

Spinning Gold: The Financial Returns to External Stakeholder Engagement

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ABSTRACT

We provide direct empirical evidence in support of instrumental stakeholder theory's argument that increasing cooperation and reducing conflict with stakeholders enhances the financial valuation of a firm holding constant the objective valuation of the physical assets under its control. We undertake this analysis using panel data on 26 gold mines owned by 19 publicly traded firms 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. By incorporating this index in a market capitalization analysis, we reduce the discount placed by financial markets on the net present value of the gold controlled by these firms from 72 to 9 percent.

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. The empirical literature examining the returns to such investments is, however, highly equivocal and provides limited evidence of at best a marginal and contingent positive relationship between these efforts and financial performance. Theoretical explanations for the imbalance between rhetoric in support of such activities and their limited financial impact focus on either managers' incentives to extract rents from the economic value chain or shareholders or the particular set of circumstances required for redistribution of existing rents among members of the economic value chain to enhance financial performance. We highlight another theoretical argument consistent with the original tenets of instrumental stakeholder theory (Clarkson, 1995, Donaldson & Preston, 1995, Jones, 1995). We argue that efforts to win the cooperation of and reduce the conflict with external stakeholders, rather than merely altering the distribution of rents among direct factors of production, can be conceived of as investments in political and social capital. Such investments reduce opportunistic hold-up by a broad range of political and social actors thereby enhancing the probability that a business plan can proceed on schedule and on budget and, ultimately, generate sustainable shareholder value.

Our empirical analysis is set in the gold mining sector where strong stakeholder conflict resulting from the social and environmental consequences of mining and its association with corruption and private rent seeking has led to costly delays and disruptions in project development and execution. The resulting cost overruns or revenue shortfalls have triggered substantial corrective investment in stakeholder engagement strategies by many mining companies. Ironically, the very companies that were once pilloried for their lack of concern for anything but the short-term financial bottom line are now global leaders in the implementation of stakeholder engagement. Their growing preference for operating mines under conditions of political and social support are also affecting small mining companies, who, motivated by their desire to eventually sell their operations to the majors, are increasingly acknowledging

the need to obtain a “social license” for their mining projects around the world. 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, and 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 manually code over 50,000 stakeholder events from the population of media reports covering these mines. Our sentence-level coding protocol identifies the population of media relevant stakeholders initiating an action or expressing a sentiment as well as the target of that action or statement. It codes the action or expression according to a well-developed scale in the conflict studies literature that quantifies the degree of cooperation or conflict among political and social actors. We explore various means to aggregate this time varying network of stakeholder cooperation and conflict into a single time varying metric of political and social support for the mine. We demonstrate that these metrics are 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. Specifically, by incorporating this metric in a market capitalization analysis that also includes macro-political level constraints on policy change, we reduce the discount placed by financial markets on the net present value of the gold controlled by these firms from 72 to 9 percent.

We first summarize the theoretical literature highlighting the various causal mechanisms that authors have argued influence the relationship between stakeholder conflict and cooperation and financial market valuation. We highlight the lack of direct empirical evidence for the core argument of one

mechanism in instrumental stakeholder theory: a positive relationship between cooperation or conflict with a broad set of stakeholders beyond the direct economic value chain and corporate financial performance contingent upon objective asset valuation. Next we describe the empirical context in which we find empirical support 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 instrumental stakeholder theory, corporate social responsibility as well as multinational strategy. We also argue for the generalizability of the analysis beyond gold mining and natural resource extraction more broadly to a wide array of multinational activity. We highlight, in particular, the myriad benefits offered by deploying project-level event data as reported in the media in this context and in many other elements of management research. This discussion reveals next steps in a broader research agenda designed to enhance the theoretical and empirical support for the implementation of stakeholder engagement.

An Extended Formulation of Instrumental Stakeholder Theory

Theoretical models exploring the mechanisms by which managerial efforts to enhance cooperation and reduce conflict with stakeholders impact financial performance have expanded in scope faster than the empirical literature that seeks to test these mechanisms. The emphasis in the early theoretical literature was on the determination of the sign of the relationship (i.e., do efforts at enhancing political and social support enhance or destroy shareholder value and under what conditions). In order to enhance analytic tractability, these early theoretical models sought to simplify the production process to include a tightly bounded set of direct factors of production and identified mechanisms whereby managers might seek to engage with stakeholders to the detriment or benefit of shareholders. More recently, these models have been extended to allow for the presence of activists who are willing to deploy their resources to impose costs on the focal firm. These activists may be motivated by economic or political interests to disrupt or delay the production process. Recent extensions to these models allow for managerial efforts to

address the costs that these activists face or the beliefs that they hold to reduce the intensity of these conflictual relationships or even convert them into cooperative ones whereby the activists contribute positively to the efficacy of the production process.

One set of models highlight that given imperfect corporate governance, managers may seek to enhance cooperation and reduce conflict with stakeholders in order to improve their quality of life, their reputation or their status even if it is not profitable for shareholders. They predict a negative relationship between efforts at enhancing stakeholder cooperation and reducing conflict and financial performance. A second group of models identify a set of market conditions and contingencies whereby managerial decisions to alter the nature of the production process or product increase consumers' willingness to pay and/or reduce suppliers' reservation price. Together these models suggest a distribution of potential relationships and contingencies with a growing body of empirical literature corroborating this prediction. A final group of models incorporate strategic activists. These models are as of yet largely indeterminate in their predictions regarding the sign of the relationship and its magnitude, with variance explained by characteristics of the activists and the strategic response of firms. The attention and commitment to stakeholder engagement by senior managers suggest that these theoretical extensions to incorporate a broader set of stakeholders in the basic model focusing on the economic value chain are warranted. However, we lack both clear empirical evidence regarding the magnitude of the potential returns available through such efforts and data to test the contingencies that are beginning to emerge from this theory. We seek to provide both.

Rent Distribution

Scholars skeptical of efforts to engage stakeholders or seeking to explain negative empirical associations between such efforts and shareholder value have argued that managers use relationships with external stakeholders to pursue self-interest seeking perquisites, career enhancement or moral peace of mind. 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 (see Sundaram and Inkpen, (2004) for a literature review of the shareholder value debate). Jensen (2002) models shareholder principals' loss of control over managerial agents who may seek to pursue personal social interests (Hemingway & Maclagan, 2004) by 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 managerial conformity that can arise from regulation, peer behavior and civil society independent of the efficiency of adoption (Campbell, 2007, Jennings & Zandbergen, 1995, Margolis & Walsh, 2003, Marquis, Glynn, & Davis, 2007).

Empirical research supporting these mechanisms include studies showing that financial slack is a determinant of corporate social performance (McGuire, Alison, & Schneeweis, 1988, Waddock & Graves, 1997); headquarter policies rather than local conditions drive social responsibility programs in foreign subsidiaries (Husted & Allen, 2006); shareholder activism reallocates discretionary resources away from corporate social performance (David, Bloom, & Hillman, 2007); 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). Baron, Harjoto & Jo (2009) find that social pressure diverts resources away from corporate financial performance towards corporate social performance, social performance has no net effect on financial performance (though further analysis shows that the result is positive in consumer goods and negative in industrial industries) and that social pressure is directed at soft targets.

Rent Creation via Defined Relations with Stakeholders in Value Chains (& Activists)

Scholars supportive of efforts to engage stakeholders or seeking to explain a positive empirical relationship between such efforts and shareholder value shift the focus of the theoretical argument from the costs of *ex post* managerial discretion to external stakeholders' influence over *ex ante* managerial strategy with respect to members of the value chain (see Laplume Sonpar and Litz, (2008) or Kitzmueller & Shimshack (2011) for a literature review). This literature seeks to formalize elements of Freeman's (2010, 1984) stakeholder approach to strategic management which emphasizes how the preferences and objectives of the myriad actors with a political, economic or social stake in the operations should be incorporated within strategy-making. Hill & Jones (1992) emphasize the potential for stakeholder engagement to reduce the transaction costs of exchange and monitoring between interdependent counterparties. Freeman & Evan (1993, 1990) and Phillips (1997) claim that "fairness" in stakeholder relations in a Rawlsian sense minimizes these transaction costs thereby maximizing shareholder value. Logsdon & Wood (2002, 2002, 2001), Matten & Crane (2005) and Gardberg & Fombrun (2006), by contrast, emphasize the obligations and responsibilities of citizenship that stakeholders implicitly impose on corporations as a means of determining appropriate activities. Mackey, Mackey & Barney (2007) incorporate the supply and demand for corporate social responsibility activities into a contemporaneous model of corporate valuation. Several formal accounts of this logic analyze the competition for charitable contributions from stakeholders between publicly traded companies and not-for-profit entities and consider the implications for consumer welfare, the level of public regulation and the relationship between corporate social performance and financial performance (Besley & Ghatak, 2007, Kotchen, 2006, Navarro, 1988, Zivin & Small, 2005). If combined with differentiated marketing or regulations that place followers at a disadvantage, such activity could itself generate economic rents. The financial benefits to such activities need not accrue contemporaneously. One line of theoretical (Godfrey, 2005) and empirical (Godfrey, Merrill, & Hansen, 2009) work posits and demonstrates that corporate social responsibility can contribute to moral or reputational capital that insulates the firm from negative consequences in the event of future adverse shocks.

