A cash-flow analysis and profitability study on a peer-group of mining companies.

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Contents

1. Introduction

This thesis is about the analysis of cash flows from a peer group of mining companies in the iron ore sector ranging from junior companies to major companies. The research is based on methods developed by dr. R. Weijermars for cash-flow analysis of oil and gas companies. Although being a different industry, these are believed to be directly applicable to the mining sector. The analysis focuses on the sources and the sinks of funds and the company's ability to generate cash to cover its capital expenditures (CAPEX). The applicability of these methods to the mining industry together with the sources and sinks in this sector will be investigated in this thesis.

In the last years the iron ore market went through tremendous changes. It went from a long-term contract market to a spot market and the Chinese emergence turned it upside down. Transport routes changed and the price rose dramatically following the increased demand. Now China accounts for 50% of global trade in iron ore and the market is totally different than ten years before (Hellmer & Ekstrand, 2013). The question is, have the companies shown to be able to stay profitable in these changing markets? This study tries to chart the performance and profitability of mining companies in the past years and compares it to the oil and gas industry, of which the market has the same characteristics.

2. Goal and structure

2.1 Objectives

The research conducted for this thesis is done in order to answer the following questions:

- Is the cash-flow analysis method developed by dr. Weijermars (Table 1) applicable to the mining industry?
- What are the cash sources- and sinks of mining companies in different market capitalization categories and what is the influence of credit ratings on this?
- How do mining companies perform mutually and compared to the oil and gas industry.

By applying the cash-flow analysis methods (Weijermars, 2011) on a peer-group of mining companies and looking at the credit ratings issued by rating agencies to the companies in the peer group we answer the second question. Reviewing the results we get from this analysis we can answer the first question. The third question is investigated on the basis of different profitability indicators associated with different mining companies. These are compared to results from research done on the oil and gas industry by Weijermars, 2011.

2.2 Structure

This thesis starts with an introduction to the methods used for the cash-flow analysis in chapter 3. Here it is explained where the information comes from and how it is processed to get comparable results. Thereafter in chapter 4 it is explained how and why the used peer-group is composed as it is. Also some details of the criteria to which the companies are assessed in order to come to this peer-group are explained in this chapter.

The next part (chapter 5) goes into more detail about credit ratings and financing and the relationship between these two actors and their influence on the financials of companies. After these more general explanatory parts comes

chapter 6 that goes into detail on the results from the cash flow analyses performed on the peer group of mining companies. These results are ordered and reviewed per capitalization category.

After this the profitability of several major mining companies is looked upon in chapter 7. This review is based on corporate performance indicators (ROCE, debt-to-equity ratio and share prices) and compares the mutual profitability of the major mining companies.

To see how the mining industry compares to the oil and gas industry the results of this study are compared to the oil and gas industry in chapter 8. The conclusion (chapter 9) summarizes all the results from this research and reflects on the answers to the research's objectives.

3. Methodology

The cash-flow analysis focused on 14 mining companies and their capacity to generate CAPEX from operational income during a 6-year period (2007-2012). The two main sources of funds for any company are net cash from operations and net cash from financing activities. If the operational income isn't sufficient to fund all CAPEX, additional funds need to be raised from financing activities (Weijermars, 2011).

Form 20-F SEC filings formed the primary data-sources for this research, using the consolidated income statement, balance sheet and cash-flow statements. If a company didn't file a 20-F form, the annual reports as made public on the company's website were used.

	Bigger Mining Companies		**Smaller Mining Companies**	
Cash Sources and Sinks	CAPEX can be fully funded by cash from operations; excess cash is sunk into financing activities*		CAPEX funding needs cash raised from financing activities to supplement cash from operations*	
	Algorithm	**Typical Result**	**Algorithm**	**Typical Result**
Capital expenditure (CAPEX)	CAPEX/(OPS+EX-SURPLUS)	-79	CAPEX/(OPS+EX-SURPLUS)	-102
Net income from operations (OPS)	OPS/(OPS+EX-SURPLUS)	105	OPS/(OPS+EX-SURPLUS)	70
Net income from financing activities (FINAN)	FINAN/(OPS+EX-SURPLUS)	-20	FINAN/(OPS+EX-SURPLUS)	69
Currency exchange rate correction (EX)	EX/(OPS+EX-SURPLUS)	-1	EX/(OPS+EX-SURPLUS)	4
Cash surplus/deficit for the year (SURPLUS)	SURPLUS/(OPS+EX-SURPLUS)	4	SURPLUS/(OPS+EX-SURPLUS)	43

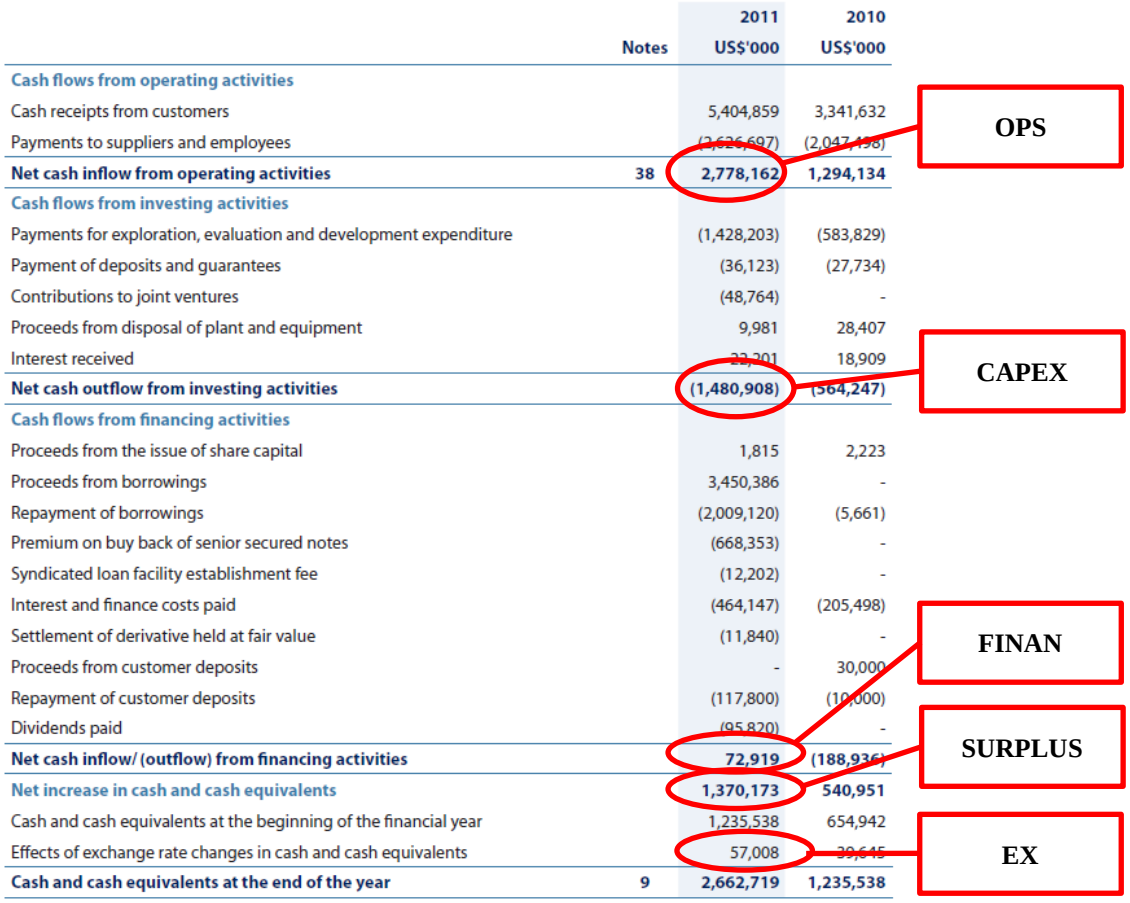
*Columns for bigger and smaller mining companies are shown here strictly separate. In the analysis the algorithms (left or right colums) were determined by an "if" statement that checks whether OPS > |CAPEX|.

