# INDUSTRY PRACTICE RELATING TO AGGRESSIVE CONSERVATIVE WORKING CAPITAL POLICIES

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## Abstract

This study looked at ten diverse industry groups over an extended time period to examine the relative relationship between aggressive and conservative working capital practices. Results strongly show that the industries had significantly different current asset management policies. Additionally, the relative industry ranking of the aggressive/conservative asset policies exhibited remarkable stability over time. Industry policies concerning relative aggressive/conservative liability management were also significantly different. Interestingly, it is evident there is a high and significant negative correlation between industry asset and liability policies. Relatively aggressive working capital asset management seems balanced by relatively conservative working capital financial management.

## INTRODUCTION

Finance textbooks typically begin their working capital sections with a discussion of the risk and return tradeoffs inherent in alternative working capital policies. High risk, high return working capital investment and financing strategies are referred to as aggressive; lower risk and return strategies are called moderate or matching; still lower risk and return is called conservative (see Moyer et al [15], Pinches [17], Brigham and Gapenski [2], Gitman [8]). This is a useful presentation when discussing general working capital principles and risk/return concepts. Little data is available, however, indicating what specific working capital policies are actually followed by industries.

This research examines the working capital investment and financing of a cross-section of ten different industries over a ten year period. The primary purpose is to determine if significant industry differences exist in working capital policies. Also explored is whether a tendency exists for industries following aggressive investment policies to also follow aggressive financing policies. Finally, the stability of working capital policies over time will also be investigated.

Results show that industries do follow significantly different aggressive/conservative working capital policies, and they remain stable relative to each other over extended periods. There is also a strong tendency that a more aggressive approach in one area is balanced by a more conservative approach in the other.

## WORKING CAPITAL RESEARCH

No evidence was found of an empirical examination that directly addresses the question of aggressive/conservative working capital policy. However several studies have addressed areas of peripheral importance to the issues examined in this paper.

The predictive power of financial ratios has been a recurring subject of analysis, and researchers have also focused on grouping ratios into useful classifications, see Chen and Shimerda [4] for an excellent review. Another area of research has focused on the issue of using regression analysis versus traditional financial ratios for analysis and prediction, for example Frecka and Lee [7]. An interesting paper by Nunn [16] examined why firms have different levels of working capital. His paper dealt with the strategic determinants of working capital (cash, short-term securities, accounts receivable, and inventory) on a product line basis. He used factor analysis to test 166 variables against the working capital policies of over 1700 businesses, or product lines, from 1971 to 1978. His final

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multiple regression model contained 19 variables pertaining to production, sales, accounting, competitive position, and industry factors. His model was used to explain why working capital levels differ between firms both within and across industries.

Some earlier work by Gupta [10] and Gupta and Huefner [11] examined the differences in financial ratio averages between industries. The conclusion of both studies was that differences do exist in ratio means amongst industry groups.

Pinches, Mingo and Caruthers [18] used factor analysis to develop seven classifications of ratios, and found that the classifications were stable over the 1951-1969 time period. Johnson [12] extended this work by finding cross-sectional stability of ratio groupings for both retailers and primary manufacturers. Similarly, Gombola and Ketz [9] examined the stability of financial ratio patterns between manufacturing and retail firms and found them to be very stable over time, although the structure of the ratio patterns varied.

Much of recent working capital literature focuses on special subsets of business. Ferconio and Lane [6], Kincaid [14], and Chu, Zollinger, Kelly, and Saywell [5] looked at the healthcare industry. Belt and Smith [1] examined Australian companies; Kim, Rowland, and Kim [13] investigated Japanese manufacturers in the United States; and Burns and Walker [3] studied small businesses. However, these studies did not address the issue of differences in aggressive/conservative working capital policies.

## METHODOLOGY

Aggressive asset management results in capital being minimized in current assets versus long-term investments. This has the expectation of higher profitability but greater liquidity risk. As an alternative, a more conservative policy places a greater proportion of capital in liquid assets, but at the sacrifice of some profitability. To measure the degree of aggressiveness the current asset to total asset ratio is used, with a lower ratio meaning a relatively more aggressive policy.