While extremely useful in leading to a broadening of the scope of inquiry beyond *ex post* rent distribution, stakeholder theory has struggled with the development of direct empirical tests of these mechanisms. Recent work strives, instead, to create better typologies for the identification and prioritization of stakeholders (Barnett, 2007, Bourne & Walker, 2005, Mitchell, Agle, & Wood, 1997), their psychological and social motivations (Aguilera, Rupp, Williams, & Ganapathi, 2007, Rupp, Williams, & Aguilera, 2011), their influence tactics (de Bakker & den Hond, 2008a, 2008b, Den Hond & De Bakker, 2007, den Hond, de Bakker, & de Haan, 2010, Frooman, 1999), the resulting optimal form of engagement for multinational corporations with those stakeholders (Greenwood, 2007, van Huijstee & Glasbergen, 2008) and the cross-national differences therein (Matten & Moon, 2008, Williams & Aguilera, 2008). Nevertheless, the link between identification, engagement and, especially, asset valuation or corporate performance remains elusive. One exception is in the area of environmental compliance where scholars find positive financial returns to investments in pollution reduction (Dowell, Hart, & Yeung, 2000, King & Lenox, 2001) and highlight the financial impact of environmental pressure groups (Binder & Neumayer, 2005, Epstein & Schnietz, 2002, Maxwell, Lyon, & Hackett, 2000).

By contrast, a growing body of literature in organizational economics highlights the impact of (stakeholder perceptions of) corporate social responsibility on the supply or price of factors of production (McWilliams & Siegel, 2001) and the extent of shared value creation (Porter & Kramer, 2011). Moral motivations may alter the behavior of numerous stakeholders (Brekke, Kverndokk, & Nyborg, 2003), including consumers who may be willing to pay more for a product or service perceived as socially responsible (Arora & Gangopadhyay, 1995, Casadesus Masanell, Crooke, Reinhardt, & Vasishth, 2009, Elfenbein, Fisman, & McManus, 2009, Elfenbein & McManus, 2010, Hiscox & Smyth, 2011). As a result, where signaling of producer type is more important or effective (McWilliams & Siegel, 2001) or where 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, demand lower wages or benefits or exert greater effort (Besley & Ghatak, 2005, Bhattacharya, Sen, & Korschun, 2008, Brekke & Nyborg, 2008, Collier & Esteban, 2007, Greening & Turban, 2000, Kim, Lee, Lee, & Kim, 2010, Preston, 1989, Turban & Greening, 1997). 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, 2006a, 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 corporate governance is strong (Shahzad, David, & Sharfman, 2011), 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) allows first movers to monetize their advantage. The choice as to whether to engage or confront stakeholders is itself a complex function of competitor strategies and stakeholders' choices between engagement and confrontation (Baron, 2011; Diermeier, Abito & Besanko, 2011).

While these extensions of agency models of managerial discretion highlight circumstances under which the returns to stakeholder engagement may be positive, it must be noted that the circumstances are relatively specific. One interpretation of the equivocal empirical findings regarding the sign and magnitude of the relationship lies in these contingencies. Such findings highlight that while stakeholder engagement may pay for shareholders of a subset of firms, it is costly for others, and seem to suggest that on balance, the rhetoric surrounding stakeholder engagement is oversold. We disagree.

Broadening the Scope of Stakeholders and Impacts

The emphasis within these formal models and the supporting empirical analysis on stakeholders who form a part of the economic value chain as defined by the producer runs counter to the broader precepts of a stakeholder approach. The addition of homogenous activists is a welcome extension, but we argue for an even broader conceptualization of relevant stakeholders and offer an alternative empirical approach to demonstrating the financial impact of broad stakeholder engagement.

For many production processes, an implicit or explicit social license to operate is a necessary if difficult to specify 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 not only members of the economic value chain but also government officials, regulators, community leaders 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 able to either extract rents for their preferred causes from the efficient operation of the mine or 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 in order 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 (Aden, Kyu-Hong, & Rock, 1999, Dasgupta, Laplante, & Mamingi, 2001, Liu, 2009). In this formulation, activities perceived by stakeholders as socially responsible build up political and social capital that enhances stakeholder cooperation and reduces stakeholder conflict. As a result, the probability that a business plan can proceed on schedule and on budget is enhanced and the financial market discount applied to the objective (i.e., free of stakeholder influence) valuation of the tangible assets is reduced. The resulting empirical

prediction is that we should observe that stakeholder cooperation positively and stakeholder conflict negatively impact the market valuation of a firm, *holding constant the objective value of firm assets*.

Empirical Analysis

Throughout the nearly four-decade long history of empirical literature on the link between stakeholder relations and corporate financial performance (see Margolis, Elfenbein and Walsh (2007) and Orlitzky, Schmidt & Rynes (2003)), measurement of the former construct has proven a daunting challenge. Early studies relied on small sample comparisons of subjectively rated “better” vs. “worse” 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 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 remained the corporation. While scholars thus explored the link between corporate-level disclosures, audits and policies 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 for stakeholder relations 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.

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, & Vondryk, 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 a 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 international conflict or cooperation.

The closest analogue to this type of data in the management realm lies in the realm of corporate reputation (Fombrun & Shanley, 1990) 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 to testing instrumental stakeholder theory offers numerous advantages over the extant approaches of relying on corporate disclosures, audits or principles. 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 cooperation and conflict 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.

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 organizational economics 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 so the indirect costs that activists and other stakeholders could impose may be substantial. Stakeholder cooperation or conflict with 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 Exchange who own and operate one, two or three mines outside of the United States, Canada and Australia as defined by the Raw Materials Database¹, (a total of 26 mines in 20 countries) that have reached the stage of a feasibility study.² 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 Raw Materials Database – <http://www.rmg.se>.

² “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.

- 1) draw upon strict Canadian disclosure requirements³ 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
- 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 parent company's quarterly financial reports filed with SEDAR 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

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

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 the probability of successfully exploiting it, P_{jit} .

³ http://www.tsx.com/en/listings/tsx_issuer_resources/continuous_disclosure.html

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 engineers 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 constrains 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 quarters⁴

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.

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 media relevant⁵ stakeholder (or the firm) acts or expresses sentiment towards the firm (or a stakeholder). Events may be cooperative or conflictual and

⁴ T denotes *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.

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 the past than a report from the present. Formally, for each mine j of each company i at time t we calculate:

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

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.

⁵ Our reliance on the media to define the population of relevant stakeholders generates an inclusive set of political, social and economic actors without regard to their normative legitimacy. As we seek to measure the financial impact of stakeholder cooperation and conflict not the choice by managers as to whether to engage with a specific stakeholder, we believe this strategy appropriate.

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.

Political Constraints

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, 2000a).

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 renegeing 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).

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 β_i and assuming instead that the coefficients β_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 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 discounted 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.

Robustness Analysis

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.

FUTURE WORK INCLUDES

- *Excluding stakeholders who are members of the economic value chain from calculation to assess their relative importance*
- *Using exogenous variation in gold reserves (i.e., discontinuous jumps in the npv of a mine) to further address concerns of reverse causality*
- *Examining the link between stakeholder conflict-cooperation and mine delays and disruptions and use the data to more structurally incorporate the stakeholder data into the project valuation model (i.e., predict a shift in the future revenue stream due to an estimated probability of delays/disruptions)*
- *Exploring whether fit improves by normalizing weighted average of conflict-cooperation by stakeholders towards the mine by country-level conflict-cooperation by stakeholders towards all objects*
- *Confirming that future (i.e., unknown to the investor) stakeholder conflict-cooperation does not influence current market capitalization*

- *Confirming that mines are not systematically accelerating extraction in countries with high conflict or political risk*
- *Examining the impact of stakeholder events reported in different types of media (e.g., national vs. international; high credibility vs. low; independent vs. press releases and other controlled sources as well as splitting sample according to density of media coverage and availability of English language media)*
- *SUGGESTIONS WELCOME!*

Discussion

Our theoretical arguments and empirical results point to the existence of a direct positive and economically substantive relationship between financial market valuation and cooperation or conflict with a wide array of stakeholders including those outside the economic value chain. Future research and analysis should continue to explore not only tradeoffs but also complementarity between resource allocations to enhance stakeholder cooperation and productive efficiency. This finding has important implications for future research on corporate social responsibility, instrumental stakeholder theory and multinational strategy which we discuss in turn. We also discuss the limitations of our analysis including, in particular, questions regarding its generalizability beyond our sample of 19 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 (Vogel, 2005). Initially supportive empirical results were rightly attacked on the grounds of spurious or reverse causality and inappropriate metrics. Agency theorists and financial economists countered with theoretical and empirical analysis that highlighted how managers' pursuit of perquisites or individual morality diverted shareholder returns to stakeholder interests. Organizational economists extended these models to allow for shareholder value maximizing redistributions to stakeholders in the direct economic value chain under certain circumstances. Yet, in our empirical context, none of the

mechanisms emphasized by organizational economists are operative (i.e., consumers are unable to identify the mine or company from which their purchase 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).

