To: The McIntire Investment Institute Managers  
From: Benjamin Andrew  
Subject: Long Position – Companhia Vale do Rio Doce  
Date: November 19, 2007  

FINANCIAL INFORMATION & COMPARISON

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2005</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>19,651</td>
<td>12,792</td>
<td>8,066</td>
</tr>
<tr>
<td>% Change</td>
<td>53.6%</td>
<td>58.6%</td>
<td>50.8%</td>
</tr>
<tr>
<td>EBITDA</td>
<td>9,580</td>
<td>6,051</td>
<td>3,522</td>
</tr>
<tr>
<td>% Margin</td>
<td>48.8%</td>
<td>47.3%</td>
<td>43.7%</td>
</tr>
<tr>
<td>EPS</td>
<td>0.47</td>
<td>1.02</td>
<td>1.37</td>
</tr>
<tr>
<td>% Change</td>
<td>34.3%</td>
<td>117.4%</td>
<td>41.7%</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>16.6%</td>
<td>24.6%</td>
<td>16.1%</td>
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<tr>
<td>Return on Equity</td>
<td>43%</td>
<td>50.5%</td>
<td>37.4%</td>
</tr>
<tr>
<td>CFFO</td>
<td>4,965</td>
<td>4,417</td>
<td>2,687</td>
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<thead>
<tr>
<th></th>
<th>CVRD</th>
<th>Rio Tinto</th>
<th>BHP Billiton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Price (11/23/07)</td>
<td>$32.56</td>
<td>$436.05</td>
<td>$72.82</td>
</tr>
<tr>
<td>Shares Outstanding</td>
<td>4.83B</td>
<td>321.13M</td>
<td>2.84B</td>
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<tr>
<td>Market Cap.</td>
<td>157.3B</td>
<td>140.25B</td>
<td>207.02B</td>
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<tr>
<td>Enterprise Value</td>
<td>177.84B</td>
<td>142.63B</td>
<td>224.29B</td>
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<tr>
<td>52-week range</td>
<td>$12.73-38.72</td>
<td>$192.86-484.21</td>
<td>$36.37-87.43</td>
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<tr>
<td>Float</td>
<td>4.83B</td>
<td>N/A</td>
<td>2.84B</td>
</tr>
<tr>
<td>Short Interest</td>
<td>32.3M</td>
<td>684.84K</td>
<td>4.77M</td>
</tr>
<tr>
<td>Ave. Daily Volume</td>
<td>25,130,000</td>
<td>781,000</td>
<td>6,200,000</td>
</tr>
<tr>
<td>Price/Earnings</td>
<td>14.55</td>
<td>20.76</td>
<td>15.90</td>
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<tr>
<td>PEG</td>
<td>0.76</td>
<td>N/A</td>
<td>1.45</td>
</tr>
<tr>
<td>EPS</td>
<td>2.23</td>
<td>21.00</td>
<td>4.58</td>
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FIGURES
Companhia Vale do Rio Doce is a global diversified metals and mining company with operations in 13 Brazilian states and more than 30 countries. The company was founded in June 1942, and was originally operated by the Brazilian Federal Government out of Itibira, Brazil. During 1997 the company was privatized as a consortium of Brazilian companies successfully bid for its control and established new headquarters in Rio de Janeiro, Brazil. Over the past decade CVRD has worked diligently towards its corporate mission and has established itself as a world leader in its field. Today the company is the world’s largest producer of iron ore and pellets, it holds the world’s largest nickel reserves, it has successfully penetrated new markets with strategic investments, and it has extended its reach across the globe (see below for current locations).

![Map of CVRD's operations around the world](image)

The company’s main business segments include:

- **Mining**: Mineral research, iron ore and pellets, manganese and ferro-alloys, nickel, copper, coal, potassium, kaolin, bauxite mining and alumina refining, primary aluminum production

- **Logistics**: Integrated railway transport, ports, terminals

- **Energy**: Electric power

**INVESTMENT OVERVIEW**

CVRD is a strong company that has positioned itself well for future profitability and sustainable development. It has simultaneously enhanced its traditional businesses and expanded into new, promising markets. I believe that CVRD would provide MII with international exposure to a company that has increasingly become a growth story.

**INVESTMENT THESIS**
(I) Continued Increases in Global Steel Production

Through its continued expansion into international markets, CVRD has positioned itself well to take advantage of the world’s booming steel industry. Over the years the company has precociously recognized the substantial demand for steel products in emerging markets and has moved to target these markets in its service lines. In aggressively pursuing this internationalization, CVRD’s management has taken steps to organically grow the mining of iron ore, pellets, and nickel (three key ingredients in industrial steel products) and has also capitalized on several key acquisition opportunities. Efforts to augment the company’s mineral reserves through these acquisitions are now being complemented with investments directed towards increasing operating efficiency. Before acknowledging these control decision benefits, however, it is necessary to analyze the health of the industries which underlie CVRD’s business.