Table 1- Principal algorithms used to normalize cash-flow statements (Weijermars, 2011).

For the source/sink analysis the algorithms shown in Table 1 were used. As can be seen they are based on five components:

- Capital expenditure (CAPEX)
- Net income from operations (OPS)
- Net income from financing activities (FINAN)
- Currency exchange rate correction (EX)
- Cash surplus/deficit for the year (SURPLUS)

All of these five components can be extracted from the company's consolidated cash flow statement and are put in the algorithms. The ratio between these components is leading for the outcome of the analysis. Normalization was done for comparison irrespective of the absolute amounts involved.



	Notes	2011 US$'000	2010 US$'000
Cash flows from operating activities			
Cash receipts from customers		5,404,859	3,341,632
Payments to suppliers and employees		(2,626,697)	(2,047,498)
Net cash inflow from operating activities	38	2,778,162	1,294,134
Cash flows from investing activities			
Payments for exploration, evaluation and development expenditure		(1,428,203)	(583,829)
Payment of deposits and guarantees		(36,123)	(27,734)
Contributions to joint ventures		(48,764)	-
Proceeds from disposal of plant and equipment		9,981	28,407
Interest received		23,201	18,909
Net cash outflow from investing activities		(1,480,908)	(564,247)
Cash flows from financing activities			
Proceeds from the issue of share capital		1,815	2,223
Proceeds from borrowings		3,450,386	-
Repayment of borrowings		(2,009,120)	(5,661)
Premium on buy back of senior secured notes		(668,353)	-
Syndicated loan facility establishment fee		(12,202)	-
Interest and finance costs paid		(464,147)	(205,498)
Settlement of derivative held at fair value		(11,840)	-
Proceeds from customer deposits		-	30,000
Repayment of customer deposits		(117,800)	(10,000)
Dividends paid		(95,820)	-
Net cash inflow/ (outflow) from financing activities		72,919	(188,936)
Net increase in cash and cash equivalents		1,370,173	540,951
Cash and cash equivalents at the beginning of the financial year		1,235,538	654,942
Effects of exchange rate changes in cash and cash equivalents		57,008	39,645
Cash and cash equivalents at the end of the year	9	2,662,719	1,235,538

Figure 1- Consolidated Cash-Flow statement from Fortescue Metals Group out of the 2011 annual report. The five elements that are needed for the cash-flow analysis are outlined in red.

4. Peer groups panel constitution

For a good comparison the establishment of a representative panel of peer groups was needed. The bases for this peer groups were four market capitalization categories (Table 3). A list of sixty-eight companies was assembled together with their respective market capitalization, prime commodity, credit rating and beta (see Appendix 1). Below these three indicators are shortly explained in more detail.

4.1 Market capitalization

Market capitalization (or market cap) is the total value of all issued shares of a publicly traded company. The market capitalization is equal to the share price multiplied with the number of all shares outstanding (investopedia.com, 2013). It can be used as an indicator of the net worth the shareholders (public) think the company has. In this research market cap is used to scale and categorize companies. These categories are quite arbitrary as there is no definition when a company is respectively junior, small-, mid- or large cap. The categorization in this research is based on the categorization as is made in the research of Weijermars, 2011 which are in line with common market assumptions. All the values for market cap were taken on the same day to have a fixed point in time for measurement as share prices differ in time and thus does market capitalization. The exact absolute value of a company's market cap is not relevant in this research because companies are categorized relative to each other.

4.2 Prime commodity

This is the commodity that is the main trading commodity of the company, that is, in the metals and mining department if any others. BHP for instance generates a lot of cash with its petroleum branch but is still mainly a mining company and iron ore is responsible for the biggest part of their mining activities (BHP Billiton, 2012). Also, many copper miners sometimes also mine other metals (i.e. molybdenum) but their main focus is on copper mining.

4.3 Credit rating

Credit ratings are issued by private firms called rating agencies that offer opinions about the credit worthiness of borrowers in the financial market (Levinson, 2005). These credit ratings are used by investors as indicators of the likelihood of receiving the money owed to them in accordance with the terms on which they invested. Based on their credit rating access to unsecured debt is cheaper for some companies then for others (Weijermars, 2011). Three firms, Standard & Poor's (S&P), Moody's Investor Services and Fitch IBCA, rate money-market issuers around the world (Levinson, 2005). For this research ratings from S&P and Moody's are used.

4.4 Beta

Beta is a measure of a share's price volatility, relative to the average volatility of the stock market. A share with a beta of 1.0 will, on average, move in tandem with the market average; a share with beta 1.5 can be expected to rise, or fall, 1.5% when the market rises, or falls, 1%. A share with a negative beta moves, on average, in the opposite direction from the market (Levinson, 2005).

Based on this list different peer groups and panels were assembled and assessed for their suitability to this research.

Panels were made for coal, gold, copper and iron ore. Pros and cons are listed in Table 2.

Commodity	Pros	Cons
Coal	nice pool of junior and mid cap companies; global market; Good correlation with global economy	opaque finances for some (state-owned) companies; different markets for different coal-types (i.e. thermal coal, metallurgical coal); lack of large cap companies
Gold	actively and globally traded; many small- and mid-caps; all companies publicly traded	very different market-drivers (beta<1.0); lack of large cap companies; less 'bigger juniors'
Copper	good market with good correlation to the global economy; globally traded	less small-caps; smaller part of portfolio for large caps
Iron Ore	good market with good correlation to the global economy; globally traded; good pool of companies; globally traded; main part of portfolio for large diversified miners	main market is Asia, rest of the world is minor although not small

Table 2 - Pros and cons for choosing a commodity for further research.