We argue, by contrast, for a broader conceptualization of that value chain more consonant with instrumental stakeholder theory. The value 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 both 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.

While managers, scholars of stakeholder relations and some activists have long asserted the existence of a positive benefit from stakeholder engagement, 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.

This link offers an opportunity for instrumental stakeholder theory to address the question of which stakeholders are more important and how much should managers invest in their relationships. Current empirical efforts to examine 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 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. In ongoing research, rather than simply capturing a moving average of stakeholder cooperation and conflict, we construct stakeholder networks for each of the 26 mines. Using the same coding protocol we deployed here, we capture every stakeholder event in which the mine OR another stakeholder is the object of the sentence. The resulting dataset is amenable to analysis using tools developed in the network literature to ascertain the relative importance of various stakeholders in the diffusion of cooperation or conflict as well as the optimal strategies for an organization seeking to enhance its degree of stakeholder cooperation (Nartey, 2010, Nebus & Rufin, 2010, Rowley, 1997, Rowley & Moldoveanu, 2003). While currently time intensive, progress in information extraction software development (King & Lowe, 2003) could allow for lower-cost deployment in the near future.

Such progress is particularly needed in the study of multinational firms who, by virtue of their foreignness, are more likely to engender a conflictual relationship with a given host country 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). Whereas the political risk literature in international business has made great strides in modeling the formal institutional structures that govern the likelihood of policy change in response to such pressure (Henisz, 2000b), the extent to which investors from one country may be more or less susceptible to this pressure (Holburn & Zelner, 2010) and the existence of experiential learning in the mitigation of these pressures (Delios & Henisz, 2002a, 2002b, Henisz & Delios, 2004, 2002, 2001), the tactics or mechanisms that firms actually deploy in such cases remain largely unexamined despite long-standing exhortations for analysis (Behrman, Boddewyn, & Kapoor, 1975, Boddewyn & Cracco, 1972, Kobrin, 1979) as does the use of project-level data rather than firm-level proxies (Kobrin, 1979). The dynamic and contingent analysis of stakeholder networks could usefully extend the existing literature examining the impact of political risk on multinational strategy bringing it closer to scholarship in non-

market strategy (Baron, 1995a, 1995b, Baron, 2009, Baron & Diermeier, 2007, Hillman & Hitt, 1999) as well as strategic corporate social responsibility (Kytte & Ruggie, 2005, Porter & Kramer, 2011, Porter & Kramer, 2006b, Post, Preston, & Sauter-Sachs, 2002)

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 spillovers both negative (e.g., environmental or social costs, disruptions of cultural tradition and heritage, and the reinforcement of preexisting inequity) and 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). 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. In short, the social license to operate is more than rhetoric. It is operationalizable, empirically testable and strategically relevant.

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Table 1: Samples of Stakeholder Event Coding

<u>Sentence Text</u>	<u>Source (i.e., subject)</u>	<u>Verb(s)</u>	<u>Target(s) (i.e., object(s))</u>	<u>Conflict-Cooperation Category</u>	<u>Conflict-Cooperation Scale</u>
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 14 th 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	# Stakeholder		# stakeholders	# unique ties	Min year	Max year
			# Articles	Events				
Luna Gold Corporation	Aurizona	Brazil	569	197	19	13	2006	2008
Nevsun Resources Ltd.	Bisha	Eritrea	1131	2387	177	94	2003	2008
Olympus Pacific Minerals Inc.	Bong Mieu	Vietnam	476	111	74	46	1997	2008
Gold Reserve Inc.	Brisas	Venezuela	1525	6650	457	205	1993	2008
European Goldfields Limited	Certej	Romania	700	413	62	45	2000	2004
Dundee Precious Metals Inc.	Chelopech	Bulgaria	936	3342	338	166	2003	2008
Infinito Gold Ltd./Vannessa	Crucitas	Costa Rica	480	616	90	47	2001	2008
OceanaGold Corporation	Didipio	Philippines	534	1783	120	72	2006	2008
Minefinders Corporation Ltd.	Dolores	Mexico	1125	164	61	48	1996	2008
Orvana Minerals Corp.	Don Marino	Bolivia	1718	492	82	61	1994	2008
Orezone Resources Inc.	Essakane	Burkina Faso	583	230	34	31	2004	2008
Australian Solomons Gold Ltd	Gold Ridge	Solomon Islands	300	896	100	54	2004	2008
Dundee Precious Metals Inc.	Krumovgrad	Bulgaria	587	2630	230	129	2003	2008
Infinito Gold Ltd./Vannessa	Las Cristinas	Venezuela	653	7620	756	285	1995	2005
OceanaGold Corporation	Macraeas	New Zealand	554	97	46	36	2004	2008
Mundoro Mining Inc.	Maoling	China	629	342	69	54	2004	2008
European Goldfields Limited	Olympias	Greece	700	6633	232	123	2003	2008
		Central African						
AXMIN Inc.	Passendro	Republic	400	277	20	13	2003	2008
Olympus Pacific Minerals Inc.	Phuoc Son	Vietnam	763	132	48	33	1997	2008
Gabriel Resources Ltd.	Rosia Montana	Romania	1593	4543	254	191	1997	2010
OceanaGold Corporation	Reefton	New Zealand	457	153	36	31	2004	2008
European Goldfields Limited	Skouries	Greece	650	6394	178	102	2003	2008
Centamin Egypt Limited	Sukari	Egypt	1400	508	25	20	1997	2008
Banro Corporation	Twangiza	DR Congo	2744	4255	1007	435	1995	2008
Alhambra Resources Ltd.	Uzboy	Kazakhstan	499	362	51	29	2001	2008
European Minerals Corp.	Varvarinskoye	Kazakhstan	523	527	57	40	1996	2008
Total		19	22229	51754	4623	2403		

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, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

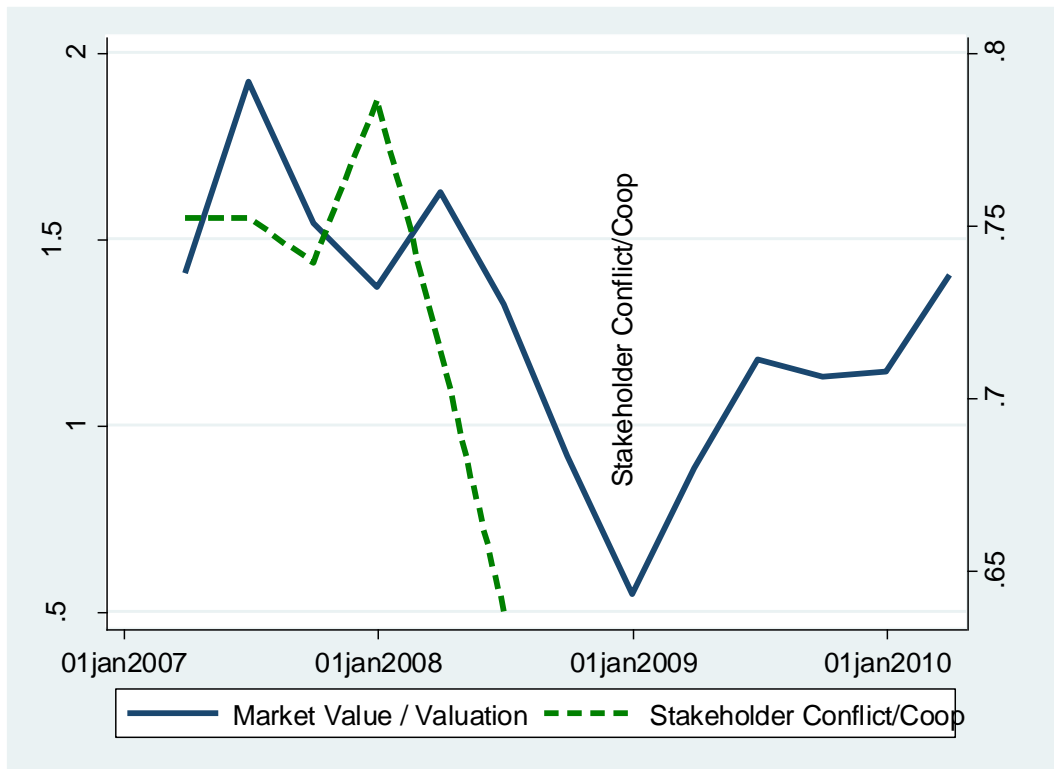
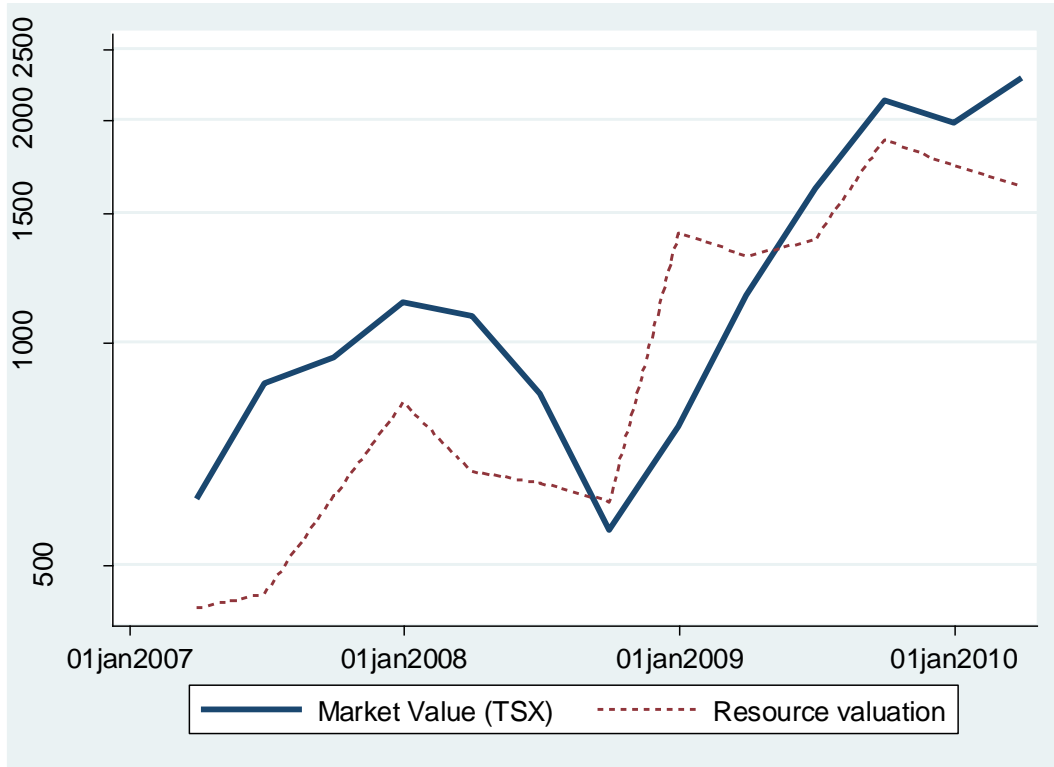
Table 5. Random-coefficient estimates

