



# **Reorganisation of bankrupt firms – the case of General Motors**

by

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**Master in Management Dissertation**

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## **Biographical Note**

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## **Acknowledgment**

First of all I want to express my gratitude to my family who helped and supported me to complete my studies and for passing me their values.

Second I want to thank my friends and professors for everything they have taught to me and for the support I have received from them.

At last but not least, a special recognition to my supervisor Professor Miguel Augusto Sousa for all the help, knowledge, time and patience he has demonstrated during these last two years as professor and supervisor. Without him this dissertation would not be possible.

## **Abstract**

Reorganisation of a bankrupt firm is a legal procedure that involves a plan to restructure corporation's assets and liabilities as well as a plan of payments to the company's creditor. In June of 2009 General Motors filed for Chapter 11 bankruptcy protection in the United States bankruptcy court. This procedure ended with the acquiring of the operational assets by a new entity with the backing of the United States Treasury.

This study aims to verify if the bankruptcy theories apply to the case of General Motors in terms of prediction, process and post-performance.

Using GM case study to study this subject is important and helpful because it allows us to analyse the bankruptcy reorganisation field within a certain context. Furthermore this is a recent case (2009) that can bring new insights to this field.

This study is also helpful in the actual economic context in Europe and in the U.S. where the number of bankruptcy process is increasing and so all the knowledge that we can acquire is valuable.

**Key-words:** Bankruptcy, prediction, reorganisation, post-performance, General Motors

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# 1. Introduction

One of the main concerns when managing a company is to make sure that a company always meets its payments to its debt holders. When a company is not able to pay its current obligations we say it is facing financial distress. When dealing with financial distress “a firm that must restructure the terms of its debt contracts to remedy or avoid default is faced with two choices; it can either file for bankruptcy or attempt or renegotiate with its creditors privately in a workout” (Gilson and Lang, 1990). Bankruptcy is a legal procedure that can be separated in a reorganisation or a liquidation process, while in private workout “the firm and its creditors renegotiate their contracts privately, resolving distress without resorting to the bankruptcy courts” (Wruck, 1990).

However a firm does not go bankrupt within a year. It is not a phenomenon that happens abruptly. So how can we know if a company is facing that type of risk? The only way to know that from a stakeholder point of view is to look at the financial statements and compute some financial ratios that can provide us some insights about the company’s health.

Ratio analysis started to be used for prediction purpose in 1930’s when the first studies began (Bellovary *et al.*, 2007). The first studies focused on a univariate (single ratio) analysis. This kind of analysis was used until mid-60’s and has as the most important study/author Beaver (1966). Altman (1968) presented the first multivariate study which remains very popular in the literature today. In 1980’s, with the contribution of technology and some advancements on this field, new types of analysis arise (logit analysis, probit analysis, and neural networks) being Ohlson (1980)’s model very popular.

The bankruptcy phenomenon received more attention during certain periods like the 1987-1991, the 2001-2003 and the 2008-2011 periods, as highlighted by Altman and Hotchkiss (2005). In the period 1987-1991, 34 firms with liabilities greater than \$1 billion filed for Chapter 11 and between 2001 and 2003 100 billion-dollar companies did the same. According to the U.S. bankruptcy court, in 2008, 1,117,771 companies initiated the bankruptcy process while in 2011 1,410,653 companies did the same which represents an increase of 26% during this period. Among the organisations that filed for Chapter 11 during this period was General Motors. General Motors is the fourth largest

U.S. bankruptcy in terms of the total of its assets and even though the complexity of the process it was able to reorganise into a new company.

This dissertation intends to test most of the theories regarding bankruptcy with the case of General Motors. From testing whether it was possible to predict the GM's bankruptcy with the models provided by the literature to the analysis of the performance of the new GM in the years after the reorganisation, passing through the process of restructuring the firms' debt and assets, most of the bankruptcy theories will be tested against this specific case.

## **2. Literature Review**

### **2.1 Bankruptcy prediction**

Business failure or bankruptcy is of critical importance to the stakeholders of the firm, to the country where the firm is and maybe to other countries around the world depending on the firm's size. Being able to forecast potential failure provides an early warning system so that something can be done to change such fate. But how can we forecast bankruptcy?

The literature on bankruptcy prediction started in 1930's when some authors begin to study the power of ratio analysis to predict business failure (Bellovary et al, 2007). Those authors analysed several ratios separately for failed and successful firms. For example, Fitz Patrick (1932) compared thirteen ratios of failed and successful firms and reported that two significant ratios were net worth to debt and net profits to net worth. Smith and Winakor (1935) found that working capital to total assets was a far better predictor of financial problems. They also found that the current assets to total assets ratio dropped as the firm approached bankruptcy. Merwin (1942) found three ratios that were significant indicators of business failure– net working capital to total assets, the current ratio and net worth to total debt.

Since then, the main focus of the authors is to find the best ratios and the best methodologies to predict more accurately business failure. We have models that use 1 ratio/factor and models that use 57 ratios/factors. Regarding the methodology used, first studies used univariate analysis and then multivariate analysis appeared as the main method for model development and finally conditional probability models (logit, probit and neural networks).

### **2.1.1 Univariate models**

The univariate models to forecast business failure are models that assume that a single variable can be used for predictive purposes.

#### **Beaver Model**

Beaver (1966) has made the most important univariate analysis of business failure. In his study Beaver stress two main ideas: first financial ratios can be used to predict failure and second available ratios could not be used indiscriminately because some ratios could prove to be more accurate in their predictive ability than others (Cook and Nelson, 1998)

Beaver (1966) has analysed 30 ratios individually for a sample of 79 failed firms and 79 non-failed firms during the period 1954-1964. Financial-statement data of each firm was obtained for five years prior to failure.

In order to reach to those 30 ratios, three criteria were used:

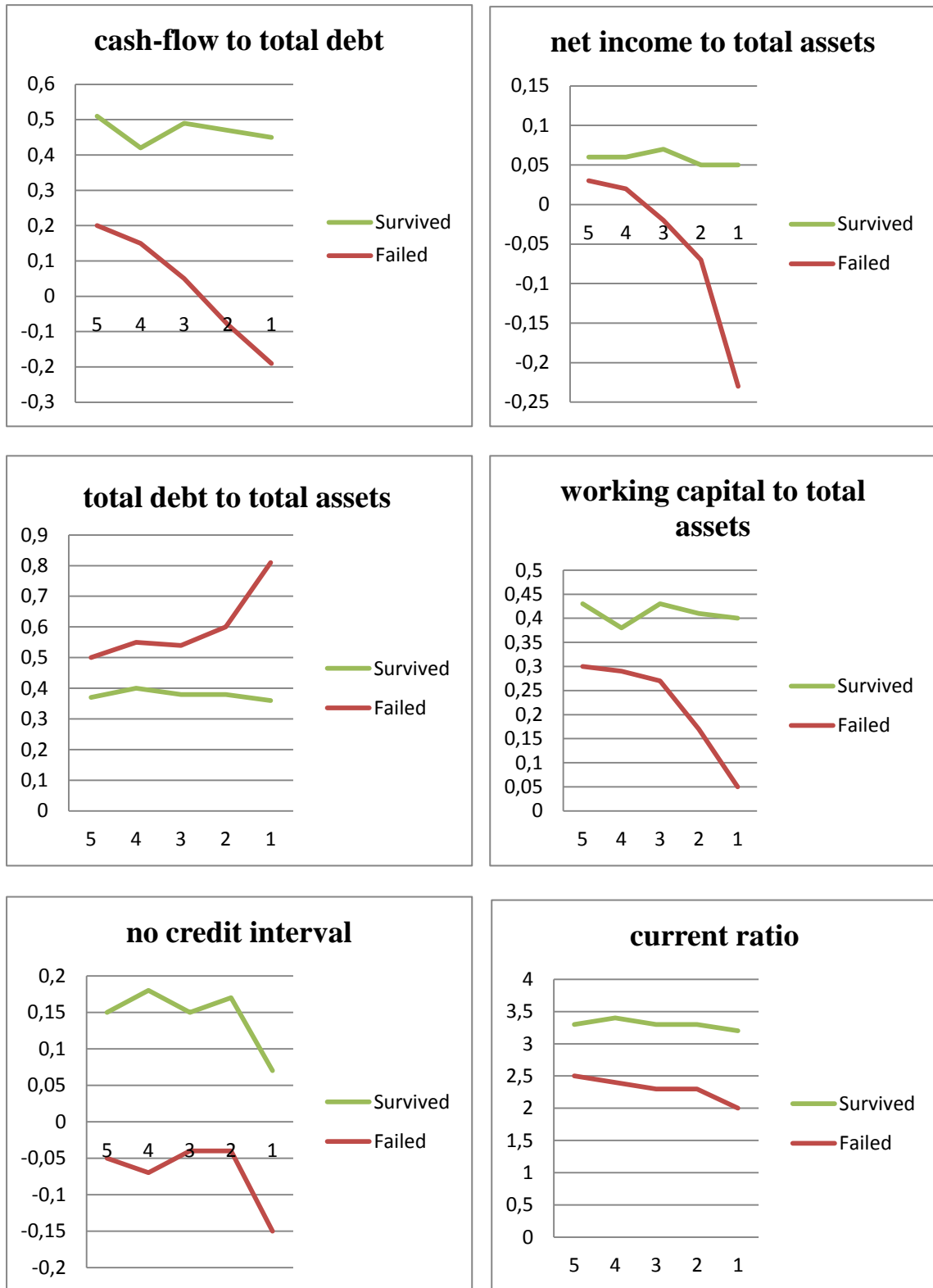
1. Popularity–frequent appearance in the literature;
2. Performance in previous studies;
3. Ratio should be defined in terms of a "cash-flow" concept.

The means of those 30 ratios was computed for failed and non-failed companies. Of those 30 ratios, 6 were selected to be tested. The ratios selected are the following:

- Cash-flow to total debt;
- Net income to total assets;
- Total debt to total assets;
- Working capital to total assets;
- Current assets to current liabilities;
- No-credit interval

Figure 1 shows the means of the 6 ratios selected computed for failed firms and for non-failed firms across the 5 years prior to bankruptcy.

**Figure 1 – Profile analysis, comparison of mean values**



From the analysis of the means distribution of the 6 ratios, Beaver (1966) concluded that the ratio distributions of non-failed firms are quite stable throughout the five years before failure but the deterioration in the means of the failed firms is evident over the years, especially in the year before failure.

Although the previous analysis allowed the author to find some differences between failed and non-failed companies, this analysis concentrates upon a single point on the ratio distribution— the mean. So without any dispersion measure no meaningful statement can be made regarding the predictive ability of a ratio.

