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Where did the money go? A forensic analysis of the cash position of General Motors following the bailout

Mariah C Webinger*

General Motors (GM) received almost 20 billion dollars in US government funds over a period of about 6 months. This amount represents more than 25% of GM's revenues the year before (sec.gov). The cash infusion was unable to prevent bankruptcy, which GM filed for on June 1, 2008. The bankruptcy led to a reorganization where the US government forgave the 20 billion dollars in debt and provided another 33.3 billion dollars of relief, in the form of Debtor-in-Possession relief, in return for stock in the new (restructured) GM (Marin et al, 2009). This assistance cost the US taxpayers a total of over 50 billion dollars.

Where did all the money go? This question is difficult to answer because in June 2009, GM became a privately held company and as such was not subject to the Security and Exchange Commission (SEC) filing regulations. Therefore there is no public access to accounting statements during the bankruptcy process. The money was spent very quickly and the lack of transparency for the funds raises classic red flags in accounting. In addition, the lack of reporting may be a contributing factor to the public ill will surrounding the GM bankruptcy. Rassmussen Reports (2009) suggest that only 26% of the American population approved of the bailout while 17% favor a boycott of GM cars in protest of the bailout.

The forensic accounting technique of tracing is employed to answer these questions. Courts have established that it is not necessary to show direct evidence of cash transactions but is sufficient to show a flow of funds to establish evidence about how money was spent. This study also differentiates between results that would be considered the best evidence in a US court of law. To address where GM spent the bailout funds the cash ledger would provide the best evidence. As that is not available, business documents (regular financial statements) released by GM become the best evidence. Business documents are an exception to the hearsay rule and are treated as direct evidence (Manning, 2011, p. 97). This paper treats statistical conclusions as secondary evidence. An expert's option, methods, results, and evaluations would be contested before the opinion can be entered as evidence.

* The author is at John Carroll University.

Popular media sources are searched to find allegations of how GM spent the bailout funds. Four popular theories are then adopted about where GM spent the bailout funds. The first is that GM used the money to buy property in Brazil. The second was that GM used the money to pay operating expenses. The third is that GM used the money to prop up their pensions and the fourth is that GM used the money to pay salaries and benefits to their executives. All of these were reported in popular press outlets (see figure 1). The second allegation is the only one that GM publically acknowledged (FOXnews, 2009).

This article will be of interests to academics as it uses a forensic technique to answer a popular question using accounting data. It will be of interest to policy and standard setters as it highlights the need for transparency through bankruptcy, particularly publically-funded bankruptcy. It will be of interest to accountants as it illustrates forensic accounting on a high profile case. And finally, it will be of interest to the general population as it addresses a high profile bankruptcy and attempts to answer some of the questions surrounding the GM bailout funds.

Background of General Motors

The US auto industry had more than 200 producers in 1909. The number dropped sharply over the next 10 years and settled into the oligopoly of General Motors, Ford, and Chrysler. By 1930 these three firms produced more than 80% of the industry output. (Klepper, 2001).

Leadership was extremely important during this shakeout period. The fact that all three of the oligopoly firms were started by experienced entrepreneurs shows that key capabilities reside in people as much as in organizations (Klepper, 2001). Leadership problems came to plagued GM even as an icon of US manufacturing.

Roger Smith took over GM in 1981 to begin a decade-long tenure. The 1980's were characterized by similar car models from the three-firm oligopoly, which forced dealers to bring foreign models on the lots to get sufficient variety (Hunt and Ropo, 1995). Smith also began a series of investments that were later abandoned in a search for a high-tech solution to high labor costs. Low quality and employee morale led to lower market share and high costs which began GM's cash bind (Hunt and Ropo, 1995). If Smith began GM's troubles, Wagoner finished them.

Rick Wagoner took over the helm of GM in June 2000. April 2000 began with a GM high stock price of 93.63 but fell to 1.45 in March 2009 when the Obama administration asked Wagoner to leave (Petruno, 2009). Although GM had record sales in 2006, they were consistently losing money since 2000 as a result of high labor costs and ineffective management (Petruno, 2009).

Japanese firms started competing and eventually were able to gain a large market share. In January 2007, Toyota pushed Chrysler into spot number four (Isadore, 2007) and was able to grab the number one spot in January 2009 (Ryall, 2009). Japanese firms were able to derive a greater competitive advantage from cooperative supplier relations where, in the west, decades of close but adversarial buyer-supplier relationships were entrenched (Mudambi and Helper, 1998).

