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Valuing distressed privately held companies in Brazil that export to Europe and the US: The case of a furniture manufacturing company

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International School of Management Paris

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Brazil that export to Europe and the US: The case
of a furniture manufacturing company**

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Valuing distressed privately held companies in Brazil that export to Europe and the US: The case of a furniture manufacturing company

ABSTRACT

This paper explains the valuing of distressed privately held companies in Brazil based on the acquisition process of a furniture manufacturing company that exports 90 percent of its furniture to Europe and the US. The three valuation approaches--discounted cash-flow valuation, relative valuation and contingent claims valuation--are described, as are the shortcomings of each approach in the valuation of distressed privately held companies. The discounted cash-flow approach is detailed for the valuation of a distressed privately held company in Brazil that exports to Europe and the US.

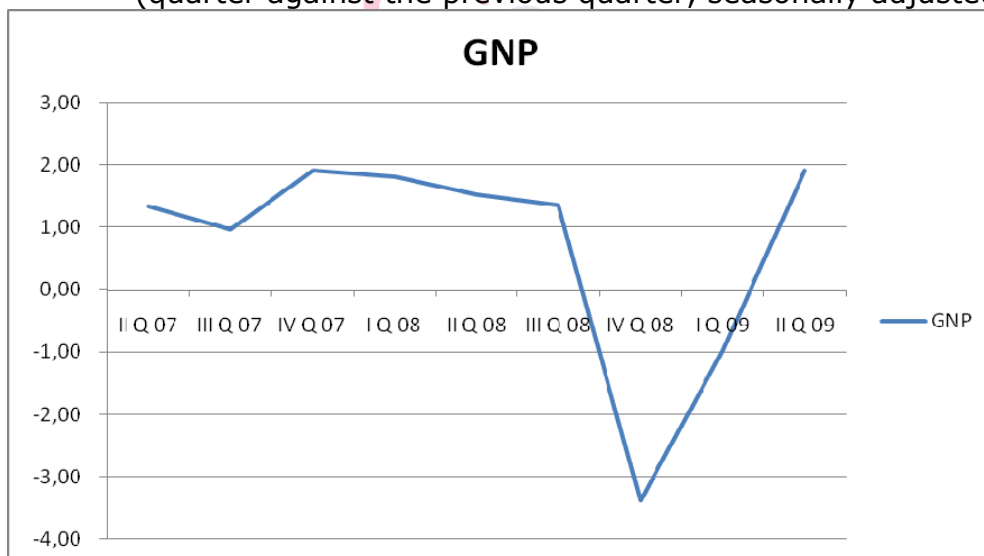
Keywords: valuing distressed companies, valuing privately held companies, valuing companies in Brazil that export to Europe and the US, determining the average cost of capital, determining the weighted cost of capital for companies in Brazil that export to Europe and the US


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Introduction

The financial crisis of 2007-9, the economic recession and the appreciation of the Brazilian real in relation to the dollar (or depreciation of the dollar in relation to the real) have negatively affected many Brazilian exporting manufacturing companies. They saw an abrupt decrease in demand for their products in the US and European markets because of the global economic recession (Figure 1) and at the same time lost competitiveness to Chinese or other Asian manufacturers due to the appreciation of the real (Figure 2). The purpose of this paper is to describe the acquisition process and the valuation approach used for one of these companies.

Figure 1. GNP growth of Brazil
(quarter against the previous quarter, seasonally adjusted)

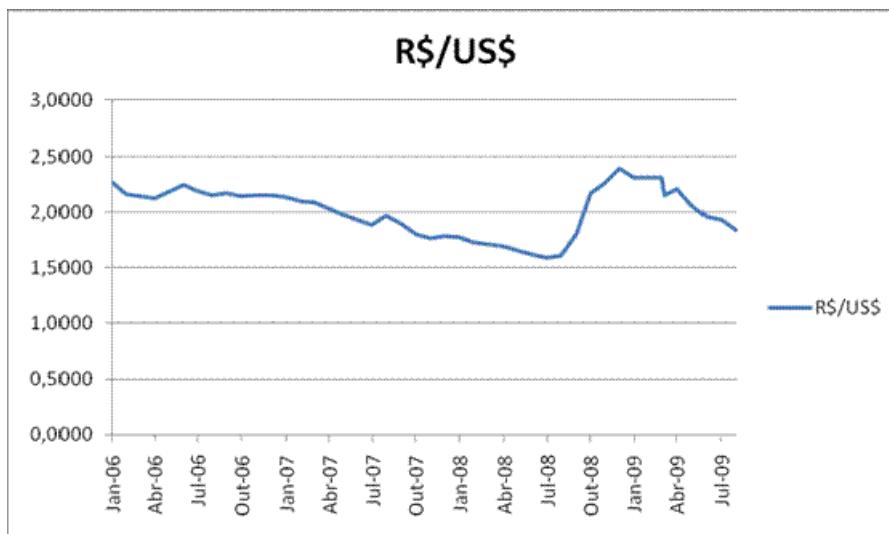


Source: <http://www.bcb.gov.br/?INDICATORS>

The target company, located in Brazil, was a privately held exporter of pine furniture to the US and Europe that was facing financial distress. The company was privately held and had incurred a large debt to finance the growth of its production capacity. However, the demand for its pine furniture from clients in the US like Pier 1 had decreased dramatically starting in 2007 due to the global economic recession. The remaining export

