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## THE QUALITY OF A POST-DISTRESS STATUS OF FIRMS OVERCOMING DECLINE: DETERMINANT FACTORS OF A RISKY OUTLET

*The paper focuses on the fact that post-distress status should assess not only if a firm manages to solve its critical state but also the quality of the final position by considering the risk to re-enter into distress. Our fitness indicator discriminates between well-performers, which just exit distress, and best performers, which are located in a new healthy scenario minimizing the likelihood to fall again in distress. We use the financial data on the US firms in the 8-year period, 1993–2000. The results show that the determinant factors and their significance change depending on the temporal reference taken for the analysis as well as on a specific industry where a firm is operating.*

*Keywords:* post-distress status, severity, data envelopment analysis.

## Арйола Мечай, Марія Ісабель Гонсалес-Браво СТАТУС ФІРМИ ПІСЛЯ ПОДОЛАННЯ КРИЗИ: ФАКТОРИ, ЩО ВИЗНАЧАЮТЬ РИЗИКИ

*У статті увагу сконцентровано на фірмах, яким вдалося вийти з кризи, а також на тому, наскільки така ситуація стабільна і чи існує ризик повторного входу в кризу. Розроблено індикатор, що дозволяє відрізнити організації, які просто вийшли з кризи, і фірми, які добре функціонують за новим сценарієм розвитку, що зводить до мінімуму ймовірність повторення кризи. Використано фінансові дані по американських фірмах за восьмирічний період (1993–2000 рр.). Результати показують, що визначальні чинники та їх значення змінюється залежно від часових координат, взятих для аналізу, а також від конкретної галузі, в якій працює фірма.*

*Ключові слова:* статус виходу з кризи, тяжкість, аналіз середи функціонування.

*Табл. 2. Рис. 2. Форм. 1. Літ. 34.*

## Арйола Мечай, Мария Исабель Гонсалес-Браво СТАТУС ФИРМЫ ПОСЛЕ ПРЕОДОЛЕНИЯ КРИЗИСА: ФАКТОРЫ, ОПРЕДЕЛЯЮЩИЕ РИСКИ

*В статье внимание сконцентрировано на фирмах, которым удалось выйти из кризиса, а также тому, насколько такая ситуация стабильна и существует ли риск повторного входа в кризис. Разработан индикатор, позволяющий отличить организации, которые просто вышли из кризиса, и хорошо функционирующие фирмы с новым сценарием развития, сводящем к минимуму вероятность повторения кризиса. Используются финансовые данные по американским фирмам за восьмилетний период (1993–2000 гг.). Результаты показывают, что определяющие факторы и их значение меняется в зависимости от временных координат, взятых для анализа, а также от конкретной отрасли, в которой работает фирма.*

*Ключевые слова:* статус выхода из кризиса, тяжесть, анализ среды функционирования.

**1. Introduction.** Every organization is inevitably exposed to ups and downs during its lifecycle (Burbank, 2005) and failure is not a sudden event (Agarwal and Taffler, 2008). If failure is considered a firm's misalignment with its environment (Sheppard and Chowdhury, 2005), the fittest firms have greater chance to survive (Kahl, 2001) in its continuous lifecycle.

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Managing a crisis situation is a fundamental issue as it is not a spontaneous process and the probability of a successful exit is very low. However, the percentage of firms that succeed in getting through decline cannot be disregarded (50% in the sample by Barniv et al. (2002); 1/3 in Kahl's (2001) study; or 22.5% of the sample in Gonzalez-Bravo and Mecaj (2011)).

However, not all the successfully exiting firms manage to keep the new situation stable. In this sense, Kahl (2002) states that financial distress should be considered a long-term process which makes that firms end up debilitated even after having recovered from decline. In this sense, Hotchkiss (1995) attested that during the first 5 years after exiting a bankruptcy, 35 to 40% of firms show negative operating income and up to one third of the firms that manage to ease their distress through debt restructuring re-enter a financial distress situation a few years later. Yet, we should consider that the exit from a difficult condition, as Moulton and Thomas (1993) suggest, is only the beginning of the story.