Aggressive financing policies utilize higher levels of normally lower cost short-term debt and less long-term capital. Although lowering capital costs, this increases the risk of a short-term liquidity problem. A more conservative policy uses higher cost capital but postpones the principal repayment of debt, or avoids it entirely by using equity. The total current liability to total asset ratio is used to measure the degree of aggressive financing policy, with a high ratio being relatively more aggressive.

The data set includes quarterly levels of current liabilities, current assets, and total assets for companies in ten different industries between 1984 and 1993. The ten industries, identified by SIC number, cover durable and non-durable goods, and include a variety of manufacturing, service, and retail, see Table 1. The number of companies ranged from 15 to 33 in each industry, with a total of 216 in the final sample. All data was obtained using *Compustat.*

To arrive at the final sample, a company was eliminated if there were three or more years of data missing during the ten year total period.   If this caused the number of companies in the industry to fall below 15, that industry was replaced. For better inter-industry comparability, calendar rather than fiscal year data was compiled. This eliminates the distorting impact of different reporting periods and seasonality patterns.

To remove the effects of seasonality, quarterly data for all firms in each industry was added and averaged together. Therefore, a sequence of ten yearly figures for each ratio per industry was generated. To maintain the integrity of the yearly figures, if a given company had one or more quarters of data missing the entire year was deleted. A ten year industry mean was also computed for each ratio by averaging the individual yearly means.

## RESULTS

### Differences in Policies

One objective was to determine if a significant difference exists in the aggressive/conservative working capital policies between industries. Industry investment policy is the first examined. To determine if significant differences exist in the current asset to total asset ratio means, a one-way ANOVA was applied to the set of 10 ten year average ratio means. As indicated by the F-ratio of 495.89 (Table 2) the differences in the means is highly significant.

To further examine the strength of differences between industry values, Tukey's HSD test was also performed, comparing the industry means on a paired sample basis. These results are also presented in Table 2 and show that 43 of the 45 comparisons are significant at the 1 percent level. Both The ANOVA and Tukey's HSD tests clearly show a distinctive difference in the asset management policies between industries.

**TABLE 1**
**Ten Year Industry Means and Standard Deviations for Current Assets**
**/ Total Assets and Total Current Liabilities / Total Assets**

| Industry (SIC Codes) | Number of Companies | CA / TA | | TCL / TA | |
|---|---|---|---|---|---|
| | | Mean | STD | Mean | STD |
| Motor Vehicles (3711,3714) | 22 | .530 | .026 | .299 | .013 |
| Petroleum Refining (2911) | 29 | .230 | .010 | .230 | .015 |
| Publications (2711,2721,2731) | 17 | .303 | .031 | .210 | .051 |
| Apparel (2300,2320,2330) | 15 | .753 | .031 | .319 | .025 |
| Chemicals (2800,2810,2820,2821) | 15 | .409 | .008 | .238 | .018 |
| Computers (3570,3572,3575,3576,3577) | 29 | .681 | .017 | .300 | .024 |
| Transportation (4011,4100,4210,4213,4220,4400) | 20 | .276 | .029 | .196 | .012 |
| Steel, Furnaces (3310,3312) | 16 | .452 | .019 | .221 | .011 |
| Department Stores (5311,5331,5399) | 20 | .579 | .009 | .300 | .016 |
| Food (2000,2011,2013,2015,2020, 2024,2030,2033,2040,2050,2060) | 33 | .476 | .032 | .273 | .009 |

Differences in the relative degree of aggressive/conservative liability management were tested by performing a one way ANOVA on the total current liability to total asset means. The resulting F-ratio was 34.65, Table 3. Tukey's HSD was also applied to this data and 26 of the 45 comparisons showed a significant difference at the one percent level, and one more at 5 percent. This left 18 pairs of industries with ratios whose differences were not statistically significant. It is apparent that significant industry differences do exist in the relative degree of aggressive/conservative working capital policies for both asset and liability management. However, both the ANOVA and Tukey's HSD tests show these differences are generally broader and more significant when examining asset management.

Examination of the data in Table 3 reveals that the ratios divide into two groups of industries: One is motor vehicles, apparel, computers, retail stores, and food; the other is petroleum, publishing, steel, transportation, and chemicals.