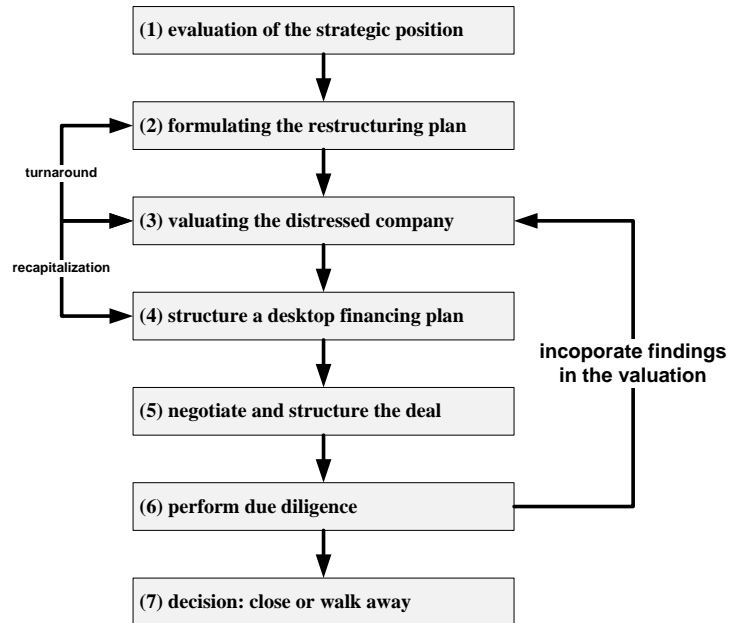
contracts, mainly to Europe, were fixed in dollars, which had depreciated in relation to the real. Because the company's costs were in reals, these contracts had to be honored at a loss. The possibility of raising prices to European clients to compensate for the higher costs due to the currency appreciation seemed difficult because of competition from China and especially Vietnam.

Figure 2. Appreciation of the real in relation to the dollar



Source: http://fgvdados.fgv.br/dsp_gratuitas.asp

The acquisition process of the privately held target company was adapted from the acquisition flow diagram proposed by DePamphilis (2003) to the specific situation of the target company and the way the sellers proposed to conduct the sale. The process was structured into seven phases: (a) evaluation of the strategic position, (b) formulating the restructuring plan, (c) valuing the distressed company, (d) structuring the desktop financing plan, (e) negotiating and structuring the deal, (f) performing due diligence, and (g) making the decision to close or walk away. Each of these seven phases (Figure 3) and the interactions among them will be described in the sequence of this paper.

Figure 3. Acquisition process of the target company

Source: Adapted to the particular acquisition from DePamphilis (2003, p. 171)

Evaluating the Strategic Position

The opportunity to acquire the target company was the direct consequence of the economic global crisis of 2007-9 and the poor risk management of the present owners. The explosive demand for pine furniture in the US market due to the housing boom in 2005-6 and the devaluation of the real against the dollar in 2008 increased the competitiveness of Brazilian exports against Chinese and other Asian competitors. Motivated by this apparently favorable scenario, the owners of the target company decided in the second half of 2008 to expand and modernize their production capacity to supply the expected growth in demand, taking advantage of declining interest rates to finance the investment.

The investment in expansion and modernization of the manufacturing plant, as well as the hiring of personnel and their training, were concluded in the first half of 2009. The timing of the investment, however, was particularly unfortunate. The economic global crisis that had exploded after the September 14 bankruptcy of Lehman Brothers provoked an immediate worldwide contraction in demand for furniture exported from Brazil as well

as the slow devaluation of the dollar against the real starting in the first half of 2009.

The consequence was that the target company had a substantial overcapacity in equipment and personnel due to the worldwide recession, along with a substantial debt from the investments made into building this surplus. The incurred debt was guaranteed by the personal wealth of the owners of the company. Additionally, because the production cost in reals was now higher in dollars (due to the devaluation of the dollar in relation to the real), the export contracts made during the second half of 2008 and first months of 2009 that were priced in dollars had to be honored at a loss. This situation generated monthly losses to the company, which drove the owners to put the company up for sale. They especially feared the possibility of a "concordata" (Chapter 11 in Brazil) and the prospect of losing their personal wealth, which they had given as collateral to the banks.

To evaluate the strategic position of the target company, the following question had to be answered: Will the company be able to increase its export prices and compete against Chinese and other Asian furniture manufacturers when the recession ends? To answer this question requires an evaluation of the competitive situation of Brazilian pine furniture manufacturers in US and European markets against Chinese and other Asian manufacturers.

Using Porter's (1990) model of the competitive advantage of nations, I concluded that Brazilian pine furniture is competitive in two basic factors of production: the south cone region of Latin America has one of the fastest growth rates in the world for pine trees, and many of the plantations are FSC (Forestry Stewardship Council) certified. The average pine trees in southern Brazil, where the target company is located, grow five times faster than those in the northern hemisphere. This gives Brazilian pine a substantial cost advantage over northern hemisphere pine. The target company has its own timberland, which guarantees its supply of pine for the manufacturing of furniture. The company's timberland is FSC certified,

which has become a basic requirement for any US or European client that wishes to be seen as socially responsible.