Out of these four commodities iron ore was decided to be the most suitable for further research.

Iron ore is a well-traded commodity with a very global market and is mined by companies throughout the capitalization categories (Table 3). Also, all three companies that form the large cap peer group are diversified miners but for all three iron ore is the major part of their portfolio. This makes up for a fair comparison to the other companies in the panel.

	Capitalization (billions, USD)			
	0.5<	**0.5-5**	**5-50**	**>50**
Category	**Juniors**	**Small Caps**	**Mid Caps**	**Large Cap**
Name	BC Iron Ltd. Gindalbie Metals Iron Ore Holdings	Ferrexpo Atlas Iron Mount Gibson Iron Ore Sundance Resources	ArcelorMittal Fortescue Metals Group NLMK Cia. Siderúrgica Nacional	BHP Billiton Rio Tinto Vale
Referred to in this study as:	Smaller Companies		Bigger Companies	

Table 3 – Iron ore peer group categorized on a market capitalization basis.

The panel is not only made up of companies that thrive fully on mining but also companies that have an important steelmaking division like ArcelorMittal, NLMK and Compania Siderúrgica Nacional; although all this companies own and mine substantial iron ore deposits.

5. Credit ratings and financing

Companies, big and small, at some point need financing to meet CAPEX demands and unlock new cash-flows to keep their shareholders satisfied. The terms on which companies can lend money on the capital market are based on their credit rating. In Table 4 I listed an inventory of the companies in the peer group panel and their corresponding credit rating and market capitalization; sourced from respectively S&P, Moody's and Bloomberg.com. The historic interest is retrieved from Weijermars, 2011. As can be seen in Table 4 there tends to be a correlation between market cap and credit ratings. The trend seems to be that with increment of the market capitalization the credit rating increases too.

For companies that want to raise funds there are roughly two ways of financing, debt- and equity financing. Following are those two ways and their differences explained.

Companies in the peer group panel	Market capitalization (billion USD)*	Capitalization Category	S&P Credit Rating**	Moody's Credit Rating**	Default rate perception based on status	Historic Default Rates Credit Grade
BHP Billiton	200,5	Large-Cap	A+	A1	Strong capacity to meet financial commitments, investment-grade.	1-3%
Rio Tinto	112,7		A-	A3		
Vale	108,3		A-	Baa2		
ArcelorMittal	29,1	Mid-Cap	BB+	Ba1	Adequate capacity to meet financial commitments, investment-grade.	5-30%
Fortescue Metals Group	15,9		BB-	Ba3		
NLMK	12,7		BBB-	Baa3		
Cia. Siderurgica Nacional	8,0		BBB-	Ba1		
Ferrexpo PLC	2,4	Small-Cap	B	B3	Speculative grade. Vulnerable to adverse economical conditions.	50-55%
Atlas Iron	1,6		B+	B2		
Mount Gibson Iron Ore	1,0		Unrated	Unrated	Non-rated, junk-bond status. Extremely speculative and highly vulnerable.	70% and higher
Sundance Resources Ltd.	1,0		Unrated	Unrated		
BC Iron Ltd.	0,5	Junior	Unrated	Unrated		
Gindalbie Metals	0,4		Unrated	Unrated		
Iron Ore Holdings	0,2		Unrated	Unrated		

* Market Cap as of February 2013
** Ratings as of February 2013

Table 4 - Long Term credit rating of companies in the iron ore peer group panel, based on categorization by (Weijermars, 2011).

5.1 Debt financing

A way for a company to attract additional funding is to borrow money from institutions like banks with the obligation to repay the money plus interest. The company however doesn't lose part of the ownership to the lender. The lender also doesn't have any claims to the future profit of the borrower. This is called unsecured debt. The downside of this is that contractual interest payments must be paid and cannot be suspended or reduced; this places a burden on the company because it has to fulfill its obligations, also if business is slow and the cash flows are shrinking. This vulnerability to market volatility is assessed by credit rating firms and leads to the credit rating of a company. This rating is for lenders an indication of the debtor's ability to pay back the debt and interest and they adjust the interest according to this (see Table 4). These ratings can be split in two categories, investment-grade (BBB and up) and noninvestment-grade or junk-bond status (BB and lower). When rated as junk-bond it is difficult and expensive for companies to borrow money. Banks for example are not authorized to lend money directly to such junk-bond status companies and such companies therefore have to resort to junk-bond underwriters where a high interest must be paid (Weijermars, 2011).This is also the reason why companies put a lot of effort in getting an investment grade rating and maintaining it. Credit ratings influence the strategy of a company as for instance can be seen with Rio Tinto, which hurried to promise significant cash proceeds from divestments after being warned for a possible downgrade by S&P's in February 2013 (Hume, 2013).

5.2 Equity Financing

Another form of financing is to attract funds by selling a share in the company to investors. This form of raising funds has a few advantages over debt financing. The big advantage is that all the risk lies with the investor and the company doesn't have to pay the money back, not even if it fails. There is also more cash at hand because of the absence of loan payments. The downside however is that part of the company is sold to the investor. This also implies sharing profits (i.e. dividends) and consulting the investors before making decisions affecting the

company. Depending on the investors the risk of equity financing is also that the corporate strategy is turning to short-term earnings rather than pursuing strategies that show less immediate promise. Equity financing can be beneficial if a company wants to expand its debt financing, bankers and bond investors will be more generous if the firm has substantial equity capital, because this ensures that the borrowers, the firm's owners, have put their own money at risk (Levinson, 2005). For junior miners equity financing is an important source of funding, in 2012, 92% of the funds raised by juniors in the exploration phase equity. Most equity financing for junior mining companies, 90% in 2011, is raised on the Toronto Stock Exchange (TSX) (PwC, 2012).

	Pros	**Cons**
Debt Financing	No loss of ownership; cheap for large-caps	Interest must be paid; makes company vulnerable to market; expensive for junk-bonds
Equity Financing	No interest burden; more cash readily available	Loss of ownership; sharing profits; modified corporate strategy

Table 5 - Pros and cons of debt- and equity financing.

