

# DETERMINANTS OF CORPORATE RATINGS IN THE OIL INDUSTRY: THE REPSOL-YPF CASE

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## ABSTRACT

The financing patterns of corporations have changed over the last fifteen years. Bond financing has superseded bank loans. In addition, the deeper integration of worldwide financial markets has diffused risk assessment mechanisms, which were previously restricted to industrialized countries. In this context, credit ratings issued by rating agencies such as Standard & Poor's and Moody's play an important role in the procurement of financing. A rating is referred to as "... an opinion about an issuer's future capability, legal responsibility, and willingness to meet the payment of the principal and interest of a specific bond..." (MOODY'S 1999a, p.5). This paper aims to verify whether or not it is possible to predict corporate ratings based on a set of financial indicators. We study the case of Repsol-YPF, a world-renowned Argentine oil company. The ordered logit model was used as estimation method, as it yields better results than the more commonly used least squares and probit models. From a small set of financial indicators, the most relevant appear to be earnings (EBITDA) and short term debt over total debt (STD/TD). This small number of financial indicators was able to reasonably predict Repsol-YPF corporate ratings, suggesting that ratings may not have information in addition to that publicly available.

**Keywords:** Repsol-YPF, Argentine, rating, corporate finance, financial indicators.

## DETERMINANTES DOS RATINGS CORPORATIVOS NA INDÚSTRIA PETROLÍFERA: O CASO DA REPSOL-YPF

### RESUMO

O padrão de financiamento de empresas mudou nos últimos 15 anos. Empréstimos bancários cedendo lugar aos títulos de dívida. Ao mesmo tempo, o aprofundamento da integração do

mercado financeiro mundial trouxe a difusão de mecanismos de avaliação de risco antes restritos aos países desenvolvidos. Neste contexto, os *ratings* de crédito emitidos por agências de classificação, como a *Standard & Poor's* e *Moody's*, passaram a ter um papel importante na obtenção do financiamento. O *rating* refere-se a “...uma opinião sobre a capacidade futura, a responsabilidade jurídica, e a vontade de um emitente de efetuar, dentro do prazo, pagamentos do principal e juros de um título específico de renda fixa...” (MOODY'S, 1999a, p.5). O objetivo deste artigo é mostrar se é possível prever os ratings corporativos ou de empresas a partir de um grupo de indicadores financeiros. Os indicadores pertencem a Repsol-YPF, empresa petrolífera argentina de notoriedade internacional. O método de estimação usado em modelos econométricos foi o ordered logit, que mostrou melhores resultados que os modelos de mínimos quadrados e probit. De um conjunto pequeno de indicadores financeiros, os mais relevantes parecem ser o EBITDA, Dívida de Curto Prazo sobre Dívida Total. Concluiu-se que um pequeno número de indicadores financeiros pôde prever os ratings corporativos da Repsol-YPF, sugerindo que ratings não trazem informações adicionais àquela já disponível em demonstrativos contábeis e financeiros.

**Palavras-chave:** Repsol-YPF; Argentina; rating; finanças corporativas; indicadores financeiros.

## 1 INTRODUCTION

When setting out growth, investment, and production strategies for a company, financing decisions play an important role. This is due to the fact that access to low-cost financing is a *sine qua non* for the economic feasibility of expansion projects.

The financing patterns of corporations have changed over the last fifteen years. Bond financing has superseded bank loans. In addition, the deeper integration of worldwide financial markets has diffused risk assessment mechanisms, which were previously restricted to industrialized countries.

In this context, credit ratings issued by rating agencies such as Standard & Poor's and Moody's play an important role in the procurement of financing. A rating is referred to as “... an opinion about an issuer's future capability, legal responsibility, and willingness to meet the payment of the principal and interest of a specific bond...” (MOODY'S 1999a, p.5). Ratings below the investment grade may increase the cost of capital and hinder financing.

According to the agencies, the assignment of ratings is based on quantitative financial variables that are widely disseminated in the market (MOODY'S, 2000a). For instance, Moody's considers macroeconomic fundamentals, sectoral data (competitiveness and market share), and corporate data. In case of oil companies, financial, production and reserve indicators are used. Agencies also state that ratings reflect a subjective assessment of privileged information to which they have access, such as inside information (GOH and EDERINGTON, 1993). Thus, changes in ratings provide new information about the market.