The differences between industries within the two groups were not significant, but industry differences between the two groups were significant. At least with respect to this data set, the industries with a somewhat heavier consumer orientation appear to have more aggressive financing policies, but a deeper investigation into the nature of the industries' asset and liability composition would be required to draw a more definitive conclusion.

**TABLE 2**
**Significance Levels for Industry Mean Differences of the**
**Current Asset / Total Asset Ratio (F Test and Tukey's HSD)**

| **F statistic = 495.89** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **M.Veh.** | **Petrol.** | **Pub.** | **App.** | **Chem.** | **Comp.** | **Dpt.St.** | **Steel** | **Transp.** |
| **Petrol.** | .301** | --- | | | | | | | |
| **Pub.** | .227** | -.074** | --- | | | | | | |
| **App.** | -.223** | -.523** | -.449** | --- | | | | | |
| **Chem.** | .121** | -.180** | -.106** | .343** | --- | | | | |
| **Comp.** | -.151** | -.451** | -.377** | .072** | -.271** | --- | | | |
| **Dpt.St.** | -.049** | -.350** | -.276** | .173** | -.170** | .101** | --- | | |
| **Steel** | .078** | -.223** | -.149** | .300** | -.043** | .228** | .127** | --- | |
| **Transp.** | .254** | -.047** | .027 | .476** | .133** | .404** | .303** | .176** | --- |
| **Food** | .054** | -.247** | -.173** | .276** | -.067** | .205** | .103** | -.024 | -.200** |

** Significant at 1% level

**TABLE 3**
**Significance Levels for Industry Mean Differences of the Total**
**Current Liability / Total Asset Ratio (F Test and Tukey's HSD)**

| **F statistic = 34.65** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **M.Veh.** | **Petrol.** | **Pub.** | **App.** | **Chem.** | **Comp.** | **Dpt.St.** | **Steel** | **Transp.** |
| **Petrol.** | .069** | --- | | | | | | | |
| **Pub.** | .089** | .020 | --- | | | | | | |
| **App.** | -.020 | -.089** | -.109** | --- | | | | | |
| **Chem.** | .161** | -.008 | -.028 | .081** | --- | | | | |
| **Comp.** | .000 | -.069** | -.089** | .020 | -.061** | --- | | | |
| **Dpt.St.** | -.001 | -.070** | -.090** | .190 | -.062** | -.001 | --- | | |
| **Steel** | .079** | .010 | -.010 | .099** | .018 | .079** | .080** | --- | |
| **Transp.** | .103** | .034 | .014 | .123** | .042** | .103** | .104** | .024 | --- |
| **Food** | .260 | -.043** | -.063** | .046** | -.035* | .026 | .027 | -.053** | -.077** |

*Significant at 5% level,  **Significant at 1% level

## Stability Between Policies

Having established that the ten year ratio means were significantly different between industries, next examined was the stability of these relative differences over time. Rank order correlations were used as a test of relative stability.

For each of the ten years the current asset/total asset ratio was computed for each industry and then ranked from the highest to lowest ratio. The base year rankings (1984) were then sequentially compared to the rankings of each succeeding year. The results are presented in Table 4. Each industry maintained its relative level of aggressiveness with respect to working capital investment over time. The only exception is the relationship between the food and steel industries, which had very close ratios during the last five years and changed places in 1990 and back again in 1992. Not surprisingly, Tukey's HSD (Table 2) shows the mean differences between the steel and food industries is one of the two comparisons that is not significant.

The industries were also ranked each year on the basis of current liabilities to total assets and these rank order correlations are also presented in Table 4. The relationship between these ratios was less stable than the current asset/total asset ratios, but still significant at either the 1% or 5% level for the first nine years. The abrupt change in the publication industry ratio from the second lowest to the highest value in 1993 caused a drop in the level of significance to 10%.

Although the strongest results were found with asset management, both facets of aggressive/conservative working capital policy show statistically significant stability. It is apparent that relative differences in working capital policy not only exist, but they persist over extended periods of time.