5.3 Balancing debt and equity

Because both debt- and equity financing have its advantages and disadvantages (see Table 5) firms typically raise capital in both ways. The relationship between their borrowing and equity is carefully balanced and know as the debt-to-equity ratio, also called gearing. However, very junior companies most of the time have no other choice than to get their money on the equity markets because of their very unsecure future outlook. As mentioned earlier in 2012 92% of the capital raised by juniors in the exploration phase was equity. If we look at a bit more mature, development-phase, juniors it can be observed that the amount of equity has decreased to 70% of the total raised capital. Once the company has reached production-phase this is 68%, or in other words, a debt-to-equity ratio of 0.47 (PwC, 2012). Figure 2 shows the average debt to equity ratio of the 4 largest miners in the peer group. As can be seen, in during the Great Recession (2008-2009) Rio Tinto cut their debts, likely due to the credit squeeze, and came back to a peer-group average around 0.45.

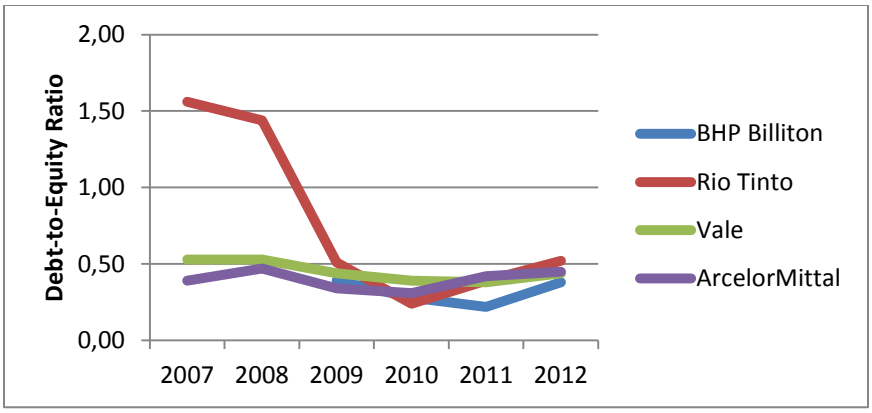


Figure 2 - Debt-to-Equity Ratio of the top 4 miners in the peer group (source: Morningstar.com)

Mining companies seem to be somewhat conservative in their financing, some might call it underleveraged, and keep their debts relatively low. Reason for this is probably the volatile nature of the market the industry relies on and the risk of having a too high debt burden if commodity prices go down.

6. Cash-Flow Analysis in detail

When the raw data from the panel's yearly statements is plugged in in the algorithms described in Table 1 we get the results as can be seen in Table 7. We see from this normalized cash-flows that the panel forms a good example of how funding of CAPEX throughout the market capitalization categories is expected. Smaller companies need external funding to complement the cash generated by operations to fund their CAPEX whilst bigger companies can fund their CAPEX completely from their operations and have even money to spare for financing activities (i.e. share buy-back, retiring loans).

Cash Sources & Sinks	**Bigger companies**	**Smaller companies**
CAPEX	-79	-102
Operations	+105	+70
Financing	-20	+69
Exchange rates	-1	+4
Cash Surplus	+4	+43

Table 6 - The cash sources and sinks for the two arbitrary categories, smaller and bigger companies.

In Table 7 the sources and sinks for the different market cap categories are specified. There is a clear trend visible that with an increasing market capitalization the dependency on external funding is decreasing. The same trend can be observed for the cash reserves held by the companies. In the following the outcome will be discussed for each peer group.

Cash Sources & Sinks	Majors	Mid-Caps	Small Caps	Juniors
CAPEX	-79	-90	-187	-89
Operations	+107	+87	+178	+7
Financing	-19	+25	+84	+134
Exchange rates	-2	+1	-5	0
Cash Surplus	+5	+20	+73	+40

Table 7 - Funding of CAPEX by Majors, Mid Caps, Small Caps and Junior companies

6.1 Major Miners

The three large-cap mining majors have a strong operational cash flow (Table 9) which gives them a strategic advantage over smaller companies because of their much smaller reliance on external financing. We see that both BHP Billiton and Rio Tinto have a large negative cash-flow regarding financing. This means they are very active in financing activities like share buy-back programs, retiring loans and of course paying dividends. The average dividend yields for BHP Billiton, Rio Tinto and Vale over the past 5 years were respectively 2.76%, 5.11% and 3.95% and they paid dividend on a regular basis. These dividends are needed to keep their stocks interesting for investors. Compared to smaller companies and based on their cash flows mining majors are doing so well because there is more flexibility in their balance sheets and debt gearing is more easily because of their credibility (see 5.1 Debt financing).

	Majors	Mid-Caps	Small-Caps	Juniors
Financial Leverage	2.36	3.39	1.33	1.22
Debt-to-Equity Ratio	0.51	1.90	N/A	N/A

Table 8 - Debt ratios (6-year averages, 2007-2012) (Source: Morningstar.com)

Economy of scale also plays a big role for these mining majors. Bigger mining companies run bigger operations which are more efficient to run than smaller operations due to their larger scale and therefore the costs per ton of ore are lower. This also means that in case of a downfall in ore prices, bigger companies can still mine on and make profit whereas smaller companies cannot.

Looking at Table 9 we see that both BHP and Rio Tinto need approximately 70% of their operational income to cover all CAPEX projects. A little less than 30% is sunk into financing activities. Vale on the other hand uses most of its operational income to fund CAPEX and uses only a very minor percentile for financing activities. Compared to the other two Vale is also relatively heavily influenced by currency exchange rates. This is because it is mainly dependent on the behavior of the Brazilian Real whereas BHP and Rio Tinto act worldwide and the fluctuations in currencies can average out. This dependency on a single currency can pose good and bad things. If the real is weak Vale benefits because the traded iron ore is priced in dollars and most CAPEX is spent in reals so Vale gets more reals for its ore and CAPEX gets relatively cheaper. However, if the real gets stronger opposed to the dollar Vale encounters relative higher capital costs. This is also the reason why many companies invest in different currencies to hedge against volatility on the foreign exchanges.

Cash Sources & Sinks	**BHP Billition**	**Rio Tinto**	**Vale**	**Mean**
CAPEX	-74	-70	-91	-79
Operations	+103	+109	+108	+107
Financing	-26	-29	-2	-19
Exchange rates	0	-1	-4	-2
Cash Surplus	+3	+8	+5	+5

Table 9 - Cash flow sources and sinks for large-cap miners (6-year averages, 2007-2012).

6.2 Mid-Cap Mining Companies

The normalized cash-flows over the past 6-years (2007-2012) of the four mid-cap mining companies in the peer group are shown in Table 10, the mean of these cash-flows is used in Table 7. It can be seen that CAPEX is higher than the operational income for Fortescue and CSN an additional funding is attracted. ArcelorMittal and NLMK on the other hand can fund their capital expenditures from cash generated by their own operations and their cash-flow performance, especially that of ArcelorMittal, is like that of the major mining houses. Both companies have a large 'downstream' steel-making branch that is quite mature and doesn't need heavy investing. Both companies are also self-supporting to a great extend with self-owned iron ore and coal assets. This makes them less vulnerable to market volatility on the supply side.

