

**IDENTIFICATION OF ECONOMIC VALUE DRIVERS  
IMPACTING OPERATIONAL CASH FLOWS  
IN THE CASUAL THEME RESTAURANT INDUSTRY**

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# **IDENTIFICATION OF ECONOMIC VALUE DRIVERS IMPACTING OPERATIONAL CASH FLOWS IN THE CASUAL THEME RESTAURANT INDUSTRY**

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## **(ABSTRACT)**

The importance of environmental analysis in the strategic management process and the effects of economic value drivers on firm or industry performance have been discussed conceptually and empirically by researchers in corporate failure, and in the areas of finance, accounting, strategic management, and the hospitality industry in the past. The belief is that the more systematic and frequent the scanning performed by managers the higher the chances of improving the firm's or industry's performance. The present study is an attempt to identify economic value drivers that impact the casual theme sector of the restaurant industry and to ascertain the degree of the impact during the period 1994-2003.

The statistical analysis was based on time series data, using Cross Correlation, Granger Causality, and Multivariate Regression. An exhaustive range of economic value drivers within ten categories were tested: commodity market; foreign currency market; labor market; inflation; stock market; national income and output; interest rate; government revenue, spending, debt, and taxes; money supply; and consumer spending. The unit of analysis was done at the industry level, and an index of operational cash flows of the casual theme sector of the restaurant industry was developed.

Economic value drivers within the categories of commodity markets, labor markets, inflation, stock market, national input/output, government revenue/spending/debt/taxes, money markets, and consumer spending indicated co-movements with and causality to the index of operational cash flows per unit in the casual theme restaurant industry. A high variance in the operational cash flows in the casual theme restaurant industry was explained

by a set of economic value drivers within commodity markets, inflation, and labor markets.

In broad, practical terms, the study intends to support the importance of assessing the economic environment for better performance of the restaurant industry and to provide food service managers with a conceptual model to understand the unanticipated effects on the performance of existing or new strategies. In real terms, the model and set of economic value drivers in the model would help them decide what kinds of action or investment in a firm or industry's weakness should be taken to buffer future operational risks against value drivers within economic environment.

## **DEDICATION**

I dedicate this work:

To my parents: ByungHun Chung and MyungSang Kwon

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## CHAPTER ONE

### INTRODUCTION

#### **Problem Statement**

According to the co-alignment theory, environmental analysis is integral to systematic strategic planning (Ginter & Duncan, 1990; Olsen, West, & Tse, 1998). As such, this theory offers a framework for strategic planning that takes into consideration the factors of the environment, strategy choice, firm structure, and performance. The co-alignment principle states that "if the firm is able to identify the opportunities that exist in the forces driving change, invest in competitive methods that take advantage of these opportunities, and allocate resources to those that create the greatest value, the financial results desired by owners and investors have a much better chance of being achieved" (Olsen et al. 1998).

All firms work within complex environments—but those belonging to the hospitality industry operate in relatively more dynamic, uncertain, and complex environment (Tung, 1979; Jurkovich, 1974; Lawrence & Lorsch, 1967; Duncan, 1972; DeNoble & Olsen, 1986). Firms in general depend upon their environments for both survival and success, and thus environment scanning—the acquisition of information about events taking place outside the firm—can be used to respond effectively to changes in the environment (Culnan, 1983). Structured environmental analysis is therefore beneficial both conceptually and functionally; consideration of socio-cultural, economic, technological, and political and/or ecological environments is likewise crucial for both firms and industries.

Among the aforementioned environments, the economic environment is what management has little control over even as broad economic uncertainty affects the results of the firms within an industry. Therefore, managers must envision their economic

environments relative to their businesses, understand causal relationships, and then attempt to understand what drives industry performance from an economic perspective. The purpose of this study is to identify what industry drivers exist in the casual theme restaurant industry. It is believed that the restaurant industry's performance depends upon changes in such internal economic variables as purchasing power (revenue), operational expenses, and investment. These changes may vary according to economic environmental events—thus resulting in unexpected results. For example, the depressed economy has led to unusually cautious consumer spending within the food service sector (Hume, 2002; Brumback, 2003). In an uncertain economy, operational expenses within the foodservice industry fluctuate, making it difficult to project the value of new investments definitively or accurately. In such a scenario, unanticipated costs may well offset the earning benefit. In this sense, identifying economic value drivers in business environment and understanding their impacts on a firm or an industry are critical for success and survival.

## **Theoretical Underpinning / Conceptual Framework**

### **Environment**

The business environment is divided into external and internal categories. The internal environment comprises physical and social factors within the boundaries of a firm or industry; the external environment comprises correlating factors existing outside the boundaries of the firm (Duncan, 1972). As such, the external environment refers to phenomena not in control of the firm and is classified into remote and task environments (Dill, 1958; Bourgeois, 1980; Olsen et al. 1998). The remote environment is comprised of political, socio-cultural, economic, ecological, and technological categories (Dill, 1958; Thompson, 1967; Miles, 1980, Olsen et al., 1998), while the task environment comprises customers, suppliers, competitors, and regulators. (Dill, 1958; Thompson, 1967; Duncan, 1972; Tse & Olsen 1990; Olsen et al., 1998). The task environment is affected by the remote environment, while most of the external environment is beyond a firm's or industry's control.

## **Value Drivers**

A value driver is a variable that reflects the environment and through which the value of a firm's strategy or performance can be measured. Value drivers should be carefully analyzed relative to how they affect the firm's or industry's performance and focuses on such internal drivers as cash flow value adding products and services of the firm/industry. Through such an analysis, it would be important to establish the causal relationship of value drivers with performance. Identifying value drivers is the first step to figuring out the practical effects of economic or other environmental domains on an industry's performance. Finding key value drivers that add value to the industry is a challenging and creative process that relies on trial and error (Copeland et al., 1996)

Value drivers are of two types: external and internal. External value drivers correspond to the remote, task, and industry environments (Olsen et al., 1998) and, while being out of firms/industry control, they affect the firm's value. Internal value drivers on the other hand reside within the firm and thus the firm can have some degree of control over them. Commodity prices, for example, are external economic value drivers that affect the operating expenses in the food service industry—which a restaurant cannot control. By contrast the profit margin can be controlled by a restaurant through pricing, and would thus be considered an internal value driver.

## **Causal Relationships between Environment and Industry**

Research suggests that environmental scanning improves the performance of firms within the hospitality industry. The more thorough and more frequent the scanning, the higher the chances of improving the firm's performance. (West & Olsen, 1988; West & Anthony, 1990) A fast growing economy, low competition and stability of external and internal environments enable firms to maximize their business value through quantitative growth. However, dynamic changes in the structure of the environment and competition

make it more challenging to generate profits because firms cannot survive on the basis of older business philosophies and strategies. The importance of a volatile economic environment to the competitiveness of a firm should be clear to managers and other stakeholders especially after the economic turbulence of recent years.

Although casual dining is the fastest-growing segment in the food service industry, the tough US economy has forced some overextended multi-concept casual-dining operators to shrink their portfolios (Peters, 2003). According to a recent survey conducted by the Smith Barney Group, “overall consumer spending and economy” were regarded the most important drivers of sales performance going forward. Eighty percent of the respondents expected expenses to rise significantly or modestly over the next 6-12 months and they agreed that increases in the cost of goods, energy, insurance, and employee compensation would offset increases in sales or lead to change in business strategies, such as menu pricing. The particular concerns afflicting the casual theme restaurant industry are energy and product costs.

The responses from the above survey — of executives — suggest that a comprehensive analysis of external economic risk is essential. That response seems to be reaffirmed by research in strategic management that indicates significant relationships among environment, strategy, structure, and performance (Chandler, 1962; Lawrence & Lorsch, 1967; Jurkovich, 1974; Miles & Snow, 1978; Porter, 1980, 1985; Bourgeois, 1980; Hambrick, 1980, 1982, 1983; Dess & Beard, 1984; Mintzberg, 1988; Miller, 1986, 1987; Lenz & Engledow, 1986; Odom & Boxx, 1988; Hamel & Prahalad, 1991; Jennings & Lumpkin, 1992; Kotha & Valdamani, 1995). Strategy research in hospitality management has tried to theorize connections between environment and other constructs of the co-alignment model, such as strategy choice, structure, and performance (Olsen, 1980; Reid & Olsen, 1981; West & Olsen, 1988; Dev & Olsen, 1989; Turnbull, 1996; Zhao, 1994; Chathoth, 2002).

## **Business Failure**

Desai & Montes (1982), Altman (1983), Wadhvani (1986), Levy & Bar-Niv (1987), Goudi & Meeks (1991), Wickramanayake (1996), and Bhattacharjee (2002) in their failure prediction models found ample evidence that the economic environment are a significant explanatory factor for company failure. Therefore, if management ignores or is not sufficiently informed about how to scan the economic environment, it may not have a chance to avoid business failure. In hospitality research, Kish (1982) and Min-Ho Cho (1994) attempted to predict the business failure attributable to ignorance of the macro and micro level of environment, including the general economy in the food service industry. Gao (1999) later suggested that some macroeconomic and microeconomic factors significantly impact on business failure in the hospitality industry.

Business failure, also called corporate failure, insolvency, or bankruptcy, ranges from failing to earn an economic rate of return on invested capital given the risk of the business, to legal bankruptcy followed by liquidation of the firm's assets. Business failure does not always occur because of internal organizational problems, but may result from unforeseen effects of events occasioned by the economic remote and task environments. It is therefore important that management recognize the signs of business failure before it is too late for the situation to be resolved or avoided.

## **Limited View of Hospitality Executives**

In spite of the importance of the business environment, the hospitality industry does not seem to sufficiently utilize environment scanning to formulate and implement its strategy and structure. Studies by DeNoble & Olsen (1982), and Pinto & Olsen (1987) found that hospitality executives not only have a limited view of the environment, but they also lack interest in considering the environment for strategic planning. DeNoble and Olsen (1982) investigated the relationship between the strategic planning process and the service delivery system: They examined how executives in the food service industry scan the

environment, how they perceive their environment, and who participates in the strategic planning process. The findings showed executives may be too operations oriented, and they may not pay enough attention to opportunities in the environment based on their internal capabilities. Pinto and Olsen (1987) later confirmed the discomfiting and unflattering fact that executives' readings tend to follow patterns and focus very narrowly on the financial arena.

### **Purpose of the Study**

In the foregoing sections, it has been pointed out that many studies in the hospitality industry have conceptualized the dimensions of the environment, recognized the lack of environmental scanning by hospitality firms, and emphasized the need for using environmental scanning for effective business practices, which would be a combination of the right strategies and right structure, which will lead to good performance. However those studies have been limited to conceptualizing and theorizing environmental effects on firms. In other words, the existing research has neglected to focus on how environmental events drive strategic decision-making and how they influence the value of the firm in the research realms of strategic, financial, economic, accounting, and hospitality management. In view of the scarcity of research on external economic effects, this study undertakes to achieve the following objectives:

1. Provide an account of research done on economic variables having causal effects upon the casual theme restaurant industry.
2. Assess the causal relationships among key economic variables hypothesized to affect performance variables pertaining to an industry sector.
3. Provide a practical and empirical way for food service managers to understand the causal effects on industry performance, which would allow the industry participants to make appropriate strategic decisions to achieve competitive advantages.

Environmental scanning is the acquisition and use of information about events,

trends, and relationships in a firm's external environment, the knowledge of which would assist management in planning its future path of action (Aguilar 1967; Choo & Auster, 1993; Choo, 1998). Firms scan the environment in order to understand external forces driving change so that they may develop effective responses aimed at securing or improving their position in the future. To the extent that a firm's ability to adapt to its outside environment depends on knowing and interpreting the external changes, environmental scanning constitutes a primary mode of organizational learning targeted at long term success and survival. Since this study focuses on identifying the influence of external economic events upon industry performance, it is expected to help hospitality management in acquiring the skills related to economic environment scanning.

From the point of view of performance evaluation, external economic effects on the operations can be regarded as noise to the extent they are not predictable and may cause a strategy to produce results that belie management projection (Oxelheim & Wihlborg, 1997, 2003). From the strategic management perspective, identifying noise is desirable because it enables management to ascertain what led to the results of its operations and to find out how the resources should be (re)allocated to reduce or avoid the influence of economic events upon the firm's performance. While external economic forces are usually beyond management control, the cash flow effects of those forces can be avoided to some extent through managerial actions, such as the use of financial or commodity derivatives. Accordingly, if management can gain useful information about current and future prospects of the firm by identifying external economic influences, it can develop more appropriate strategies and structures for a sustainable and competitive position.

Economic uncertainty is reflected in value drivers, which link microeconomic patterns with the macroeconomic paradigm (Sweet, 2001). Value drivers suggest ways in which managers can use the environmental scanning process to understand the causal relationships between their firms and the forces driving change in their environments, and to assess their impacts upon strategic success (Olsen & Zhao, 2003). If the cash flows for a new strategy are forecasted irrespective of the value drivers that affect macro demand and

cost conditions, then an estimated positive project value may not be sustainable even under normal economic conditions. (Under a normal economic environment, a firm can at least evaluate its strategies and structure.)

Based on the need to identify influential measures within the uncertainty and complexity of the business environment, the primary objective of this study is to develop a set of external value drivers pertaining to the economic environment of the casual theme restaurant industry and to identify the degree of their effects on the industry's performance. As such, this study is expected to provide a theoretical framework that would assist casual dining firms in allocating resources to the right strategy and structure, avoiding or reducing risks from the uncertainty of the economy, and in understanding the sources of unexpected profits.

### **Research Questions**

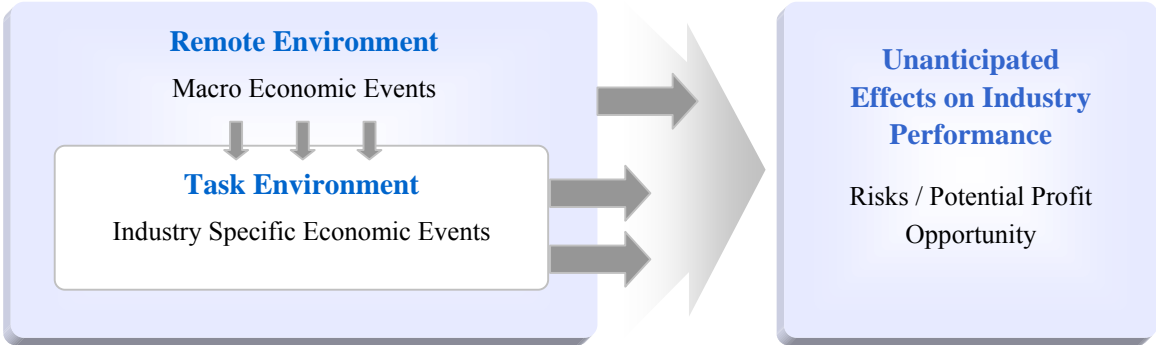
In pursuance of the previously mentioned research objectives, this study sets out the following three major research questions for exploration:

1. What economic value drivers have causal effects upon the casual theme restaurant industry sector's operating cash flows?
2. How much variance of the cash flow of the casual theme restaurant industry can be explained by the economic fluctuation?
3. What is the sensitivity of the industry operating cash flows to changes in those economic value drivers?

### **A Broad Conceptual Model: Linking Economic Events to Cash Flow Effects**

Based upon a survey of literature in the food service industry, it is proposed that the following conceptual model can illustrate the link between economic variables and their cash flow effects on the industry:

Figure 1: Conceptual Model for Unanticipated Effects of Economic Environment on Industry Performance



This model suggests that uncertainty in the macro economy in the remote environment domain first affects industry specific economic events in the task environment. These industry-related economic events influence the industry performance, while some of the macro economic events directly affect industry performance. In other words, the industry is exposed to the economic environment comprising a composite set of macro and industry specific variables. For example, Oxelhiem and Whilborg (1997, 2003) suggest that the macroeconomic environment is a set of four price variables: exchange rates; interest rates; inflation rates; and political risk premiums. Assuming that analysis of a limited number of variables can capture the important effects on the industry’s performance within a complex economic environment (Oxelheim & Wihlborg, 1997), this study will identify variables causally related to industry performance.

The effects of the remote and task environment from the economic perspective are unanticipated and the unanticipated effects on industry performance reflect the degree of exposure to risk resulting from economic factors. This total exposure to performance includes the potential for profit opportunity and the risk, i.e. both positive and negative influences on the cash flow. Unanticipated economic events are not always considered risk. In financial theory, the proxy for risk is standard deviation of return, and thus it is symmetric, viewed both negative and positive. Behavioral decision theory suggests that the use of variability, while a popular approach, may not reflect managers’ and investors’

conceptualization of risk (Miller & Leiblein, 1996). Therefore, from the management point of view, the proposed study distinguishes the variance of cash flows from the downside variance termed as “pure risk” for the industry. The model to be employed for this study emphasizes investigating the relations between economic value drivers and the unanticipated effects on industry performance.

## **Methodology and Procedure**

### **Data and Analysis**

The study will utilize time series data collected from the following secondary sources: COMPUSTAT, Securities and Exchange Commissions (SEC) filings, Government, and Investment Banks, and quarterly data from 1994 to 2003 will be employed for the analysis of the study.

Specifically, data from the SEC filings of eleven food service companies in the casual theme restaurant industry would be aggregated to make a single data set for their composite operating cash flow. That data set would then be used to indicate the industry’s performance. The selection of the companies is based on the commonality of their business and the availability of a data set for the observed time period of ten years.

Possible economic variables are identified based on literature and preliminary study. The lead and lag effects of the variables will be taken into consideration, which will insure the strength of the overall analysis and findings. Considering the lead and lag effects, longitudinal data from these possible data will be collected to test the relationships between economic variables and the composite cash flow through the following process:

#### **1. Cross Correlation**

To identify co-movements between the industry’s performance and economic value drivers, considering leading, coincident, and lagging correlations.

## 2. Granger Causality Test (Granger, 1969; Sims, 1972; Engle & Granger, 1987)

To test the direction of causality between the composite operating cash flow and individual economic value drivers

## 3. Time Series Multivariate Regression

To find the degree of explanation of the selected economic value drivers.

## **Summary**

The importance of environmental analysis in the strategic management process has been emphasized by many researchers in the past. The present study is an attempt to find economic value drivers that impact the casual theme sector of the restaurant industry and to ascertain the degree of the impact. In pursuing that objective, the study seeks to rely on theories and methodologies from the fields of economics, corporate finance, and hospitality strategic management. In broad, practical terms, the study intends to support the importance of assessing the economic environment for better performance of the food service industry and to provide food service managers with some conceptual tools to understand the unanticipated effects on the performance of existing or new strategies. In real terms, those tools would help them decide what kinds of action to take in order to reduce or avoid the influence of economic uncertainty.

The present study will identify the dimensions and variables using prior research and testing causality of all potential variables in the economic environmental domain. As a next step, it would identify those economic variables that have a causal relationship with industry performance, and go on to examine the degree of sensitivity. The unit of analysis will be done at the industry level, and hence, to use industry level data, the study will combine data of casual theme sector of the restaurant industry. The research design will include time series data of casual theme restaurants through a pre-selected time period that would address the lead and lag effects of variables across the time period. The overall objective of this study is to assess the causal relationships among key economic variables hypothesized as having impact on industry performance.

## CHAPTER TWO

### LITERATURE REVIEW

This chapter provides: (1) a review of existing research on the theme of environmental scanning and corporate failure; (2) an overview of literature from the field of corporate finance, economics, and hospitality strategic management—as relevant to the specific topic of economic value drivers of a firm’s or industry’s performance; (3) an introduction to the theory of complex economic events and to the theory of strategy for industry analysis; (4) an introduction to potential economic value drivers.

#### **Business Environment**

##### **Concept of Environment**

Several researchers have tried to define business environment and to explore its dimensions. Selznick (1948) defined the business environment as flows of information relevant to goal setting and decision-making through managerial perceptions. Duncan (1972) defined business environment as the totality of physical and social factors taken into consideration by a firm for making decisions.

Duncan (1972) categorized business environment into “internal” and “external”. While the internal environment comprises physical; and social factors existing within the boundaries of a firm, the external environment comprises the correlates of those factors existing outside the boundaries of the firm and thus outside its control. Bourgeois (1980) classified environment into “perceived” and “objective” perspectives. Despite the claims that the perceived environment differs from the objective environment (Hambrick, 1982; Olsen, Tse, & West 1992), several studies have found strong associations between subjective assessments and objective assessments of the environment (Dess & Robinson, 1984; Boyd, Dess & Rasheed, 1993). Extending this theoretical taxonomy, Dill (1958) and Bourgeois (1980) further

divided the external environment into “general” and “task” categories. They considered the task environment to be the layer closest to the firm, which influences daily operations and goal achievement. Included were the customer, competition, and technological environments. Conversely, the outer layer, or the general environment, consists of sectors that affect firms indirectly. These sectors were the regulatory, economic, and socio-cultural environments.

Within the context of the hospitality industry, DeNoble & Olsen (1986) classified the environment into general and task environment. Olsen et al. (1998) detailed this classification by “remote”, “task”, “functional”, and “firm” environments (Olsen et al., 1998). The remote environment comprises political, socio-cultural, economic, ecological, and technological issues (Thompson, 1967; Zhao & Merna, 1992; Olsen et al., 1998). The task environment is grouped into customers, suppliers, competitors, and regulators (Dill, 1958; Thompson, 1967; Duncan, 1972; Tse & Olsen 1990; Olsen et al., 1998).

### **Environment Scanning**

In the hospitality strategic management literature, the so-called “co-alignment principle” is employed to explore the relationship amongst key elements of the strategic management process in a firm (Olsen et al., 1998). The elements that fall within the purview of the principle are: 1) forces driving change in the environment in which the firm competes; 2) strategies in which the firm invests in order to add to its financial value; 3) business structure must follow in conjunction with strategies identified; and 4) the firm’s performance evaluation. According to the co-alignment principle, effective strategic management focus upon identifying existing and emerging forces driving changes in the various categories of the environment and to find out how these changes impact the choice of strategy, structure and the firm’s overall performance.

The first step in implementation of the co-alignment principle is environment scanning, which involves gathering and synthesizing information about environmental forces driving change and uncovering opportunities and threats in the environment. Emery & Trist (1965), Lawrence & Lorsch (1967), Child (1972), and Jurkovich (1974) are

researchers chiefly credited for conceptualizing the environment as a critical component within the corporate strategic management process. In the context of (hospitality) strategic management, Olsen (1980), DeNoble & Olsen (1981), Slattery & Olsen(1984), West and Olsen (1989), Selznick (1948), Aguilar (1967), Bourgois (1980), and Hambrick (1980, 1982) have all emphasized the importance of understanding the impact of environmental events on corporations. Most of these researchers suggest that the information gathered through environmental scanning should be used to formulate, implement, and plan strategies for food service operations.