To solve this problem, a dichotomous classification test was done. “In this test, a firm's ratios were compared with the ratios of other firms by placing them in an array. A cut-off point based on previous experience with failed and non-failed firms could then be established as a predictor with some degree of confidence” (Cook and Nelson, 1998). If a firm's ratio is below (above for the total debt to total assets ratio) the cut-off point, the firm is classified as failed. If the firm's ratio is above (below for the total debt to total assets ratio) the critical value, the firm is classified as non-failed.

Beaver (1966) concluded that the ratio cash-flow to total debt has the most predictive ability with 87% in the year before failure and 78% five years before failure. The net income to total assets ratio predicts second best. The total debt to total assets ratio predicted next best, with the three liquid-asset ratios performing least well.

In the end of his work, Beaver (1966) refereed as possible future researches the use of other techniques like multivariate analysis and market price information to improve the power of predictive ability of the ratios. This last technique to predict bankruptcy was studied by Beaver afterwards in 1968.

Similar studies to this one were already published when Beaver started his investigation and so he based his study in those previous studies. One of those studies was from Fitz Patrick (1932) as mentioned before.

Fitz Patrick (1932) analysed nineteen pairs of failed and non-failed firms. His evidence indicated that there were persistent differences in the ratios for at least three years prior to failure.

Winakor and Smith (1935) investigated the mean ratios of failed firms for ten years prior to failure and found a marked deterioration in the mean values with the rate of deterioration increasing as failure.

Merwin (1942) compared the mean ratios of continuing firms with those of discontinued firms for the period 1926 to 1936. A difference in means was observed for as much as six years before discontinuance, while the difference increased as the year of discontinuance approached.

Beaver (1968) studied in what extent changes in market prices of stocks can also be used to predict failure. He used the same sample of the previous study—79 failed and 79 non-failed firms during the period 1954 to 1964. The measure of market price change selected for study is:

$$R_{it} = \frac{D_{it} + P_{it} - P_{it-1}}{P_{it-1}}$$

Where:  $P_{it}$  is the price for security  $i$  at time  $t$

$D_{it}$  is the cash dividend paid on security  $i$  between time  $t-1$  and  $t$

$P_{it-1}$  is the price for security  $i$  at time  $t-1$ , adjusted for capital changes

Beaver (1968) assumes that failure firms should be riskier than non-failure firms and so risk-averse investors would require a higher rate of return on their investments. So in each period, investors would evaluate the solvency position of the firm and adjust the market price of the common stock. His evidence indicates that investors recognise and adjust to the new solvency positions of failing firms in each moment however they are still surprised about the failure in the year before bankruptcy.

## 2.1.2 Multivariate models

The multivariate approach to forecasting financial failure attempts to overcome the potentially conflicting indications that may result from using single variables. Multivariate models assume that the dependent variable is explained by multiple ratios/factors simultaneously. These models have a more predictive power. Multivariate models classify firms into groups (bankrupt or non-bankrupt) based on each firm's ratios/factors.

Based on sample observations, coefficients are calculated for each characteristic ratio used in the model. Then a linear combination of variables that best discriminates between groups is computed. The products of the ratios and their coefficients are summed to give a discriminant score, allowing classification of the firm.

The most well-known and used multivariate model is Altman (1968)'s Z-score. In 1968, following the suggestion of Beaver in 1966 about the predictive power of multivariate models, Altman has developed a five-factor multivariate model (Z-score model).

### **Z-score**

Altman (1968) used sample of 66 corporations with 33 firms in each of the two groups. The bankrupt firms are manufacturers firms that filed a bankruptcy petition during 1946-1965. The non-bankrupt firms group consisted of a paired sample of manufacturing firms which still existence in 1966.

Of the 22 potentially helpful ratios chosen on the basis of their popularity in the literature, potential relevancy to the study and some "new" ratios initiated in this paper, 5 were identified as providing the best predictive ability:

$$X1 = \frac{\textit{Working Capital}}{\textit{Total Assets}}$$

X1 is a measure of the net liquid assets of the firm relative to the total capitalization. Working capital is defined as the difference between current assets and current

liabilities. A firm experiencing consistent operating losses will have shrinking current assets in relation to total assets. Of the three liquidity ratios evaluated, this one proved to be the most valuable.

$$X2 = \frac{\textit{Retained Earnings}}{\textit{Total Assets}}$$

X2 is a measure of cumulative profitability over time and was cited earlier as one of the "new" ratios. A relatively young firm will probably show a low X2 ratio because it has not had time to build up its cumulative profits. Therefore, it may be argued that the young firm is somewhat discriminated against in this analysis, and its chance of being classified as bankrupt is relatively higher than another, older firm, *ceteris paribus*. But, this is precisely the situation in the real world. The incidence of failure is much higher in a firm's earlier years.

$$X3 = \frac{\textit{EBIT}}{\textit{Total Assets}}$$

X3 is a measure of the true productivity of the firm's assets, abstracting from any tax or leverage factors. Since a firm's ultimate existence is based on the earning power of its assets, this ratio appears to be particularly appropriate for studies dealing with corporate failure. Furthermore, insolvency in a bankruptcy sense occurs when the total liabilities exceed a fair valuation of the firm's assets with value determined by the earning power of the assets.

$$X4 = \frac{\textit{Market Value of Equity}}{\textit{Book Value of Total Debt}}$$

X4 shows how much the firm's assets can decline in value (measured by market value of equity plus debt) before the liabilities exceed the assets and the firm becomes insolvent.

$$X5 = \frac{\text{Sales}}{\text{Total Assets}}$$

X5, the capital-turnover ratio is a standard financial ratio illustrating the sales generating ability of the firm's assets. It is one measure of management's capability in dealing with competitive conditions.

Altman estimated the following model:

$$Z = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 0.999 X5$$

With this formula we just have to put the ratios for each company in the equation and then given the Z score we just have to classify it has one of the following categories:

Z-score	Bankruptcy Probability
$\leq 1,81$	High
$1,81 < Z\text{-score} \leq 2,99$	Grey zone
$> 2,99$	Low

The Z-score model proved to be extremely accurate in predicting bankruptcy correctly in 95 per cent of the initial sample. However, the model's predictive ability dropped off considerably from there with only 72% accuracy two years before failure, down to 48%, 29%, and 36% accuracy three, four, and five years before failure, respectively.

### **2.1.3 Conditional probability models**

The multivariate approach was the most popular technique for bankruptcy studies using vectors of predictors until the end of 70's. However this technique has some problems: first there are certain statistical requirements imposed on the distributional properties of the predictors for example, the variance-covariance matrices of the predictors should be the same for both groups (failed and non-failed firms) and a normal distribution is required for predictors; second the output of the application of an multivariate model is a score which has little intuitive interpretation; third there are also certain problems related to the "matching" procedures of failed and non-failed firms which are matched according to criteria such as size and industry, and these tend to be somewhat arbitrary (Ohlson, 1980).

The use of conditional probability models like logit and probit try to avoid all these problems. No assumptions have to be made regarding prior probabilities of bankruptcy and/or the distribution of predictors.

#### **Ohlson Model / O-Score**

Ohlson (1980) created a logit model in order to have a more accurate bankruptcy prediction model. However in order to improve the model accuracy other things have to be improved besides the technique—the sample.

First Ohlson stated what he meant by bankrupt firm. “In this study, failed firms must have filed for bankruptcy in the sense of Chapter X, Chapter XI, or some other notification indicating bankruptcy proceedings” (Ohlson, 1980). Then 3 restrictions were made: the sample period is from 1970 to 1976; companies have to be traded in exchange market or over-the-counter; just industrial firms are considered. The final sample was composed of 105 bankrupt firms and 2058 non-bankrupt firms.

A logit model as stated before is a model that instead of giving a score give us the probability of firm goes bankrupt.

So, the probabilistic function of a firm goes bankrupt is:

$$P = \frac{1}{1 + e^{-Z}}$$

Where:  $Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n$

$\beta_0, \beta_1, \dots, \beta_n$  are the coefficients of the ratios/factors

$X_1, X_2, \dots, X_n$  are the ratios/factors

Ohlson (1980) chose 9 ratios to test on his model. The ratios choice did not have any kind of complex criteria. He just chose these ratios based on simplicity. The ratios chosen are the following:

1. SIZE = Ln (Total Assets/GNP price-level index). The index assumed a base value of 100 for 1968. This procedure assures a real-time implementation of the model.
2. TLTA = Total liabilities divided by total assets.
3. WCTA = Working capital divided by total assets.
4. CLCA = Current liabilities divided by current assets.
5. OENEG = One if total liabilities exceeds total assets, zero otherwise.
6. NITA = Net income divided by total assets.
7. FUTL = Funds provided by operations divided by total liabilities.
8. INTWO = One if net income was negative for the last two years, zero otherwise.
9. CHIN =  $(N_{it} - N_{t-i}) / (|N_{it}| + |N_{t-i}|)$ , where NI is net income for the most recent period. The denominator acts as a level indicator. The variable is thus intended to measure change in net income.

With these 9 ratios computed for the firms of the sample then the coefficients were estimated in order to complete the equation. So the equation is the following:

$$Z = -1,32 - 0,407 * Size + 6,03 * TLTA - 1,43 * WCTA + 0,757 * CLCA - 1,72 * OENEG - 2,37 * NITA - 1,83 * FUTL + 0,285 * INTWO - 0,521 * CHIN$$

After obtaining this score we are able to see which will be the probability of a certain company goes bankrupt within one year.

In this study Ohlson (1980) stated that “there is always the possibility that an alternative estimating technique, could yield a more powerful discriminant device” however when compared with multivariate approach this model produced better results.

## **2.2 Bankruptcy Process**

When a company finds itself in a situation of financial distress it has two options to avoid default: it can either file for bankruptcy or attempt to renegotiate with its creditors privately in a workout. When none of these options are available the last resource is the liquidation.

In a workout, the firm and its creditors renegotiate their contracts privately, resolving distress without going to the bankruptcy courts. The outcome of a workout can range from a one-time waiver of payment to a restructuring of all liabilities and equity claims.

Reorganisation is the option of keeping the firm a going concern; it sometimes involves issuing new securities to replace old securities while liquidation means termination of the firm as a going concern; it involves selling the assets of the firm for salvage value.

### **2.2.1 Bankruptcy Reform Act of 1978**

In order to study the bankruptcy process and its implications it is important to have in mind the rules of the country where we will fill the petition. In this case we have to understand the U.S. Bankruptcy Code. The substantive and procedural laws that guide the process of bankruptcy today in the U.S. date back from 1978 with the Bankruptcy Reform Act of 1978. This reform act emerged as a way of facing some inefficiencies of a system formulated in an age with relatively few bankruptcies and almost no consumer bankruptcies.

The Bankruptcy Reform Act of 1978 and next amends contains six basic types of bankruptcy cases:

1. Chapter 7 – Liquidation;
2. Chapter 9 – Municipality Bankruptcy;
3. Chapter 11 – Reorganisation;
4. Chapter 12 - Family Farmer or Family Fisherman Bankruptcy;
5. Chapter 13 – Individual Debt Adjustment;
6. Chapter 15 – Ancillary and other cross-border cases.