Of the three-firm oligopoly, only Ford was able to survive. It has been questioned if Ford would continue to operate after the GM and Chrysler bankruptcy (Muller, 2008). Suppliers were declaring bankruptcy and Ford was shedding cash as they scrambled to find parts. Although Ford was not immune to the market conditions, they saw a milder drop in sales compared to GM as consumers exhausted by bailouts looked for a stable brand (Langlois, 2009).

At the end of 2008, GM signed a deal with the United States Treasury (UST) for a $13.4 billion dollar loan. They received a second infusion in April and May and then finally declared bankruptcy on July 10, 2009. The total amount of public assistance exceeds this amount since much of the assistance was in the form of debtor-in-possession financing during bankruptcy.

Neil Barofsky, the inspector general for TARP (Troubled Asset Relief Program), estimated that GM stock would have to reach $133.78 for the UST to recoup their investment (Krisher, 2010). That is 42% higher than the high stock price for GM in 2000 when they were the largest car manufacturer in the world. The expected IPO price for new GM stock was between $20-25. (Forsyth, 2010) The IPO, that took place in late 2010, was the largest IPO ever and had a share price of $33 (Isidore, 2010). Some believe GM to be a great turnaround story: A better than anticipated IPO price, a steady balance sheet and a stabilization of the auto industry in general (Seetharaman, 2011). Others feel that GM is still underperforming competitors. They hold their currently reported margins suspect and feel that the lack of a functional financing arm (GMAC) weakens the company (Krantz, 2010). They think leverage position where the pension preferred stock must be paid before any dividends to common shareholders will stifle any potential for growth (Krantz, 2010).

There is some academic support for the assertion that GM will not recoup losses (McManus et al, 2009 and Collins, 2009). In addition, the unusual circumstances of the GM bailout/bankruptcy threatens the Chapter 11 reorganization process as some creditors were favored (VEBA – GM's pension program) over and at the expense of the claims of others (bondholders) (Adler, 2010).

Allegations

Several allegations of the use of the funds have come forth and were published and circulated in popular press. Figure 1 contains a summary of the allegations theories and their sources (Please see Figure 1).

A1 GM was allegedly using the money to invest in operations in Brazil. This theory was followed closely in popular press (The Economic Populist; Latin American Herald Tribune; Business Pundit). GM was considering investing in a plant in Brazil in hopes to lower production costs. The funds were allegedly coming from the financial aid the manufacturer was receiving from the US government.

A2 GM allegedly used the money to pay operating expenses. This theory received the most reputable coverage (FoxNews; CarTech; CNNmoney.com). Julie Gibson, a GM spokeswoman, said that proceeds from the UST loan were "being used for operating expenses" (FOX news.com, 2009). The theory maintains that the money was used to keep GM afloat and pay their normal operating bills as they came due. Calogera (2009) reports that a government watchdog released a report claiming that GM spent 65% of the bailout funds on day-to-day expenses. No details are given as to why day to day expenses were financed with bailout funds rather than through conventional means. In addition to supporting or refuting GM's claim, the study will also examine how the bailout funds flowed through to operating expenses.

A3 GM allegedly used the money to pay off pension and healthcare obligations. This allegation is based on the fact that pension and healthcare obligations were often cited as the reasons for GM's inability to be competitive. There was no published news story related to this but it was wide-spread enough to make a mention in Politico.com, a political lobby group, article in defense of the GM bailout.

A4 GM allegedly used the money to pay off executives. The public ire over executive pay did not stop at GM's bankruptcy. New GM is coming under increased scrutiny of their compensation packages because of the bailout finds. Popular press implied that executives were paid too much for running a bankrupt company (Kirsher, 2010). The article seems to imply that taxpayer money went to pay excessive compensation packages.

Methodology

All data is collected from EDGAR database available on the SEC's website (sec.gov). Quarterly and annual reports for the years 2006-2008 are collected. The bailout money was included in the first quarter (1Q) 2009 financials and this is the last quarterly report that GM filed as they declared bankruptcy in June. The 1Q 2009 data is the test observation and quarterly numbers from 1Q 2006- 4Q 2008 were used to estimate normal levels and variability of the variables.

All income statement and cash flow amounts are normalized to the preceding three months for that disclosure. Annual report numbers were adjusted for the amounts previously disclosed in their interim reporting.[1] Account balances were tested against previous average balance to determine any abnormal activity. Where applicable, accounts were scaled to allow for justifiable changes in balance. For example, accounts payable was found to be abnormally small. It was then scaled by inventory to rule out the possibility that it was smaller due to lower inventory levels.