The present paper focuses on the fact that post-distress status should assess not only if a firm solves the initial state, but also the quality of firms' welfare accounting for the risk of re-entry into distress. This line permits to consider a Fitness indicator discriminating between well-performers, which just exit the crisis situation, and best performers, which are located in a new healthy scenario minimizing the likelihood to re-enter in distress.

**2. Determinant factors of Post-distress status.** Even though some weak crisis situations tend to show a natural evolution throughout the "exit" and may be solved by simply making "routine" decisions, recovery process is not a "spontaneous" event. Companies that do not have a long-term orientation and just adopt patch strategies do not usually reach successful exits (Pretorius, 2008). However, certain initial conditions may affect the reaction capacity as well as the effectiveness of the measures taken by managers.

*Initial severity status and reaction capability.* Similar to a disease process, the gravity of the initial crisis position not only conditions the measures to take but also their success possibilities. Smith and Graves (2005) found that the gravity of the starting situation is strongly associated with the probability of recovery. However, Gonzalez-Bravo and Mecaj (2011) affirm that the severity of the initial situation does not have to be a crucial factor in the outcome of the crisis. In this way, following Robbins and Pearce (1992) and Moulton and Thomas (1993), the initial gravity status has an influence over the process of recovery more than on the final resolution. Thus, severity determines the rate of recuperation, so the harder the severity is, the greater the effort to react are and the slower the process of healing the levels of solvency and profitability is.

The structural reaction capability of a firm, like the capacity to obtain additional funds managing sales or using efficiently the leverage level, can soothe the prior pressure imposed by a deteriorated financial distress position (Barker and Duhaime, 1997). These patterns are evidenced in Gonzalez-Bravo and Mecaj (2011) when distressed firms with remarkable financial reaction capacity and/or a solid financial structure evolve mainly toward a healthy zone. However, concerning debt structure Kahl (2001) did not find evidence on if the debt level or the debt structure of a firm influences the final outcome of a crisis situation.

Severity status and reaction capability, as initial restrictions, could be moderated by firm size when considering the exit from a crisis situation (Moulton and Thomas, 1993; Barniv et al., 2002; Smith and Graves, 2005). Altman and Hotchkiss (2006) found that one of the most obvious factors that discriminate between firms that successfully restructure and those that liquidate the firm's size. Nevertheless, other works observe that this variable did not present any clear relation with the survival chance (Kahl, 2001; Ooghe and Prijcker, 2008). Possibly, firm's size does not determine the final resolution of a distress situation but it influences the reaction capability to confront it, moderating/strengthening the drawbacks when additional support should be guaranteed and restructuring decision must be made.

*Performance in distress.* Beaver (1966) already stated that if a difficult situation was properly detected, measures that lead to an improved position could be taken, avoiding a fast deterioration of financial indicators. Regardless the initial state restrictions, the adopted strategies and the behavior of companies during a financial crisis are crucial for the "exit" process (Sun and Li, 2007). Robbins and Pearce (1992), Pearce and Robbins (1993) and Harker and Harker, (1998) stated that in-distress strategies oriented towards cost reduction and efficiency improvement were safe bets for a favorable outcome. However, Castrogiovani and Bruton, (2000) and Smith and Graves (2005) affirmed that no positive relation could be found between certain strategies and successful outcome. Firms facing a distress situation and carrying out a retrenchment strategy are more likely to survive, but the performance was statistically not greater than that of not retrenched firms (Castrogiovanni and Bruton, 2000).