### **2.2.1.1 Chapter 9, 12, 13 and 15<sup>1</sup>**

#### *Chapter 9 – Municipality Bankruptcy*

The purpose of chapter 9 is to provide to the bankrupt municipality some protection from its creditors while it develops and negotiates a plan for adjusting its debts. Although it is similar to the other chapters, Chapter 9 has a significant difference: the assets of the municipality cannot be liquidated.

#### *Chapter 12 - Family Farmer or Family Fisherman Bankruptcy*

This chapter enables family firms in financial distress family to propose and carry out a plan to repay all or part of their debts. Chapter 12 is less complicated and less expensive than Chapter 11 which is better suited to large corporate reorganizations. In addition, Chapter 13 is also not a very good option as it is mainly for those usually designed as wage earners.

#### *Chapter 13 - Individual Debt Adjustment*

It is a process that allows individuals with regular income to develop a plan to repay their debts. Under this chapter, debtors propose a repayment plan of their debts over three to five years. The plan period will vary from 3 to 5 years, depending upon whether your income is generally above or below the median income for your state of residence.

Chapter 13 offers individuals an opportunity to save their homes from foreclosure. Another advantage of Chapter 13 is that it allows individuals to reschedule secured debts (other than a mortgage for their primary residence) and extend them over the life of the Chapter 13 plan.

#### *Chapter 15 - Ancillary and other cross-border cases*

The purpose of Chapter 15 is to provide effective mechanisms for dealing with insolvency cases involving debtors, assets, claimants and other parties in interest involving more than one country.

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<sup>1</sup> <http://www.uscourts.gov/FederalCourts/Bankruptcy/BankruptcyBasics.aspx>

### **2.2.1.2 Chapter 7 - Liquidation<sup>2</sup>**

Chapter 7 is a bankruptcy proceeding that can be filed by a company or an individual as alternative to other chapters. The liquidation process does not involve the filing of a plan of repayment as in other chapters of the U.S. bankruptcy code. As an alternative, in this case the court chooses a bankruptcy trustee which is task is gathering and selling the debtor's assets (individuals are allowed to maintain certain properties) and uses the proceeds of the sale to pay to creditors in accordance with the absolute priority rule established in the code.

A Chapter 7 case begins with the debtor filing a petition in the bankruptcy court. At the same time the debtor also needs to provide other types of information regarding the company like: schedules of assets and liabilities; schedule of current income and expenditures; statement of financial affairs; schedule of executor contracts and unexpired leases; copy of the tax return or transcripts for the most recent tax year as well as tax returns filed during the case; and a list of all creditors and the amount and nature of their claims.

One advantage of filing a petition under Chapter 7 is that it automatically stops most collection actions against the debtor or the debtor's property. When the stop is in effect, creditors generally may not initiate or continue its actions to obtain the payments due like lawsuits or even phone calls. The bankruptcy clerk gives notice of the bankruptcy case to all creditors whose names and addresses are provided by the debtor.

Claims are paid in full in the following order: first, administrative expenses of the bankruptcy process itself; second, claims taking statutory priority, such as tax claims, rent claims, and unpaid wages and benefits; and, third, unsecured creditors' claims, including those of trade creditors, long-term bondholders, and holders of damage claims against the firm. Subordination agreements which specify that certain unsecured creditors rank above others in priority are followed; otherwise all unsecured creditors' claims have equal priority. Equity holders receive the remainder, if any.

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<sup>2</sup> <http://www.uscourts.gov/FederalCourts/Bankruptcy/BankruptcyBasics.aspx>

### 2.2.1.3 Chapter 11 – Reorganisation<sup>3</sup>

Chapter 11 is typically used to reorganize a business. Under Chapter 11, existing managers of firms usually remain in control as debtors-in-possession<sup>4</sup>. Although managers can continue to operate the business they need to seek court approval for any actions that fall outside of the scope of regular business activities. When a Chapter 11 debtor needs operating capital, it may be able to obtain it from a lender by giving the lender a court-approved “super priority” over other unsecured creditors or a lien on property of the estate (ex: Debtor-in-Possession financing). Managers are also the ones who primarily propose a reorganization plan for the firm. The reorganization plan specifies how much each creditor will receive in cash or new claims on the firm. And it is here that Chapter 11 differs from Chapter 7. While in Chapter 7 high priority and secured creditors tend to receive full payoff and low priority creditors and equity receive the remaining if any, in Chapter 11 each class of creditors and equity receives partial payment.

If the parties fail to adopt a reorganization plan proposed by managers, then creditors are eventually allowed to offer their own plans. If no plan proposed by creditors is adopted, then eventually either the bankruptcy judge orders that the firm be liquidated under Chapter 7 or the firm may be offered for sale as a going concern under Chapter 11, a 363 sale.

The term "363 sale" refers to a sale of a debtor's assets authorized under section 363 of the Bankruptcy Code. Under Section 363, a bankruptcy trustee or debtor-in-possession may sell the bankruptcy estate's assets. This kind of sale is usually attractive because it is quick and the assets are "free and clear of any interest in such property." The proceeds of the sale are distributed according to the absolute priority rule.

Firms in Chapter 11 benefit from a number of provisions intended to increase the probability that they successfully reorganize. Managers are allowed to retain pre-bankruptcy contracts that are profitable and reject pre-bankruptcy contracts that are unprofitable (while non-bankrupt firms are required to complete all their contracts).

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<sup>3</sup> <http://www.uscourts.gov/FederalCourts/Bankruptcy/BankruptcyBasics.aspx>

<sup>4</sup> Debtor in possession is an individual or corporation that has filed for Chapter 11 bankruptcy protection and remains in control of property.

They are allowed to terminate underfunded pension plans and the government picks up the uncovered pension costs. Firms' obligation to pay interest to most creditors ceases when they file for bankruptcy. With the bankruptcy court's approval, firms in bankruptcy may give highest priority to creditors who provide post-bankruptcy loans, even though much of the payoff to these new creditors will come at the expense of pre-bankruptcy creditors. Also, the firm escapes any obligation to pay taxes on debt forgiveness under the reorganization plan until it becomes profitable.

However, Chapter 11 has received some critics by some authors across the years. Hotchkiss (1995) stated that importance of managers of the company in the reorganization plan leads to the preservation of unprofitable firms. Quoting other authors, she said that management has too much power in Chapter 11 and that they exercise this power in a self-serving manner. For example, managers typically remain in control of the firm's operations and have an exclusive right, often throughout the entire case, to propose a plan of reorganization. However, it is also true that management turnover in financial distressed companies is high.

The debate over management's role in the restructuring process has led to a number of proposals for reform of the current system that would be free from these sources of inefficiencies and would "place appropriate discipline on management." Replacement managers, whose reputations are less tied to existing assets, who have less firm-specific human capital, and who often have lower initial shareholdings are some examples of avoiding this bias towards the reorganization of unprofitable companies.

## 2.2.2 Studies about bankruptcy process

Concerning the type of process used to restructure the organisation, Gilson (1990) studied the incentives of financially distressed firms to choose between private workout and Chapter 11. He concluded that in about 47% of the cases, financially distressed firms successfully restructure their debt in a private workout while 53% go to Chapter 11. Financial distress is more likely to be resolved through private workout when more of the firm's assets are intangible, and relatively more debt is owed to banks; private workout is less likely to succeed when there are more distinct classes of debt outstanding. Fisher and Martel (2009) examine empirically the liquidation-reorganization decision using the Bulow-Shoven-White (BSW) framework. This model examines how conflicts among creditors and asymmetries in their negotiating and controlling abilities can lead to a suboptimal resolution to financial distress. BSW model assumes that firm's claimants can be grouped into three classes: bondholders who cannot alter or renegotiate the terms of loans in the event of financial distress; bank lenders who have the ability to alter or renegotiate the terms of its loan and equity holders who get nothing in bankruptcy. Given the three classes of claimants, Bulow and Shoven (1978) proposed the following notation:

$P$  = present expected value of future earnings of the plant;

$L$  = liquidation value of the plant;

$C$  = cash or liquid assets of the firm;

$B_c$  = present expected value of the claim of the (large loan) bank if the firm is allowed to continue one more period with the additional loans granted at the same interest rate;

$B_d$  = value of the (large loan) bank's claim under immediate bankruptcy;

$D_c$  = present expected value of the claim of bondholders with continuance;

$D_b$  = value of the bondholders' position under immediate bankruptcy;

$E_c$  = present expected value of the equity holders' claim with continuance;

$E_b$  = equity holders' bankruptcy claim (assumed to be zero).

With this notation we can put things like this:

Liquidation value of a firm –  $E_b + B_b + D_b = C + L$ ,

Continuation value of a firm –  $E_c + B_c + D_c = C + P$ ,

Bankruptcy costs =  $P - L$

So bankruptcy occurs in this framework when:

$E_c < B_b - B_c$ , and

$B_c < D_c - D_b$

The first inequality states that a firm will go bankrupt if the bank's continuation claim is less than or equal to its bankruptcy claim while the second inequality states that bankruptcy will occur if bankruptcy costs are less than the bondholders' gain from continuation.

White (1981, 1983, 1989) shows that the liquidation-reorganisation decision depends on variables like maturity and ownership structure of debt and the composition of a firm's assets other than a firm's net worth.

Fisher and Martel (2009) found that free assets, the amount of debt reduction in reorganization, and the firm's size all have a significantly positive effect on the probability firms choose reorganization over liquidation. The proportion of unsecured debt has a significant negative effect on the probability of reorganization. Also there are factors affecting the reorganization decision that are not taken into account in the basic BSW framework like the relative size of government claims, the legal form of the firm, and the asset/debt ratio.

Wang (2012) studied the determinants of the choice of a formal bankrupt procedure. The author concluded that the legal origin of the bankruptcy code was an important factor determining the choice of reorganization versus liquidation and that judicial efficiency played the most important role in this choice. Denis and Rodgers (2007) concluded in their study that firms that have greater debt ratios and size are more likely to reorganise than to liquidate or be acquired and that firms in more profitable industries are more likely to reorganise than to be acquired.

## 2.3 Post-Performance

Beyond the purpose of prohibit creditors from collecting on pre-bankruptcy debts, Chapter 11 has also the objective of allowing the company to reorganize its existing finances and operations in order to continue afterwards as a profitable organisation. But after Chapter 11, do companies need to fill for Chapter 11 again or simply close the business? Or in the other hand do they succeed as a prosper company?

Hotchkiss (1995) analysed the performance of 197 firms that emerged from Chapter 11 as public companies using three different measures: (1) accounting measures of profitability: Hotchkiss measured the firms' cash-flow by the operating income (EBITDA) divided by the sales, (2) whether the firm meets cash flow projections developed at the time of reorganization, and (3) whether the reorganized business needs to restructure again through a private workout or second bankruptcy.

