Spinning Gold: The Financial Returns to External Stakeholder Engagement

Witold J. Henisz
Associate Professor of Management
The Wharton School, University of Pennsylvania
3107 Steinberg Hall-Dietrich Hall, 3620 Locust Walk
Philadelphia, PA 19104-6370
henisz@wharton.upenn.edu

Sinziana Dorobantu
Senior Research Fellow and Lecturer
The Wharton School and The Lauder Institute, University of Pennsylvania
2206 Steinberg Hall - Dietrich Hall, 3620 Locust Walk
Philadelphia, PA 19104-6370
sdor@wharton.upenn.edu

And

Lite Nartey
Doctoral Candidate
Wharton School, University of Pennsylvania
3034 Steinberg Hall-Dietrich Hall, 3620 Locust Walk
Philadelphia, Pennsylvania 19104-6370
lnartey@wharton.upenn.edu

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ABSTRACT

In response to the growing societal challenge to multinational corporations' strategic pursuit of short-term economic returns, these organizations increasingly seek to buttress the political and social support for their operations. Agency theorists and financial economists often claim that such actions to pursue corporate social responsibility are frequently efforts by senior managers seeking perquisites that necessarily impose costs upon shareholders. Others scholars agree that managers have discretion and are diverting shareholder returns but interpret these initiatives as altruistic and motivated by managers' morality. A growing body of organizational economists, identify market conditions under which the diversion of shareholder returns to enhance social responsibility may, in fact, be optimal for a manager because they lead to a reduction in the cost of capital, improve employee productivity, increase consumer willingness to pay or reduce activists' efforts to impose financial losses on the company. While acknowledging the existence of these causal mechanisms as well as managerial agency, we wish to call attention to an alternative and more direct driver of efforts by managers to improve external stakeholder perceptions of responsibility. We argue and present evidence that there exist cases in which such efforts, rather than diverting shareholder rents or moving the firm into a market niche with an alternative higher cost product, can be inputs into a more efficient production process. We undertake this analysis using panel data on 26 gold mines over the period 1993-2008. We code over 50,000 stakeholder events from media reports to develop an index of the degree of stakeholder cooperation or conflict for these mines and demonstrate that this measure of political and social capital is an important component, together with characteristics of the mine and the price of gold, in calculating the financial market valuation of the 19 publicly traded parent firms.

Introduction

In response to the growing societal challenge to multinational corporations' strategic pursuit of short-term economic returns, these organizations increasingly seek to buttress the political and social support for their operations. Agency theorists and financial economists often claim that such actions to pursue corporate social responsibility are frequently efforts by senior managers seeking perquisites that necessarily impose costs upon shareholders. Others scholars agree that managers have discretion and are diverting shareholder returns but interpret these initiatives as altruistic and motivated by managers' morality. A growing body of organizational economists, identify market conditions under which the diversion of shareholder returns to enhance social responsibility may, in fact, be optimal for a manager because they lead to a reduction in the cost of capital, improve employee productivity, increase consumer willingness to pay or reduce activists' efforts to impose financial losses on the company. While acknowledging the existence of these causal mechanisms as well as managerial agency, we wish to call attention to an alternative and more direct driver of efforts by managers to improve external stakeholder perceptions of responsibility. We argue and present evidence that there exist cases in which such efforts, rather than diverting shareholder rents or moving the firm into a market niche with an alternative higher cost product, can be inputs into a more efficient production process. In short, we demonstrate the existence of a direct positive financial return to stakeholder engagement.

Despite long standing efforts to identify such a link, research to date has generated highly inconclusive and suspect results. Progress has been hampered both by a lack of attention to the full spectrum of theoretical mechanisms underlying the potential relationship as well as by data limitations. We offer an alternative causal mechanism that differs substantively in its emphasis on rent creation from the growing body of work emphasizing rent diversion that seeks to address the former gap and offer a distinctive empirical approach using new media based project-level data on stakeholder actions and perceptions to address the latter.

Our empirical analysis is set in the gold mining sector where strong stakeholder opposition to the environmental consequences of mining and its association with corruption and private rent seeking has led to substantial reform in the stakeholder engagement strategies of many mining companies. Ironically, companies in this industry including Anglo American and Newmont Gold which were once pilloried for their lack of concern for anything but the short-term financial bottom line, are now leaders in the implementation of sustainability programs and in stakeholder engagement. Even among the myriad small mining companies, practices are changing motivated by their desire to eventually sell their operations to the majors they are incorporating the preferences and valuation models of those potential buyers which increasingly incorporate political and social support. This sentiment was expressed to us in the following quote from The Chief Operating Officer of one of the mines in our sample.

> It used to be the case that the value of a gold mine was based on three variables: the amount of gold in the ground, the cost of extraction, the world price of gold. Today, I can show you two mines identical on these three variables that differ in their valuation by an order of magnitude. Why? Because one has local support and the other doesn't." (Yani Roditis, COO Gabriel Resources, interview by authors)

Our empirical design follows directly from this observation in linking information on financial market valuation to the intrinsic value of the gold mine and demonstrating that the degree of stakeholder cooperation and conflict helps to explain the gap or difference between these figures. We undertake this analysis using panel data on 26 gold mines over the period 1993-2008. We code over 50,000 stakeholder events from media reports to develop an index of the degree of stakeholder cooperation or conflict for these mines and demonstrate that this measure of political and social capital is an important component, together with characteristics of the mine and the price of gold, in calculating the financial market valuation of the 19 publicly traded parent firms.

We first summarize the theoretical literature highlighting the various causal mechanisms that authors have argued could lead to a positive relationship between stakeholder perceptions of social responsibility and financial market valuation. We then develop our own supplementary causal mechanism Next we describe the empirical context in which we test for this relationship including anecdotal and

qualitative evidence supporting our hypothesis as well as the specific data we amass for the purpose of this test. We close by discussing the contribution of this analysis to the literatures on corporate social responsibility and financial performance and on multinational strategy. This discussion reveals next steps in a broader research agenda designed to enhance the theoretical and empirical support for the implementation of stakeholder engagement.

Limitations to the Analysis Linking Corporate Social Responsibility and Financial Performance

Our current understanding of the link between actions undertaken by agents of corporations that are perceived to be socially responsible by external stakeholders and corporate financial performance is limited by two tightly coupled constraints. First, the theoretical focus has abstracted away from the process of production assuming that the choice facing managers is how best to allocate a given stock of *ex post* rents among shareholders and stakeholders rather than how to allocate *ex ante* factors of production to generate the largest sustainable flow of *ex post* rents. Second, measurement occurs at the corporate level with a focus on global activists, financiers, managers and consumers not at the operational level with a focus on local community leaders, employees, politicians and residents.

From Ex Post *Rent Distribution to* Ex Ante *Sustainable Rent Generation and Capture*

Across each of the theoretical perspectives typically used to examine corporate social responsibility, scholars have focused their attention on the *ex post* allocation of predetermined rents. From an agency perspective, scholars have considered whether managers use corporate social responsibility to pursue self-interest seeking perquisites, career enhancement or moral peace of mind. Scholars drawing on stakeholder theory have sought to expand the scope of management research to more explicitly incorporate the preferences and perceptions of external stakeholders towards activities that they perceive to be socially responsible. Organizational economists have formalized the intrinsic component of this insight demonstrating the conditions under which consumers, financiers and other external groups could lead managers to reallocate resources away from economic rents towards socially responsible output. If

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combined with differentiated marketing or regulation that disadvantaged followers, such activity could itself generate economic rents. Given their effort to expand the scope of inquiry to incorporate corporate social responsibility, it is perhaps understandable that each of these literatures abstracts away from a firm's production process that generates the economic rents whose distribution they seek to model. We challenge this modeling choice and seek to incorporate activities that are perceived by stakeholders as socially responsible both within and subsequent to the production process.

Levitt (1958) and Friedman (1962, 1970) famously attack efforts by managers to pursue objectives other than shareholder value maximization as short-term conflict avoidance by managers. They advocate instead a single-minded all-out focus on profit maximization. Jensen (2002) models the necessary loss of control of managerial agents who may seek to pursue personal social interests (Hemingway & Maclagan, 2004) by shareholder principals in the presence of multiple hard to quantify performance metrics. Authors have also highlighted the possibility of collusion between managers and either institutional shareholders (Cespa & Cestone, 2007) or non-shareholding stakeholders (Surroca & Tribó, 2008) in support of managerial tenure and social responsibility at the expense of (non-institutional) shareholder returns. Institutional theorists have highlighted the pressures for conformity by managers that can arise from regulation, peer behavior and civil society independent of the efficiency of adoption (Campbell, 2007, Jennings & Zandbergen, 1995, Margolis & Walsh, 2003). Empirical research supporting the importance of managerial agency include studies showing that financial slack is a determinant of corporate social performance (McGuire, Alison, & Schneeweis, 1988, Waddock & Graves, 1997); headquarters policies rather than local conditions drive social responsibility programs in foreign subsidiaries (Husted & Allen, 2006); and insider ownership and leverage (i.e., factors that increase managerial alignment with shareholder interests) are negatively associated with corporate social responsibility (Barnea & Rubin, 2006).

An alternative theoretical perspective emphasizes not the existence of managerial discretion but rather the external stakeholder demands for the use of that discretion or for constraints upon it. Freeman's

(2010) stakeholder approach to strategic management emphasizes the myriad actors with a political, economic or social stake in the operations of a corporation and highlights the manager's need on instrumental and moral grounds to incorporate stakeholders' preferences and objectives into strategy-making. While extremely useful in leading to a broadening of the scope of inquiry, stakeholder theory has struggled with the identification of priorities among competing stakeholder (and shareholder) demands. Recent work strives to create better typologies both for the identification and prioritization of stakeholders (Mitchell, Agle, & Wood, 1997) and the form of engagement with those stakeholders (Greenwood, 2007) but the link between identification, action and, especially, performance remains elusive.

Some of the key insights of verbal stakeholder theory have, however, recently been formalized by organizational economists generating strong empirical support for an instrumental stakeholder theory or a strategic version of corporate social responsibility. Rather than its earlier focus on manager-owner agency conflict, more recent work has incorporated pressures, constraints and opportunities from across the value chain. Consumers may be willing to pay more for a product or service perceived as socially responsible (Casadesus Masanell, Crooke, Reinhardt, & Vasishth, 2009, Elfenbein, Fisman, & McManus, 2009, Elfenbein & McManus, 2010, Hiscox & Smyth). As a result, where signaling of producer type is more important or effective (McWilliams & Siegel, 2001) or such consumers are more powerful (Hoepner, Yu, & Ferguson, 2010) or markets vary in their competitiveness (Bagnoli & Watts, 2003, Fisman, Heal, & Nair, 2005, Fisman, Heal, & Nair, 2006), companies should exhibit greater corporate social responsibility. Employees may prefer to work for a company they perceive to be socially responsible demanding lower wages or benefits or exerting greater effort (Bhattacharya, Sen, & Korschun, 2008, Collier & Esteban, 2007, Kim, Lee, Lee, & Kim, 2010). Suppliers of other factors of production could make similar choices influencing the cost of capital or production (Bruyn, 1991, Mackey, Mackey, & Barney, 2011, Porter & Kramer, 2006, Sparkes & Cowton, 2004, Waddock, 2000). Activists themselves can be considered a stakeholder whose preferences, strategies or resources can influence corporate behavior (Baron, 2009, 2001, Baron & Diermeier, 2007, Frooman, 1999, Hendry, 2006, Rehbein, Waddock, & Graves, 2004,

Rowley & Berman, 2000, Spar & La Mure, 2003). Efforts at generating such advantages with key stakeholders can generate sustained rents if customer switching is costly due to the development of relation-based trust (Du, Bhattacharya, & Sen, 2007, Lacey, 2007, Mohr & Webb, 2005, Salmones, Crespo, & Bosque, 2005, Vlachos, Tsamakos, Vrechopoulos, & Avramidis, 2009) or regulation emanating from governments (after lobbying) or industry leaders (Frynas, 2010, Frynas, 2008, Michael, 2003) that allow first movers to monetize their advantage.

While the extension of agency-based models of corporate behavior to incorporate multiple stakeholder principals is of substantial importance, the literature continues to take a truncated perspective on the potential causal mechanisms by which activities perceived by stakeholders to be socially responsible can impact corporate financial performance. The focus throughout the agency, stakeholder and organizational economics literature is on the *ex post* distribution of rents from a fixed economic activity. The implicit production process is assumed constant and independent from stakeholder pressures except in so far as they impose some cost (e.g., pollution control) which reduces productive efficiency in order to reduce negative externalities or generate a greater willingness to pay among consumers or willingness to sacrifice rents among suppliers of the factors of production. In short, activities perceived to be socially responsible and those generating economic rents are either substitutes or additive factors in the production of a product that buyers or suppliers perceive as more socially responsible. While the insights generated from these simplifying assumptions are important and we do not intend to challenge them, we relax them to allow complementarity between the two activities. As a result, we substantially broaden the scope of activities perceived to be socially responsible that positively impact financial performance.

