Ethical quotation system

COVALENCE ANALYST PAPERS

Reputation index: societal barometer and financial instrument

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Executive Summary

Research at Covalence S.A., a private limited company incorporated in Geneva, Switzerland, shows that there is no available gauge or index in the market today that measures how corporations in a society are faring in terms of being responsible with regards to their financial returns. It is also recognised that profitability of a company is key to remaining socially responsible and that the higher a company's market capitalisation is, the more impacting its actions are on a society.

Keeping in view the above, Covalence, in the following report proposes the creation of a new index or family of indices (hereafter the "Index") that will bring together financial and reputation information of corporations. The said Index will show quantitatively and at a glance whether the corporate world in general is more or less responsible than it was, say, last month. The central idea is that if the reputation data of the company does not change as much as or more than the change in its financials, then the company is not putting as much effort in socially responsible practices as it should be.

A modification of the traditional index calculation formula to take into account the reputation information is presented and it is then used to process and plot real financial and reputation data from the period 2000-2005.

The results show that the curve that takes into account reputation as well as financial data largely stays ahead of the purely financial curve. It is also seen that whenever the rise in reputation of the companies has kept pace with their financial successes, the general trend of the said curve has been upwards. At the same time, unusual spikes in reputation have always been followed by crashes of both the financial as well as the reputational indices. It is therefore possible to conclude that it is in the interest of all parties for the businesses to practice social responsibility that is commensurate with their financial growth.

Finally, most likely users and business opportunities with the Index are identified, which include designing leveraged financial instruments on the Index, the Index being used as an indicator by the companies themselves or their industry sector associations, etc.

1. Introduction

After a period of associative collaboration, Covalence was formally incorporated in 2001 in Geneva as a private limited company. Its founders came from the fields of finance and social sciences.

The flagship product and service of Covalence, EthicalQuote, was inspired by the stock quotation system and today forms the basis of various products and consulting services in ethical and sustainable investments, reputation analysis, risk management and overall ratings of corporate social responsibility practices of corporations. Covalence also produces detailed reports on companies and industry sector specific issues, which offer a holistic view of claims and initiatives related to corporate social responsibility on a global scale.

The heart of the EthicalQuote system is comprised of 45 criteria, which range from business contribution to human development impacts of a corporation's actions and have been formulated in conformity with the international legal framework and recognised best practices in the fields of concern.

At the same time, it is recognised that the same corporate action can have different impacts on a society depending on how powerful the underlying corporation is and how far its reach is. Going forward Covalence intends combine this with its core expertise, which is the EthicalQuote database, in proposing the launch of an index or a family of indices, hereafter the "Index", that will measure on a regular basis the general state of corporate social responsibility in the society taking into account both reputation and financial information into account.

This document explains the rationale behind such an index, demonstrates how such an Index can be crafted out of traditional index calculation formulas, illustrates the procedure, simulates the resulting formula with real historical data from the past 5 years and finally draws inferences from the results.

2. Index philosophy

2.1. Objective

The primary driving force behind the proposed Covalence index is to address market gaps that Covalence has been able to identify. All market indices that are available today measure the performances of companies for the investor community using only financial data and little else. With the corporate social responsibility standing becoming more and more important by the day and an increasing number of studies linking it to corporate health and profitability, it will be sooner rather than later that reputation data based on the social responsibility standing of a company will come to be considered as vital in measuring its overall performance. It is this concern that the proposed index bringing together financial and reputation data together hopes to address.

2.2. A societal barometer

Although there are a number of indices in the market today that already track sustainability, they use negative, positive or shareholder advocacy screening to filter out or in the companies that they would either like to track or invest in. Once the said companies are admitted into the index, the actual value of the index is calculated using one of the traditional financial methods viz., equal weighted, cap weighted or price weighted.

There is no available gauge in the market to measure how the society is doing in terms of being responsible – one only gets to see the financial health or performance of the companies that were let in on the basis of their CSR practices because post-admission only their financial health is measured. How the sector or the industry is doing in terms of

improving or declining social responsibilities is not measured.

In addition to being a barometer of responsible behaviour of corporations in a society, the Index also has the potential to serve as a far better leading indicator of corporate failures and successes than pure financial indices. This stems from the fact that Covalence's EthicalQuote is a reflection of public and media perception of corporate actions and it forms the basis of the contributing reputation factor in the Index formula. It is increasingly being thought that consumer and public opinions and trends make for a more accurate and reliable harbinger of things to come.