	(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*** (29.30)	161.0*** (32.95)	139.4*** (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* (26.66)	78.83** (31.007)	59.519* (36.28)
Corr (Random Coefficient, Constant)	0.999*** (0.000)	0.999*** (0.000)	-0.183 (0.692)
Observations	147	112	73

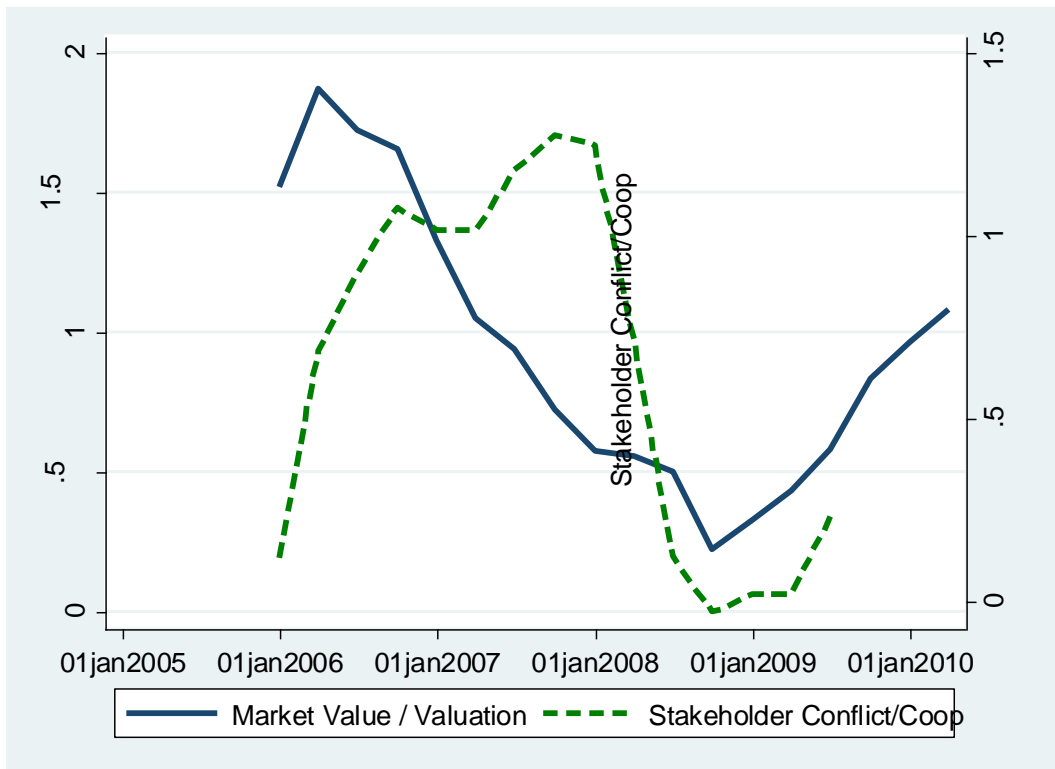
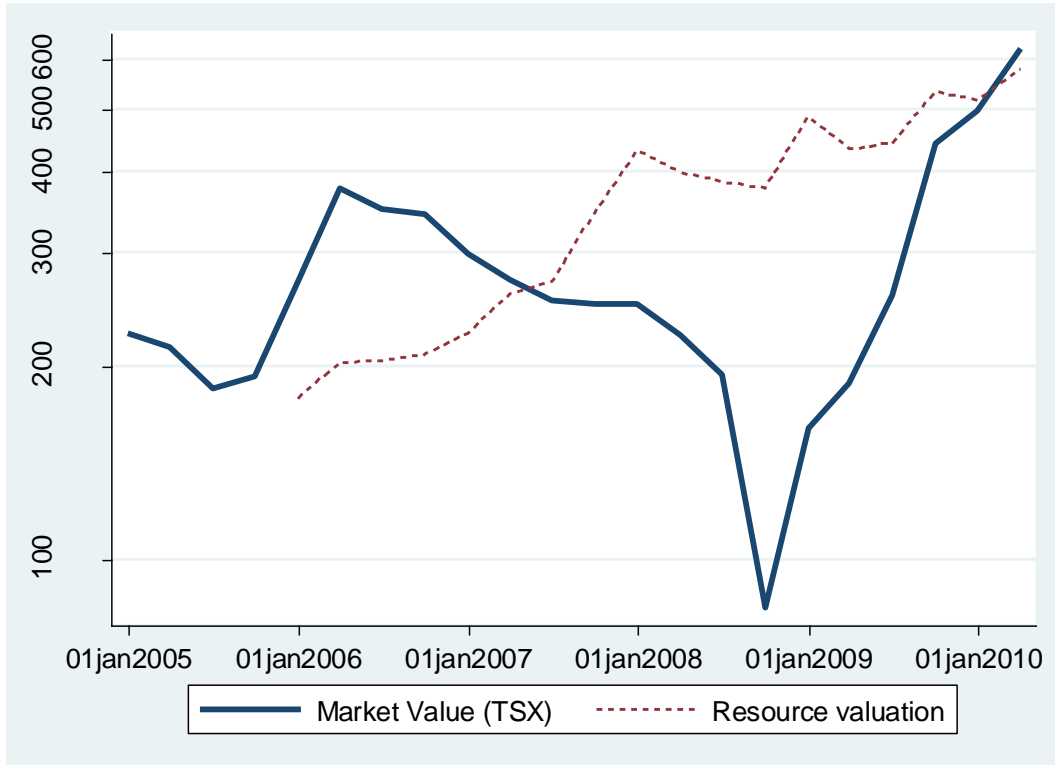
Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