For many production processes, an implicit or explicit social license to operate is a necessary input. For example, fifteen billion dollars of gold sitting in a mountainside cannot be transformed into shareholder rents with financial, engineering and marketing inputs alone. It also requires the political and social support of key stakeholders including government officials, regulators, community leaders, suppliers, employees, financiers and members of civil society. These stakeholders may reside locally,

nationally or internationally. As their degree of conflict with the owner and operator of the proposed gold mine increases, they are not only able to extract rents for their preferred causes from the efficient operation of the mine or reduce the efficiency of those operations but they may also coordinate public and private activity (e.g., in the government, among unions or activists) to delay the opening of the mine, suspend its operations or so raise the cost of continued development or operations as to make the mine owner and operator choose to suspend or abandon it. Efforts to build community support are made not to increase consumer willingness to pay for the gold nor to extract rents from suppliers but rather so as to maintain the right formally and directly granted by the government but informally and indirectly granted by a broader set of external stakeholders to transform the gold and generate rents from that process. In this formulation, activities perceived by stakeholders as socially responsible build up political and social capital that enhances the degree of cooperation, reduces the probability of adverse events and enhances the rent generating capacity of the gold mine.

If managers were completely aware of these interdependencies, they would optimally allocate resources to stakeholder engagement. In reality, the integration of such activities into the production process is far from complete. Particularly for multinational firms unfamiliar with the domestic institutional context, identifying, learning from, building and sustaining cooperative relationships with the optimal network of stakeholders poses enormous practical challenges (Nartey, 2010). Furthermore, by virtue of their foreignness, multinational investors are more likely to engender a conflictual relationship with a given stakeholder than a cooperative one (Zaheer, 1995). Such reactions may be based on intrinsic nationalism or opportunistically formented (i.e., by a domestic opponent or other stakeholder who seeks to supplant or stop project development).

From Data on Corporate-level Disclosure and Reputation to Project-level Cooperation and Conflict

Throughout the nearly four-decade long history of empirical literature on the link between corporate social responsibility and corporate financial performance (see Margolis, Elfenbein and Walsh

(2007) for a recent and extremely comprehensive review), measurement of the former construct has proven a daunting challenge. Early studies relied on small sample comparisons of subjectively rated "better" vs. "worse" social performers or used corporate responses to surveys. Over time, external sources of data replaced researchers' own ratings and the data became more objective relying upon consumer polling for corporate reputation, and analysis of annual reports and other public documents regarding corporate practices. While these external and more objective data sources were a clear improvement over their predecessors both in assuaging concerns on construct validity and in expanding the sample of covered firms, their unit of analysis, however, remained the corporation. While scholars thus explored the link between corporate-level events and performance, they struggled with converting these results into operational guidance to front line managers tasked with resource allocation decisions. Doing so required untenable assumptions that corporate policies translated into operational practices and that strategies were not contingent upon country, stakeholder, issue, time, industry and project context. Scholars seeking to loosen these assumptions struggled with a lack of more fine grained data necessary for their line of inquiry.

By contrast, scholars seeking to highlight the costs to corporations of irresponsible activity or of being targeted by activists, have long used more micro-level event data drawn from media reports (Earl, Martin, McCarthy, & Soule, 2004). A wide body of literature links media reporting of adverse events including product recalls (Davidson & Worrell, 1992), corporate criminal activity (Davidson & Worrell, 1988, Gunthorpe, 1997, Karpoff, Lee, & Vendrzyk, 1999, Karpoff & Lott Jr, 1993, Reichert, Lockett, & Rao, 1996), violations of labor law (Davidson, Worrell, & Cheng, 1994, Hersch, 1991) and environmental violations (Karpoff, Lott Jr, & Wehrly, 2005) to negative financial performance. More recently and closely related to our analysis, King & Soule (2007) demonstrate that activist campaigns in the media negatively impact market valuation particularly for campaigns targeting consumers or workers in firms who themselves lack a strong prior record of media coverage (i.e., a stock of reputational capital). These studies typically proceed by linking information on the date of an adverse event to abnormal stock market

returns or a long-term reduction in market valuation. King & Soule (2007) go further in coding

information on the size of the protest, the number of sponsoring organizations and the type of issue.

Scholars in international relations and conflict studies have gone even further in their coding of

event data in their long-standing examination of the impact of 'soft power' or the degree of conflict and

cooperation among states on subsequent relations between those states including the incidence of military

conflict (for review of this literature see Schrodt (1993)). In this literature, events are coded as subject-

verb-object triples in which one actor undertakes an action or expresses an opinion connoting conflict or

cooperation with another actor. The intertemporal evolution of dyadic and network conflict and

cooperation is analyzed to ascertain the determinants of escalation of conflict or international cooperation.

The closest analogue to this type of data in the management realm lies in the realm of corporate

reputation where the appearance of negative words in the media is associated with subsequent

deterioration in earnings and stock prices (Tetlock, Saar-Tsechansky, & Macskassy, 2008) as well as

overall stock index levels, trading volume and volatility (Das & Chen, 2007, Loughran & McDonald,

2010, Remus, Heyer, & Ahmad, 2009). The tone of earnings press releases is associated with subsequent

earnings and short term stock price movement (Davis, Piger, & Sedor, 2007). Text analysis of Amazon

seller reviews similarly demonstrates that strong reputations are associated with increasing market power

(Ghose & Ipeirotis, 2008).

Following such an event-based approach in the study of stakeholder engagement offers numerous

advantages over the extant approaches of relying on independent corporate audits or broad-based

perceptions of experts. First, a much larger sample of firms could potentially be incorporated within an

analysis. Second, the perceptual or stakeholder opinions that are included within the media reports are

more likely to be those who have direct association with the firm as opposed to more distant topical

experts. Third, real time event reports in the media offer a much more accurate source of information on

how a company is perceived by its stakeholders at a moment in time than do periodic audits or expert

surveys. As stakeholder engagement fluctuates with events and tactics, a measure which captures these dynamics should outperform those that are more static. Finally, it is easier to separate and, in particular, examine the interdependence of stakeholder actions and opinions and those of the focal firm.

Implications

As the theoretical literature linking corporate social responsibility to financial performance has developed, excess attention has been paid to situations in which socially responsible products or production processes are substitutes to or costly transformations of otherwise profit maximizing alternatives. Scholars have argued that these activities and costs are undertaken because of managerial agency or external stakeholder pressure. In such a set-up, stakeholder engagement is rent diverting and negatively impact financial market valuation. Governance structures that constrain managerial agency (e.g., independent board oversight or institutional investors), consumer willingness to pay, supplier willingness to concede and buyer or supplier switching costs may all also factor into the choice by a firm as to how much effort and resources to dedicate to altering perceptions of external stakeholders.

We argue for the inclusion of another causal link between these constructs. We believe that in some industries or for some projects, there exists a direct and positive link between efforts to improve the perceptions of the focal firm by external stakeholders and the profitability of its production process. External stakeholder perceptions and, in particular, cooperation are necessary inputs without which property owned by the investor cannot be transformed or sold in a manner that maximizes the sustainable economic rents that can be captured by shareholders. Rather than pursuing a constrained optimization choice between productive efficiency and social responsibility or comparing different production processes that vary in their social responsibility for managerial preferences, consumer willingness to pay or supplier willingness to concede, managers should truly integrate their corporate and external stakeholder engagement strategies. Their choice of stakeholder engagement strategies should be much more heavily intertwined with the production process rather than only with the preferences of managers, consumers, suppliers or activists. Empirically, in such instances, we should observe that stakeholder

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cooperation positively and stakeholder conflict negatively impacts the market valuation of a firm, *ceteris paribus*.

Empirical Analysis

Empirical Context

We conduct our empirical analysis in the gold mining industry due to the availability of data and due to the widespread acknowledgement of the critical role of stakeholder engagement for profitability even in the absence of the causal mechanisms considered in the recent extant literature. A recent report by Control Risks Group examines the importance of above surface (i.e., political and social) risks and writes,

> While headlines of the blistering ascent (and volatility) of commodity prices as well of those speculating about the industry's next big merger tend to dominate the current mining sector headlines, a variety of other types of headlines are also appearing with increasing frequency. These tend to have much less to do about mining or commodity prices and more to do with government action or inaction, non-governmental organisation (NGO) activity or problems with communities and other stakeholders. The weeks that preceded the writing of this article saw strikes at mines in Mexico and elsewhere raise fears about production levels, concern over government action on mining in Bolivia, a controversial windfall tax on mining approved in Mongolia, ongoing concerns over the potential results of the Peruvian elections and the launching of a new NGO campaign against the gold industry.
>
> All of these headlines deal with the complexities of managing above-surface political risks. Whether the industry likes it or not, these types of issues will continue to challenge mining companies. These events are about companies doing business with new partners, in new parts of the world and in many cases, new organisations and actors taking an interest (not always in a positive sense) in the sector. If anything, political risks in mining will increase. While this certainly will be a challenge, it is also an opportunity. Mining companies that firmly grasp these issues stand poised to create enduring shareholder value. However, many companies have a long way to go (Control Risks Group, 2006).

The report goes on to highlight that given the declining reserves in industrialized democracies and the rising mean price and volatility in price, increased political and social conflict over the distribution of rents during boom years and losses during lean years is inevitable. The report concludes that "The successful 21st century mining company will have to become a master at managing political risk. It will make sophisticated, informed and rational decisions about political risk and will manage the implementation of value-creating risk management programmes. It will not be afraid to pursue

opportunities in most parts of the world. As a consequence, it will create substantial and enduring value for its shareholders (Control Risks Group, 2006)."

Note that in the case of mining companies, there is little evidence that the channels by which the literature posits this relationship to exist are operative. Consumers are unable to differentiate between gold from one mine or company or another. There is little evidence that miners or managers of mining companies are defecting or offering wage or productivity benefits to more responsible mining companies. An insufficient number of investors are allocating capital on socially responsible grounds to influence managerial behavior. Activists though prominent are unable to impose substantial direct costs on mining companies. By contrast, mining is an industry where the valuation of a fixed resource (i.e., a gold mine), could vary wildly based on the degree of stakeholder cooperation. Community, activist and government preferences towards a mining company can influence the regulatory environment, land permitting, environmental regulation, taxation, labor contracts, terms of capital intensive imports and the like. The value of a fixed stock of gold is thus plausibly linked to these stakeholders preferences on whether the owner should have the right to transform the underground gold into shareholder capital.

Our specific empirical context is the population of 19 publicly traded mining firms on the Toronto Stock Exchanges who own and operate one, two or three mines outside of the United States, Canada and Australia (a total of 26 mines in 20 countries) that have reached the stage of a feasibility study.[1] We have gathered all available financial and operating data on these companies during the period that they were publicly listed after the completion of their feasibility studies. This sampling criterion allows us to

1) draw upon strict Canadian disclosure requirements[2] for financial and operating data of mining firms to provide sufficient information to estimate the intrinsic value of the mines using widely accepted resource valuation models; and

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[1] "A feasibility study is an engineering study based on test work and engineering analysis, which presents enough information to determine whether or not the project should be advanced to the final engineering and construction stage." The accuracy of these estimates is intended to be accurate within a 15 percent error band.
[2] http://www.tsx.com/en/listings/tsx_issuer_resources/continuous_disclosure.html

2) exploit the clear and direct links between media reports on a single (or two or three) mine(s) and changes in financial performance without contamination from numerous other news stories covering other assets or practices of the same publicly traded company.

For these mines we combine financial and operating data from the Raw Materials Database[3], the parent company's quarterly financial reports filed with SEDGAR and the stock price information from the Toronto Stock Exchange which allow us to measure the current market valuation of the firms, the intrinsic valuation of their gold reserves and their degree of stakeholder cooperation or conflict as detailed below.

Financial Market Valuation.

We use a simple financial valuation formula that models stock market value as a function of the value of a company's announced resource stock and the probability that the company will successfully extract these resources. Formally, we estimate

$MV_{it} = \alpha + \beta \sum_{j=1}^{m_i}(RV_{jit}P_{jit}) + \varepsilon_{it}$, where

MV_{it} refers to the stock market value of company i at time t

RV_{jit} reflects the current valuation of mine j of company i at time t,

m_i is the number of mines owned and operated by company i, and

P_{jit} is the probability at time t that company i will successfully exploit the resources at mine j.

The market value of company i at time t (MV_{it}) is calculated by multiplying the stock price times the number of common shares outstanding and adding any company debt. Stock price data was obtained directly from the Toronto Stock Exchange. Shares outstanding and debt information are taken from the COMPUSTAT North America database. We discuss below the evaluation of the resource value RV_{jit} and of the probability of successfully exploiting it, P_{jit}.

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[3] Raw Materials Database – http://www.rmg.se.

Resource Valuation.