2.3. The offer and its key tenets

In light of the above, Covalence proposes the following:
- Drawing on its years of experience creating and maintaining a large and comprehensive database and quotation system for all sectors of the market, the creation of an index that will include reputation and behavioural data of the company as well.
- The proposed index will serve as a societal barometer of responsible practices of companies. There is no way today of knowing quantitatively and at a glance whether the corporate world in general is *more* or *less* responsible than it was, say, last month.
- Sector wise, it will show clearly and concisely the sectors that are making the most progress in terms of being responsible.
- Include financial data in addition to reputation information. Profitability is key to remaining socially responsible and improving corporate standing. Thus, measuring only social responsibility standing does not reflect the sustainability of the process; it needs to be tied in with the financial health of the company as well.
- The central idea is to reflect the relative change in reputation in comparison with change in financials. The assumption is that if the reputation index did not change as much as or more than the financial change, the company did not practice social responsibility as vigorously as it should have. The relative reputation factor input to the index should then be negative.

3. Index methodology

3.1. Market cap method

The ability of power to impact society more often than not depends on how powerful the holder of the power is and how far and wide its reach extends out to. If we were to extend that logic to a corporation, in general, the higher the market capitalisation of the corporation is, the wider its reach is and the more damaging or uplifting its actions can be for a society than that of a small or mid-cap company. Thus, for the purposes of the Covalence reputational index, it is felt that the most appropriate method would be to weigh the constituent companies according to their market capitalisations.

3.2. Incorporation of reputation information and modification of Index formula

The Covalence index is calculated in a manner that merges the classic base weighted aggregate method of well-known indices with weighted reputation information from the Covalence database. This means the level of the index on any given day reflects not only the market value of all the component stocks relative to a base period, but also the overall social responsibility standing of all the component stocks in the society. The total market value of each of the component stock is calculated by multiplying the stock price with the total number of shares available after float adjustment. The reputation value comes from the Covalence database, which already plots the reputation standing of companies from its database. The two are then combined to produce an indexed value that is easily tracked and graphed.

The index value that is calculated at the end of the day is the quotient of the total market capitalisation of the Index's constituents multiplied by a weighted reputation factor and the

divisor of the Index. As it is important to maintain continuity and thus avoid abrupt changes in the index levels that do not follow any significant market or reputation changes, the divisor is adjusted and used to temper any share capital changes after the base date. The idea here is that the index value, an infinitesimal time before a change in base capital, is exactly equal to the index value an infinitesimal time after the change.

Thus the formula for calculation of the index value is:

$$I_{i,t} = \frac{\sum_{n=1}^{Nt} P_{n,t} \times S_{n,t} \times R_{n,f}}{B_t} \qquad \text{where} \quad R_{n,f} = \frac{r_{n,t}/r_{n,t-1}}{P_{n,t} \times S_{n,t}/P_{n,t-1} \times S_{n,t-1}}$$

is a ratio that measures the relative increase in reputation vis-à-vis increase in the market capitalisation of the underlying stock. It is less than 1 if the % increase in reputation falls below the % increase in market capitalisation and greater than 1 if it is otherwise. It is designed to reflect whether corporate social responsibilities practices of the company are keeping pace with its market capitalisation.

Essentially, the idea behind the index can be characterised by

$$\frac{\Delta p}{p} > \frac{\Delta r}{r} \Rightarrow R < 1$$

where p is price and r reputation.

$$\frac{\Delta p}{p} < \frac{\Delta r}{r} \Rightarrow R > 1$$

In terms of implementation logic for Microsoft Excel, the above conditions may be represented as follows:

$$\text{if } r_{n,t} = r_{n,t-1} \Rightarrow r_{n,f} = 1 \qquad (1)$$

$$\text{if } r_{n,t} > r_{n,t-1} \Rightarrow r_{n,f} = \left|1 + \left|\frac{r_{n,t} - r_{n,t-1}}{r_{n,t-1}}\right|\right| \qquad (2)$$

$$\text{if } r_{n,t} < r_{n,t-1} \text{ \& } |r_{n,t} - r_{n,t-1}| < r_{n,t-1} \Rightarrow r_{n,f} = \left|1 - \left|\frac{r_{n,t} - r_{n,t-1}}{r_{n,t-1}}\right|\right| \qquad (3)$$