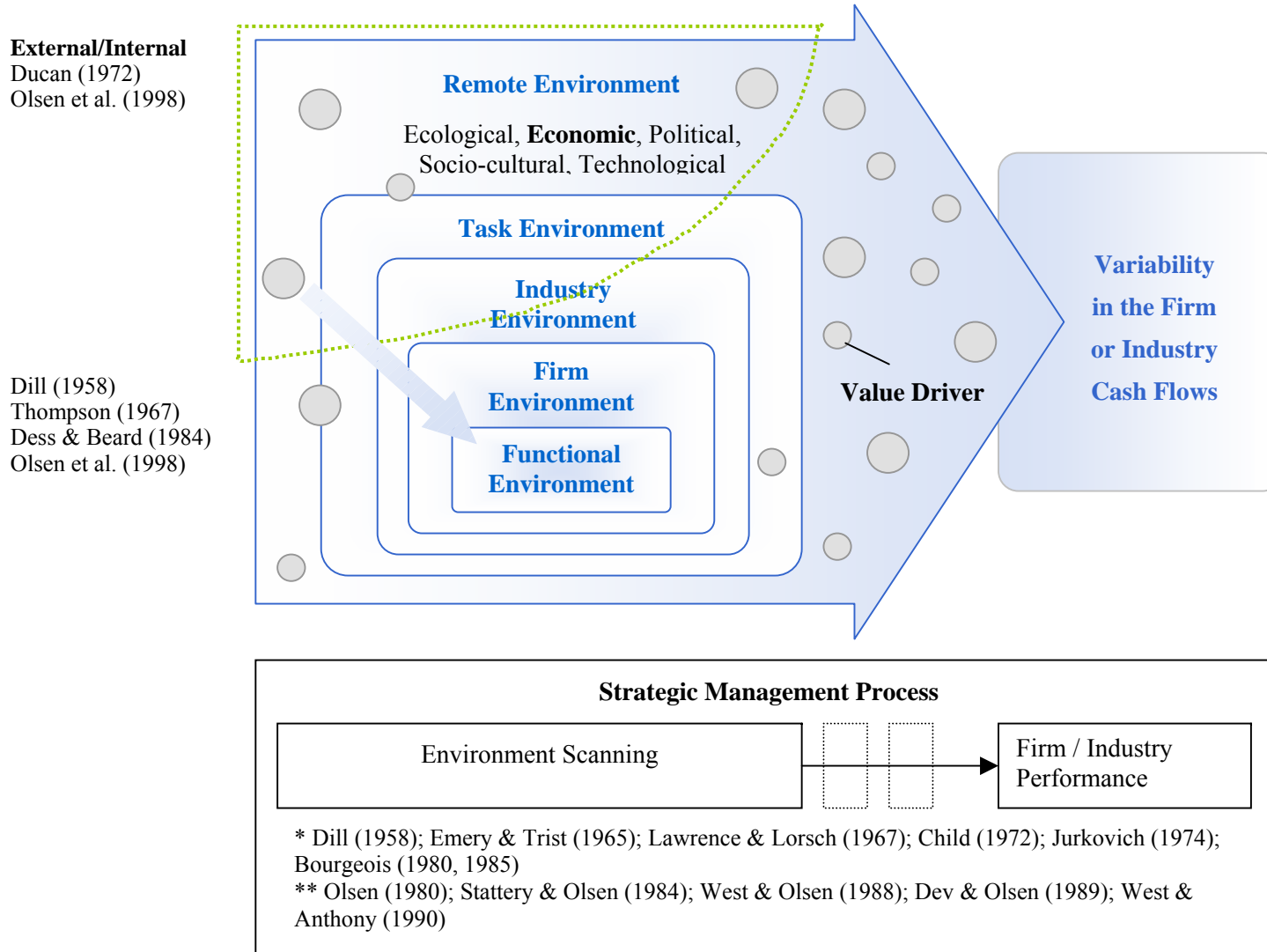
### **Relationship between Environmental Scanning and Firm Performance**

West and Olsen (1988) made the first attempt to measure the relationship between environment scanning and firm performance in hospitality research. Using Porter's industry structure for measuring environmental variables, West and Olsen assessed the extent to which environmental scanning was used. Their research showed that high performing firms resort to significantly greater scanning than low performers. Later, West and Anthony (1990) confirmed that finding based upon their examination of the effect of environmental scanning on firm performance within the food service industry. Dev and Olsen (1989) suggested that a firm needs to correlate its strategies to its environment, in order to secure higher levels of performance.

Although these works have matured over time from the conceptual and descriptive to empirical level of research, there is still a limited amount of empirical evidence supporting environmental scanning. What an industry desires is to find practical ways to understand, forecast, and control its environmental situation in order to improve its performance through effective strategies. Choi (1999)'s research is an important step in providing precisely such practical methodologies—methodologies through which restaurant industry cycles and their economic indicators could be detected and established. Those economic indicators can be useful for the actual conduct of business insofar as they allow managers to track the course of the economy and thus possibly to predict future turning points. Understanding the business cycles and their economic indicators may allow the managers not to miss opportunities or avoid threat in the

restaurant industry. Figure 2 presents the overview of literature regarding business environment that contains the concept of environment and the relationship between environmental scanning and firm performance.

Figure 2: Overview of Business Environment in Literature



## **Corporate Failure**

Company insolvencies tell us about the relationship between the economy and the value of firms. In other words, they may indicate business failure caused by the ignorance of the economic environment. There is no unique definition of corporate failure (Altman, 1993). Possible definitions range from firm's failure to earn an economic rate of return on invested capital given the risk of the business to legal bankruptcy followed by liquidation of the assets of the firm.

Beaver (1967) firstly attempted to build a corporate failure prediction model with financial ratios, utilizing univariate discriminant analysis. At the microeconomic level, it remains important to speculate whether a business would go bankrupt in the near future. Studies devoted to such speculation focus on potential lenders with an individual firm's credit value (Dunis & Triantafyllidis, 2002). The methodology involves using key financial variables, obtained from corporate financial statements as independent variables signaling the possibility of failure (Altman, 1968; Deakin, 1972; Blum, 1974; Ohlson, 1980). Macroeconomic indicators should also prove helpful in predicting corporate failures, since most companies have a higher propensity to fail in times of economic recession (or downturn) than in times of economic prosperity (Rose et al., 1982; Bhattacharjee et al., 2002; Dunis & Triantafyllidis, 2002). The study of business cycles and the fluctuations of aggregate demand can further enhance the understanding of the determinants of company insolvencies. In order to develop business failure prediction models, multiple discriminant analysis (MDA) and conditional probability statistics such as logit analysis (LA), probit analysis (PA) and linear probability modeling (LPM) have been widely used.

### **Corporate Failures from Macroeconomic Perspective**

Many researchers have analyzed the business failure process using macroeconomic indicators. Based upon his research on the application or suitability the time series model to track the behavior of corporate liquidations through the recession of the 1990s and the subsequent recovery, Wlieghe (2001) concluded that macroeconomic variables had more explanatory power

than financial accounting ones during the period.

Rose, Andrews, and Giroux (1982) analyzed the association between macroeconomic factors and business failures, using quarterly data over the period 1970-1980 and a variable selection approach. Their six-variable model showed that economic conditions do influence business failures, and the lead-lag relationships they found suggest in particular that failure rate forecasts can be made one to four periods ahead by determining and using an appropriate index of economic indicators.

In defining corporate failure, Desai and Montes (1982) concentrated on monetary factors, because in their view bankruptcy is a financial or monetary phenomenon. Using annual data and dynamic sets of equations, they explored the effect of the interest rate and money supply growth upon business failures in the UK from 1945 to 1980. Observing that interest rates had a positive effect on failures while money supply had a negative one, they concluded that these monetary variables have a remarkable predicting power for corporate bankruptcies.

Levy and Bar-Niv (1987) showed that corporate bankruptcy was positively correlated with variances of the Gross National Product (GNP) and the GNP deflator and negatively correlated with the covariances of these variables for the period 1947 -1982. Swanson & Tybout (1988) observed the impact of macro-economic variables on business failure and concluded that interest rates and the occurrence of credit shocks is the most key factor that affect bankruptcy. .

In order to bridge the gap between their approach and multivariate discriminant analysis (MDA), Goudie and Meeks (1991) used a macro-micro model. They forecast failures based not only on the basis of financial accounts, but also on macroeconomic developments. Focusing on one key macroeconomic variable, the exchange rate, they identified individual companies that were at risk of business failure because of possible sets of macroeconomic conditions. As such, Goudie and Meeks avoided predicting just an aggregate failure rate.

Wadhvani (1986) found significant positive effects of inflation, interest rates and debt

level upon rates of insolvency, based on UK data from the year 1962 to 1981. Introducing a dummy variable to account for the impact of the 1986 /insolvency Act, Cornelius and Wright (1995) re-estimated Wadhvani's model for the period 1965-1994 and generated similar results.

Wickramanayake (1996) examined the relationship between business failures and some economy-wide factors such as bank advances/GDP ratio, unemployment, price level of goods, and service and the Australian stock index from 1973 to 1995. Based on a co-integration approach the findings showed that business failures have a positive relationship with bank advances/GDP ratio, level of unemployment and price level, but a negative one with the stock index.

### **Corporate Failure in Hospitality Industry**

Historically, the hospitality industry has experienced a high rate of financial failure; within it the restaurant industry has more failures than the hotel industry (Tavlin, Moncarz, & Dumont, 1989; English, 1996). According to an Ohio State University study, the failure rate for the restaurant industry is around 57 to 61 percent, whereas the fact that 90 percent of all restaurants fail in their first year of operation is of a commonly accepted notion. Although there are apparent reasons for the high failure rate in the hospitality industry-- such as relatively low legislative, financial, and competitive barriers to entry (Boer, 1992)-- the failures are also influenced by economic conditions. Not much empirical analysis exists on the relationship of economic factors to these financial failures.

Tavlin et al. (1989) blamed the business failures in the hospitality industry on economic fluctuations in the relationship between the financial failure and the market demands as well as on the firms' poor marketing or financial strategies. For example, La Quinta Motor Inns Inc. experienced business failure owed to the 1982-1983 recession, whereas some restaurants and lodging firms suffered financial failure because of their inability to pay interest on their loans through over-expansions. Jerrico Inc. and Ponderosa also experienced business failures due to unexpected increase in food costs.

Adams and Kwansa (1992; cited in Choi, 1999) listed the following factors affecting hotel bankruptcy: insufficient profits; high interest rates; loss of market share; lack of consumer spending; and little promise of growth. From a microeconomic perspective, Kish (1982) examined which ratios were better indicators to predict restaurant failure, and concluded that cash based issues are the ones.

Gao (1999) examined business failures in the hospitality industry from both macro and micro economic perspectives. He suggested that at the macroeconomic level change in real gross state product and change in disposable personal income significantly influenced lodging failure rates; financial ratios and discriminant analysis, on the other hand, can be used to predict bankruptcies at the micro level.

## **Economic Value Drivers and Firm Performance**

### **External and Internal Value Drivers**

The complex nature of the environment and industry structure cannot directly explain the value of the firm's strategy or performance. Hence, one needs to conceptualize value drivers related to strategies. Value drivers should be carefully identified and analyzed in accordance with the cause and effect relationships they may have with the cash flow streams of key value adding products and services of the firm. Namely, value drivers explaining the causal impact of environmental forces driving change on firm strategies, structure, and performance should be identified in order to achieve competitive advantages. As such, value drivers can be understood as frontier sensors for forces driving change; analyzing those sensors, in turn, would provide explanation for firm performance. By identifying and analyzing value drivers, managers can understand the entire organization and also communicate their expectations about performance (Copeland, et al., 1996). Copeland et al. (1996) pointed out that identifying key value drivers is a creative process that relies on trial and error. This means that value drivers may vary, depending on the strategies and structure of a firm and its environment.

Value drivers are two types: external and internal. External value drivers are considered to be out of the firm's control, but which nonetheless affect the firm's value. Internal value drivers, on the other hand, are variables within the firm that the management can control. Some researches have identified some external and internal value drivers. Copeland et al. (1996), for example, suggested return on invested capital, free cash flow, and economic profit as major internal value drivers. In the hospitality industry, Olsen et al. (1998) identified internal value drivers, such as cash flow per share, return on assets, return on investment, and customer service. Many other external value drivers pertaining to different business sectors also have been identified and will be discussed in the next section in detail. The focus of the next section would be external value drivers within the economic environment.

### **External Economic Value Drivers and Their Causal Relationships**

#### *Economic Variables and Stock Market*

Financial researchers or analysts and economists have typically examined the relationship of the (macro) economy to stock market performance, but not with corporate profit. Mounting empirical evidence suggests that a range of financial and macroeconomic variables can predict stock market returns or asset returns (Campbell, 1987; Fama & French, 1989; Schwert 1990; Balvers, Cosimano & McDonald, 1990; Campbell & Hamao, 1992; Ferson & Harvey, 1993; Patelis, 1997; and Pesaran & Timmerman, 1995, 2000; Rapach, 2001). As a corollary, changes in the stock market are also believed to affect the economy (Rogalski & Vinso, 1977; Rozeff, 1974; and Cooper, 1974). These researchers found a close association between stock market cycles and economic cycles, and the National Bureau of Economic Research included stock prices, as a leading index of business conditions.

Major economic factors that have been discussed as influences on stock prices are GNP, employment, real income, inflation or CPI, and money supply. Lorie & Hamilton (1973), Poole

(1975), Reilly (1989), Thorbecke (1997) and Rapach (2001) found convincing and overwhelming evidence that changes in the rate of money supply growth leads to changes in equity prices. Friedman and Schwartz (1963) hypothesized that when the Federal Reserve Bank buys or sells bonds to adjust bank reserves and eventually the money supply (M2), the immediate shock is on government bonds, followed by corporate bond prices and common stock prices. Using money aggregation data as a measure of money supply, Sprinkel (1964), Palmer (1970), Homa & Jaffee (1971) and Hamburger & Kochin (1972) supported that finding. In light of this indication of a strong relationship between money supply changes and the stock market, Rapach (2001) concluded that money supply could be used as an indicator of stock price changes. Additionally, Cooper (1974), Rozeff (1974), and Rogalski & Vinso (1977) disagreed that stock returns lag behind changes in monetary policy. They suggested that past changes in money supply have no significant forecasting power for stock returns.

Inflation is also one of the most popular economic factors influencing stock prices. The Fisherian assumption is that real rates of return are independent of inflationary expectations. Both Keynes and Fisher (1973) believed that inflation is advantageous to stock holders, as it reduces the burden on corporations to service and repay their debt. However, Gultekin (1983) and Lorie & Hamilton (1973) found that the greater inflation leads to a lower level of returns on common stocks.

In addition to the aforementioned factors, Nelson (1976), Bodie (1976), Fama (1979), and Schwert (1981) have presented evidence that monthly returns of a broad group of New York Stock Exchange common stocks are negatively related with both the expected and unexpected components of the Consumer Price Index (CPI) from 1952 to 1981. Additionally, Chen, Roll and Ross (1986) have proposed that the following five macro economic factors are significant in explaining expected stock returns: unanticipated inflation rate; change in expected inflation; unanticipated change in term structure; unanticipated change in risk premium; and, unanticipated change in the growth rate of industrial production.

Binder and Merges (2001) tested four economic variables to explain the behavior of

stock market volatility: uncertainty about the price level; the riskless rate of interest; the risk premium on equity; and the ratio of expected profits to expected revenues. They found that the set of four economic variables had significant explanatory power and accounted for a high variation in market volatility from 1929 to 1989. Several researchers have shown that macroeconomic factors may cause systematic risk. For example, Elsinger et al (2002) showed that systematic risk is the consequence of macroeconomic shocks such as interest rate, exchange rate, and business cycles.

In the field of financial management, almost all of literature regarding economic events focuses on factors affecting the value of the stock market. Researchers within that field seem to believe that management's primary goal is stockholders' wealth maximization, or the maximization of the price of the firm's common stock. This angle in research has led most researchers to examine the relationships between the economic environment and the stock market, rather than to a firm's and/or industry's operations.

### ***Economic Variables and Corporate Profit***

Like the market index of common stock, aggregate earnings indices were used in order to find macroeconomic impacts on earnings in early literature. Brown and Ball (1967; cited in O'Brien, 1994) suggested that an economy-wide earnings index accounted for 35% to 40% of the cross-sectional variation in individual firms' earnings, and an additional 10% to 15% was explained by industry indices. O'Brien (1994) examined the relations between corporate earnings and shocks in industrial production, inflation, interest rates and stock returns, and found that corporate earnings are sensitive to industrial production and inflation shocks, and this sensitivity does not appear to vary by industry. Oxelheim (1987, 1997, 2003) developed the macroeconomic uncertainty strategy (MUST) analysis to identify the macroeconomic variables that are most important to the particular company and determine the effect on performance of fluctuations in these variables. Oxelheim (2003) suggested that the vulnerability of a company to changes in its macroeconomic environment can be expressed as measures of sensitivity to changes in the relative prices of three categories-exchange rates, interest rates, and inflation rates.

In his book *Concepts of Strategic Management* (1993), David suggested some variables of each of the five categories: 1) Economic forces; 2) Social, cultural, demographic, and environmental forces; 3) Technological forces; 4) Competitive forces; and 5) Political, legal, and governmental forces. These categories altogether constitute the external environment. Acknowledging economic forces as one category, he demonstrated that economic factors have a direct impact on the potential attractiveness of strategies, such as interest rate, value of the dollar and government budget deficits. Other key economic factors that may affect a firm's internal and external environment include: availability of credit; level of disposable income; interest rates; inflation rates; money market rates; federal government budget deficits; gross domestic product trends; consumption patterns; unemployment trends; worker productivity levels; value of the dollar in world markets; stock market trends; foreign countries' economic conditions; import/export factors; demand shifts for goods/services; income differences by region/customer; price fluctuations; exportation of labor & capital; monetary policies; fiscal policies; tax rates; ECC policies; OPEC policies; and, LDC policies.

### ***Economic factors in Hospitality research***

Within hospitality management research, Olsen (1980) first raised the issue of economic factors, such as general economy, inflation, money supply, interest rate, and cost of energy. Olsen et al. (1992) later also suggested that unemployment, inflation, wage and price controls, energy supply and costs, economic expansion and recession critically affect most sectors in the hospitality industry. Their study included the following economic environmental variables: GNP; fiscal policies (taxation, deficit spending); monetary policies (interest rate and inflation); labor (unemployment rates, spending on welfare); trade (imports and exports); financial markets(availability of capital); and, disposable income.

Several other researchers including Denoble & Olsen (1986), VanDyke (1985), Olsen et al. (1992), Zhao & Merna (1992), Jurowski & Olsen (1992), Hiemstra & Ismail (1992), Choi (1999) also focused on economic factors to be considered when scanning the environment. More

factors include: GNP; income distribution; foreign exchange rates; monetary and fiscal policies; industry trade; and, labor market. Examining GDP, net exports, disposable income, savings rate, population, labor force, employment, consumer price index, minimum wage levels, benefits, government regulations and taxes as key economic indicators, Haywood (1993) found that consumer expenditure on hospitality and tourism changes in accordance with changes in disposable income, and thus have an impact on the sales of hospitality and tourism services. Table 1 shows the variables stressed by the above authors. Those economic factors are hypothesized to directly or indirectly influence sales or profits in hospitality industry.

Several other researchers have conducted extensive empirical studies of the above factors (Arbel & Ravid, 1983, Wheaton & Rossoff, 1998, Palmer & Hackmey, 2003). Evaluating the effect of energy costs on industry's prices and output, Arbel & Ravid (1983) found that while customers had reduced travel, they had not reduced demand for lodging facilities. They explained that irony or apparent contradiction by differences in the distribution of distance and in the number of trips and length of stay per trip, along with changes in transportation mode. The small negative energy related price impact seen on the supply side is more than offset by the positive impact on the demand side. Examining lodging industry from 1969 to 1994, Wheaton & Rossoff (1998) observed that hotel demand moved closely with the United States economy, at a much higher cyclic frequency. Their findings showed that the demand for hotel night stays moved very closely with the U.S. GDP, and that new hotel investment moved in a long-range pattern that bears little connection to macroeconomic fluctuations. Choi (1998) explored the role of economic value drivers further, examining and developing the business life cycle and 54 economic indicators relevant to the restaurant industry. His indicator system included leading, coincident, and lagging indicators and was used to forecast future restaurant industry sales.

Barrows & Naka (1994) made the first attempt to explain the movement of restaurant, lodging, and hospitality industry's stock returns by macroeconomic variables. They found that expected inflation rate, money supply, and domestic consumption are able to explain the variance of restaurant stock returns to a greater extent than either the lodging or industrial sector, and presented that term structure of interest rates and industrial

production are not significant factors for any selected group. Despite the attempt, the analysis limited to the hospitality industry's stock returns and adopted macroeconomic variables based on the Arbitrage Pricing Theory. More recently, using multivariate linear regression, Palmer & Hackmey (2003) determined that the following five variables consistently explained restaurant sales movements over the past 10 years: unemployment rate; prime rate; price inflation of restaurant meals relative to overall consumer price inflation, the University of Michigan's index of consumer expectations; wage and salary disbursements.

Prior to Choi's research, the hospitality literature had focused rather restrictively on the importance of influential factors on a firm's performance. Choi (1998) pioneered empirical investigation of the relationship between economic cycles and business cycles in the hospitality industry based upon explanatory economic factors. He collected a large range of economic indicators for restaurant companies, but in the process failed to filter out unnecessary, overlapping, or highly correlated variables. He also stopped short of examining the degree of the impact of economic events on the industry's performance. In fact, few hospitality studies seem to have been interested in identifying and measuring the external value drivers, even though they have dealt with the same conceptually and descriptively.

Table 1: Economic factors and Hospitality Industry

<b>Year</b>	<b>Authors</b>	<b>Economic Variables</b>
1980	Reid & Olsen (Hospitality)	General economy; Inflation; Money supply and interest rate; Availability and cost of energy; Government regulations, Changing life styles and markets
1981	Denoble & Olsen (Restaurants)	Food price; Fuel price; Interest rate;
1982	Denoble & Olsen (Restaurants)	Exogenous (food price, employment policies, inflation, import, export); Endogenous (consumption, investment)
1983	Arbel & Ravid (Hotels)	Energy Price

1986	DeNoble & Olsen (Restaurants)	GNP growth; Purchasing power; Inflation; Interest rates; Energy costs; Disposable income; Unemployment, Money supply
1987	VanDyke & Olsen (lodging)	Labor cost, Food cost, Property tax
1992	Olsen, Tse, & West (Hospitality)	GNP, Fiscal policies(taxation, deficit spending); Monetary policies(interest rate and inflation); Labor(unemployment rates, spending on welfare); Trade(imports and exports); Financial markets(availability of capital); Disposable income
1992	Zhao & Merna (Hospitality)	GNP; Income distribution; Foreign exchange rates; Monetary and fiscal policies; Trade industrial factors; Labor market
1992	Jurowski & Olsen	Cost of fuel; Changes in real exchange rates
1992	Hiemstra & Ismail (Hotels)	Room tax
1993	Haywood (Hospitality & Tourism)	Disposable personal income; GDP, net exports; Disposable income; Saving rate; Population; Labor force; Employment; Consumer price index; Minimum wages; Benefits; Government regulations; Taxes
1994	Barrows & Naka (Restaurant, Lodging, Industrial Stock Returns)	Expected inflation rate; Money supply; Domestic consumption
1998	Wheaton & Rossoff	GDP; Construction cost index in hotels
1998	Choi (Restaurants)	A. Leading Indicators Compensation per hours in business sectors (% change), General business failure rate, Foreign Exchange rates (Yen per U.S. dollar)

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		<p>New York stock exchange composite index, Output per hour of all persons (business sector), index number, Population (total), Saving percentage of disposable income, Unemployment rate, persons unemployed 15-26 weeks, Construction cost index, Average weekly initial claims for unemployment insurance, Consumer expectation (Index of Bureau of Economic Analysis)</p> <p>B. Coincident Indicators</p> <p>Consumer confidence, Disposable income, Dow Jones Industrial Average, Hours of all persons in business sector, percentage change, Index of leading economic indicators, overall economy, Building permits, new private housing units</p> <p>C. Lagging Indicators</p> <p>Preferred stock yield index (yield in percent), Common stock price-earning ratio, CPI for food and beverage, CPI for motor fuels, CPI for food away from home, CPI – U, Discount rate on new issues of 91-day Treasury-bill, Federal fund rate, GDP of service, Average daily rate (hotel industry), Revenue per available room (hotel industry), Manufacturers' new orders in non-durable goods industries, Prime interest rate charged by banks, Dividend yield percent (high), Gross private domestic investment (nonresidential), billions of dollars, The total new construction (value put in place, billions of dollars), Unit labor costs in business sector, percentage change, Total value put in new commercial building construction , Wages &amp; salaries in service industry, Index of coincident economic indicators, overall economy, Index of lagging economic indicators, overall economy</p>
2003	Palmer & Hackmey (Restaurant)	<p>Unemployment rate;</p> <p>Prime rate;</p> <p>Dining-out price inflation</p> <p>Consumer expectations;</p> <p>Wage and salary disbursements</p>

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### **Measurement of Firm Performance**

The dependent variable in the study of strategic management is usually the performance of the firm. Venkatraman and Ramanujam (1986) regarded firm performance as a subset of organizational effectiveness. However, organizational effectiveness is a broader term that captures organizational performance (Cameron & Whetten 1983). Organizational performance is rather external measures of ultimate performance capturing three areas: 1) financial performance such as profits, return on assets (ROA), return on investment capital (ROIC), return on equity (ROE), cash flow; 2) market performance such as sales, market share; and 3) shareholder return such as total shareholder return, economic value added (Devinney, Richard, Yip, & Johnson, 2004).