We build upon a baseline resource valuation model developed by Cairns and Davis (1998). The authors criticize a previous formulation of the Hotelling valuation principle (Miller & Upton, 1985a, 1985b) and its practical applications (Bartelmus & Van Tongeren, 1994, Bureau of Economic Analysis, 1994) because they suggest that the value of mineral reserves should be estimated by multiplying the quantity of reserves by the difference between the commodity price and the *marginal* cost of extraction/production, which is rarely available. Because data on marginal costs of production are scarce, practitioners frequently substitute the *average* cost of production estimated and made public by mining companies, introducing error in the valuation result (typically towards the overvaluation of the mining reserve). Cairns and Davis propose an alternative formula for valuing hard-rock mineral properties that relies on assumptions used by mining engineering when planning the rate of extraction for a mine. Specifically, they assume that "nominal prices and instantaneous unit extraction costs either do not change through time or inflate at the same rate; the quality of ore is homogenous throughout the mine; before production begins, the firm invests in a level of capacity that constraints the maximum output of the firm at any time during the exploitation of the mineral deposit; the level of capacity is chosen to maximize the present value of the mine; and the anticipated level of output at any time is equal to the capacity level" (Cairns & Davis, 1998: 659). The resulting formulation retains the central parameters of the Hotelling valuation principle (commodity price, cost of production, and mineral reserve data) but allows for the use of average cost data which is more readily available for different mines.

To apply Cairns' and Davis' models to our empirical context, we add a time dimension and consider the possibility that companies in our sample own multiple mines for which the resource value can be assessed separately. Formally, we evaluate each mine *j* of company *i* as follows

$$RV_{jit} = W_{jit} S_{jit} \frac{1 - e^{-r_t(T_{jit} - y_{jit})}}{r_t(T_{jit} - y_{jit})}, \text{ where}$$

W_{jit} = average forecast operating profit per unit of gold of mine *j* and time *t*

S_{jit} = quantity of gold reserves of gold mine j at time t

T_{jit} = estimated mine life for gold mine j at time t, in quarters[4]

y_{jit} = quarters of operation of gold mine j at time t

r_t = Treasury bond yield with term $T_{jit} - y_{jit}$ at time t

We compute the average forecast operating profit per unit of gold for mine j of company i at time t

as $W_{jit} = \frac{1}{(T_{jit}-y_{jit})} \sum_{k=t}^{T_{jit}-y_{jit}} (GoldPrice_t - CostExtraction_{jk})$, or the average quarterly profit for the

remaining period of operation. Following Cairns and Davis (1998), we use the current price of gold to

estimate forecast profits. For each mine, data on the cost of extraction ($CostExtraction_{jk}$), the remaining

quantity of proven and probable gold reserves S_{jit}, the estimated mine life T_{jit}, and the production start

date used to calculate the quarters the mine has already been in operation y_{jit} were collected from

company annual and quarterly reports, annual information forms, technical reports and press releases. For

the Treasury-bond yield r_t we use Treasury constant-maturity data provided by the Federal Reserve Bank

of St. Louis and available for different terms from 1 month to 30 years.

Finally, we posit that investors discount heavily the resource value by the probability that the

company will successfully develop its mining reserves. The value of hundreds of ounces of gold reserves

is zero if the mining company has its license to exploit revoked or if it cannot get approval to begin the

construction of the mine. On the basis of this intuition, we discount the resource value by the probability

that the resource will be exploited. We model this probability of success in two ways: (1) as a function of

project-level risks determined by the level of conflict or cooperation between the company and various

stakeholders affected or interested in the development of the gold mining project, and (2) as a function of

both project-specific level of stakeholder conflict-cooperation and country-level risk. We describe the

operationalization of the stakeholder conflict-cooperation in the following section; we measure the

country-level risk using the Political Constraint Index (POLCON) dataset (Henisz, 2000).

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[4] T denotes to *total* estimated mine life, not the remaining mine life at time *t*. *T* is indexed by *t* because companies often adjust their estimates of the total life of a mine to reflect adjustments in reserve estimates, or changes in technology or production schedules.

The construction of this measure begins with the identification of the number of independent branches of government with veto power over policy change (e.g., one or two legislative chambers, the judiciary, and sub-federal states or provinces). A measure of institutional constraints is then generated by assuming the preference of each branch and the status quo policy is drawn independently and identically from a uniform distribution. The measure is then modified to take into account the extent of alignment across the branches of government and the extent of preference heterogeneity within each legislative branch. The final values of the POLCON index range from 0 (least constrained) – which corresponds to an executive with no formal checks or balances on his behavior – to 0.89 – which corresponds to an executive checked by a fractious bicameral legislature, the judiciary, and sub-federal provincial or state governments (e.g., Belgium).

To the extent that such constraints serve to inhibit a host-country government from reneging on prior commitments made to respect property rights (i.e., responding to the time consistency problem they face in the case of long-term investment), countries with fewer constraints have weak commitment mechanisms and, therefore, a more uncertain relationship between resource valuation and financial market valuation or one that is more contingent upon stakeholder engagement. Based on a similar logic to what we employ here, previous studies have found that higher levels of POLCON are associated with a reduction in the volatility of macroeconomic policies (Fatás & Mihov, 2003, Henisz, 2004) and the sensitivity of trade policy to increases in unemployment (Henisz and Mansfield 2006).

Stakeholder Conflict-Cooperation.

We create a novel hand-coded stakeholder events database comprising events linking firms and stakeholders. The unit of analysis is the stakeholder dyad-quarter. The stakeholder events data is compiled from a corpus of the full set of media documents in the FACTIVA database that mention the mine or the parent company of the mine. For each mine's corpus, every sentence of every article is read and all

stakeholder events are hand-coded according to a detailed coding protocol adapted from the international conflict studies literature (Bond, Bond, Oh, Jenkins, & Taylor, 2003, King & Lowe, 2003).

A stakeholder event is an instance in which a stakeholder (or the firm) acts or expresses sentiment towards the firm (or a stakeholder). Events may be cooperative or conflictual and vary in their strength along these two dimensions. We distinguish between the initiator of the event and the target of the relation by coding which source actor did what to which target actor, i.e., concisely captured by the phrase: who (SOURCE actor) did what (VERB or VERB PHRASE) to whom (TARGET ACTOR)? This unique stakeholder event database includes over 50,000 hand-coded stakeholder events of which approximately half include the investing firm and are therefore included with our empirical analysis. The degree of conflict or cooperation is coded using a modified version of the Goldstein (1992) scale. We augmented this scale to better apply to relations between firms and stakeholders in the business context. The Goldstein conflict-cooperation scale is based upon McClelland's (1971) World Events Interaction Survey (WEIS). Our modified scale is a measure of the cooperation or conflict between firms and stakeholders. It ranges from cooperative relations of +10 to conflictual relations of -10 (see Appendix 1 for the summary categories). The full vocabulary includes 4,639 unique verbs or verb phrases and is available from authors upon request). Table 1 provides several examples of sentences from our database coded according to this protocol. Table 2 provides some summary statistics for each mine in the sample. We aggregate these stakeholder event data for the purpose of our analysis by computing a rolling stock of stakeholder cooperation-conflict. The empirical measure is constructed using a moving average that discounts the "relevance" of past reports by weighing less a report dating from t-1 than one report from time t. Formally, for each mine j of each company i at time t we calculate:

$$CC_{jit}^{*} = \sum_{l=0}^{w} \frac{\delta^{l} n_{ji,t-l}}{\sum_{m=0}^{w} \delta^{m} n_{ji,t-m}} cc_{ji,t-l} \text{ , where}$$

cc_{jit} = *level of stakeholder conflict-cooperation at mine j of company i at time t*

n_{jit} = *number of new media reports for mine j of company i at time t*

w = window of the moving average, and

δ = discount factor.

The results presented below are estimated using a window of 8 quarters and a discount rate of 0.8.

Summary statistics and a correlation matrix for the variables in our dataset are reported in Table 3.

Exploratory Analysis

Before we undertake more sophisticated econometric analysis, we present some simple bivariate

graphs that highlight the importance of stakeholder cooperation and conflict for financial market

valuation. In Figure 1, we present a plot for each mine of the financial market valuation and the resource

valuation formula (top panel). While in some cases, these figures track each other closely, in others there

are substantial and time varying gaps. We next plot the ratio of the financial market valuation to the

resource valuation formula and the rolling stock of stakeholder conflict and cooperation (bottom panel).

The strong relationship between these latter time series evident even in this simple exposition highlights

the substantive strength of the direct link between these constructs.

Econometric Model

To assess whether the expected value of the company's mine(s) matches the market value, we

estimate two types of random-parameter models, which can accommodate individual (i.e., parent firm

level) heterogeneity in the relationship between resource and financial market valuation. If estimating the

regression coefficient on the resource valuation (RV_{jit}) or the expected resource valuation ($RV_{jit}P_{jit}$) for

each company, results vary considerably. The coefficient on resource value obtained using a generalized

least-squares estimator which accounts for the fact that the errors follow a first-order autoregressive

process varies across the parent companies between -0.135 and 0.766 (results not shown). Similarly, the

coefficient on expected resource valuation ranges between 0 and 1.9. The wide array of coefficient

estimates obtained in company-by-company regressions indicate that investors assign different dollar

values to a unit increase in the resource valuation (or the expected resource valuation) of different mines.

Random-parameter estimators can accommodate such unit to unit variation by relaxing the assumption

that the relationship between Y_i and X_i is defined by a vector of *true* coefficients $\boldsymbol{\beta}_i$ and assuming instead that the coefficients $\boldsymbol{\beta}_i$ are random variables.

We estimate the following random-parameter model:

$$MV_{it} = \alpha_i + \beta_i \sum_{j=1}^{m} RV_{jit}\, P_{jit} + \varepsilon_{it}$$

where $\alpha_i = \alpha + \gamma_\alpha v_{i,\alpha}$, $\beta_i = \beta + \gamma_\beta v_{i,\beta}$, and $v_{i,\alpha}, v_{i,\beta} \sim N(0,1)$.

Results

[NB: THIS DRAFT OF 10/26/10 CONTAINS PRELIMINARY EMPIRICAL RESULTS ON A SUBSAMPLE OF 10 MINES OWNED BY 9 COMPANIES IN 9 COUNTRIES]

Before we evaluate the specified random-coefficient model, we estimate several time-series cross-sectional regression models with "fixed" (non-random) parameters and random effects (or random intercepts). Table 4 shows the results for specifications including fixed effects (models 1-3), fixed effects with a first-order autoregressive disturbance term (models 4-6), random effects (models 7-9), and random effects with a first-order autoregressive disturbance term (models 10-12). The results indicate that the stock market places a relatively low value (around 20 cents on the dollar) on resource valuation estimates that are not discounted by the probability that the resource will be exploited (models 1, 4, 7, and 10). By contrast, investors value higher resource valuation estimates that are dicounted by project-level risks related to stakeholder conflict (models 2, 5, 8, and 11) and resource valuations that incorporate both project-level risks related to stakeholder conflict and country-level political constraints (models 3, 6, 9, 12).

Models 7 through 12 are the equivalent of a random-parameter model in which only the intercept is assumed to be a random variable, $\alpha_i = \alpha + \gamma_\alpha v_{i,\alpha}$, while the coefficients on the independent variables are "fixed" (i.e. non-random). The results suggest that investors are willing to pay about 20 cents for an

increase of 1 dollar in the valuation of a company's gold mine project(s) if the probability of success is assumed to be 1; they are willing to pay 32 cents for an increase of 1 dollar in the valuation of a company's gold mine project(s) if the probability of success is defined in terms of the level of stakeholder cooperation or conflict; and 76 cents for an increase of 1 dollar in the valuation of a company's gold mine project(s) if the probability of success is defined in terms of *both* the level of stakeholder cooperation/ conflict (reflecting project-level risk) and country-level political constraints.

The "full" random-parameter model estimates are presented in Table 5. The models assume that the coefficients are random variables drawn from a normal distribution, and estimate both the mean and the standard deviation for the intercept and the slope. We should note that in random-parameter models, the usual statistical tests do not necessarily indicate the presence or absence of a 'significant' relationship among the variables included in the estimation (Greene, 2004). Model (1) shows that, when assuming that the probability of developing the project is 1, investors are willing to pay, on average, about 28 cents for an increase of 1 dollar in the resource valuation of a gold mining company's cash flows. By contrast, when we account for the fact that the probability of bringing the mine to production is less than 1 and model it in terms of the level of stakeholder cooperation or conflict (model 2) or in terms of both the level of stakeholder cooperation or conflict and political constraints (model 3), the estimated unconditional mean for the coefficients are higher and closer to 1. More specifically, if we assume that the probability of developing the gold mine is defined by whether the company's strategy to develop the mine has engendered cooperation or conflict from various stakeholders affected by the mine and discount the company's expected cash flows by this value, our random estimate suggests that investors are willing to pay, on average, about 50 cents for every dollar increase in the company's expected resource valuation. If we model the probability of success as the mean of stakeholder cooperation/conflict and political constraints and discount the valuation of the company by this value, the estimated random coefficient suggests that investors are willing to pay, on average, about 90 cents for every dollar increase in the expected resource valuation of the company.

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To address concerns that our results are driven by managerial agency or time variant firm-level heterogeneity, we regressed stakeholder cooperation on lagged financial market valuation using the same set of specifications detailed above. In no cases did we observe a statistically significant relationship.

Discussion

Our theoretical arguments and empirical results point to the existence of a direct relationship between market valuation and stakeholder engagement. Future research and analysis should consider not only tradeoffs but also complementarity between resource allocations to enhance stakeholder cooperation and productive efficiency. This finding has important implications for the future research on corporate social responsibility and multinational strategy which we discuss in turn. We also discuss the limitations of our analysis including, in particular, questions regarding its generalizability beyond the sample of 20 publicly traded gold mining companies. This discussion reveals exciting topics for future research.