The results showed that a large number of the firms that emerge from Chapter 11 either are not viable or soon require further restructuring. Over 40 percent of the firms emerging from bankruptcy continue to experience operating losses in the three years following bankruptcy. Thirty-two percent of the sample (63 firms) restructured again after emerging from bankruptcy either through a private workout (23 firms), a second bankruptcy (35 firms), or through an out-of-court liquidation (5 firms). This evidence is consistent with arguments that there are economically important biases toward reorganization under the current structure of Chapter 11. One of the causes of these biases can be the fact of being managers to propose the reorganisation plan. In this study for all firms with projections available, the median forecast errors in each year were negative and significantly different from zero. If managers have private information about their firm's prospects, they may have incentives to overstate or understate these projections. Management, concerned with the firm's survival, may need to convince creditors and the court that the firm value is high enough to warrant reorganization rather than liquidation. A shareholder-oriented management might also overstate forecasts in order to justify giving a greater share of the reorganized stock to prepetition equity holders. Alternatively, there may be incentives to understate the firm's prospects in order to justify greater concessions from creditors.

Hotchkiss (1995) also examined the relationship between management changes and post-bankruptcy performance. The results showed that retaining pre-bankruptcy management is strongly related to worse post-bankruptcy performance. Furthermore, firms often fail to meet cash flow projections prepared at the time of reorganization, particularly when pre-bankruptcy management remains in office through the time these projections are made. Management changes appear to provide useful information about future performance.

Gilson (1997) analysed the leveraged—measured as the long-term debt divided by the book value of assets or the market value of assets—of 108 publicly-traded firms that reorganised during the period between 1980 and 1989, either by reorganizing under Chapter 11 (51 firms) or by restructuring their debt out of court (57 firms). He concluded that leverage remains high after both out of court restructuring (0.64) and Chapter 11 reorganization (0.47), which fall well above the range of 0.25-0.35 considered "typical" for nonfinancial U.S. corporations.

In his study, Gilson (1997) gives some justification for this difficulty in reducing firms' leverage:

1. *The Creditor Holdout Problem* - One obstacle to reducing debt is the difficulty to put all creditors together to participate in a restructuring plan. Individually, each creditor has no incentive to forgive principal or exchange debt for stock if he or she believes enough other creditors will make the concessions needed to return the firm to solvency, so firms that face a greater number of creditor holdouts will have more difficulty reducing their debt.
2. *Institutional Lenders' Preference for Debt* - Debt reductions should be smaller for firms that initially owe more of their debt to commercial banks and insurance companies because of regulatory principles and also because institutional lenders' claims are generally senior and secured.
3. *Adverse Tax Consequences of Debt Cancellation* - When debt is repurchased or replaced for less than its face value, the difference is considered "cancellation of indebtedness" (COD) and is taxed at ordinary corporate rates. Sample firms therefore had an incentive to keep their debt high to avoid creating COD income.

4. *Managers' Information Advantage over Outsiders* - Creditors will be less willing to exchange their senior claims for common stock when they believe the stock is overvalued. The risk of such overvaluation will be greater when managers have superior inside information about the firm's future profitability.
5. *Costs of Selling Assets* - Debt reductions should be larger for firms that sell off relatively more of their assets. Financially distressed firms may find it quite costly to sell assets because lender pressure or a lack of potential buyers results in assets being sold at fire-sale prices.

Eberhart et al (1999) investigated the efficiency of the stocks' market of firms emerging from bankruptcy. To do so, they tested if the average cumulative abnormal returns (ACARs) were significantly different from 0 for 131 firms to the first 200 days of returns after emergence. The empirical results showed that there is a weak evidence of positive returns in the short-term but there is evidence of positive excess returns in the long-term (24.6 to 138.8 percent depending on the return estimation method). However, these results do not take into account the transaction costs and the risk. These factors were not captured in the estimation of the returns.

As we have seen before literature presents mixed evidence regarding post-bankruptcy performance. While Hotchkiss (1995) and Gilson (1997) suggested a poor post-bankruptcy performance due to weak accounting performance and maintenance of high leverage, Eberhart et al (1999) reported good common stock returns. In this context, Alderson and Bekter (1999) analysed the post-bankruptcy performance of 89 firms by evaluating the total cash flows produced by the firm's assets for the five years after emerging from bankruptcy.

$$\begin{aligned}
 & \text{Net cash flows from operations} \\
 & + \text{Net cash flows from investment} \\
 & + \text{Cash interest paid} \\
 & - \text{Change in cash} \\
 & - \text{Other cash flows from financing} \\
 \hline
 & = \text{Net cash flows paid to all claimholders}
 \end{aligned}$$

Then, the annualised rate of return that was earned by investors who owned all of the debt and equity claims on the firm was computed. The authors concluded that, despite having substandard accounting profitability, at least one-half of the sample firms generated a return that exceeded the return available on benchmark portfolios. They also found that firms' investment behaviour following bankruptcy affects their performance, but that this effect depends on the investment-opportunity set facing the firm. High-growth-option firms earn superior returns when their net investment exceeds the industry median. However, among low-growth-option firms, performance is unrelated to investment behaviour.

As well as Hotchkiss (1995), they examined the operation margins of the sample and concluded that post-bankruptcy companies have a poor performance when evaluated in this way however, operating margins do not tell the whole story because they omit consideration of post-reorganisation asset sales and other transactions that can cause EBITDA to differ from cash flow.

### **3 Relevant definitions**

One important thing to do before entering in this case study is to clarify some definitions which on this field are not clear. Words like financial distress, failure, insolvency default and bankruptcy are used most of the time indifferently. However there are little differences between them. For example, Wruck (1990) and Ross *et al.* (2008) defined financial distress as a situation where cash flow is insufficient to cover current obligations. Altman and Hotchkiss (2005) distinguish, on their book, the other four terms. To the authors failure means that the realized rate of return on invested capital is significantly and continually lower than prevailing rates on similar investments. Insolvency, in a technical way, exists when a firm cannot meet its current obligations, signifying a lack of liquidity. In a bankruptcy sense insolvency is when a firm finds itself in a situation where its total liabilities exceed a fair valuation of its total assets. The real net worth of the firm is negative. Defaults can be technical and/or legal and always involve a relationship the debtor firm and a creditor class. Technical default takes place when the debtor violates a condition of an agreement with a creditor and can be the ground for legal action. A legal default happens when a firm misses a schedule loan or bond payment, usually the periodic interest obligation. Bankruptcy is a situation where the real net worth of the firm is negative or when a company enters in a legal process of reorganisation or liquidation.

In this work all these terms can be used with the same meaning: a situation where a firm enters in a legal process of reorganisation or liquidation.

## 4 General Motors

General Motors also known as GM is an American multinational company which has as its core business the development, production and selling of cars, trucks and parts worldwide. Besides that the company also provides automotive financing services through General Motors Financial Company, Inc. (GM Financial). GM was the world's largest motor-vehicle manufacturer for much of the 20th and early 21st centuries. GM's headquarters are in Detroit, Michigan.

General Motors was founded by William "Billy" Durant on September 16, 1908 as a leading manufacturer of horse-drawn vehicles in Flint, Michigan before entering into the automobile industry. In the beginning GM held only Buick Motor Company but in the following years the company bought several motorcar companies like Oldsmobile, Cadillac, Oakland (later Pontiac), Ewing, Marquette, Chevrolet, and other autos, as well as Reliance and Rapid trucks. Later on, during the II World War, GM supplied the Allies with airplanes, trucks and tanks contributing to a boost in GM sales. For example, in 1942, one hundred percent of GM's production was in support of the Allied war effort which represents more than \$12 billion. However, after the II World War, German and Japan started to export a large quantity of smaller and more fuel-efficient vehicles to the U.S. leading to a decrease of the U.S. market share for GM. By the start of the new millennium, GM had built a strong presence worldwide. The design and quality of GM's new cars improved significantly, but GM found it difficult to regain share from its offshore competitors, and legacy cost from GM's decades as a larger, less efficient company continued to weigh on financial results.<sup>5</sup>

In 2008, alongside with the international financial crisis, emerged also an auto industry crisis. Almost overnight, demand for new automobiles fell from an annual rate of over 17 million units to an annual rate under 10 million units. In order to face the collapse of the industry and this company in particular, U.S. government guaranteed loans to it. In exchange GM had to work in a reorganisation plan.<sup>6</sup> After GM emerged from Chapter 11 bankruptcy, it was split into two companies: General Motors and Motors Liquidation (the name for leftover assets).

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<sup>5</sup> [www.gm.com](http://www.gm.com)

<sup>6</sup> <http://www.uaw.org/story/2008-2009-auto-industry-crisis>

The new GM operates through five business segments: GM North America, GM Europe, GM International Operations, and GM South America. Financing activities are primarily conducted by General Motors Financial Company. The GM North America segment sells vehicles under the brands Chevrolet, GMC, Buick and Cadillac with sales, manufacturing and distribution operations in the U.S., Canada and Mexico and distribution operations in Central America and the Caribbean. The GM Europe segment sells vehicles under the brands Opel, Vauxhall and Chevrolet with sales, manufacturing and distribution operations across Western and Central Europe. The GM International Operations segment sells vehicles under the brands Buick, Cadillac, Chevrolet, Daewoo, FAW, GMC, Holden, Isuzu, Jiefang, Opel and Wuling brands with sales, manufacturing and distribution operations in Asia-Pacific, Russia, the Commonwealth of Independent States, Eastern Europe, Africa and the Middle East. The GM South America segment sells vehicles under the brands Chevrolet, Suzuki and Isuzu with sales, manufacturing and distribution operations in Brazil, Argentina, Colombia, Ecuador and Venezuela. GM Financial specializes in purchasing retail automobile instalment sales contracts originated by GM and non-GM franchised and selects independent dealers in connection with the sale of used and new automobiles. GM Financial also offers lease products through GM dealerships in connection with the sale of used and new automobiles that target customers with sub-prime and prime credit bureau scores. The firm sells vehicles to its dealers for consumer retail sales and also sells cars and trucks to fleet customers, including daily rental car companies, commercial fleet customers, leasing companies and governments. It sells vehicles to fleet customers directly or through its network of dealers. The company offers a wide range of after sale vehicle services and products through its dealer network, such as maintenance, light repairs, collision repairs, vehicle accessories and extended service warranties to retail and fleet customers.<sup>7</sup>

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<sup>7</sup> <http://www.forbes.com/companies/general-motors/>

## 4.1 Was it possible to predict GM's bankruptcy?

In an interview given to Bloomberg in July 2008, a year before General Motors file for Chapter 11, Edward Altman, author of Z-score model, said: "*General Motors Corp. and Ford Motor Co., the two biggest U.S. automakers, have about a 46 percent chance of default within five years*". He also said that his model showed that GM was "*on the verge of bankruptcy*".

