FORMAL STRATEGIC PLANNING, INFORMEDNESS AND FIRM PERFORMANCE: AN EMPIRICAL INVESTIGATION

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I. INTRODUCTION

Formal strategic planning (hereafter FSP) is the most sophisticated form of planning. It implies that a firm’s strategic planning process involves explicit systematic procedures used to gain the involvement and commitment of the stakeholders most affected by the plan. There is a significant strategic dimension to the planning at both corporate and lower levels. In this context, the corporate plan is a document that takes a corporate perspective and is not just an agglomeration of lower level plans.¹

A recurring theme in management literature is that firms should engage in such systematic or formal strategic planning. Advocates of planning such as Ansoff (1984), Hax and Majluf (1984), and Thompson and Strickland (1978) argue that FSP contributes to managerial effectiveness and, thus, to corporate success. A logical extension of this assertion is that firms engaged in FSP should outperform firms not engaged in such planning and/or that firms’ post-planning performance should be superior to their performance prior to launching formal strategic planning processes. No clear empirical evidence, however, has emerged to support a positive relationship between FSP and organization performance. Studies of the performance-planning relationship for American firms are inconclusive with respect to the benefits of corporate planning, and little direct evidence on this topic is available on Canadian firms.²
The purpose of this paper is to test three hypotheses about FSP:

1) that its adoption has information content; that is, that it alters investors' informedness and consensus of beliefs on firm value;
2) that there is a reduction in firms' riskiness following its adoption; and
3) that its adoption takes place in times of economic austerity—lack of prosperity or threats.

The empirical evidence examined consists of common stock return and risk data for a sample of large Canadian firms. The paper is organized as follows: The results of previous studies are briefly reviewed in Section 2; the sample of firms utilized in this study is discussed in Section 3; the link between the adoption of FSP and stock prices is addressed in Section 4; the hypotheses related to the informedness and the consensus of beliefs effects as well as the empirical evidence are presented in Section 5; in Section 6, some results obtained in the only two papers that used stockholders' returns and risks in planning studies are tested. A brief conclusion follows in Section 7.

II. PREVIOUS STUDIES

Previous studies on the planning-performance relationship can be classified according to the performance measures utilized: accounting-oriented measures of performance (e.g., sales, earnings, or return on assets) and stock market-oriented measures (e.g., common stock returns and risks).

Accounting Performance Measures

Ansoff et al. (1970), Thune and House (1970), Herold (1972), Rue and Fulmer (1973), and Malik and Karger (1975) were among the first to investigate the effect of formal planning on financial performance. Formal planners were found to outperform informal planners by virtually all accounting criteria. Subsequent studies by Burt (1978), Wood and Laforge (1979), and Robinson (1980) also indicated that FSP leads to superior financial performance.

Although these previous studies support a positive relationship between formal planning and financial performance, studies by Thune and House (1970), Fulmer and Rue (1974), Sheehan (1975), Grinyer and Norburn (1975), Shapiro and Kallman (1978), Leontiades and Tezel (1980), Crittenden (1982), Robinson and Pearce (1983), and Nkomo (1987) questioned or rejected the idea that formal planning leads to superior financial performance.

Stock Market Performance Measures

Two studies tested the relationship between formal planning and measures of performance based on common stock returns and risks. Kudla (1980) employed
the market model to estimate firms' monthly residuals over a five-year period prior to the initiation of FSP and a 10-year post-planning period. The hypothesis that stockholders of FSP firms experienced abnormal returns while stockholders of non-FSP firms did not experience such returns and the hypothesis that the average betas for FSP firms were different after planning was initiated relative to the average betas prior to planning were tested. Kudla's results did not indicate any significant difference between the average residuals of planning and non-planning firms. However, indication of a transitory decline in systematic risk of planning firms after the initiation of planning was found.

Ang and Fatemi (1985) related the implementation of formal planning to both accounting and market-oriented performance measures. Asset turnover, return on assets, and the growth of earnings per share were significantly higher following the initiation of formal planning, and the net profit margin was lower. However, no significant planning effect was found on the combination of accounting performance measures. They also did not find any statistical difference between monthly average returns and residuals of the pre-planning and post-planning periods. However, post-planning betas were significantly higher than were pre-planning betas. Finally, they observed that the sample firms, as a group, posted negative cumulative average residuals up to three months prior to FSP implementation.

III. DATA

The data sample for this study was developed with the help of the Conference Board in Canada on the basis of questionnaires sent to CEOs of a total of 228 Canadian firms for which financial and market data were available on the Laval Files. A high response rate of 68 percent generated 156 replies of the highest quality. Because planning in its general meaning was not the issue, the questionnaire was designed to clearly identify firms engaged in a systematic (specifically, the utilization of specialized computer support systems) approach to corporate strategic planning and to identify the month of adoption of FSP for decision purposes.