The research on corporate social responsibility has struggled to make the business case for such activity. Initially supportive empirical results were rightly attacked on the grounds of spurious or reverse causality and inappropriate metrics. More recent theoretical and empirical analysis has focused on causal mechanisms whereby managers pursuing perquisites or individual morality divert shareholder returns to stakeholder interests. Another group of theoretical arguments examine sacrifices to productive efficiency that rational managers might make to assuage suppliers of factors of production who place a high value on corporate social responsibility or appeal to analogous consumers. These latter arguments typically rely upon evidence of high consumer willingness to pay, employee morality, capital market scrutiny or activist willingness and ability to punish.

We argue, by contrast, for the existence of an omitted causal mechanism linking cooperation or conflict with external stakeholders to corporate financial performance. The intrinsic worth of certain assets can be diminished if external stakeholders directly interfere with or lobby government to interfere

with the property rights of the owner of that asset. In our case, financial models that generate a valuation for a gold mine omit the future uncertainty over government regulation, permitting and community relations or take these factors to be exogenously or environmentally determined. While it certainly simplifies financial models to make this assumption, the actions of managers in the industry and analysts who cover it to devote resources and effort to mitigate and quantify what they call "above-ground" risks suggest that they disagree with this characterization and see variation in political and social support as a source of competitive advantage or economic rents.

However, none of the mechanisms in contrast to the extant theoretical literature considering causal mechanisms whereby social responsibility can generate value seem to be operative in gold mining. Consumers are unable to identify the mine or company from which their purpose originates, miners and mining company managers are not seen as leaders in social responsibility, investors who emphasize social responsibility are seen as relatively peripheral and activists have limited power to cause direct harm to investors. Despite the absence or weakness of these established causal mechanisms, using both exploratory bivariate graphical exposition and more sophisticated random coefficient models, we demonstrate the existence of a positive relationship between stakeholder cooperation and market valuation.

We believe that these findings have important implications for the literature on corporate social responsibility as well as that on multinational strategy. First, we believe that we offer the first clear large-N empirical evidence of the mythical win-win for stakeholders and shareholders. We also believe that the methodology and dataset we use to generate this evidence can be deployed in real time by managers seeking to improve their financial performance through stakeholder engagement strategies.

While managers, scholars in stakeholder relations and some activists have long asserted the existence of a positive benefit from social responsibility, empirical evidence using corporate level data has been equivocal at best. The focus among theorists and empirical scholars has turned to special

circumstances where a link may yet exist. Our results point to a need to broaden the scope of such inquiry. Where stakeholder cooperation is necessary to transform an asset into shareholder returns, a direct link between productive efficiency and stakeholder cooperation exists. The strength of this linkage in the gold mining sector is economically and financially substantive.

We also believe that stakeholder event data is critical to better understand the boundary conditions where such a positive relationship exists and, more critically, the point at which additional resource allocation decisions by managers contribute rather that detract from market valuation. Current empirical efforts to examine (auditing) corporate-level reporting and practices are too far removed from the operational practices of greatest concern to stakeholders both external and internal to the corporation. By tracking what the actions and statements of media-relevant stakeholders, scholars and practitioners can avoid subjective biases, broaden the potential pool of covered firms and better identify which practices at which times substantively contribute to market valuation.

Such research links the literature on corporate social responsibility to that on multinational strategy for it shows that the degree of stakeholder cooperation and conflict should be conceived as endogenous to the strategies of the firm. Most of the literature within multinational strategy that has examined the importance of external stakeholders (i.e., political and social risk management) has assumed that some countries or industries are inherently more risky than others creating a risk premium that leads some countries to eschew investment or build in costly safeguards for that investment. A smaller group of scholars have called for greater analysis of political and social risk management strategies that alter these probabilities thereby reducing the risk premium or increasing the expected value of a revenue stream endogenously (Baron, 1995a, 1995b, Behrman, Boddewyn, & Kapoor, 1975, Boddewyn & Cracco, 1972, Frynas, Mellahi, & Pigman, 2006, Henisz & Zelner, 2010, Hillman & Hitt, 1999).

Despite the repeated exhortations for such a project-level and strategic perspective on political risk management (Kobrin, 1979), empirical evidence for such a shift particularly has been sparse largely

due to data limitations. With the exception of a few studies examining specific government agency rulings (de Figueiredo & Tiller, 2001, Lenway & Rehbein, 1991, Marsh, 1998, Schuler, 1996), the vast majority of empirical work in this domain has taken the form of case studies. The use of media reported stakeholder events opens a new channel for empirical inquiry on larger samples. The growing power of natural language parsing software offers the promise of expanding the scope even further (King & Lowe, 2003).

While our study focused on the firm-stakeholder dyad, the full population of stakeholder events could be used to examine the evolution of stakeholder networks and the corporate strategies that enhance cooperation within this network (Henisz, 2009, Nartey, 2010, Nebus & Rufin, 2010). Such an approach which examined the impact on the stakeholder network of firm strategy in the market and stakeholder arenas would begin to fulfill the promise of a strategic perspective which spanned the market, policy and social arenas (Baron, 1995a, Kytle & Ruggie, 2005, Porter & Kramer, 2006).

We believe that the scope of such potential inquiry is far wider than the gold mining industry. While we chose this empirical context because it allowed us to clearly identify the existence of the mechanism we posited between stakeholder cooperation and market valuation in isolation from numerous potential competing causal explanations, the contingent nature of property rights faced by owners of gold mines has widespread analogues in other industrial contexts. The argument clearly applies to other natural resources (e.g., minerals, oil or gas, agriculture and water). Industries with substantial upfront investments and long payback periods are similarly influenced by the realization of property rights over those up-front investments in property, plant and equipment, intellectual property, production processes or brand. Concerns over government and stakeholder support for the right to transform property are heightened where the good or service manufactured or the production process is politically or socially salient. Such salience is a function of perceptions of negative (e.g., environmental or social costs, disruptions of cultural tradition and heritage, and the reinforcement of preexisting inequity) or positive (e.g., categorization as high technology or desirability, creation of high value added jobs, consistency with

broader social or political objectives, or a critical and undersupplied input into a production process that itself has these characteristics) spillovers. While the absolute and relative importance of this direct link between perceptions of social responsibility and market valuation will obviously vary enormously across industries and countries, we would argue from the above set of conditions that its existence is ubiquitous.

Post, Preston and Sauter-Sachs (2002) make a similar argument for strategic corporate social responsibility arguing and providing case study evidence that "mutually beneficial stakeholder relationships enhance the wealth-creating capacity of the corporation" (p. 36). They conclude that "the corporation must earn its 'license to operate.' (p. 256). Stakeholder theory remains largely uncomfortable with such exhortations linking their normative and moral based agenda to shareholder value maximization (Walsh & North, 2005). They prefer "to develop", "to inspire" and "to create" moral leadership by appealing to individual managers. While such efforts may well influence managers and allow those with discretion to alter operational strategies, we would counter that more empirical evidence that such managerial efforts enhance shareholder value would help to build a powerful coalition of like-minded investors, community leaders, politicians, regulators and even some activists in favor of such managerial agency.

We concur with executives such as Lawrence Kurlander of Newmont Gold who claim that

Changing social and political dynamics have made companies more aware of the need to be part of the community rather than separate from it. People are becoming increasingly involved in protecting their communities from the potential downside that may result when a huge project comes to town. Through the Internet, they can instantly communicate their grievances to others and a company's reputation is always on the line. At the same time, the transformation of political institutions in many parts of the world is creating another set of challenges. "The toppling of autocratic leaders has eased repression, but the social welfare programs used by these leaders to garner support have vanished with them. Consequently, local politicians view the area's multinational companies as a source for increased tax revenues that can be used to fund the needs of their communities," said Kurlander. He does not believe the government should be relieved of its social obligations in this way. "Nonetheless, we do have a role to play, and failing to do so threatens our ability to successfully operate." (Kurlander, 2001: 1)

Our empirical analysis builds explicitly upon the experience of mining executives such as Yani Roditis and Lawrence Kurlander to augment the growing anecdotal and case study evidence for a business case

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for corporate social responsibility with econometric evidence from a clear straightforward financial valuation exercise. We believe this growing body of empirical work from a variety of industries and countries using multiple methods is increasingly making the case that the social license to operate is operationalizable, empirically testable and strategically relevant.

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Table 1: Samples of Stakeholder Event Coding

Sentence Text	Source (i.e., subject)	Verb(s)	Target(s) (i.e., object(s))	Conflict-Cooperation Category	Conflict-Cooperation Scale
ASG Chairman Stephen Everett also praised RAMSI and local police and thanked the Solomons government for its positive support	ASG Chairman Stephen Everett	Praise; Thank	Local Police; Solomons Government	[express support verbally]	3
On September 14th 2007, President Nursultan Nazarbayev of Kazakhstan ceremonially kicked off the process of extracting gold and copper ore at the Varvarinskoye deposit. He was quoted as saying that this mine is one of many enterprises in the region that will "build up the power of Kazakhstan's economy	President Nazarbayev	Ceremonially kicked off	Varvarinskoye deposit [owned by European Minerals Corporation]	[show support through action]	4
[George] Salamis [President of Rusoro, Russian firm] shied away from commenting directly on the importance of Rusoro's Russian component but instead said: "We wouldn't be anywhere in Venezuela if it weren't for the great connections we've built with the Venezuelan government at all levels.	Salamis - President of Rusoro	build connections	Venezuelan government	[build positive relations with]	3
Mr. Kabila has ordered foreign companies operating there to negotiate or see their concessions sold to rivals. The companies involved - the Toronto-based exploration company Banro Resource, a Belgian-Canadian consortium called Mindev and Barrick Gold, one of the world's largest gold companies - are in an unenviable position.	Mr. Kabila [leader of ADFL rebel group]	ordered… to negotiate or see their concessions sold	Foreign companies Banro, Mindev & Barrick	[Threaten]	-4
Kabila's government is fighting for its survival as rebels backed by neighboring Rwanda and Uganda have pushed their way westward toward the capital city of Kinshasa. Zimbabwe and Angola are supporting Kabila with arms and troops.	Kabila's government	fight for survival	rebels	[opposed in active military conflict]	-10
Kabila's government is fighting for its survival as rebels backed by neighboring Rwanda and Uganda have pushed their way westward toward the capital city of Kinshasa. Zimbabwe and Angola are supporting Kabila with arms and troops.	Rwanda government; Uganda government	back	Rebels	[support in active military conflict]	10
Kabila's government is fighting for its survival as rebels backed by neighboring Rwanda and Uganda have pushed their way westward toward the capital city of Kinshasa. Zimbabwe and Angola are supporting Kabila with arms and troops.	Zimbabwe government; Angola government	Support with arms	Kabila	[support in active military conflict]	10

Table 2: Summary Data on Mines in our Estimating Sample

FIRM NAME	MINE NAME	COUNTRY	# Articles	# Stakeholder Eve	# stakeholders	# unique ties	Min year	Max year
Alhambra Resources	Uzboy	Kazakhstan	499	362	51	29	2001	2008
Australian Solomons	Gold Ridge	Solomon Islands	300	896	100	54	2004	2008
AXMIN Inc.	Passendro Gold Proje	Central African Rep	400	277	20	13	2003	2008
Banro Corporation	Twangiza	Democratic republ	2744	4255	1007	435	1995	2008
Centamin Egypt Limit	Sukari	Egypt	1400	508	25	20	1997	2008
Dundee Precious Met	Chelopech	Bulgaria	936	3342	338	166	2003	2008
Dundee Precious Met	Krumovgrad	Bulgaria	587	2630	230	129	2003	2008
European Goldfields	Certej	Romania	700	413	62	45	2000	2004
European Goldfields	Olympias	Greece	700	6633	232	123	2003	2008
European Goldfields	Skouries	Greece	650	6394	178	102	2003	2008
European Minerals Co	Varvarinskoye	Kazakhstan	523	527	57	40	1996	2008
Gabriel Resources Ltd	Rosia Montana	Romania	1593	not yet complete	not yet complete	not yet complete	1997	2008
Gold Reserve Inc.	Brisas	Venezuela	1525	6650	457	205	1993	2008
Infinito Gold Ltd./Var	Crucitas	Costa Rica	480	616	90	47	2001	2008
Infinito Gold Ltd./Var	Las Cristinas	Venezuela	653	7620	756	285	1995	2005
Luna Gold Corporatio	Aurizona/Piaba	Brazil	569	197	19	13	2006	2008
Minefinders Corporat	Dolores	Mexico	1125	164	61	48	1996	2008
Mundoro Capital Inc./	Maoling	China	629	342	69	54	2004	2008
Nevsun Resources Ltd	Bisha	Eritrea	1131	2387	177	94	2003	2008
OceanaGold Corporat	Didipio	Philippines	534	1783	120	72	2006	2008
OceanaGold Corporat	Macraeas	New Zealand	554	97	46	36	2004	2008
OceanaGold Corporat	Reefton	New Zealand	457	153	36	31	2004	2008
Olympus Pacific Mine	Bong Mieu	Vietnam	476	111	74	46	1997	2008
Olympus Pacific Mine	Phuoc Son	Vietnam	763	132	48	33	1997	2008
Orezone Resources Ir	Essakane	Burkina Faso	583	230	34	31	2004	2008
Orvana Minerals Corp	Don Marino	Bolivia	1718	492	82	61	1994	2008
19	**26**	**20**	**20511**	**46719**	**4287**	**2151**		