The purpose of this chapter is to apply three different models of bankruptcy prediction, (Beaver's ratios, Z-score and Ohlson's model) in order to understand if it was expectable that GM would need to fill for Chapter 11.

Using the financial reports from General Motors from 2004 to 2008, 6 ratios used by Beaver (1966) were computed: Cash-Flow<sup>8</sup> to Total Deb<sup>9</sup>t, Net income to Total Assets, Total Debt to Total Assets, Working Capital<sup>10</sup> to Total Assets, Current Assets to Current Liabilities<sup>11</sup> and No-credit interval<sup>12</sup>. Figure 2 shows the results obtained after computing the ratios.

Looking at the evolution of these 6 ratios through the years and as expected, there is a deterioration of all the ratios. Since 2004, GM has seen a decrease in its net income and cash-flow which have reached negative values after 2006. These consecutive negative result leads to a less capacity of paying its obligations. If we compare figure 2 with the ones computed by Beaver (Figure 1), we conclude that the evolution of the ratios is similar to the evolution of failed companies' ratios.

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<sup>8</sup> Cash-Flow=Net Income + Depreciation and Amortization

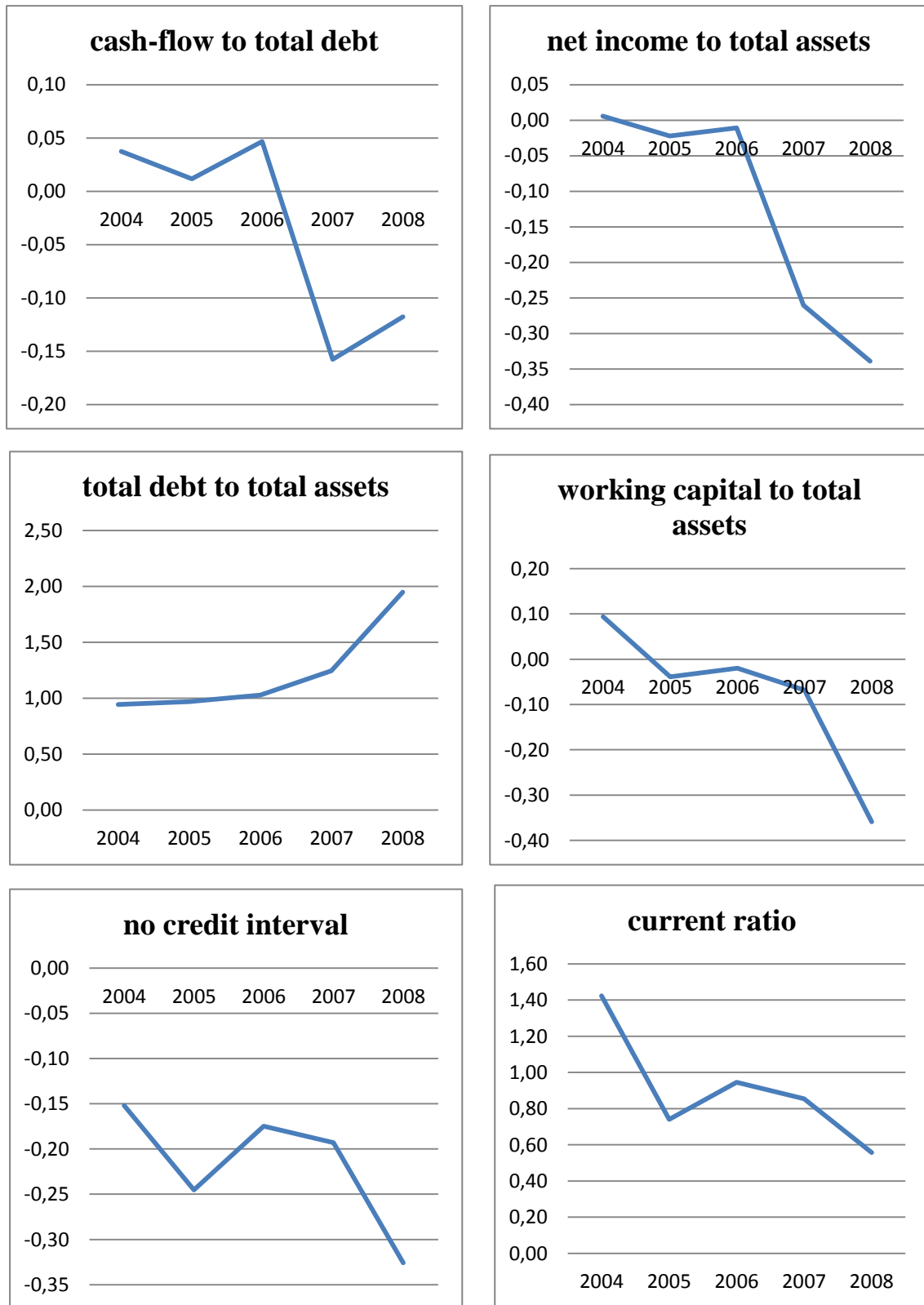
<sup>9</sup> Total Debt=Current Liabilities + Long-term Liabilities + Preferred Stocks

<sup>10</sup> Working Capital=Current Assets – Current Liabilities

<sup>11</sup> Current assets and current liabilities do not include values related with financing and insurance area

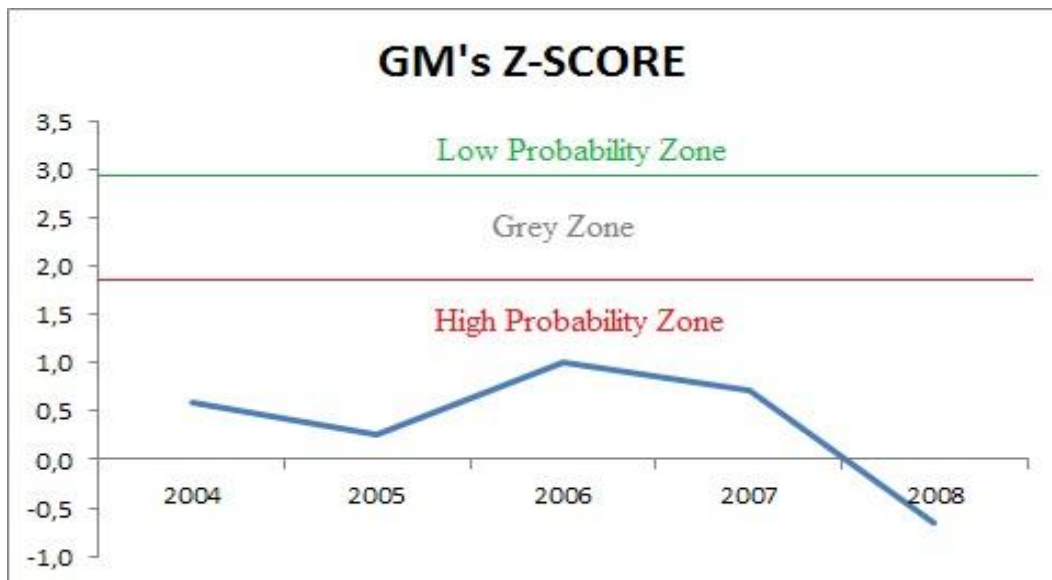
<sup>12</sup> No-Credit Interval=Quick Assets – Current Liabilities / Operating expenses – Depreciation and amortization

**Figure 2 - Beaver's ratios applied to General Motors from 2004 to 2008**



Next, Altman's Z-score model was used to test the predictability of General Motors bankruptcy. Figure 3 shows the Z-score values of General Motors since 2004 to 2008.

**Figure 3** - General Motors' Z-Score values from 2004 to 2008



Other than financial data that was collected from the annual reports provided by General Motors, market capitalization was computed by multiplying the shares outstanding by the stock close price of the last day of the year when transactions occurred.

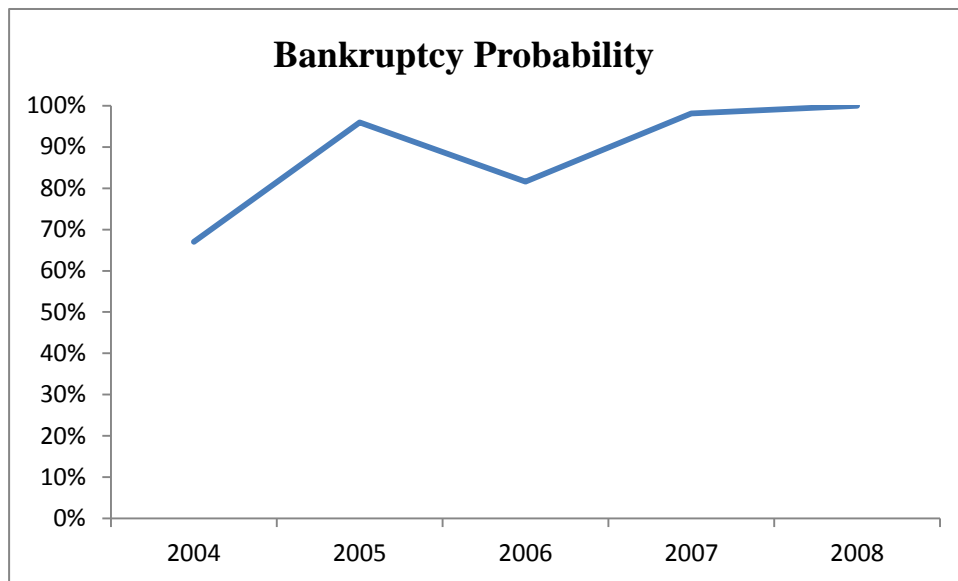
Analysing the values of GM's Z-Score since 2004 to 2008 we can observe that the company was always in a high risk of bankruptcy according to the categories defined by Altman. General Motors trend gradually downward over the observed time period with the exception of 2006. This is consequence of subsequent income losses and increasing debt as well as decreasing stock's price.

In 2008 the year GM asked for help of the U.S. Treasury because it has a liquidity problem and could not meet its obligations was also the year that it presented a negative score.

Then Ohlson's model was computed in order to see if it provides the same conclusions of the previous ones. And although with different methodology and different ratios, the conclusions are the same. Looking to Figure 4, we can see that there is an increasing probability of failure except in 2006 however even in 2006 the probability of failure is

high (the probability is always above 60%). Also it is important to notice that in 2008 this model gives us a 100% probability of failure and that in this year General Motors asked for help of the U.S. Treasury.