The effectiveness of efficiency-oriented strategies is supported by the results showing that firms resolving a situation of financial distress are statistically more profitable than those who did not settle (Routledge and Gadenne, 2000). The in-distress operating performance has a strong positive relation with the survival prospect, driving a successful evolutionary route towards a new healthy scenario (Kahl, 2001; Routledge and Gadenne, 2000). In the same line, Gonzalez-Bravo and Mecaj (2011) found evidence that the companies positioned in a "safety zone", starting from a situation of failure status, are characterized by a strong managerial action measured by the ROA ratio. However, other authors found that ROA coefficients were statistically not significant in predicting the outcome of a crisis situation (Barniv et al. 2002; Laitinen, 1993).

Severity and reaction capability should be understood as initial conditions that will impose restrictions in selecting the strategies which will drive the performance during recovery, thus, determining the final post-distress status of long-term financial distress process as shown in Figure 1.

The left side of the diagram gathers the initial determining factors outlining the firm's ability to overcome the difficult situation. The right side defines the final subsequent status of firms, once specific actions have been taken, not only because the firm solves the initial state, but also since the new position is reached evidencing a well performance to set a suitable continuity in the new balanced situation. Post-distress status assesses the quality of firms' welfare accounting for the risk to re-entry into distress discriminating well performers and best performers in a crisis management process.

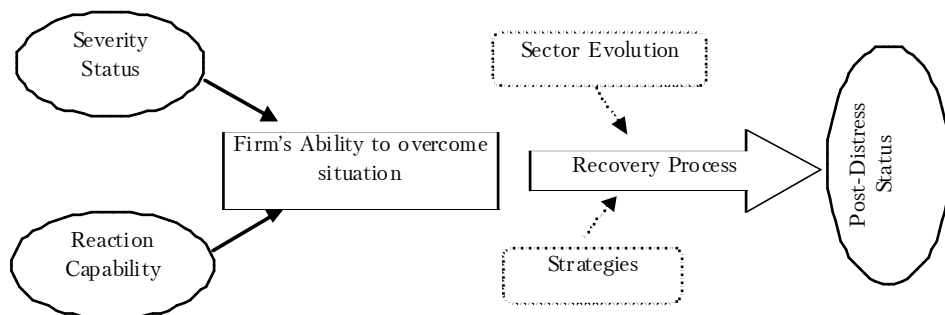


Figure 1. Recovery process model

According to previous theoretical arguments and empirical evidence, the following hypotheses are established:

H1: Severity degree of financially distressed firms will show a positive association with the risky post-distress status.

H2: Financially distressed firms presenting a higher initial reaction capability to obtain additional funds or to streamline their financial structure will display a better risky post-distress position.

H3: Performance in-distress by efficiency oriented strategies and asset reduction actions will be positively related with the welfare of the post distress status.

H4: Size of financially distressed companies will have a positive influence on the risky post-distress position.

**3. Methodology, sample and variables.** To test the hypothesis we use the financial data of the US firms derived from the Compustat Database in the 8-year period (1993–2000) stopping the analysis before the peak business activity occurred in the US economy in 2001 (NBER, 2001). From the total of 1721 companies that offer complete data in their financial statements during all the years, only the ones that had a crisis status in the first year of analysis, 1993, were selected. We consider a crisis status as a variety of enterprise adversity situations that threaten future viability of the company (Graveline and Kokalari, 2008), which show some "incapacity" to generate resources and/or to fulfill the payment of debts in time. This "incapacity" can be observed through a series of widely accepted symptoms alerting that the health and the future of the company are at risk (Gonzalez-Bravo and Mecaj, 2011). We classify a firm as financially distressed if in the first year of our analysis it presented one or more of the following criteria: negative net income, negative operating income, negative retained earnings, negative working capital, negative cash flow, negative operating cash flow and negative shareholder's equity. Variables representative of the economic performance such as net income, EBIT and retained earnings are commonly used to determine the existence of a decline phase in turnaround and recovery research (Pearce and Robins, 1993; Arogyaswamy et al., 1995; Smith and Graves, 2005). Negative operating cash flow is also an indicator of liquidity deterioration and of financial distress probability (Anandarajan et al., 2001). As a result, our study is performed on the total of 526 companies that satisfied all the previous conditions. 77.38% of the firms can be classified as being in a weak crisis, because they present 3 or less criteria; while 22.62% could be facing a situation of strong crisis presenting 4 or more indicators.