There are different ways to measure firm or industry performance. Barney (1997) defined organization as an association of productive assets that come together for sake of economic advantages. According to his definition, the performance can be measured on the basis of the following parameters: organizational survival; accounting measures; stakeholders' approaches; and present value approaches. In the field of finance, performance is measured almost exclusively in terms of stakeholders' value. There, the firm's goal is assumed to be to maximize the stockholder's wealth. In other words, in the capability-based field of finance, company's performance is measured in terms of stakeholder groups including shareholders, customers, employees, and communities (Atkinson, Waterhouse, & Wells, 1997). For this reason, the criterion variable in the field of finance tends to consist of one of the variables (proportionality or ratio) related to stock market performance, not variables from pure operational performance. Economists, on the other hand, are inclined to use other macroeconomic factors because their objective is to examine mutual impacts in economics rather than impact on the firm or industry performance from a macro perspective.

The most common and traditional measures for firm performance are profit margin, return on assets, return on equity, earnings per share, price/earning ration, excess value, return on capital, and economic value added. Copeland et al. (1996) favor of return on investment capital (ROIC) rather than ROE or ROA as a measurement of firm's performance, because they believe that ROIC focuses on 'true operating performance', whereas ROE mixes in financial aspects of performance with non-financial aspects. They also suggested that free cash flow (FCF) could serve as a major variable by which a firm's performance could be measured. The idea there is to get at the firm's true operating cash flow that could have been generated for shareholders if the firm had no debt. Copeland noted that financial structure does not generally affect FCF even though it affects the firm's value, since the Weighted Average Cost of Capital (WACC) is affected by financial structure. Snow and Hrebniak (1980) used the ratio of total income to total assets, and Hitt and Ireland (1986) used return on market investment for the measurement of performance. Hall (1992) used the increase in sales per employee to compare the competencies by grouping the high performers and the low performers. Banker, Chang, & Majumdar (1996) pointed out that returns on investment (ROI) and its component ratios such as return on sales

(ROS), return on equity (ROE), and return on assets (ROA) are traditional measures for comparing strategic performance across firms.

Several researchers insist that accounting measures are more practical tools for measuring a firm's performance than market related prices (Oxelheim & Wihlborg, 1997; Oxelheim, 2003). They believe that the significant advantage of accounting measures including financial and operational performance is their usefulness for practitioners. Oxelheim and Wihlborg (1997, 2003) discussed how management exposure caused by macroeconomic events, developing a Macroeconomic Uncertainty Strategy (MUST) analysis. They claimed that the use of commercial (non-financial) cash flows is appropriate for purposes of performance assessment in order to estimate exposure coefficients for the impact of macroeconomic price variables. Other measure was considered more relevant in a general stakeholder perspective, not in management perspective in their study.

Performance evaluation based on profitability and growth has been employed in hospitality strategy (West & Olsen, 1988; Tse & Olsen, 1988; Schaffer & Litschert, 1990; Singh & Gu, 1994; Jogaratnam, 1995). West & Olsen (1988), Tse & Olsen (1988), and West & Anthony (1990) utilized various performance measures such as average return on sales (ROS), average return on assets (ROA), and average growth in unit sales. In their study, they proposed that ROS was the best performance discriminator. Singh and Gu (1994) selected ROA, ROE, and net profit margin (NPM) as the measures of performance to determine the relationship between diversification and financial performance in the restaurant industry. Jogaratnam (1995) used sales level, ROS, market share, cash flow, sales growth rate, and net profit as performance measurements in order to examine the relationships among and between the principal constructs of strategy, environment, and performance from a contingency theory perspective. Occupancy percentage and average daily rate are very commonly used as a measurement for firm performance in the hotel industry (Damonte, Rompf, Bahl, & Domke, 1997).

Some other researchers in the service industry have approached the topic of performance measurement differently. Kish (1982) and Cho (1994) insisted that cash measures were the best

predictors or measures for financial analysis. Kish (1982) found that the ratios dealing with cash flow problems are the best indicators to predict business failure in the food service industry. Cho (1994) pointed out that cash based measures reflect the real demand side of restaurants, like customer's buying behaviors.

The choice of measurement depends on what the measurer is interested in and what the measurement is for (Banker, Chang, & Majumdar, 1996). This study is interested in the variance of the casual theme restaurant industry's operation. In other words, the goal of the study is to provide the management of the casual theme restaurant industry with the tools to understand the economic environment and to decide their course of action when exposed to economic forces. Therefore, the target of the analysis in the study goes with the operations and management perspective, which pay more attention to generating operational performance than to any other financial performance. Operating cash flow used in this study is the real outcomes of the strategic decision made by management and is revealed through operational activities of producing and selling.

### **Complexity of Economic Shocks**

Most economic variables have indirect or direct relationships with each other. The IS-LM model<sup>1</sup> is one of the most familiar economic theories regarding these interactions. The IS curve plots the relationship between the interest rate and the level of income in the commodity market. The LM curve is the relationship between the interest rate and the level of income in the money market. The IS-LM model gathers the most important variables of the economy and links them in a straightforward way. The model comprehends household consumption, public expenditure, tax revenue, imports, exports, GNP, a basic measure of economic level of a nation,

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<sup>1</sup> A Keynesian macroeconomic model, popular especially in the 1960s, in which national income and the interest rate were determined by the intersection of two curves, the IS-curve and the LM-curve. In the IS-LM model, the curve representing the combinations of national income and interest rate at which aggregate demand equals supply for all goods. It is normally downward sloping because a rise in income increases output by more than aggregate demand (through consumption), while a rise in the interest rate reduces aggregate demand through investment.

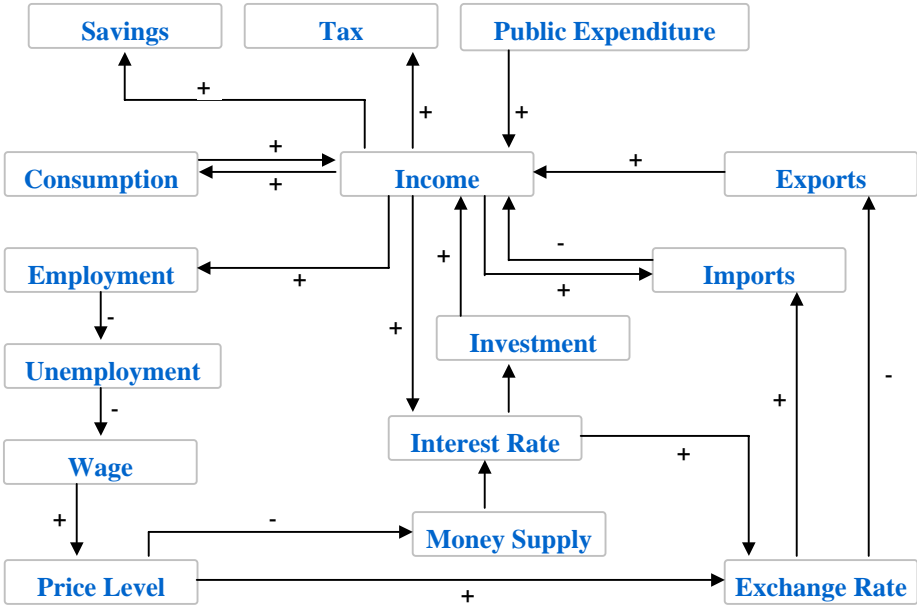
inflation, and interest rates.

There are some claims against this model. The Keynesian IS-LM model focuses on the demand side of the economy - the relationship between national income and the aggregate demand for product (goods and services) by consumers, producers, and governments. The IS-LM model ignores the price level of goods and services, the level of employment, the wage rate of workers, and the amount of output of product. Another weakness of the model is that it ignores the time lag.

However, IS-LM model is still regarded as a basic macro-economic framework for understanding a whole economy, just as the field of finance uses the CAPM and the field of management uses TQM. A simplified description of this model provided in Figure 3 could help to understand the direct/indirect shocks or the inter-correlations among economic value drivers

In Figure 3, a positive sign means that the change in one variable causes a change in the same direction for the other. It can be interpreted that an increase gives rise to an increment. For instance, higher income may mean that people are richer, thus they will additionally spend a part of this new income. By contrast, a negative sign indicates that the change in the second variable is in the opposite direction. The relationship between unemployment and wage is an example. The increase in unemployment might make workers to accept lower wages, both in individual negotiations and in collective bargains.

Figure 3: Relationships among Economic Variables Based on IS-LM Model



**Industry Group**

It is well known that corporate earnings tend to move together because of macroeconomic and industry-wide events that affect many firms in similar ways (Brown and Ball, 1967; Gonedes 1973; Magee 1974). This idea came from industrial organization (IO) theory, which made a great contribution to the development of strategic management research. In between the early development of the strategic management field in the 1960s and the rise of the resource based view theory in the 1980s, IO theory was a major stream of strategic management research (Hoskisson et al, 1999). This change in the strategy research (from inductive case studies based on a single firm to large-scale deductive statistical analyses based on models belonging to the structure-conduct-performance (S-C-P) paradigm) is the effort to seek to validate scientific hypotheses. Originating in the 1970s, strategic management research moved toward industrial organization (IO) economics (Porter, 1980, 1985). Theoretically the research is rooted in the works of Bain (1956, 1968) and Mason (1939). Researchers like Porter (1973) applied IO economics to develop research on strategic groups, and classified firms into those with strategic similarity versus differences. IO economics considers structural aspects of an industry, while

work on strategic groups is largely focused on firm groupings within an industry. The focus of both IO economics and strategic group research is on groups not individual firms.

Bain suggested that the IO approach is basically external and the primary unit of analysis was the industry or competing groups of firms, rather than the individual firm or the economy wide aggregate of enterprises. Porter (1981) summarized that a firm's performance is primarily a function of the industry environment where the firm competes. Consequently, the S-C-P paradigms in strategic management shifted the research focus from the firm to market structure.

Beyond a doubt, both the IO approach and the firm-specific approaches should be employed in order to understand business environmental issues in strategic management within diverse contexts. In the strategic management field, IO economics emphasizes scientific generalizations based on the study of broader sets of firms. Unlike firm-specific analysts, strategy researchers employ multivariate statistical tools (e.g., multiple regression and cluster analysis) with large data samples primarily collected from secondary resources in order to test theory. The development of strategic management into a more "respected" scholarly field of study was at least partially a result of the adoption of "scientific" methods from IO economics (Hoskisson, 1999).

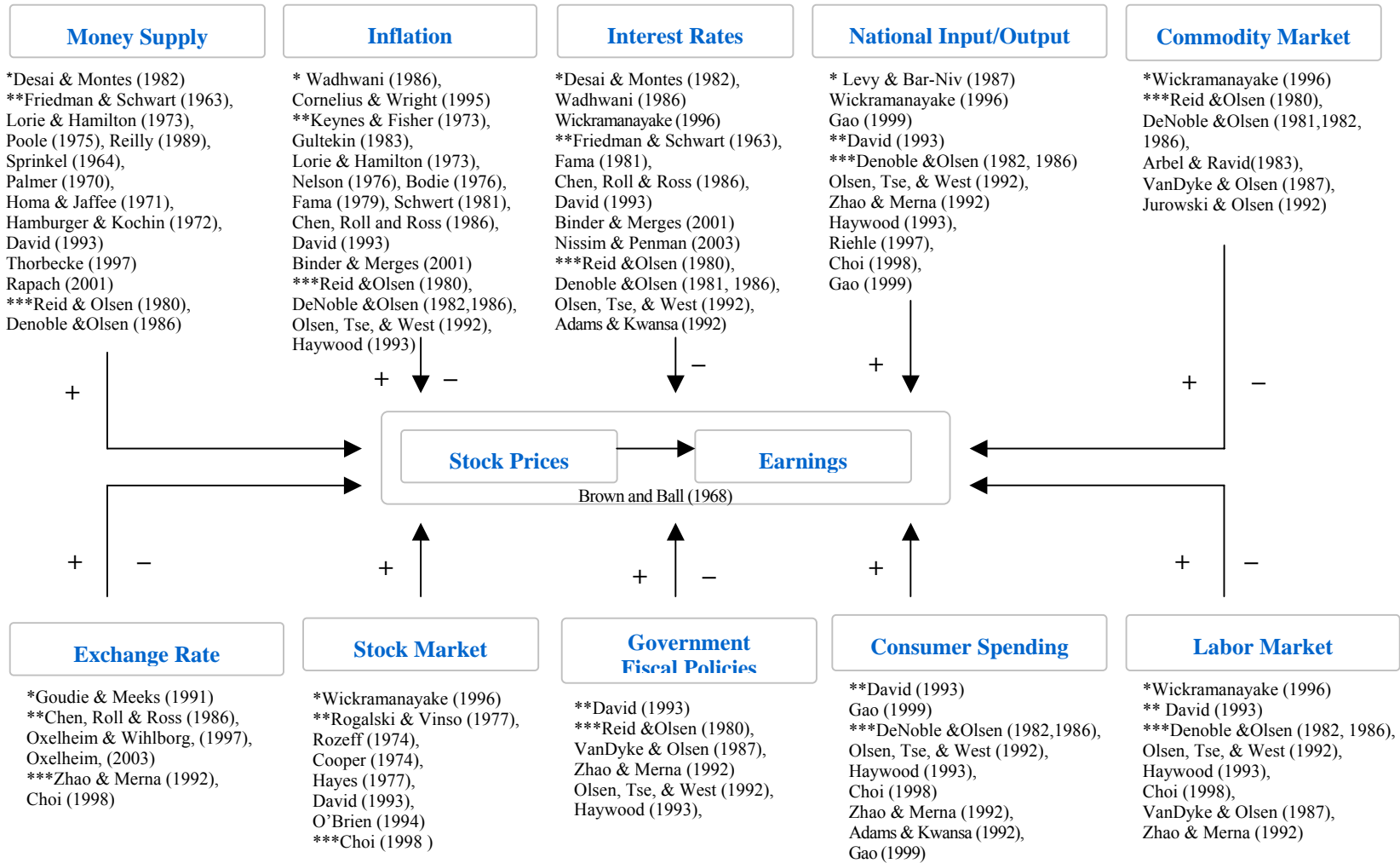
IO theory can support the underlying assumption of this study, that the impacts of the economic environment on an individual firm's performance are similar to all firms within this industry. This study, as an effort to develop a scientific model, investigates one segment of the restaurant industry—the casual theme sector. The result of the study could enable managers to understand the homogeneous movement of the casual theme restaurant industry's performance, and to capture the broad reflection of the effect of economy on the industry group.

## **Rationalization for Potential Economic Value Drivers**

It is important for restaurateurs to keep in mind that the restaurant industry remains sensitive to the nation's business cycles and overall economic climate. The industry has experienced declines in real annual sales only three times within the past two decades — in 1974, 1980 and 1991 — each time having been when the nation's economy was in a recession. Still, these declines show the restaurant industry's sensitivity to fluctuating national business cycles (Riehle, 1997). Therefore, it is believed that there are economic value drivers that can explain the variance of the industry group's performance and the sensitivity to a fluctuating economy.

Based on the literature in finance, economics, accounting and hospitality management, an exhaustive range of economic value drivers has been identified as having a causal relationship with the industry group. Major categories of the value drivers are: commodity markets; foreign currency market; labor markets; inflation; stock market; national income and output; interest rates; government revenue, spending, debt, and taxes; money supply; and consumer spending as suggested in various literature (Figure 4). These possible economic variables from these categories will be analyzed to address the objectives of this study and to identify the significant explanatory/influential factors for the casual theme sector of the restaurant industry.

Figure 4: Overview of Economic Value Drivers and Firm Performance in Literature



Note: \*Economic value drives and business failure \*\*Economic value drivers and stock prices  
 \*\*\* Economic value drivers and profitability in hospitality industry

## **Commodity Market**

Many of the ingredients used in the products sold in the casual theme restaurants are commodities that are subject to unpredictable price volatility. Extreme change in commodity prices and long term changes could affect the industry's financial result adversely. The strategy used by casual theme restaurants in general to cover the negative impact on their cash flows is in most cases the increase in menu prices. However such a quick response of the management to the rising price may be difficult to implement due to existing customers who react sensitively to the menu price change in restaurants. DeNoble & Olsen (1981, 1982) and VanDyke & Olsen (1987) pointed out that the food price is one of major economic variables that influence the restaurant business. Choi (1998) identified the CPI for food and beverage as a lagging economic indicator for restaurant industry business cycle.

The casual theme restaurant industry includes various types of restaurants: bar/grill, steak restaurants, ethnic restaurants, Italian restaurants, seafood restaurants, and the major commodities used are beef, pork, poultry, butter, cheese, and seafood (Mintel Report 2004). For example, Outback Steakhouse's heavy dependence on beef prices can be regarded as a major business risk as the steakhouses account for more than 80% of the company's total restaurants. As in the case of Outback Steakhouse, some rising commodity prices have pressured the casual theme restaurant sector's profitability.

Based on the probable relationships, possible explanatory economic factors related to the casual theme restaurant industry are the change of commodity production, its Consumer Price Index <sup>2</sup>(CPI), and Producer Price Index (PPI) as follows:

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<sup>2</sup> The Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. The Consumer Price Index affects nearly all Americans because of the many ways it is used. Three major uses are as an economic indicator, as a deflator of other economic series, and as a means of adjusting dollar values. The CPI represents about 87 percent of the total U.S. population. It is based on the expenditures of almost all residents of urban or metropolitan areas.

- Industrial Total Production Index, Meat Production Index, Beef Production Index, Pork Production Index, Poultry Production Index, Dairy Production Index, Cheese Production Index, Butter Production Index, Consumer Price Index (CPI) for Food, CPI for Meats/Poultry /Fish/Eggs, CPI for Meats, CPI for Beef/Veal, CPI for Fish/Seafood, CPI for Dairy Related Products, CPI for Cheese Related Products, CPI for Tomatoes, CPI for Fresh Vegetables, Producer Price Index (PPI) for All Commodities, PPI for Meats/Poultry/Fish, and PPI for Meats

### **Foreign Currency Market**

Exposure to market risk from change in foreign currency exchange rates may be directly related to the casual theme restaurant industry. The business risk from foreign currency fluctuation relates primarily to the direct investment and debt in restaurants in other countries and royalties from international franchisees. Darden Restaurants, Brinker International, Outback Steakhouse, and Applebee's International also have several international investments and franchisees. For instance, Outback Steakhouse may be the most affected company due to foreign currency fluctuation among the group, as their investments totaled approximately tens of millions as of 2001,2002, and 2004 (Outback Steakhouse 10-K).

Even though a restaurant company is purely domestic, the change of foreign currency rate is closely related to interest rates and other economic conditions (Oxelheim & Wihlborg 1997). Goudie and Meeks (1991) focused on one key macroeconomic variable, the exchange rate that could cause business failure. In hospitality industry research, Zhao & Merna (1992) and Jurowski & Olsen (1992) indicated that the change in foreign exchange rates have impacts on the hospitality industry. Choi (1998) found that the foreign exchange rates (Yen per U.S. dollar) are a leading indicator of restaurant's business cycle.

Major foreign exchange rates that will be used in this study are:

- Hong Kong Dollar/ U.S Dollar Rate, Japan Yen/ U.S Dollar, U.S Dollar /UK Pound,

Broad Index<sup>3</sup>, and Major Currencies<sup>4</sup>

## **Labor Market**

The restaurant industry employs an estimated 12 million people, making it the nation's largest private-sector employer. The restaurant industry provides work for nearly 9% of those employed in the United States (2004 Restaurant Industry Forecast, 2004). It is well known that the hospitality industry is a very labor-intensive industry and in fact labor cost is the largest single cost of all the operational costs. According to the National Restaurant Association's 2003 Restaurant Industry Operations Report, The Salaries, wages, and benefits are approximately 33 percentages of total sales in full service restaurants (Table 2). Increased employee turnover and higher wage rates may result from a tighter job market and could lead to rising labor costs (Milton 2004). As a result, the increased employee compensation, insurance, and wages would offset increases in sales or lead to changes in business strategies. The concerns about the relationship between labor market and hospitality industry have been made by DeNoble & Olsen (1986), VanDyke & Olsen (1987), Olsen, Tse, & West (1992), Zhao & Merna (1992), Haywood (1993), and Choi (1998).

Table 2: The Restaurant Industry Dollar

	Full service	Limited service*
Where It Came From		
Total Sales	100%	100%
Where It Went		
Cost of Sales	31	30
Salaries and Wages	30	28

<sup>3</sup> The broad index is a weighted average of the foreign exchange values of the U.S. dollar against the currencies of a large group of major U.S. trading partners. The index weights change over time and are derived from U.S. export shares and from U.S. and foreign import shares.

<sup>4</sup> The major currencies index is a weighted average of the foreign exchange values of the U.S. dollar against a subset of currencies in the broad index that circulate widely outside the country of issue. The weights are derived from those in the Broad index

Employee Benefits	3	2
Restaurant Occupancy Costs	5	7
Other	27	25
Income Before Taxes	4	8

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\* Includes quick service and quick/fast casual restaurants

Note: All figures are averages, are computed individually for each cost category, and are rounded. All amounts are reflected as a percentage of total sales.

Source: National Restaurant Association, *2003 Restaurant*

The typical employee in a foodservice occupation is female (55 percent), under 30 years of age (52 percent), single (67 percent), and living in a household with two or more wage earners (79 percent) according to 2004 Restaurant Industry Forecast by National Restaurant Association. Nine out of 10 salaried employees at table service restaurants started as hourly employees (working part-time and averaging 25.3 hours a week) and eating-and-drinking places employ more minority managers than any other industry.

The primary effects on the casual theme restaurant industry may be more reflected in the demand side, not the side of operational costs because unlike Quick service restaurants, casual theme restaurants would be more sensitive to the change in consumer spending. For example, the higher unemployment rate and/or the lower earnings per hour would result in fewer customers than expected. Consequently, the labor market somewhat could affect the casual theme restaurant industry through both the increase in operational costs and the decrease in revenue, so the following variables could explain the variance of the cash flow in the casual theme restaurant industry.

- Civilian Labor Force Level, Employment Level, Employment-Population Ratio, Full Time Employed, Part Time Employed, Unemployment Rate, Total Non-farm Employment, Total Private Employment, Service-Providing Total Employment, Private Service-Providing Total Employment, Total Private Average Hourly Earnings, Average Hourly Earnings for Private Service-Providing, Average Hourly Earnings for Leisure and hospitality, Average Hourly Earnings of Production Workers in Food Services and Drinking Places, Total Compensation Employment Cost Index (ECI) for All Workers,

Total Compensation ECI for Services Industries, Total Compensation ECI for Service Occupations, Wages and salaries ECI for All Workers, Wages and salaries for Services Industries, Wages and salaries for Service Occupations

## **Inflation**

Inflation is a frequent studied economic variable to identify the relationship with business failure and stock prices in finance research. Wadhvani (1986) and Cornelius and Wright (1995) found the significant positive effects of inflation upon rates of bankruptcy, and the causal relations between (unexpected) inflation and stock prices were presented by Keynes and Fisher (1973), Gultekin (1983) and Lorie & Hamilton (1973), Chen et al. (1986). In hospitality researches, Reid & Olsen (1980), Denoble & Olsen (1981,1986), and Choi(1988) regarded inflation an influential factor on the hospitality business.