Table 3. Summary statistics and Correlation Matrix

Variable	Observations	Mean	Std. Dev.	Min	Max
Market Value	176	304.227	355.215	3.930	2279.556
Resource Valuation	147	594.553	522.003	83.819	2294.293
Valuation * Conflict/Cooperation	112	221.013	166.453	0.000	799.493
Valuation * ((Conflict/Cooperation + Political Constraints)/2)	73	125.524	79.642	9.790	339.052
Conflict/Cooperation	115	0.507	0.218	0.000	1.000
Political Constraints	176	0.158	0.198	0.000	0.670

	Market Value	Resource Valuation	Valuation* Conflict/Coop	Valuation * (Conflict/Coop + Political Constraints)/2	Conflict/Coop	Political Constraints
Market Value						
Resource Valuation	0.110					
Valuation * Conflict/Coop	0.121	0.911				
Valuation * (Conflict/Coop + Political Constraints)/2	0.206	0.913	0.905			
Conflict/Cooperation	0.082	-0.116	0.260	0.092		
Political Constraints	0.155	-0.085	-0.241	0.152	-0.203	

Table 4. Cross-section time-series estimates

	Fixed Effects			Fixed Effects, AR(1)		
	(1)	(2)	(3)	(4)	(5)	(6)
Valuation	0.202*** (0.0442)			0.199*** (0.0572)		
Valuation * Conflict/Cooperation		0.317*** (0.0834)			0.170* (0.0856)	
Valuation * (Conflict/Cooperation + Political Constraints)/2			0.752*** (0.182)			0.160 (0.232)
Constant	196.7*** (30.56)	180.5*** (20.86)	133.4*** (31.12)	260.5*** (10.74)	220.8*** (7.958)	279.4*** (14.47)
Observations	147	112	73	138	103	65

	Random Effects			Random Effects, AR(1)		
	(7)	(8)	(9)	(10)	(11)	(12)
Valuation (company total)	0.204*** (0.0437)			0.228*** (0.0533)		
Valuation * C/C		0.319*** (0.0825)			0.206* (0.0876)	
Valuation * ((CC + Political Constraints)/2)			0.759*** (0.178)			0.445* (0.202)
Constant	207.7 (126.1)	209.5* (96.09)	162.7 (92.48)	212.8 (122.0)	222.3** (71.13)	206.8** (75.73)
Observations	147	112	73	147	112	73

Standard errors in parentheses, $^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 5. Random-coefficient estimates

	(1)	(2)	(3)
Valuation	0.276		
	(0.152)		
Valuation * Conflict/Cooperation		0.504[*]	
		(0.240)	
Valuation * ((Conflict/Cooperation + Political Constraints)/2)			0.908[*]
			(0.462)
Constant	151.6[***]	161.0[***]	139.4[***]
	(29.30)	(32.95)	(33.77)
SD(Valuation)	0.414[***]		
	(0.114)		
SD(Valuation * Conflict/Cooperation)		0.658[***]	
		(0.193)	
SD(Valuation * (Conflict/Cooperation + Political Constraints) / 2)			1.14[***]
			(0.365)
SD(Constant)	41.391[*]	78.83[**]	59.519[*]
	(26.66)	(31.007)	(36.28)
Corr (Random Coefficient, Constant)	0.999[***]	0.999[***]	-0.183
	(0.000)	(0.000)	(0.692)
Observations	147	112	73

Standard errors in parentheses
[*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$