The variables of severity status, reaction capability and fitness status, as representative indicators of post-distress position in the above proposed model (Figure 1) are built by gathering information given by some individual variable-indicators (Figure 2).

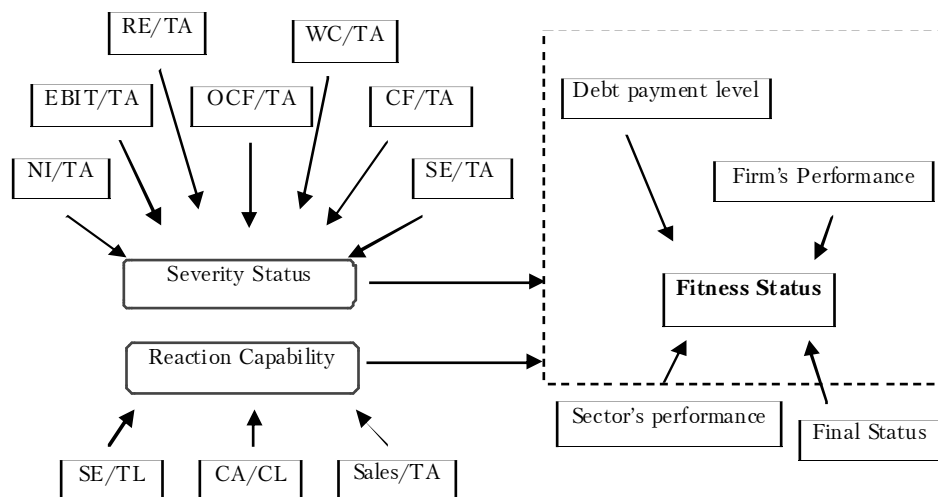


Figure 2. Variables of influence in a recovery process

Severity status (SEV\_STAT) is the index created starting from the 7 symptom-indicators used to classify a firm as being in financial distress previously described, all divided by total assets in order to eliminate the size effect. These 7 indicators should be considered in a negative direction with respect to financial distress. That is, the lower is the value of the indicators, the worse is the starting situation of the firm. Reaction capability is evaluated through 3 indicators: sales/total assets (TURNOV), shareholders equity/total liabilities (FIN\_AUT) and current assets/current liabilities (SOLV). Together, these 3 variables measure the capacity of a firm to obtain further resources without worsening its position, the capacity of debt negotiation and the ability to generate resources.

Fitness status (FIT\_STAT) is defined as the index measuring the final health position, *t* years after the financial distress has been detected, on an objective and on a quality base as well, by means of 4 variables. To measure the health quality of this position, we follow the approach of Jostarndt (2006) when he identifies 3 factors that could cause financial distress: excessive leverage, a poor firm-specific operating performance and an industry downturn (see Appendix A). These factors could be interpreted as indicators of the incapacity of a firm to generate cash flow and should be understood in a negative sense, thus, the higher the 3 ratios are, the worse is the quality position of a firm and the greater is the probability of financial distress. Additionally, final position is a categorical variable which indicates the existence or not of a crisis situation, when the firm still presents any symptom of distress. This variable takes the value of 0 if a firm exits successfully and doesn't present distress signals or value 1 otherwise.

Severity status and fitness status are presented as 2 composite indicators. To overcome some of the drawbacks of the aggregated indices, such as the degree of sub-

jectivity in attribution of weights to each individual component (Munda and Nardo, 2009), we decided to use the data envelopment analysis (DEA) to combine the complex information in just one index by means of an optimization process without assuming an a priori weights structure (Cherchye et al., 2008). Thus, both scores are obtained applying the DEA model with only outputs and the single constant input (Chen, 2002; Liu et al. 2011).