Inflation has been defined as a process of continuously rising prices, or equivalently, of a continuously falling value of money. Various indexes have been devised to measure different aspects of inflation. The CPI measures inflation as experienced by consumers in their day-to-day living expenses; the Producer Price Index (PPI) measures inflation at earlier stages of the production and marketing process; the Employment Cost Index (ECI) measures it in the labor market; and the Gross Domestic Product Deflator (GDP-Deflator) measures combine the experience with inflation of governments (Federal, State and local), businesses, and consumers. Finally, there are specialized measures, such as measures of interest rates and measures of consumers' and business executives' inflation expectations (U.S. Department of Labor).

The best measure of inflation for a given application depends on the intended use of the data. The CPI is generally the best measure for adjusting payments to consumers when the intent is to allow consumers to purchase, at today's prices, a market basket of goods and services equivalent to one that they could purchase in an earlier period. The following inflation related variables are hypothesized as affecting the revenue and

operational costs in the casual theme restaurant industry.

- Inflation in Consumer Prices at Annual Rates, Inflation in Consumer Prices, Total Consumer Price Index (CPI) for All Urban Consumers, CPI for All Items Less Food and Energy, CPI for All Items Less Food and Shelter, CPI for Energy, CPI for Services, CPI for Food Away From Home, CPI for Food At Home, PPI for Finished Goods Less Food and Energy, and PPI for Non-durable Goods Less Food and Energy

### **Stock Market**

The (causal) relationship between stock market and cash flows seems to be a controversial issue, and in fact none of researchers in the hospitality industry have brought up the relationship except that Choi (1988) used the New York stock exchange composite index as a leading economic indicator in his analysis. In financial research, Rogalski & Vinso (1977), Rozeff (1974), and Cooper (1974) believed and found some evidence that changes in the stock market affect the economy. Hayes (1977) found a close connection between stock market cycles and economic cycles, and even the National Bureau of Economic Research included stock prices, as a leading index of business conditions.

Believing that the stock prices reflect the future profitability of companies, the following major variables can be considered to determine the causal relationship between stock prices and cash flows in the casual theme restaurant industry.

- DJ Industrial Average Close, NASDAQ Composite Index, S&P 500 Close, Composite Index of New York Stock Exchange

### **National Income and Output**

Measures of national income and output are used in economics to estimate the value of goods and services produced in an economy. They use a system of national accounts or national accounting developed by Simon Kuznets in the 1960s. Some of the more common measures are Gross National Product (GNP), Gross Domestic Product

(GDP), Net National Product (NNP), and Net National Income (NNI).

There are several ways to generate the measures. The expenditure approach determines aggregate demand, or Gross National Expenditure, by summing consumption, investment, government expenditure and net exports. On the other hand, the income approach and the closely related output approach can be seen as the summation of consumption, savings and taxation. The three methods must yield the same results because the total expenditures on goods and services (GNE) must by meaning be equal to the value of the goods and services produced (GNP) which must be equal to the total income paid to the factors that produced these goods and services (GNI), although, in actual fact, there will be minor differences in the results obtained from the different methods due to changes in inventory levels

The national income and output is important for the restaurant industry, which usually mirrors the overall health of the economy. Positive changes in real income and an expanding economy correlate with growth in restaurant sales (Riehle, 1997). Better national wealth often results in more disposable income available for spending on food prepared away from home.

The study needs to be especially cautious in this category, because many economic variables are ingredients of GDP or GNP, meaning the high collinearity problem. Possible explanatory variables are:

- Gross Domestic Product, Real Gross Domestic Product, Gross National Product, Personal Consumption Expenditures, Personal Consumption Expenditures for Services, Gross Private Domestic Investment, Net Exports of Goods and Services, Net Exports of Services, Government Consumption Expenditures and Gross Investment (Federal and State/local), Federal Government Consumption Expenditures and Gross Investment, Gross Private Saving, National Income, Value of Total Construction Put in Place, Value of Commercial Construction Put in Place, Value of private Construction Put in Place for Food and Beverage, Value of Construction Put in Place for Food, and Value of

### **Interest Rates**

Numerous studies have documented that stock returns are negatively related to changes in interest rates (Nissim & Penman, 2003; Chen et al., 1986). The negative correlation may be attributed to changes in the discount rate, a denominator effect in a valuation model. Most interest rate exposure concepts such as maturity gap, duration, modified duration, and value at risk have been developed in the financial sector where both assets and liabilities are financial and thus tend to be limited to the measurement of the exposure of financial assets and liabilities. Although interest rate is possibly correlated to non-financial assets and cash flows, few firms go beyond financial positions when measuring interest rate risk.

In hospitality industry research, Olsen (1980), DeNoble & Olsen (1981, 1982, 1986), Olsen, Tse, & West (1992) brought up the concern about the interest impacts on the hotel and restaurant industry. For the first time in the hospitality industry, Barrows and Naka (1994) attempted to investigate the effect of macroeconomic variables on hospitality stock returns of three groups (restaurant, lodging, and industrial group) in the U.S., based on the arbitrage pricing theory. They found that the term structure of interest rate was positively correlated with stock returns, but the regression results showed the term structure of interest rates is not a significant factor in explaining explain the variance of any of hospitality group.

An interest rate is significant in evaluating an operational result for four reasons. First, the change in interest rate affects the firm's cost of capital and thus the discount rate applied to future cash flows and current interest costs (Oxelheim & Wihlborg, 1997). Secondly, the decrease in interest rates generally provides firms with more growth opportunity because the lower interest rate means the lower cost of investment. Thirdly, consumer spending is affected by the interest rate change by such activities as refinancing

home equity line of credit or debt consolidation (Campbell, 1989). Fuhrer (1993) found that as the interest rate falls, consumer confidence (or sentiment) tends to rise in his quarterly regression analysis of sentiment on broad macroeconomic aggregates for thirty years. Carroll, Fuhrer, & Wilcox (1994) found that lagged values of the University of Michigan's Index of Consumer Sentiment (ICS) explained about 14% of the variation in the growth of total real personal consumption expenditures over the post-1954 period. Lastly, other macroeconomic variables such as aggregate demand in an economy tend to be related to the interest rate (Oxelheim & Wihlborg, 1997).

Considering the previous research and theories, the following economic variables are investigated in this study in order to find the effect of the interest rate fluctuation.

- AAA Corporate Bonds, BAA Corporate Bonds, 3-month CD Rate, 3-month Non-financial Commercial Paper Rate, Federal funds rate, Bank Prime Loan Rate, 6-Month Treasury Constant Maturity Rate, 6-month Treasury Bills - Secondary Market, 1-Year Treasury Constant Maturity Rate, 5-Year Treasury Constant Maturity Rate, and 10-Year Treasury Constant Maturity Rate

### **Government Revenue, Spending, Debt, and Taxes**

Government Revenue, Spending, and Debt may be considered a value driver that can explain the variance of the restaurant industry profitability because government policy may change the regulation on taxes and the federal government surplus or deficit may affect the level of money supply or other economic variables (David, 1993).

Gavin et al. (2004) found that monetary policy had important effects on the behavior of the business cycle prior to 1980, but these effects are considerably less in post-1980 calibrations of the model. Haywood (1998) presented the importance of government regulations and taxes for the hospitality industry. While Government Revenue, Spending, and Debt may not be directly related to the firm's performance, the tax rate itself is a component affecting the operational cash flow. Therefore the variables proposed here include:

- Treasury Department Gross Tax Collections, Individual Income Taxes, Corporate Income Taxes, Federal Government Current Surplus or Deficit, and Federal Budget Surplus or Deficit

### **Money Supply**

Money is the set of assets in the economy that people regularly use to buy goods and services from other people, and money stock is the quantity of money circulating in the economy. There are different ways of measuring the money stock in the economy: M1 and M2. The most familiar form of money used is M1 that includes: Coins, Currency, Check Deposits, and Travelers Checks. M2 is a broader measure of money than M1. M2 includes M1, Savings Deposits, Small Time Deposits, Money Market Mutual Funds, and other minor categories (Mankiw, 2000).

Lorie & Hamilton (1973), Poole (1975), Reilly 1989) found convincing and overwhelming evidence that changes in the rate of money supply growth lead to changes in equity prices. The money market is often mentioned and found as a major factor that explain a significant level of the insolvency. Money market related variables are as follows:

- M1 Money Stock, M2 Money Stock, and M3 Money Stock

### **Consumer Spending**

A higher level of consumer spending can be expected to increase the frequency of dining out and is likely to directly relate to the sales of the casual theme restaurant industry. Haywood (1993) found that consumer expenditures on hospitality and tourism products and services changes in accordance with changes in disposable income, and thus has an impact on the sales of hospitality and tourism services Therefore the proposed variables are:

- Total Disposable Personal Income, Personal Consumption Expenditures, Personal Consumption Expenditures for Food, Personal Income, Disposable Personal Income Per Capita, Wage and Salary Disbursements, US Total Retail Sales, US Total Retail Sales and Food Services, US Retail Sales for Food and Beverage Stores, US Retail Sales for Food

Services and Drinking Places, US Retail Sales for Full Service Restaurants, Index of Consumer Expectations, Consumer Sentiment, and Index of Consumer Confidence

Table 3s contains a summary of economic value drivers that are hypothesized to affect the composite cash flow of the casual theme restaurant industry and their sources and measures in this study. It is hypothesized that the potential economic variables in the table 3s have relationships to the operational performance of the casual theme restaurant industry. This is based on previous researches regarding the relationships between economic events and financial performance (i.e. stock price, cash flows, ROI, ROA, and FCF), business failures, and other descriptive studies that focused on the economic issues for a firm and industry. This study will attempt to identify the set of economic variables that can explain the variance of the industry's operational performance through three statistical methods that will be described in the chapter 3.

Table 3. 1: Potential Economic Value Drivers: Commodity Market

Economic Variable	Measure	Source
Industrial Total Production Index	IPI	Federal Reserve Statistics
Meat (Animal Slaughtering and Processing) Production Index	IPIMEAT	Federal Reserve Statistics
Beef Production Index	IPIBEEF	Federal Reserve Statistics
Pork Production Index	IPIPORK	Federal Reserve Statistics
Poultry Production Index	IPIPOUL	Federal Reserve Statistics
Dairy Production Index	IPIDAIR	Federal Reserve Statistics
Cheese Production Index	IPICHEE	Federal Reserve Statistics
Butter Production Index	IPIBUTT	Federal Reserve Statistics
Consumer Price Index (CPI) for Food	CPIFOOD	U.S. Bureau of Labor Statistics
CPI for Meats, Poultry, Fish, and Eggs	CPIMPFE	U.S. Bureau of Labor Statistics
CPI for Meats	CPIMEAT	U.S. Bureau of Labor Statistics
CPI for Beef and Veal	CPIBEEF	U.S. Bureau of Labor Statistics
CPI for Fish and Seafood	CPISEA	U.S. Bureau of Labor Statistics
CPI for Dairy and Related Products	CPIDAIR	U.S. Bureau of Labor Statistics
CPI for Cheese and Related Products	CPICHEE	U.S. Bureau of Labor Statistics
CPI for Tomatoes	CPITOMA	U.S. Bureau of Labor Statistics
CPI for Fresh Vegetables	CPIVEG	U.S. Bureau of Labor Statistics
Producer Price Index (PPI) for All Commodities	PPI	Federal Reserve Economic Data: St. Louis Fed
PPI for Meats, Poultry, and Fish	PPIMPF	Federal Reserve Economic Data: St. Louis Fed
PPI for Meats	PPIMEAT	Federal Reserve Economic Data: St. Louis Fed

Table 3. 2: Potential Economic Value Drivers: Foreign Exchange

Economic Variable	Measure	Source
Foreign Exchange (FX) Rate; Hong Kong dollar/ U.S dollar	EXHKUS	Federal Reserve Bank
Foreign Exchange (FX) Rate; Japan yen/ U.S dollar	EXJPUS	Federal Reserve Bank
Foreign Exchange (FX) rate; U.S dollar /UK pound	EXUSUK	Federal Reserve Bank
Broad Index	BROAD	Federal Reserve Bank
Major Currencies	MFX	Federal Reserve Bank

Table 3. 3: Potential Economic Value Drivers: Labor Market

Economic Variable	Measure	Source
Civilian Labor Force Level	LABORF	Bureau of Labor Statistics
Employment Level	EMPLO	Bureau of Labor Statistics
Employment-Population Ratio	EMPPP	Bureau of Labor Statistics
Usually Work Full Time Employed	EMPFULL	Bureau of Labor Statistics
Usually Work Part Time Employed	EMPPART	Bureau of Labor Statistics
Unemployment Rate	UNEMP	Bureau of Labor Statistics
Total Non-farm Employment	EMPT	Bureau of Labor Statistics
Total Private Employment	EMPPRI	Bureau of Labor Statistics
Service-Providing Total Employment	EMPSER	Bureau of Labor Statistics
Private service-providing Total Employment	EMPPRIS	Bureau of Labor Statistics
Total Private Average Hourly Earnings	HRPRI	Bureau of Labor Statistics
Average Hourly Earnings for Private Service-Providing	HRPRIS	Bureau of Labor Statistics
Average Hourly Earnings for Leisure and hospitality	HRLH	Bureau of Labor Statistics
Average Hourly Earnings of Production Workers in Food Services & Drinking Places	HRFB	Bureau of Labor Statistics
Total Compensation Employment Cost Index (ECI) for All Workers	ECICOM	Bureau of Labor Statistics
Total Compensation ECI for Services Industries	ECICOSI	Bureau of Labor Statistics
Total Compensation ECI for Service Occupations	ECICOSO	Bureau of Labor Statistics
Wages and salaries ECI for All Workers	ECIWAG	Bureau of Labor Statistics
Wages and salaries for Services Industries	ECIWASI	Bureau of Labor Statistics
Wages and salaries for Service Occupations	ECIWASO	Bureau of Labor Statistics

Table 3. 4: Potential Economic Value Drivers: Inflation

Economic Variable	Measure	Source
Inflation in Consumer Prices at Annual Rates	INFLAR	Economagic.com: Economic Time Series
Inflation in Consumer Prices	INFLA	Economagic.com: Economic Time Series
Total Consumer Price Index (CPI) for All Urban Consumers	CPI	Federal Reserve Economic Data: St. Louis Fed
CPI for All Items Less Food and Energy	CPILEFE	Federal Reserve Economic Data: St. Louis Fed
CPI for All Items Less Food and Shelter	CPILEFS	U.S. Bureau of Labor Statistic
CPI for Energy	EPIENER	Federal Reserve Economic Data: St. Louis Fed
CPI for Services	CPISER	U.S. Bureau of Labor Statistic
CPI for Food Away From Home	CPIAWAY	U.S. Bureau of Labor Statistic
CPI for Food At Home	CPIHOME	U.S. Bureau of Labor Statistic
PPI for Finished Goods Less Food and Energy	PPILEFE	Federal Reserve Bank of Dallas: Economic & Financial Data
PPI for Non-durable Goods Less Food and Energy	PPINOND	Federal Reserve Bank of Dallas: Economic & Financial Data

Table 3. 5: Potential Economic Value Drivers: Stock Market

Economic Variable	Measure	Source
DJ Industrial Average Close	DJIN	Wall Street Journal (Dow Jones & Company)
NASDAQ Composite Index	NASDAQ	Wall Street Journal (NASDAQ Stock Market)
S&P 500 Close	SP500	Wall Street Journal (Standard & Poor's)
Composite Index of New York Stock Exchange	NYSEC	Wall Street Journal (New York Stock Exchange)

Table 3. 6: Potential Economic Value Drivers: National Income and Output

Economic Variable	Measure	Source
Gross Domestic Product	GDP	U.S. Department of Commerce
Real Gross Domestic Product	GDPQ	U.S. Department of Commerce
Gross National Product	GNP	U.S. Department of Commerce
Personal Consumption Expenditures	PCE	U.S. Department of Commerce
Personal Consumption Expenditures for Services	PCESER	U.S. Department of Commerce
Gross private domestic investment	PRINV	U.S. Department of Commerce
Net exports of goods and services	EXPORT	U.S. Department of Commerce
Net Exports of Services	EXPOSER	U.S. Department of Commerce
Government Consumption Expenditures and Gross Investment (Federal & State/local)	GCEINV	U.S. Department of Commerce
Federal Government Consumption Expenditures and Gross Investment	FGCEIN	U.S. Department of Commerce
Gross Private Saving	SAVING	U.S. Department of Commerce
National Income	NINCOM	U.S. Department of Commerce
Value of Total Construction Put in Place	CONSTR	U.S. Census Bureau, Manufacturing and Construction Division
Value of Commercial Construction Put in Place	CONSTCO	U.S. Census Bureau, Manufacturing and Construction Division
Value of private Construction Put in Place for Food/Beverage	CONSTFB	U.S. Census Bureau, Manufacturing and Construction Division
Value of Construction Put in Place for Food	CONSTF	U.S. Census Bureau, Manufacturing and Construction Division
Value of Dining/Drinking Construction Put in Place for Dining/Drinking	CONSTDI	U.S. Census Bureau, Manufacturing and Construction Division

Table 3. 7: Potential Economic Value Drivers: Interest Rate

Economic Variable	Measure	Source
AAA Corporate Bonds	AAA	Federal Reserve Bank
BAA Corporate Bonds	BAA	Federal Reserve Bank
3-month CD Rate	CD3M	Federal Reserve Bank
3-month Non-financial Commercial Paper Rate	CP3M	Federal Reserve Bank
Federal funds rate	FEDFUND	Federal Reserve Bank
Bank Prime Loan Rate	PRIME	Federal Reserve Bank
6-Month Treasury Constant Maturity Rate	TCM6M	Federal Reserve Bank
6-month Treasury Bills - Secondary Market	TB6M	Federal Reserve Bank
1-Year Treasury Constant Maturity Rate	TCM1Y	Federal Reserve Bank
5-Year Treasury Constant Maturity Rate	TCM5Y	Federal Reserve Bank
10-Year Treasury Constant Maturity Rate	TCM10Y	Federal Reserve Bank

Table 3. 8: Potential Economic Value Drivers: Government Revenue, Spending, Debt, and Taxes

Economic Variable	Measure	Source
Treasury Department Gross Tax Collections	TAX	U.S. Department of the Treasury, Internal Revenue Service (IRS)
Individual Income Taxes	TAXIND	U.S. Department of the Treasury, Internal Revenue Service (IRS)
Corporate Income Taxes	TAXCO	U.S. Department of the Treasury, Internal Revenue Service (IRS)
Federal Government Current Surplus or Deficit	FGACC	U.S. Department of the Treasury, Financial Management Service
Federal Budget Surplus or Deficit	FDEBT	U.S. Department of the Treasury, Financial Management Service

Table 3. 9: Potential Economic Value Drivers: Money Market

Economic Variable	Measure	Source
M1 Money Stock	M1	Federal Reserve Economic Data: St. Louis Fed
M2 Money Stock	M2	Federal Reserve Economic Data: St. Louis Fed
M3 Money Stock	M3	Federal Reserve Economic Data: St. Louis Fed

Table 3. 10: Potential Economic Value Drivers: Consumer Spending

Economic Variable	Measure	Source
Total Disposable Personal Income	DISPOIN	U.S. Department of Commerce
Personal Consumption Expenditures	CONSUM	U.S. Department of Commerce
Personal Consumption Expenditures for Food	CONSUMF	U.S. Department of Commerce
Personal Income	PERINCO	U.S. Department of Commerce
Disposable Personal Income Per Capita	PERCDIS	U.S. Department of Commerce
Wage and Salary Disbursements	WAGDIST	U.S. Department of Commerce
US Total Retail Sales	RETAIL	U.S. Census Bureau: Monthly Retail Trade Survey
US Total Retail Sales and Food Services	RETNFS	U.S. Census Bureau: Monthly Retail Trade Survey
US Retail Sales for Food and Beverage Stores	RETFBS	U.S. Census Bureau: Monthly Retail Trade Survey
US Retail Sales for Food Services and Drinking Places	RETFBP	U.S. Census Bureau: Monthly Retail Trade Survey
US Retail Sales for Full Service Restaurants	RETFULL	U.S. Census Bureau: Monthly Retail Trade Survey
Index of Consumer Expectations	SENTIM	Conference Board
Consumer Sentiment	CCI	University of Michigan
Index of Consumer Confidence	CEI	Conference Board

## CHAPTER THREE

### METHODOLOGY

As mentioned in chapter one, this study examined the causal effect of economic value drivers (variables) on the industry wide operational cash flow. This chapter provides: (1) a proposition and research questions; (2) an introduction to data collection; (3) an introduction to the lagged effect of economic value drivers; (4) an introduction to three statistical techniques for data analysis.

#### **Research Design**

#### **Research Questions**

The methodology is based on the following operational questions under three major research questions that were mentioned in Chapter one.

1. What economic value drivers have causal effects upon the casual theme restaurant industry sector's operating cash flows?
  - What value drivers have co-movement with operating cash flow and at what time lags do the value drivers move together?
  - What value drivers have a causal effect on operating cash flow?
  
2. How much of the variance of cash flow in the casual theme restaurant industry can be explained by the economic value drivers?
  - What value drivers can maximize the explanation of the variance in the operational cash flow?
  - How much variance of the cash flow is likely to be explained by the value drivers?

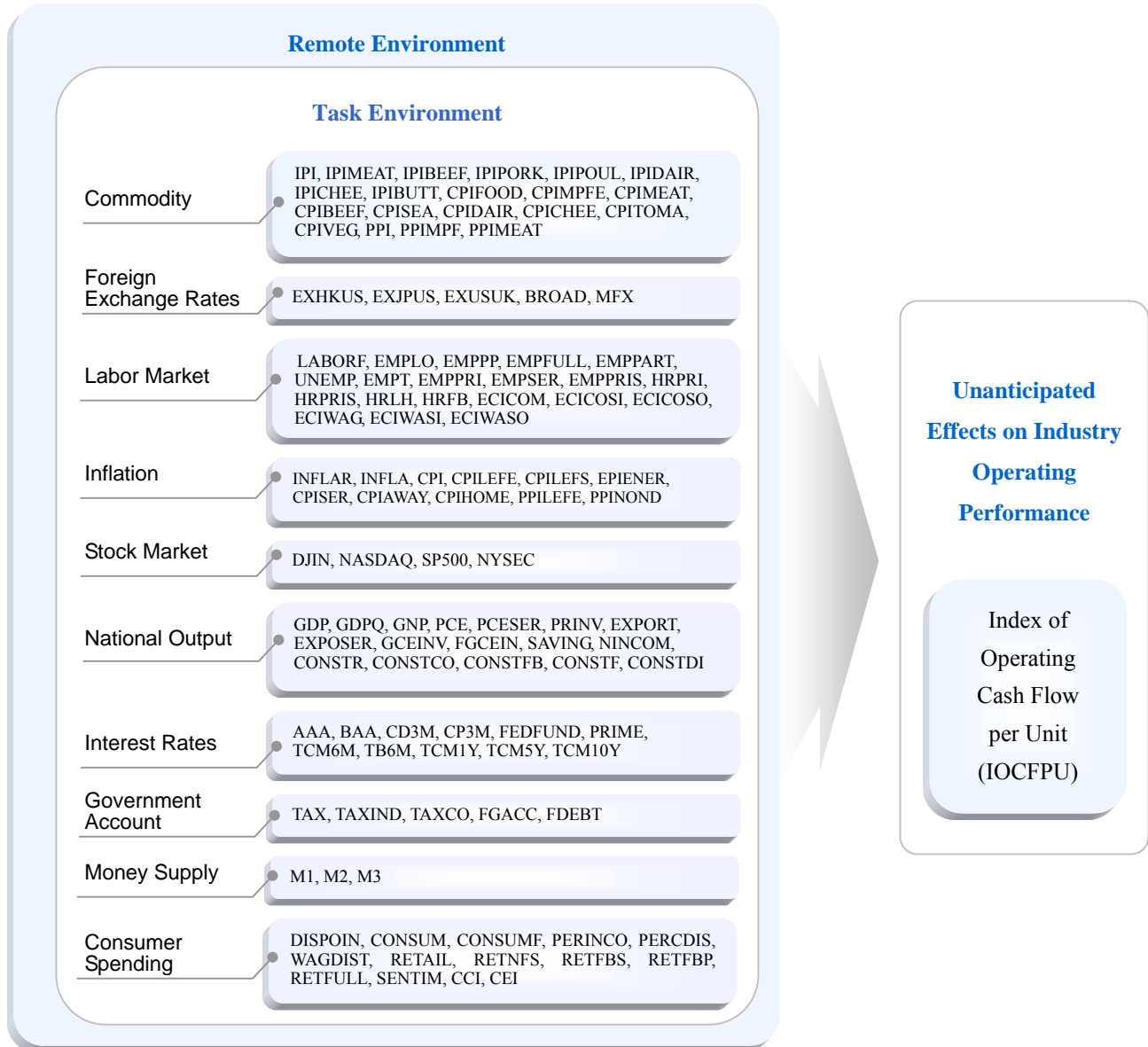
3. What is the sensitivity of the industry operating cash flows to changes in those economic value drivers?