Chinese and other Asian furniture manufacturers, on the other hand, lack sufficient domestic supply of pine with FSC certification due to the slow growth of the trees, so they must depend on imports from Latin America or New Zealand. This increases the cost of the wood they need to manufacture pine furniture. Thus most Asian furniture is made of native timber that is not FSC certified and not sold by socially responsible large furniture retailers like IKEA or Pier 1.

Initial contact with one of the largest worldwide furniture retailers confirmed the basic production advantages of the Brazilian pine furniture manufactures and the interest of this retailer in buying most of the pine furniture production from the target company. The retailer justified its interest in that, as a company engaged in promoting sustainable development, it has a preference for pine furniture from the target company. The retailer cited two reasons: the target company's furniture is made of FSC certified renewable pine; and Brazil, having the fastest-growing pine plantations in the world, has the lowest costs for pine. The retailer was also interested in a minority participation in the target company in order to guarantee the supply of pine furniture. Additionally, he was willing to sign a binding supply contract with an automatic price readjustment clause that limited the fluctuation of the relationship between the dollar and the real to a pre-established range. This would eliminate the target company's risk of the devaluation of the dollar that had generated the present losses.

Based on this evaluation of the strategic position of the target company and the interest of the large worldwide retailer in its pine furniture, I concluded that the company's future was sustainable and that the business model was sound. The two problems that generated the losses were temporary. The present surplus will be consumed as soon as the world economy emerges from the present recession because the pine furniture produced in Brazil is competitive with Asian manufacturers. Additionally, because of the enormous debt that the US has accumulated, there is a

strong tendency for the Chinese yuan and other Asian currencies to appreciate in relation to the dollar, reducing their present manufacturing cost advantage (Bolli, 2009; Degen, 2009).

The currency exchange rate risk between the real and the dollar that forced the target company to honor supply contracts to its clients at a loss can be managed by establishing the proper price adjustment clauses that would limit the fluctuation between the currencies. The proposed clause would automatically increase the price in dollars if the dollar devaluates in relation to the real below a predetermined threshold, or reduce the price in dollars if the dollar revaluates in relation to the real over a predetermined threshold.

Formulating the Restructuring Plan

The marketing and technical evaluation of the target company identified (besides the overcapacity and the exchange rate structural problems mentioned before) the following operational problems: sales in the US and in Europe conducted by commissioned agents who received their commission independent of whether or not the sale was profitable, dependence on sales agents with no loyalty to the company, no direct relationship with its clients, filling production over capacity with small, unprofitable orders, overstaffing for the present production load due to the high cost of severance pay (in Brazil this is one month's salary plus 40 percent of a month's salary per years worked) and excessive integration of the production process that reduced the flexibility to adapt to changing production loads.

The restructuring plan addressed these identified problems: the creation of a small direct-sales organization with sales representatives in the US and Europe to build direct relationships with the clients, a sales representative incentive plan based on the direct margins of orders, rightsizing of the staffing to the production requirements and outsourcing standard production processes to increase flexibility. The cost and savings of the restructuring plan were included in the valuation of the acquisition of the target company.

Valuing the distressed privately held company

Authors like Damodaran (1994), Bruner (2004), Crystal & Mokal (2006) and Arzac (2008) recommend three general approaches, from the simple to the sophisticated, to the valuation of a company. The first, discounted cash-flow valuation, relates the value of a company to the present value of expected future cash flows generated by the company. The second, relative valuation, estimates the value of a company by looking at the pricing of comparable companies on a common variable like earnings, cash flow, book value or sales. The third, contingent claim valuation, uses option pricing models to measure the value of a company that shares option characteristics. The valuation of a company with each of these approaches can be significantly different. In practice all three are used (when possible), and based on the reasons for the different outcomes, one approach ends up determining the valuation of the company. The different approaches, and their applicability and limitations in valuing a distressed company are described below.

Discounted Cash-Flow Valuation

The value of a company is defined as the present value of its expected future free cash flow (free cash flow [FCF] is the cash flow of the company after meeting all operating expenses and taxes, but prior to payments toward the company's debt).

$$\text{Company value} = \sum_{t=1}^{t=n} \frac{FCF_t}{(1+r)^t}$$

where n is the life of the company, FCF_t is the free cash flow in the period t and r is the discount rate reflecting the riskiness of the estimated cash flow.