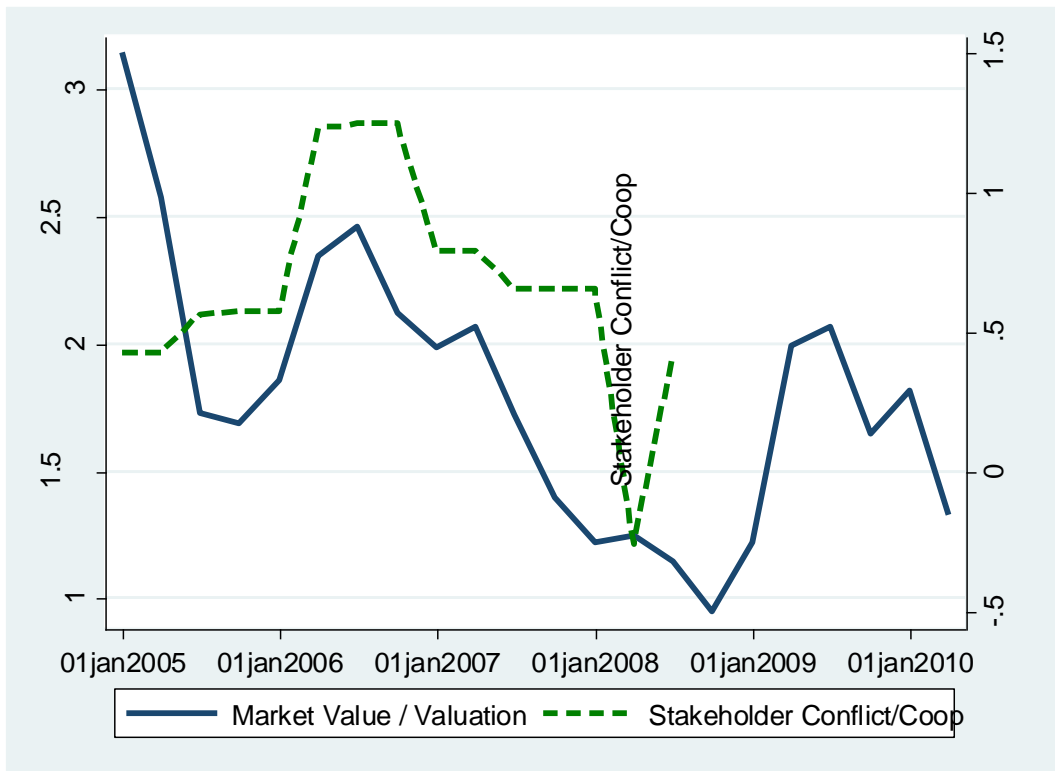
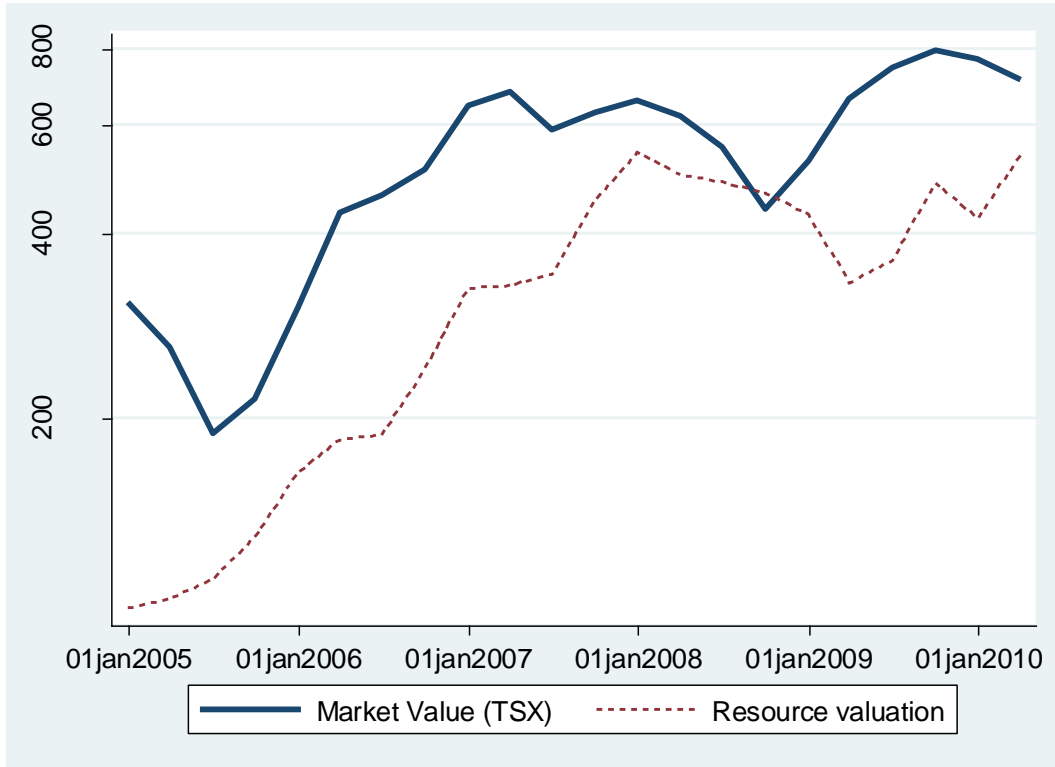
Figure 1 CENTAMIN: SUKARI



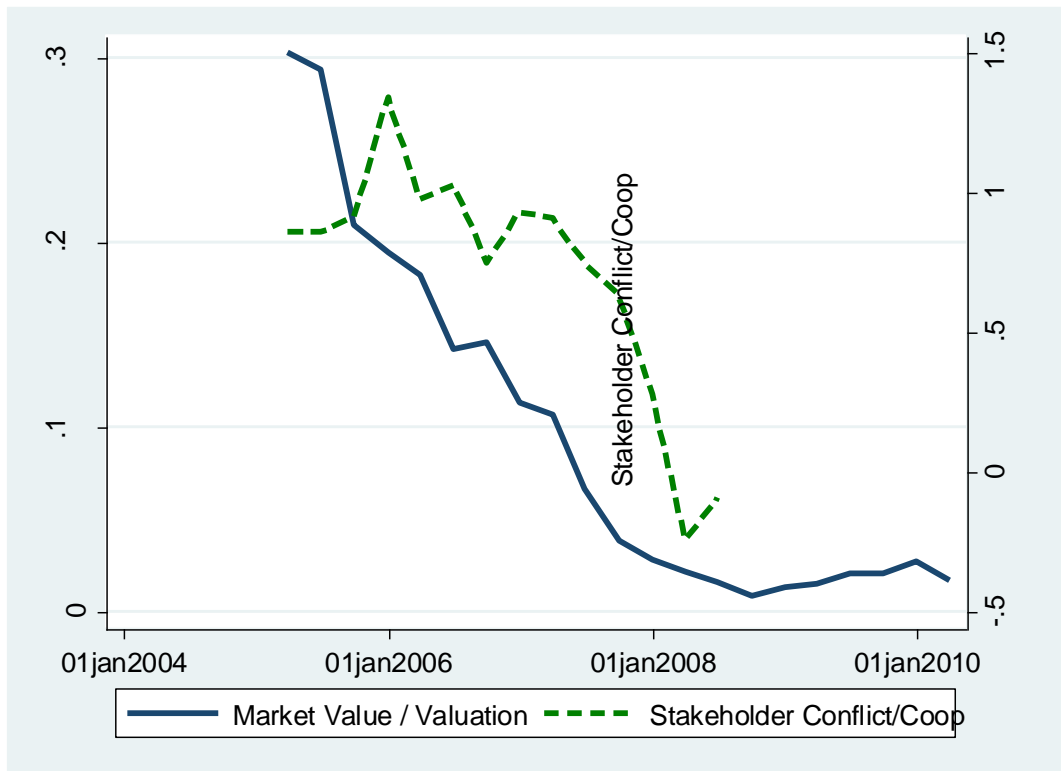
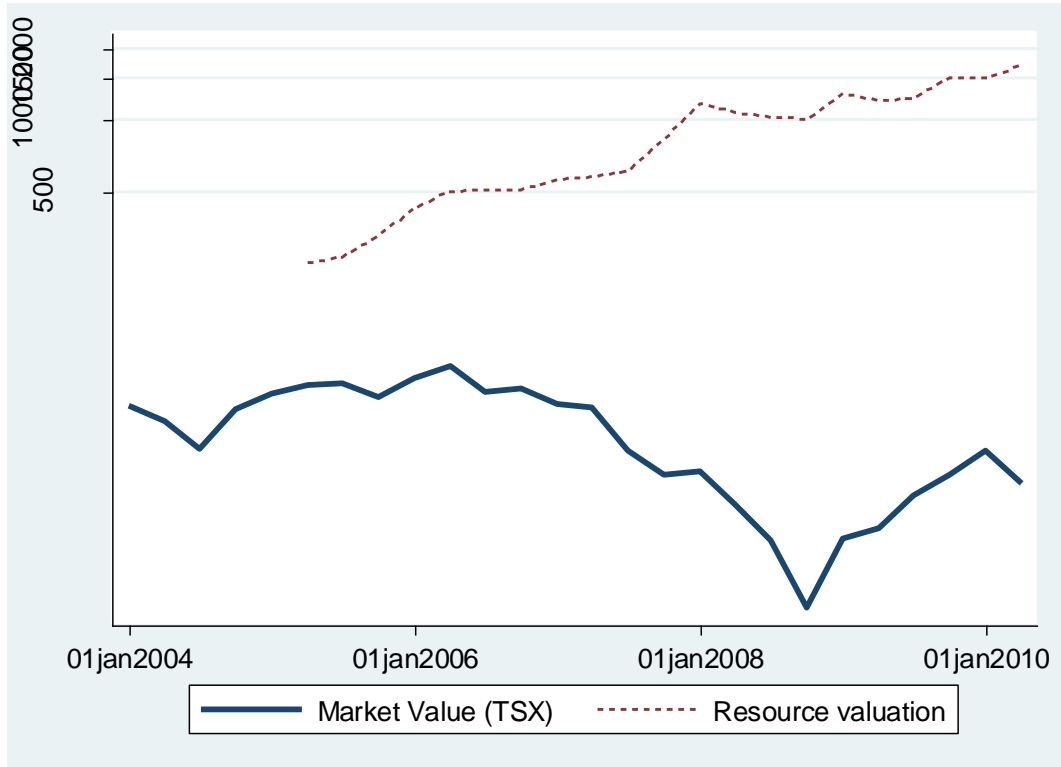
NEVSUN: BISHA