The four allegations are tested using forensic accounting techniques to identify where the bailout funds were spent. Forensic research techniques are different from traditional research techniques. The Merriam-Webster dictionary defines forensics as "relating to or dealing with the application of scientific knowledge to legal problems." This study will gather and test evidence surrounding the bailout funds given to GM. Information regarding cash is particularly important evidence, as it is in all forensic accounting, because of its non-bias nature and lack of estimations

[1] The cumulative numbers were adjusted by the previous quarter reported levels. E.g. If annual income for the year was $10 and quarters one through three reported $3, $2 and $4 consecutively, then the three months income for the fourth quarter is $1.

normal to accrual measurements. Where cash flow disclosures are unavailable, income statement and balance sheet accrual numbers are used to estimate the cash effect. The tracing method is employed to show the flow of funds into and out of GM. The primary purpose of tracing is to map the flow of funds. Courts have ruled that the exact amount is not necessary to establish, only that funds flowed in a specific manner over a certain time period (Manning, 2011). The study also differentiates between results by what would be considered the best evidence in a US court of law (Please see Tables 1 and 2).

Results

The evidence suggests that GM spent all of the $13 billion given to them by the UST by their March 31st filing. If GM had an abnormally high cash position it could be concluded that bailout funds were spent after the first 10-Q of 2009 and no forensic trail is available from the public financial filings; however, that is not the case. As per table 1, GM had significantly *less* cash than the average of the previous 12 filings (tstat = -8.84, p-value <0.001). While they spent all of the cash loaned to them, they did not have a significantly different (tstat = 1.64, p-value = 0.127) proportion of their assets in cash. This shows that while GM had significantly less cash even after the $13 billion from the UST, they had a similar proportion of their assets in cash as previously. This evidence is more consistent with a shrinking of asset base than a consistent liquidity position.

A1 GM used bailout moneys to buy property in Brazil

To test A1, whether GM spent the money on investing in property, cash flows to property investment are estimated as 1) a proportion of ending cash balance and 2) a proportion of operating cash flows. There is no evidence to support this theory. GM did spend $1.566 billion on property between Jan 1st and March 31st 2009, however this is not significantly different from their usual property spending (tstat = 0.389, p-value = 0.704). When this variable is scaled by the amount of cash that GM was carrying at the time or by the current cash flows from operating activities the measure remains insignificant (p-value = 0.437 and p-value = 0.817 respectively).

News stories alleged that GM was spending this money on property in Brazil. The $1.566 billion could have been spent anywhere, including Brazil, but this amount is similar to previous property expenditures. The amount is disclosed by the GM in their financials and would be considered best evidence for the amount of the cash flows spent on property. Showing that this number is not statistically different from GM's average property expenditures is secondary evidence. Taken together this evidence does not provide an adequate explanation for the expenditure of bailout funds.

A2 GM used bailout moneys to pay normal operating expenses

This section first establishes that there is evidence of an abnormal cash outflow from operations. Next it explores possible explanations for this abnormal outflow. The identified effects are (1) a decrease in revenues, (2) an increase in accounts receivable, (3) an increase in the cost of sales and (4) a decrease in accounts payable.

To test whether GM spent bailout funds to pay normal operating expenses, cash flows from operating is tested to see if there was a significant change in cash outflow. This is found to be very significant. The cash outflow for operations is seven times higher than the average for the previous 12 periods (-9,390 vs -1,341 million). Although there is a lot of variation in cash flows from operations for GM, cash outflow is still shown to be significantly larger (tstat = -6.992, p-value <.0001). Just looking at the raw means of this variable accounts for almost 8 of the $13 billion from the UST loan. Because of the significant variation of cash outflow from operations from year to year, it would be naive to take this result at face value – the minimum of cash flows from operations is even more negative than the March 31st reported number (-9,661 vs -9,390). Cash flows from operations are scaled by revenues and operating expenses and tested. This stabilizes the variable significantly and both are found to be significant (t stat = 13.98, 11.30, pvalue <.0001 respectively, inclusively).

An increase in net cash outflow from operations could be a result of a decrease in cash inflow or an increase in cash outflow. The first issue, a decrease of cash inflow, may have resulted from either lower revenues or an increase in accounts receivable. GM may have had trouble collecting from their customers. This would have resulted in a normal revenue level, an increased in accounts receivable, and ultimately a larger cash outflow from operations. Both revenues and accounts receivable are significantly lower (t stat = -11.45, -3.39, pvalue = <.0001, .0054 respectively) and the proportion of accounts receivable to revenues is significantly higher (tstat = 9.61, pvalue = <.0001). This suggests that, while lower revenues were a contributing factor, a lower proportion of these revenues was being collected, thus exacerbating GM's cash flow problem. While the general decline in the economy helps to explain the uncollectability of GM's receivables, the general trend of the variable does not (see Figure 2). As figure 2 shows there was an increase in the level of accounts receivable from June 2006 to March 2007. Then the level seems to hold steady until there is a sizable jump at March 2009. General economy conditions are consistent with the prior movement but do not sufficiently explain the latter one (please see Figure 2).