Since we cannot estimate the FCF of a company for an unlimited time, we generally stop when the FCF in subsequent periods becomes repetitive

or has a constant growth rate. When this happens, we calculate a terminal value that reflects the value of the company at that point. There are three methods for calculating the terminal value (Damodaran, 2002): One method is to assume a liquidation of the company's assets in the terminal year and estimate what others would pay for these assets. The other two methods value the company as a going concern at the time of the terminal value estimation. The first method simply calculates the terminal value based on the relative valuation, which will be explained in next section. The second and most commonly used method assumes that the FCF of the company will continue constant or grow at a constant rate (stable growth rate) forever. The company's terminal value can be estimated using the perpetual growth model (if the FCF is constant, the growth rate is zero).

$$\text{Company value} = \sum_{t=1}^{t=n} \frac{FCF_t}{(1+r)^t} + \frac{\text{Terminal value}_n}{(1+r)^n} = \sum_{t=1}^{t=n} \frac{FCF_t}{(1+r)^t} + \frac{\frac{FCF_n}{(r - \text{stable growth rate})}}{(1+r)^n}$$

The discounted cash-flow valuation (DCFV) can be calculated for the equity or for the entire company (equity plus debt). The *value of the equity* is obtained by discounting expected FCF to equity at the *cost of equity* (r_{CE} is the rate of return required by equity investors in the company). This is the FCF left after meeting all expenses, tax obligations and interest and principal on the company's debt. The *value of the company* is obtained by discounting expected cash flows to the company at the *weighted average cost of capital* (WACC is the cost of the different components of financing used by the company, weighted by their market value proportion). This is the FCF left after meeting all operating expenses and taxes, but prior to payments toward the company's debt.

These two approaches, while using different definitions of free cash flow and discount rates, will yield consistent estimates of value. Given these informational requirements, the DCFV approach is relatively easy to use as long as the cash flows are currently positive and can be estimated with some reliability for future periods and if a proxy for risk that can be used to obtain discount rates is available.

The biggest problem in using DCFV to value privately held companies is the measurement of risk to estimate the discount rates. Since securities of privately held companies are not traded, there are no risk parameters to be estimated from the historical prices of the securities. A solution is to estimate the risk of comparable companies that are publicly traded. Another is to relate risk to the history of the available accounting variables of the company.

WACC for the Company in Brazil

The WACC used to obtain the value of the company with the DCFV approach is computed weighting the cost of equity and the after-tax cost of debt by the target debt and equity ratios (Damodaran, 2002).

$$WACC = \text{Cost of equity} \times \left[\frac{\text{Equity}}{(\text{Debt} + \text{Equity})} \right] + [\text{Cost of debt} \times (1 - \% \text{ Tax})] \times \left[\frac{\text{Debt}}{(\text{Debt} + \text{Equity})} \right]$$

where $\frac{\text{Debt}}{(\text{Debt} + \text{Equity})}$ is the target debt ratio of the company being valued, and the $[\text{Cost of debt} \times (1 - \% \text{ Tax})]$ is computed to capture the tax ($\% \text{ Tax}$) shield resulting from the tax deductibility of interest expenses (Arzac, 2008; dos Santos, 2005).

The *cost of equity* (r_{CE}) for a determined company is generally estimated by the *capital asset pricing model* (CAPM). This model's concept is that the risk to the investor of holding the company's equity is the risk added by the asset to the investor's market portfolio. Statistically, this added risk is measured by the *covariance of the company's equity* (σ_{CE}) with the *covariance of the market portfolio* (σ_{MP}) because the covariance is a percentage value that makes it difficult to judge the relative risk. For this reason the measure was standardized by dividing the covariance of the company's equity with the market portfolio by the variance of the market portfolio. The result of this division is the risk measure of the company's equity and is called the *beta of the company's equity* (β_{CE}).

$$\beta_{\text{Company equity}} (\beta_{CE}) = \frac{\sigma_{\text{Company equity}}}{\sigma^2_{\text{Market portfolio}}} = \frac{\sigma_{CE}}{\sigma^2_{MP}}$$

Since the *covariance of the market portfolio* (σ_{MP}) is its own variance, the *beta of the market portfolio* (β_{MP}) is 1. Because by extension the average asset in the market portfolio is also 1, any company equity that is riskier than average will have a β that exceeds 1, and any company equity that is safer than average will have a β that is lower than 1. The riskless assets will have a β of zero (Damodaran, 2003).

The *cost of equity* (r_{CE}) for the company's equity is calculated by adding the risk-free rate (r_f) to its β (β_{CE}) multiplied by the risk premium (expected return on the market portfolio [r_{MP}] minus the risk-free rate [r_f]). The r_{MP} in the US is usually the average rate of the securities included in the Dow Jones Index or the Standard & Poor's 500 Composite Index; for the r_f , it is the rate for US treasury bills.

$$\text{Cost of equity}(r_{CE}) = r_f + \beta_{CE} \times (r_{MP} - r_f)$$

The *cost of equity in Brazil* (r_{CEBR}) for an international investor, writes Damodaran (2002), can be calculated in the same way with the addition of the country's risk rate (r_{BR}). The r_{BR} is usually the average rate of the securities in the Embi+ (Emerging Market Bonds Index from JP Morgan) for Brazil (Martelanc et al., 2005; dos Santos, 2005).

$$\text{Cost of equity in Brazil}(r_{CEBR}) = r_f + \beta_{CE} \times (r_{MP} - r_f) + r_{BR}$$