$$\text{if } r_{n,t} < r_{n,t-1} \text{ \& } |r_{n,t} - r_{n,t-1}| > r_{n,t-1} \Rightarrow r_{n,f} = 0.01 \qquad (4)$$

$$\text{if } m_{n,t} = m_{n,t-1} \Rightarrow m_{n,f} = 1 \qquad (5)$$

$$\text{if } m_{n,t} > m_{n,t-1} \Rightarrow m_{n,f} = \left|1 + \left|\frac{m_{n,t} - m_{n,t-1}}{m_{n,t-1}}\right|\right| \qquad (6)$$

$$\text{if } m_{n,t} < m_{n,t-1} \Rightarrow m_{n,f} = \left|1 - \left|\frac{m_{n,t} - m_{n,t-1}}{m_{n,t-1}}\right|\right| \qquad (7)$$

and the final contributing reputation factor is $R_{n,f} = \frac{r_{n,f}}{m_{n,f}}$ (8)

where $r_{n,t}$ = covalence ethical quote of stock n at time t;

$r_{n,t-1}$ = covalence ethical quote of stock n at time t-1(for demonstration purposes this is the previous month);

$r_{n,f}$ = month-on-month ratio of the covalence ethical quote of stock n;

$m_{n,t}$ = market capitalisation of stock n at time t, adjusted for stock splits and dividend issuances;

$m_{n,t-1}$ = market capitalisation of stock n at time t-1, adjusted for stock splits and dividend issuances;

$m_{n,f}$ = month-on-month ratio of market capitalisation of stock n, adjusted for stock splits and dividend issues;

$R_{n,f}$ = contributing reputation factor of stock n;

Thus, if the company's market capitalisation, or in other words stock price, has been increasing at a higher rate than its reputation number as per Covalence's database, the resulting *reputation factor* would have a depressing effect on the overall index number calculation to reflect the fact that corporate responsibility practices were not keeping pace with corporate gains. On the other hand if the reputation of the company is pacing ahead of its financials, it will have uplifting effect on the value of the index.

3.3. Illustration of index calculation

Let us consider three companies X, Y and Z.

Step 1: Calculate Index Market Value			
Company	Share price	Shares outstanding	Market value
X	10	50,000	$500,000
Y	20	100,000	2,000,000
Z	40	150,000	6,000,000
Step 2: Set initial divisor value from base period market value			
Initial Index value (to be chosen) = 100 (Index market value)/Divisor = Index value $8,500,000/Divisor = 100 Therefore, Divisor = 85,000			
Step 3: Calculate index value for time t=2 (say day 2)			
Company	Share price	Shares outstanding	Market value
X	12	50,000	$600,000
Y	25	100,000	2,500,000
Z	50	150,000	7,500,000
Total market value at t=2: $10,600,000			
(Index Market Value)/Divisor = Index Value Divisor = 85,000 New Index value = 10,600,000/85,000 = **124.7**		124.7	Traditional Method

The following table illustrates how reputation information can now be incorporated into the above index.

Company	Reputation quote at time T	Reputation quote at time T+1	Reputation change		
X	30	33	1.1		
Y	40	37	0.93		
Z	34	35	1.03		
Calculate index market value + reputation value (INITIAL VALUE)					
Company	Stock price	Outstanding shares	Market value	Reputation Price ratio	
X	10	50,000	$500,000	1	
Y	20	100,000	2,000,000	1	
Z	40	150,000	6,000,000	1	
Divisor and index value remains the same as initial *reputation price ratio* is set to 1.					
Company	Stock price at T+1	Market value	Price increase	Reputation price ratio $R_{n,t}$	Market Value x Rep/Price ratio
X	12	$600,000	1.2	0.92	$552,000

Y	25	2,500,000	1.25	0.74	1,850,000
Z	50	7,500,000	1.25	0.82	6,150,000
Total market + reputation value at time t=t+1 = $8,552,000 The divisor has remained the same = 85,000 New index value = 8,552,000/85,000 = **100.61**			100.61	With reputation information	

3.4. Currency of index calculation

The USD (United States Dollar) shall be the currency of denomination for all calculation purposes regarding the index.

4. Reputation Index calculations for the period 2000-2005

In order to illustrate the index construction further, in this section the theoretical models that were developed in Section 3.2 are applied to real financial and reputation data from the period 2000-2005 for all the constituents of the index.