Table 1 shows the distribution of the firms surveyed, respondents, and final samples classified by industry and by planning class. As expected, FSP is most evident in the manufacturing industry (namely the paper and allied products industries, the petroleum refining and related industries, and the primary metal industries). An attempt, therefore, is made to control for possible industry effects in empirical tests. After screening for the following restrictions, (1) the number of consecutive missing monthly stock returns did not exceed 12 in the 1963–1983 period and (2) the month of FSP adoption was clearly specified and occurred within the 1968–1981 period, the final sample contained 108 firms equally divided (by coincidence) between 54 formal strategic planners and 54 non-formal planners.
### Table 1
DISTRIBUTION OF FIRMS, RESPONDENTS AND FINAL SAMPLES

<table>
<thead>
<tr>
<th>Industry</th>
<th>S.I.C. Range&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Firms Surveyed</th>
<th>Respondents</th>
<th>Final Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>FSP</td>
<td>Non-FSP</td>
</tr>
<tr>
<td>Mining</td>
<td>1000–1499</td>
<td>55</td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>Construction</td>
<td>1520–1600</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2000–3714</td>
<td>102</td>
<td>56</td>
<td>22</td>
</tr>
<tr>
<td>Transportation&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4011–4922</td>
<td>18</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>5012–5199</td>
<td>16</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>5211–5922</td>
<td>16</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Finance&lt;sup&gt;c&lt;/sup&gt;</td>
<td>6400–6799</td>
<td>13</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Services</td>
<td>7370–8911</td>
<td>5</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>228</td>
<td>87</td>
<td>69</td>
<td>54</td>
</tr>
</tbody>
</table>

Notes:  
<sup>a</sup>S.I.C. (Standard Industrial Classification).  
<sup>b</sup>Includes communications and other public utilities.  
<sup>c</sup>Includes insurance and real estate.

### IV. STOCK PRICES AND FSP

The basic stock valuation model of Miller and Modigliani (M&M) (1961) can be used to develop an argument of a theoretical link between stock prices and FSP.<sup>9</sup> M&M showed that the value of the firm can be expressed either as the discounted value of an infinite constant-growth stream of cash flows (dividends) arising to current shareholders or as the sum of the present value of an infinite stream of constant cash flows (value of assets in place) and the present value of future investment opportunities (value of growth opportunities). Common stocks are priced according to this valuation model for they possess some attributes, such as claims to firms' future cash flows, that are valued by investors. Thus, stock prices can be characterized as dependent upon investors' expectations regarding these attributes. The role of information (such as the adoption of FSP) is to alter investors' beliefs about these attributes. Hence, information can alter stock prices. The statistical dependency between stock prices and information variables is referred to as the variable's information content, and stock prices are said to reflect that variable. Therefore, the argument that the adoption of FSP has information content, that is, that there is a relationship between stock prices and FSP, is based on the prediction that it alters investors' beliefs regarding firm value or future cash flows.

The conceptual relationship between current stock prices and current earnings can also help to understand the link between stock prices and FSP. The price-earnings process can be viewed as consisting of three elements:
1) a link between current stock prices and future dividends (the valuation relationship);
2) a link between future dividends and future earnings (the payout ratio); and
3) a link between future earnings and current earnings (the stochastic process perceived to describe earnings over time).

This last link is very important in understanding the relationship between stock prices and FSP. The information content of FSP depends upon how its adoption is perceived to impact upon the level of future earnings. In other words, the importance of the adoption of FSP depends upon its impact on the process governing the time series behavior of earnings: Is it perceived to have implications for permanent earnings, future dividends, and, hence, current stock prices? Or, is it perceived to have no effect on the level of future earnings? Since any change in earnings could be taken as transitory and could lead to no revision in expectations regarding future accounting earnings, it is not sufficient to observe an increase in earnings and other related accounting ratios after the adoption of FSP (as most researchers have done) and conclude to a link between planning and firm performance. Clearly, what really matters is the link between planning and stock prices.

V. HYPOTHESES AND EMPIRICAL RESULTS

FSP and Informedness Effect—Increased Variability Approach

Prices can be viewed as arising from an equilibrium process in which they depend upon investors' backgrounds, educations, *a priori* beliefs, abilities to process information, etc. Changes in prices have traditionally been used by empirical researchers in finance and accounting to measure the information content of public information releases.\(^1\) It is generally agreed that unexpected price changes imply that an announcement or event contains information; that is, that it alters investors' beliefs. Holthausen and Verrecchia (1990), who are more precise on the definition of information content than most authors, identified two effects of information: an informedness effect and a consensus or convergence of beliefs effect. The informedness effect measures the degree to which investors become more knowledgeable, and the consensus effect measures the extent of agreement among investors at the time of an information release, regarding future cash flows or firm value. They suggest that information manifests both informedness and consensus effects simultaneously. With respect to price changes, Holthausen and Verrecchia (1990) showed that an increase in both investors' informedness and consensus of beliefs result in an increase in the variance of unexpected price changes.\(^1\)

Based on the above discussion on the relationship between information and unexpected price changes, and by conceptualizing the adoption of FSP for decision purposes as providing more precise information about firm value or future cash flows, Hypothesis 1 is formulated as follows:
H1: Unexpected price variability during the period of FSP adoption is greater than unexpected price variability outside this period.