Another option for calculating the cost of equity in Brazil (r_{CE}), used by Brazilian investors, is to use the average rate of the securities included in the Brazilian Bovespa Index for r_{MP} and use the rate of the Brazilian federal government saving bank's (Caixa Econômica Federal) popular savings accounts (Caderneta de Poupança) for the r_f . These saving accounts have fixed interest rates of 6 percent per year and are guaranteed by the Brazilian government. For this reason the rate of the Caderneta de Poupança (r_{CP}) is considered a risk-free rate in Brazil. This option is also used by some international investors who consider the average rate of the Bovespa Index (r_B) to already include the country risk. These investors believe that the worldwide integration of financial institutions automatically arbitrages the risk between countries.

$$\text{Cost of equity in Brazil}(r_{CEBR}) = r_{CP} + \beta_{CEBR} \times (r_B - r_{CP})$$

where the *beta of the company's equity in Brazil* (β_{CEBR}) in Brazil can be calculated based on the covariance of the company's equity in Brazil (σ_{CEBR}) against the Bovespa Index market portfolio (σ_{MPB}).

$$\beta_{\text{Company equity in Brazil}} (\beta_{CEBR}) = \frac{\sigma_{\text{Company equity in Brazil}}}{\sigma^2_{\text{Market portfolio of the Bovespa Index}}} = \frac{\sigma_{CEBR}}{\sigma^2_{MPB}}$$

WACC for a Company in Brazil that Exports to Europe and the US.

A company's exposure to country risk does not come from its location (or where it was incorporated) but from its operations. Some Brazilian companies are less exposed to the Brazilian country risk than are European or US companies. Damodaran (2003) explains that Embraer (the Brazilian airplane manufacturer) is less exposed to the Brazilian country risk than the local operations of companies like Nestle, Coca-Cola and Gillette. This is because Embraer sells its airplanes worldwide and has a low dependence on the Brazilian domestic market, and thus has a low exposure to the country's risk. On the other hand, the local operations of Nestle, Coca-Cola and Gillette in Brazil sell only to the Brazilian domestic market, and thus are fully exposed to this country's risk. He concludes that for this reason the country risk needs to incorporate an additional multiplier for the particular risk exposure of each individual company. Using Damodaran's (2003) reasoning, the *country risk rate for a particular Brazilian company* (r_{PBR}) can be determined by the percentage of the sales of the particular company that are exposed to the country risk compared to the percentage of the country's total internal GNP exposed to its country risk (Martelanc et al., 2005).

Country risk rate for a particular Brazilian company (r_{PBR})

$$= \frac{\frac{\text{Company sales in Brazil}}{\text{Total company sales}}}{\left(1 - \frac{\text{Brazilian exports}}{\text{Brazilian GNP}}\right)} \times \text{Country risk of Brazil } (r_{BR})$$

$$= \frac{\% \text{ of sales in Brazil}}{\left(1 - \% \text{ of Brazilian exports in relation to GNP}\right)} \times r_{BR}$$

Relative Valuation

The value of a company is estimated based on the pricing of comparable companies using a common variable such as earnings, cash flow, book value or revenue. An example of this approach is the use of the industry-average price/earnings (P/E) ratio to value a company. This obviously assumes that other companies in the industry are comparable to the company being valued and that the market (on average) prices these companies correctly. Other widely used multiples are the price/book value ratio and the price/sales ratio.

The use of multiples to estimate the value of companies is simple and easy to relate to. They are particularly useful when there are a large number of comparable companies being traded on financial markets and the market is (on average) pricing these companies correctly. The problem is that no companies are ever exactly similar in terms of risk and growth.

Contingent Claim Valuation

A contingent claim or option value is based on the pre-specified value of a call option (call strike price) if the value of the underlying asset exceeds this value, or on the pre-specified value of a put option (put strike price) if the value of the underlying asset is less than this value. An option can be valued as a function of the current value (option selling price), the strike price, the variance in value of the underlying asset (the option in money if it is worth more than the strike price or out of money if it is worth less), the time to expiration of the option and the riskless interest rate.

The first option pricing model was established by Black & Scholes (1972); since then much work has been done in developing models that value options (Ignatov, 2006). These option pricing models can be used to value any assets (including companies) that have option-like features (Schmidt, 2009). The equity of a company can be valued as a call option on its value, with the face value of debt representing the strike price and the term of the debt measuring the life of the option. When the securities of the company are not traded, the inputs for its valuation cannot be extracted from financial markets and have to be estimated. Thus the estimated values

obtained have a greater error associated with them than do the estimates obtained by the other approaches.

Valuation of Distressed Companies

The three approaches described above (discounted cash-flow, relative and contingent claim valuations) are generally used to complement each other in the valuation of companies with positive earnings. The DCFV arrives at an estimate of the company's value. The relative valuation compares the estimated value obtained for a company by the DCFV approach with the value of other comparable companies using multiples to check its consistency. The contingent claim valuation is used to show the impact of volatility on the estimated value of the company obtained by the DCFV method (Schwartz & Moon, 2000).