An explanation for the increased cash outflow from operations is that the cost of sales as a proportion of revenue may have increased. This would mean that GM was spending more for each car it was making. There is some evidence for this explanation. The ratio after the bailout dollars is significantly higher than the average 12 months prior (t stat = 5-65, pvalue = .0001) but it is only 0.012 higher than the previous quarter and 0.044 *lower* that three quarters prior so this result must be interpreted cautiously. The most plausible explanation for this significant increase is a time trend towards less and less profitable sales by GM (see figure 3). Also included in the cost of sales is the cost of a voluntary employee attrition program. Note 8 in the March 31, 2009 10-Q states:

> In February 2009, we announced the 2009 Special Attrition Program for our U.S. hourly employees. The 2009 Special Attrition Program offers a cash incentive of $20,000 coupled with a car voucher of $25,000 for individuals who elect to retire or voluntarily terminate employment. Consistent with the terms of the UST Loan Agreement, the incentives paid to employees electing to participate in this program will not be paid from pension plan assets. In total, 7,000 of our employees accepted this program resulting in a charge of $296 million recorded in Cost of sales.

A final explanation for the increase in cash outflow is the inability of GM to secure trade credit. As GM's business prospects degenerate, their suppliers will become less willing to extend trade credit and will demand cash to fill GM's orders of raw materials. There is a significant decrease in the level of accounts payable (tstat = -14.45, pvalue = <.0001). The ratio of accounts payable to inventories is also tested to make sure that a decrease in the level of inventory is not the explanation for the decrease in payables. This variable remains significant (tstat = -7.11, pvalue = <.0001). The evidence suggests that GM spent an abnormal amount of cash paying suppliers who were not extending credit to the extent they had in the past (Please see Figure 3).

In conclusion, there is significant evidence to support GM's claim that bailout funds were spent on operating expenses. In addition, the increase in operating expenses is due to three main reasons. First is a general decline in sales and an inability to collect on sales resulting in a higher accounts receivable. Second there is an increase in the cost of sales. GM disclosed in the footnotes that part of the increase in the cost of sales was a special attrition program offered to employees as part of the terms of agreement of the UST loan. Lastly, GM suppliers were unwilling to extend credit to the extent they had in the past resulting in a much lower cost of sales. These three factors contributed to GM's increased cash need for operations.

In a US court of law, all the statistical analysis would be subject to scrutiny by the opposing council. It is interesting to note, the sources cited previously that allege that GM spent the bailout funds on operating expenses would be inadmissible as evidence based on hearsay – these articles wrote about something someone else said. Legal council would need to call the individuals cited in the article to the witness stand to have the statements entered as evidence. The above analysis would then serve as secondary evidence supporting or refuting those claims.

A3 GM used bailout moneys to pay pensions

Allegation 3 contains that GM spent the bailout money propping up their pensions. Although pension expense was undoubtedly one of the major reasons for the extremely high cost of sales proportionate to sales it may not have had a cash effect. The pension expense is disclosed in the footnotes and pension obligation and prepaid pension is found in the balance sheet. Taking the change in the level of pension on the balance sheet and subtracting it from pension expense and then adding the change in prepaid pension approximates the cash flow associated with pension. This measure is deficient to the extent that components of pension expense are recognized in other comprehensive income and that the amortization[2] of prior service cost and/or losses/gains are not consistent throughout the testing period.

The pension obligation is higher (tstat = 9.83, pvalue <.0001) and prepaid pension is lower (tstat = -5.88, pvalue <.0001). Both US and non US pension expense and post retirement benefit expense are included when calculating the variable. It is interesting to note that the most obvious difference between the US and non US numbers associated with pension and other post retirement benefits is the variability. There is no discernable trend in either but the US disclosure for pension exp has almost 10 times the variation of the non US disclosure. The

[2] The components of pension expense are disclosed in the footnotes. There is an amortization of prior service cost and it appears to be consistent from year to year. There were no explicit mentions of a change in prior service costs or any evidence of an amortization of a loss/gain. Although there are specific disclosures about cash flows and benefits paid in the annual report it is not disclosed in the quarterly report. Therefore the estimation methodology is used even for annual measurements.

pension expense variable remains the same after the bailout funds (t stat = -0.80, pvalue = 0.44). In examining the constructed variable of cash flows due to pension, there is only a marginally significant difference in the cash outflow (tstat = 2.16, pvalue = 0.052). This variable is in the hypothesized direction but is so weak and the variability so high that it is difficult to interpreted as significantly different from the previous quarters cash flows. This finding is more consistent with the idea that the prepaid asset was exhausted to meet the pension obligation rather than using UST loan cash.