The hypothesis of informedness associated with the adoption of FSP can be tested by focusing on the variance of prediction errors. Hypothesis 1 postulates that if the adoption of FSP has information content, the variance of prediction errors should be greater during the FPS event period \([0, \ldots, +6]\) than during non-event periods. To test that proposition, prediction errors series must be estimated.

Two approaches for measuring normal returns are employed: the mean-adjusted returns method and the comparison portfolio returns method. In the mean-adjusted returns approach, the prediction error of stock \(i\) in month \(t\), \(\bar{u}_{it}\), is estimated as the difference between its actual return and its average return as follows:

\[
\bar{u}_{it} = \bar{R}_{it} - \bar{R}_{i}
\]

where \(\bar{R}_{i}\) is the actual return for stock \(i\) in month \(t\) and \(\bar{R}_{i}\) is the arithmetic average return for stock \(i\) over the \([-24, \ldots, -1]\) period.

For the comparison portfolio returns approach, six portfolios were created in the following manner: (1) The variance of monthly returns for each stock in the sample over the \([-24, \ldots, -13]\) period was computed; (2) each stock was ranked according to the sample variance of its monthly returns; and (3) the nine lowest-variance stocks were assigned to the first comparison portfolio, the next nine lowest-variance stocks to the second comparison portfolio, and so on. The comparison portfolio returns approach defines the prediction error of a stock \(i\) in month \(t\), \(\bar{u}_{it}\), as the deviation of its actual return from the return of its comparison portfolio, \(\bar{R}_{pt}\), as follows:

\[
\bar{u}_{it} = \bar{R}_{it} - \bar{R}_{pt}
\]

The information content of the adoption of FSP for each firm is measured by the ratio of the variance of the prediction errors during the FSP event period \([0, \ldots, +6]\) to the variance of the prediction errors during non-event periods. For the mean-adjusted returns approach, the \([-24, \ldots, -1]\) and \([-24, \ldots, -1]\) and \(+7, \ldots, +24\) periods represent non-event periods; \([-12, \ldots, -1]\) and \([-12, \ldots, -1]\) and \(+7, \ldots, +24\] are the non-event periods for the comparison portfolio returns approach. For each firm, the prediction errors variance ratio measures unexpected return variability. If there is no change in investors' informedness and consensus of beliefs associated with the adoption of FSP, the prediction errors variance ratio would not be significantly different from 1.0. Hence, Hypothesis 1 would be supported by the empirical results if the mean of the measure of informedness is significantly greater than 1.0.

The means of the prediction errors variance ratios and the significance tests are reported in Table 2. For the mean-adjusted returns approach, the mean of the ratios of the variance of the prediction errors during the FSP event period to the variance
Table 2

PREDICTION ERRORS VARIANCE RATIOS

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Ratios Based on Mean-Adjusted Returns Method</th>
<th>Ratios Based on Comparison Portfolio Returns Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$V(1,1)^b$</td>
<td>$V(1,2)^c$</td>
</tr>
<tr>
<td>Mean</td>
<td>1.7741</td>
<td>1.4226</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.9087</td>
<td>1.2339</td>
</tr>
<tr>
<td>Number of firms (n)</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>$t^a$</td>
<td>3.13**</td>
<td>2.65**</td>
</tr>
</tbody>
</table>

Notes:  
*Statistically significant at the five percent level.  
**Statistically significant at the one percent level.  

$a^t = (\text{Mean} - 1.0) / \sigma \sqrt{\left(1 - \frac{n}{N}\right)}$, where $N$ is the estimated number of firms from which the sample was selected ($N = 567$) and $\sigma$ is the standard deviation of the prediction errors variance ratios.  

$b^V(1,1) = \text{Var} \left[ \bar{u}, t \in [0, \ldots, +6] \right] / \text{Var} \left[ \bar{u}, t \in [-24, \ldots, -1] \right]$.  

$c^V(1,2) = \text{Var} \left[ \bar{u}, t \in [0, \ldots, +6] \right] / \text{Var} \left[ \bar{u}, t \in [-24, \ldots, -1] \text{ and } +7, \ldots, +24 \right]$.  

$d^V(2,1) = \text{Var} \left[ \bar{u}, t \in [0, \ldots, +6] \right] / \text{Var} \left[ \bar{u}, t \in [-12, \ldots, -1] \right]$.  