Distressed companies with negative earning, like the target company, are more difficult to value than those with positive earnings. Damodaran (2002) explains the significant problems in measuring the value of companies in this situation:

1. *Earnings growth rates cannot be estimated or used in valuation.* The calculation of earnings growth with negative earnings yields a meaningless number.
2. *Tax computation becomes more complicated.* Firms that have negative earnings can carry these losses forward in time and apply them to earnings in future periods. Thus it is important to keep track of the net operating losses of the company and use them to shield income in future periods from taxes.
3. *The going concern assumption may not apply.* There is a very real possibility that a distressed company with negative earnings will go bankrupt if the earnings stay negative. As a consequence, the assumption of infinite lives that underlies the estimation of terminal value may not apply in these cases.

In valuing distressed companies, the first thing is to determine the causes of the negative earnings. The causes can be temporary, long term or even related to where the company finds itself in its life cycle. In the case of

the target company, the conclusion was that the causes of the negative earnings were temporary and could be reversed with the proposed restructuring plan explained above. The strategic position of the target company and the interest of the large worldwide retailer in its pine furniture led to the conclusion that its future was sustainable and that the business model was sound.

Estimating the value of a company using DCFV and relative valuation implicitly assumes that the company is a going concern and that the present financial stress is temporary. This assumption is normally based on the evaluation of the strategic position of the company and a restructuring plan. On the other hand, a significant portion of the estimated value for the company in the DCFV valuation approach comes from the terminal value (usually well in the future). In the case of distressed companies, there is the very real chance that the restructuring plans will fail and that the company will not survive to its terminal value.

Damodaran (2006) explains that the traditional valuation approaches tend to overvalue distressed companies because it is difficult to fully capture the effect of the risk of distress and of the restructuring plan in the expected cash flow and discount rate. He gives three basic ways to incorporate the effects of this risk into the estimated value of the company. The first is to simulate the distribution of the expected critical input variables used to estimate the company's value using the DCFV approach. The second is to modify the DCFV to reflect some or most of the risk on the estimated value. The third is an alternative modified DCFV separating the going concern assumption from the distress sale value. Because of its simplicity, this third approach is the most commonly used approach in valuing distressed companies.

$$\text{Company value}_{TC} = \text{Value as a going concern} \times (1 - \pi_{Distress}) + \text{Value of distress sale} \times \pi_{Distress}$$

where $\text{Company value}_{TC}$ is the value of the company considering the cumulative probability of distress $\pi_{Distress}$ over the valuation period and the $\text{Value of the distress sale}$ is the liquidation value of the assets of the company if the restructuring plan fails.

Valuing Privately Held Companies

The three general valuation approaches (discounted cash-flow, relative and contingent claim valuations) are applicable to any company, whether publicly or privately held. However, some of the critical inputs needed for valuation are easier to obtain for publicly traded companies than for privately held companies. Damodaran (1994) classified the problem of valuing privately held companies into two categories: estimating the applicable discount rate and estimating future cash flow. He explains these problems:

1. *Estimating discount rates.* The models of risk and return used in estimating discount rates, including the capital asset pricing model and the arbitrage pricing model, use parameters estimated from past prices and/or returns. These traditional estimation procedures cannot be used for firms that are not traded or have been traded for only a short time.
2. *Estimating cash flows.* The estimation of both current cash flows and expected future growth rates is much more difficult to do for private firms than for public traded firms. In calculating current cash flows, for instance, it is often difficult in private firms to draw a distinction between management compensation and return on capital, since owners often also operate as managers. The absence of the strict information requirements that apply to publicly traded firms also makes the financial statement of private firms less reliable.

When traditional procedures to estimate discount rates cannot be used, Damodaran (1994) recommends the following solutions to estimate β for a privately held company: estimate based on comparable firms, estimate from earnings rather than returns or estimate by regressing the β s of public traded companies against financial fundamentals and compare them to the same parameters of the privately held company.

Valuing the Target Company

Estimating the value of the target company using DCFV and relative valuation, I implicitly assume that the company is a going concern and that the present financial stress is temporary. This assumption is based on the evaluation of the strategic position of the target company and the proposed restructuring plan. I also consider a 10 percent *real chance that the restructuring plans will fail* (Distress) and that the company will not survive to its terminal value.

Figure 4. Financial statement of target company in reals (due to confidentiality the statement is fictitious)

Balance Sheets		
Assets	6/30/2008	6/30/2009
Cash	200,000	20,000
Account receivables	400,000	480,000
Inventories	240,000	290,000
Total Current Assets	840,000	790,000
Properties	4,000,000	4,400,000
Accumulated Depreciation	-200,000	-300,000
Other Receivables	50,000	20,000
Total Assets	4,690,000	4,910,000
Liabilities	6/30/2008	6/30/2009
Accounts Payable	200,000	410,000
Salaries Payable	40,000	60,000
Total Current Liabilities	240,000	470,000
Long-term Debt	2,400,000	2,450,000
Equity	2,050,000	1,990,000
Total Liabilities	4,690,000	4,910,000
Operating Statements		
	6/30/2008	6/30/2009
Sales	19,000,000	25,000,000
Sales Taxes	-200,000	-600,000
Costs of Goods Sold	-16,500,000	-21,640,000
Gross Margin	2,300,000	2,760,000
Cost of Overhead	-2,280,000	-2,750,000
Earnings before interest and taxes	20,000	10,000
Interest on Debt	-550,000	-700,000
Earnings before taxes	-530,000	-690,000
Taxes (34%)	0	0
Net Loss	-530,000	-690,000
Depreciation	360,000	390,000
EBITDA	380,000	400,000

The target company's operating statements and free cash flow (the cash available for distribution to investors and debt holders after all planned capital investment and taxes) were projected for five years based on historical data of the company (Figure 3) and implementation of the restructuring plan (Figure 4).

