{risk-free} > . < 1 + \Delta\, \text{counrisk} > .$$

$$. < 1 + \Delta\, \text{sysrisk}_k > . < 1 + \Delta\, \text{nonsysrisk}_k > . < 1 - \Delta\, \text{govrisk}_k >$$

Exhibit 2 The path to governance risk adjustment

The value of the rate of discount comes out from the equation above and leads to:

(6)

$$\Delta\ \mathbf{govrisk}_k = \frac{\mathbf{r}_k\ \mathbf{(\ governance)}}{\mathbf{< 1 + \ r}_k\ \mathbf{(\ governance) >}}$$

Which is the role that the discount factor

$$\mathbf{< 1 - \Delta\ govrisk}_k\mathbf{>}$$

will play when all is said and done? To answer such question, we must move on to the expected return of a financial asset, or a portfolio consisting of financial assets.

3. A MULTIPLICATIVE MODEL FOR THE EXPECTED RETURN OF FINANCIAL ASSETS AND PORTFOLIOS

Let us appraise the minimal expected rate of return $\mathbf{E[\ R}_k\ \mathbf{]}$ an investor may claim for certain financial asset $\mathbf{A}_k$, issued by any organization in the private sector[18]. We are going to stress that such return stems from five variables, or explanatory factors:

Δ risk-free expected return from an USA risk-free asset[19];

Δ counrisk expected rate of change for a suitable measure of country risk;

Δ sysrisk $_k$ expected rate of change for systemic risk for company **k**;

Δ nonsysrisk $_k$ expected rate of change for non systemic risk for company **k**;

Δ govrisk $_k$ expected rate of change in the governance of the institution.

[18] It goes without saying that our analysis holds also true on portfolios of financial assets (see Apreda, 2005a).

[19] Further details on this choice of risk-free assets can be found in Damodaran (2001, 1999).

Formally, we are going to factor these variables into the expected rate of return by using a multiplicative model[20]:

(7)

$$\mathbf{1 + E[\,R_k\,] = < 1 + \Delta\ risk\text{-}free > . < 1 + \Delta\ counrisk > .}$$

$$\mathbf{. < 1 + \Delta\ sysrisk_k > . < 1 + \Delta\ nonsysrisk_k > . < 1 - \Delta\ govrisk_k >}$$

Notice that over the flat risk-free rate level, we actually embrace a risk adjustment or (risk premium) that comes explained by the composite:

(8)

$$\mathbf{Risk\ Adjustment = < 1 + \Delta\ counrisk > . < 1 + \Delta\ sysrisk_k > .}$$

$$\mathbf{. < 1 + \Delta\ nonsysrisk_k > . < 1 - \Delta\ govrisk_k >}$$

We leave for Appendix 1 a more analytical approach to handling (7) and (8) in a real world background.

SENSITIVITY ANALYSIS

Firstly, we must realize that variables

$$\mathbf{\Delta\ counrisk\ ;\ \Delta\ sysrisk_k\ ;\ \Delta\ nonsysrisk_k}$$

may marginally increase the risk adjustment depicted by (8), any time each of them signals that a positive increment took place.

Secondly,

$$\mathbf{\Delta\ govrisk_k}$$

entails a contrarian behavior.

When the rate of governance $\mathbf{r_k}$ **(governance)** raises, then the value of $\mathbf{\Delta\ govrisk_k}$ increases but, being a discount rate, it takes value away from the risk adjustment[21]. That is to say, good governance lessens the contribution of the discount factor to the risk adjustment in

[20] In this section we take advantage of a comprehensive analysis rendered in my book, *Differential Rates, Residual Information Sets, and Transactional Algebras*, Nova Science Publisher, New York, 2005. Background on additive and multiplicative models, as well as their linkage can be found in Apreda (2005a, 2006b).

[21] This can also be regarded, from a marginal standpoint, as a negative contribution to risk adjustment.

(8). That is why the rate Δ **govrisk** $_k$ turns out to be a proxy for risk-premium.

Thirdly, if governance worsens, by a similar argument, we can state that $\mathbf{r_k}$ **(governance)** becomes negative (it decreases the value of the index), and Δ **govrisk** $_k$ also turns out negative, being the final outcome that

$$\mathbf{1 - \Delta\, govrisk}_k \;\; \mathbf{> \; 1}$$

hence the discount factor makes a positive and marginal contribution to risk adjustment as the company **k** becomes riskier due to underperforming governance.

From this point of view, Δ **govrisk** $_k$ partakes of the same nature of the country risk measure: both stand for certain number of basis points to reward the investor for his risky choice. In the first case, by diminishing the risk premium whenever the governance proves to be good, in the second one to increase the risk premium when the country risk worsens by getting a larger value.

CONCLUSIONS

This paper has put forth a weighted-average index whose rate of change measures governance performance. The variables of governance have been chosen out of relevance. It is not a minor feature that most of them do not stem from enabling provisions in the charter but from actual issues in governance as well as regulatory governance prescriptions.

By means of the rate of governance, its discount rate carries out the task of measuring governance risk. That is to say, good governance rates diminishes the company's risk premium to be attached to the investor's expected return, whereas bad governance rates increase the risk premium requested by a rational investor.