$e^V(2,2) = \text{Var} \left[ \bar{u}, t \in [0, \ldots, +6] \right] / \text{Var} \left[ \bar{v}, t \in [-12, \ldots, -1] \text{ and } +7, \ldots, +24 \right]$.  

of the prediction errors during the period preceding the adoption of FSP, $V(1,1)$, is 1.77 percent ($t = 3.13$) and statistically significantly greater than 1.0 at the one percent level. The mean of the ratios of the variance of the prediction errors during the FSP event period to the variance of the prediction errors during the period preceding and following the adoption of FSP, $V(1,2)$, is 1.42 percent ($t = 2.65$) and statistically significant at the one percent level. Similar results are obtained for the means of the prediction errors variance ratios for the comparison portfolio returns approach. Thus, the hypothesis that the adoption of FSP increases both investors' informedness and consensus of beliefs is strongly supported by the results.

**FSP and Informedness Effect—Rate of Return Approach**

The information effects of the adoption of FSP can also be assessed by comparing, over time, the return distribution function conditional upon new information, $F(\bar{R}_t | \Theta_t)$ where $\Theta_t$ represents the increase in information precision generated by firms by adopting FSP at time $t$ with the corresponding unconditional return distribution $F(\bar{R}_t)$. In other words, the return distribution function of FSP firms is compared to the return distribution function of non-FSP firms in the FSP event period and the months following the adoption of FSP. If the two distribution functions are unequal, then the inequality can be attributed to the informedness effect associated with the adoption of FSP. Under the multivariate normality assumption, Hypothesis 2 is formulated as follows:
H2: The mean and/or the variance of the return distribution of FSP firms is different from the mean and/or the variance of the return distribution of non-FSP firms, that is, \( E(\tilde{R}_i \mid \Theta_i) \neq E(\tilde{R}_i) \) and/or \( \text{Var}(\tilde{R}_i \mid \Theta_i) \neq \text{Var}(\tilde{R}_i) \).

To compare the parameters of the return distribution of FSP and non-FSP firms, two portfolios having the same systematic risk in month relative -1 are formed. The first portfolio, \( p \), is composed of FSP firms and the second portfolio, \( c \), is composed of non-FSP firms. According to the Capital Asset Pricing Model (CAPM) the expected returns of these two portfolios should be equivalent before any effect of new information is incorporated into equilibrium returns. Formally: \( E(\tilde{R}_{pt}) = E(\tilde{R}_{ct}) \) since they have the same systematic risk, \( \beta_{pt} = \beta_{ct} \). Now, suppose that the adoption of FSP has no information effect. Then, \( E(\tilde{R}_{pt} \mid \Theta_i) = E(\tilde{R}_{ct}) \). However, any inequality between \( E(\tilde{R}_{pt} \mid \Theta_i) \) and \( E(\tilde{R}_{ct}) \) will be attributed to \( \Theta_i \) since factors other than the adoption of FSP are controlled for by having \( \beta_{pt} = \beta_{ct} \).

To form portfolios \( p \) and \( c \), FSP firms are individually matched with non-FSP firms of equal systematic risk in month relative -1 and, to the extent possible, from the same industry classification. Their expected returns are then estimated as follows:

\[
\tilde{R}_{pt} = \frac{1}{np} \sum_{i=1}^{np} \tilde{r}_{pt} \quad (3)
\]

\[
\tilde{R}_{ct} = \frac{1}{nc} \sum_{i=1}^{nc} \tilde{r}_{ct}
\]

### Table 3

**SUMMARY STATISTICS ON RETURN DIFFERENCES AND VARIANCES**

<table>
<thead>
<tr>
<th>Time Periods (in months)</th>
<th>Statistics</th>
<th>FSP</th>
<th>Non-FSP</th>
<th>Differences RD</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. [0, ..., +24]</td>
<td>Mean</td>
<td>0.0091</td>
<td>0.0072</td>
<td>0.0019</td>
</tr>
<tr>
<td></td>
<td>St. dev.</td>
<td>0.0187</td>
<td>0.0184</td>
<td>0.0212</td>
</tr>
<tr>
<td></td>
<td>( t^a )</td>
<td>0.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( F^b )</td>
<td>1.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. [0, ..., +6]</td>
<td>Mean</td>
<td>0.0106</td>
<td>0.0004</td>
<td>0.0102</td>
</tr>
<tr>
<td></td>
<td>St. dev.</td>
<td>0.0182</td>
<td>0.0187</td>
<td>0.0197</td>
</tr>
<tr>
<td></td>
<td>( t )</td>
<td>1.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( F )</td>
<td>1.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. [0, ..., +12]</td>
<td>Mean</td>
<td>0.0062</td>
<td>0.0022</td>
<td>0.0040</td>
</tr>
<tr>
<td></td>
<td>St. dev.</td>
<td>0.0194</td>
<td>0.0152</td>
<td>0.0184</td>
</tr>
<tr>
<td></td>
<td>( t )</td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( F )</td>
<td>1.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. [+12, ..., +24]</td>
<td>Mean</td>
<td>0.0115</td>
<td>0.0128</td>
<td>-0.0013</td>
</tr>
<tr>
<td></td>
<td>St. dev.</td>
<td>0.0176</td>
<td>0.0198</td>
<td>0.0236</td>
</tr>
<tr>
<td></td>
<td>( t )</td>
<td>-0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( F )</td>
<td>1.27</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