- What value driver is the most influential on the operating cash flow?
- What level of sensitivity does each of influential value drivers have?

### **Proposition and Hypothesized Model**

The research questions are framed by the research proposition, “A set of macroeconomic factors affects the variance of the industry wide performance of the casual theme restaurant industry”. It is believed that a combination of economic value drivers can explain the variance in industry operational cash flows. The variance is, in most cases, out of the control of management, and thus presents the economic risk of the casual theme restaurant industry. The economic variables that were hypothesized to have an impact on the variance in the operational cash flow include the broad categories of commodity price, foreign currency market, labor market, inflation, stock market, national income and output, interest rate, government account, money supply, and consumer spending. Therefore, the conceptual model reflecting these proposed relationships is further developed in Figure 5.

Figure 5: Hypothesized Model for Unanticipated Effects of the Economic Environment on Industry Performance



Note: \* The details of economic value drivers (Variables) are described in Chapter 2

## **Data Collection**

### **Sources of Data**

This study employed secondary data from COMPUSTAT, Securities and Exchange Commissions (SEC) filings, Government, Investment banks, and other associations. Detailed sources regarding economic variables are Board of Governors of the Federal Reserve System, Federal Reserve Bank of New York, International Monetary Fund, Moody's Investor Service, National Association of Realtors, New York Stock Exchange, Standard & Poor's Corporation, the Conference Board, U.S Department of Agriculture, U.S Department of Commerce-Bureau of Economic Analysis, U.S Department of Commerce, Bureau of the Census, U.S Department of Labor-Bureau of Labor Statistics, U.S. Department of the Treasury, and University of Michigan.

### **Firm Selection**

Firms are selected for an industry group using Standard Industrial Classification (SIC) codes and observing the similarity of the firms' strategies. All selected firms are in the category of the casual theme restaurant industry. The underlying assumption is that the impacts of external economic factors on strategic group will be similar for members of the group. Selected casual theme restaurants as an industry group are Applebee's International Inc (APPB<sup>5</sup>), Benihana Inc (BNHNA), CBRL Group Inc (CBRL), O'Charleys Inc (CHUX), Darden Restaurant (DRI), Brinker International Inc (EAT), Max & Ermas Restaurants (MAXE), Outback Steakhouse Inc (OSI), Rare Hospitality International Inc (RARE), Ruby Tuesday (RI), Lone Star Steakhouse Saloon (STAR). (Refer to Appendix A). Table 4 presents the market share of selected firms for the sample in this study. The eleven-selected casual theme restaurant represents approximately 67% of the casual theme restaurant industry<sup>6</sup> and 13% of the total restaurant industry<sup>7</sup> in

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<sup>5</sup> Ticker Symbol

<sup>6</sup> Publicly traded firms

terms of market capitalization in 2004. As for sales, the selected restaurants make up about 13% of the full service category's sales<sup>8</sup> and 7% of the total restaurant industry sales<sup>9</sup> in 2003. (Refer to Appendix C for the details of each firm's share)

Table 4: Market Share of Selected Firms

	Sales (As of 2003, \$ in millions)	Market Share	Market Capitalization (As of 2004, \$ in millions)	Market Share
Total Restaurant Industry	291,899	100%	149,333	100%
Full Service Restaurant Industry***	147,767	51%		
Casual Restaurant Industry****			27,989	19%
Selected restaurant industry	18,982	<b>*13%</b>	18,890	<b>**67%</b>
APPB	990		2,311	
BNHNA	203		46	
EAT	3,707		3,341	
OSI	3,202		3,313	
RARE	843		1005	
STAR	670		542	
CHUX	759		451	
CBRL	2,381		2034	
MAXE	183		38	
DRI	5,003		4258	
RI	1,041		1551	

\* The proportion of full service industry \*\* The proportion of casual restaurant industry

\*\*\* Including private and publicly traded firms \*\*\*\* Including publicly traded firms

<sup>7</sup> Publicly traded firms

<sup>8</sup> Publicly traded and private firms

<sup>9</sup> Publicly traded and private firms

## **Time Frame**

All of the data are quarterly data, because annual data may eliminate the cyclical and other detailed aspects (Sherman, 1991) and daily/monthly data may not capture the trends with such a narrowed view (Burns & Mitchell, 1946). All the time series of economic and industry financial data except for interest rates that are already stationary are computed by the change/growth (%) or/and will be transformed into natural logs. The logarithmic transformation often removes enough skewness to allow least squares models to produce unbiased results. The time period observed is ten years from 1994 to 2003. The choice of a ten-year period is based upon the following reasons: the reliability of regression model and the availability of the number of data from casual theme restaurants.

## **Dependent Variable: Index of Industry Operating Cash Flow per Unit**

For firm performance, aggregated operating cash flows from the eleven casual theme restaurants listed earlier were used. The cash generated from the operations of a company (Operating Cash flow, OCF), generally defined as revenues less all-operating expenses, but calculated through a series of adjustments to net income. This is the cash generated in the course of a company executing its strategy.

OCF is arguably a better measure of a business's profits than earnings, because a company can show positive net earnings and still not be able to pay its debts. OCF also can be used as a check on the quality of a company's earnings. If a firm reports record earnings but negative cash, it may be using aggressive accounting techniques. Most analysts and financial experts agree operating cash flow is a more transparent measure of financial health. Wayman (2003) argues that operating cash flow is a better metric of a company's financial health than net income for two main reasons. First, cash flow is harder to manipulate under Generally Accepted Accounting Principles (GAAP) than net income, although it can be done to a certain degree. Second, a company that does not generate cash over the long term cannot survive among its competitors.

There are various approaches to generate the operational cash flow but they all produce the same answer. Different definitions of operating cash flow simply amount to different ways of manipulating basic information about sales, costs, depreciation, and taxes to get at cash flow (Ross et al., 2003). To calculate operating cash flow, three adjustments should be made. First, depreciation must be included because it is a non-cash expense, and interests must be excluded because it is a financing expense. The last adjustment is to subtract taxes because taxes are paid in cash.

In this study, the bottom-up approach is used to calculate the operational cash flow of each company as follows:

Equation 1. Operating Cash flow

$$\begin{aligned} \text{Operating Cash Flow} &= \text{Earning Before Interests and Taxes (EBIT)} \\ &+ \text{Depreciation} \\ &- \text{Taxes} \end{aligned}$$

Where EBIT is defined as sales minus costs and depreciation

Then, the Composite Operating Cash Flow for the casual theme restaurant industry is calculated by

Equation 2. Industry Composite Operating Cash Flow

$$\text{Industry Operating Cash Flow (OCF)} = \sum_{i=1}^{11} X_i$$

Where  $X_i$  is the operational cash flow of an individual casual theme restaurant firm.

### Standardization of Dependent Variable

In order to insure the appropriate analysis of the dependent variable, the index of operating cash flow, among a wide range of restaurants and company size, it is necessary to standardize the measure of operating cash flow. Therefore, for the purpose of creating

better benchmarks, the industry operating cash flow is standardized by the number of restaurants of the selected casual theme restaurants as shown in Equation 3.

Equation 3. The Standardization of Industry Cash Flow

Index of Industry Operating Cash Flow per Unit (IOCFPU)

$$= \text{OCF} / \text{Total Number of Restaurants}$$

The standardized performance, or operation cash flow per unit in this study, eliminates the variance of performance that is caused by the growth in the number of new units in the casual theme restaurant industry. Therefore, the real variance of cash flow that is explained by economic value drivers is analyzed with the standardization of data. Using quarterly data for the period 1994-2003, the dependent variable has forty composite observations to be analyzed in the study.

#### *Treatment of Different Fiscal Periods*

While a majority of companies have a fiscal quarter which coincides with the calendar quarter (ending in March, June, September, December), some employ different accounting periods. In the sample of this study, Applebee's International Inc (APPB<sup>10</sup>), Benihana Inc (BNHNA), O'Charleys Inc (CHUX), Brinker International Inc (EAT), , Outback Steakhouse Inc (OSI), Rare Hospitality International Inc (RARE), and Lone Star Steakhouse Saloon (STAR) have quarter reports that provide financial results and information regarding other company's position based on calendar quarters. However, CBRL Group Inc (CBRL) and Max & Ermas Restaurants (MAXE) report their quarterly results at the end of January, April, July, and October, and Darden Restaurants (DRI) and Ruby Tuesday's (RI) do at the end of February, May, August, and November.

Therefore, the data of CBRL, MAXE, DRI, and RI including operational cash

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<sup>10</sup> Ticker Symbol

flows (EBITDA, depreciation, and taxes) and restaurant number are transformed into the calendar quarterly data so that an industry index can be made for a dependent variable. The converted data set is computed as shown in Table 5.

Table 5: Computation of Fiscal Period Varying Cash Flow

	APPB, BNHNA, EAT, OSI, RARE, STAR, & CHUX	CBRL & MAXE	DRI & RI
Fiscal Quarter Ending	March, June, September, and December	January, April, July, and October	February, May, August, and November
1 <sup>st</sup> Quarter	Jan, Feb, Mar (JFM)	=1/3NDJ+2/3FMA	=2/3DJF+1/3MAM
2 <sup>nd</sup> Quarter	April, May, June (AMJ)	=1/3FMA+2/3MJJ	=2/3MAM+1/3JJA
3 <sup>rd</sup> Quarter	July, Aug, Sept (JAS)	=1/3MJJ+2/3ASO	=2/3JJA+1/3SON
4 <sup>th</sup> Quarter	Oct, Nov, Dec (OND)	=1/3ASO+2/3NDJ	=2/3SON+1/3DJF

\* NDJ = Aggregated data of November, December, January

FMA= Aggregated data of February, March, April

MJJ= Aggregated data of May, June, July

ASO= Aggregated data of August, September, October

DJF= Aggregated data of December, January, February

MAM= Aggregated data of March, April, May

JJA= Aggregated data of June, July, August

SON= Aggregated data of September, October, November

### Lagged Effect of Economic Value Drivers

A high correlation coefficient between two time series indicates that values at time t in the two series tend to be of the same sign. Sometimes values at time t in one series is related to values at different times in the other series. As such, the simple correlation coefficient between two series properly aligned in time poorly summarizes the relationship.

Such a conclusion ignores the fact that not all economic or business situations imply such instantaneous relationships between the dependent and independent variables. In many cases there should be the possibility that time might elapse between a change in

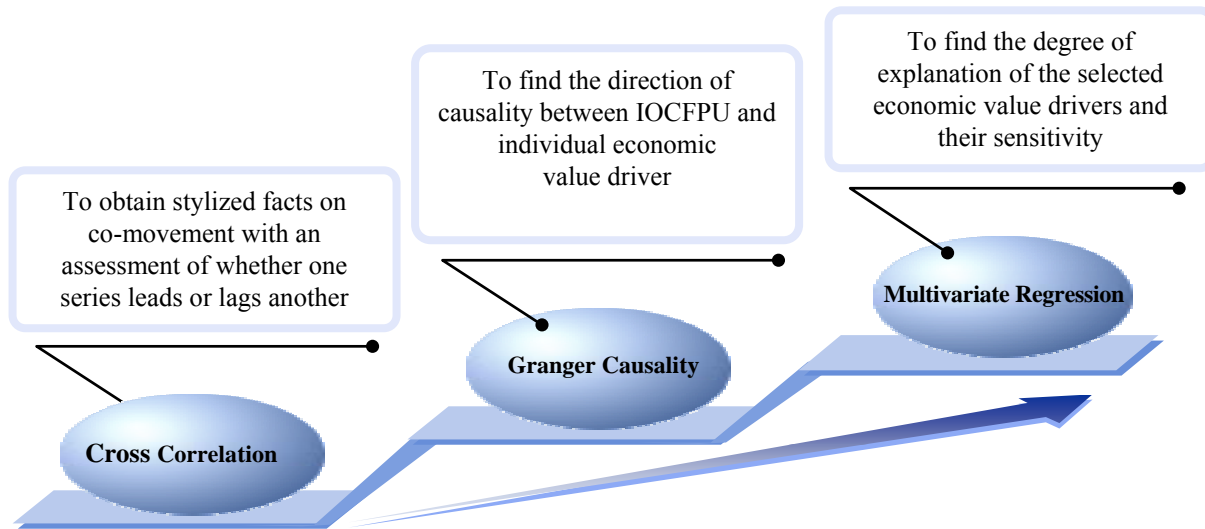
the independent variable and the resulting change in the dependent variable (Studenmund, 2000). The length of this time between cause and effect is called a lag. Many econometric equations include one or more lagged independent variables like  $X_{t-1}$ , where the subscript  $t-1$  indicates that the observation of  $X$  is from the time period previous to time period  $t$ . Additionally, lagged independent variables could be introduced to capture expectations (Oxelheim & Wihlborg, 1997). Lagged relationships are characteristic of many economic analyses since the movements in the economy do not occur at the same time and they often have time varying effects.

## **Data Analysis**

With the above database, the following analysis was conducted to answer the research questions. This study divided the possible economic value drivers into two groups: Macroeconomic value drivers and industry specific value drivers. Stockman (1988) investigated the amount of the variation in industrial production growth that was due to industry specific shocks and to nation specific shocks, and he reasoned that in real business cycle models, industry specific shock should be more important than nation specific shock. On the other hand, in models emphasizing the real effects of monetary and other macroeconomic policies, nation specific shocks should be more important than industry specific shocks. His finding showed that both industry specific and nation specific shocks are empirically important.

Three steps will be conducted to analyze the relationships between economic variables and the industry operational performance: Cross Correlation, Granger Causality Test, and Time Series Multivariate Regressions. Cross Correlation and Granger Causality Tests are used to filter and select major economic value drivers as explanatory factors of casual theme restaurants. Time Series Multivariate Regressions will be used to measure the sensitivity of the restaurants operating cash flow to changes in these external value drivers and the degree of explanation of the selected economic value drivers as presented in Figure 6. All of this process will be conducted using the SPSS program.

Figure 6: Three Steps to Identify Influential Economic Value Drivers on The Operating Cash Flow of Casual Theme Restaurant Industry



### **Cross Correlation Functions (CCF)**

The cross correlation function (CCF) computes correlations between two variables (or series as statisticians refer to them) in which the values of one series are displaced by any specified number of time periods. This displacement can be both forwards or backwards and hence allows the study to obtain stylized facts on co-movement with an assessment of whether one series leads or lags another. As mentioned before, the lag effects of the variables should insure the robustness of the analysis and findings.

While a simple correlation matrix might be prone to ignore the lead-lag relationship between variables, some researchers have used a new test for lead-lag relationships based on cross correlations (Brooks, Garrett, & Hinich, 1999). The CCF is a preliminary step for further regression analysis. The CCF analyzes (lagged) co-movements between the industry index of cash flow (dependent variable) and all possible

economic variables (independent variable), and provides the opportunity to reduce the collinearity problem among economic variables. For example, before constructing expectations models based on multiple-input transfer functions (MITF), Koreisha (1984) determined which periods have the greatest effects on the dependent variable, by calculating lead and lag cross correlations between innovations related to the variables in the model.

There are two major reasons that the CCF is employed in this study. First, by inspecting the CCF between two series the lag at which they are most highly correlated can be examined. Time lag is critical in order to uncover actual relationships among economic and financial variables because the effect of an economic shock on the economy and companies will only emerge after some period of time. Secondly, observing inter correlation coefficients among independent variables could reduce the degree of collinearity that is a situation where there is close to a nearly perfect linear relationship among some or all of the independent variables in a regression model. In practical terms, this means there is some degree of redundancy or overlap among the variables.

The cross correlation function (CCF) of two time series is the product-moment correlation as a function of lag between the series. The sample cross-covariance function is given by:

Equation 4. Cross Covariance Function

$$C_{.xy}(k) = \frac{1}{N} \sum (x_t - \bar{x})(y_{t+k} - \bar{y}) \quad [k = 0, 1, \dots, N-1] \quad \text{--- (1)}$$

$$C_{.xy}(k) = \frac{1}{N} \sum (x_t - \bar{x})(y_{t+k} - \bar{y}) \quad [k = -1, -2, \dots, -(N-1)] \quad \text{--- (2)}$$

Where N is the series length,  $\bar{x}$  and  $\bar{y}$  are the means of the corresponding series. Then, the cross correlation is the cross covariance scaled by the variances of the two series:

Equation 5. Cross Correlation Function

$$r_{xy}(k) = \frac{c_{xy}(k)}{\sqrt{c_{xx}(0)c_{yy}(0)}}$$

Where  $c_{xx}(0)$  and  $c_{yy}(0)$  are the sample variances of  $x_t$  and  $y_t$ .

The cross correlation function and the cross covariance function are asymmetric functions so that value at lag  $k$  is not equal to the value at lag  $-k$ , while the autocorrelation function is a symmetric function. The asymmetry requires the two parts of the equation. The first part (Equation 4-(1)) applies to  $y_t$  lagging  $x_t$ , and the second part (Equation 4-(2)) applies to  $x_t$  lagging  $y_t$ .

The result of the cross correlation function will provide the significant correlation coefficients based on lead and lag effects identifying the time-variant correlations. Although the SPSS program tests both lead and lag effect, this study only considers a part of the cross correlation lag, in that economic variables lead IOCFPU.

### **Granger Causality Test**

Correlation alone does not imply causality among variables. Therefore the second step to uncover the causal impact of each economic variable on the industry performance index will employ Granger's (1969) causality test. The Granger testing procedure requires that one set up and test two equations. In each equation, the current value of one variable ( $X_t$  or  $Y_t$ ) is a function of the other variable and its own value in previous time periods (or lagged values). The intuition behind the Granger test is simple: if previous values of variable  $X$  significantly influence current values of variable  $Y$ , then one can say that  $X$  causes  $Y$ .

The Granger causality relationship is expressed in two pairs of regression equations by simply twisting independent and dependent variables as follows (Granger, 1969; Sims,

1972):

Equation 6. Granger Causality Equations

$$Y_t = a_0 + a_1 X_{t-1} + a_2 X_{t-2} + \dots + a_n X_{t-n} + b_1 Y_{t-1} + b_2 Y_{t-2} + \dots + b_m Y_{t-m} + e_t \dots\dots(1)$$

$$Y_t = a_0 + b_1 Y_{t-1} + b_2 Y_{t-2} + \dots + b_m Y_{t-m} + e_t \dots\dots(2)$$

or,

$$Y_t = a_0 + \sum_{i=1}^n a_i X_{t-i} + \sum_{i=1}^m b_i Y_{t-i} + e_t$$

$$Y_t = a_0 + \sum_{i=1}^m b_i Y_{t-i} + e_t$$

Where  $Y_t$  and  $X_t$  are the two series undergoing tests to determine their causal relationship, and coefficients of  $a$ 's, and  $b$ 's are constants to be estimated.  $e_t$  is an independent error term. Equations (1) is called unrestricted, and (2) is restricted. In the study,  $Y_t$  is the composite operating cash flow of the casual theme restaurant industry, and  $X_t$ 's are the hypothesized economic variables.

According to Granger, if

$H_{0(X)}: a_1 = a_2 = \dots = a_m = 0$  is not rejected, then X does not cause Y.

Otherwise X causes Y

To decide whether or not to reject the null hypothesis of the Granger causality test, Granger applies the  $F$  test of overall significance, computed as:

Equation 7. F Statistics for the Granger Causality

$$F = \frac{(RSS_R - RSS_{UR})/m}{RSS_{UR}/(T - 2m - 1)}$$

Where  $RSS_{UR}$  is the unrestricted residuals sum of squares from the estimated Equation (1) or Equation (2) under the null hypothesis, and  $RSS_R$  is the restricted residuals sum of squares from the estimated Equation (1) or Equation (2). F statistics follows F distribution with m and (T-2m-1) degrees of freedom, where m and T are, respectively the number of lagged periods and the sample size (observation). If the computed F value exceeds the critical F value at the chosen level of significance, the null hypothesis is rejected implying evidence of causality. Otherwise, the null hypothesis is not rejected implying no causal relationship.

This process will confirm the causal relationship between the dependent variable and economic variables that are cross correlated with the dependent variable (IOCFPU) in the preliminary test.

### **Time Series Multivariate Regression**

The vulnerability of a firm to changes in the economic environment can be expressed as measures of sensitivity to change in relative value drivers. The analysis of this part of the study is built on a multivariate linear regression framework.

Equation 8. Multivariate Linear Regression

$$\Delta IOCFPU^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_t X_t + \varepsilon$$

Where the dependent variable ( $\Delta IOCFPU$ ) is the estimated change of IOCFPU that can be explained by the independent variables. Independent variables ( $X_1, X_2, X_3, \dots, X_t$ ) is the change or natural log of economic value drivers that are hypothesized to predict the variance of industry operating cash flows. These independent variables are selected and hypothesized by testing the cross correlation function and the Granger causality.

Each of  $\beta_0, \beta_1, \beta_2, \beta_3, \dots, \beta_t$  is the regression coefficient that indicates the sensitivity of the dependent variable to a particular independent variable.

### **Testing for Assumptions**

The Cross Correlation Function, Granger Causality, and Multivariate Regression Analysis techniques can only be used if the time series is stationary. A stationary variable is one whose mean and variance do not systematically differ over the time period. For example, in the common situation where all variables are increasing over time, cross correlation will be spurious: all variables will appear to be leading indicators of all other variables simply because all are increasing. Most macro-variables are non-stationary as GDP, CPI or retail sales all increased substantially over the post-war period: their mean in the 1950s is very different from their mean in the 1990s. The stationarity of a time series can be achieved through differencing, which is subtracting the previous value from the current value. First-order differencing can eliminate linear trends and second-order differencing subtracts can remove exponential trends. Not all series can be rendered stationary by differencing. In this study, most of the macroeconomic variables except for interest rates that are already stationary will be transformed into natural logs. The logarithmic transformation often removes enough skewness to allow least squares models to produce unbiased results.

Most time series are transformed into the natural logarithm of the ratios because applying the natural logarithm transformation to the ratios could symmetrize the skewed distributions (Thompson & Sigman, 1996). Therefore, in this study, Quarterly changes of real values of variables, except for interest rates, federal surplus and deficit, and unemployment rates were used for the entire analysis, that is, the conventional first difference transformation of variables (in logs) by

Equation 9. Transformation of Variables

$$\Delta V_t = \ln V_t - \ln V_{t-1}$$

Where  $\ln$  denotes the natural logarithm and  $V_t$  denotes the value of a variable in quarter  $t$

Some variables such as government surplus or deficits are zero or even negative and cannot be logarithmized and thus the simple first difference was employed, and interest rates were transformed into real rates by calculating  $(1 + V_t) / (1 + V_{t-1})$ .

In setting up the Granger causality test, the length of the lagged period can make the results quite different. The study will test Granger causality with various lag lengths from 1 to 4. This means that the study does not consider the cause and effect relationships that occur over one year since one lag is one-quarter period. This applies to the maximum lag in the cross correlation function as well.