It is noteworthy that both Fortescue and CSN import a huge surplus of cash from external funds. Keeping this cash passive on the balance seems to be an unnecessary expensive way of storing money but there might be an underlying strategy to it, like big bumping up the credit rating or large capital expenditures in the near future.

Cash Sources & Sinks	**ArcelorMittal**	**Fortescue Metals Group**	**NLMK**	**Cia. Siderúrgica Nacional (CSN)**	**Mean**
CAPEX	-77	-117	-75	-92	-90
Operations	+97	+67	+107	+75	+87
Financing	-30	+57	+1	+73	+25
Exchange rates	-1	+3	-3	+6	+1
Cash Surplus	-4	+26	+4	+55	+20

Table 10 - Cash flow sources and sinks for mid-cap miners (6-year averages, 2007-2012).

6.3 Small-Cap and Junior mining companies

The summary of cash-flows for small-caps and junior companies is given in Table 11. These smaller companies do typically do not generate enough cash from operations to sufficiently fund their CAPEX and for this reason have to attract additional cash. The cash-flows of smaller companies can be very volatile because of the evolutionary path of these young companies. It can be observed from Table 11 that most companies bring in a huge surplus from financing activities but except for Mount Gibson Iron Ore and Gindalbie Metals most of this cash is kept as surplus. This cash is needed to buffer for movements in the market to which smaller companies are lots more vulnerable than majors. As discussed earlier this vulnerability results in junk-bond credit ratings, leaving smaller companies no other resort than to go to junk-bond underwriters or equity investors for raising new capital; both of which expect premium returns on investments (Weijermars, 2011). Next to the disadvantage regarding the economy of scale this makes smaller companies are double disadvantaged in comparison to big mining companies. However, the growth rate of successful juniors and small-caps is typically steep so the potential gain for investors willing to take the risk to invest in junk-bond rated companies is high, but then again, so is the risk.

	Small Caps					Juniors			
Cash Sources & Sinks	**Ferrexpo PLC**	**Atlas Iron**	**Mount Gibson Iron Ore**	**Sundance Resources Ltd.**	**Mean**	**BC Iron Ltd.**	**Gindalbie Metals**	**Iron Ore Holdings**	**Mean**
CAPEX	-163	-85	-96	-106	-112	-88	-94	-129	-104
Operations	+173	+83	+105	-35	+81	+88	+1	+83	+58
Financing	+59	+103	-13	+163	+78	+89	+111	+109	+103
Exchange rates	-8	0	0	0	-2	-1	0	0	0
Cash Surplus	+65	+86	+5	+28	+46	+76	+12	+125	71

Table 11 - Cash flow sources and sinks for small-cap an junior miners (6-year averages, 2007-2012).

The difficulty for juniors to get access to capital markets is also used by majors for their benefit. This is because the struggling –for-cash juniors make an excellent and relatively cheap way to acquire assets without having to do the risky, money- and time-consuming early exploration. The majors make use of

their credibility and scale to supply the needed CAPEX for the operation and the juniors' initial shareholders see their risk rewarded with a takeover premium. However, only a small amount of junior companies get to this stage and most will be bankrupt and forgotten long before.

7. Profitability

Any company's capacity to generate value growth can be comprehensively measured by its return on capital employed (ROCE) (Weijermars, 2012). This is definitely applicable to mining companies too. When looked at the average corporate profitability of the top-4 companies of the peer group (BHP Billiton, Rio Tinto, Vale and ArcelorMittal) in Figure 3 we see that is has seen some sharp bends over the past decade and we also see that a higher iron ore price (Figure 4) doesn't have to mean the profitability goes up. Other factors besides the iron ore price can also be the price of credit or the cost of CAPEX, both get more expensive during financial downturn or a currency crisis.

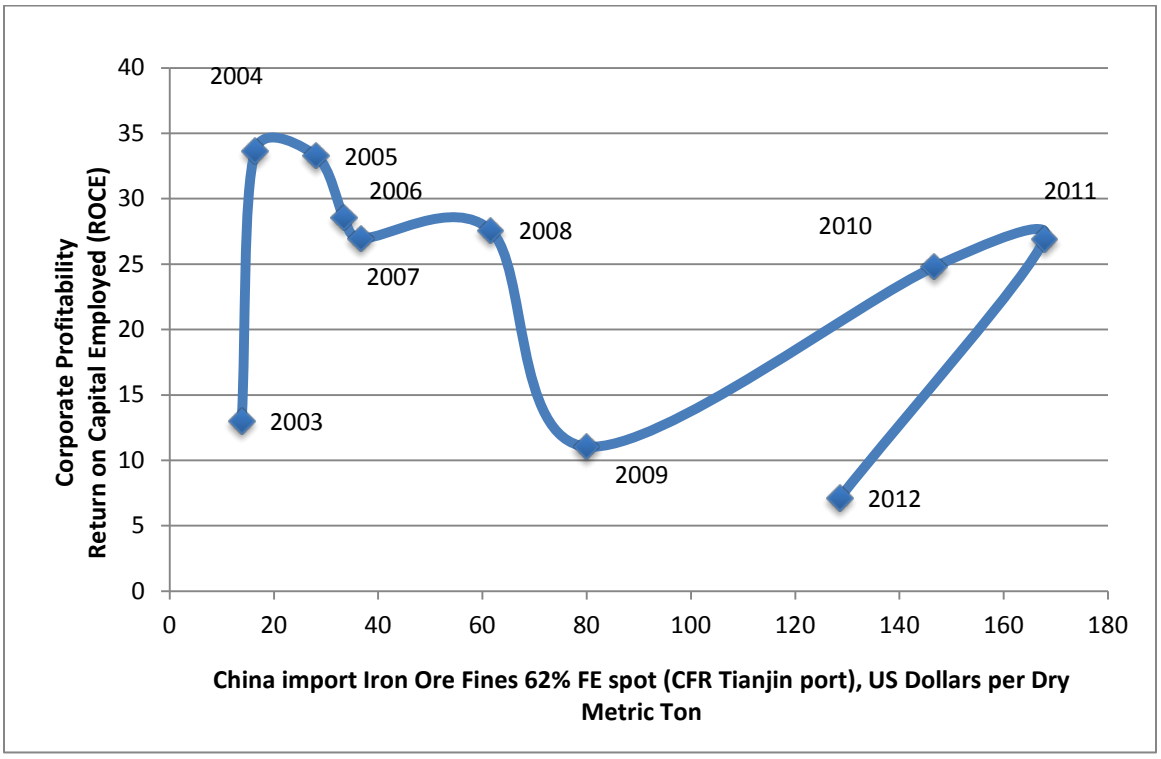


Figure 3 - Peer group profitability (ROCE) versus iron ore price (annual average 2003-2012; gurufocus.com and indexmundi.com)