Other post retirement benefits are also examined and found to be a significantly lower liability account (tstat = -7.60, pvalue <.0001). The constructed variable of cash flows due to post retirement benefits is significant (tstat = 3.29, pvalue = 0.0064). This suggests that GM did have an abnormally high cash outflow due to other post retirement benefits. This variable is only significant when testing GM's US operations and not under their foreign operations.

GM also recognized their pension and other benefit obligation costs were unsustainable. They were in the process of revising them to make GM more viable. The following was disclosed in the footnotes:

> In October 2007, we signed a Memorandum of Understanding — Post-Retirement Medical Care (Retiree MOU) with the International Union, United Automotive, Aerospace and Agricultural Implement Workers of America (UAW), now superseded by the settlement agreement entered into in February 2008 (Settlement Agreement). The Settlement Agreement provides that responsibility for providing retiree healthcare will permanently shift from us to a new retiree plan (New Plan) funded by a new independent Voluntary Employee Beneficiary Association (New VEBA).

In addition to testing the numbers in the balance sheet, note 8 of the footnotes to the financial statements for the 1st quarter 2009 (after bailout funds) indicate the following pertaining to their special attrition program:

> Consistent with the terms of the UST Loan Agreement, the incentives paid to employees electing to participate in this program will not be paid from pension plan assets. In total, 7,000 of our employees accepted this program resulting in a charge of $296 million recorded in Cost of sales. Refer to Note 13 for details. These employees represent approximately 11.5% of our active hourly employees that participate in the U.S. hourly benefit plans. However, due to the high proportion of retirement eligible employees accepting the 2009 Special Attrition Program, we were not required to remeasure our U.S. hourly benefit plans for the three months ended March 31, 2009.

This excerpt first verifies the fact that a change in the pension obligation or benefit obligation was not due to a prior service adjustment. Also it discloses that the UST loan had terms that specifically protected the pension plan. The cash associated with this particular program ($296 million) is fairly insignificant and the effect is found and measured in H2 when the cost of sales was examined.

In conclusion, there is some weak evidence that GM spent an abnormally large amount of cash on either pensions or post retirement obligations. The footnote disclosures (best evidence) about pension offer no suggestions that pension or post retirement obligations are accounted for differently than in the past. The constructed variable is erratic. This evidence would be submitted as the opinion of an expert witness, the model measurement and statistical conclusions are subject to cross-examination and compared to an opposing expert witness opinion. Legal council needs to be advised that the evidence is weak and additional evidence should be sought to pursue this allegation.

A4 GM used bailout funds to pay executives.

There is no evidence to support A4, the theory that UST loan funds were used to pay executive wages. The footnotes in the annual report dated 12-31-2008 contain disclosure relating to executive compensation. It reads "Mr. Osborne's bonus payment of $480,000 payable pursuant to his hiring agreement dated September 1, 2006, has not been paid in light of the terms of the UST Loan Agreement." Also disclosed is that CEO compensation will be $1 for 2009 and there will be a 30% reduction in salary for COO and CFO.

In addition to the best evidence above, supporting evidence from expenses related to executive compensation also do not support bailout funds going to pay executives. Selling, general and administrative expense was significantly *lower* after the UST loan (tstat = -3.02, pvalue = 0.01). The level of accrued expenses is not significantly different after the loan (tstat = -0.25, pvalue = 0.81) (Please see Table 3).

GM's pursuit of other liquidity sources

It is also worth noting that there was of evidence in the year end reports of 2008 to suggest that GM had on-going plans to continue operations. They were downsizing the company and had disclosures such as the following plan to improve liquidity.