Industrial steel and stainless steel markets have been some of the most active areas in modern global industry. This activity has been largely determined by the ongoing industrialization of developing economies. More specifically, it has been driven by the surge in demand for the steel products which are necessary for their commercialized ventures. In order to assess the outlook for such ventures, it is necessary to examine some of the fundamental changes taking place in the developing world.

Emerging markets’ steel consumption is not determined by their surface demand figures, but rather by their institutional progression. The particular drivers behind the demand, and how these drivers fit into the economies that CVRD serves therefore provides a better forward-looking estimate for the business of mining iron ore and nickel. The first driver to note is that of infrastructural development. This is particularly relevant to China, CVRD’s largest service line. In the past decade the Chinese government has designated an increasing proportion of fiscal expenditures to its economic infrastructure. Multiple forms of transportation, electricity supply, piped gas, telecommunications, urban water supply, and sanitation are only a few of the areas in which these capital expenditures have been directed. Furthermore, at the heart of this development has been a rapid increase in the urbanization of the Chinese people. An urbanization rate of over 40% has not only influenced the country’s policymakers to ramp up spending on transportation systems, but it has also deepened the pockets of those who are migrating to the cities. Higher wages and increased standards of living have driven the greater Chinese population to clamor for cars, condominiums, and other steel-based products. Vehicle sales have risen by 20% already in 2007 and their manufacturing is expected to increase more than 25% through 2009, heavy machinery development is on pace to match 15% growth through 2010, and refrigerator production should expand between 8 and 10% before 2009. It is obvious that China’s steel consumption should continue to run apace for at least the next several years.

An interesting method of comparing this utilization with historic steel consumption of other industrialized countries is depicted below. During their industrializations, virtually all developed nations proportionately increased their steel consumption with rises in per
capita GDP. These increases seemed to level off at somewhere in the range of $16,000 to $20,000 per capita. Fortunately for CVRD, China has yet even to reach $10,000 per capita.

(II) Favorable Iron Ore Price Trends in the Short Term (2-3 years)

Overall, the recent pricing environment in commodity markets has been quite favorable in the eyes of suppliers. Surges in demand for mineral-based products (particularly those related to iron ore, nickel, and copper) have created shortages in many of the main markets. In accord with the fundamental economic relationship between demand and supply, these shortages have lead to numerous price increases over the past several years. However, what are important here are not necessarily these historical trends, but rather
forward-looking pricing estimates. The prices that CVRD is able to negotiate in its contracts are surely important determinants of its future operating profitability.

To obtain any sense of short-term price trends, it necessary to compare industry demand with company production figures. In the case of iron ore, data from a few large distributors is sufficient since over 80% of the world’s supply is provided by three companies. Fortunately, during recent industry conferences in China and Australia, new production targets for iron ore were released by BHP (300 Mta), Rio Tinto (320 Mta), and FMG (200 Mta). With these new disclosures, it is possible to construct a preliminary supply-demand model for iron over the next several years.

In my particular analysis, I chose to average several demand forecasts in order to alleviate the possibility of bias from any one source. What I found was that, on average, demand for seaborne iron ore will continue to outstrip supply (conservatively) through 2009, but more likely through 2010. Even after introducing some sensitivity analysis in this model, it seemed unlikely that supply would trend above demand for at least the next three years. With these assumptions in place (and after consulting several experts), I found it safe to consider price increases of 25-35% in 2008 and 10-20% in 2009 (Perkins). Though the percentage increases should eventually retreat to zero, I don’t believe the market is currently anticipating this strength in the short term pricing environment.

(III) Formidable Investment Plan

Last month at a conference in New York, CVRD’s management announced a record-breaking investment schedule. The strategic plan is the largest ever for a mining company and involves the distribution of $59 billion over the course of the next five years (of which at least $35 billion will be designated to internal growth projects). This substantial push towards organic development of CVRD’s businesses not only demonstrates management’s commitment to global fundamentals for commodity markets, but also indicates a confidence in the protracted strength of the mining cycle. Moreover, it also displays the various growth options that CVRD has going forward, despite all the growth it has posted since its privatization ten years ago.

Specifically included in this growth plan is a capital expenditure commitment of $11 billion in 2008. For next year, executives have decided to ramp up company spending on logistics services, electricity, and ferrous minerals. The transport and infrastructure portions of these investments are particularly attractive considering the logistics cost inflation that miners have experienced in recent years. Heavy expenditures in these areas should allow CVRD to continue moving functions in-house (and away from third parties) and should lead to lower service and maintenance costs in the shipment of all products. This in turn, is likely to contribute to the company’s already expanding margins.