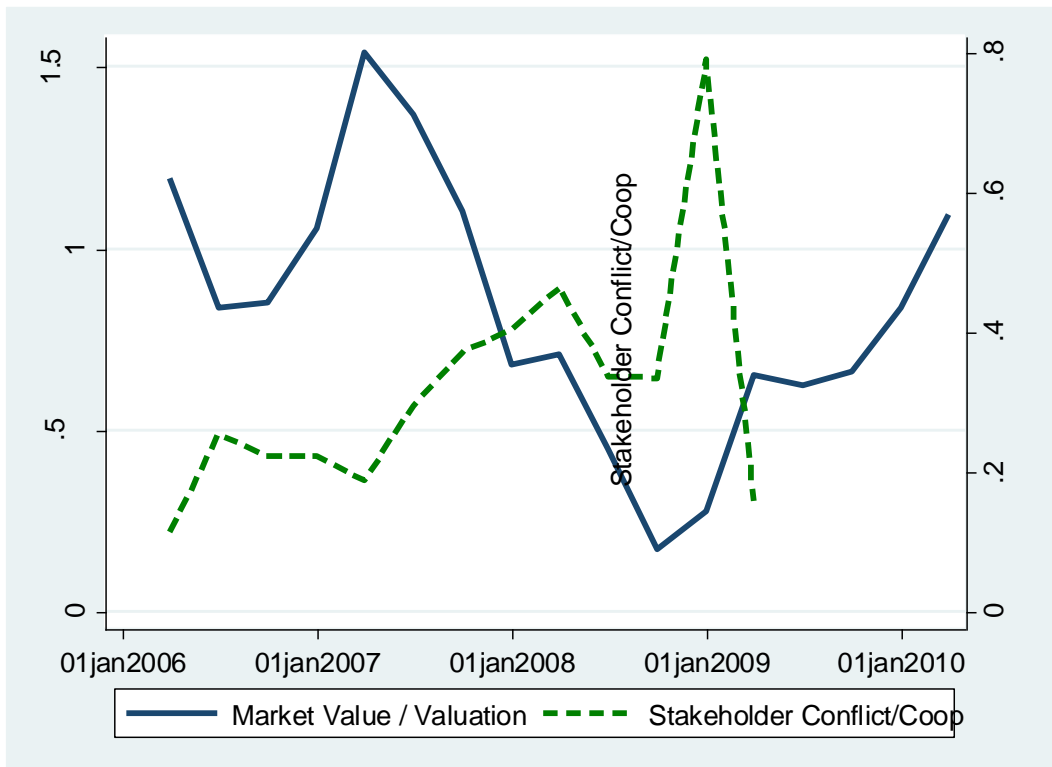
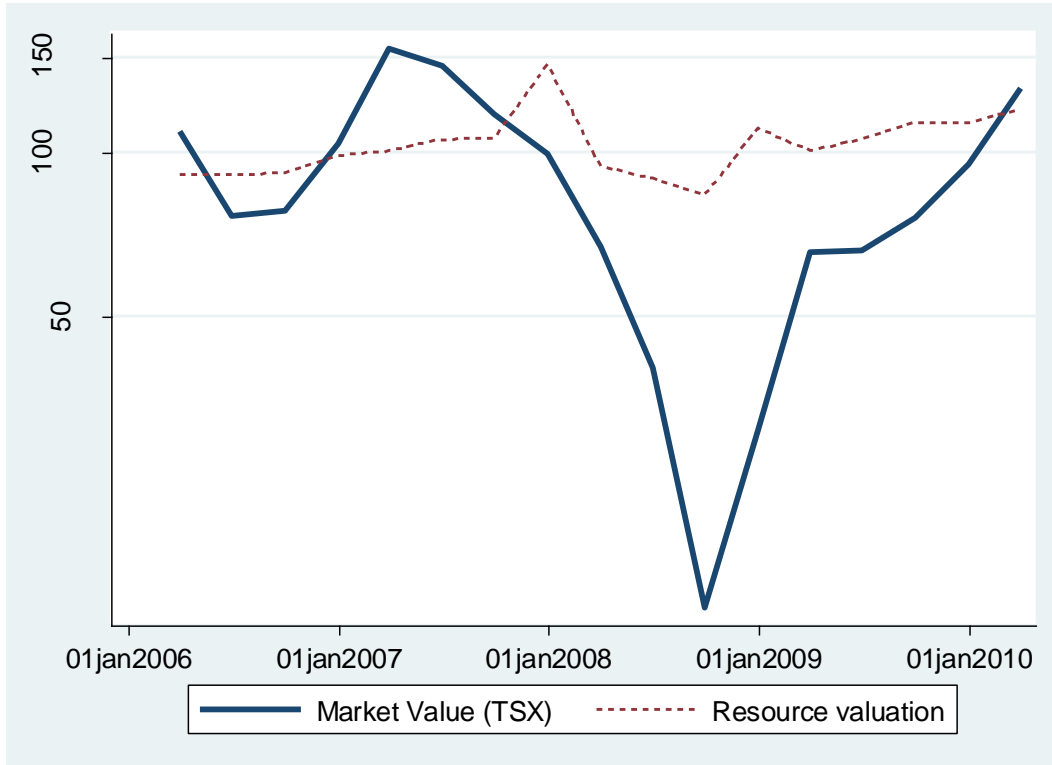
MINEFINDERS: DOLORES



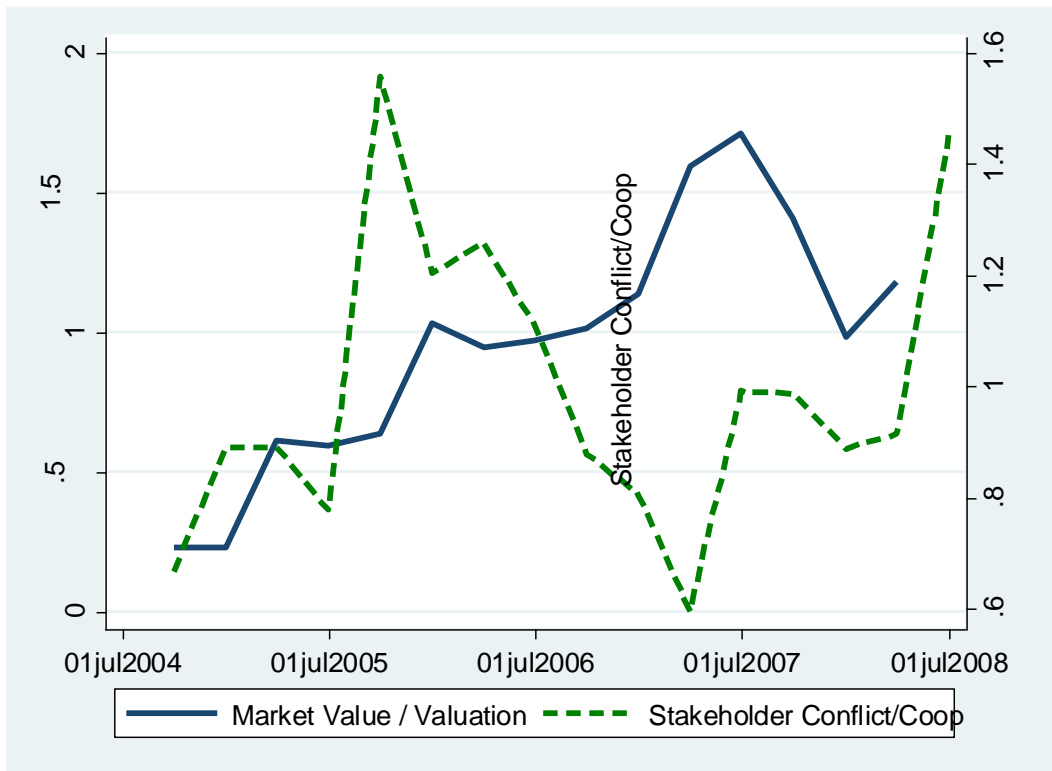
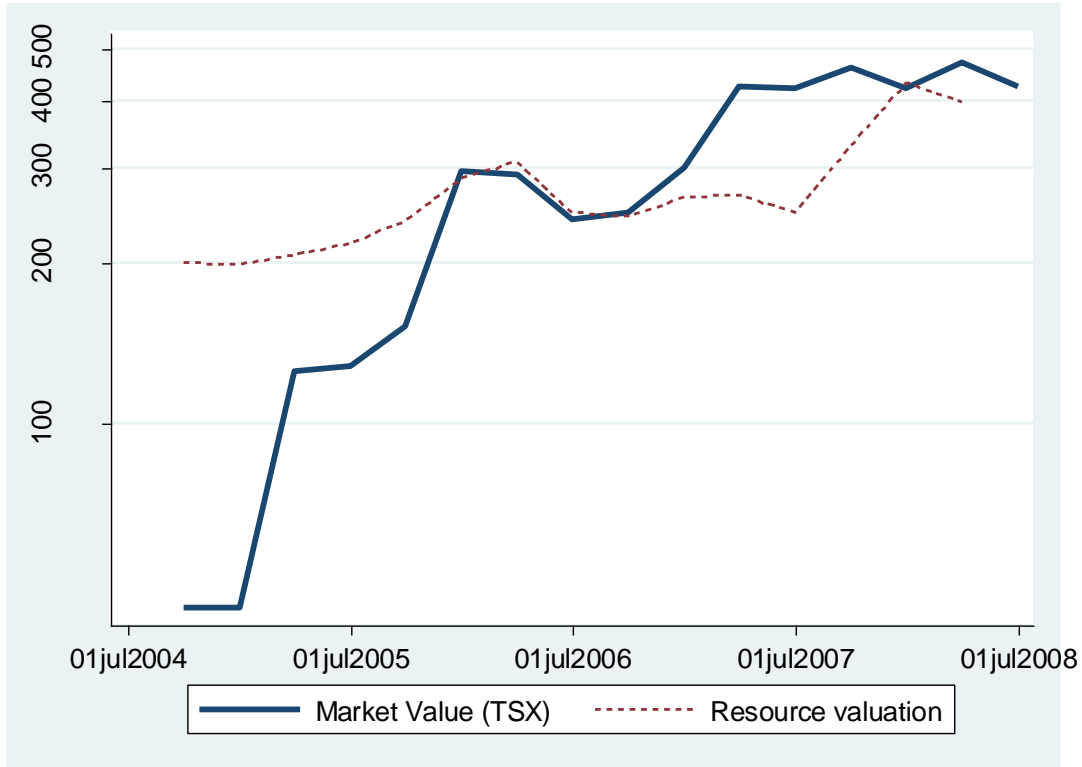
MUNDORO: MAOLING