\( ^a t = \frac{(\text{Mean} - 0.0)}{\text{St. dev.}\sqrt{n}} \) where \( n \) is the number of firms.

\( ^b F = \frac{\text{Highest variance}}{\text{Lowest variance}} \).
Strategic Planning versus Performance

where $\tilde{R}_{pt}$ ($\tilde{R}_{ct}$) is the observed return of portfolio $p$ (c) in month $t$; $\tilde{R}_{ipt}$ ($\tilde{R}_{ict}$) is the observed return for stock $i$ in portfolio $p$ (c) in month $t$, and $n_p$ ($n_c$) is the number of stocks in portfolio $p$ (c).

Hypothesis 2 can be verified by calculating the differences between the observed returns of portfolios $p$ and $c$, $RD$, as follows:

$$RD_t = \tilde{R}_{pt} - \tilde{R}_{ct}$$  \hspace{1cm} (4)

Hypothesis 2 would be supported by the empirical results if the mean of the differences between the observed returns of portfolios $p$ and $c$, $\bar{RD}$, is significantly different from zero and/or the variance of portfolio $p$'s observed returns is significantly different from the variance of portfolio $c$'s observed returns.

The data in Table 3 does not support the hypothesis that the adoption of FSP has information content. First, the mean of the return differences between FSP firms (portfolio $p$) and non-FSP firms (portfolio $c$) for different time periods is never significantly different from zero at the five percent level or better. Although $RD$ during the FSP event period is 1.02 percent, it is not significant ($t = 1.39$). Second,

### Table 4

<table>
<thead>
<tr>
<th>Time periods (in months)</th>
<th>Statistics</th>
<th>High Risk RD</th>
<th>Low Risk RD</th>
<th>Multivariate Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. [0, ... , +24]</td>
<td>Mean</td>
<td>0.0013</td>
<td>0.0026</td>
<td></td>
</tr>
<tr>
<td></td>
<td>St. dev.</td>
<td>0.0280</td>
<td>0.0267</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$t$</td>
<td>0.23</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$T^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$F(2,23)^a$</td>
<td></td>
<td></td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>$F(2,5)$</td>
<td></td>
<td></td>
<td>0.12</td>
</tr>
<tr>
<td>B. [0, ... , +6]</td>
<td>Mean</td>
<td>0.0068</td>
<td>0.0138</td>
<td></td>
</tr>
<tr>
<td></td>
<td>St. dev.</td>
<td>0.0251</td>
<td>0.0208</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$t$</td>
<td>0.72</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$T^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$F(2,5)$</td>
<td></td>
<td></td>
<td>3.09</td>
</tr>
<tr>
<td></td>
<td>$F(2,11)$</td>
<td></td>
<td></td>
<td>1.29</td>
</tr>
<tr>
<td>C. [0, ... , +12]</td>
<td>Mean</td>
<td>0.0077</td>
<td>-0.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>St. dev.</td>
<td>0.0286</td>
<td>0.0269</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$t$</td>
<td>0.97</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$T^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$F(2,11)$</td>
<td></td>
<td></td>
<td>0.94</td>
</tr>
<tr>
<td>D. [+12, ... , +24]</td>
<td>Mean</td>
<td>-0.0048</td>
<td>0.0028</td>
<td></td>
</tr>
<tr>
<td></td>
<td>St. dev.</td>
<td>0.0259</td>
<td>0.0279</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$t$</td>
<td>0.66</td>
<td>0.37</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$T^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$F(2,11)$</td>
<td></td>
<td></td>
<td>1.23</td>
</tr>
</tbody>
</table>

Notes: $^aF(p,N-p) = T^2[(N-p)/p(N-1)]$ where $p$ is the number of portfolios and $N$ is the number of observations.
Table 5
SUMMARY STATISTICS ON COVARIANCE MATRICES