4.1. Criteria for choosing the corporations

The 40-odd corporations have been chosen on the basis of the following criteria:

- Each corporation has at least 232 reputation entries in the covalence database between May 2000 and May 2005. This was so that the reputation and ethical quote numbers were stable, meaningful and were not prone to undue fluctuations because of a few entries.
- They are publicly traded companies and the trading information is easily available. These include end of day closing prices, information on splits, dividend issuance announcements, and adjusted closing prices.   Out of the corporations that constituted the index, almost all are either directly traded on the NYSE or via ADRs (American Depository Receipts). The remaining ones, while they are traded on the NYSE OTC, for the calculation of outstanding shares, the quotes from their overseas market, which is their primary listing, are considered.
- All the above-mentioned data is available on a monthly basis for each of the constituent stocks from May 2000 to May 2005.
- All relevant ethical quotation information in the Covalence database are available on a monthly basis for each of the constituent stocks from May 2000 to May 2005.

4.2. Industry sector representation

All 10 industry sectors were represented in the index, although their shares of the total market capitalisation varied widely. Because this simulation was for illustration purposes only, selection according to the amount of data available on each of them took precedence over whether they reflected the real make-up of the economy or not. The following is the breakdown by sector and number of corporations in each of them:

- Chemicals   3
- Mining & Metals   4
- Entertainment & Leisure   2
- Automobiles & Parts   4
- Retailers   2
- Food & Beverage   6
- Oil & Gas   5
- Banks   2
- Pharmaceuticals   9
- Technology & Hardware   4

4.3. Economic Representation

The cumulative net market capitalisation of all the constituents of the index amounted to just over USD 4 trillion. In comparative terms, this is about 50% the size of the US economy, twice the German economy and about 5 times that of China.

4.4. Frequency of Calculation

The index was calculated on a monthly basis because of technical reasons. However, it is envisaged that calculating it on a weekly or even daily basis might be worth exploring.

4.5. Use of "Adjusted" closing prices

It was decided that the simulation of the index with real data should use the *adjusted* closing prices in order to minimise the number of sources of possible errors as well as to keep the calculation simple and focus on the effect of reputation number alone on the overall index number. However, the said *adjustment* took into account only the stock splits and dividend issuances. It did not adjust the prices for large tranches of shares that were either bought or sold by long-term shareholders or the directors of the company. It was felt that the adjustments that should have been made due to the latter were not large enough to detract us from grasping the effect of reputation on an index, which is what we had intended to illustrate.

4.6. Negative e-quote values & Forced Limits

Unlike stock prices, the e-quotes from the Covalence Ethical Quotation system, which constitutes one of the basic sources of information for the calculation of the index, can be positive as well as negative. As a consequence, it is possible for the e-quote of a company to drop by more than 100%, but not in the case of stock prices. However, for the purposes of the calculation of the ratio, not only does this jeopardise the procedure, but also because the decrease in the e-quote directly affects the calculation of the R-adjusted market capitalisation, it does not make sense to diminish the financial market capitalisation of a company by more than 100%. Thus, the algorithm that has been used limits the market capitalisation to 1%, effectively making the company non-existent, of its financial value whenever the e-quote value diminishes by more than 100%.

4.7. Sources of data

Data was collected using Yahoo! Finance and NYSE's MarketTrac applications. The former was used to gather the end of month adjusted closing prices while the latter for the outstanding shares.

4.8. Simulation results and inferences

Before presenting the simulation results, one instance of calculation of the R-adjusted market capitalisation is illustrated below to further elaborate on the calculation procedure of the index value. The example of market capitalisation calculation for Bayer (NYSE: BAY) and the overall index value calculation for one month (August 2000) is shown below.

> Adjusted closing stock price of BAY in August 2000 = $36.26 (source Yahoo! Finance)
> Adjusted closing stock price of BAY in July 2000 = $36.15
> Outstanding shares = 730,342,000 (source NYSE MarketTrac)
> E-quote of BAY in August 2000 = -14.13 and in July 2000 = -12.13
> Therefore, the financial market capitalisation is calculated to be *closing price x no. of outstanding shares* = $26,482,200,920.

> Using Equation 8, developed in Section 3.2, the contributing reputation factor of stock BAY is calculated to be 1.138. The R-adjusted market capitalisation then is *contributing reputation factor x financial market capitalisation* = $30,138,038,779.

Similarly, the R-adjusted market capitalisations of all the constituents are calculated and the sum-total is divided by the divisor, which is calculated to be 40,156,511,489 (after dividing the sum-total of all the R-adjusted market capitalisations in month 1, May 2000, by 100, which was chosen as the initial value of the index).