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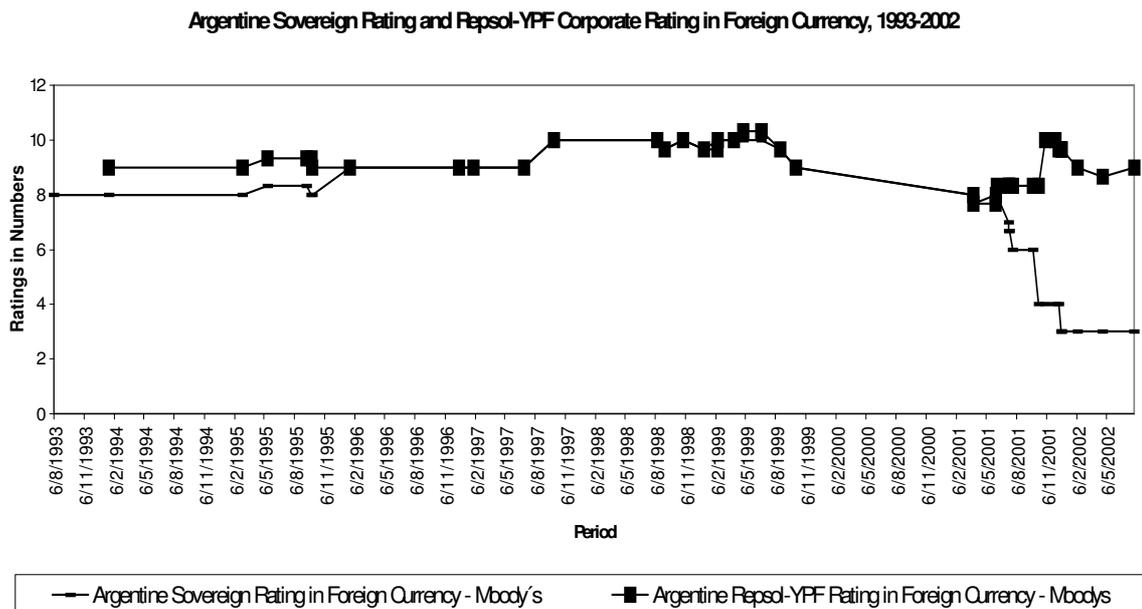
On the other hand, some studies assert that ratings do not provide such information in theoretical or practical terms (PARTNOY, 2002). In this case, the demand for ratings would result exclusively from regulatory obligations, which in the U.S. case, are imposed by the Securities and Exchange Commission (SEC).

Despite the method and the affirmation by some rating agencies that various indicators are employed in the analysis, some researchers state that a small set of accounting variables is enough for the study of the determinants of corporate ratings (EDERLINGTON, 1985, BLUME, LIM & MCKINLAY, 1998, and others).

The purpose herein is to verify whether or not it is possible to predict corporate ratings using a set of financial indicators based on the Repsol-YPF case. If the selected indicators can predict most Repsol-YPF ratings, this means that ratings do not add any new information besides that which is provided by balance sheets and financial statements. The predictive model also allows outlining more efficient financial indicators management so that such rating can be achieved.

The Repsol-YPF case is important since Repsol-YPF is one of the few oil companies that pierced its home country (Argentina) sovereign ceiling. The breaching of the sovereign ceiling in foreign currency occurred in July 2001, on the eve of the severe crisis that swept Argentina.

**Figure 1**



Rating agencies highlight the existence of a sovereign ceiling for the corporate ratings of domestic companies. Due to the presence of a systemic risk, a change in sovereign rating pushes the corporate rating in the same direction. On the other hand, some companies may not be influenced by such pressures because of their internal and external notoriety (STANDARD & POOR'S, 2001a; MOODY'S, 2001a). We can determine whether this was the case of Repsol-YPF.

BONE (2007) has a similar case study for Petrobras, the largest Brazilian oil company. Petrobras is also a case of an oil firm in developing countries whose rating pierced the sovereign ceiling. The ordered logit model estimated suggested that firm variables explained the majority of the firm ratings over the period studied. It is not possible to extend the analysis to other oil firms in Latin America, as firms, such as PEMEX, PDVSA, Petroleos de Ecuador, do not have either foreign currency ratings issued and/or lack accessible, standardized financial data.

The present paper is organized into five sections: introduction, theoretical aspects of the determination of corporate ratings; methodology; analysis of results, and conclusion.

## **2 THEORETICAL ASPECTS OF THE DETERMINATION OF CORPORATE RATINGS**

### **2.1 Corporate Indicators**

The econometric models of corporate ratings consider a few indicators of profitability, leverage, and cash. On the other hand, rating agencies state that a great number of indicators are considered and that some of them are even specific to the industries in which their activities are developed, as is the case of oil companies. The financial indicators studied in this paper are the same as those analyzed in the literature and are divided into (1) financial coverage; (2) capital structure, and (3) business assessment.

Financial coverage indicators capture the company's ability to generate positive cash flow in order to meet financial obligations. For this reason, companies split cash flow into retained cash flow, operating cash flow and free cash flow, among other indicators (further details in DAMODARAN, 1999; MOODY'S, 1998b, 1999a, and 2001b). Chart 1 shows the expected behavior of financial indicators towards corporate ratings.

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**Chart 1 – Expected Behavior of Financial Indicators towards Corporate Ratings**

Indicator	Acronyms	Correlation Signs
<b>Financial Coverage</b>		
Retained Cash Flow/Total Debt	RCF/TD	+
Operating Cash Flow/Short-term Debt	OCF/STD	+
Operating Cash Flow/Total Debt	OCF/TD	+
EBIT Interest Coverage	EBIT	+
Free Cash Flow/Total Debt	FCF/TD	+
EBITDA interest coverage	EBITDA	+
EBITDA minus Capital Expenditures interest coverage	EBITDA-CE	+
Total Debt/EBITDA	TD/EBITDA	-
<b>Capital Structure</b>		
Total Debt/Capitalization	TD/CAP	-
Short-term Debt/Total Debt	STD/TD	-
<b>Business Assessment</b>		
Gross Margin	GM	+
Operating Margin	OM	+
Capital Expenditures/Depreciation	CE/D	+
Total Revenue	TR	+

In each group, variables present similar definitions and may be largely correlated. For this reason, some indicators were selected within the strongly correlated groups.

### 3 ESTIMATING THE DETERMINANTS OF CORPORATE RATINGS: METHODOLOGY

An ordered logit model was used to identify which financial indicators determine Repsol-YPF corporate ratings issued by Moody's. This model is more appropriate than the usual regression ones, due to the ordinal and discrete nature of the rating. The rating scale used is presented in the Appendix. The period of analysis covered the first quarter of 1994 up to the fourth quarter of 2002, when data were more widely available.