**Figure 4** – General Motors' bankruptcy probability using Ohlson (1980)'s model from 2004 to 2008



## **4.2 Filing for Chapter 11**

### **4.2.1 Out-of-court reorganisation attempt**

Across the years, General Motors was not able to adapt its structure of costs after the entrance of a large quantity of smaller and more fuel-efficient vehicles coming from Japan and Germany in the U.S. GM's United States market share fell from 45% in 1980 to 22% in 2008.

These led to consecutive years of negative results as well as to a decreasing in GM's shares of common stock which have declined from \$93.62 per share as of April 28, 2000 to \$1.09 per share as of May 15, 2009, resulting in a dramatic decrease in market capitalization by approximately \$59.5 billion.

Furthermore, in 2008, a worldwide recession as well as an automotive crisis has led to the dramatic financial distress of GM. By the fall of 2008, the Company was in a severe liquidity crisis.

*“It has been a week since General Motors (GM), the international car manufacturer based in Detroit, warned that it is burning through its cash reserves so quickly – at the rate of \$2bn (£1.3bn) a month – that it may not have enough to continue operating beyond the end of this year.”*

*David Usborne, The Independent*

As a result, in the end of 2008, the company sought financial assistance from the Federal Government. On December 31, 2008, GM and the U.S. Treasury entered into an agreement that provided GM with emergency financing of up to an initial \$13.4 billion pursuant to a secured term loan facility (the "U.S. Treasury Facility"). GM borrowed \$4.0 billion under the U.S. Treasury Facility on December 31, 2008 and an additional \$5.4 billion on January 21, 2009. The remaining \$4.0 billion was borrowed on February 17, 2009.

In order to obtain this loan, General Motors had to develop a viability plan to transform GM in a competitive company, an out-of-court reorganization. The U.S. Treasury Loan Agreement required:

1. A dramatic shift in the Company's U.S. product portfolio, with 22 of 24 new vehicle launches in 2009-2012 being fuel-efficient cars and crossovers;
2. Full compliance with the 2007 Energy Independence and Security Act, and extensive investment in a wide array of advanced propulsion technologies;
3. Reduction in brands, nameplates and dealerships to focus available resources and growth strategies on the Company's profitable operations;
4. Full labour cost competitiveness with foreign manufacturers in the U.S. by no later than 2012;
5. Further manufacturing and structural cost reductions through increased productivity and employment reductions;
6. Balance sheet restructuring and supplementing liquidity via temporary Federal assistance.

However in February, 2009 economic situation have continued to deteriorate globally which led to worst liquidity conditions of GM.

As consequence, General Motors requested a new Federal assistance totalling \$18 billion comprised of a \$12 billion term loan and a \$6 billion line of credit to sustain operations with the commitment of deeper and quicker restructuring.

Table 1 shows the differences between the first plan of restructuring (Viability Plan I) and the new plan proposed (Viability Plan II).

In order to accomplish the objectives of Viability Plan II, GM's planed the following:

1. Brands and Channels – The Company has committed to focus its resources primarily on its core brands: Chevrolet, Cadillac, Buick, GMC and Pontiac as a niche brand. The other brands could potentially be sold.
2. Dealers – GM dealerships would be reduced at an accelerated rate, declining by a further 25% (from 6,246 to 4,700) during the period between 2008 and

2012. Most of this reduction would take place in metro and suburban markets where dealership overcapacity is most prevalent.

3. Labour cost – The competitive labour cost gap between GM and the other competitors are mainly the following: greater number of retirees GM supports with pension and health care benefits, higher mix of indirect and skilled trade employees and the lower percentage of GM workers earning lower than competition. So GM and UAW<sup>13</sup> started to negotiate an agreement to reduce excess employment costs through voluntary incentivized attrition of the current hourly workforce, suspension of the JOBS program, which provided full income and benefit protection in lieu of layoff for an indefinite period of time and an agreement regarding modification to the GM/UAW labour agreement.

On March 30, 2009, the President of the United States announced that the new funding request was denied because Viability Plan II was not satisfactory and did not justify a new investment of public money. Also on March 30, 2009, the U.S. Government set a deadline of June 1, 2009 for the Company to demonstrate that an out-of-court reorganization was viable and that it would transform the firm's operations into a profitable and competitive car company.

Beyond the necessity of reorganising its operations, General Motors also needed to restructure its debt. So at the same time the company was preparing Viability Plan II, it was also preparing for the launch of an out-of-court bond exchange offer.

On April 27, 2009, GM asked its bondholders to exchange \$27 billion of claims for equity to help the company avoid bankruptcy. In exchange of this \$27 billion in bonds, GM offered 10% in equity and also accrued interest in cash. However some conditions were imposed by the U.S. treasury in order to consummate this operation:

1. at least 90 percent in principal amount of the notes need to be exchanged;
2. the firm needed to cut at least another \$20 billion in liabilities by reaching a deal with the UAW.

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<sup>13</sup> International Union, United Automobile, Aerospace and Agricultural Implement Workers of America

**Table 1 - Key changes between Viability Plan I and II**

Plan Elemental	December 2, 2008	February 7, 2009
2009 U.S. GDP Forecast (%)	(1%)	(2%)
2009 U.S. Industry Volumes		
Baseline	12M	10,5M
Upside	12M	12M
Downside	10,5M	9,5M
2012 Market Share		
U.S.	20,5%	20%
Global	13,1%	13%
Labour Cost Competitiveness Obtained	2012	2009
2012 U.S. Manufacturing Plants	38	33
2012 U.S. Salaried Headcount	27k	26k
U.S. Breakeven Volume	12,5-13M	11,5-12M
U.S. Brand reduction Completed	No date	2011
Foreign Operations Restructuring		
Sweden (SAAB)	No	Yes
Europe	No	Yes
Canada	No	Yes
Thailand and India	No	Yes
Financial Projections Through	2012	2014

One month later, General Motors announced that the exchange failed because the requirements were not achieved. And so, on July 1st, 2009 GM filed for Chapter 11 reorganization in the Manhattan New York federal bankruptcy court.

## 4.2.2 A '363 Sale'

In order to preserve the going concern value of the firm, avoid systemic failure and more unemployment, U.S. Treasury suggested a 363 transaction under Chapter 11. As stated before under a '363 sale' the assets of the bankrupt firm can be sold. This sale is quick and the assets are then independent of the process.

This was the case of General Motors. With the backup of the American and Canadian governments, which provide a debtor in possessing financing<sup>14</sup> of \$30 billion, a "new" GM was created in order to purchase the profitable assets of the "old" GM. The assets bought were the core operating assets which allowed the new GM to immediately begin operating. Beyond the assets, trademarks and intellectual property, the new GM assumed also some liabilities necessary for the benefit of its stakeholders such as suppliers' contracts, retiree health and welfare benefits to former UAW employees, etc.

The assets excluded from the sale like some brands, factories and other operations as well as the proceeds of the sale were administered in the Chapter 11 process to support the liquidation of the company, including paying to the unsecured creditors.

At the moment of the Chapter 11 filing, "old GM" indicated the 50 largest unsecured claims. The most important unsecured claims were the following:

- Wilmington Trust company – Bond Debt - \$22,76 billion;
- UAW – Employee Obligations - \$20,56 billion;
- Deutsche Bank AG – Bond Debt - \$4,44 billion;
- IUE-CWA<sup>15</sup> – Employee Obligations - \$2,67 billion.

Wilmington Trust Company was selected as the Trust Administrator and Trustee for the Motors Liquidation Company and so responsible for the distributions to holders of Unsecured Claims. These distributions consist of common stock of the "new" General Motors Company (10% of the equity), warrants to purchase General Motors Company common stock and cash.

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<sup>14</sup> Debtor in possessing financing is a method of financing provided to a company while in Chapter 11 process. DIP has priority over existing debt, equity and other claims.

<sup>15</sup> International Union of Electronic, Electrical, Salaried, Machine and Furniture Workers – Communications Workers of America

### **4.2.3 The new General Motors**

The new GM is headquartered in Detroit and had as first CEO Fritz Henderson and Edward E. Whitacre, Jr. as chairman of the board of directors. The company was owned by:

- U.S. Government (60%);
- Canadian Government (12.5%);
- UAW (17.5%);
- Unsecured Claimers (10%)

It was not only the firm's board and stockholders that changed. As result from the '363 sale', other restructuring and cost savings were done.

First of all, a new agreement with UAW regarding retiree plan was made. Also GM's business model suffered modifications.

GM's new business model was set to continuously invest in vehicle design, quality and technology. The brands sold in the United States were reduced from eight to four: Chevrolet, Buick, Cadillac and GMC, allowing General Motors to improve its market share. Furthermore, manufacturing capacity efficiency was improved and so 14 factories were closed. The inventories were reduced in order to save costs. At the same time, with this reduction of brands and in a context of sales decrease, the number of dealers in the U.S. was also cut. At last, as consequence of plants reduction, there was a reduction of U.S. hourly employment levels from 61.000 to 49.000 (table 2 summarises the most important changes in General Motors after reorganisation).

On November 18, 2010 General Motors made an initial public offer which was one of the largest IPO's until now. In this operation, GM sold 478 million common shares at \$33 each, raising \$15,77 billion, as well as \$4,35 billion in preferred shares. This price of \$33 was a price higher than the company and its underwriters (Morgan Stanley, J.P. Morgan and others) thought was possible due to the strong demand. GM's common shares are listed on the New York Stock Exchange and on The Toronto Stock Exchange.

The U.S. government's stake in GM dropped to about 33 percent from 61 percent. The proceeds helped GM pay back to the U.S. Government however in order to be fully repaid, the share's price needed to rise.