It seems also noticeable the fact that most companies could be rated with such index, mainly those that belong to countries where the governance paradigm does not follow the Anglo-Saxon one.

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APPENDIX 1
ON MULTIPLICATIVE AND ADDITIVE MODELS

To begin with, let us set forth a multiplicative model for the expected return of a financial asset or portfolio denoted $\mathbf{A_k}$, where the return comes explained by a risk-free rate and systemic risk only:

$$\mathbf{1 + E[R_k] = < 1 + \Delta\ risk\text{-}free > . < 1 + \Delta\ sysrisk_k >}$$

that leads to the equivalent expression:

(A1)

$$\mathbf{1 + E[R_k] = 1 + \Delta\ risk\text{-}free + \Delta\ sysrisk_k + \Delta\ risk\text{-}free . \Delta\ sysrisk_k}$$

For instance, in terms of the Security Market Line[22], it would follow

$$\mathbf{E^{SML}[R_k] = \Delta\ risk\text{-}free + \Delta\ sysrisk_k}$$

Or, to frame it in the streamlined fashion:

$$\mathbf{E^{SML}[R_k] = R(F) + Risk\ Premium . \beta_k}$$

by which (A1) would turn out to be equal to:

$$\mathbf{1 + E[R_k] = 1 + R(F) + Risk\ Premium . \beta_k + R(F) . Risk\ Premium . \beta_k}$$

or, lastly,

(A2)

$$\mathbf{1 + E[R_k] = 1 + E^{SML}[R_k] + R(F) . Risk\ Premium . \beta_k}$$

Hence, (A2) shows the expansion of the multiplicative model as depicted by (A1).

Now, we move on to the multiplicative model advocated by (7) in section 3:

(A3)

$$\mathbf{1 + E[R_k] = < 1 + \Delta\ risk\text{-}free > . < 1 + \Delta\ counrisk > .}$$

$$\mathbf{< 1 + \Delta\ sysrisk_k >. < 1 + \Delta\ nonsysrisk_k > . < 1 - \Delta\ govrisk_k >}$$

In pursuing the same line of analysis conveyed in relationships (A1) and (A2), we could shape (A3) the following way:

[22] As regards SML, Damodaran (1995) furnishes with a suitable expansion for practitioners, whereas Elton and Gruber (2004) deal with a more wide-ranging treatment.

(A4)

$$1 + E[R_k] = \Delta \text{risk-free} + \Delta \text{counrisk} + \Delta \text{sysrisk}_k +$$

$$+ \Delta \text{nonsysrisk}_k - \Delta \text{govrisk}_k + \text{multiplicative remainder}$$

From the precedent discussion we can argue that the usefulness of additive models seems faulty, to say the least, any time the multiplicative remainder becomes distinctively consequential in (A4).

APPENDIX 2
AN EPISTEMOLOGICAL ISSUE

An index attempts to measure the behavior of certain variable, or a set of them, along time. But the choice of the index relies upon the meaning we attach to the underlying variables.

Both Gompers' index and the one set forth in this paper provide an example for such linkage between the intended tool and the basic theory.

a) Gompers's index

The notion of governance that feeds into this ordinal index reviewed in the introduction is the following:

Corporate governance addresses the agency problems that are induced by the separation of ownership and control in modern corporation (Gompers et al. 2001, page 1).

The framework of this definition narrows down the available governance variables to those strongly related to agency problems, which is highly consistent with the final choice of provisions included in the founding charter, and the shaping of an ordinal index eventually.

It is worthy of being remarked, on the other hand, that with such definition the index could run analytical trouble if we attempted to use it in non-Anglo-Saxon governances, where closed corporation, tightly held by controlling families are the sum and substance in many countries.

b) The weighted-average index

The scope of our index is broader and more complex than the one introduced by Gompers et al., to the extent of choosing governance variables beyond those embedded in the founding charter. ***Exhibit 1***, in this paper, throws light on this point, as a matter of fact.

The definition that lays ground on this index, can be found in my paper *The Semantics of Governance (The common thread running through corporate, public and global governance)*[23].

*By **Corporate Governance** is meant a field of knowledge and practice within corporations and nearly alike organizations (including state-owned firms) that brings to focus the following subjects:*

- *Ownership structure.*
- *Company's founding Charter, by-laws, statutes, and codes of good practices.*
- *Board of Directors and Trustees; allocation of control and board's decision rights.*
- *Managers' fiduciary duties towards owners and their management decision rights.*
- *Investors' property rights and protective covenants.*
- *Conflicts of interest between managers, creditors, owners and other stakeholders.*
- *Managers' performance and incentives.*
- *Rent-seeking and soft-budget constraints.*
- *Production and disclosure of transparent information to markets, regulators and stakeholders.*
- *Accountability to regulators and stakeholders.*

As we can see, the variables picked in ***Exhibit 1*** stem from distinctive layers provided by the definition above.

[23] Apreda, R. (2006a) *The Semantics of Governance: The Common Thread Running Through Corporate, Public and Global Governance.* Corporate Ownership and Control, volume 3, number 2, pp. 45-53.