<table>
<thead>
<tr>
<th>Time periods (in months)</th>
<th>Risk Class/Statistics</th>
<th>Variance-Covariance FSP</th>
<th>Variance-Covariance Non-FSP</th>
<th>Multivariate Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. [0, . . . , +24]</td>
<td>High</td>
<td>0.000690</td>
<td>0.000650</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>0.000260</td>
<td>0.000570</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High, Low</td>
<td>0.000210</td>
<td>0.000060</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td></td>
<td>7.68</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\chi^2$</td>
<td></td>
<td>7.33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d.f. of $\chi^2$</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>B. [0, . . . , +6]</td>
<td>High</td>
<td>0.000750</td>
<td>0.000730</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>0.000170</td>
<td>0.000390</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High, Low</td>
<td>0.000200</td>
<td>0.000120</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td></td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$p^b$</td>
<td></td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d.f. of F</td>
<td></td>
<td>3;25,907</td>
<td></td>
</tr>
<tr>
<td>C. [0, . . . , +12]</td>
<td>High</td>
<td>0.000760</td>
<td>0.000400</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>0.000270</td>
<td>0.000530</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High, Low</td>
<td>0.000230</td>
<td>0.000007</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td></td>
<td>4.92</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F</td>
<td></td>
<td>1.51</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d.f. of F</td>
<td></td>
<td>3;114,501</td>
<td></td>
</tr>
<tr>
<td>D. [+12, . . . , +24]</td>
<td>High</td>
<td>0.000610</td>
<td>0.000720</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>0.000260</td>
<td>0.000640</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High, Low</td>
<td>0.000170</td>
<td>0.000098</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td></td>
<td>3.72</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F</td>
<td></td>
<td>1.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d.f. of F</td>
<td></td>
<td>3;104,167</td>
<td></td>
</tr>
</tbody>
</table>

Notes: $\chi^2 = MC^{-1}$, where $C^{-1} = (1 - A)\alpha$,

$$A = \frac{2p^2 + 3p + 1)(k+1)/6(p+1)kn}{\text{where}}$$

$p =$ number of portfolios
$k =$ number of groups of firms
$n =$ number of observations $- 1$

$$b^2 = \frac{f_1f_2}{(f_2-M)/(f_1(b-M))}, \text{ where}$$

$$f_1 = \frac{1}{2}(k-1)p(p+1)$$

$$f_2 = \frac{(p-1)(p+2)(k^2 + k + 1)/6k^2n^2}{\text{where}}$$

$$b^2 = \frac{f_2}{(1 - A + 2/f_2)}$$

the hypothesis of equality between the variance of returns of FSP and non-FSP firms cannot be rejected. None of the $F$ statistics are significant at the five percent level or better.

According to Gonedes (1975), return distributions of stocks in different risk classes may be affected differently by the same information. Therefore, the results of the above univariate tests could conceal information effects that are, in fact,
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significant. Portfolios \( p \) and \( c \) are thus partitioned into high risk portfolios, \( H \), consisting of the 25 stocks having the highest systematic risk, and into low risk portfolios, \( L \), consisting of the 24 stocks having the lowest systematic risk. A two-components (high, low) return differences vector and two-components covariance matrices are obtained as follows:

\[
\begin{pmatrix}
\tilde{R}_{Dt} (H) \\
\tilde{R}_{Lt} (L)
\end{pmatrix} = \begin{pmatrix}
\tilde{R}_{pt} (H) \\
\tilde{R}_{ct} (H)
\end{pmatrix} - \begin{pmatrix}
\tilde{R}_{pt} (L) \\
\tilde{R}_{ct} (L)
\end{pmatrix}
\]

\[
\begin{pmatrix}
\text{Var}(\tilde{R}_p (H)) & \text{Cov}(\tilde{R}_p (H), \tilde{R}_p (L)) \\
\text{Cov}(\tilde{R}_p (H), \tilde{R}_p (L)) & \text{Var}(\tilde{R}_p (L))
\end{pmatrix} \quad \begin{pmatrix}
\text{Var}(\tilde{R}_c (H)) & \text{Cov}(\tilde{R}_c (H), \tilde{R}_c (L)) \\
\text{Cov}(\tilde{R}_c (H), \tilde{R}_c (L)) & \text{Var}(\tilde{R}_c (L))
\end{pmatrix}
\]

Hypothesis 2 would be supported by the empirical results if the mean of the vector of differences between the observed returns of portfolios \( p \) and \( c \) is significantly different from zero for at least one of the components and/or if the covariance matrix of portfolio \( p \)'s observed returns is significantly different from the covariance matrix of portfolio \( c \)'s observed returns for at least one of the components.

In Table 4, none of the Hotelling's \( T^2 \) statistics are significant, in terms of \( F \) tests, at the five percent level. Thus the means of the return differences between high or low risk FSP firms and high or low risk non-FSP firms are not significantly different from zero. No statistical difference is found either between the covariance matrix of observed returns of high or low risk FSP firms and high or low risk non-FSP firms. In Table 5, none of the Box's modified \( M \) statistics are significant, in terms of \( \chi^2 \) tests or \( F \) tests, at the five percent level.