After the selection of the indicators, the Repsol-YPF corporate rating was estimated using the model below.

$$\text{Rating}_t = r(\beta_1 \text{OCF/TD} + \beta_2 \text{FCF/TD} + \beta_3 \text{EBITDA} + \beta_4 \text{OM} + \beta_5 \text{STD/TD} + \beta_6 \text{TD/EBITDA} + \varepsilon_t) \quad (1)$$

Where:  $r(\cdot)$  is a function that relates ordinal ratings to cardinal variables, i.e., financial indicators.

### 3.1 Details about the Ordered Logit Model

The main feature of an ordered model is the existence of an ordinal discrete dependent variable. Therefore, non-cardinality and non-continuity of this variable do not allow estimating the model's parameters using the Ordinary Least Squares (OLS) method, corrected or not for the cases of autocorrelation and/or heteroskedasticity. Since ordinality does not usually demand symmetric intervals for its values, the value assigned to an investment grade rating, for instance, is not twice the value of a speculative grade rating. In other words, grade "Aaa" (number 22) is not the same as two grades "Ba2" (number 11), although the numerical scale of the ratings may suggest so.

In models with ordered dependent variables, observation  $y$  denotes the ordered ratings results. Thus, ratings can be modeled considering a latent numerical variable  $y_i^*$ , which linearly depends on explanatory variables  $x$ :  $y_i^* = x_i \beta + \varepsilon_i$  where:  $\varepsilon_i$  is a random variable. The estimate follows the assumptions of error distribution  $\varepsilon_i$ . The observed ratings are based on the latent variable  $y_i^*$ , according to the following rule:

$$\begin{array}{lll} y_i = 0 & \text{if} & y_i^* \leq \gamma_1 \\ y_i = 1 & \text{If} & \gamma_1 < y_i^* \leq \gamma_2 \\ \dots & \dots & \dots \\ y_i = M & \text{if} & \gamma_M < y_i^* \end{array}$$

It should be underscored that the values chosen to represent the ratings in  $y$  are arbitrary. The model requires that high rating values correspond to high values of the latent variables, such that  $y_i^* < y_j^*$  results in  $y_i < y_j$ . In this case,  $y_i^*$  would be an unobserved

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numerical scale, which is later transformed into letters ( $y_i$ ) by the rating agencies. This means that the method turns intervals into ordinal values.

The probabilities of each observed value of  $y$  is given by:

$$\begin{aligned} Pr(y = 0 / x, \beta, \gamma) &= F(\gamma_1 - x' \beta) \\ Pr(y_i = 1 / x_i, \beta, \gamma) &= F(\gamma_2 - x'_i \beta) - F(\gamma_1 - x'_i \beta) \\ &\dots \\ Pr(y_i = M / x_i, \beta, \gamma) &= 1 - F(\gamma_M - x'_i \beta) \end{aligned}$$

Where  $F$  is a cumulative distribution function of  $\varepsilon$ . Several options for the selection of  $F$  can be found in the literature. Normal and logistic distributions are the most usual ones.

In case of the logistic distribution, the probability is given by  $Pr(y = 0 / x, \beta, \gamma) = e^z / (1 + e^z)$ , where  $z = \gamma_1 - x' \beta$ . The Maximum Likelihood method was utilized for the estimation. The EViews 3.0 software was used.

Parameter interpretation requires some care, especially with regard to the estimated coefficients. Since the estimated coefficients do not represent the marginal effect of the explanatory variable on the dependent variable, it is necessary to calculate the marginal effects for each one of them. They cannot be inferred by the mere observation of the coefficients. For more details, refer to Greene (2000).

#### 4 RESULTS OF REPSOL-YPF CORPORATE RATINGS CONSIDERING FINANCIAL INDICATORS

Financial indicators were previously selected by considering the existence of a strong correlation between them. The selection procedure considered a correlation coefficient greater than 65%. Thus, a set of highly correlated indicators was replaced by one of its participants. For example, OCF/TD is highly correlated, both directly and indirectly, to RCF/TD and OCF/STD. Therefore, OCF/TD was chosen. The expected behavior of Repsol-YPF financial indicators is shown in Chart 1. The results are qualitatively robust to changes in selected variables.

Table 1 presents the results from the initial model. Among six explanatory variables, three did not have the expected sign: FCF/TD, OM and TD/EBITDA. Both FCF/TD and OM presented a negative sign instead of the expected positive sign. This means that an

improvement in these variables represents a higher probability of lower ratings. As for TD/EBITDA, the sign indicates higher ratings instead of lower ones. For this reason, the signs of coefficients obtained from the application of the ordered logit method cannot be interpreted in the same way as those obtained from the OLS method, since they reflect the marginal effects of changes in selected indicators on each Repsol-YPF corporate rating, assigned in the 1994-2002 period.

By observing the coefficient probabilities, FCF/TD and STD/TD would not be excluded from the model. The remaining ones have low explanatory power and, according to the coefficient significance test, showed the following probabilities: OCF/TD (22.42%), EBITDA (21.69%), OM (18.08%) and TD/EBITDA (81.11%). Notably, OM and TD/EBITDA did not have the expected signs and cannot be considered statistically significant for determining the corporate rating during the analyzed period.

The joint analysis of all indicators using LR statistics (5 degrees of freedom) presents a calculated value of 32.95 and a probability of 0%. Thus, it is verified that the coefficients have explanatory power over the ordered corporate rating when analyzed together.