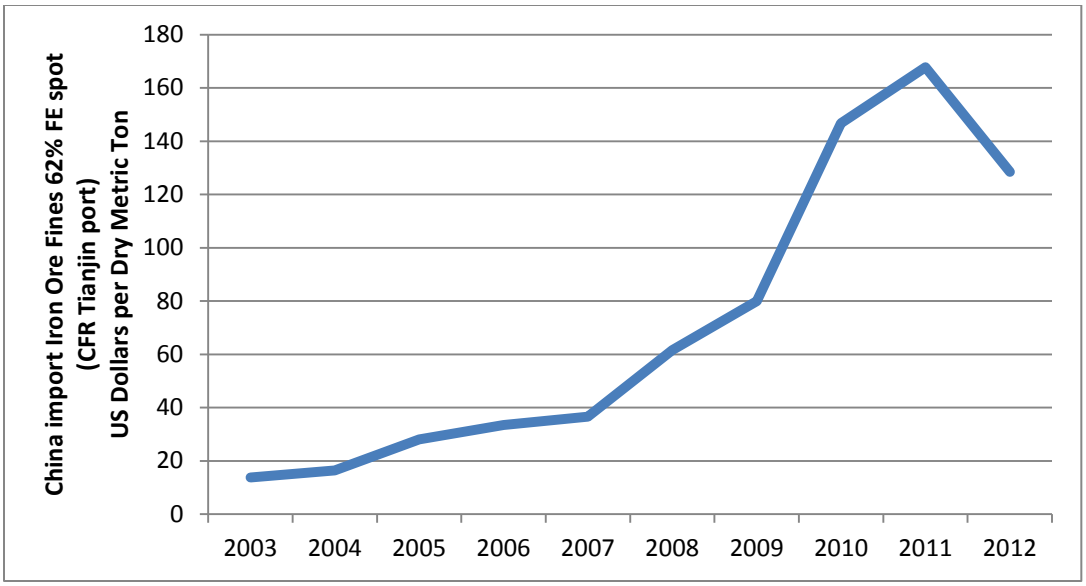


Figure 4 - Iron ore price in the past decade (2003-2012)

The average profitability (ROCE) of these companies over the past decade has been 23%, which is an outstanding performance. The Great Recession resulted in a dent in 2009 but the profitability recovered fast in 2010. When we compare these four companies with other mining majors and with respect to each other we can see that BHP is outperforming all competitors whilst Xstrata and ArcelorMittal are consequently underperforming (Figure 5).

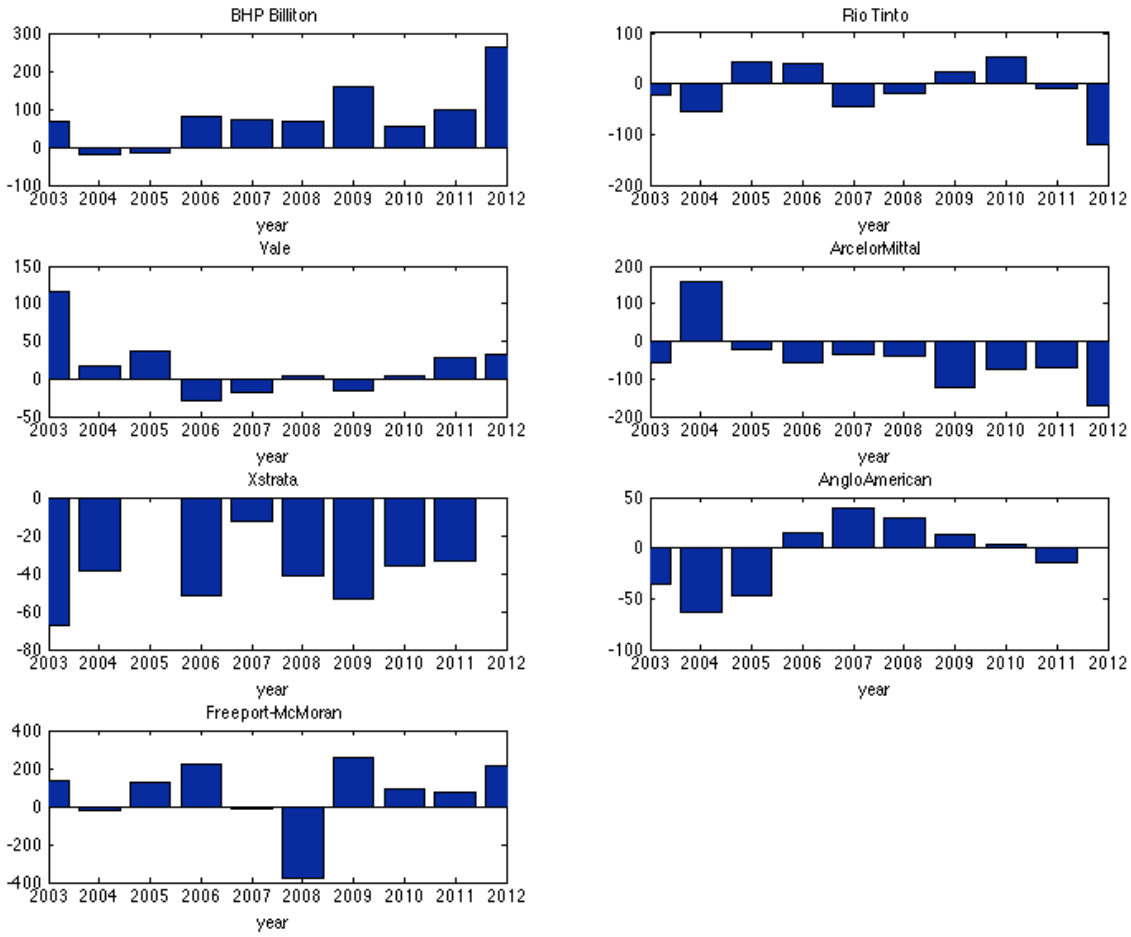


Figure 5 - ROCE from mining majors (including companies outside the peer-group) with respect to each other (source: Gurufocus.com)

Looking into more detail to the peer group panel and using share prices as an indicator we see a considerable spread in performance over the past 6 years (Figure 6), we see that between the majors only BHP hasn't suffered from the crisis. Amongst the only companies we see that only ArcelorMittal, CSN, Gindalbie Metals and for a small bit Iron Ore Holdings have lost considerable value and surprisingly the rest have recovered in a great way from the Great Recession.