Figure 4. Forecasted operating statements and free cash flow of the target company in reals

Historical			Five year forecast				
Operating Statements	6/30/2008	6/30/2009	6/30/2010	6/30/2011	6/30/2012	6/30/2013	6/30/2014
Sales	19,000,000	25,000,000	20,000,000	22,000,000	24,200,000	25,400,000	25,400,000
Sales Taxes	-200,000	-600,000	-500,000	-400,000	-600,000	-650,000	-650,000
Costs of Goods Sold	-16,500,000	-21,640,000	-17,100,000	-18,500,000	-19,100,000	-19,100,000	-19,100,000
Gross Marging	2,300,000	2,760,000	2,400,000	3,100,000	4,500,000	5,650,000	5,650,000
Cost of Overhead	-2,280,000	-2,750,000	-2,280,000	-2,200,000	-2,200,000	-2,200,000	-2,200,000
EBIT	20,000	10,000	120,000	900,000	2,300,000	3,450,000	3,450,000
Interest on Debt	-550,000	-700,000	-700,000	-700,000	-700,000	-650,000	-650,000
EBT	-530,000	-690,000	-580,000	200,000	1,600,000	2,800,000	2,800,000
Taxes (34%)	0	0	0	-34,000	-103,000	-612,000	-612,000
Net Profit or Loss	-530,000	-690,000	-580,000	166,000	1,497,000	2,188,000	2,188,000
Depreciation	360,000	390,000	390,000	390,000	390,000	390,000	390,000
EBITDA	380,000	400,000	510,000	1,290,000	2,690,000	3,840,000	3,840,000
Net Profit or Loss	-530,000	-690,000	-580,000	166,000	362,000	1,188,000	1,188,000
Interest on Debt	-550,000	-700,000	-700,000	-700,000	-700,000	-650,000	-650,000
Tax Benefit on Interest	0	0	0	119,000	238,000	221,000	221,000
NOPAT	-1,080,000	-1,390,000	-1,280,000	-415,000	-100,000	759,000	759,000
Depreciation	360,000	390,000	390,000	390,000	390,000	390,000	390,000
Change in Working Capital Investments		100,000					
Free Cash Flow	-720,000	-900,000	-890,000	-25,000	290,000	1,149,000	1,149,000

The valuation of the company for a foreign investor using the DCFV approach was calculated as follows:

$$\text{Company value} = \sum_{t=1}^5 \frac{FCF_t}{(1 + WACC_{PBR})^t} + \frac{FCF_5}{(1 + WACC_{PBR})^5} \frac{(WACC_{PBR} - \text{stable growth rate})}{(1 + WACC_{PBR})^5}$$

$$WACC_{PBR} = r_{CEBR} \times \text{Debt ratio} + [r_D \times (1 - \% \text{ tax})] \times \text{Debt ratio}$$

$$r_{CEBR} = r_f + \beta_{CE} \times (r_{MP} - r_f) + r_{PBR}$$

$$r_{PBR} = \frac{\% \text{ of sales in Brazil}}{(1 - \% \text{ of Brazilian exports in relation to GNP})} \times r_{BR}$$

where the debt ratio is 0.55, tax is 0.34, r_f is 0.06, r_{MP} is 0.12, r_{BR} is 0.08, r_d is 0.23, β_{CE} is 3.0, zero growth rate after the fifth year, company's sales in the domestic market are 10 percent and Brazil exports an average

16% of GNP. These values are historical averages for similar acquisitions in Brazil before the crisis of 2007-09. Using these numbers, r_{PBR} is 0.01, r_{CEBR} is 0.25, $WACC_{PBR}$ is 0.22 and the company value is 1.8 million reais.

The estimated target company value calculated with the DCFV approach is 84 percent composed of the terminal value in the fifth year, which depends directly on an exit of the proposed restructuring plan. Because the target company is a distressed company and there is a real 10 percent chance that the restructuring plan will fail, this chance must be included in the valuation of the target company.

$$\text{Company value}_{t_2} = \text{Value as a going concern} \times (1 - \pi_{\text{Distress}}) + \text{Value of distress sale} \times \pi_{\text{Distress}}$$

where the value as a going concern is 1.8 million reais, the real chance that the restructuring plan will fail (π_{Distress}) is 10 percent, and the value of the distress sale is 1.0 million reais. The company value considering the chance of failure ($\text{Company value}_{t_2}$) is 1.7 million reais. Subtracting from $\text{Company value}_{t_2}$ the company's debt of 2.4 million reais, the value of the equity is negative by 0.7 million.