Severity and Fitness Status use as DEA variables a series of indicators that measure negative features of a firm. This is in agreement with the so-called pessimistic DEA approach, where the efficiency frontier contains, using Azizi and Ajirlu (2011) terminology, the worst practisers as efficient in being poor performers. In this way, DMUs scoring unity or close to unity levels will be the ones with higher degree of severity in their financial distressed situation.

To measure strategies and the behavior of firms during distress, profitability and downsizing actions have been included in the analysis. With regard to profitability, we use ROA in the last year of the analysis (ROA) and the average of its variations in the previous years (ROA\_AVG) to measure the impact of efficiency oriented strategies to the final post-distress position. Concerning downsizing actions, variations in total assets during previous year are included to measure the impact of retrenchment strategies (RET\_STG). Finally, to control the size effect (SIZE), natural logarithm of sales [ $\ln(\text{sales})$ ] is included in the analysis.

The DEA score Fitness Status will be treated as a dependent variable to analyze to what extent post-failure risky position could be explained by the issues such as severity, reaction capability or certain strategies implemented by firms. In this way, equation (1) reflects the final regression model applied, for both 3-year and 8-year analysis. Following the approach of McDonald (2009), the consideration of DEA score as a censored variable has been the argument for using regression censored models such as Tobit. In accordance with the approach of McDonald (2009), we consider that OLS is an unbiased and consistent estimator to easily evaluate the influence of factors to the non-parametric DEA performance measure.

Poston et al. (1994) consider that a 7–8 year period is appropriate for a company to get ahead of a crisis situation. On the contrary, Kahl (2001) or Smith and Graves (2005) contemplate that a 4-year period should be sufficient to detect if a firm in a distressed situation can successfully return to a healthy scenario. Considering these arguments, the above regression model to explain the post-distress position will be applied in both in 3 and 8 year scenarios, performing the analysis considering the outcome in a short and long term. Indeed, equation (1) reflects the final regression model applied for both 3-year and 8-year analyses.

$$\begin{aligned} \text{Fitness status} = & \beta_1 \text{SEV\_STAT} + \beta_2 \text{FIN\_AUT} + \beta_3 \text{SOLV} + \\ & + \beta_4 \text{TURNOV} + \beta_5 \text{ROA} + \beta_6 \text{ROA\_AVG} + \beta_7 \text{RET\_STG} + \\ & + \beta_8 \text{SIZE} + \varepsilon \end{aligned} \quad (1)$$

**4. Empirical results.** The initial results of the post-distress position (see Table 1) show that 8 years after a financial distress has been identified, a small number of firms are considered to be the worst performers and with a high distress risk according to the fitness status score. However, a considerable number of firms (37% of the total)

obtain satisfactory results in the final year of the analysis, showing a fitness status close to 0 (score < 0.0009). Considering the 3-year scenario, the percentage of firms that 3 years after the classification of the distress situation obtained favorable fitness status scores (<0.0001) reached 23%, compared to 12% in the last year of the analysis.

**Table 1. Score Frequency Distribution**

	3-year window	8-year window
Firms scoring unity (poor performers)*	5	3
Firms scoring near 0 (< 0.0001)	124	72
Average	0,053654	0,025980
Standard deviation	0,1434524	0,1045733

\* The scores near or equal to unity identify poor performers and, on the contrary, the scores near to 0 identify good performers, given that fitness status DEA score is constructed on the pessimistic sense.

The results of the Wilcoxon test show that the quality of a healthy/distressed new position is distinct between scores of the 3-year scenario and of the 8-year scenario and higher in the latter case with the significance level of 0.000. According to these results and the statements on the evolution of distress symptoms of firms during the analyzed period, it could be considered that a long term, as Kahl (2001) affirms, actually permits an effective outcome of a crisis situation. This situation could be explained by the fact that the firms detecting certain symptoms of adversity react by using "bump" measures which produce satisfactory results in the short run but they also reduce the possibility of the firm to maintain this stable situation. We could figuratively denominate this phenomenon as "spring recovery process".