	Price January 2007	Price December 2012	Relative difference
BHP Billition	40,99	78,42	91%
Rio Tinto	76,6	66,01	-14%
Vale	33,93	20,96	-38%
ArcelorMittal	47,57	17,47	-63%
Fortescue Metals Group	1,535	4,65	203%
NLMK	N/A	N/A	N/A
Cia. Siderurgica Nacional (CSN)	37,39*	5,9	-84%
Ferrexpo PLC	185**	251,2	36%
Atlas Iron	0,58	1,79	209%
Mount Gibson Iron Ore	0,8	0,83	4%
Sundance Resources Ltd.	0,09	0,37	311%
BC Iron Ltd.	0,68	3,56	424%
Gindalbie Metals	0,63	0,25	-60%
Iron Ore Holdings	0,88	0,76	-14%

* Starting point February 2008
** Starting point June 2007

Figure 6 - Relative difference in share prices over het last 6 years (2007-2012)

8. Comparison to the oil & gas industry

Because the methods used in this research are to a great extend based on methods developed by dr. Weijermars for analysis of the oil & gas industry it obvious to compare the results of this research with the results dr. Weijermars got.

When comparing results we conveniently see that most are alike, the same trends in cash flows and need for external funding from juniors to majors can be observed. This is what one would expect with two markets bearing so many similarities. Both are global markets with a good correlation to the global economy with companies that have more or less the same cost-curve; meaning heavy investments are needed before cash from operations is returned. Both industries act on the same capital markets too.

Next to these similarities there are some remarkable differences too. Starting with the cash-flow analysis; mining companies have a tendency to be quite conservative and keep a lot of free cash in reserve whereas oil companies don't seem to do this. Performance between the two industries also differs although both are producing formidable last numbers. When looking at the average ROCE over the last decade it can be observed that mining companies are better performers, at 23%, than oil companies, 16% (Weijermars, 2012). However the amounts involved in the oil & gas industry are higher than in mining.

9. Conclusions

Cash-flow analysis indicates that mining majors can fully finance their operations and growth projects from internal cash flows. This, combined with an investment-grade credit rating and the advantage of economy of scale makes them robust and able to withstand conjectural declines like the Great Recession in 2008-2009. Although credit cost also rose for these major companies their performance wasn't as affected as it was for smaller companies.

These smaller companies cannot generate enough cash from operations to sufficiently fund their ambition for rapid growth and the associated capital expenditures. This makes them reliant on capital markets, as they must resort to additional financing sources such as debt, equity or asset sales. However, with a smaller liquidity, less profitable projects (higher cost per ton) and less diversified portfolios they are much more vulnerable to market volatility and operational risk.

These results show a trend one would expect from companies ranging from juniors to majors. There is also no reason to believe that the methods for cash-flow analysis developed by dr. Weijermars are not applicable to the mining industry based on the research performed for this thesis. The cash sources and sinks where indicated nicely and fitted the annual statements from the investigated companies. The used algorithms are therefore a good instrument to compare the cash-flows of companies in different market capitalization categories.

Performance-wise it could be clearly seen that based on ROCE, BHP Billiton outperformed the rest of the mining majors over the past decade. Xstrata on the other hand fell consequently behind. That said, the peer-group outperformed the oil & gas majors based on ROCE by an average of 23% versus 16%.

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Appendix 1

The initial company pool of which the peer groups where assembled.
Data as for February 1st 2013 and retrieved from Bloomberg, S&P's, Moody's, Morningstar and Gurufocus.

Company Name	Listing (ticker)	Status	Prime Commodity	Credit Rating S&P Foreign-Long Term	Credit Rating Moodys Foreign Long-Term	Beta	Currency	Market Cap (bn)	Market Cap (bn USD)
BHP Billiton	BHP:US	Public	Diversified	A+	A1	1,48	USD	200,52	200,52
Rio Tinto	RIO:US	Public	Diversified	A-	A3	1,81	USD	112,72	112,72
Vale	VALE:US	Public	Diversified	A-	Baa2	1,47	USD	108,28	108,28
China Shenhua Energy	CSUAY:US	PPP	Coal			0,65	USD	80,23	80,23
Xstrata	XTA:LN	Public	Diversified	BBB+	Baa2	1,78	GBP	34,5	53,41
Suncor	SU:US	Unconventionals	Oil Sands	BBB+	Baa1	1,90	USD	52,62	52,62
Anglo American	AAL:LN	Public	Diversified	BBB+	Baa1	1,61	GBP	27,13	42,00
Coal India	COAL:IN	PPP	Coal				INR	2206,94	40,85
Norilsk	NILSY:US	Public	Nickel	BBB-	Baa2	1,70	USD	38,32	38,32
PotashCorp	POT:US	Public	Potassium	A-	Baa1	1,05	USD	36,86	36,86
Freeport-McMoRan	FCX:US	Public	Copper, Gold	BBB	Baa3	1,93	USD	33,92	33,92
Southern Copper Corp	SCCO:US	Public	Copper	BBB	Baa2	1,53	USD	33,69	33,69
GoldCorp	GG:US	Public	Gold	BBB+	Baa2	0,54	USD	29,15	29,15
ArcelorMittal	MT:US	Public	Iron	BB+	Ba1	2,11	USD	29,1	29,10
Codelco		PPP	Copper	A	A1		USD		27,50
Barrick	ABX:US	Public	Gold	BBB+	Baa1	0,45	USD	23,24	23,24
Newmont	NEM:US	Public	Gold	BBB+	Baa1	0,34	USD	21,77	21,77
Teck Resources	TCK:US	Public	Diversified	BBB	Baa2	3,39	USD	21,66	21,66
Newcrest Mining LTD	NCM:AU	Public	Gold	BBB+	Baa2	0,86	AUD	17,883	18,49
Antofagasta PLC	ANTO:LN	Public	Copper			1,58	GBP	11,1	17,18
China Coal Energy	CCOZY:US	PPP	Coal			1,14	USD	16,72	16,72
Fortescue Metals Group	FMG:AU	Public	Iron	BB-	Ba3	1,78	AUD	15,382	15,90
NLMK	NLMK:LI	Public	Iron	BBB-	Baa3		USD	12,68	12,68
Jianxi Copper	600362:CH	PPP	Copper				CNY	78,74	12,61
Yanzhou Coal Mining Co	YZC:US	Public	Coal	BBB-	Baa3	2,38	USD	12,58	12,58
Anglo Gold Ashanti	AU:US	Public	Gold	BBB-	Baa2	0,55	USD	11,28	11,28
First QuantumMinerals	FQVLF:US	Public	Copper	B+	Ba3		USD	9,81	9,81
Alcoa	AA:US	Public	Aluminium	BBB-	Baa3	2,04	USD	9,6	9,60
Gold Fields	GFI:US	Public	Gold	BB+	Ba1	0,56	USD	8,84	8,84
Randgold	GOLD:US	Public	Gold			0,46	USD	8,81	8,81