**Table 1 – Initial Model for Ordered Corporate Rating – Ordered Logit Method**

Explanatory Variables	Coefficient	Standard Deviation	Z Statistics	Probabilities
OCF/TD	0.0453	0.0373	1.2153	0.2242
FCF/TD	-0.1006	0.0521	-1.9296	0.0537
EBITDA	0.0338	0.0273	1.2348	0.2169
OM	-0.0899	0.0671	-1.3383	0.1808
STD/TD	-37.4147	11.3705	-3.2905	0.0010
TD/EBITDA	0.0669	0.2799	0.2390	0.8111
Threshold Points ( $\gamma_j$ )				
Threshold for B2 up = 8.33	-28.1086	7.28844	-3.8566	0.000114
Threshold for B1 down = 8.67	-25.7919	6.79666	-3.7947	0.000147
Threshold for B1 conf. = 9.00	-24.7031	6.41848	-3.8487	0.000118
Threshold for B1 up = 9.33	-18.4577	5.23793	-3.5238	0.000425
Threshold for Ba3 down = 9.67	-18.2036	5.21398	-3.4913	0.000480
Threshold for Ba3 conf. =10.00	-17.1261	5.15692	-3.3210	0.000896
Log Likelihood	-30.9151 LR index (Pseudo-R2)			0.347640

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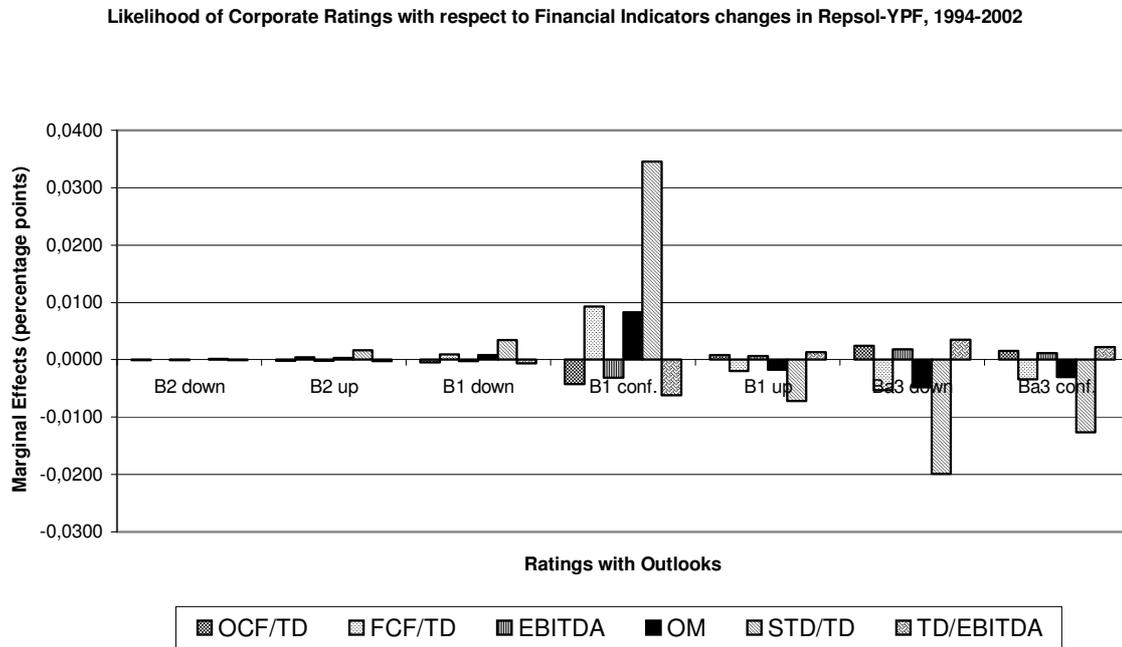
LR Statistics (5df)	32.94911 Prob. (LR statistics)	1.07E-05
Number of Observations	36 Number of Ordered Ratings	7

Table 2 shows the prediction errors regarding Repsol-YPF corporate ratings. The difference between the observed and calculated frequencies corresponded to 12 prediction errors. Out of this total, the highest concentrations were found in the B1-confirmed and Ba3-downgrade ratings. In the B1-confirmed rating case that the selected financial indicators led to a higher calculated frequency than an observed frequency. On the other hand, the Ba3-downgrade rating had a higher observed frequency than the calculated frequency. In the latter case, none of the selected indicators matched with the rating issued by Moody's. Finally, one may affirm that the company could have received higher grades, i.e., more B1-confirmed (+5) and Ba3-confirmed (+1) ratings than they actually did in the period.

**Table 2 – Prediction of the Dependent Variable in the Initial Model – Corporate Rating**

<i>Ratings with Outlook</i>	Observed Frequency	Calculated Frequency	Prediction Error
B2 <i>downgrade</i>	1	1	0
B2 <i>upgrade</i>	2	2	0
B1 <i>downgrade</i>	1	0	1
B1 confirmed	21	26	-5
B1 <i>upgrade</i>	1	0	1
Ba3 <i>downgrade</i>	4	0	4
Ba3 confirmed	6	7	-1

Figure 2 shows the effect of the changes in the selected financial indicators on the probable occurrence of ratings. Where, the marginal effects of the changes in these indicators on corporate ratings were calculated, *ceteris paribus*. The probability of occurrence of each corporate rating is observed in percentage points when the financial indicators individually change their value in one unit.