The regression results for the long-term scenario (Table 2) offer satisfactory levels of goodness of fit for the global model ( $R^2 = 66,4\%$ ) and for the individual sectors as well (between 61,1% for consumer discretionary and 91,2 % for the materials industry). In the case of the three-year scenario, the global model reaches  $R^2 = 62,3\%$  while individual sectors obtain the values between 89,5% for Information Technology and 65,4% for Consumer Staples, which is the worst represented.

Severity appears to be significant in the general model ( $p = 0.000$ ) in explaining the performance of firms 8 years after the distress symptoms have been identified. However, the negative sign of its coefficient indicates that firms starting from a worse situation present a lower distress risk and a more solid position at the end of the analysis. These results permit affirming the hypothesis that the severity degree does not determine a negative outcome of the situation. Thus, in both scenarios the results show that our first hypothesis is not supported. With regard to reaction capability, there is lack of evidence to support H2. In this way, a suitable level of activity that generates resources (turnover ratio) and an appropriate management of the maturity period (solvency ratio) are crucial factors for the survival in distress situations ( $p = 0.000$ ). On the contrary, financial autonomy does not seem to be of any significance on the fitness status after recovery. Profitability, which represents the performance during the analyzed period, was significant only when concerning the variable that measures the returns in terms of ROA and not when considering the average overall performance. However, these results are not sufficient to conclude that continuous profitable performance is a necessary condition to overcome a difficult situation.

Table 2. Regression coefficients and level of significance

Scenario	CD		CS		EN		IND		IT		MA		TS		Global		
	8 year	3 year	8 year	3 year	8 year	3 year	8 year	3 year	8 year	3 year	8 year	3 year	8 year	3 year	8 year	3 year	
Model R <sup>2</sup>	61,1%	73,5%	78,7%	65,4%	72,6%	84,0%	82,2%	73,3%	88,2%	89,5%	74,9%	68,9%	91,2%	78,7%	66,4%	62,3%	
Independent variables	SEV_STAT	-0,026	0,061	0,043	0,259	-0,047	<i>-0,180</i>	-0,076	<i>-0,126</i>	<i>-0,107</i>	-0,054	-0,139	0,068	-0,078	-0,489	<b>-0,134</b>	<i>-0,062</i>
	FIN_AUT	<b>-0,259</b>	<b>-0,256</b>	-0,111	-0,052	-0,207	-0,061	-0,067	<i>-0,142</i>	<b>-0,331</b>	<b>-0,395</b>	<i>-0,341</i>	-0,179	-0,273	-0,379	-0,029	-0,020
	SOLV	<i>-0,118</i>	-0,016	-0,224	<i>-0,408</i>	-0,128	<i>-0,467</i>	<b>-0,295</b>	<i>-0,186</i>	-0,122	<i>-0,125</i>	-0,204	-0,097	0,496	0,139	<b>-0,207</b>	<b>-0,210</b>
	TURNOV	<b>-0,532</b>	<i>-0,312</i>	0,028	0,102	0,161	<i>-0,351</i>	<b>-0,417</b>	-0,148	<b>-0,528</b>	<b>-0,618</b>	-0,190	-0,239	0,354	-0,267	<b>-0,233</b>	<b>-0,362</b>
	RET_STG	0,028	-0,079	0,180	<i>0,297</i>	0,280	<i>-0,187</i>	-0,001	<i>-0,101</i>	<i>0,112</i>	-0,032	0,000	-0,164	-0,289	0,135	0,003	<i>-0,062</i>
	ROA	<b>-0,139</b>	-0,266	<i>-0,586</i>	-0,509	<i>-0,572</i>	0,049	0,020	-0,035	-0,072	<i>-0,326</i>	<b>-0,437</b>	-0,391	<i>-0,495</i>	-0,439	<b>-0,093</b>	-0,082
	ROA_AVG	0,021	0,162	-0,121	0,068	0,015	<i>-0,415</i>	0,012	<i>-0,333</i>	0,077	<b>0,306</b>	0,070	0,172	0,335	0,087	0,024	0,025
	SIZE	<i>-0,111</i>	<i>-0,319</i>	-0,300	-0,447	-0,389	<i>0,455</i>	<b>-0,242</b>	-0,134	-0,051	0,127	-0,089	-0,235	-0,713	0,121	<b>-0,422</b>	<b>-0,287</b>