In addition to creating cost saving opportunities, CVRD’s investments are aimed at enhancing an already robust project pipeline. Production capacity is being expanded in all of its mining areas in order to facilitate increases in world market share. Some specific developments include:
Iron Ore – Carajas Seras Sul (+90Mtpy expected), Maquine-Bau (+24Mtpy expected), Oman pelletising plant (+9Mtpy expected), Tubarao VIII pelletising plant (+6Mtpp expected).

Nickel – Voisey’s Bay expansion (50Ktpy expected), Totten (+10Ktpy expected).

Copper – Salobo (+100Ktpy expected), Papomono (+20Ktpy expected), Totten (+12Ktpy expected).

(IV) Strategic Expansion into the Coal Business

The newest growth platform for CVRD undoubtedly lies in the global coal industry. During the first half of 2007 the company completed its acquisition of AMCI Holdings Australia, a privately held company which owned and operated Australian coal assets. These assets have provided CVRD with a production capacity of 8-10 million tons of coal. It is important to note that this capacity is predominantly related to the mining of coking coal (as opposed to steaming coal). While coking coal is a primary ingredient for steelmaking, steaming coal is used only in the creation of energy at power plants. CVRD’s coal ventures therefore seem to be positioning it extremely well (in terms of location and service) to penetrate the two most important coking coal markets: China and India. Quite favorably, China has become a net importer of coal for the first time this year, while India has been increasing its imports steadily over the last 20 years. Moreover, there are no limits on emissions in either of these countries and new coal-burning plants continue to emerge each week. Overall, the coal industry is set to grow by 2.5% a year until 2030 – faster than demand for oil or natural gas.

In addition, CVRD is working on other coal projects that will help drive its marketing and diversification in this area. The projects are located in Moatize, Mozambique, Belvedere, Australia, and Mainland China (Longyu and Yankuang). These developments should not only supplement the AMCI business, but should also provide opportunities to branch out into new markets.

RISKS

With such a diverse set of businesses and locations, CVRD exhibits certain risks characteristics that should be assessed by any potential investor. As such, in evaluating CVRD as a long position for MII’s portfolio, managers should consider the following points:

(I) Dependence on the Global Steel Industry; lower-than-expected increases in iron ore/nickel prices and weaker demand from key markets could adversely affect the company.

A large portion of CVRD’s revenues are generated through the production and commercialization of iron ore and nickel products. In the last several quarters, iron ore
and nickel sales alone have comprised roughly 55% of the company’s gross revenues. To some extent this demonstrates CVRD’s dependence upon the vitality of the world’s industrial steel and stainless steel industries. Considering that demand in these industries is cyclical in nature, any number of factors which trigger an overall economic downturn (and thus a decrease in steel demand) could adversely impact sales volume and/or contract prices. However, though continued capacity expansion in these areas can never be assured, I believe the first two thesis points above accurately reflect the fact that conditions in the steel markets will remain favorable for CVRD through 2010.

(II) Risk Stemming from Emerging Market Operations

As is the case with any company which ventures into developing economies, CVRD faces various political, economic, regulatory, and social risks associated with its international operations. Political regime changes, shifts in economic policy, increased regulatory burdens, and social tensions may all have material adverse effects on the company’s business. Additionally, volatility in any of the emerging markets which it serves may also undermine investor confidence and lead to a depreciation in the value of the stock. This exposure can also be seen in the face of foreign exchange risk. As 85% of revenue and 45% of costs are dollar-linked, a sharp revaluation of the Brazilian Real or the Canadian Dollar could lead to a compression of CVRD’s margins.

(III) Potential for Complications in the Implementation of Investment Projects

As described above, CVRD plans to invest heavily to further increase its production capacity and logistics capabilities, and to expand the scope of the minerals it produces. The projects involved in this comprehensive expansion are subject to various cost-related and market-sensitive risks. In terms of costs, there are two potential concerns: costs for equipment and services necessary to build and operate the investment projects could be higher than anticipated, and permits/licenses required for their initiation may be more expensive than projected or may take longer to obtain than expected. Additionally, it is important to note that the licenses required for CVRD’s mining operations are often environmental in nature. As such, more stringent environmental oversight could lead to inflationary cost pressure. Aside from the direct cost pressures, market conditions at the time of project completion may not be in line with company forecasts. In such cases, profitability of the investment projects undertaken is uncertain.