**Figure 2**

By analyzing the two significant variables of the model (FCF/TD and STD/TD), the ratings mostly influenced by marginal changes were: B1-confirmed, Ba3-downgrade and Ba3-confirmed. In case of the FCF/TD, the increase by one unit had stronger effects on the probable occurrence of B1-confirmed (0.93 pp) and Ba3-downgrade (-0.54pp) ratings. As for the STD/TD, it has a stronger influence on Repsol-YPF corporate ratings, since the probable occurrence of B1-confirmed rating (3.46pp) significantly increased when one unit was added, whereas the probable occurrence of Ba3-downgrade (-0.2pp) and of the Ba3-confirmed ratings (-0.13pp) diminished.

By comparing the results in Table 2 and Figure 2, one notes that the higher incidence of prediction errors is closely related to the marginal effects of FCF/TD and STD/TD. In other words, they resulted in a higher probability of both B1-confirmed and Ba3-downgrade ratings. The remaining indicators, albeit not statistically significant, increased the probability of ratings greater than the B1-confirmed, as shown in Figure 2.

Figure 3 shows the behavior of observed and predicted ratings. By analyzing every quarter of the 1994-2002 period, no differences were found between the observed and predicted ratings in several moments. The highest incidence of errors between the observed and predicted ratings occurred in the third and fourth quarters of 1997 and 1998 and

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throughout 2001. This may be related to the Asian (1997), Russian (1998) and Argentinean (2001) crises.

The first set of errors shows that Moody's changed Repsol-YPF rating from B1-confirmed to Ba3-confirmed in the second quarter of 1997. However, this change was not confirmed by the selected financial indicators, which would only suggest upgrade in the first quarter of 1998. On the other hand, in the last two quarters of 1998, the indicators maintained the Ba3-confirmed rating, while Moody's issued a Ba3-downgrade rating in the last two quarters of 1998. In 2001, differences between the observed and predicted ratings could be observed. In the first quarter, Repsol-YPF was downgraded to B2-downgrade by Moody's, but in the following quarter, Repsol-YPF was assigned a higher outlook (B2-upgrade), which resulted in the piercing of the sovereign ceiling. In the last quarter of 2001, new upgrades were issued in favor of Repsol-YPF, which received a Ba3 upgrade rating, although this was not confirmed by the selected financial indicators.

In other words, Moody's believes that:

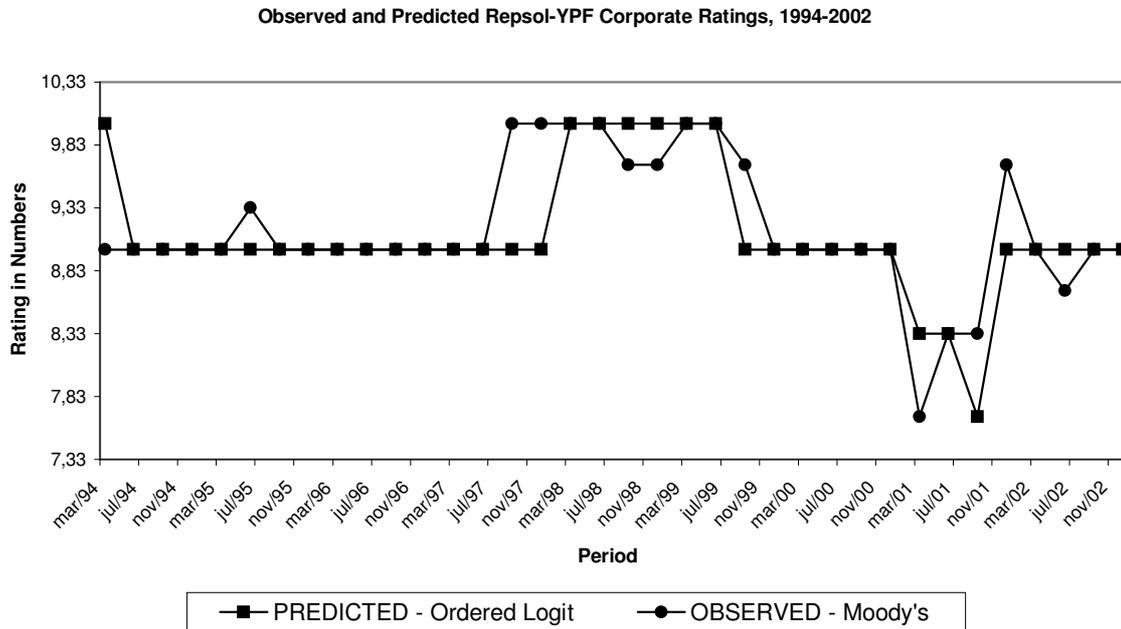
“YPF is strategically important to Argentina's energy industry and generates significant foreign exchange through its exports of crude oil and natural gas. As Argentina's leading integrated oil and gas company, YPF accounts for over 50% of domestic oil production and about 60% of domestic gas sales. About 50% of YPF's revenues are denominated in U.S. dollars and are generated from export sales and from its international investments. Hence, YPF would be more likely to be exempt from a government-imposed debt moratorium than companies that do not exhibit such characteristics. In addition, YPF derives certain strategic, operational, and financial benefits as a result of its ownership by Repsol YPF.” (MOODY'S, 2001c, pp. 2)

During 2002, whereas ratings assigned by Moody's oscillated between downgrades and upgrades, the financial indicators pointed out to the maintenance of the B1-confirmed rating.