Cia. Siderurgica Nacional	CSNA3:BZ	PPP	Iron	BBB-	Ba1	1,85	BRL	15,731	8,01
Turquoise Hill Resources	TRQ:US	Public	Copper			1,74	USD	7,7	7,70
Alrosa	ALRS:RM	PPP	Diamonds	BB-	Ba3		RUB	222,201	7,23
Sterlite Industries India	SLT:US	Public	Copper			2,32	USD	6,864	6,86
Peabody Energy	BTU:US	Public	Coal	BB+	Ba1	1,38	USD	6,73	6,73
Vedanta Resources	VED:LN	Public	Diversified	BB	Ba1	1,73	GBP	3,331	5,16
Boliden	BOL:SS	Publc	Diversified			0,86	SEK	32,493	5,13
African Rainbow Minerals	ARI:SJ	Public	Diversified			1,25	ZAR	44,46	5,05
New Gold Inc.	NGD:CN	Public	Gold	BB-	B1	0,60	CAD	4,76	4,75
IAMGOLD	IAG:US	Public	Gold	BB-	Ba3	0,45	USD	3,15	3,15
Ferrexpo PLC	FXPO:LN	Public	Iron	B	B3	1,54	GBP	1,526	2,36
Compass Minerals	CMP:US	Public	Industrial minerals	BB+	Ba1	0,42	USD	2,4	2,40
National Aluminium Co	NACL:IN	PPP	Aluminium				INR	123,32	2,28
Coeur d'Alene Mines Corp.	CDE:US	Public	Gold / Silver	B+	B2	1,75	USD	2,05	2,05
Alpha Natural Resources	ANR:US	Public	Coal	B+	B1	1,69	USD	1,92	1,92
Atlas Iron	AGO:AU	Public	Iron	B+	B2	1,48	AUD	1,519	1,57
Novagold Resources	NG:CN	Public	Gold			1,07	CAD	1,42	1,42
Molycorp	MCP:US	Public	REE	CCC+	Caa1	1,57	USD	1,295	1,30
Sandstorm Gold	SAND:US	Public	Gold				USD	1,05	1,05
Mount Gibson Iron Ore	MGX:AU	Public	Iron			1,65	AUD	0,954	0,99
Sundance Resources Ltd.	SDL:AU	Public	Iron			1,43	AUD	0,922	0,95
Taseko Mines Ltd.	TKO:CN	Public	Copper	B	B3	1,67	CAD	0,622	0,62
Coalspur Mines	CPL:AU	Public	Coal			1,58	AUD	0,495	0,51
Iberian Minerals Corp	IZN:CN	Public	Copper	B+		1,27	CAD	0,507	0,51
BC Iron Ltd.	BCI:AU	Public	Iron			1,25	AUD	0,447	0,46
Chesapeake Gold Corp	CKG:CN	Public	Gold			1,10	CAD	0,418	0,42
Aurcana Corp	AUN:CN	Public	Silver			1,56	CAD	0,406	0,41
Gindalbie Metals	GBG:AU	Public	Iron			1,63	AUD	0,386	0,40
Lumina Copper Corp	LCC:CN	Public	Copper			1,08	CAD	0,379	0,38
Copper Fox Metals	CUU:CN	Public	Copper, Gold			1,37	CAD	0,338	0,34
Copper Mountain Mining	CUM:CN	Public	Copper			1,26	CAD	0,334	0,33
Bear Creek Mining	BCM:CN	Public	Silver			1,05	CAD	0,303	0,30
Guildford Coal Ltd.	GUF:AU	Public	Coal			1,55	AUD	0,224	0,23
Iron Ore Holdings	IOH:AU	Public	Iron			1,05	AUD	0,152	0,16
Nucoal Resources	NCR:AU	Public	Coal			0,41	AUD	0,142	0,15
Nautilus Minerals	NUS:CN	Unconventionals	Copper / Gold			1,04	CAD	0,101	0,10
Weatherly International PLC	WTI:LN	Public	Copper			0,67	GBP	0,029	0,04
Stanmore Coal Ltd.	SMR:AU	Public	Coal			1,21	AUD	0,039	0,04

Appendix 2

ROCE for major mining companies
(source: gurufocus.com)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BHP Billiton	17,2	21,2	25,6	47,8	49,8	44,7	25,8	35,1	47,4	25,8
Rio Tinto	8,1	12,3	42,6	36,7	15,4	21,7	12,4	34,7	21,9	-1,5
Vale	22,3	31,3	41,1	18,8	23,4	27,6	8,5	24,0	30,9	9,4
ArcelorMittal	4,4	69,8	23,8	10,9	19,3	16,3	-2,5	5,4	7,5	-5,2
Xstrata	3,4	16,4	29,8	12,7	25,1	15,8	4,7	14,7	16,1	NA
AngloAmerican	6,6	10	16	30,3	40,0	34,6	11,4	23,7	20,5	NA
Freeport-McMoRan	24,1	20,2	67,4	84,7	25,1	-73,6	36,2	43,9	40,8	22,2

Appendix 3

Financial leverage for the iron ore peer group over the past 6 years.
(source: Morningstar.com)

	2007	2008	2009	2010	2011	2012
BHP Billiton	1,96	1,98	1,97	1,83	1,81	1,96
Rio Tinto	4,09	4,34	2,22	1,93	2,28	2,51
Vale	2,31	2,43	2,17	2,21	2,11	2,29
ArcelorMittal	2,36	2,41	2,09	2,10	2,15	2,22
Fortescue Metals Group	7,43	N/A	5,18	3,59	3,54	4,00
NLMK	1,44	1,61	1,45	1,45	1,71	1,66
Cia. Siderurgica Nacional	4,49	4,74	4,55	4,95	5,87	5,72
Ferrexpo PLC	1,48	1,87	1,74	1,72	1,79	1,75
Atlas Iron	1,14	1,07	1,13	1,08	1,09	1,21
Mount Gibson Iron Ore	1,52	1,50	1,43	1,40	1,33	1,40
Sundance Resources Ltd.	1,02	1,06	1,02	1,06	1,05	1,06
BC Iron Ltd.	1,04	1,06	1,03	1,41	1,54	1,54
Gindalbie Metals	1,13	1,11	1,57	1,12	1,89	1,00
Iron Ore Holdings	1,05	1,01	1,05	1,22	1,06	1,11