This gives us the value of the reputation index for the month of August 2000 to be **114.47**. The same set of calculations performed on the same set of corporations on only their financial performance gives us the index value for the month of August 2000 to be 105.68.

The results are presented in the form of graphs. The

Figure 1: Reputational index value plotted for all sectors

index calculated over all sectors including the constituent corporations is shown in Figure 1, whereas Figure 2 shows index values only for the pharmaceutical sector.

On the basis of the graphs in Figure 1 and 2, a couple of key observations can be made. First, it is clear that the reputation curve for the most part stays ahead of the financial curve. This can be interpreted as companies taking care of their social responsibilities and contributing to them commensurate with their financial successes. It can also be argued, lending credibility to the school of thought that being socially responsible contributes to financial success, that whenever the rise in reputation of the company has kept pace with its financial success, the general trend
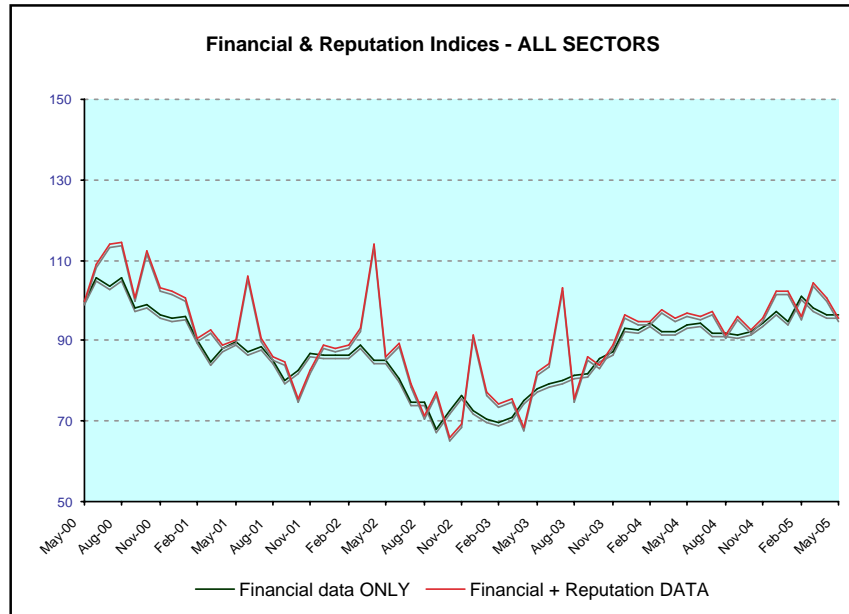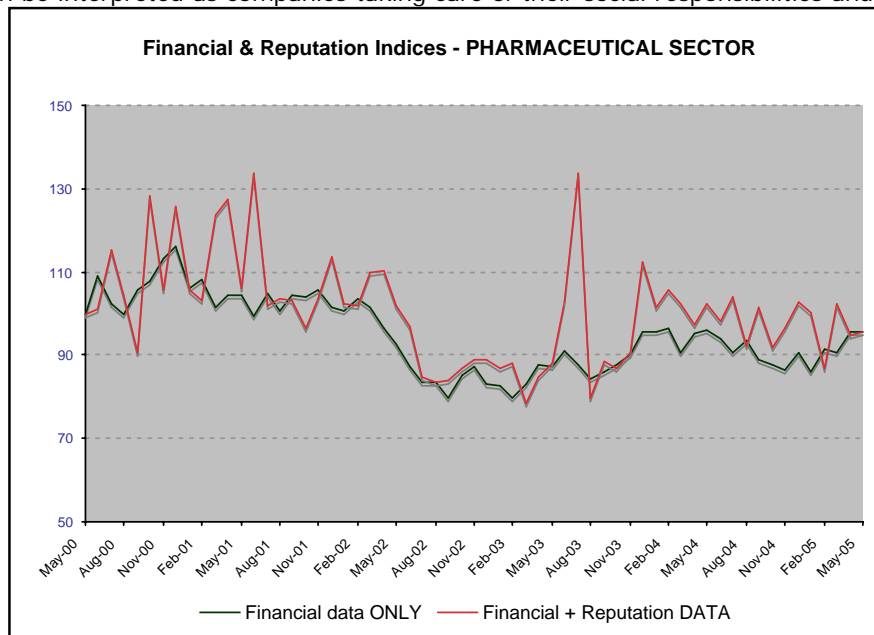

Figure 2: Reputational index value plotted for the *pharmaceutical sector*

of the curve has been upwards.