VI. PERFORMANCE COMPARISONS

In this section, two previous empirical results on the planning-performance controversy are tested: (1) the hypothesis of a reduction in the riskiness of firms after the adoption of FSP and (2) the hypothesis that the decision to adopt FSP may be based more on an attempt to reverse a poor performance than on a choice.

Reduction in Riskiness

To test the hypothesis of a reduction in the riskiness of firms after the adoption of FSP, the market model coefficients for each FSP and non-FSP firm in the sample are estimated by regressing 61 monthly returns preceding and including month relative -13 as follows:\(^19\)

\[
\tilde{R}_{it} = \hat{\alpha}_i + \hat{\beta}_i \tilde{R}_{mt} + \tilde{e}_{it}
\]

where \( \tilde{R}_{it} \) is the return for stock \( i \) in month \( t \), \( \tilde{R}_{mt} \) is the return on a value-weighted market portfolio (the Toronto Stock Exchange Composite) in month \( t \), \( \hat{\alpha}_i \) and \( \hat{\beta}_i \) are the
estimated coefficients of the market model for stock \( i \), and \( \tilde{\epsilon}_{it} \) is the residual return or the prediction error of stock \( i \) in month \( t \).

Non-FSP firms are then individually matched with FSP firms on the basis of systematic risk \( (\beta_i) \) in month relative -13 and on the basis of industry classification. Firms for which no matching by systematic risk and industry membership is possible are matched on the basis of estimated systematic risk only (firms for which no matching of systematic risk was possible were excluded from the sample).

While the mean beta decreased over the \([-24, \ldots, 0, \ldots, +24]\) period (not shown), the average beta in month relative -24 is not significantly different from the average beta in month 0 or in month relative +24. Tests on the equality of beta distributions in months -24, -12, 0, +12 and +24 were also performed. The beta distributions were found statistically similar; none of the chi-square statistics was significant at the five percent level. Therefore, there is no evidence of a change in the systematic risk of FSP firms.

**Trend Reversal**

To test the hypothesis that the decision to adopt FSP is based on an attempt to reverse a downward trend in performance, risk-adjusted prediction errors or residual returns of firm \( i \) in month \( t \), \( \tilde{\epsilon}_{it} \), are obtained as follows:

\[
\tilde{\epsilon}_{it} = \tilde{R}_{it} - (\hat{\alpha}_t + \hat{\beta}_i \tilde{R}_{mt})
\]  

(8)

Monthly average prediction errors for FSP and non-FSP firms, \( APE_t \), are computed as follows:

\[
APE_t = \frac{1}{N_t} \sum_{i=1}^{N_t} \tilde{\epsilon}_{it}
\]  

(9)

where \( N_t \) is the number of stocks having residuals in month \( t \). Monthly average prediction errors for both groups of firms are computed for 12 months prior to the adoption of FSP and 13 months including and following the month of FSP adoption. Monthly average prediction errors are then cumulated over various month intervals to obtain cumulative average prediction errors, \( CAPE_t \), as follows:

\[
CAPE_t = \sum_{\tau=1}^{t} APE_{\tau}
\]  

(10)

where \( \tau \) is the first month used in the cumulation period.

Results in Table 6 indicate that stockholders of both groups of firms earned, on average, negative residual returns over the \([-12, \ldots, -1]\). FSP firms' cumulative prediction errors for the 12 months prior to FSP adoption averaged -8.81 percent \((t = 2.12)\), which is statistically significant at the five percent level. A shift to less negative and/or positive average residuals is subsequently observed since the
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Table 6
CUMULATIVE AVERAGE PREDICTION ERRORS (CAPE)

<table>
<thead>
<tr>
<th>Time periods (in months)</th>
<th>FSP</th>
<th>Non-FSP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAPE (%)</td>
<td>t</td>
</tr>
<tr>
<td>A. [-12, . . . , -1]</td>
<td>-8.81</td>
<td>2.12*</td>
</tr>
<tr>
<td>B. [0, . . . , +6]</td>
<td>3.78</td>
<td>1.19</td>
</tr>
<tr>
<td>C. [+7, . . . , +12]</td>
<td>-2.50</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Notes: *Statistically significant at the five percent level.

\[ t = \frac{\text{CAPE}}{\sigma(\text{APE})} / \sqrt{K} \]

where \( K \) is the number of months used in the calculation of CAPE.

CAPE of FSP firms in the FSP event period is 3.78 percent \((t = 1.19)\). Finally, the CAPE following the FSP event period is also not statistically different from zero at the five percent level. This result supports Ang and Fatemi’s (1985) finding.