It seems clear that the piercing of the sovereign ceiling can be better explained by the strong downgrades of the sovereign rating, from July 2001 on, rather than an increase in the corporate rating. Nevertheless Repsol-YPF's financial indicators did not seem to be unduly

influenced by the 2002 crisis, so that the predicted ratings are constant over the period and above the sovereign ceiling.

**Figure 3**



Note: Model including six variables: OCF/TD, FCF/TD, EBITDA, OM, STD/TD and TD/EBITDA. The Repsol-YPF corporate rating refers to foreign currency bonds.

In order to find an alternative model with significant variables and a small number of prediction errors, i.e., small or no differences between observed and predicted ratings, usual selection criteria were used on the initial model. Therefore, the selection of an alternative model to the model with six variables (OCF/TD, FCF/TD, EBITDA, OM, STD/TD and TD/EBITDA) took into account the significance of each variable and the number of prediction errors of each model. As a result, two alternative models were developed:

$$Rating_t = r (\beta_1 EBITDA + \beta_2 DCP/DT + \varepsilon_t)_t \tag{a}$$

$$Rating_t = r (\beta_1 FCL/DT + \beta_2 DCP/DT + \varepsilon_t)_t \tag{b}$$

Where  $r(\cdot)$  is a function that relates ordinal ratings to cardinal variables.

The results obtained for alternative models *a* and *b*, respectively, show that the corresponding explanatory variables are statistically significant. LR test (two degrees of freedom) for both models showed that when the variables are analyzed together, they can explain the Repsol-YPF corporate rating. Alternative model *a* presented a calculated value of

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22.23 for the LR statistics and a probability of 0%, whereas alternative model *b* presented a value of 24.37 and a probability of 0%. Coefficients are not presented, since they do not indicate marginal effects. Marginal effects were estimated and are presented in the Figure below.

Tables 4 and 6 show the prediction errors of alternative models *a* and *b*, respectively. Both models had the same number of errors: 14 units. The highest concentrations occurred in the B1-confirmed and Ba3-downgrade ratings, respectively. These results were similar to the initial model of Repsol-YPF.

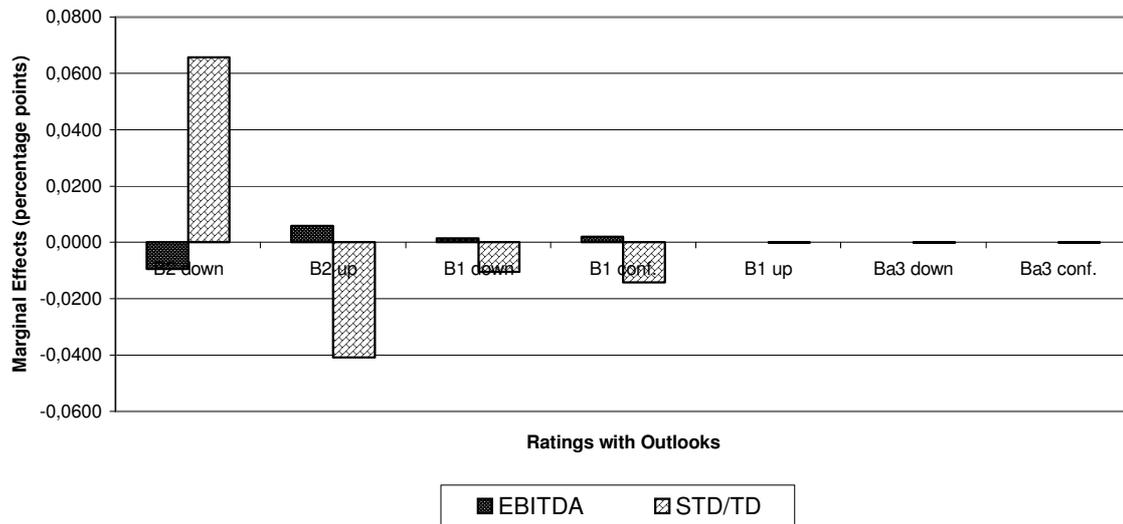
**Table 4 - Prediction of the Dependent Variable of Alternative Model *a* – Corporate**

<b>Rating</b>			
<i>Ratings with Outlook</i>	Observed Frequency	Calculated Frequency	Prediction Error
B2 downgrade	1	0	1
B2 upgrade	2	2	0
B1 downgrade	1	0	1
B1 confirmed	21	26	-5
B1 upgrade	1	0	1
Ba3 downgrade	4	0	4
Ba3 confirmed	6	8	-2

Figures 4 and 6 for models *a* and *b*, respectively, show the likelihood of corporate ratings relative to marginal changes in the indicators. Both Figures show that STD/TD has a stronger impact on rating assignments. This means that a one-unit change in this variable increases the probable occurrence of B2-downgrade and B2-upgrade ratings. However, in alternative model *a*, the STD/TD variable had a much stronger effect on B2-downgrade and B2-upgrade ratings; in alternative model *b*, the same variable had a stronger impact on B2-downgrade and B1-confirmed ratings. It should be highlighted that in alternative models *a* and *b*, the probability of ratings higher than B1-confirmed was virtually nonexistent.