The multicollinearity among variables is an issue for the reliability of the regression analysis. The lower the reliabilities of the measures or the higher the correlation among the variables will lead to greater distortions in the estimation of regression coefficients that result from measurement error (Pedhazur, 1997). The distortion means that, regardless of the multicollinearity, the model cannot achieve acceptable estimation of coefficients, and thus lacks explanatory power. In this study the correlation functions result in a preliminary test for the multicollinearity, filtering out the economic variables that have high correlation with other economic variables. Next when the regression model is analysed, the collinearity will be diagnosed by the collinearity statistics: Variance Inflation Factor (VIF), tolerance, and conditional index.

Equation 10. Collinearity Statistics

$$VIF_i = \frac{1}{1 - R_i^2}$$

$$Tolerance = 1 - R_i^2 = 1/VIF_i$$

Where  $1 - R_i^2$  is the square multiple correlation of independent variable I with the remaining independent variables.

Low tolerance and high VIF indicate that the model may have multicollinearity, so that the model will be re-estimated and revised to reduce the collinearity (Pedhazur, 1997).

Condition index is defined in the way that measure how 'unimportant' a dimension is. It has an opposite relationship with eigenvalues. The larger the index, the less important the dimension is. If a dimension is larger than 30, then it is, in general, 'unimportant' in statistical sense. If two or more than two independent variables are related to the unimportant eigenvalue, with a variance proportion greater than 0.9, then those two (or more) independent variables have multicollinearity problem.

## CHAPTER FOUR

### ANALYSES AND FINDINGS

The previous chapters have provided the basis for developing a set of economic variables having causal effects upon the casual theme restaurant industry, which are tested using the sample of firms from the casual theme restaurant sector. This chapter will present statistical analyses and findings in detail.

#### **Results**

Based on the proposition, “a set of economic factors affects the variance of the industry wide performance of the casual theme restaurant industry”, the following research questions were answered in this study.

#### **Research Question One**

What economic value drivers have causal effects upon the casual theme restaurant industry sector’s operating cash flows?

#### ***Operational Question 1***

- What value drivers have co-movement with operating cash flow and at what time lags do the value drivers move together?

In order to obtain insight into the lead and lag structure of economic variables with respect to operating cash flow per unit, cross-correlations were calculated. All hypothesized economic variables in chapter 2 are tested by a cross correlation function to find whether there is any co-movement with the industry index of operating cash flow per unit (IOCFPU, hereafter). The significant cross correlations at  $p=0.05$  are plotted in Figure 7, and the result of the cross correlation test suggests that selected variables lead to change in IOCFPU at a particular lag. Each detailed graph of cross correlation between IOCFPU and economic variables are presented in Appendix B.

Figure 7: The Cross Correlated Economic Variables with IOCFPU



Note: \* All plotted variables at a particular time lag are significant at  $p=0.05$

*Hypotheses 1: The commodity market is related with IOCFPU at a certain lag.*

In the category of commodity markets, industrial production, consumer price index, and producer price index were found to have correlations with IOCFPU at a particular lag (Table 6.1). The industrial meat production index (IPI MEAT) had the highest correlation coefficient (-0.642) with IOCFPU 3 quarter later. cheese production index (IPI CHEE), poultry production index (IPI POUL), butter production index (IPI BUTT), total industrial production index (IPI), and pork production index (IPI PORK) were positively correlated with IOCFPU by 4, 3, 1, 3, and 1 lag, while the industrial production index for animal slaughtering and processing (IPI MEAT) and the industrial production index for beef (IPI BEEF) are negatively correlated at 1 lag. The consumer price index for tomatoes (CPI TOMA), CPI for fish/seafood (CPI SEA), CPI for dairy (CPI DAIR), CPI for vegetables (CPI VEG) are significantly correlated with IOCFPU respectively at 3, 1, 1, and 2 lag ( $p=0.05$ ). The producer price index for all commodities changes three quarters before IOCFPU does. The industrial dairy production index (IPI DAIR) and CPI for cheese related products (CPI CHEE) coincidentally move with IOCFPU, positively ( $\rho=0.639$ ) and negatively ( $\rho=-0.388$ ).

Table 6.1: Cross Correlation Analysis: IOCFPU and Commodity Market

Economic Variables (EV)	Measure	Lag i	Correlation ( $\Delta IOCFPU_t$ , $\Delta EV_{t-i}$ )
Meat (Animal slaughtering/processing) Production Index	IPI MEAT	1	-0.642
Beef Production Index	IPI BEEF	1	-0.626
Cheese Production Index	IPI CHEE	4	0.613
Industrial Production of Poultry processing	IPI POUL	3	0.634

Butter Production Index	IPIBUTT	1	0.573
Total Industrial Production Index	IPI	3	0.566
Pork Production Index	IPIPORK	1	0.550
Dairy Production Index	IPIDAIR	0	0.639
CPI for Tomatoes	CPITOMA	3	-0.454
CPI for Fish and Seafood	CPISEA	1	-0.428
CPI for Dairy and Related Products	CPIDAIR	1	0.405
CPI for Fresh Vegetables	CPIVEG	2	-0.353
PPI for All Commodities	PPI	3	0.365
CPI for Cheese and Related Products	CPICHEE	0	-0.388

Note: \* Lags were selected based on the strongest cross correlation. \*\* Lag is the number of quarters IOCFPU lags an economic variable (EV) \*\*\* The maximum number of lags plotted is 4. \*\*\*\*Significance at the 5% level.

*Hypothesis 2: Labor market is related with IOCFPU at a certain lag.*

Eighteen time-varying variables in the labor market demonstrated significant correlations with IOCFPU at  $p=0.05$  as shown in Table 6.2. The employment-population ratio(EMPPP), employment level (EMPLO), private service-providing employment (EMPPRIS), employment cost index of service occupations compensation (ECICOSO), employment cost index of total compensation (ECICOM), and labor force level had positive correlation coefficients by 2, 2, 2, 1, 3, and 3 lag. On the other hand, average hourly earnings in leisure and hospitality, total private employment, total private average hourly earnings, employment cost index of wages and salaries, unemployment rate, total private employment, employment cost index of total compensation in services industries, average hourly earnings of private service-providing, total non-farm employment, hourly earnings of production workers in food services and drinking places, and employment cost index of wages and salaries in services industries showed negative co-movements with IOCFPU respectively by 3, 3, 4, 2, 1, 4, 3, 1, .3, and 4 lag. The result also showed

that contemporaneous correlations between part time employed (EMPPART) and full time employed (EMPFULL) were positively and negatively significant, respectively.

Table 6.2: Cross Correlation Analysis: IOCFPU and Labor Market

Economic Variables (EV)	Measure	Lag i	Correlation ( $\Delta\text{IOCFPU}_t$ , $\Delta\text{EV}_{t-i}$ )
Employment-Population Ratio	EMPPP	2	0.563
Average Hourly Earnings for Leisure and hospitality	HRLH	3	-0.563
Total Private Average Hourly Earnings	HRPRI	3	-0.543
Usually Work Full Time Employed	EMPFULL	0	-0.513
Usually Work Part Time Employed	EMPPART	0	0.513
Employment Cost Index of Wages and salaries in Services Industries	ECIWASI	4	-0.533
Unemployment Rate	UNEMP	2	-0.506
Employment Level	EMPLO	2	0.498
Total Private Employment	EMPPRI	1	-0.488
Total Compensation ECI for Services Industries	ECICOSI	3	-0.516
Private Service-Providing Total Employment	EMPPRIS	2	0.456
Average Hourly Earnings for Private Service- Providing	HRPRIS	3	-0.465
Total Non-farm Employment	EMPT	1	-0.410
Hourly Earnings in Food services/drinking places	HRFB	3	-0.409
Total Compensation ECI for Service Occupations	ECICOSO	1	0.358

Wages and salaries ECI for All Workers	ECIWAG	4	-0.401
Total Compensation Employment Cost Index (ECI) for All Workers	ECICOM	3	0.346
Civilian Labor Force Level	LABORF	3	0.448

Note: \* Lags were selected based on the strongest cross correlation. \*\* Lag is the number of quarters IOCFPU lags an economic variable (EV) \*\*\* The maximum number of lags plotted is 4. \*\*\*\*Significance at the 5% level.

*Hypothesis 3: Inflation is related with IOCFPU at a certain lag*

The result of the cross correlation between inflation related variables and IOCFPU is presented in the Table 6.3. Three quarter was the most common lag to explain the significant relationship between IOCFPU and economic variables: consumer price index (CPI) for energy (CPIENER); CPI for services (CPISER); CPI for all urban consumers (CPI); CPI for all items less food and shelter (CPILEFS); the producer price index (PPI) for finished goods less food and energy (PPILEFE); and PPI for total non-durable goods (PPINOND). Their cross-correlation coefficients were more than 0.5 at 5% significant level. The relationship between IOCFPU at time t and two inflation related variables – CPILEFE at time t-2 and PPILEFE at time t-3 – was inverse, while the rest indicated positive signs.

Table 6.3: Cross Correlation Analysis: IOCFPU and Inflation

Economic Variables (EV)	Measure	Lag i	Correlation ( $\Delta$ IOCFPU <sub>t</sub> , $\Delta$ EV <sub>t-i</sub> )
Consumer Price Index (CPI) for Energy	CPIENER	3	0.564
CPI for Services	CPISER	3	0.554
Total CPI for All Urban Consumers	CPI	3	0.577
CPI for All Items Less Food and Energy	CPILEFE	2	-0.515
CPI for All Items Less Food and Shelter	CPILEFS	3	0.556

PPI for Finished Goods Less Food and Energy	PPILEFE	3	-0.503
PPI for Non-durable Goods Less Food and Energy	PPINOND	3	0.412

Note: \* Lags were selected based on the strongest cross correlation. \*\* Lag is the number of quarters IOCFPU lags an economic variable (EV) \*\*\* The maximum number of lags plotted is 4. \*\*\*\*Significance at the 5% level.

*Hypothesis 4: The stock market is related with IOCFPU at a certain lag.*

Dow Jones industrial average and NASDAQ composite index positively moved four quarter earlier than IOCFPU changes. Correlation coefficients with Dow Jones industrial average (DJIN) and S & P 500 (SP500) were 0.457 and 0.388 respectively.

Table 6.4: Cross Correlation Analysis: IOCFPU and Stock Market

Economic Variables (EV)	Measure	Lag i	Correlation ( $\Delta$ IOCFPU <sub>t</sub> , $\Delta$ EV <sub>t-i</sub> )
DJ Industrial Average Close	DJIN	4	0.457
S & P 500	SP500	4	0.388

Note: \* Lags were selected based on the strongest cross correlation. \*\* Lag is the number of quarters IOCFPU lags an economic variable (EV) \*\*\* The maximum number of lags plotted is 4. \*\*\*\*Significance at the 5% level.

*Hypothesis 5: National income and output are related with IOCFPU at a certain lag.*

Value of total construction put in place (CONSTR), value of food and beverage construction put in place (CONSTFB), value of total commercial construction put in place (CONSTCO), and value of private construction put in place for food (CONSTF) were all positively correlated with OCFPU 3 quarter later ( $p > 0.05$ ). Correlation coefficients between IOCFPU and the four variables: CONSTRM; CONSTFB; CONSTCO; and CONSTF were 0.606, 0.514, 0.532, and 0.399 respectively. Contemporaneous correlation between National income and IOCFPU was found at 0.05 significant level. Three quarter lagged Gross National Product (GNP) and two quarter

lagged personal consumption expenditures for services (PCESER) presented negative relationship with IOCFPU.

Table 6.5: Cross Correlation Analysis: IOCFPU and National Output

Economic Variables (EV)	Measure	Lag i	Correlation ( $\Delta\text{IOCFPU}_t$ , $\Delta\text{EV}_{t-i}$ )
Value of Total Construction Put in Place	CONSTR	3	0.606
Value of private Construction Put in Place for Food/Beverage	CONSTFB	3	0.514
Value of Commercial Construction Put in Place	CONSTCO	3	0.532
Value of Construction Put in Place for Food	CONSTF	3	0.399
National Income	NINCOM	0	0.329
Gross National Product	GNP	3	-0.346
Personal Consumption Expenditures for Services	PCESER	2	-0.336

Note: \* Lags were selected based on the strongest cross correlation. \*\* Lag is the number of quarters IOCFPU lags an economic variable (EV) \*\*\* The maximum number of lags plotted is 4. \*\*\*\*Significance at the 5% level.

*Hypothesis 6: Government Revenue, Spending, Debt, and Taxes are related with IOCFPU at a certain lag.*

Given that the corresponding coefficient values of -0.608, -0.581, and -0.429 were significant, total tax collection (TAX), individual income taxes (TAXIND), and corporate income taxes (TAXCO) appear to be leading IOCFPU by a quarter.

Table 6.6: Cross Correlation Analysis: IOCFPU and Government Revenue, Spending, Debt, and Taxes

Economic Variables (EV)	Measure	Lag i	Correlation ( $\Delta$ IOCFPU <sub>t</sub> , $\Delta$ EV <sub>t-i</sub> )
Treasury Department Gross Tax Collections	TAX	1	-0.608
Individual Income Taxes	TAXIND	1	-0.581
Corporate Income Taxes	TAXCO	1	-0.429

Note: \* Lags were selected based on the strongest cross correlation. \*\* One lag means one quarter. \*\*\* The maximum number of lags plotted is 4.

*Hypothesis 7: Money market is related with IOCFPU at a certain lag.*

Three quarter lagged M1 money stock and money stock had negative correlations with IOCFPU, while M2 money stock that had shorter time lag (1) was positively comoved with IOCFPU.

Table 6.7: Cross Correlation Analysis: IOCFPU and Money Market

Economic Variables (EV)	Measure	Lag i	Correlation ( $\Delta$ IOCFPU <sub>t</sub> , $\Delta$ EV <sub>t-i</sub> )
M1 Money Stock	M1	3	-0.428
M3 Money Stock	M3	3	-0.417
M2 Money Stock	M2	1	0.375

Note: \* Lags were selected based on the strongest cross correlation. \*\* Lag is the number of quarters IOCFPU lags an economic variable (EV) \*\*\* The maximum number of lags plotted is 4. \*\*\*\*Significance at the 5% level.

*Hypothesis 8: Consumer spending is related with IOCFPU at a certain lag.*

Retail sales of food and beverage stores (RETFBS), total retail sales (RETAIL), and retail sales and food services (RETNFS) were related with IOCFPU three quarter later. Retail sales of food services and drinking places (RETFBP) and its sub category,

retail sales of full service restaurants (RETFULL), at 1 lag showed significant correlations with IOCFPU ( $p=0.05$ ). The result also indicated the contemporaneous correlation between personal income and OCFPU, and correlation coefficient was 0.346.

Table 6.8: Cross Correlation Analysis: IOCFPU and Consumer Spending

Economic Variables (EV)	Measure	Lag i	Correlation ( $\Delta IOCFPU_t$ , $\Delta EV_{t-i}$ )
US Retail Sales for Food and Beverage Stores	RETFBS	3	-0.593
Total US Retail Sales	RETAIL	3	-0.569
US Retail Sales and Food Services, US Retail Sales for Food Services and Drinking Places	RETNFS	3	-0.566
	RETFBP	1	-0.545
US Retail Sales for Full Service Restaurants	RETFULL	1	-0.531
Personal Income	PERINCO	0	0.346

Note: \* Lags were selected based on the strongest cross correlation. \*\* Lag is the number of quarters IOCFPU lags an economic variable (EV) \*\*\* The maximum number of lags plotted is 4. \*\*\*\*Significance at the 5% level.

*Hypothesis 9: Foreign currency market is related with IOCFPU at a certain lag.*

*Hypothesis 10: Interest rates are related with IOCFPU at a certain lag.*

None of economic variables from the two categories – foreign exchange market and interest market – presented any significant cross correlation with IOCFPU when time varying relationship for one year (or four quarter lag) from 1994 to 2003 was considered. Therefore the foreign currency market and interest rates have no statistical relationship with IOCFPU between 1994 and 2003.

### *The Selection of Economic Variables*

The cross correlation function firstly allowed choosing influential economic variables out of 110 hypothesized variables. Before going further, such cross correlated economic variables with IOCFPU should be filtered out again because a model including all statistically significant economic variables may cause spurious result due to the inter-correlations among independent variables. Therefore, although significant correlations between an economic variable (IV) and IOCFPU (DV) exist at the 0.05 significant level, another reasonable selection process is necessary to avoid collinearity problem and thus generate robust analysis. The selection of variables should be conducted by rational decision rule, because the elimination of a variable may cause the loss of important information and the inclusion of too many variables may lead to redundant information. The selection process was done by conceptual estimation and statistical output. In this selection process, the elimination of an economic variable does not imply that the economic variable has no relationship with IOCFPU. Rather, the variables finally selected may represent the relationships between other inter-correlated variables within the same category and IOCFPU.

The decision-making as to which variables to further analyze is based on the following decision rules based on statistical output and a conceptual estimation. Economic variables that meet all criteria were kept for a further analysis to build a set of economic value drivers that influence the industry wide operational cash flow in the casual theme restaurant sector.

Decision Rules:

- D1. The economic variables (IVs) that have significant cross correlations with IOCFPU (DV)
- D2. The highest correlated lag of the selected economic variables
- D3. The economic variable (IV) that has the highest correlation coefficient with IOCFPU (DV) among selected variables in the process of 1.

D4. The economic variables (IVs) that have no inter-correlation or lower than 4.0 with any other economic variables (IVs) in the same category

Based on these rules, the industrial meat production index (IPIMEAT), CPI for fish/seafood (CPISEA), CPI for cheese (CPICHEE), CPI for fresh vegetables (CPIVEG), and the producer price index for all commodities (PPI) were selected from the commodity market variables. One quarter lagged meat production index has the highest correlation with IOCFPU. The economic variables significantly correlated with industrial meat production -- Industrial production of animal slaughtering and processing, industrial production of pork, industrial production of poultry processing, industrial production of dairy products, industrial production of cheese, industrial production of creamery butter – were excluded to eliminate redundant information (D4). These variables are not only highly correlated with the meat industrial production index but also are all functions of total industrial production and thus have homogeneity in their movements. Eventually, five economic variables in the commodity market category were selected as follows. (Refer to Appendix C for correlation matrices of economic variables)

- $\text{Corr}(\text{IOCFPU}_t, \text{IPIMEAT}_{t-1}) = -0.642$
- $\text{Corr}(\text{IOCFPU}_t, \text{CPISEA}_t) = -0.428$
- $\text{Corr}(\text{IOCFPU}_t, \text{CPICHEE}_t) = -0.388$
- $\text{Corr}(\text{IOCFPU}_t, \text{CPIVEG}_{t-2}) = -0.353$
- $\text{Corr}(\text{IOCFPU}_t, \text{PPI}_{t-3}) = 0.365$

Under labor market, civilian labor force level, employment-population ratio, employment cost index of total compensation were included, while employment level, full time employed, part time employed, unemployment rate, total non-farm employment, total private employment, private service-providing employment, total private average hourly earnings, average hourly earnings for private service-providing, average hourly earnings for leisure and hospitality, hourly earnings of production workers in food services and drinking places, employment cost index for total compensation in services industries, employment cost index for total for service occupations compensation,

employment cost index for wages and salaries, employment cost index for wages and salaries in services industries were excluded (D4), based on the decision rule. In other words two-quarter early employment-population ratio has the highest correlation with IOCFPU (D3) among labor market related variables, other labor market related variables except for the labor force level and employment cost index of compensation are greatly inter-correlated with the employment-population ratio (D4). (Refer to Appendix C for correlation matrices of economic variables)

- $\text{Corr}(\text{IOCFPU}_t, \text{LABORF}_{t-3}) = 0.448$
- $\text{Corr}(\text{IOCFPU}_t, \text{EMPPP}_{t-2}) = 0.563$
- $\text{Corr}(\text{IOCFPU}_t, \text{ECICOM}_{t-3}) = 0.346$

The consumer price index for all urban consumers at  $-3$  lag was first selected in the inflation category based on the highest correlation with IOCFPU (D3). Then PPI for finished goods less food and energy was included. CPI for all items less food and energy, CPI for all items less food, shelter, energy, and services, and PPI for total non-durable goods were left out because their high inter-correlations with CPI of all items for all urban consumers (D4) exist and all CPI variables are a function of CPI of all items for all urban consumers. Moreover they had lower correlations with IOCFPU than the CPI for all items for urban consumers. (Refer to Appendix C for correlation matrices of economic variables)

- $\text{Corr}(\text{IOCFPU}_t, \text{CPI}_{t-3}) = 0.577$
- $\text{Corr}(\text{IOCFPU}_t, \text{PPILEFE}_{t-3}) = -0.503$

As for the stock market, two economic variables – the Dow Jones Industrial Average and the S & P 500 -- led IOCFPU, but the S & P 500 was deselected due to the very high correlation with DJ Industrial Average ( $\rho=.941$ ) (D3 & D4).(Refer to Appendix C for correlation matrices of economic variables)

- $\text{Corr}(\text{IOCFPU}_t, \text{DJIN}_{t-4}) = 0.457$

GNP, personal consumption expenditures for services, national income, and

value of total construction put in place were chosen based on the decision rule. The value of total construction put in place had the highest correlation with IOCFPU, so it was firstly considered for further analysis. GNP, Personal consumption expenditures for services, and national income had no inter-correlations with any other variables. On the other hand, the value of commercial construction put in place, private food/beverage construction put in place, and private food related construction put in place were excluded because they all are functions of the value of total construction put in place which had the highest correlation with IOCFPU, thus showing high inter-correlations with it. (Refer to Appendix C for correlation matrices of economic variables)

- $\text{Corr}(\text{IOCFPU}_t, \text{GNP}_{t-3}) = -0.346$
- $\text{Corr}(\text{IOCFPU}_t, \text{PCESER}_{t-2}) = -0.336$
- $\text{Corr}(\text{IOCFPU}_t, \text{NINCOM}_t) = 0.329$
- $\text{Corr}(\text{IOCFPU}_t, \text{CONSTR}_{t-3}) = 0.606$

The value of treasury department gross taxes was a primary variable in the category of the government revenue, spending, debt, and taxes. It represents individual income taxes and corporate income taxes, so it had a higher correlation with IOCFPU than any other government related variables. As expected, the gross taxes had significant correlations (.942 and .631, respectively) with individual income taxes and corporate income taxes at  $p=0.05$  (D4). (Refer to Appendix C for correlation matrices of economic variables)

- $\text{Corr}(\text{IOCFPU}_t, \text{TAX}_{t-1}) = -0.608$

Among money market variables –M1, M2, and M3 – that presented significant correlations with IOCFPU, M1 and M2 were selected because M2 and M3 were significantly inter-correlated ( $\rho=-.370$ ) (D4). (Refer to Appendix C for correlation matrices of economic variables)

- $\text{Corr}(\text{IOCFPU}_t, \text{M1}_{t-3}) = -0.428$
- $\text{Corr}(\text{IOCFPU}_t, \text{M2}_{t-1}) = 0.374$

The retail sales of food and beverages stores that would explain the aspect of consumer spending showed the highest correlation with IOCFPU (D3). Other retail sales were excluded because they had very high correlations with the retail sales of food and beverages stores, while personal income was included, showing no inter-correlations (D4). (Refer to Appendix C for correlation matrices of economic variables)

- $\text{Corr}(\text{IOCFPU}_t, \text{PERINCO}_t) = 0.346$
- $\text{Corr}(\text{IOCFPU}_t, \text{RETFBS}_{t-3}) = -0.593$

Consequently, based on the decision rules, the following twenty economic variables at a particular time lag were selected by the cross correlation (Table 7).