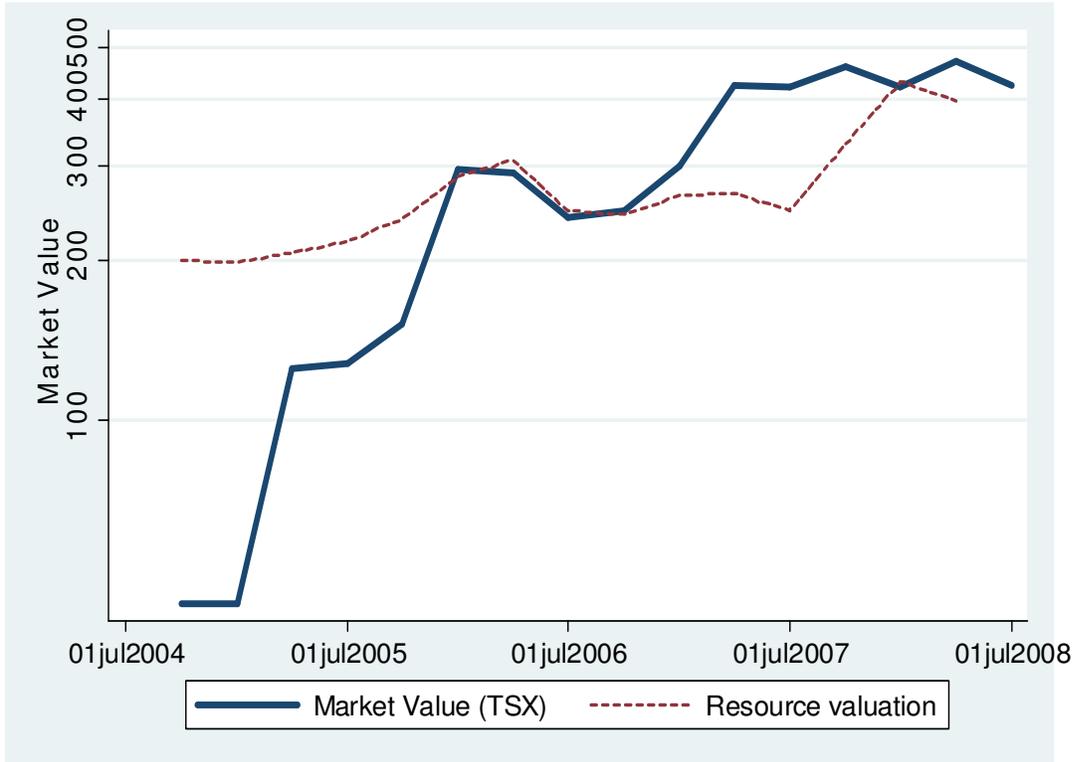**Figure 1** CENTAMIN: SUKARI
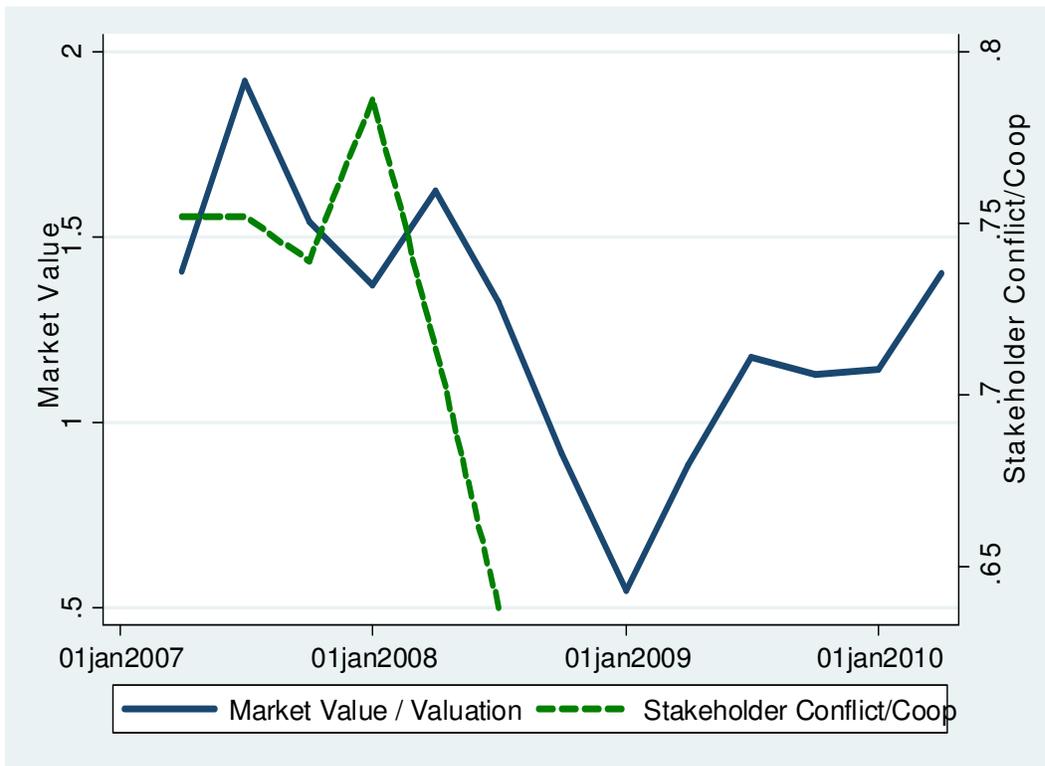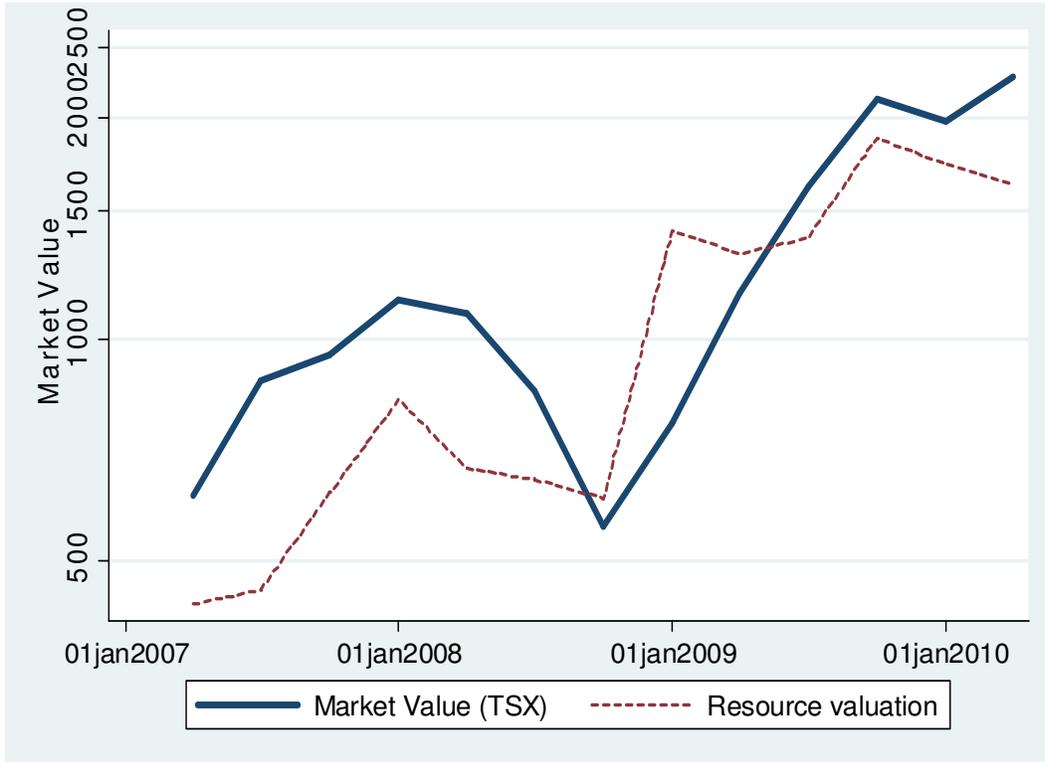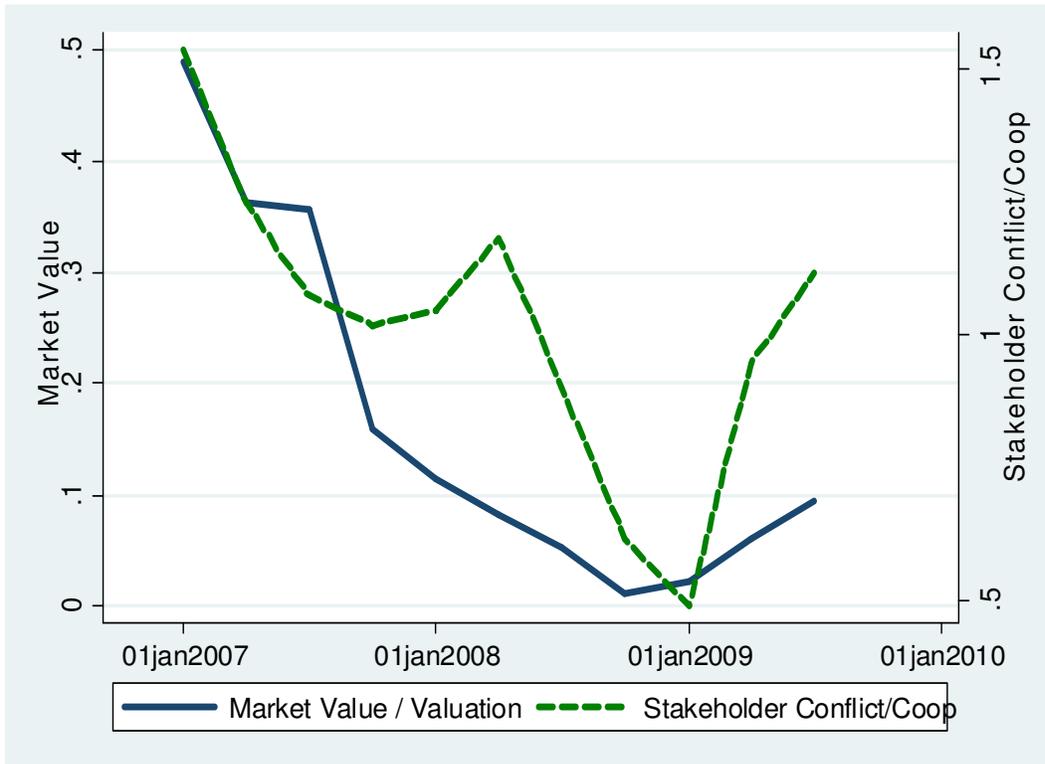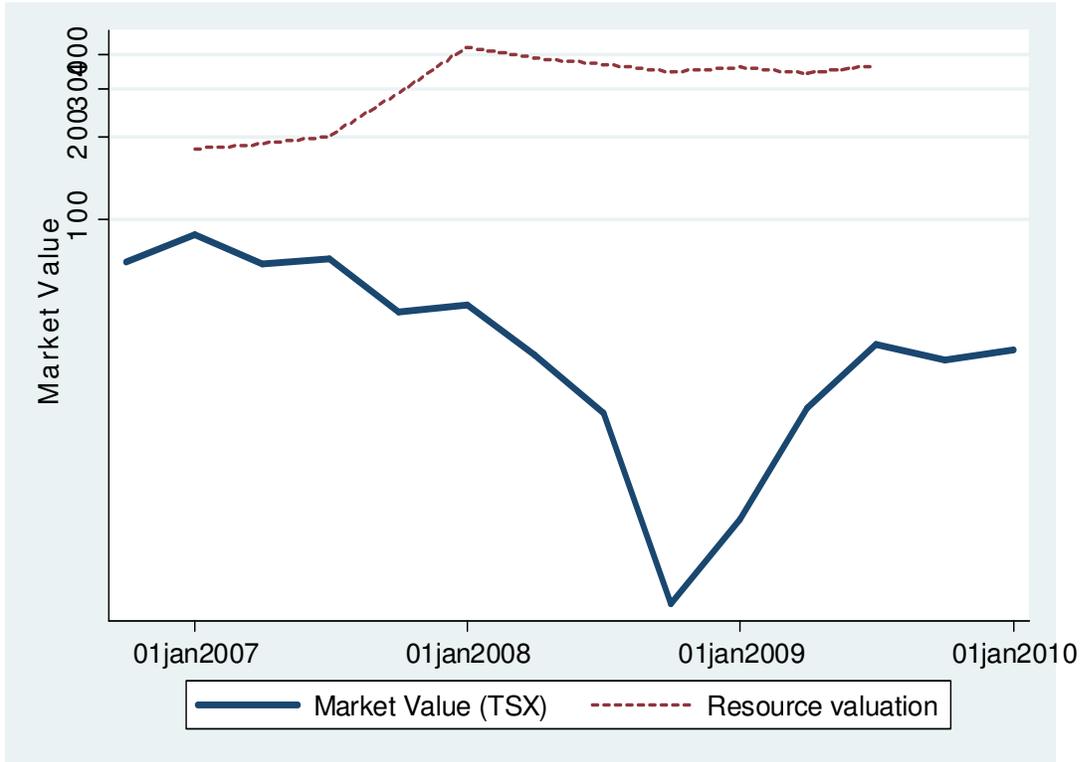
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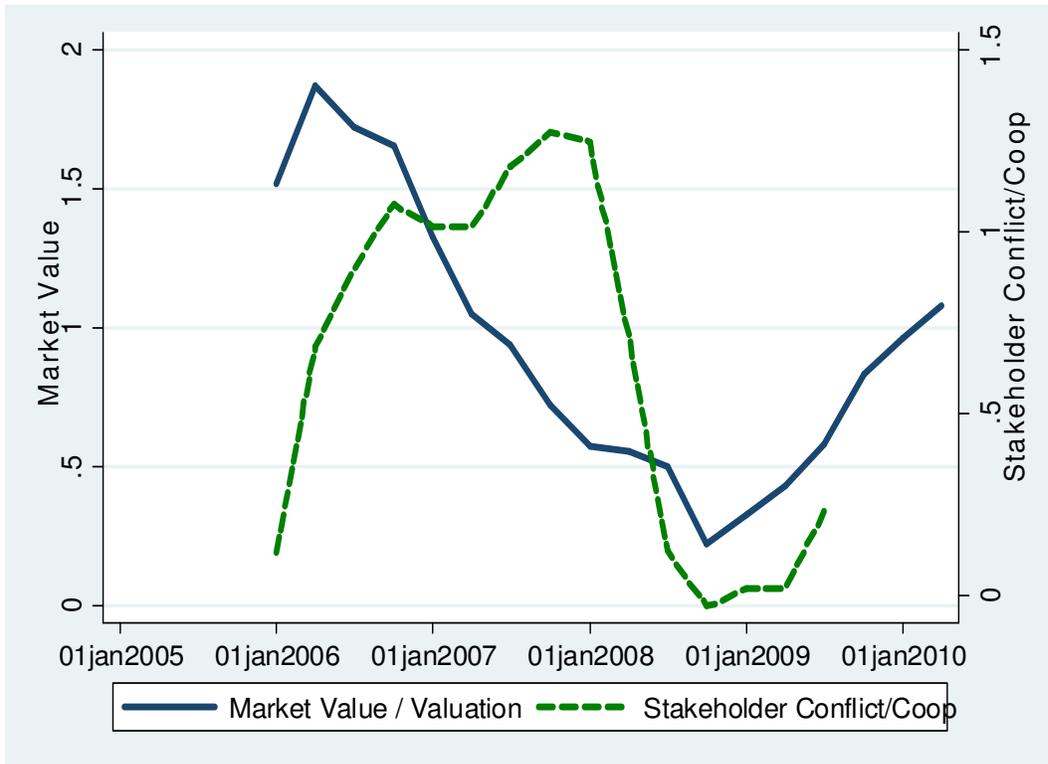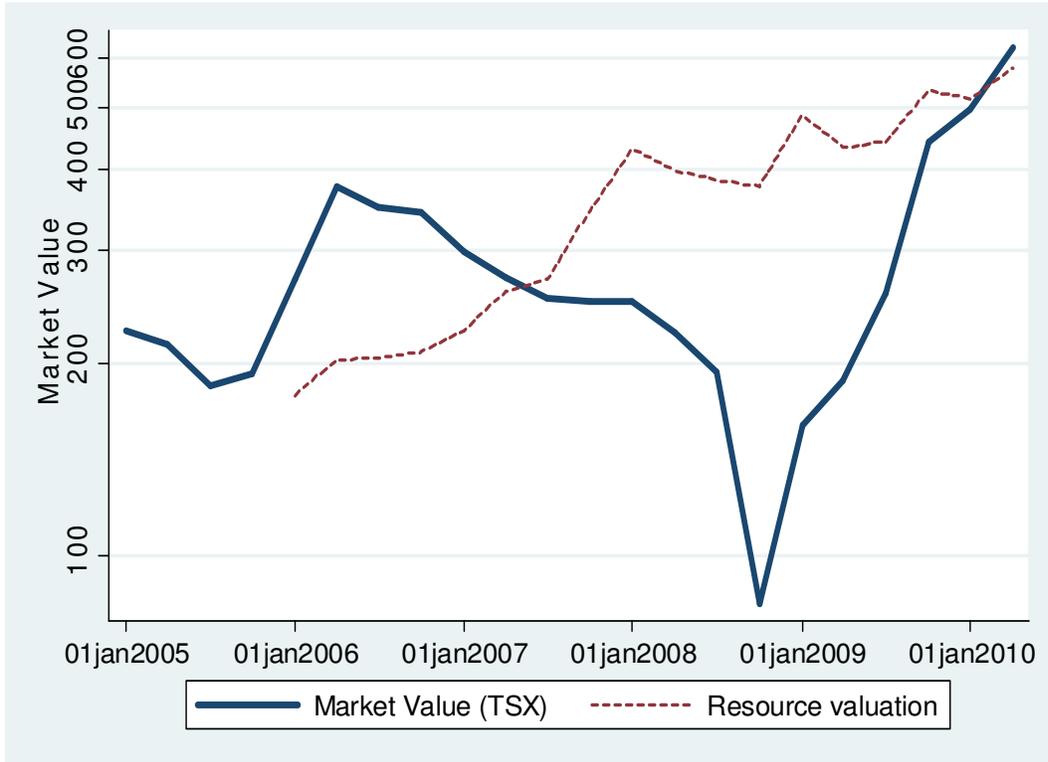
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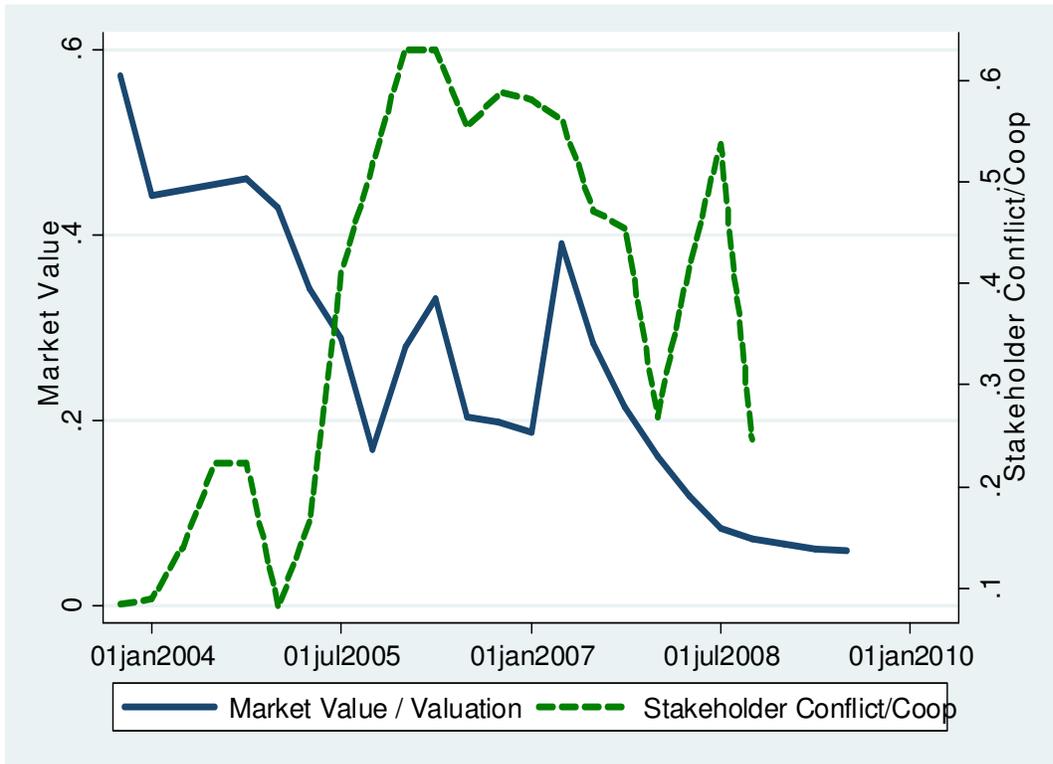MUNDORO: MAOLING