**TABLE 4**
**Rank Order Correlations and Z values Between Base**
**Year and Each Succeeding Year for Current Assets**
**/ Total Assets and Total Current Liabilities/Total Assets**

| | CA / TA | | | TCL / TA | |
|---|---|---|---|---|---|
| **Between Base Year and:** | | | | | |
| **Year** | **Correlation** | **Z Value** | | **Correlation** | **Z Value** |
| 2 | 1.00 | ** | | .87 | 2.60** |
| 3 | 1.00 | ** | | .92 | 2.75** |
| 4 | 1.00 | ** | | .93 | 2.78** |
| 5 | 1.00 | ** | | .87 | 2.60** |
| 6 | 1.00 | ** | | .79 | 2.38* |
| 7 | .99 | ** | | .71 | 2.13* |
| 8 | .99 | ** | | .74 | 2.22* |
| 9 | 1.00 | ** | | .90 | 2.71** |
| 10 | 1.00 | ** | | .65 | 1.95 |

*Significant at 5% level,  **Significant at 1% level

## Relationship Between Asset and Financing Policies

Another relationship examined was how aggressive asset management corresponded to aggressive financial management. This relationship was tested on a year by year basis. For the first year, the industries were ranked from low CA/TA ratios to high ratios, corresponding to ascending order of relatively aggressive policies. Rankings were also ordered, for the first year, from high to low TCL/TA ratios, again corresponding to an ascending order of aggressiveness. Rank order correlations between the two policies were then computed for year one. This procedure was repeated for each of the remaining nine years and the results are presented in Table 5.

**TABLE 5**
**Rank Correlation, Per Year, of Aggressive Asset Policies**
**and Aggressive Financing Policies**

| Year | Correlation | Z Value |
|---|---|---|
| 1 | -.81 | -2.45* |
| 2 | -.75 | -2.24* |
| 3 | -.82 | -2.45* |
| 4 | -.87 | -2.60** |
| 5 | -.88 | -2.64** |
| 6 | -.81 | -2.42* |
| 7 | -.84 | -2.53* |
| 8 | -.79 | -2.38* |
| 9 | -.89 | -2.67** |
| 10 | -.62 | -1.87 |

*Significant at 5% level,  **Significant at 1% level

Without exception the correlations between the two policies were highly negative each year, and they are significant at the 1 or 5 percent level except for 1993 which is at 10 percent. It is evident that industries which pursued relatively aggressive asset policies simultaneously followed relatively conservative financing policies.

## Changes in Policies

To the extent that industry policies change over time, the question arises whether they change in the same direction and at the same time, indicating a possible macroeconomic influence. Regression analysis was used to examine the relationship in the changes between industries.

The ten current asset to total asset ratios for each industry were regressed against the ratios for each other industry. The results of the regressions of the 45 pairs of industries are presented in Table 6. All of the relationships are positive, and 29 of the 45 regressions have significant results at the 1% or 5% level. Steel and petroleum are the only two industries that do not tend to change their working capital investment policies with the other industries. The policies of both motor vehicles and transportation were highly correlated with those of the other industries in the study. The high correlation between the working capital investment policies of these industries appears to suggest a possible relationship between the policies and some external macroeconomic factor such as the business cycle.

**TABLE 6**
**Regressions, Between Industries, of Current Asset**
**/ Total Asset Ratios for the Ten Year Period (R-Squared and t Values)**