Table 7: Selected Economic Variables by the Observation of Inter-correlations

Economic Variables (EV)	Measure	Lag i	Correlation ( $\Delta\text{IOCFPU}_t$ , $\Delta\text{EV}_{t-i}$ )
Industrial Production of Animal Slaughtering/Processing	IPIMEAT	1	-0.642
CPI for Fish and Seafood	CPISEA	1	-0.428
CPI for Fresh Vegetables	CPIVEG	2	-0.353
PPI for All Commodities	PPI	3	0.365
CPI for Cheese and Related Products	CPICHEE	0	-0.388
Employment-Population Ratio	EMPPP	2	0.563
Employment Cost Index for All workers' compensation	ECICOM	3	0.346
Civilian Labor Force Level	LABORF	3	0.448
Consumer Price Index for All Urban Consumers	CPI	3	0.577
PPI for Finished goods less food and energy	PPILEFE	3	-0.503
DJ Industrial Average	DJIN	4	0.457
Value of Total Construction Put in Place	CONSTR	3	0.606
National Income by Type of Income	NINCOM	0	0.329
Gross National Product	GNP	3	-0.346
Personal Consumption Expenditures for Services	PCESER	2	-0.336

Treasury Department Gross Tax Collections	TAX	1	-0.608
M1 Money Stock	M1	3	-0.428
M2 Money Stock	M2	1	0.375
US Retail Sales of Food and beverage stores	RETFBS	3	-0.593
Personal Income	PERINCO	0	0.346

### *Operational Question 2*

- What value drivers have a causal effect on operating cash flow?

In the preliminary tests cross correlation functions, the relationships between economic variables (X) and the industry operating cash flow per unit (IOCFPU) were examined with different lag structures. Testing causality between twenty economic variables and IOCFPU, in the Granger sense, involves using F-tests to test whether lagged information on a variable X (or twenty economic variables in this study) provides any statistically significant information about a variable Y (or IOCFPU) in the presence of lagged Y as described in Equation 12. If not, then "X does not Granger-cause Y."

Equation 12. Regression Model for Causality Test

$$\text{IOCFPU}_t = f(\text{IOCFPU}_{t-1}, \text{IOCFPU}_{t-2}, \dots, \text{IOCFPU}_{t-m}, X_{t-1}, X_{t-2}, \dots, X_{t-n})$$

$$\text{IOCFPU}_t = f(\text{IOCFPU}_{t-1}, \text{IOCFPU}_{t-2}, \dots, \text{IOCFPU}_{t-m})$$

Hypotheses about expected causal relationships between economic variables and operating cash flow per unit that operationalize the concepts discussed in the research question are as follows:

*H 11: Meat industrial production (IMEAT) causes a variance in IOCFPU*

*H12: Consumer price index for fish and seafood (CPISEA) causes a variance in IOCFPU*

*H 13: Consumer price index for cheese (CPICHEE) causes a variance in IOCFPU*

*H 14: Consumer price for vegetables (CPIVEG) causes a variance in IOCFPU*

*H 15: Producer price for commodities (PPI) causes a variance in IOCFPU*

- H 16: Labor force level (LABORF) causes a variance in IOCFPU*
- H 17: Employment to population ratio (EMPPP) causes a variance in IOCFPU*
- H18: Employment cost index for compensation (ECICOM) causes a variance in IOCFPU*
- H 19: Consumer price index for all items (CPI) causes a variance in IOCFPU*
- H 20: Producer price index for all items less food and energy (PPILEFE) causes a variance in IOCFPU*
- H 21: Dow Jones industrial index (DJIN) causes a variance in IOCFPU*
- H 22: Gross national product (GNP) causes a variance in IOCFPU*
- H 23: Personal consumption for services (PCESER) causes a variance in IOCFPU*
- H 24: National income (NINCOM) causes a variance in IOCFPU*
- H 25: Value of construction (CONSTR) causes a variance in IOCFPU*
- H 26: Tax causes (TAX) a variance in IOCFPU*
- H 27: Money that can be spent immediately (M1) causes a variance in IOCFPU*
- H 28: Money consisting of M1 and all savings or short-term deposits (M2) causes a variance in IOCFPU*
- H 29: Retail sales of food and beverage stores (RTFBS) causes a variance in IOCFPU*
- H 30: Personal income (PERINCO) causes a variance in IOCFPU*

Table 8 presents F statistics for the above hypotheses and whether the unidirectional relationship that economic variables (X) cause the variance in the index of industry operating cash flow per unit (Y). Based on one to four lag lengths, the null hypothesis for H13, H18, H21, H22, H23, H24, and H29 failed to be rejected by all lag lengths. In other words, CPICHEE, ECICOM, DJIN, GNP, PCESER, NINCOM, and RTFBS do not have a causal relationship with IOCFPU (or the movements in CPICHEE, ECICOM, DJIN, GNP, PCESER, NINCOM, and RTFBS in a previous period are not associated with current movements in IOCFPU).

IPIMEAT had a high F value at all lag lengths, and thus the null hypothesis for H1 was rejected. The second null hypothesis of the non-causality from CPISEA to IOCFPU was rejected when the lag length was 1, 2, or 3, suggesting CPISEA causes the

variance in IOCFPU by the lag length of 1, 2, and 3. CPIVEG and PPI cause the variance in IOCFPU with the lag length of 1 and 2. LABORF and EMPPP also have a causal relationship with OCPU at the 0.01 significant level by the lag length 1 and 2. Null hypotheses for H19 and H20 were also rejected, suggesting CPI and PPILEFE cause the variance in IOCFPU. The null hypothesis for the relationship between CONSTR and IOCFPU was also rejected by the lag length of 1 and 2. The non-causality from TAX to IOCFPU was rejected by all the lag length tested, and the null hypotheses for H 28 and H29 as to M1 and M2 were rejected respectively by the lag length 2 and 1. The null hypothesis for PERINCO (H30) was rejected by lag length of 2.

Table 8: The Granger Causality from Economic Variables to Operating Cash Flows per Unit

F-statistics				
$H_0$ : X (Economic Variables) $\nRightarrow$ Y (Industry Operating Cash Flow per Unit)				
X	Lag of X			
	1	2	3	4
<b>IPIMEAT</b>	23.463 <sup>***</sup> $x \Rightarrow y$	6.644 <sup>***</sup> $x \Rightarrow y$	3.001 <sup>**</sup> $x \Rightarrow y$	2.972 <sup>**</sup> $x \Rightarrow y$
<b>CPISEA</b>	4.967 <sup>**</sup> $x \Rightarrow y$	3.020 <sup>**</sup> $x \Rightarrow y$	3.520 <sup>**</sup> $x \Rightarrow y$	2.450 <sup>*</sup> $x \nRightarrow y$
<b>CPICHEE</b>	1.1221 $x \nRightarrow y$	0.637 $x \nRightarrow y$	0.280 $x \nRightarrow y$	0.218 $x \nRightarrow y$
<b>CPIVEG</b>	7.265 <sup>**</sup> $x \Rightarrow y$	2.852 <sup>*</sup> $x \Rightarrow y$	0.576 $x \nRightarrow y$	0.975 $x \nRightarrow y$
<b>PPI</b>	0.799 $x \nRightarrow y$	4.792 <sup>**</sup> $x \Rightarrow y$	2.472 <sup>*</sup> $x \Rightarrow y$	1.812 $x \nRightarrow y$
<b>LABORF</b>	17.350 <sup>***</sup> $x \Rightarrow y$	4.212 <sup>***</sup> $x \Rightarrow y$	1.465 $x \nRightarrow y$	2.516 <sup>**</sup> $x \Rightarrow y$
<b>EMPPP</b>	16.029 <sup>***</sup> $x \Rightarrow y$	9.040 <sup>***</sup> $x \Rightarrow y$	2.248 $x \nRightarrow y$	2.510 $x \Rightarrow y$
<b>ECICOM</b>	0 $x \nRightarrow y$	1.112 $x \nRightarrow y$	1.189 $x \nRightarrow y$	1.340 $x \nRightarrow y$
<b>CPI</b>	0.335 $x \nRightarrow y$	9.586 <sup>***</sup> $x \Rightarrow y$	3.208 <sup>**</sup> $x \Rightarrow y$	2.738 <sup>**</sup> $x \Rightarrow y$

<b>PPILEFE</b>	7.053** $x \Rightarrow y$	3.303** $x \Rightarrow y$	2.537* $x \Rightarrow y$	1.798 $x \not\Rightarrow y$
DJIN	0.002 $x \not\Rightarrow y$	1.063 $x \not\Rightarrow y$	0.526 $x \not\Rightarrow y$	2.192 $x \not\Rightarrow y$
GNP	0.121 $x \not\Rightarrow y$	1.118 $x \not\Rightarrow y$	2.394 $x \not\Rightarrow y$	1.756 $x \not\Rightarrow y$
PCESER	0.072 $x \not\Rightarrow y$	1.862 $x \not\Rightarrow y$	1.322 $x \not\Rightarrow y$	0.913 $x \not\Rightarrow y$
NINCOM	0.053 $x \not\Rightarrow y$	0.743 $x \not\Rightarrow y$	0.824 $x \not\Rightarrow y$	0.668 $x \not\Rightarrow y$
<b>CONSTR</b>	41.684*** $x \Rightarrow y$	11.173*** $x \Rightarrow y$	2.912* $x \Rightarrow y$	2.557* $x \Rightarrow y$
<b>TAX</b>	15.127*** $x \Rightarrow y$	10.881*** $x \Rightarrow y$	4.376** $x \Rightarrow y$	3.841** $x \Rightarrow y$
<b>M1</b>	1.990 $x \not\Rightarrow y$	6.000*** $x \Rightarrow y$	1.901 $x \not\Rightarrow y$	1.451 $x \not\Rightarrow y$
<b>M2</b>	8.281*** $x \Rightarrow y$	2.026 $x \not\Rightarrow y$	0.610 $x \not\Rightarrow y$	0.478 $x \not\Rightarrow y$
RTFBS	2.446 $x \not\Rightarrow y$	2.502 $x \not\Rightarrow y$	1.950 $x \not\Rightarrow y$	1.769 $x \not\Rightarrow y$
<b>PERINCO</b>	0.194 $x \not\Rightarrow y$	3.242* $x \Rightarrow y$	1.148 $x \not\Rightarrow y$	0.837 $x \not\Rightarrow y$

Note : \*\*\*Correlation is significant at p=0.01, \*\*Correlation is significant at p=0.05, \*Correlation is significant at p=0.10

## **Research Question Two**

How much variance of the cash flow of the casual theme restaurant industry can be explained by the economic value drivers?

### ***Operational Question 1***

- What value drivers can maximize the explanation of the variance in the operational cash flow?

The previous tests – the cross correlation function and the Granger causality test – found thirteen economic variables that have co-movements and causality with the index of operating cash flow per unit (IOCFPU). The thirteen variables are industrial production for meat, consumer price index for fish/seafood, consumer price index for vegetables, producer price index for all commodities, labor force level, employment to population, consumer price index for all items, producer price index for finished goods less food and energy, value of all construction put in place, tax collection, M1 money stock, M2 money stock, and personal income. Therefore, the relationship between economic variables and operating cash flow per unit could be presented as:

Equation 13. Regression Model

$$\text{IOCFPU}_t = f(\text{IPIMEAT}_{t-1}, \text{CPISEA}_{t-1}, \text{CPIVEG}_{t-2}, \text{PPI}_{t-3}, \text{LABORF}_{t-3}, \text{EMPPP}_{t-2}, \text{CPI}_{t-3}, \text{PPILEFE}_{t-3}, \text{CONSTR}_{t-3}, \text{TAX}_{t-1}, \text{M1}_{t-3}, \text{M2}_{t-1}, \text{PERINCO}_t)$$

Among linear multiple regressions, backward stepwise regression was employed. A small, readily interpretable model arises, which contains the most important explanatory factors. Usually, the backward model is a better procedure when the analyst wants to consider all the predictor variables from the outset so that no important variables will be left out (Li, 2000).

Backward stepwise regression begins with a full or saturated model and variables are eliminated from the model in an iterative process. The fit of the model is tested after

the elimination of each variable to ensure that the model still adequately fits the data. When no more variables can be eliminated from the model, the analysis has been completed. This process was conducted by the SPSS program.

The backward stepwise regression found that  $CPISEA_{t-1}$ ,  $PPI_{t-3}$ ,  $EMPPP_{t-2}$ ,  $PPILEFE_{t-3}$  were significantly related to  $IOCFPU_t$  at the 0.05 level, while excluding  $IPIMEAT_{t-1}$ ,  $CPIVEG_{t-2}$ ,  $LABORF_{t-3}$ ,  $CPI_{t-3}$ ,  $CONSTR_{t-3}$ ,  $TAX_{t-1}$ ,  $M1_{t-3}$ ,  $M2_{t-1}$ , and  $PERINCO_t$ .

**Operational Question 2:**

- How much variance of the cash flow is likely to be explained by the value drivers?

R\_Square (the Coefficient of Determination) is the percent of the Total Sum of Squares that is explained; i.e., Regression Sum of Squares (explained deviation) divided by Total Sum of Squares (total deviation). The result of the multiple regression showed that R square is 66.6% and significant at the 0.001 significant level. Adjusted R\_Square that reacts to alternative equations for the same dependent variable in a manner similar to the Standard Error of the Estimate is 62.3%

Table 9: The Test of Significance of R Square

R	R Square	Adjusted R Square	Std. Error of the Estimate		
0.816	<b>0.666</b>	0.623	0.129		
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1.032738	4	0.258184	15.48292	0.000
Residual	0.516938	31	0.016675		
Total	1.549676	35			

Note : \*Predictors: (Constant),  $CPISEA_{t-1}$ ,  $PPI_{t-3}$ ,  $EMPPP_{t-2}$ ,  $PPILEFE_{t-3}$ )

\*\*Dependent Variable:  $IOCFPU$

### **Research Question Three**

What is the sensitivity of the industry operating cash flows to changes in those economic value drivers?

#### ***Operational Question 1:***

- What value driver is the most influential on the operating cash flow?

CPISEA<sub>t-1</sub> has the highest standardized coefficient (beta=-0.442), followed by PPILEFE<sub>t-3</sub> (beta=-0.410). The standardized coefficients of PPI<sub>t-3</sub> and EMPPP<sub>t-2</sub>, are 0.267 and 0.288, respectively.

Table 10: The Multiple Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.069	0.026		2.618	0.014		
CPISEA <sub>t-1</sub>	-8.893	2.113	-0.442	-4.209	0.000	0.974	1.027
PPI <sub>t-3</sub>	3.557	1.431	0.267	2.486	0.019	0.934	1.070
EMPPP <sub>t-2</sub>	6.712	2.753	0.288	2.438	0.021	0.771	1.297
PPILEFE <sub>t-3</sub>	-13.423	3.739	-0.410	-3.590	0.001	0.824	1.214

Note: Dependent Variable: IOCFPUt

#### ***Operational Question 2:***

- What is the sensitivity of operating cash flow to each of influential value driver?

(Unstandardized) Regression coefficients of CPISEA<sub>t-1</sub> and PPILEFE<sub>t-3</sub> have negative regression coefficients that are -8.893 and -13.423, whilst the coefficients of PPI<sub>t-3</sub> and EMPPP<sub>t-2</sub> are positive, 3.557 and 6.712, respectively.

## Testing For Assumption

Multicollinearity was statistically examined for the final model. Multicollinearity exists when there is high correlation among the economic variables used in the analysis. First, correlation matrix was used earlier. If two economic variables are highly correlated, multicollinearity is suspected and thus eliminated in the variable selection process after the analysis of cross correlations. Correlation among economic variables for the regression model did not exceed 0.80, which indicate the presence of multicollinearity in social science

Formal methods to detect multicollinearity are to check Variance Inflation Factor (VIF), tolerance, eigenvalue, and condition index. Table 10 and 11 detail these collinearity diagnostic statistics. The higher the tolerance (close to 1), the lower is the multicollinearity and vice versa. The largest VIF among all predictors is often used as an indicator of severe multicollinearity. It is suggested that when VIF is greater than 10, then the regression coefficients are poorly estimated. Multicollinearity statistics for CPISEA t-1, PPI t-3, EMPPP t-2, and PPILEFE t-3 were good indicators of low multicollinearity. Tolerance was close to 1, ranging between 0.77 and 0.98, and VIF range between 1.02 and 1.30 for four economic variables.

Eigenvalues, condition indices and the variance proportion can be also used to when examining multicollinearity. A rule of thumb is that if the condition index is 15, multicollinearity is a concern; if it is greater than 30 multicollinearity is a very serious concern. Eigenvalue close to zero and larger variance proportion than 0.9 are collinear indicators for two or more than two independent variables. In the model, Except for dimension 5, eigenvalues are not close to zero, and there was no condition index larger than 15 and no large variance proportion larger than 0.9, hence no multicollinearity problem.

Table 11: Collinearity Diagnostics

Dimension	Eigenvalue	Condition Index	Variance Proportions				
			(Constant)	CPISEA t-1	PPI t-3	EMPPP t-2	PPILEFE t-3
1	1.735	1.000	.15	.09	.03	.03	.12
2	1.347	1.135	.03	.01	.23	.28	.05
3	.919	1.374	.00	.58	.14	.00	.16
4	.604	1.694	.24	.07	.59	.35	.05
5	.394	2.098	.59	.25	.00	.34	.62

### Supporting the Result of the Analysis

In this study, the dependent variable, IOCFPU was a transformed value into the calendar quarterly data. There is an alternative approach to creating a composite index of the operating cash flow, and doing so may result in a dissimilar result. In this approach, the quarterly operating cash flow and the number of units can be set on the basis of fiscal quarter ending. For example, the first quarter data is obtained by aggregating each company's data of fiscal quarter ending March, April, and February as shown in Table 12

Table 12: Computation Of Fiscal Period Varying Cash Flow on The Basis of Fiscal Ending

Calendar Quarter	Fiscal Quarter Ending		
	March, June, September, December	January, April, July, and October	February, May, August, and November
1 <sup>st</sup> Quarter	Jan, Feb, <b>Mar</b>	Feb, March, <b>April</b>	Dec, Jan, <b>Feb</b>
2 <sup>nd</sup> Quarter	April, May, <b>June</b>	May, June, <b>July</b>	Mar, April, <b>May</b>
3 <sup>rd</sup> Quarter	July, Aug, <b>Sept</b>	Aug, Sept, <b>Oct</b>	June, July, <b>Aug</b>
4 <sup>th</sup> Quarter	Oct, Nov, <b>Dec</b>	Nov, Dec, <b>Jan</b>	Sept, Oct, <b>Nov</b>

Applying this approach to obtain the composite industry cash flow and the number of units, alternative analysis was conducted in order to strengthen the result of this study. Table 13 presents the backward stepwise regression result, based on thirteen

economic variables and the alternative index of operating cash flow. The result was similar to our primary analysis. In this analysis, PPI was excluded in the final model, while tax and M2 money stock were included. CPISEA, PPILEFE, and EMPPP had significant relationships with the index of operating cash flow at  $p=0.05$ . 44.5% of the variance in the alternative index of operating cash flow is likely to be explained by the combination of CPISEA, PPILEFE, EMPPP, TAX, and M2.

Table 13: Regression Analysis Using Alternative Index of Operating Cash Flow

R	R Square		Adjusted R Square	Std. Error of the Estimate	
0.667	0.445		0.352	0.2365	
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1.344	5	0.269	4.806	0.002
Residual	1.678	30	0.056		
Total	3.022	35			
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.130	.096		-1.352	.187
CPISEA t-1	-12.491	4.358	-.445	-2.866	.008
EMPPP t-2	21.527	9.063	.662	2.375	.024
PPILEFE t-3	-15.913	7.048	-.348	-2.258	.031
TAX t-1	1.277	.390	.994	3.280	.003
M2 t-1	14.340	5.100	.419	2.812	.009

Note : \*Predictors: (Constant), CPISEA t-1, EMPPP t-2, PPILEFE t-3, TAXt-1, M2t-1)

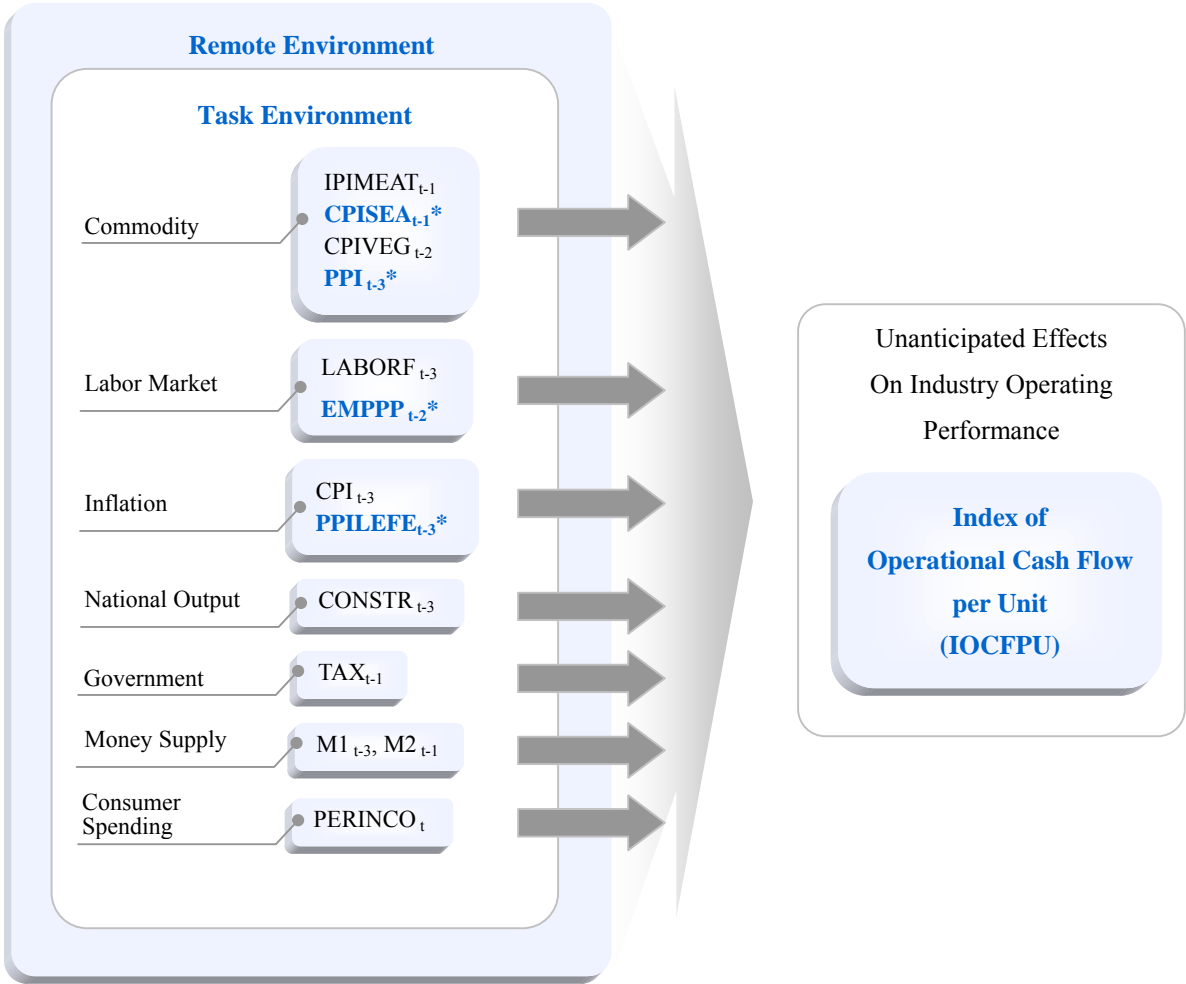
\*\*Dependent Variable: IOCFPU

### Proposed Empirical Model

Based on the result of the cross correlation and the Granger causality test, thirteen economic value drivers (variables) are found to have casual effects on industry

operating cash flow, and four value drivers among thirteen value drivers are likely to explain sixty seven percent of the variance in the industry operating cash flow at  $p=0.001$ . The hypothesized model in Figure 5 after statistical tests resulted in the model in Figure 8. This model shows influential economic value drivers on the industry operating cash flow.

