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# MODEL FOR REPUTATIONAL RISK FOR SUBSIDIARIES OF NON-PUBLIC GROUP WITH RECIPROCAL SHAREHOLDING

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## Summary

The paper presents the model for reputational risk for subsidiaries of non-public group with reciprocal shareholding within the Basel Accord. A test for lack of reputation risk is presented. Proposal for quantification of the non-measurable risk has been outline first for the case of the effective public market, than a limited model has been presented for the non-consolidated level in case of the lack of public benchmark.

## Key words /Tags:

Risk, Reputational risk, Model, Risk management, IFRS, BASEL,CRD, Accord

JEL: M41, G32, K23

Type o research: theoretical

## 1. Introduction

To support the global financial system the central banks and governments of U.S., U.K and Europe used \$9 trillion (Wilmarth, 2009). The global GDP of 2008 was approximated to \$61 trillion, and the biggest GDP of a single country - U.S. of \$14 trillion (IMF, 2009). Those \$9 trillion were financing provided to maintain the credibility of the entire financial systems which in turn give right to explore potential costs of reputation global-wide. This paper narrows the issue to the area of the corporate risk management.

Multidimensional and cross science branches analysis of reputation has been challenged on numerous fields. Akerlof called the issue of asymmetry between buyers and seller in terms of “determining the economic costs of dishonesty” (Akerlof, 1970). Online application of system feedback to enhance the security of auctions has been reported e.g. by Resnick (Resnick & Zeckhauser, 2002). Within this stream of research a computational model of trust and reputation has been proposed by Mui (Mui, 2002). On the other hand some aspects of the reputation transfer has been reviewed in field of accounting mainly the relation between the IPO and auditors credibility (Bulut, Cankaya, & Er, 2009). The discussion on the credibility is as well present in field of macroeconomics (Henckel, Menzies, Prokhovnik, & Zizzo, 2011). The rational of the agent self selection of risk has been analyzed by DeGeorge *et al.* who concluded that “assuming that the market has no strong prior about whether the agents are good or bad, good agents will choose low levels of risk, and bad agents high levels” (DeGeorge, Moselle, & Zeckhauser, 2004). Milo *et al.* indicated that the lack of accuracy in the risk model does not necessary brings the inaccuracy into the management processes (Millo & MacKenzie, 2009). There number of other examples of current trends and research areas in respect of reputation and its management. The overview gives the support for the reputation definition as provided by Jonathan Low and Pam Cohen Kalafut in Invisible Advantage

*“In a sense the company’s reputation is the ultimate intangible. It’s literally nothing more than how the organization is perceived by the variety of people. It is slippery, volatile, easy compromised, impossible to control, amorphous”* (Honey, 2009)

Brand, goodwill, image are not necessary synonyms of the reputation itself. From the supervisory perspective reputational risk raised attention for the II pillar of the Basel Accord. In the Basel Accord the reputation risk has been excluded from the operational risk. The Committee defined the operational risk in section 644 “as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk,(90) but excludes strategic and reputational risk”. While in section 742 indicated that “other risks: Although the Committee recognises that ‘other’ risks, such as reputational and strategic risk, are not easily measurable, it expects industry to further develop techniques for managing all aspects of these risks”. (Committee, 2004). In

consequences there is no formal definition of the reputational risk within the Basel framework.

As above there is no defined metrics for reputation for the companies risk management purposes. Some guidance could be actually derived from the general framework, to be financially meaningful the risk must be translatable into currency units; and measurable within one year horizon accumulated risk. The reputational risk concept will be linked to the operational risk and likely to inherit the issues of the capital allocation among the controlled entities, some possible solution has been provided by Staszkievicz in application of the risk of the structure metric (Staszkievicz, 2010).

In order to allow a general analysis of the reputation risk profile for a parent and subsidiaries companies it is developed a simplified linear model. The main idea behind that is to grasp an overview of the value of reputation and related risk.

## **2. Linear financial reputation risk model**

### **Reputation general model (RGM) for consolidated entity on liquid market**

For purpose of the model let define reputation that it is current or potential cash outflow arising from information not reflected of the current fair value of net assets controlled or influenced by an entity.

Let :

- y - represents the fair value of assets controlled or influenced,
- x - current market value of the equity,
- z - value of reputation.

Subject to (initial assumptions):

- i. efficient market,
- ii. public traded shares of entity on consolidated bases,
- iii. lack material influences on other companies,
- iv. net controlled and influenced assets are verifiable,
- v. the auditing procedures are efficient, subject to non-material errors,
- vi. a consolidated values are available.

The following equation denotes the lack of the reputation:

$$y = x \quad [1]$$

$$x \in \mathbb{R}; y \in \mathbb{R}_+$$

The equation represents the situation while the fair value of the net controlled and influenced assets is equal to the market values. Thus the value of reputation equals

$$z = x - y \quad [2]$$

$$z, x \in \mathbb{R}; y \in \mathbb{R}_+$$

While  $z \neq 0$  than the reputation is recognized, in any  $z > 0$  the reputation assets is build up while for negative values of  $z$  there is a fair market expectation that the entity assets include the expected cash outflow due to the reputation.

Let's denote  $M$  as the entity materiality, where  $M <$  than the risk appetite of a given entity.

Lemma 1 for  $|z| \geq M$  than the reputation risk management system should be in place for any entity. Thus there could be a tendency for high positive  $z$  (above  $M$ ) to set up the risk management system but without recognition the risk value in the risk reporting.

The reputation risk is thus the chance that the  $z < 0$ .

For any  $z < 0$  where  $|z| \geq M$  the reputation risk should be disclosed by the application true and fair concept to the financial reporting.