Figure 4

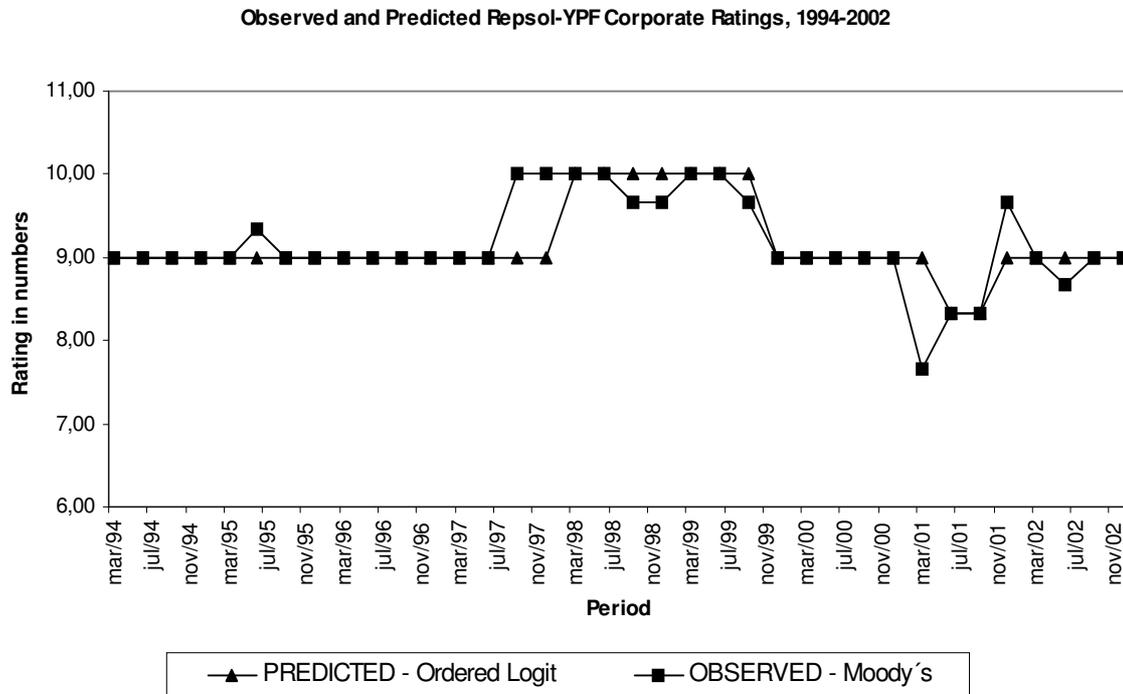
Likelihood of Corporate Ratings with respect to Financial Indicators changes in Repsol-YPF, 1994-2002



Finally, Figures 5 and 7 show the behavior of the Repsol-YPF rating in the 1994-2002 period, considering alternative models *a* and *b*. In both Figures, the differences are similar to the ones found in Figure 2 in the initial model. The last quarter of 1999 was an exception in terms of the calculated rating. Alternative model *a* presents a predicted rating higher than that issued by Moody's, i.e., Ba3-confirmed is maintained. On the other hand, alternative model *b* indicates a rating lower than the observed one, namely B1-confirmed. Thus, one may say that alternative model *a* is more favorable than alternative model *b*.

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Figure 5



Note: Model with two variables: EBITDA and STD/TD. The Repsol-YPF corporate rating refers to foreign currency bonds.

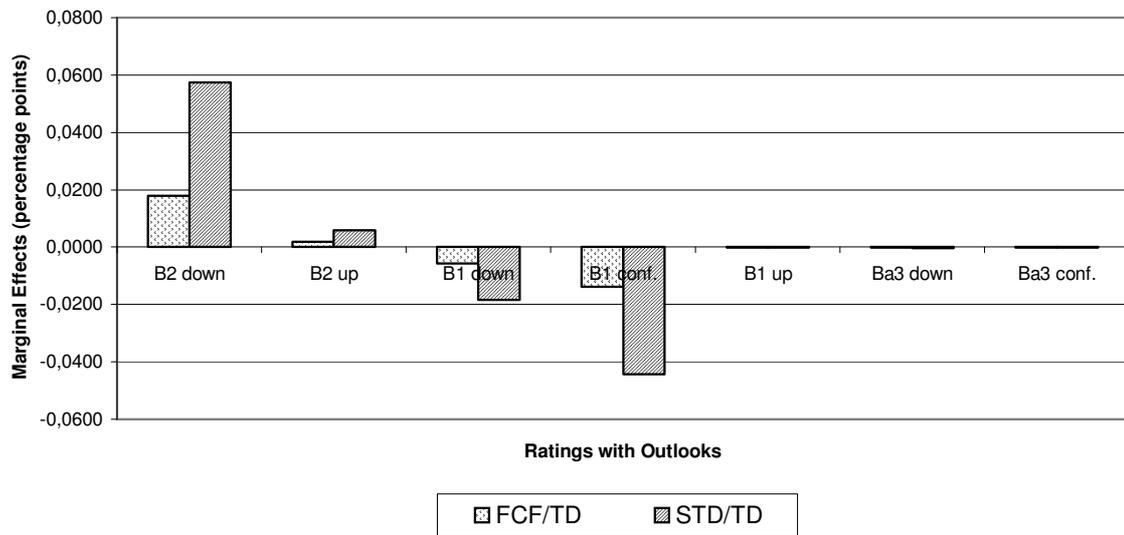
Table 6 – Prediction of the Dependent Variable in Alternative model *b* – Corporate  
Rating

<i>Ratings with Outlook</i>	Observed Frequency	Calculated Frequency	Prediction Error
B2 <i>downgrade</i>	1	0	1
B2 <i>upgrade</i>	2	2	0
B1 <i>downgrade</i>	1	0	1
B1 confirmed	21	27	-6
B1 <i>upgrade</i>	1	0	1
Ba3 <i>downgrade</i>	4	0	4
Ba3 confirmed	6	7	-1

Note: Model with two variables: FCF/TD and STD/TD. The Repsol-YPF corporate rating refers to foreign currency bonds.