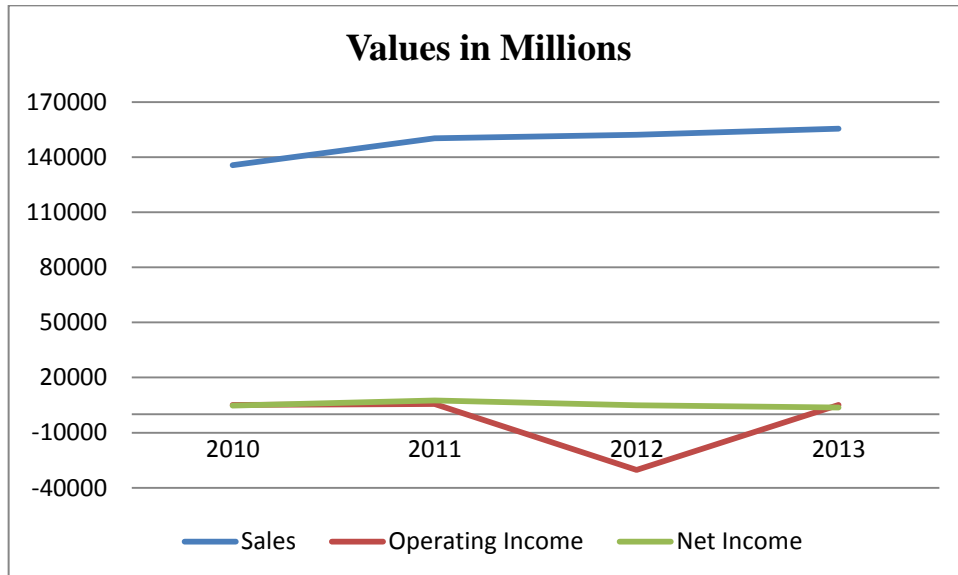
**Table 2 - GM before and after chapter 11**

	Before	After
<b>Brands</b>	Chevrolet Cadillac GMC Buick Pontiac Saturn SAAB Hummer	Chevrolet Cadillac GMC Buick
<b>U.S. Dealerships</b>	6,200	5,600
<b>U.S. Plants</b>	47	33
<b>U.S. Hourly Employment</b>	61,000	49,000

### 4.3 Post-Performance

Now it is time to understand how the New GM is performing after emerging from the Chapter 11s' reorganisation. As Hochkiss (1995) showed in her study, a large number of firms emerged from Chapter 11 either are not viable or soon require another restructuring and that over 40% of the firms emerging from bankruptcy continue to experience operating losses in the three years following bankruptcy. Well, this seems not to be the case of the General Motors. Until date, GM has not needed further restructuring. From 2010 to 2013 (figure 5), GM obtained positive operating incomes except in 2012 due to goodwill impairment charges. That year GM reversed \$36,2 billion of its deferred tax asset valuation<sup>16</sup>, however this has not influenced the net income (which was positive) due to income tax benefits. So since 2010, General Motors has always obtained profits.

**Figure 5** – GM's Sales, Operating Income and Net Income (2010-2013)



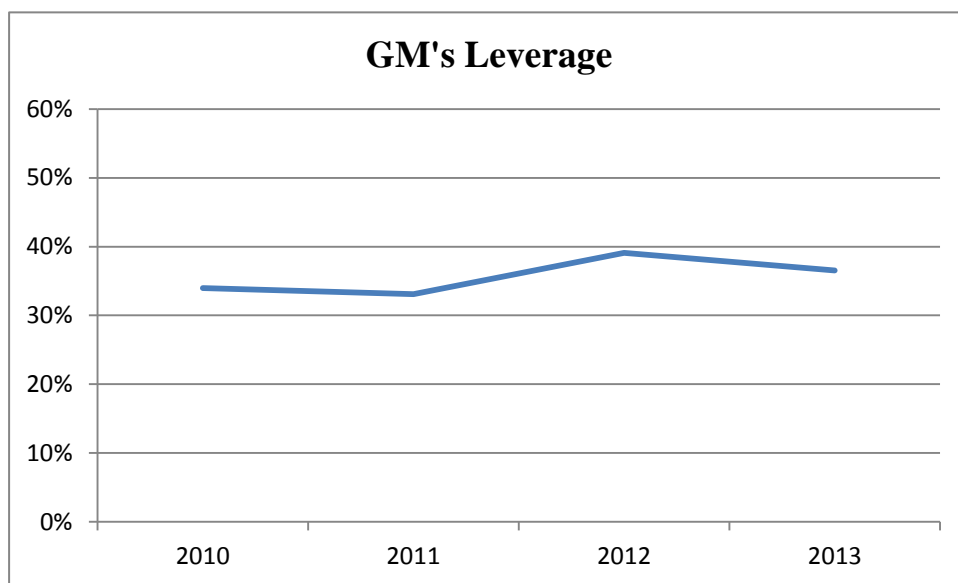
Another fact mentioned by Hotchkiss (1995) to the necessity of a new restructuring was the fact that most of times management of the firm does not change during and after the reorganisation. In GM's case, the U.S. government took some responsibility in the

<sup>16</sup> 2013 GM Annual Report

restructuring plan and a new management team was nominated to the new firm and so this condition that usually biased restructuring companies to a new reorganisation did not happen.

Another problem detected by Gilson (1997) is that even after reorganisation firms remain with high leverage (47%-64%) due to several reasons. Looking to GM's annual reports we can see that it is not the case. After reorganisation, General Motors presented leverage (long-term debt divided by total assets) between 33% and 39% as we can see in figure 6. These values are close to the ones considered by the author as typical for nonfinancial U.S. firms (25%-35%).

**Figure 6 - GM's leverage (2010-2013)**



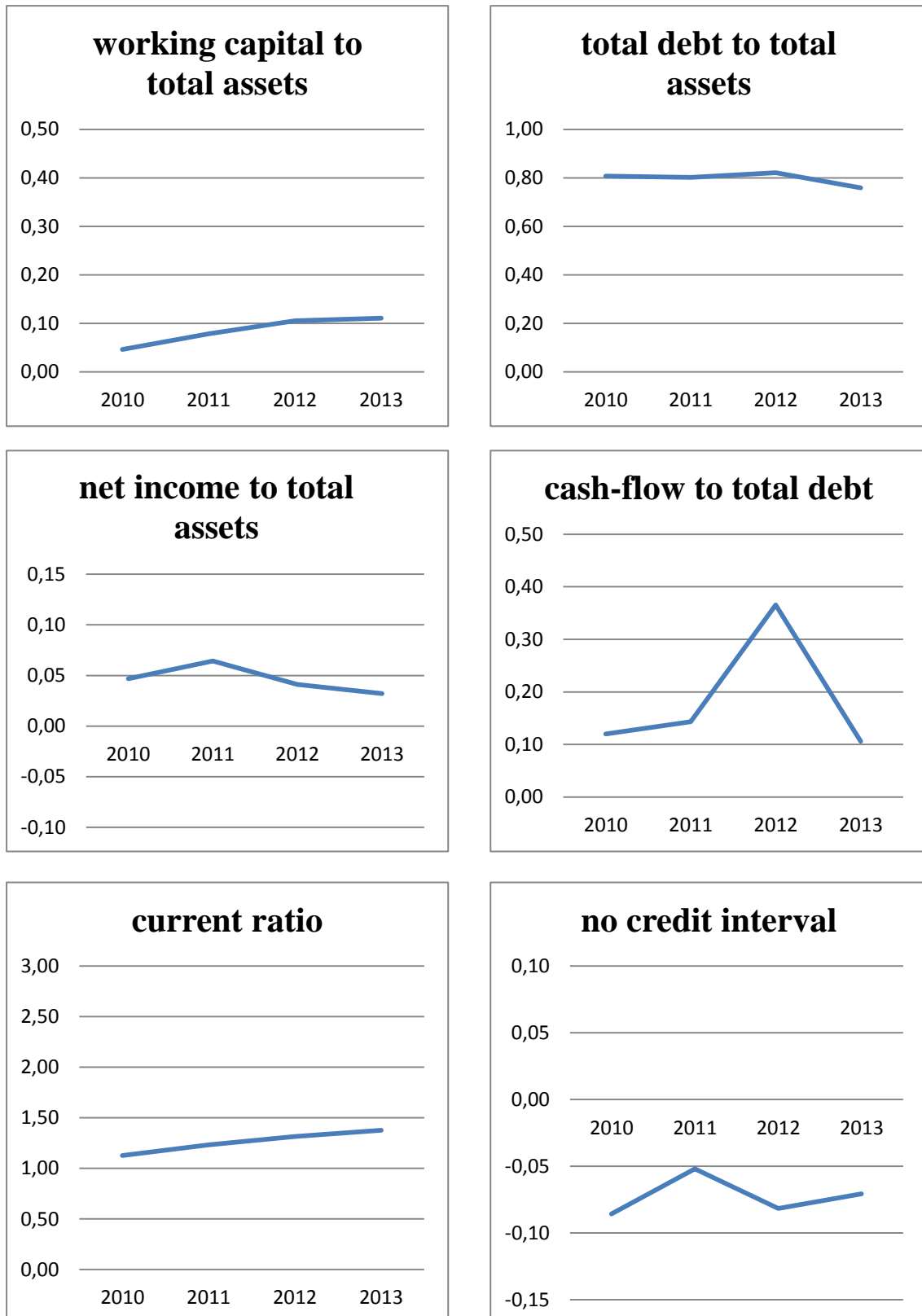
A different way of looking to the performance of GM after the reorganisation is applying again the bankruptcy prediction models in order to see if GM is doing fine or if it possibly will need further assistance. Again, three different models were applied (Beaver's ratios, Z-score and Ohlson's model) and the results provided by those models are the following:

- From the analysis of Figure 7 which represent the 6 ratios used by Beaver we can see that although they are quite stable and the majority of them show a positive value as happens with non-failed companies in the ratios presented in

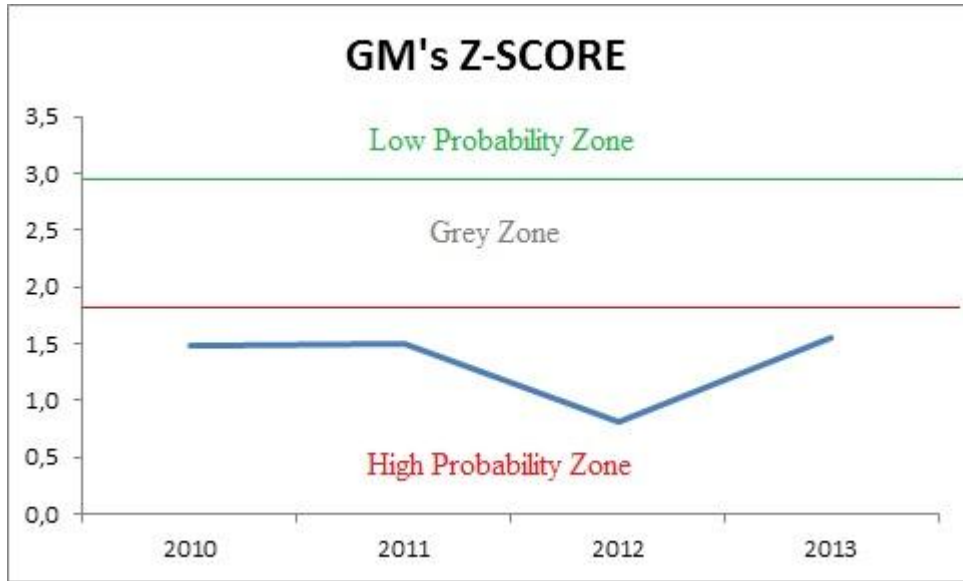
Beaver (1966)'s study, GM's ratios are still quite distant from the values of Beaver's non-failed firms' ratios.

- Altman (1968)'s Z-Score model shows that there is an improvement of the situation of the company when compared to the old GM (Figure 8). However this improvement is not enough to get out of the zone of high probability of bankruptcy. The scores achieved are around 1.5 near the bottom limit of the grey zone. The results suggest that the firm is not in a solid situation and doubts about its future may arise.
- At last but with no different results from the other models we have the O-Score of Ohlson (1980). The results (figure 9) suggest that there is an approximately 50% chance of a company need to restructure again.