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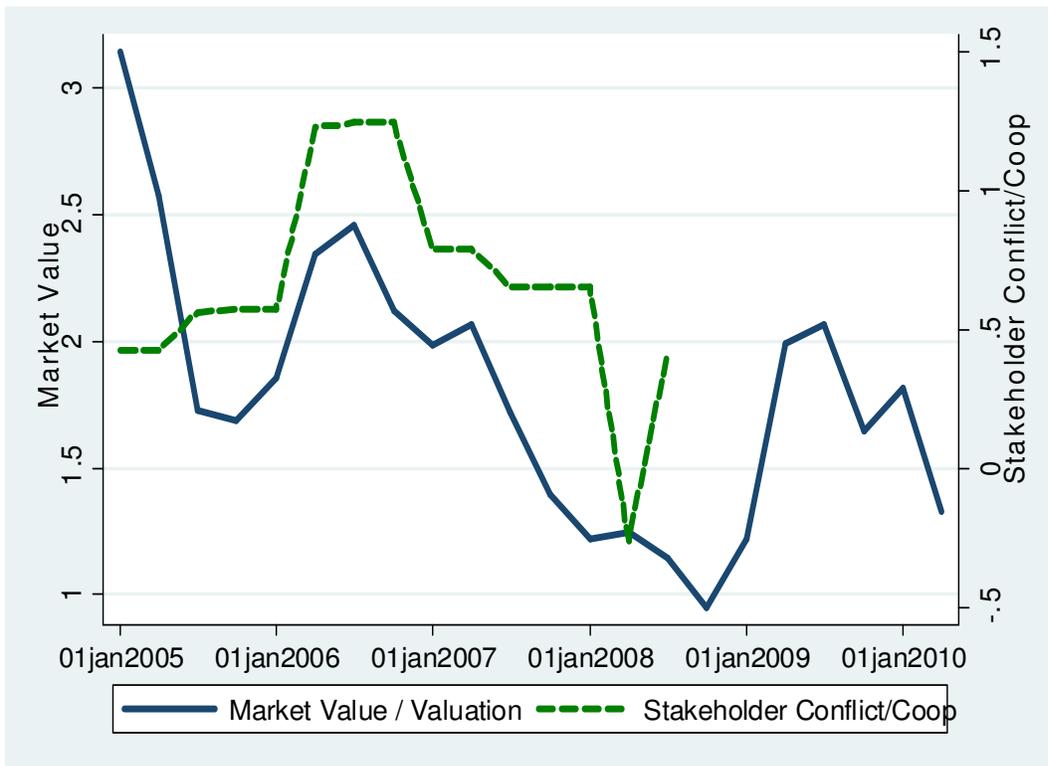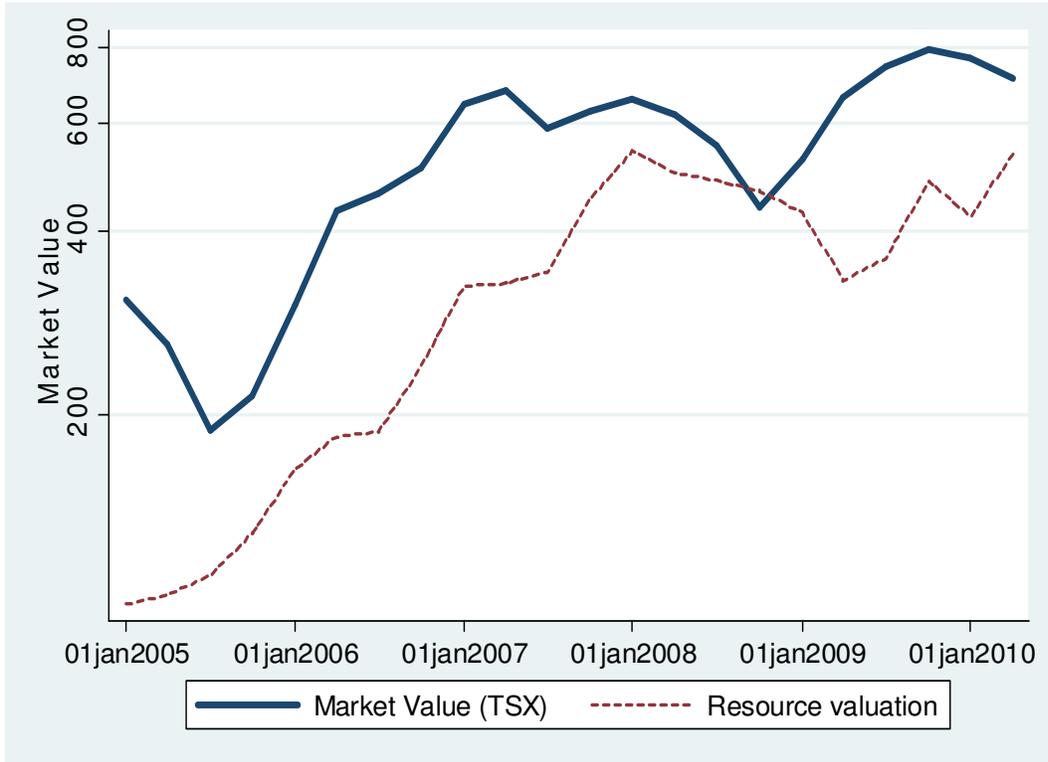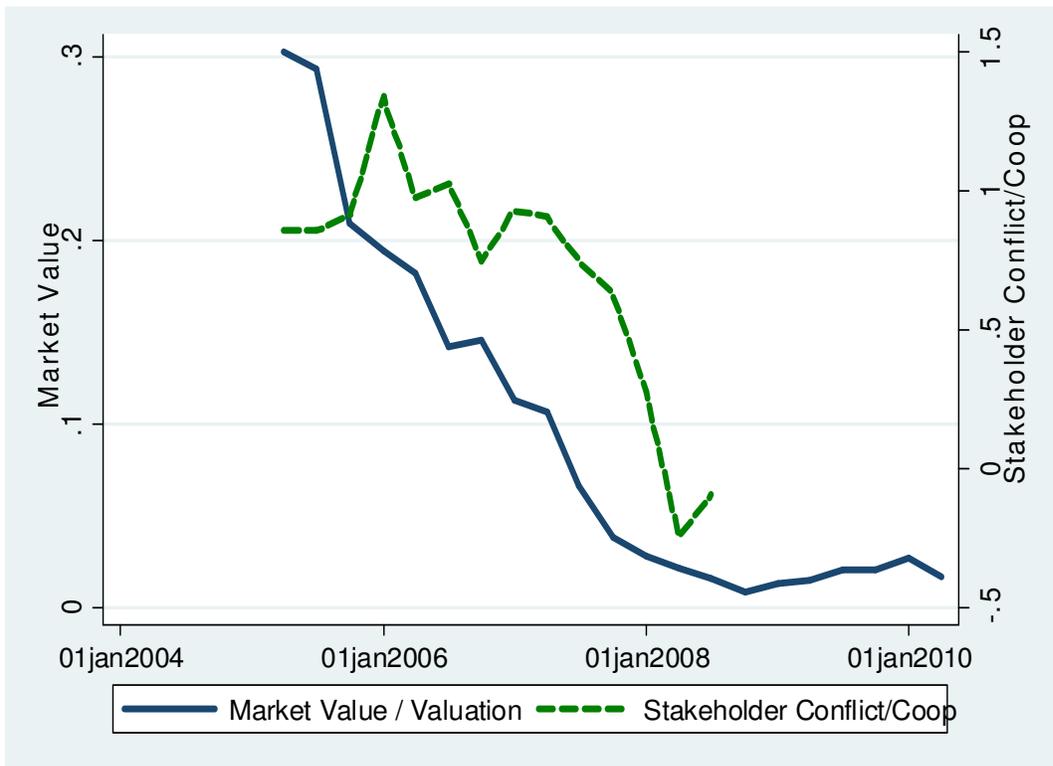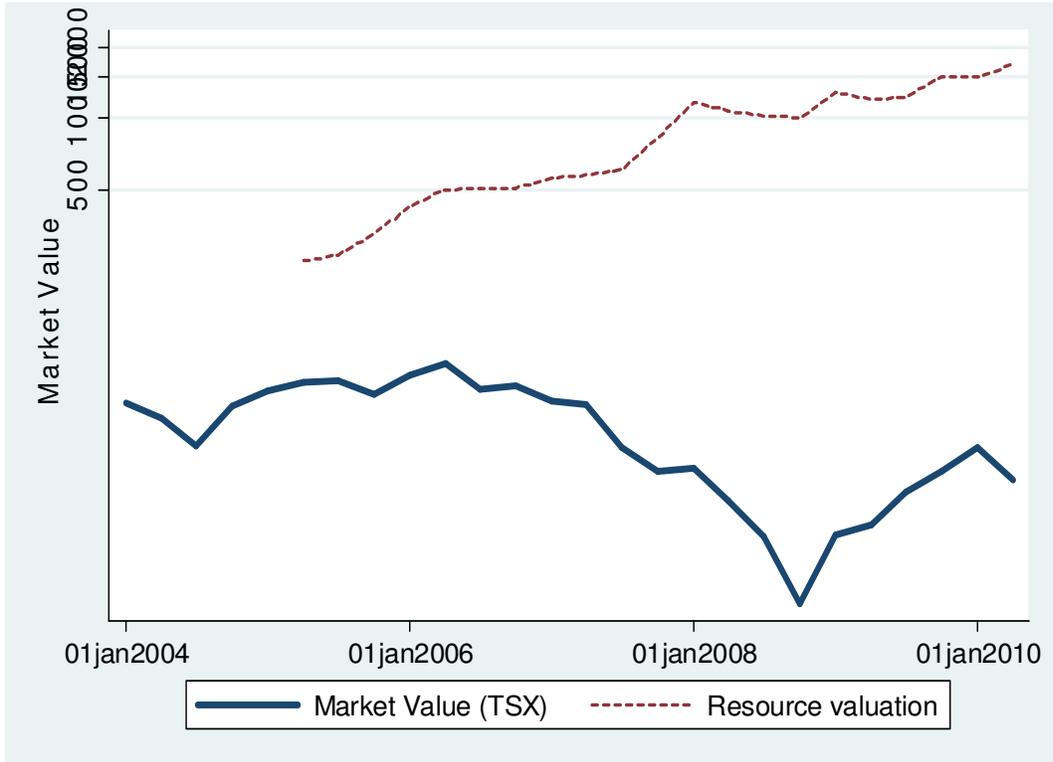
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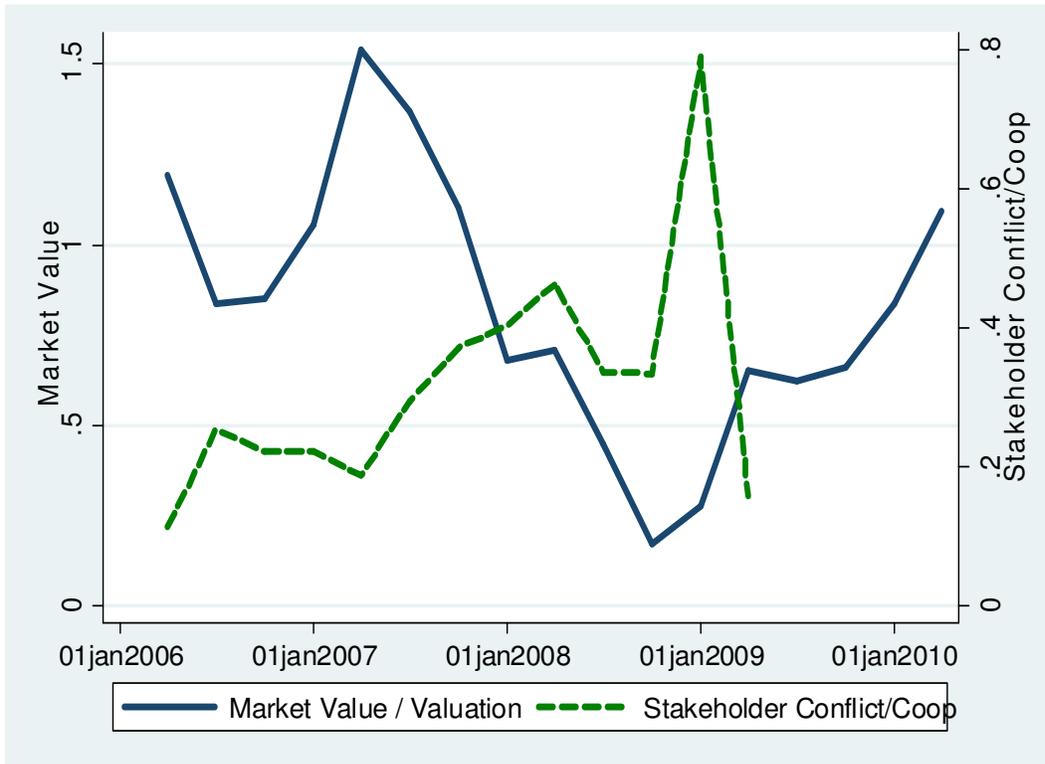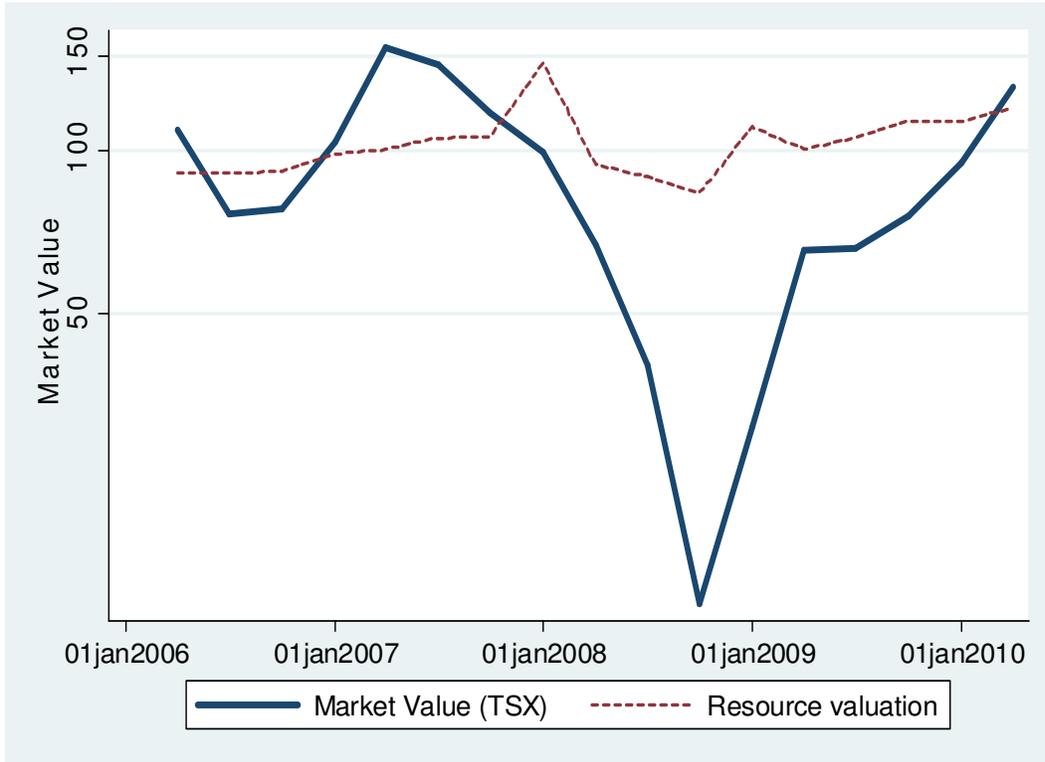
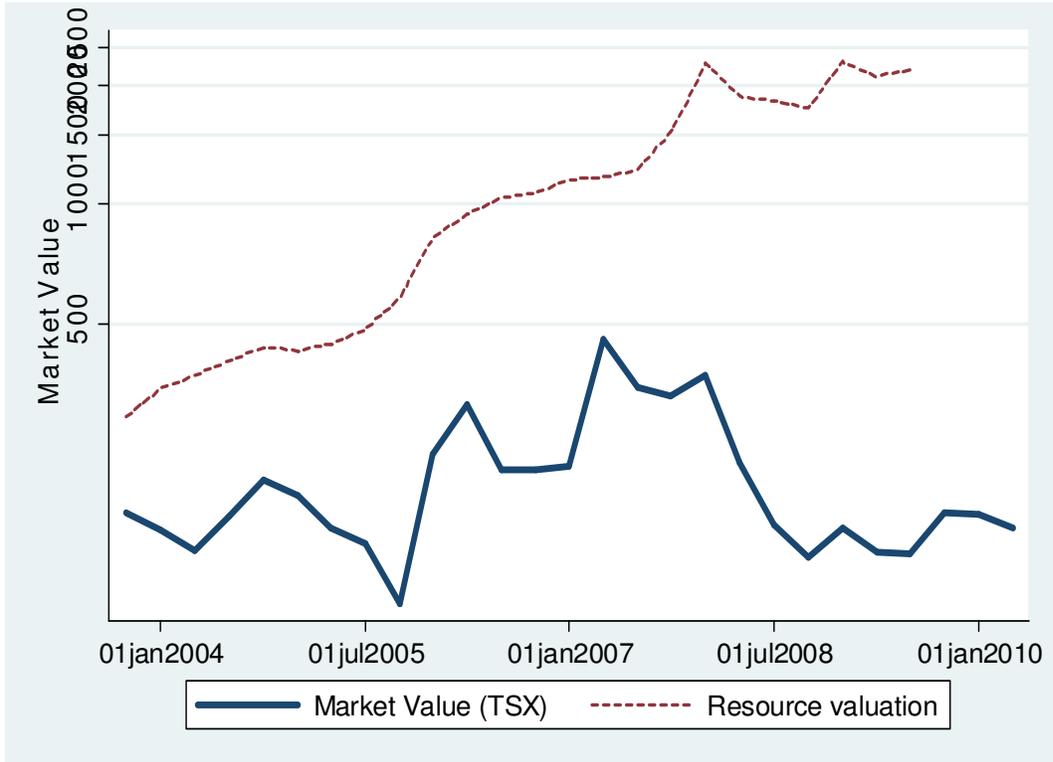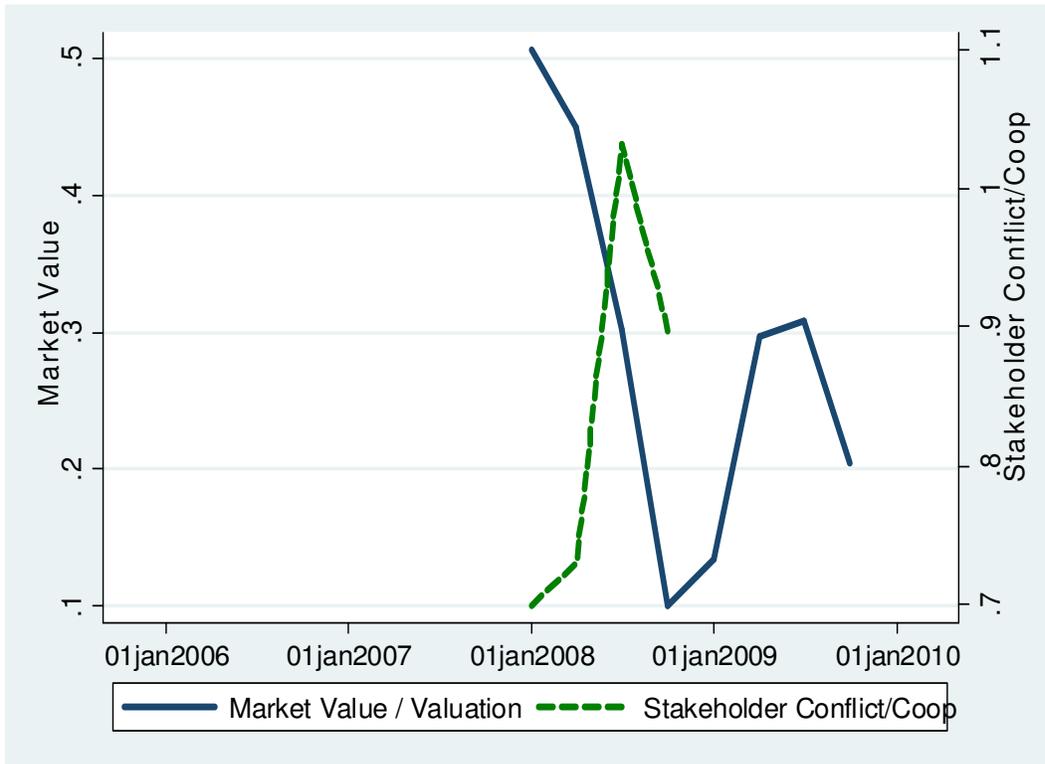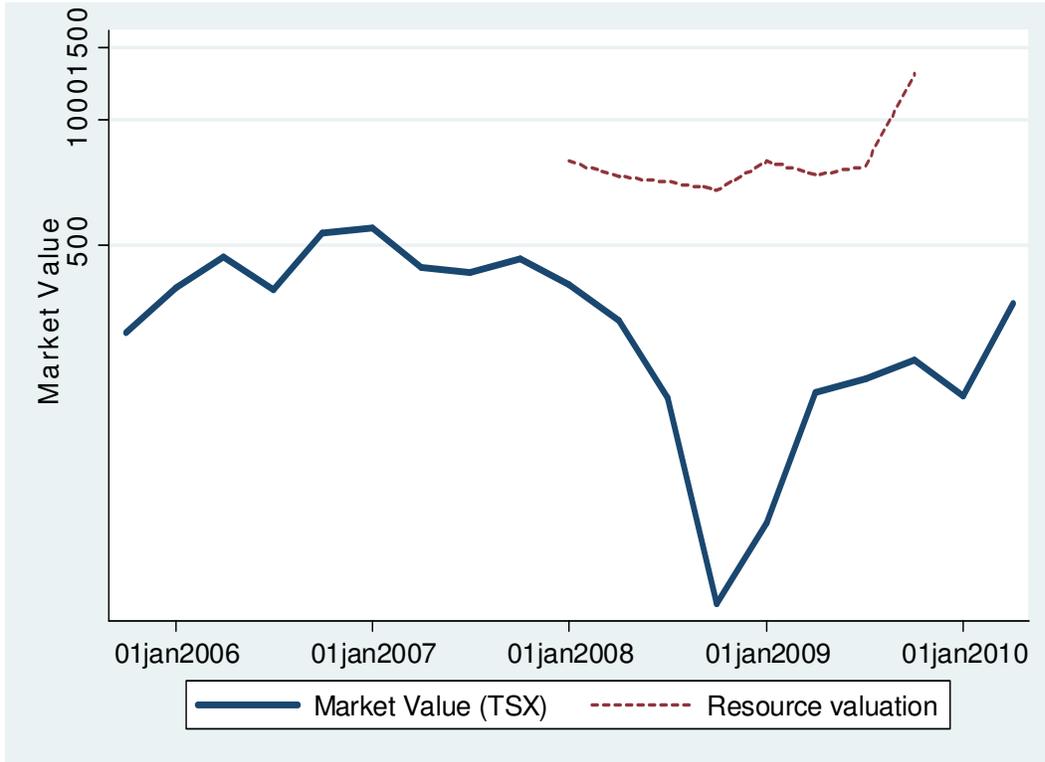EUROPEAN MINERALS: VARVARINSKOYE
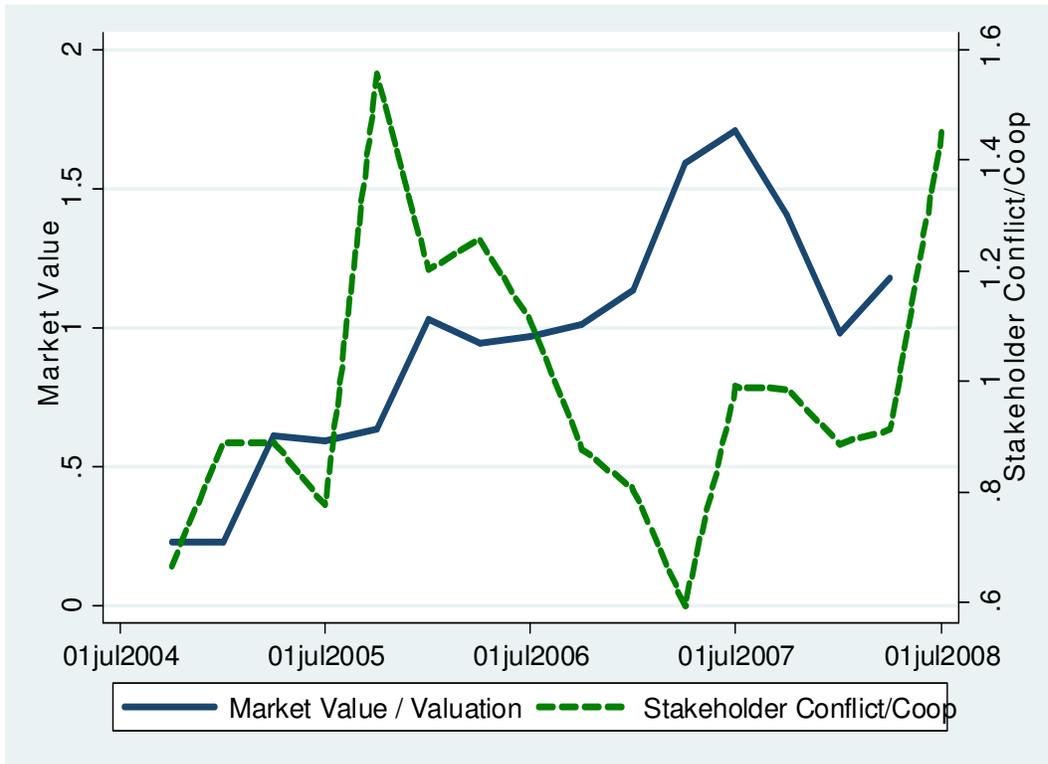
AUSTRALIAN SOLOMONS GOLD LIMITED: GOLD RIDGE