On the other hand, and this is the second observation, it is clear that unusually high rises in reputation happened at the expense of financial success as is apparent from Figure 1. Whenever there were sudden increases in the Index, the financial as well as the reputation indices are both seen crashing immediately afterwards. It can therefore be concluded that the community at large and businesses alike are both better off when the latter practises social responsibility that is in line with its financial growth.

The detailed calculations and the entire set of data that was used for simulation can be found in the accompanying Excel sheet. If the Excel sheet is missing, please write to info@covalence.ch to obtain your copy.

5. Business Opportunities

In this section, the prospective users of the proposed index are presented.

5.1. Multi-national Corporations and Industry Associations

The constituents themselves and their respective industry sector associations could understandably be interested in following and monitoring the proposed index curve in order to keep abreast with their own social responsibility ratings. They could use the index as either a leading or a lagging indicator. If a particular industry had had a major overhaul of its standards and environmental practices for example, it could use the index as a lagging indicator to judge how impacting their actions had been. On the other hand a dismal performance of the index curve for a particular sector could prompt the sector association to call for drastic actions. This would be an example of its use as a leading indicator.

5.2. Financial Instruments

As the proposed index is not based purely on financial data, replicating it directly by way of stocks would not be possible. However, in order to make it attractive to investors, it should be possible to issue derivatives or other leveraged financial instruments on the index. In other words, investors would be betting on the value of the index going up or down.

Derivatives on the index could become attractive to investors, if, for example, the rate of increase in the reputation of the constituents of the index outpaces the rate of their financial gains or vice versa. At a fundamental level, this would signal that the constituent stocks are either trading below or over their intrinsic value and thus there is a significant chance that this would be corrected by the market in the near future and therefore taking out an option betting on the anticipated direction of move could turn out to be profitable for the investor.

It is envisaged that the scope of constructing different kinds of leveraged financial instruments on the top of the proposed index is very large and with many possibilities and hence it would be worth exploring whether indeed such instruments would be commercially viable or not.

5.3. Public Agents

Given the fact that one of the main rationale behind the design of the index is that there is a need to measure the overall level of corporate social responsibility in a society, it is natural that one primary class of users of the index is the public agents, which includes public administrations departments, tax regime designers, public health monitors, public policy drafters etc.

Because the proposed index takes both financial and reputation data into account, just by looking at how the index curve is moving vis-à-vis the financial curve, these agents would be able to tell whether the largest companies in the society are doing less or more than they should be, given their financial performance. If the index keeps ahead of the financial

curve, the public agents might want to devise ways to keep it the way it is or might even institute policies that would encourage companies to stay on course. On the other hand, if it starts lagging behind, it should set off alarms at the right places for drastic measures to be taken in order to reverse the trend.

The beauty of the proposition is that so long as the curve stays ahead of the financial curve, even during economic downturns, the policy makers can rest assured that the companies are not taking more than they are giving back to the society.

5.4. Press

In a mature democratic society, the press either serves as the fourth estate or as a formidable check on the power of the government. It does this ideally by disseminating information justly, timely and without bias. Just as it today publishes a host of indices that carry information on the corruption level in the world, how competitive national economies around the world are, how much we are spending on buying our essentials to the overall level of honesty in the world, the proposed index will provide information on the overall corporate-community balance in a society on a regular basis.

In more concrete terms, it is expected that a certain number of newspapers or journals would carry the index as a regular feature in their society or corporate watch section.

5.5. NGOs & Activists

With democracy and accountability becoming ever more important in global decision-making, it is becoming increasingly clear that NGOs and non-state activists have a vital role to play in the society. Especially, in the face of globalisation, a number of cross-border issues have been created that are more and more being addressed by international NGOs than by any other type of national organisations. It is thus inevitable that in the increasingly globalising world of the 21st century, the role of NGOs will only become more important.

When these NGOs form pressure or lobby groups, they need hard facts and measurements of situations and parameters to base their arguments on and make them convincing. With corporate social responsibility gaining prominence in the corporate boardrooms, the likes of NGOs will find good use in the proposed index and use it in framing their argument as well as in setting thresholds and deciding when to start taking action. To them the index will serve as a societal barometer on which to base their actions on.