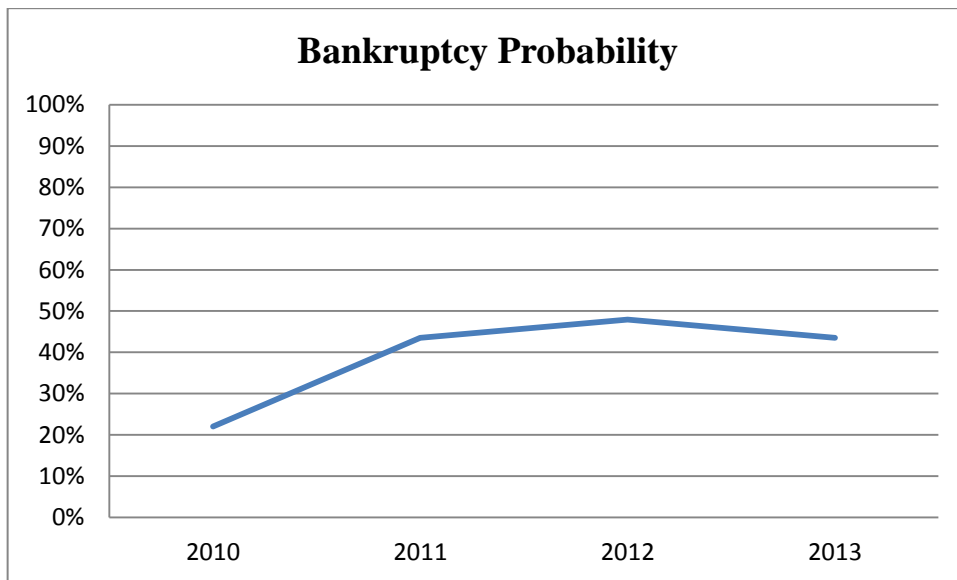
**Figure 7 - Beaver's ratios applied to General Motors from 2010 to 2013**



**Figure 8** – General Motors’ Z-Score values from 2010 to 2013



**Figure 9** - General Motors’ bankruptcy probability using Ohlson (1980)’s model from 2010 to 2013



## **5. Conclusion**

The objective of this dissertation was to understand all that have happened to General Motors after the beginning of the century and that have culminated with the need of restructuring in order to survive. To do so it was analysed the years before the filing of Chapter 11 in order to understand if it was possible to predict that something like that would happen. Then, the process that led to the beginning of a new company was described and in the end it was analysed the performance of the new company until the last year.

With decades of huge costs related essentially with employment costs, General Motors was not able to compete with other firms around the world which led to the decrease of market share mainly in the United States of America. This huge costs and market share had a great weight in the financial results of the company after the beginning of the new century. And with consecutive years of negative results, firm walked to a situation where a change was needed otherwise failure was imminent. It is exactly this that the three models of bankruptcy predictability prove. When Beaver's ratios were applied to GM, it was easy to see that the evolution of these ratios from 2004 to 2008 were equal to the evolution detected by Beaver of failed companies in his study. The same way, the results of Z-score and O-score showed that it was almost certain that General Motors would need to do a private workout or a Chapter 11 reorganisation. The evolution of these scores were always downwards culminating in 2008 (year of the first assistance) with a negative score (Z-score) and a 100% probability of failure (O-score).

With no money to face its obligations, GM had the necessity to ask for help of the U.S. government and given the importance of this firm in the American economy, this help was conceived. GM borrowed \$13 billion and in return it had to develop a viability plan where a great amount of expenses needed to be cut (mainly expenses with dealerships, plants, brands and labour costs) and a debt restructuration was necessary. Although the efforts an out-of-court reorganisation was not possible and General Motors had to file for Chapter 11 bankruptcy protection in the United States bankruptcy court.

During Chapter 11 process, a new organisation was created with the help of the American and Canadian governments. This new company acquired the core assets and

liabilities of the former GM and started immediately working, while the rest of the assets and liabilities continued in the Chapter 11 process. The new GM was property of the U.S. government (60%), Canadian government (12.5%), UAW (17.5%) and the creditors of the old company (10%). But it was not only the firm's board and stockholders that changed. The business model changed as well as other costs. A new retirement plan agreement was made with the UAW, the brands produced were reduced from eight to four (Chevrolet, GMC, Buick, Cadillac) as well as plants, inventories and employees.

In 2010, General Motors went public with a successful IPO and returned also to profits. However, in spite of a big improvement in the financial results of this new company, it is not solid yet as the bankruptcy models prove. They all show that improvement but do not consider it a strong company. Z-score model continue to put GM in the high risk zone and O-score model gives a 50% probability of General Motors goes bankrupt again.

We will have to wait a few more years to see if this was a successful reorganisation or if GM will need once again to reorganise or instead close the doors forever.

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## Appendix

**Table 3 – Factors included in five or more studies**

Ratio/Factor	Number of studies that include
Net Income / Total Assets	54
Current Ratio	51
Working Capital / Total Assets	45
Retained earnings / Total assets	42
Earnings before interest and taxes / Total assets	35
Sales / Total assets	32
Quick ratio	30
Total debt / Total assets	27
Current assets / Total assets	26
Net income / Net worth	23
Total liabilities / Total assets	19
Cash / Total assets	18
Market value of equity / Book value of total debt	16
Cash flow from operations / Total assets	15
Cash flow from operations / Total liabilities	14
Current liabilities / Total assets	13
Cash flow from operations / Total debt	12
Quick assets / Total assets	11
Current assets / Sales	10
Earnings before interest and taxes / Interest	10
Inventory / Sales	10
Operating income / Total assets	10
Cash flow from operations / Sales	9
Net income / Sales	9

Long-term debt / Total assets	8
Net worth / Total assets	8
Total debt / Net worth	8
Total liabilities / Net worth	8
Cash / Current liabilities	7
Cash flow from operations / Current liabilities	7
Working capital / Sales	7
Capital / Assets	6
Net sales / Total assets	6
Net worth / Total liabilities	6
No-credit interval	6
Total assets (log)	6
Cash flow (using net income) / Debt	5
Cash flow from operations	5
Operating expenses / Operating income	5
Quick assets / Sales	5
Sales / Inventory	5
Working capital / Net worth	5

**Table 4** – Values (in millions) to compute Z-score from 2004 to 2008

	2004	2005	2006	2007	2008
Current Assets	151.668	52.357	64.131	60.135	41.224
Short-term Liabilities	106.557	70.726	67.822	70.308	73.911
Retained Earnings	14.428	2.960	406	-39.392	-70.610
EBIT	-545	-17.806	-7.668	-4.390	-21.284
Revenues	195.351	194.655	207.349	181.122	148.979
Total Assets	479.603	474.156	186.192	148.883	91.047
Total Liabilities	451.480	458.456	190.443	184.363	176.387
Market Capitalization	22.634	10.992	17.388	14.088	1.853
X1	0,09	-0,04	-0,02	-0,07	-0,36
X2	0,03	0,01	0,00	-0,26	-0,78
X3	0,00	-0,04	-0,04	-0,03	-0,23
X4	0,05	0,02	0,09	0,08	0,01
X5	0,41	0,41	1,11	1,22	1,64
<b>Z-SCORE</b>	<b>0,6</b>	<b>0,3</b>	<b>1,0</b>	<b>0,7</b>	<b>-0,6</b>

**Table 5 - Values (in millions) to compute O-score from 2004 to 2008**

	2004	2005	2006	2007	2008
Current Assets	151.668	52.357	64.131	60.135	41.224
Current Liabilities	106.557	70.726	67.822	70.308	73.911
Total Assets	479.603	474.156	186.192	148.883	91.047
Total Liabilities	451.480	458.456	190.443	184.363	176.387
EBT	855	-16.740	-4.947	-6.253	-29.388
Depreciation	14.202	15.797	10.950	9.513	10.014
Net Income	2.701	-10.417	-1.978	-38.732	-30.860
Size	8,48	8,25	7,26	6,99	6,51
TLTA	0,94	0,97	1,02	1,24	1,94
WCTA	0,09	-0,04	-0,02	-0,07	-0,36
CLCA	0,70	1,35	1,06	1,17	1,79
OENEG	0,00	0,00	1,00	1,00	1,00
NITA	0,01	-0,02	-0,01	-0,26	-0,34
FUTL	0,03	0,00	0,03	0,02	-0,11
INTWO	0,00	0,00	0,00	1,00	1,00
CHIN	1,00	-1,70	-1,00	-1,00	-1,00
Z	0,71	3,17	1,49	3,96	9,67
<b>Probability</b>	<b>67%</b>	<b>96%</b>	<b>82%</b>	<b>98%</b>	<b>100%</b>

**Table 6 - Values (in millions) to compute Z-score from 2010 to 2013**

	2010	2011	2012	2013
Current Assets	53.053	60.247	65.952	67.223
Short-term Liabilities	47.157	48.932	50.222	48.818
Retained Earnings	266	7.183	10.057	13.816
EBIT	5.108	5.656	-30.363	5.131
Revenues	135.592	150.276	152.256	155.427
Total Assets	138.898	144.603	149.422	166.344
Total Liabilities	101.739	105.612	112.422	123.170
Market Capitalization	55.290	31.043	45.148	56.681
X1	0,04	0,08	0,11	0,11
X2	0,00	0,05	0,07	0,08
X3	0,04	0,04	-0,20	0,03
X4	0,54	0,29	0,40	0,46
X5	0,98	1,04	1,02	0,93
<b>Z-SCORE</b>	<b>1,5</b>	<b>1,5</b>	<b>0,8</b>	<b>1,6</b>

**Table 7 - Values (in millions) to compute O-score from 2010 to 2013**

	2010	2011	2012	2013
Current Assets	53.053	60.247	65.952	67.223
Short-term Liabilities	47.157	48.932	50.222	48.818
Total Assets	138.898	144.603	149.422	166.344
Total Liabilities	101.739	105.612	112.422	123.170
EBT	5.737	5.985	-28.695	7.458
Depreciation	6.923	7.344	38.762	8.041
Net Income	6.503	9.287	6.136	5.331
Size	7,24	7,24	7,23	7,30
TLTA	0,73	0,73	0,75	0,74
WCTA	0,04	0,08	0,11	0,11
CLCA	0,89	0,81	0,76	0,73
OENEG	0,00	0,00	0,00	0,00
NITA	0,05	0,06	0,04	0,03
FUTL	0,12	0,13	0,09	0,13
INTWO	1,00	0,00	0,00	0,00
CHIN	3,79	1,00	1,00	1,00
Z	-1,26	-0,26	-0,08	-0,26
<b>Probability</b>	<b>22%</b>	<b>43%</b>	<b>48%</b>	<b>43%</b>