> The remaining $5 billion of our July liquidity plan included $2 billion to $4 billion of planned asset sales and $2 billion to $3 billion of fundraising in capital markets. We believed that these actions, together with the availability of $4.5 billion under our secured credit line, would provide sufficient liquidity for the balance of 2008 and 2009 as well. The status of these previously-announced activities as of November 7, 2008, is as follows:
> Asset sales — We are exploring the sale of the HUMMER business, Strasbourg transmission plant and the AC Delco business. We expect to shortly commence providing offering materials to potential buyers for the HUMMER and AC Delco businesses pursuant to appropriate confidentiality agreements and have already commenced providing confidential offering materials for the Strasbourg transmission plant to interested parties. We are also in the process of monetizing idle or excess real estate and several individual transactions are in various stages of execution.
> Capital market activities — Our plan targeted at least $2.0 billion to $3.0 billion of financing during 2008 and 2009. However, due to the prevailing global economic conditions and our current financial condition and near-term outlook, we currently do not have access to the capital markets on acceptable terms. In the three months ended September 30, 2008, we executed $0.5 billion of debt-for-equity exchanges of our Series D convertible bonds due in June 2009. In addition, we have gross unencumbered assets of over $20 billion, which could support a secured debt offering, or multiple offerings, in excess of the initially targeted $2.0 billion to $3.0 billion, if market conditions recover. These assets include stock of foreign subsidiaries, brands, our investment in GMAC and real estate.

Of course many of these plans were stalled due to the bankruptcy. The Hummer business was sold to a Chinese Industrial business in June of 2009 right before GM entered bankruptcy (Smith, 2009). GM was unable to unload the Strasbourg plant and ended up purchasing it from themselves in bankruptcy (Luft, 2010). And they dropped plans to sell AC Delco (Gupta, 2009).

After bankruptcy, GM posted 3 quarters of earnings and raised capital through an IPO. Estimates of the IPO were close to the $30 billion dollar mark (Sullivan, 2010), the largest IPO ever but well below the total amount of bailout funds received. There was no explicit statement as to whether it was a lack of availability of capital from the market as a result of the economic conditions of the time or if it was because of the failure of GM to secure buyers for the assets they planned to sell that GM was forced into bankruptcy.

Results Summary

Table 4 summaries the results of the analysis. It begins with the amount of UST loan proceeds received in the studied time period and is followed by the estimated abnormal cash outflows that would provide evidence to where the money was spent (Please see Table 4). There are only two identified sources of abnormal cash outflow. The first is the outflow from operations. This outflow is comprised of three elements. The first is GM's inability to collect on their account receivables. The second is the increase in the cost of sales. The disclosed amount of special attrition program of $296 million is included in this measure of abnormally high cost of sales. Thirdly, the cash outflow from operations was abnormally high due to the fact that suppliers were unwilling to extend credit to the extent they had in the past as evidenced in the increase of accounts payable. Finally, there is an increase in cash outflow due to other post retirement benefits. The large range of the confidence interval associated with this variable is evidence of its high variability and makes it fairly weak.

This study employed the forensic technique of tracing. Specifically this study traced UST bailout funds through analysis of disclosures and the cash position of GM. Table 4 shows no reason to believe that a significant proportion of the bailout funds are unaccounted for. The significant increase in cash outflow due to operations and post retirement benefits more than accounts for the bailout funds.

It is also of value to note that the bailout funds of $10,284 million and the cost of the special attrition program of $296 million would be entered as best evidence in a court of law as they are disclosed by the company itself. The other measures of cash flows due to cost of sales, accounts receivable, accounts payable and post retirement obligation would be entered as supporting evidence. This evidence could be supported and critiqued by expert witnesses on such topics as statistical methodology, model assumptions, distribution of the population, etc.

Conclusion

This article provides some forensic evidence as to where GM spent the $13 billion of US taxpayer bailout funds. Although there was a lot of speculation that GM was using these funds to purchase property in Brazil and to pay their executives exorbitant salaries there is no evidence in the publically filed financial statements to support these claims. The analysis supports the assertion that some of the funds went to support other post-retirement benefits in the United States but the evidence suggests less than half the funds went there and this assertion needs to be made with caution because of the lack of stability in the test measure. There is strong evidence that GM spent the money to pay operating expenses.

The forensic analysis of GM's financial filings is consistent with GM spending bailout funds on operating expenses. Cash outflows from operating expenses are abnormally large. A more detailed analysis reveals that this is due partially to a decrease in revenues and an inability to collect accounts receivable. It is also partially due to an increase in the cost of sales. From the footnotes, $296 million of the abnormally high cost of sales was due to a special attrition program. However the additional abnormally high cost of sales relative to sales is unexplained. Finally, there is evidence to support the notion that the abnormally large cash outflow from operating activities was due in part to an inability of GM to secure credit from suppliers. There is a significant decrease in accounts payable consistent with this notion.