VII. CONCLUSIONS

Advocates of formal strategic planning view planning as having a positive impact on firm performance. It is easy enough to make broad generalizations about planning, but in reality the issue is an extremely complex one. Past empirical studies based on the planning-accounting performance found contradictory results. A different approach is taken in this paper by examining the information effects of the adoption of FSP for decision purposes. Empirical evidence supporting that the adoption of FSP has information effects using the increased variability approach is provided. This evidence represents an important contribution to the planning—performance controversy in bringing forward the fictitious and elusive link between planning and accounting performance. It gives meaning and support to the recent move to study the planning practices of firms known to create shareholder wealth.

ACKNOWLEDGMENTS

The authors thank Guy Charest, Jean-Marie Gagnon, participants at the 1990 Administrative Sciences Association of Canada Conference, Whistler, British Columbia, and participants at the 1990 Canada-China International Management Conference, Xi‘Am, China, who provided many valuable comments and suggestions. The authors also wish to thank the anonymous referees and the editor of this Journal, Manuchehr Shahrokhi, for a detailed review that shaped the final version of this study. The authors accept, of course, responsibility for any remaining errors.
NOTES

2. See Pearce, Freeman and Robinson (1987) for a systematic critical review of relevant U.S. and Canadian empirical studies. The only study of the planning-performance relationship for Canadian firms is that of Sheehan (1975). The relationship between planning sophistication levels and performance was found by Sheehan to be ambiguous.
3. This research is of interest for the study of FSP not only in Canada but also in the United States by providing a control group for the analysis of U.S. samples' results on the same topic since shares of traded Canadian firms are less widely held than shares of firms traded in the United States. Hence, Canadian managers may operate under tighter rein than their U.S. counterparts. The consequences are likely to be managerial behavior that is generally more in shareholders' interests and faster dissemination of information.
4. For manufacturing firms in drugs, chemicals, and machinery.
5. For durable goods industrial group.
6. For manufacturing firms in food, oil, and steel.
7. At year-end 1984, the Laval Files covered the 1963–1983 period. They included the Compustat Files with accounting and financial data on 270 Canadian firms and the Laval T.S.E. (Toronto Stock Exchange) Files with monthly stock market data for approximately 1,100 Canadian firms.
8. Here is a brief sample of the most frequently mentioned reasons by respondents for introducing FSP: to respond to major changes in the external environment and the competitive factors faced by the various units of the corporation; for capital requests not supported by strategic plans; to attempt to strategically position the corporation for a difficult and changing environment; to formally identify the threats and opportunities in existing businesses; to assist management in making resource allocation decisions; to develop a consensus at all levels of the corporation as to the strategic directions to take in the future; to facilitate fiscal planning and analyze changes in fiscal regimes; to systemize the planning process and provide a more efficient method to derive financial forecasts; to integrate individual planning efforts of the various functions of the business; to encourage administrative and operating staff to extend the time frame of their thinking; to assess financial requirements; to anticipate fundamental market place trends and shifts and to marshal resources to respond in a coordinated and planned fashion rather than on an ad hoc basis; to ensure long-term profitability, etc.
9. Chugh and Meador (1984) found that a majority of financial analysts consider a sound strategic plan and planning system of great importance in the stock valuation process.
10. See Atiase (1985); Beaver (1968).
12. The limitations of “event” studies are well known. In particular, most events have no true event date. That is, although a public announcement may exist,
it is next to impossible to find out precisely when information has been incorporated into stock prices. Since very little is known about the transmission process for planning information and "announcements" were usually found subsequently to the month of FSP adoption (defined as event month "0"), a span of six months following and including the month of FSP adoption for decision purposes is used as the FSP event period. Kudla (1980) as well as Ang and Fatemi (1985) used similar event periods.

13. Refer to Black and Scholes (1973), Brown and Warner (1980), and Zeghal (1984) for more details on these approaches.

14. Prediction errors are computed for the 24 months prior to the month of FSP adoption and the 25 months including and following the month of FSP adoption, that is, for \( t = [-24, \ldots , +24] \).

15. Prediction errors are computed for \( t = [-12, \ldots , +24] \).


17. Of the 49 pairs of firms obtained, 28 are matched on the basis of systematic risk and industry classification; 21 pairs are matched on the basis of systematic risk only. Results of \( t \)-tests on the mean of the differences between the systematic risk of pairs of firms indicated no significant difference.

18. Unlike the increased variability approach, the specification of a return-generating model is side-stepped in the rate-of-return approach. However, the rate-of-return approach requires the use of non-F% firms as a control group which weakens the possibility of detecting significant information effects when present.

19. The hypothetical event month "0" of each non-FSP firm in a given industry is the same as the actual event month "0" of each FSP firm in that industry with which it is paired.

20. Of the 46 pairs of firms obtained, 25 are matched on the basis of systematic risk and industry classification; 21 pairs are matched on the basis of systematic risk only. Results of \( t \)-tests on the mean of the differences between the systematic risk of firms indicated no significant difference in the risk-class of FSP and non-FSP firms.

REFERENCES