Structure a Desktop Financing Plan

Analyzing the debt structure of the target company and noting that 90 percent of its sales are generated by exports to Europe and the US, the possibility of substituting expensive domestic loans in reais for international loans in dollars was evaluated. This possibility could substantially reduce the company's interest cost. The reduction of the debt cost from 23 percent to 13 percent a year would reduce WACC from 22 percent to 19 percent. The company value with this interest reduction is 2.5 million reais, and the value considering the possibility of failure is 2.3 million reais. Subtracting the company's debt, the value of the equity is still negative by 0.1 million reais. Unfortunately, due to the high debt ratio (0.55) and the losses of the target company, the proposal of substituting debt is impossible to implement. The only feasible solution is substituting part of the existing debt with equity and then substantially reducing the cost of the remaining debt.

The solution to rehabilitate the target company is to capitalize it by 1.0 million, reducing the debt ratio to 0.32. This would make refinancing the remaining debt of 1.4 million in dollars feasible at an estimated cost of 13 percent a year. The WACC is 0.11, and the company value is 6.3 million. Considering the possibility of failure, the company's value is 5.7 million reals.

Negotiate and Structure the Deal

Based on the conclusions that the value of the equity of the target company (with the projected restructuring plan) was negative by 0.7 million reals, the value of distressed sale was 1.0 million reals and a capitalization of 1.0 million reals was necessary to make the company profitable, the acquiring company made an offer to buy the company's equity from its current owners for 0.3 million reals. The rationale for this value was that it represented the difference between the value of distressed sale and the negative equity value. The buyer also offered to replace the collateral given to the Brazilian banks by the present owners and take full responsibility for all possible liabilities presented in the disclosure document.

The largest liability described in the disclosure document was a legal dispute with the Brazilian tax authority valued at 0.5 million reals. Attached to the document was a legal opinion from defense lawyers claiming a 70 percent chance that they would win the case for the company. The buyer estimated that even if the case was lost, the company could pay the tax fine in three years, and it would not cause a major disruption in the company's cash flow.

The sellers considered the offer too low and refused it. After some negotiation on price, the acquirer and sellers reached a compromise value of 1.0 million reals for the equity of the target company. A binding sales document between the buyer and the sellers containing the target company's liability disclosure document was signed. The agreement stipulated that all liabilities not disclosed in the disclosure document would be deducted by the buyer from the purchasing price of 1.0 million reals. For this purpose the seller was to create an escrow account of 0.2 million reals

to guarantee the possible deductions. The sales document also contained a clause that if any substantial liability that exceeded the escrow amount was uncovered during the due diligence, the document would be void.

Perform Due Diligence

After the sales agreement was signed, the buyer put together a team of experts to conduct the due diligence in the target company. The work plan of the due diligence team covered the following aspects (Figure 5): accounting, property, intellectual property, intangible assets, taxes, legal, risk and insurance, finance, information technology, sales, operations, organization, human resources, environment, culture and ethics (Bruner, 2004).

Figure 5. Topics covered in the due diligence process

Due Diligence Topics
1. accounting
2. property
3. intellectual property
4. intangible assets
5. taxes
6. legal
7. risk and insurance
8. finance
9. information technology
10. sales
11. operations
12. organization
13. human resources
14. environment
15. culture
16. ethics

Source: Adapted from Bruner (2004, p.228-245).

The work executed by the due diligence team was documented in executive summaries prepared by the experts and documented with the work papers, check list and other resources used in the process. The

findings, conclusions and recommendations of the specialists were then further summarized into the due diligence report, which contained the key points, the final conclusion and recommendations on the acquisition of the target company.

All the findings and conclusions about the issues of the target company resulted in immaterial differences with the liabilities disclosure document presented by the sellers and integrated into the sales agreement. The only exception was the dispute with the Brazilian tax authorities. The legal and tax experts estimated that the liability was underestimated and that the value to be paid if the case were lost would be 1.0 million reais. They also concluded that the defense arguments were weak and that the chance of the target company losing the case was 80 percent.

Decision: Close or Walk Away

The tax expert found during the due diligence that the eventual tax liability was 1.0 million Brazilian reais. This value was the double of the value (0.5 million reais) given in the disclosure document attached to the sales agreement. Additionally, the legal expert performing the due diligence considered unrealistic the estimated probability of winning the case of 70 percent provided by the lawyers of the target company. In the legal expert's opinion, the chance of winning the case was only 20 percent because of the poor defense prepared by the target company's lawyers. These findings automatically voided the sales agreement because the amount of undisclosed liability was greater than the agreed-upon maximum of 0.2 million reais.

Based on these due diligence findings, the buyer offered to buy the company for 1 real and an additional 1.0 million reais if the case with the Brazilian tax authorities was solved in favor of the target company. This offer was not accepted by the seller, who argued that they had no control over the future of the case and thus no guarantee that the best effort would be made to win the case. Because the buyer and the seller could not find a solution to the tax issue, the negotiations were closed and the buyer walked away from the deal.

Conclusion

The DCFV approach was the easiest and most accurate approach for the valuation of a distressed privately held company in Brazil. The approach allows an adequate introduction of the country risk and the probability of distress during the valuation period. The relative valuation is not applicable because it is almost impossible to find comparable companies, and the contingent claim valuation is not accurate and very difficult to explain to the parties due to its mathematical complexity.



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