In bold: p-value = 0.01; In italic: p-value = 0.05.



Regarding the influence of retrenchment strategies, measured by means of asset variation as downsizing actions, no positive association is found with the welfare of the post-distress status. In this sense, the reduction of asset level possibly depends on the capacity of the industry to maintain a required and appropriate level of activity, or maybe it depends on the fact that this variable is not a characteristic of the sector where firm operates.

Sectors analyzed: CD (consumer discretionary), CS (consumer staples), EN (energy), IND (industrials), IT (information technology), MA (materials) and TS (telecommunication service).

As a consequence of results in performance and assets reduction actions we cannot support H3. As expected, company size influences the evolution of distress. Big firms tend to have a better situation and lower risks after the initial distress situation, thus, the results support H4.

Variables associated with severity, reaction capability and size, behave in the same way when considering both 3-year or 8-year scenarios. On the other hand, retrenchment strategies, which were not selected as explicative variables in the previous model, appear with non-zero coefficients and with  $p = 0.029$  level of significance, but with a negative sign. In contrast with the starting hypothesis, downsizing actions do not seem to be associated with the decrease of financial distress risk. These results are in line with Smith and Graves (2005) suggesting that asset expansion, and not their reduction, is more likely to affect recovery. Additionally, the fact that retrenchment strategies result significant but in a negative direction for the short run analysis suggests that drastic actions taken when a distress situation is identified may imply more deterioration for a firm in the short term.

The proposed model presents a satisfactory goodness of fit in explaining recovery processes when referring to activity industries, both in short and long term. However, the results show that the model variables have higher explanatory capacity in the 3-year window analysis. In consumer discretionary industry all model dimensions are significant except for retrenchment strategies. It is to be noticed that none of the variables used to measure the reaction capability determines the recovery process for the set of industries composed by: consumer staples, energy, telecommunication service and materials (the latter – in the short run).

**Conclusions.** Although it may appear that a firm has recovered from a critical situation, managers should pay attention to other variables that may condition the future healthy state of being. This paper aims to determine what factors affect the post-distress position of a firm facing a financial distress situation and has initiated a recovery process. A firm can reach a healthy fair position not only when it overcomes the starting situation but when it does not have a deficient underlying structure that increases the risk to fall again in distress. The results obtained suggest that the final post-distress position can be explained by certain variables and under certain circumstances. Reaction capability of distressed firms is not positively related to a fit final state after recovery but the interpretation is different if we consider the global model or if individual industries are analyzed. Severity degree does not determine a negative outcome of a situation. When considering the recovery periods, we can affirm that the long term actually permits an effective outcome of a crisis situation while for profitability the results were not sufficient to affirm that continuous prof-

itable performance is a necessary condition to overcome a difficult situation. As expected, company size influences the evolution of distress. However, regarding the influence of retrenchment strategies, there is no sufficient evidence to support a positive influence on the outcome of distress. To conclude, the industry where a firm is developing its activity has an influence on the exit from a difficult situation. Certain sector specific characteristics may contribute or inhibit the evolution of the turnaround process and as a consequence on the outcome of the strategies implied by the firms to solve the distress.

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