This study is limited in that it bases its conclusions on publicly available data only. Also accounting numbers may be unusual simply as a reflection of the unusual circumstance of the world's once leading auto manufacturer declaring bankruptcy and therefore make conclusions drawn on the expected levels suspect. Finally, the conclusions and methods deployed in this study are custom to a particular firm in a particular bankruptcy with a particular emergency loan and may not generalize to other firms under different conditions. Nonetheless, analysis of the GM bailout contains valuable lessons for industry and policy, professionals and academics, and the role of government in capital markets.

Lessons for industry, particularly for manufacturing industry, is that government bailouts can be unsuccessful. There is no doubt that the spending of federal money created company ill-will but it is debatable whether this led to GM's ultimate demise. From a policy perspective, it is important to note that when firms become distressed, their cash needs multiply and are exacerbated by the fact that credit is not as available as previously. Professionals will be likely to note the need for greater transparency and publicity management in situations like this to help to mitigate public ire. Academics will note that this paper used relatively elementary statistics to test accounting numbers against popular assertions and the relative weight given to different evidence in a court of law. Lastly, this study suggests that the role of government should not be in the capacity of lender of last resort. This model may work with the financial industry and the Federal Reserve but it didn't work in the manufacturing industry, specifically in auto manufacturing.

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Table 1 GM numbers on their last 10-q filing

Variables at March 31st 2009 (measured in millions)

Cash	$11,448
Cash/TA	0.139118
$CF_{Property}$	1,566
$CF_{property}$/Cash	-0.13379
$CF_{property}/CF_{Operating}$	0.166773
Op Exp	28,093
COS	24,611
$CF_{Operating}$	-9,390
Sales	22,431
Acct Rec	7,567
Acct payable	18,253
Inventory	11,606
$CF_{Operating}$/Cash	-0.82023
$CF_{Operating}$/Sales	-0.41862
$CF_{Operating}$/Op Exp	-0.33425
Acct Rec/Sales	0.337346
Pension	24,476
Pension expense	305
Non US pension expense	309
Prepaid pension	106
Post retirement benefits	22,503
Selling and Administrative expense	2,497
Accrued Expenses	36,989
Total Liabilities	172,810

Table 2: GM accounting data

Variable statistics measured from quarterly filings for 2006-2008

Variable[3]	Mean	Standard Deviation	Min	Max
Cash	$20,137.92	3404.217	$13,953	$24,549
Cash/TA	0.11601	0.04886	0.037709	0.164888
$CF_{property}$	-1,914.5	3107.073	-5,527	4,067
$CF_{property}$/Cash	-0.09553	0.177854	-0.34913	0.291479
$CF_{property}/CF_{Operating}$	0.268454	1.486003	-1.74177	2.959971
Op exp	47,070.5	5963.303	37,835	59,597
COS	39,841.5	3930.103	33,092	46,851
$CF_{Operating}$	-1,341.08	3987.515	-9,661	4027
Sales	44,452.5	6665.113	30,499	54,395
Acct Rec	8,893.5	1356.207	6855	10728
Acct Payable	28,278.25	2402.675	22236	30742
Inventory	15350.75	1360.266	13,195	17,744
$CF_{Operating}$/Cash	-0.07727	0.22106	-0.61026	0.182713
$CF_{Operating}$/Sales	-0.03082	0.096081	-0.25463	0.086274
$CF_{Operating}$/Op Exp	-0.02947	0.093404	-0.24884	0.086892
Acct Rec/Sales	0.205681	0.047452	0.122	0.259615
Pension	13130.58	3997.091	11293	25178
Pension exp	618.6667	1446.912	-395	4196
Non US pen exp	345.6667	153.7053	258	804
Prepaid pension	20612.42	12079.35	109	37691
Post retire benefits	41380.08	8605.619	28919	50086
SG & A	6553	4653.868	3251	14412
Accrued Expenses	37,310.67	4520.878	33927	48441
Total Liabilities	252038.9	121647.6	169419	457785

[3] These variables represent the quarterly reported numbers for the years 2006-2008. March 31st 2009 numbers are not included in the analysis as they are the tested numbers