The reputation risk value is therefore the value of  $z_k$  subject to condition that the value is negative. Metric for reputation risk value could be expressed into two timing aspects a spot value of the reputation risk and a long term values for the reputation risk. As the reputation is an attribute of the operational risk measured at the yearly interval the assessment of the spot values of the reputation risk can be ignored (A long-term value assumption 1).

Subject to the lack of efficient market than the  $x$  is approximated by the equation

$$x = y + z \quad [3]$$

While  $y$  is approximated by fairly audited carrying value of:

- a) the consolidated net assets, subject to widely recognized accounting standard (based on fair values) or (Group assumption 2)

- b) the unconsolidated net assets, subject to widely recognized accounting standard (based on fair values) (Solo-basis assumption 3).

But the potential outflow due to reputation is derived from different factors not included in the balance sheet position like among others as:

- a) Values of the potential customers.
- b) Long term costs of publicity of the entity name [denotes as P].
- c) Market shares (influences).
- d) Incurred but not recognized claims on assets and liabilities [denotes as C].
- e) Realized losses on uncontrolled related parties and entities [denotes as L].
- f) Human capital value (innovations, creativities).
- g) Liquidity (cash flow average position).
- h) Conflicts of interests.
- i) Market external factors.

As the factor list is potentially infinitive, each of them have an relative contribution to entire value of  $z_k$ . Having taken working assumption that due to the practical observation number of above stated factors are positively each other correlated, than by a professional judgment the P, C,L are unlikely to be strongly positively correlated. Thus  $z$  can be expressed as:

$$z_k = \alpha P + \beta C + \gamma L + \theta \quad [4]$$

$\alpha, \beta, \gamma$  – parameters  $\in \mathbb{R}$ ,

$\theta$  - represents any other variables.

Assumption 4 It is assumed that  $\theta$  is not significant and P,C,L are measurable.

The proposed model of  $z$  in [4] consists of two section  $\beta C + \gamma L$  representing internally generated negatives drivers jeopardizing the reputation.  $\alpha P$  – representing the external cost (or investments) for maintaining reputation.

Any material  $z_k$  the value should be disclosed or provided within financial statements or risk disclosure based on the IFRS or BASEL risk management standard.

Due to assumption 1 for economically meaningful values of  $z$ ; the variables should be proofed against a short term vulnerabilities and economic cycle, therefore let  $x$  and  $y$  represents a stable average position through the business cycle ( a long term structural reputation) than the equation [2] becomes:

$$\bar{z} = \bar{x} - \bar{y} \quad [5]$$

While dash represents the long term average though the cycle.

The above stated model is subject to the numerous assumption, but practically highly demanded are those of the efficient market (market itself), fair consolidated basis and long term structure.

### Non public market model (NPM)

As  $x$  is not available from the market than based on the [3] by replacing  $z$  with  $z_k$  the market equity and application instead of  $y$  the unscosolidated position of parent company [ $y_{uc}$ ] than is:

$y_{uc} + \alpha P + \beta C + \gamma L + \theta$  but according to [1] for non material reputation value the fraction:

should be  $\alpha P + \beta C + \gamma L + \theta = 0$  than unrealized losses of the related parties and transaction which does not constitute the reputation risk is equal to:

$$L = -\gamma^{-1}(\alpha P + \beta C + \theta) \quad [6]$$

Subject to lack of significant  $C$  and  $\theta$  [assumption 5] the simplified test for the existence of the reputation risk holds true:

$$L = -\frac{\alpha}{\gamma} P \quad [7]$$

and

$$P = \frac{\gamma}{\alpha} L \quad [8]$$

Let us call the equation [8] as simplified tests for lack of the reputation risk (the "lack test"). Then by applying the assumption 3,4,5 and approximation of  $L$  by the net equity of the controlled subsidiary, a case while both all subsidiaries express positive equity and a parent company does not perform reputation related expenditures indicates lack of reputation risk. Thus the parameter  $\frac{\gamma}{\alpha}$  is than approximated by the level of the control of over subsidiary assets by parent company.

If any given group consists of companies A and B. A is the parent company owning e.g. 80% share of company B (subsidiary) ( $r_a = 80\%$ ), B has a contrapart shareholding in A of 20% ( $r_b = 20\%$ ). The shares are expressing, in general, the percentage share ownership of the votes (control) in the shareholder meeting. Than the effective control rate ( $r_{ef}$ ) would be:

$$r_{ef} = r_a - r_a r_b / (1 - r_a r_b) \quad [9]$$

Proof for [9] delivered by Staszkievicz (Staszkievicz, 2001).



In case of the reciprocal holdings, parameters  $\frac{\gamma}{\alpha}$  becomes an effective control rate (**Effr**) derived from [9], thus the expenditures relating to migrating of the long term reputation risk could be represented by:

$$P = \sum_{i=1}^n \mathbf{Effr}_i * L_i \quad [10]$$

Where n denotes number of the controlled entities by a parent.

So long the value of  $P > 0$  than the reputation risk subject to above assumption can be ignored. In case of reputation risk averse group the weight  $\mathbf{Effr}_i$  might become 1 for each non positive  $L_i$ . The group owner possessed however an reputation option, in case while the realized losses becomes unbearable (exceed the group *risk appetite*) the subsidiaries can be let bankrupt (appetite or materiality option).

Let us assume (assumption 5) that the risk appetite is expressed as the % of the economic capital, thus the materiality can be expressed as well as the % of the economic capital. Thus the P values between materiality and risk appetite is disclosed with parent company risk profile. Any insignificant values of P can be reasonable ignored while the values exceeding the risk appetite indicate realization of the reputation option.

### 3. Conclusion

The above presented model allows for quantification of the financial aspects of reputation. There is a possibility for the practical application of the model, however the added value in contrast to the consolidation procedures quality might not necessarily outweigh the costs of application.

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