|          | M.Veh. | Petrol. | Pub. | App. | Chem. | Comp. | Dpt.St. | Steel | Transp. |
|----------|--------|---------|------|------|-------|-------|---------|-------|---------|
| **Petrol.** | .46<br>(2.61)** | --- | | | | | | | |
| **Pub.** | .66<br>(3.91)** | .24<br>(1.61) | --- | | | | | | |
| **App.** | .65<br>(3.86)** | .28<br>(1.75) | .90<br>(8.66)** | --- | | | | | |
| **Chem.** | .46<br>(2.62)** | .65<br>(3.82)** | .36<br>(2.11)* | .34<br>(2.01)* | --- | | | | |
| **Comp.** | .78<br>(5.35)** | .31<br>(1.92) | .34<br>(2.05)* | .26<br>(1.67) | .40<br>(2.31)* | --- | | | |
| **Dpt.St.** | .35<br>(2.09)* | .31<br>(1.89) | .36<br>(2.10)* | .35<br>(2.07)* | .32<br>(1.93) | .27<br>(1.72) | --- | | |
| **Steel** | .31<br>(1.90) | .31<br>(1.88) | .05<br>(0.62) | .01<br>(0.31) | .27<br>(1.72) | .65<br>(3.85)** | .28<br>(1.74) | --- | |
| **Transp.** | .57<br>(3.28)** | .35<br>(2.06)* | .89<br>(8.03)** | .79<br>(5.41)** | .46<br>(2.61)** | .36<br>(2.10)* | .56<br>(3.20)** | .15<br>(1.20) | --- |
| **Food** | .82<br>(6.00)** | .23<br>(1.55) | .72<br>(4.57)** | .59<br>(3.41)** | .29<br>(1.80) | .76<br>(5.04)** | .40<br>(2.31)* | .37<br>(2.17)* | .70<br>(4.33)** |

*Significant at 5% level,  **Significant at 1% level

Regarding changes in working capital financing policies, only ten regressions were significant at the 1% or 5% level, Table 7. Publishing was correlated with four other industries, computers was not correlated with any other industry, and the rest fell in between. Half of the significant relationships, and half of all relationships, were negative. The lack of correlation between the working capital financing policies of these industries appears to suggest that the policies are independent of any external factors. Changes in financing policies over time may depend more on industry factors than investment policy changes.

### TABLE 7
### Regressions Between Industries, of Total Current Liabilities
### / Total Asset Ratios for the Ten Year Period (R-squared and T Values)

|  | M.Veh. | Petrol. | Pub. | App. | Chem. | Comp. | Dpt.St. | Steel | Transp. |
|---|---|---|---|---|---|---|---|---|---|
| **Petrol.** | 0.00<br>(.06) | --- | | | | | | | |
| **Pub.** | .24<br>(-1.60) | .03<br>(0.48) | --- | | | | | | |
| **App.** | .07<br>(-0.80) | .33<br>(1.98)* | .36<br>(2.12)* | --- | | | | | |
| **Chem.** | 0.00<br>(-0.16) | .51<br>(-2.91)** | 0.00<br>(0.12) | .07<br>(-0.80) | --- | | | | |
| **Comp.** | .02<br>(-0.44) | .01<br>(0.20) | .29<br>(1.83) | .02<br>(0.42) | .18<br>(1.32) | --- | | | |
| **Dpt.St.** | .26<br>(1.67) | .06<br>(0.71) | .58<br>(-3.32)** | .17<br>(-1.28) | .18<br>(-1.31) | .21<br>(-1.47) | --- | | |
| **Steel** | .10<br>(-0.93) | .05<br>(-0.66) | .43<br>(2.48)* | .25<br>(1.61) | .40<br>(2.30)* | .24<br>(1.58) | .63<br>(-3.70)** | --- | |
| **Transp.** | .07<br>(0.77) | .18<br>(-1.32) | .09<br>(-0.87) | .40<br>(-2.30)* | .28<br>(1.78) | .18<br>(1.33) | .10<br>(0.95) | 0.00<br>(-0.16) | --- |
| **Food** | .40<br>(2.33)* | .02<br>(-0.44) | .51<br>(-2.90)** | .06<br>(-0.70) | 0.00<br>(0.07) | .19<br>(-1.37) | .15<br>(1.18) | .15<br>(-1.17) | 0.00<br>(-0.13) |

*Significant at 5% level
**Significant at 1% level

## CONCLUSIONS

This study looked at ten diverse industry groups to examine the relative relationship between their aggressive/conservative working capital policies. Regarding the degree of aggressive asset management, the industries had distinctive and significantly different policies. In addition, the relative nature of the asset policies between industries exhibited remarkable stability over the ten year study period. Industry policies concerning the relative degree of aggressive liability management also were significantly different, but not to the same extent or with the same stability.

Interestingly, this study also showed a high and significant negative correlation between industry asset and liability policies. In general, it appears that when relatively aggressive working capital asset policies are followed they are balanced by relatively conservative working capital financial policies.

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