(IV) High Capital Expenditures in Logistical Services Create the Potential for Overhang in Economic Downturn

While in the short term (two-three years out) the logistics capital expenditures compliment the burgeoning mineral and agriculture demand, an eventual cooling of these markets could leave the company with a fixed cost overhang. The Brazilian agriculture and steel industries are the primary drivers for the logistics side of CVRD’s business. Any substantial decrease in demand for either of these products could detract from the company’s profitability.
(V) Integration of Customers

A small, but important risk lies in the potential integration of CVRD’s steelmaking customers. Consolidation, mergers, and vertical integration of steelmaking making companies can lead to backward integration in terms of iron ore and nickel mining. This in turn, could place downward pressure on the overall demand for CVRD’s chief products and services.

VALUE ADDED RESEARCH

(I) Bruce Reynolds – Chair of Undergraduate Studies, UVa Economics Department

As a student in his “Economics of China” course, I came to realize that there aren’t many people who are as in touch with contemporary economic conditions in the Asian markets as Professor Reynolds. In light of his relevant background, I spoke with him in regards to the outlook for continued growth in Asian infrastructural development and the changing rural-to-urban demographics in China. His comments reflected the fact that migration from rural inland China to the country’s urban centers has only been increasing in recent years. He seemed to think that this phenomenon, combined with the catalytic effect that the 2008 Beijing Olympics has had on structural development in China, will propel China’s steel demand for at least the next several years. In his words, “steel demand in China is by no means slowing down.”

(II) Michael Aked – UVIMCO

Mr. Aked is involved in the management of UVa’s endowment and acts as a portfolio manager specializing in the mining industry. His comments spanned almost all the relevant areas of CVRD’s business; he was able to provide some excellent analysis on the long term demand for nickel and iron, he noted the trends which commodity prices are likely to follow over the next five years, he shed light on the coal business in Australia, and he spoke of the benefits of developing in-house logistics services for mining companies.

Comments: As Mr. Aked is a native of Australia, he was able to expound upon his country’s coal business. He was the one who indicated the important difference between coking coal and steaming coal, and how each applies to different markets. In terms of steel demand projections, Mr. Aked confirmed that per capita GDP analysis is the most accurate method for long term estimates. He thought demand should remain strong through 2010 and that this should justify the elevated commodity prices. However, he did note that as supply catches up with demand, prices should return to historical levels. Also, in commenting on CVRD’s logistical expansion, Mr. Aked asserted that such investment would certainly be a short term boon for the company. Apparently many of the mining companies experienced severe cost inflation in shipping their products last year. Shedding dependence on third-party providers should not only help CVRD control its
costs, but should also mitigate the risk of delays and disruptions in servicing its customers.

(III) Marcus Thieme – CVRD Australia

I emailed Mr. Thieme in hopes of getting an inside perspective on the progress of CVRD’s new coal business. He seemed quite honest in his response and mentioned that his office is working hard to attract new customers in the Asian markets. Apparently CVRD already has two direct investments in Chinese coal projects (anthracite coal in Longyu and coking coal in Yankuang). The Australian team is currently utilizing the relationships created from these investments to branch out into new regions. Overall, Mr. Thieme’s comments seemed to substantiate the fact that over the course of the past year coal sales have come to represent 1% of CVRD’s gross revenues (as opposed to 0% in the second quarter of 2006).

(IV) Jose Carlos Martins – President of Ferrous Minerals, CVRD

In attempting to gather unbiased data for projections of iron ore demand and prices, I contacted several different sources. One surprising response came from the president of CVRD’s ferrous minerals division. He wasn’t able to provide any personal insight, but he did offer several charts which traced historical demand and supply figures for seaborne iron ore. These were used as one set of numbers in my calculation of the average forecasts.

(V) John Gould – Iron Ore Division, BHP Billiton

The second source from which I was able to gather primary iron ore demand and supply data was a representative of the iron ore division at BHP Billiton. Mr. Gould not only provided figures for iron ore sales and demand, but also the rates at which demand has been outstripping supply in the last several years.

(VI) Dwight Perkins – Economics Professor, Harvard University

Although I was unable to speak with Professor Perkins personally, he did offer some valuable information via email. As a third and final provider of economic data, Professor Perkins forwarded me data he had used in a recent paper on the future of China’s economic growth. As was the case with the other sources, I was able to get projected figures for global iron demand (though it was hidden amongst data specific to the Chinese economy).

(VI) Aaron Howell – Howell Farms

I emailed a number of firms engaged in Brazilian agriculture in an attempt to get some information on the efficiency and reliability of CVRD’s logistical services. Fortunately I received a response from an Indiana-based farming company which owns 15,000 farming acres in western Bahia, Brazil. Mr. Howell seemed quite happy with the railroad service