GOLD RESERVES: BRISAS

BANRO: TWANGIZA

Appendix 1: Conflict-Cooperation Scale Summary

Scale	Category Details
-10	Violent attack w/ actual or potential/intended deaths or serious injury
-9	Threaten to violently attack w/ actual or potential/intended deaths or serious injury
-8	Restrain, imprison, hold against will, blockade, arrest, expel, capture, sequester
-7	Financially undermine deploy financial resources against (including sale of financial position at or below market price)
-6	Threaten to financially undermine threaten/offer financial resources against(including sale of financial position at or below market price)
-5	Oppose, veto, impose, force, break, halt, reject, flee, default on obligation, rally in opposition, overturn, lose, national political decision in opposition
-4	Investigate, demand, alert, restrict, repeal of administrative, local or regional supportive policy
-3	Deny, complain, criticize, denounce, negative comment, reject, accuse
-2	Call for action, request assistance against
-1	Delay, request clarification, request information on
0	Neutral statement of fact
1	Yield, comply, solicit, request assistance with, vote for, am encouraged by
2	Mediate, agree, travel to meet, engage, offer, positive comment
3	Host, praise, empathize, apologize, forgive, assure, thanked
4	Agreement or receipt/provision of information
5	Rally in support, ratify, win election, policy decision in support
6	Offer financial support/defense/protection (including acquisition of a financial stake at market price or above)
7	Provide financial support/defense/protection (including acquisition of a financial stake at market price or above)
8	Relax/ease major financial or security penalty/sanction/constraint
9	Offer armed support/defense/protection
10	Provide armed support/defense/protection