Table 3: Forensic analysis

T-test of difference in means

Variable	T-statistic	p-value
Cash	-8.84278	<.0001
Cash/TA	1.6381	0.127337
$CF_{Property}$	0.388546	0.704418
$CF_{property}$/Cash	-0.80377	0.437164
$CF_{property}/CF_{Operating}$	-0.23703	0.816629
$CF_{Operating}$	-6.99239	<.0001
Sales	-11.4454	<.0001
Acct Rec	-3.38822	0.0054
Acct/Sales	9.611761	<.0001
COS/Sales	5.650126	0.0001
Acct Payable	-14.4541	<.0001
AP/Inv	-7.10803	<.0001
Pension obligation	9.832569	<.0001
Pension expense	-0.75096	0.467148
Non US pen exp	-0.82637	0.424722
Cash flow due to pension	2.15764	0.05193
Post retirement benefits	-7.59877	<.0001
Cash flow due to post retire ben	3.29477	0.006402
Selling and Admin expense	-3.01908	0.010681
Accrued expenses	-0.24648	0.80948

Table 4: Summary of findings

Amount of US Treasury loan from the period of 12-31-2008 to 3-13-2009	$10,284[4]
Abnormal cash outflow from operations	8,698.7 *(8698.8 – 8698.6)*[5]
Abnormal cash flows from:	
Increase in accounts receivable[6]	2,953.363 *(2953.3 – 2953.4)*
Increase in cost of sales	4,227.116 *(4227.1 – 4227.2)*
cost of special attrition program	296
Decrease in accounts payable	3,177.742 *(3177.7 – 3177.8)*
Abnormal cash flows due to other post retirement benefits	4,470[7] *(2583.4 – 6356.6)*

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[4] This is the amount disclosed in the cash flow section of the interm report 1st quarter of 2009 for GM. The entire loan was disclosed as $13.3 billion; however the details concerning the timing of the cash flows from this loan were not disclosed. The cash flows number is used as it is the most conservative estimate of the cash that GM could have spent in this period.

[5] Confidence interval for $\alpha = 0.1$.

[6] This amount is calculated as the difference between accounts receivable/sales for 1st quarter 2009 and the mean of the variable for the previous 12 quarters. There is an increase in the variable of approximately .13. This is multiplied by the 1st quarter sales to find the cash effect of the increase in the proportion accts receivable to sales.

[7] This number is calculated by comparing the calculated cash outflow of post retirement benefits to the average post retirement benefits of 11 previous quarters. The 4th quarter of 2006 was removed because it was an extreme outlier. When the statistical analysis includes the outlier it becomes more significant. The result of this manipulation is to lower the estimated abnormal cash outflow due to post retirement benefits.

Figure 1: Popular Allegations for where GM spent the bailout funds.

Popular media source	A1: Brazil Operations	A2: Operating expenses	A3: Pension and Healthcare expenses	A4: Executive pay
Print and/or televised media		FoxNews		
Internet media	Latin American Herald Tribune	CNNmoney.com		
Internet blog	BusinessPundit.com The Economic Populist.com	egmCartech.com	Politico.com	Freep.com

Figure 2: Trend in growth of accounts receivable

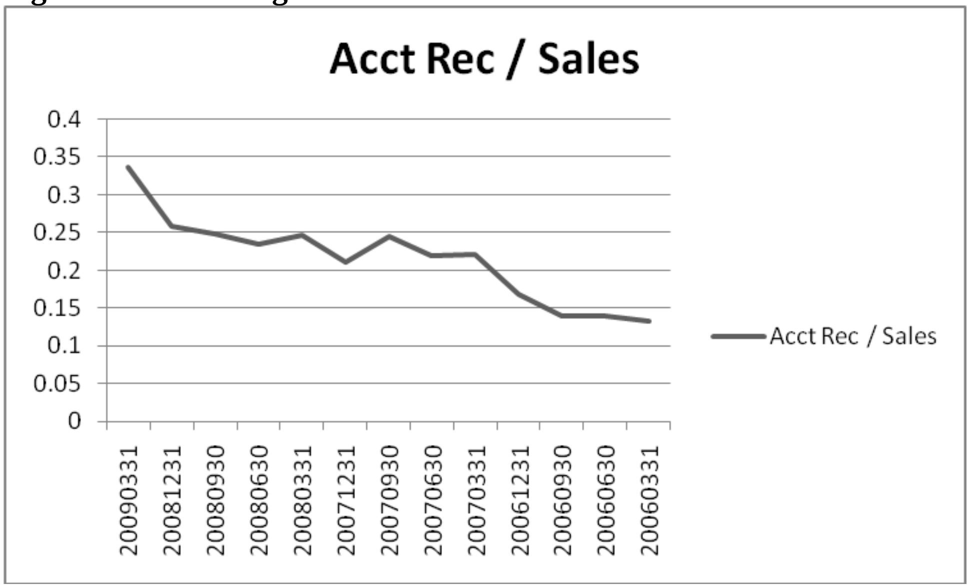

Figure 3: Trend of the increase in cost of sales