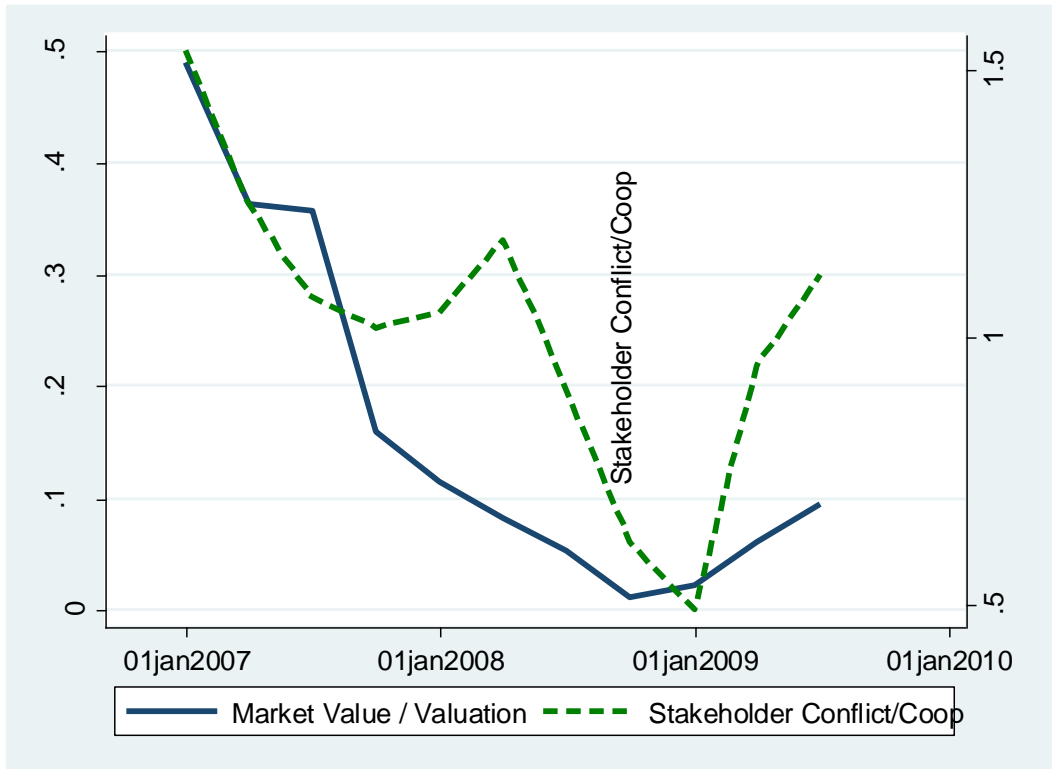
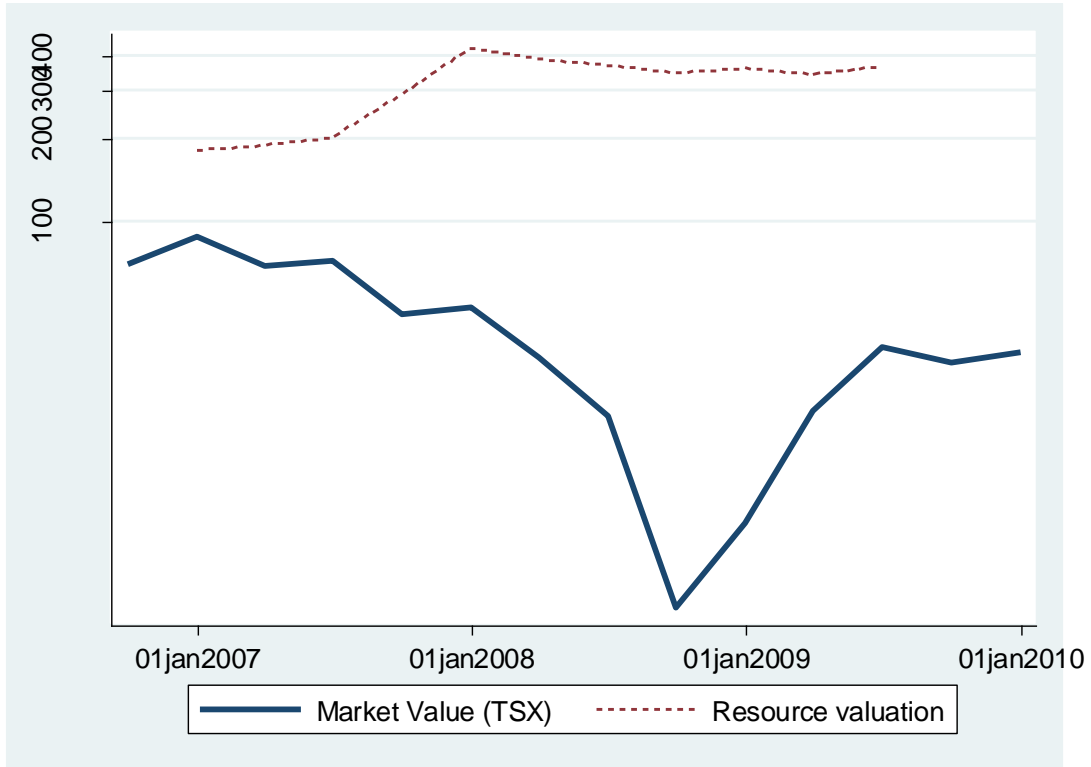
OLYMPUS: BONG MIEU AND PHOUC SON