**Figure 6**

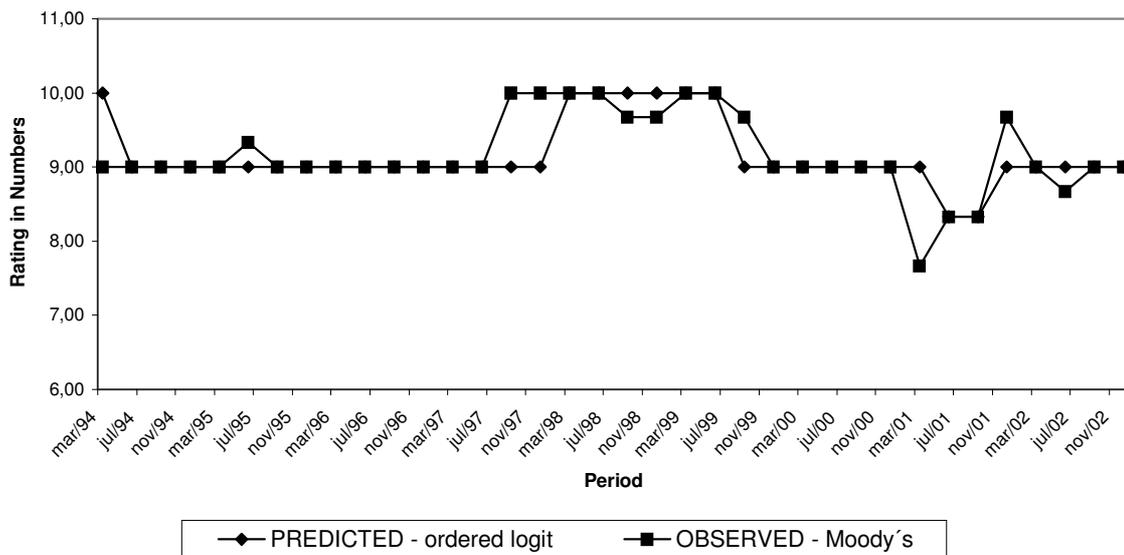
Likelihood of Corporate Ratings with respect to Financial Indicators changes in Repsol-YPF, 1994-2002



Note: Model with two variables: FCF/TD and STD/TD. The Repsol-YPF corporate rating refers to foreign currency bonds.

**Figure 7**

Observed and Predicted Repsol-YPF Corporate Ratings, 1994-2002



## 5 FINAL REMARKS

This paper aimed to verify the informational content of the Repsol-YPF corporate rating using financial indicators. The basic hypothesis is that corporate ratings reflect information that is not available in the market. In order to reject this hypothesis, it was necessary to find indicators that could explain satisfactorily the changes in a company's corporate rating.

An ordered logit model was built in order to determine the ratings, using a small set of financial indicators. It is believed that if corporate ratings provide information that is not considered by the indicators, the variables of the proposed model will have difficulty predicting them.

By analyzing the results of the ordered logit model, the conclusion is that the model with six variables (OCF/TD, FCF/TD, EBITDA, OM, STD/TD and TD/EBITDA) explains the assignments of corporate ratings in the analyzed period, as do models with only two variables (EBITDA and STD/TD in model *a* and FCF/TD and STD/TD in model *b*). The models wrongly predicted only 1/3 of the ratings assignments errors. This result shows that the Repsol-YPF corporate ratings represent, to a great extent, the information available in the market. In other words, ratings are evidence that the company has the basis for the rating assigned in the period, since the selected indicators had a positive performance, excluding those directly related to production and reserves, which were not included in this analysis.

Although the reviewed literature does not include indicators related to production, competitiveness, reserves, among others, it is believed that financial indicators respond well to the assignments of corporate ratings, as shown in the models built using the ordered logit method.

Compared to other results in the literature, BONE (2007) used the same methodology successfully to study Petrobras corporate ratings. As is the case here, EBITDA and STD/TD are important ratings predictors. On the other hand, Repsol/YPF's sovereign rating piercing seems to be more explained by the plunge of the sovereign rating itself, rather than firm improvements over time. YPF's backing by an European oil company assured rating agencies that the firm could have a rating above the Argentine sovereign ceiling in 2002.

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**APPENDIX:**

**Chart 2a - Repsol-YPF Corporate Ratings in Foreign Currency, 1994-2002**

Period	Rating	
	Symbol	Credit Watch
19/1/1994	B1	assigned
1/3/1995	B1	confirmed
16/5/1995	on watch	possible upgrade
29/9/1995	B1	confirmed
3/7/1997	B1	confirmed
2/10/1997	Ba3	upgrade
3/9/1998	on watch	possible downgrade
11/2/1999	Ba3	confirmed
30/4/1999	on watch	possible upgrade
24/6/1999	Ba3	confirmed
20/8/1999	on watch	possible downgrade
6/10/1999	B1	downgrade
28/3/2001	B2	downgrade
28/3/2001	on watch	possible downgrade
5/6/2001	B2	confirmed
7/6/2001	on watch	possible upgrade
1/11/2001	Ba3	upgrade
12/12/2001	on watch	possible downgrade
8/2/2002	B1	downgrade
25/4/2002	on watch	possible downgrade
29/7/2002	B1	confirmed

Moody's, 2003.

Obs.: seniority: senior unsecured; currency: USD.

Debt: negotiable oblig.