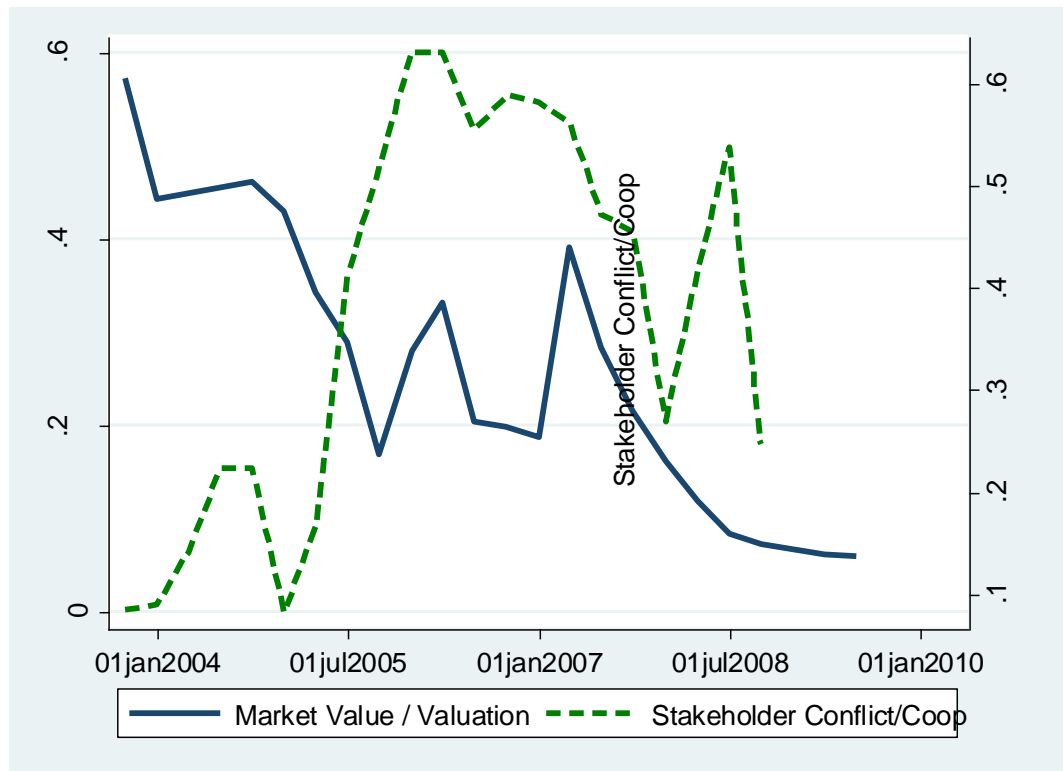
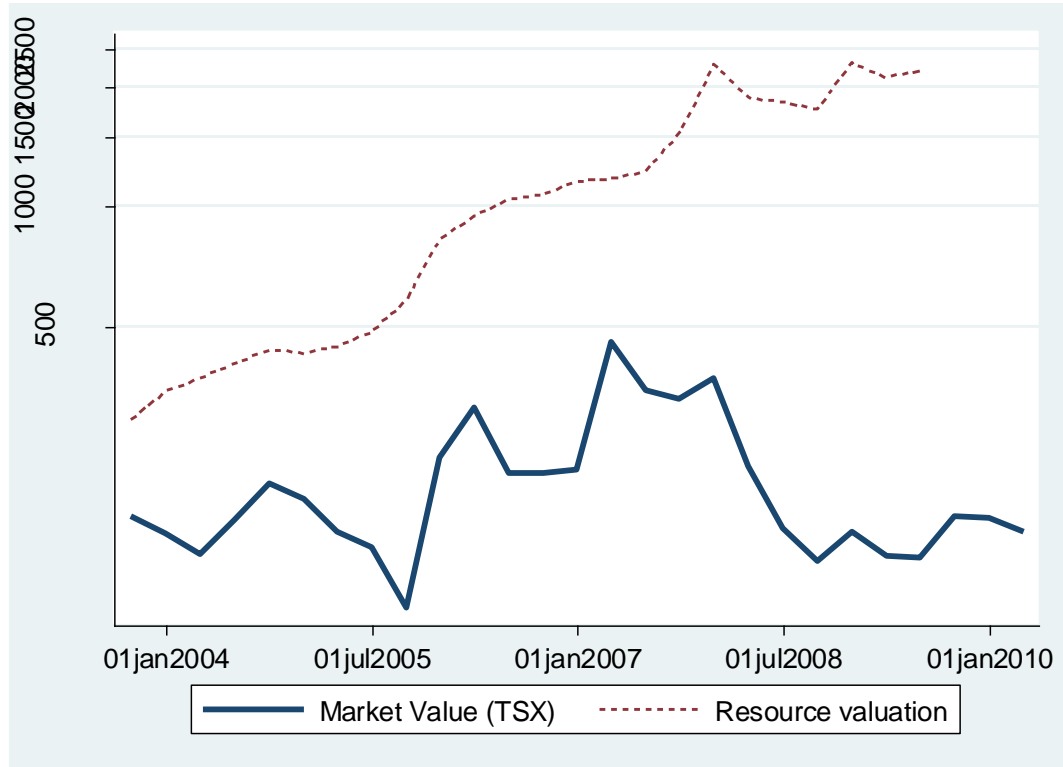
EUROPEAN MINERALS: VARVARINSKOYE



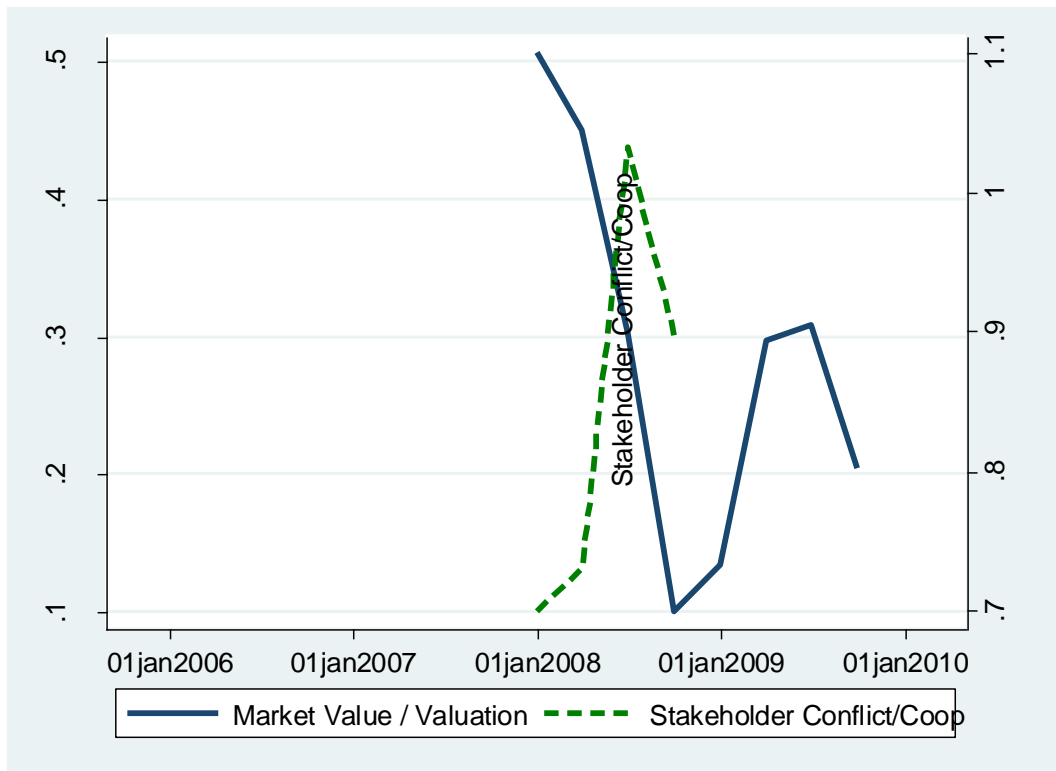
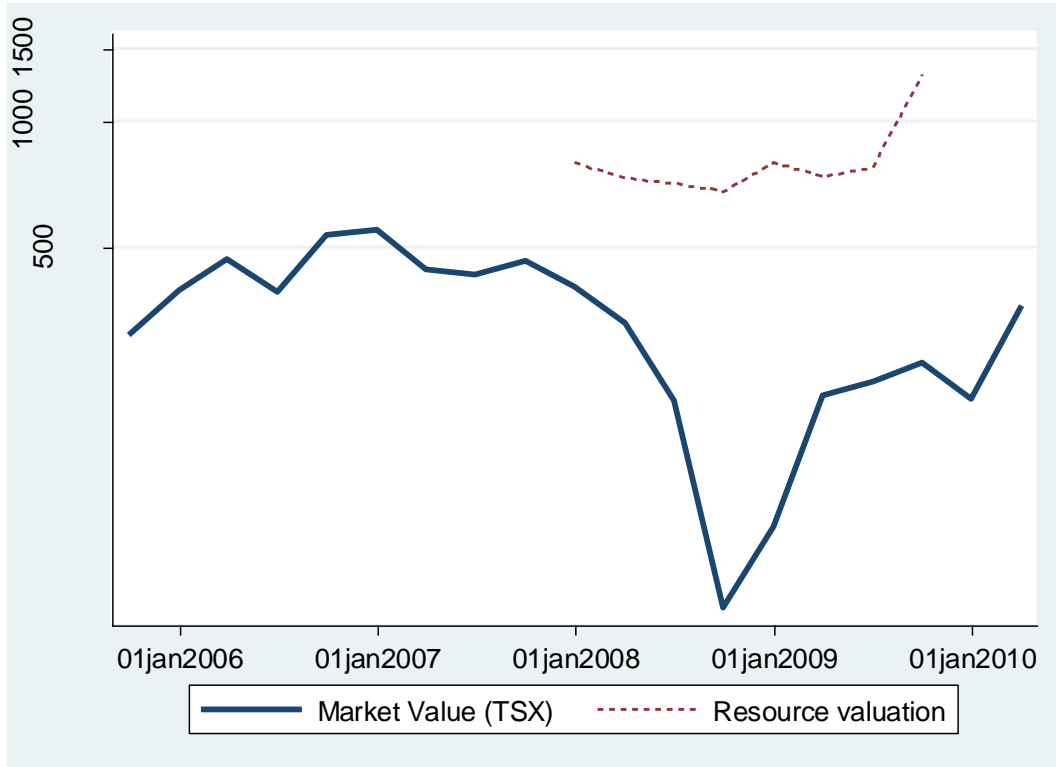
AUSTRALIAN SOLOMONS GOLD LIMITED: GOLD RIDGE



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