Figure 8: Proposed Empirical Model



Note: \* Economic Value Drivers that were significant at  $p=0.05$ , controlling for other economic value drivers in the regression model

## CHAPTER FIVE

### CONCLUSION AND DISCUSSION

The previous chapter reported the analysis performed to test the potential economic variables that were hypothesized to relate to and explain the variance of the index of operational cash flows per unit (IOCFPU, hereafter) in the casual theme restaurant industry over the period of 1994-2003. This chapter summarizes the major findings, and presents the contribution, the limitations, the conclusion, and suggestions for further study.

#### **Summary of Findings & Discussion**

This study aimed to find the answers to the following research questions and their operational questions in order to help restaurant managers understand the causal effect of economic value drivers on their operational cash flows, and improve the estimation of future operational cash flows at a known time lag. This knowledge would be valuable in buffering business operational risks against these value drivers and facilitating informed strategic decisions.

#### **Research Question One**

What economic value drivers have causal effects upon the casual theme restaurant industry sector's operational cash flows?

#### Operational Questions

- What value drivers have co-movement with operational cash flow and at what time lags do the value drivers move together?
- What value drivers have a causal effect on the operational cash flows?

The literature from the field of corporate finance, economics, and hospitality

strategic management has suggested that economic value drivers affect firm or industry performance or business failure. The result of this study obtained facts on co-movement between economic value drivers and IOCFPU with an assessment of whether an economic value driver precedes IOCFPU. The changes in economic value drivers within the commodity markets<sup>11</sup>, labor markets<sup>12</sup>, inflation<sup>13</sup>, stock market<sup>14</sup>, national input/output<sup>15</sup>, government revenue/spending/debt/taxes<sup>16</sup>, money market<sup>17</sup>, and consumer spending<sup>18</sup> category led the change in IOCFPU from 1994 to 2003, while no value drivers within foreign exchange rates and interest rates category exhibited lagged co-movement with IOCFPU. Regarding operational question two, while value drivers relating to the stock market had non-causality among the value drivers showing lagged co-movements with IOCFPU, value drivers relating to commodity market (IPIMEAT, CPISEA, CPIVEG, and PPI), labor market (LABORF and EMPPP), inflation (CPI and PPILEFE), national input/output (CONSTR), government revenue/spending/debt/taxes (TAX), money markets (M1 and M2), and consumer spending (PERINCO) indicated causality (or unidirectional relationship) to the index of operational cash flows per unit in the casual theme restaurant industry.

The commodity market had very close relationships with the operational performance of the casual theme restaurant industry. Commodity production and prices were important economic value drivers for the restaurant industry. Industrial cheese production, industrial dairy production, industrial poultry production, industrial butter

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<sup>11</sup> IPIMEAT<sub>t-1</sub>, IPIBEEF<sub>t-1</sub>, IPICHEE<sub>t-4</sub>, IPIPOUL<sub>t-3</sub>, IPIBUTT<sub>t-1</sub>, IPI<sub>t-3</sub>, IPIPORK<sub>t-1</sub>, CPITOMA<sub>t-3</sub>, CPISEA<sub>t-1</sub>, CPIDAIR<sub>t-1</sub>, CPIVEG<sub>t-2</sub>, PPI<sub>t-3</sub>, CPICHEE<sub>t</sub>, IPIDAIR<sub>t</sub>

<sup>12</sup> EMPPP<sub>t-2</sub>, HRLH<sub>t-3</sub>, HRPRI<sub>t-3</sub>, EMPFULL<sub>t</sub>, EMPPART<sub>t</sub>, ECIWASI<sub>t-4</sub>, UNEMP<sub>t-2</sub>, EMPLO<sub>t-2</sub>, EMPPRI<sub>t-1</sub>, ECICOSI<sub>t-3</sub>, EMPPRIS<sub>t-2</sub>, HRPRIS<sub>t-3</sub>, EMPT<sub>t-1</sub>, HRFB<sub>t-3</sub>, ECICOSO<sub>t-1</sub>, ECIWAG<sub>t-4</sub>, ECICOM<sub>t-3</sub>, LABORF<sub>t-3</sub>

<sup>13</sup> CPIENER<sub>t-3</sub>, CPISER<sub>t-3</sub>, CPI<sub>t-3</sub>, CPILEFE<sub>t-2</sub>, CPILEFS<sub>t-3</sub>, PPILEFE<sub>t-3</sub>, PPINOND<sub>t-3</sub>

<sup>14</sup> DJIN<sub>t-4</sub>, NASDAQ<sub>t-4</sub>

<sup>15</sup> CONSTR<sub>t-3</sub>, CONSTFB<sub>t-3</sub>, CONSTCO<sub>t-3</sub>, CONSTF<sub>t-3</sub>, NINCOM<sub>t</sub>, GNP<sub>t-3</sub>, PCESER<sub>t-2</sub>

<sup>16</sup> TAX<sub>t-1</sub>, TAXIND<sub>t-1</sub>, TAXCO<sub>t-1</sub>

<sup>17</sup> M1<sub>t-3</sub>, M3<sub>t-3</sub>, M2<sub>t-1</sub>

<sup>18</sup> RETFBS<sub>t-3</sub>, RETAIL<sub>t-3</sub>, RETNFS<sub>t-3</sub>, RETFBP<sub>t-1</sub>, RETFULL<sub>t-1</sub>, PERINCO<sub>t</sub>

production, and industrial pork production all had positive relationships with the operational performance of the casual theme restaurant industry. It is because an increase in industrial production of a commodity in most cases lowers the price of that commodity, *ceteris paribus*. As expected, economic value drivers that measure the price levels of commodities— consumer price index (CPI) for tomatoes; CPI for fish and seafood; CPI for cheese related product; and CPI for vegetables— were negatively related with OCFPU. Therefore price levels of these commodities are directly associated with eventual operational costs that affect operating margin.

However there may be an additional relationship because the industrial meat production index (including industrial beef production index) had a negative relationship with the index of industry operational cash flow per unit from 1994 to 2003. Although it is well known that the production of commodities and their prices have inverse correlations, the traditional relationship for beef or meat was often not supported<sup>19</sup>. In this study, the relationship between meat (beef) price and production may be interpreted by observing the demand for meats or beef as well as supply. The demand for meat (beef) varies by beef exports, competition with lower priced meats, and change in consumption behavior. A decrease in export activity for beef, at a constant level of production, means the greater supply for a given level of demand. Accordingly, U.S. beef prices will drop due to the increase in beef supply.<sup>20</sup>(Eenoo, Peterson, & Purcell, 2000). For every one million additional pounds per week in the U.S. domestic market, live cattle prices drop \$0.20 per hundredweight. Besides the impact of beef exports, ample supplies of competing, lower priced meats such as pork and chicken and the change in food consumption behavior like the low-carbohydrate diets may be additional factors to explain the changes in meat and beef prices (Petry, 2004). These domestic and international events seem to break down the conventional relationship between beef price

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<sup>19</sup> For example, U.S commercial beef production in 2004 averaged about 6 percent lower than in 2003, and fed cattle prices averaged about 11 percent lower than in 2003

<sup>20</sup> The increase in export demand yields an increase in beef prices of approximately \$0.275 per hundredweight (cwt) on a \$120 box of beef and \$0.18 per cwt on a \$70 fed steer.

and production, suggesting that the change in industrial meat and beef production index might not mean the corresponding similar change in cost of goods sold in the restaurant industry.

Based on the Granger causality analyses of selected variables, industrial beef production, CPI for vegetables, CPI for fish/seafood, and PPI for commodities had causal relationships with the IOCFPU. Therefore, changes in levels of commodities' prices and production would lead to the change in the operational profitability of the casual theme restaurant industry.

The literature has emphasized the effect of labor market on the hospitality industry, mainly because labor costs directly affect operating margin and an ample supply of people in the 16 to 24 age category, the traditional source of labor for restaurants, can prevent wage costs from escalating. As expected, labor force level was positively related to and caused a change in IOCFPU. Value drivers measuring labor costs had both positive and negative relationships with industry's performance. This result implies that the decrease in labor costs due to more supply for demand is not always a good sign even for the labor-dependent industry. The labor costs translate into employment earnings that are included in personal incomes and eventually associated with customer spending. In this connection, the increase in value drivers measuring employment levels led to better operational cash flows. The result suggest that employment has a greater level of impacts upon sales as opposed to operating expenses in the casual theme restaurant industry. An increase in employment or decrease in unemployment is likely to raise the number of potential customers and their spending.

Five inflation related value drivers —CPI for energy, CPI for services, CPI for all items, PPI for non-durable goods less food and energy, and CPI for all items less food and shelter— experienced positive co-movements three quarters later in the IOCFPU, while core price (inflation) indices – PPI for all finished goods less food and energy and CPI for all items less food and energy – were negatively correlated. CPI and PPILEFE

representing the inflation category had causal relationships with IOCFPU. An increase three quarters earlier in PPI for all items less energy and food is expected to decrease the operational cash flow, and the consumer price index for all items had an impact in the opposite way.

As shown in the literature review, inflation can have both a positive and negative relationship with a firm's or industry's performance, depending on the level of inflation and measurement of inflation. The moderate level of inflation may be a good signal indicating an increase in consumer's spending and a high level of inflation can lead to a recession, which is unfavorable for the restaurant industry. As for measurement of inflation, PPILEFE and CPILEFE are the commonly used measures of core inflation. This measure of core inflation systematically excludes food and energy prices because, historically, they have been highly volatile. More specifically, food and energy prices are widely thought to be subject to large changes that often fail to persist and frequently represent relative price changes (Clark, 2001). Core rates of inflation excluding the ups and downs in energy and food costs that may distort inflation's true trend were negatively affecting operational performance in the casual theme restaurant industry from 1994 to 2003.

There was evidence that there is a positive correlation between the index of operational cash flow and stock market indices – Dow Jones Industrial Average and S & P 500-- three quarters earlier. However a unidirectional relationship from the stock market to the operational performance was not present. Interest markets and foreign exchange markets also did not have any co-movement with performance in all the calendar quarters from 1994 to 2003, suggesting there is no relationship between interest and foreign exchange markets and operating performance in the casual theme restaurant industry.

Such a result may derive from the choice of the subject analyzed. This study aimed to find the effect of economic changes on operational cash flows, not on financing

or investing cash flows. Therefore if financing or investing cash flows of the industry are the subject of a study, discrepancies in outputs may be found. Financing cash flows – relating to obtaining, servicing and redeeming sources of finance like loans, debentures and share capital – and investing cash flows – relating to acquisition and disposal of debt and equity interests in other entities and interests in joint ventures – would be directly associated with interest markets, stock markets or exchange markets that had no relationship with the operational cash flow in this study.

The growth in national input and output, such as GDP, GNP, and personal consumption expenditures (a function of GDP), was often said to increase sales in the restaurant industry. National income, GNP, and personal consumption expenditures, and construction appear to have co-movements, but the national income, GNP, and personal consumption/expenditure for services did not cause any change in the industry operational cash flow. Changes in the construction variables had a causal relationship with the restaurant industry, suggesting that this value driver could positively affect the growth of restaurant sales in three quarters. The value of construction put in place is a measure of the value of construction installed or erected at a site during a given period. Construction spending that represents about 20% of the gross domestic product plays a gauging role in the national economy. Economists look to construction spending for clues about the overall economy, because the construction industry is one of the first to go into a recession when the economy declines and the first to recover as conditions improve. Therefore, the fall in construction spending would reflect weak demand.

Numerous studies have examined the empirical relationship between monetary policy and performance of stock prices. Like stock markets, the money markets had a causal relationship with the industry in terms of cash flows. M1 and M2 negatively affected the restaurant industry's performance after three quarters, however the money market with the shorter lag (M2 at 1 lag) has a positive impact on the industry performance.

The major value drivers that stand for consumer-spending patterns –disposable income, wage and salary disbursements, consumer confidence, and consumer expectations did not show any corresponding change in IOCFPU. An approximation of economic variables that might explain consumer spending, such as retail sales, had a counter cycle pattern against the industry operational cash flow. However the counter cycle did not mean causality. Personal income was the only value driver that had causal relationship with IOCFPU and the increase in personal income simultaneously raised operational performance in the casual theme restaurant industry.

### **Research Question Two**

How much of the variance in cash flow of the casual theme restaurant industry can be explained by the economic value drivers?

Operational Questions:

- What value drivers can maximize the explanation of the variance in the operational cash flows?
- How much variance of the cash flows is likely to be explained by the value drivers?

The operating performance, or the operational cash flows proposed in the study are likely to have causal relationships with commodity production and prices, inflation, labor market, national output, tax, and money markets, and thus these economic value drivers can explain the variance in operational performance. On the other hand, the stock market, foreign currency market, and interest rates seem not to have direct causal-relationships with the operating performance in the casual theme restaurant industry.

With respect to operational question two, sixty seven percent of the variance of the industry operational cash flows of the casual theme restaurant industry can be explained by four selected value drivers – the consumer price for fish and seafood, the producer price for all commodities, the employment-population ratio, and the producer price for all items less energy and food. The ability of four economic value drivers to

account for operational cash flow volatility suggests that they are useful in explaining the volatility of past behavior of operational cash flows and in forecasting future volatility in the casual theme restaurant industry.

Additionally, the four value drivers finally selected are representative value drivers of other value drivers in the same category. For example, the consumer price index for fish and seafood was highly cross correlated with other commodity prices within the commodity market category. In the process of selecting variables, it was assumed that the highest correlated CPISEA with IOCFPU could possibly be representative for other inter-correlated value drivers, such as CPI for dairy, cheese, or meat, with CPISEA. The results achieved in this study resulted from efforts to maximize the explanatory power and to minimize inter-correlations among those value drivers, filtering out highly inter-correlated value drivers with other economic value drivers.

### **Research Question Three**

What is the sensitivity of the industry operational cash flows to changes in those economic value drivers?

Operational Questions:

- What value driver is the most influential on the operational cash flow?
- What level of sensitivity does each influential value drivers have?

The price index for fish and seafood within the commodity market category and the producer price index for all finished goods less food and energy in the inflation category were the most influential<sup>21</sup> on the operational cash flow per unit in the casual theme restaurant industry, followed by employment per population and producer price index for all commodities.

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<sup>21</sup> Based on the comparison among standardized coefficients of CPISEA, PPI, PPILEFE, EMPPP

The results indicated that a one percent change in consumer price index for fish and seafood reduces the industry operational cash flow per unit by 8.89% following a one-quarter lag. The demand for fish and seafood has increased dramatically over the last 50 years and the restaurant industry has changed its menu items or acquired a seafood specialty concept in order to meet such demand. All of the casual theme restaurants in this study have increasingly provided seafood dishes and four of the companies—Outback Steakhouse, Brinker International, Darden Restaurants, and Rare Hospitality International—own and operate seafood specialty concepts. The change in the demand and supply for fish and seafood menus appears to make the restaurant industry more sensitive to the change in the price of fish and seafood. Moreover, Darden Restaurants included in the sample studied owns Red Lobster Restaurants that has a large market share in the casual theme restaurant industry. The company represents approximately 15% of total market capitalization in the casual theme restaurant industry and the average share of operational cash flows to make up IOCFPU for this study is about 30%. (Refer to Appendix D).

A one percent increase in the three-quarter earlier producer price index would yield a 3.56% increase in the growth of the industry operational cash flow per unit in the casual theme restaurant industry. The producer price index for all commodities (PPI) can be seen as commodity related or inflation related value drivers. The PPI is a group of indexes that measure the changes in the selling price of goods and services received by U.S. producers over a period of time. While the CPI measures changes in prices paid by consumers, the PPI captures price movements at the wholesale level, before price changes have bubbled up to the retail level.

The effect of inflation may depend on market conditions. At the moderate level of inflation, two effects of inflation can be explained. Raw material costs, labor costs, and other expenses go up and thus the profits of a restaurant industry will decrease. However the moderate change in inflation may allow the restaurant industry to charge higher prices for its menu items, increasing profits. At a high level of inflation, it is known that

inflation usually gives an adverse impact on businesses. PPI as a measure of inflation includes not only raw materials for restaurants but also food prepared at home and eaten away from home along with alcoholic beverages. The broad increase in food related prices would allow restaurants to charge higher prices for their menu items after three quarters, and thus the pricing of restaurants could offset the adverse impact of the increase in commodity prices. Statistically, the correlation between  $PPI_{t-3}$  and food price index ( $CPI_{FOODt}$ ) had a significant correlation coefficient of .448 at  $p=0.05$  and  $PPI_t$  (Granger) caused  $CPI_{FOODt}$ . Moreover food prices away from home ( $CPI_{AWAYt}$ ) as a component of  $CPI_{FOODt}$  had a positive relationship (.494). As mentioned, PPI can provide early signals of mounting price pressures and may be reflected in the change  $CPI_{FOOD}$  and  $CPI_{AWAY}$  that include retail prices for food and menu prices of restaurants. Consequently, the result of the positive relationship between  $PPI_{t-3}$  and  $IOCFPU_t$  may imply that the change in inflation in food prices would allow restaurants to utilize a pricing policy under the circumstance of increasing prices of foods.

The growing employment ratio implies that more people will have disposable income that may be spent on dining-out. In this analysis, the employment to population ratio is likely to increase the change of the operational cash flow by 6.71% for every one percent increase in the employment to population ratio, when  $CPI_{SEA}$ , PPI, and  $PPI_{LEFE}$  are stable. The employment per population ratio seems to greater impact on purchasing power (revenue) than operational expenses. This would be logical by looking at the fact that personal income had positive and causal relationships with industry operational cash flows in the process of the analysis.

Lastly, a one percent increase in the change of the producer price index for all finished goods less energy and food ( $PPI_{LEFE}$ ) is expected to lead to a drop at 13.42% of the change in the operational cash flow 3 quarter later. Like CPI for all items less energy and food,  $PPI_{LEFE}$  is called a core PPI. The figure excluding food and energy items is often a truer picture of inflationary forces. As mentioned in the previous section, since food and energy prices could be very volatile due to conditions that are unrelated to the

economy--such as weather, oil supply or wars-- it is important to break down the factors impacting the change in prices. Therefore, this core price index, PPILEFE, may reflect underlying inflation. Moderate inflation will increase the operational expenses including labor costs for the restaurant industry. As discussed in chapter 2, labor costs are a primary expense in the restaurant industry. Moreover, the high level of inflation may lead to a recession and thus GDP and consumer spending will decline. The sluggish spending over time naturally may lead to poor performance in the casual theme restaurant industry. From the statistical point of view, PPILEFEt-3 had positive relationships with employment cost of wages in the service industries (ECIWASIt) and employment cost of compensation in service industries (ECICOSIt). This statistical result may imply that the inflation that is measured by the core PPI (PPILEFE) is a negative signal that indicates the increase in the labor costs for the casual theme restaurant industry.

Consequently, the operational cash flows in the casual theme restaurant industry would be affected by the previous change in the labor market, the commodities markets, and inflation, and among those value drivers commodity prices and inflation are the most influential value drivers that can have impacts on operating performance.

### **Implications for Managers**

The study's ultimate objective is to provide a practical and empirical way for food service managers to understand the causal effects of economic changes on industry performance. This understanding of the business environment would allow industry participants to enhance strategic decisions in order to achieve competitive advantages. Therefore, the study aimed at answering the question of what economic value drivers are related to an industry and how the value drivers impact one's business.

As in many industries, the economy will play a big part in the variance of profitability in the hospitality industry. The present study provides evidence that economic value drivers have a causal relationship with operational cash flow in the

casual theme restaurant industry. This statistical evidence suggests three meaningful messages to managers in the industry: (1) the existence of the impact of economic events on an industry; (2) selected value drivers can explain variance in operational performance in the industry; (3) further action of the industry is necessary to achieve competitive advantages by monitoring these value drivers.

As reviewed in the early stage of the problem statement, the more systematic and frequent the scanning performed by managers, the higher the chances of improving the firm's or industry's performance. (West & Olsen, 1988; West & Anthony, 1990). Before a firm or an industry can begin with the task of strategy formulation, it must scan its external environment to identify possible opportunities and threats and examine its internal environment for strengths and weaknesses. There should be a considerable relationship between environmental scanning and the degree of profitability (Thomas, 1993). The results of this study suggests that 67 percent of the variance in the operational cash flow in the casual theme restaurant industry is likely to result from changes in economic value drivers. The sixty seven percent of the variance in operational cash flow in the industry will exist whether or not a manager scans the economic environment. Therefore, the managers' lack of knowledge about effects of the economic environment would result in a greater level of uncertainty regarding the industry cash flow variability.

Identifying value drivers that have causal relations with a firm or industry's performance is a primary task of environmental scanning. The analysis of the environment has to be guided by an accurate assessment of the relevant factors. In this study, the attempt to discover the value drivers in the economic environment was made by cross-correlation, Granger causality, and multivariate regression analysis of historical time series. Starting with 110 potential value drivers<sup>22</sup>, it was found that changes in inflation, commodity markets, and labor market could forecast some degree of the change in operational cash flow in the casual theme restaurant industry based on the analysis of

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<sup>22</sup> The economic value drivers and their sources were presented in Chapter 2.

time series data. The industry must set up a scanning system in order to track these value drivers and understand the sensitivities of its operational performance to economic value drivers. A scanning system monitoring monthly, quarterly, and yearly changes in economic value drivers will work as a tool to attain warning signs, specific trends and patterns in the industry. As a result of scanning activities, managers in the casual theme restaurant industry will have a chance to look for insights between environmental scanning and effective strategies.

The next step for management will be the effective use of the important value drivers scanned in order to improve decision-making. Because environmental scanning itself cannot be sufficient, the information gained from scanning must be used in some relevant manner. The use of leading economic value drivers—that show their changes prior to the change in an industry's performance— allows managers to perform scenario analysis in periods of uncertainty and to buffer future operational risks against these value drivers.

Environmental scanning is the acquisition and use of information about events, trends, and relationships in a firm's external environment, the knowledge of which would assist management in planning the firm's future course of action (Choo, 1999). Management must scan its environment in order to understand external forces of change so that it may develop effective responses that secure or improve its position in the future (Gable & Topol, 1987). For example, realizing that the employment to population ratio is a primary value driver that can explain the future variance of the firm's cash flow stream, an investment in human resources would be helpful in order to improve productivity and stabilize labor costs. Or if the seafood specialty concept is expanded, strategic supply channels and/or menu flexibility must be strengthened to protect and improve margins.

The notion that environmental scanning is a key factor to sustained competitive advantage requires the integration of business strategy and environment. Environmental scanning is increasingly being viewed as the first step in the process linking strategy and

environment. Effective scanning of the environment is seen as essential to the successful alignment of competitive strategy formulation and implementation with environmental requirements and thus the achievement of noticeable and sustainable performance. Consequently, although it is almost impossible to eliminate the adverse impact of the economy, the industry will have more opportunities to reduce some potential operational risks as long as the management regularly and reasonably develops its ability to act in response to its outside environment.

### **Suggestions for Further Studies**

The study focused on the identification of economic value drivers and their effects on the cash flows of the casual theme restaurant industry. The result of the analyses cannot be applied to other kinds of performance. As previously mentioned, the financing or investing cash flows as well as the equity value would be expected to different results. For example, Applebee reported that a 1% change in interest rates would result in an increase or decrease in interest expense of \$150,000 per year. Comparing the effects between financing and operational cash flow may provide useful information to understand the effect of economics in the industry.

The findings in this study improved the explanatory power of the uncertainty related to the variability of operational cash flows. The explanation of the variability may be better confirmed when specific impacts on sub-factors of operational cash flow like sales and operational expenses are examined. Labor market related value drivers are conceptually and empirically related to operational cash flows, influencing both sales and expenses. The findings of this study implied that the effect of employment on sales dominated the effect on operational expenses, suggesting that employment is a more demand related value driver. The empirical analysis of relationships between economic value drivers and sub-factors of operational cash flow may enhance the explanatory power of economic value drivers.

A set of economic value drivers and its effect on operational performance in a industry would vary according to industry segments. Customers' profiles and cost structures are not alike in industry specific segments even though they are within the restaurant industry. In other words, the quick service restaurant industry or the fine dining industry may come up with a dissimilar picture to the casual theme restaurant industry. Identifying differences among various strategic groups in the restaurant industry would benefit managers who plan to invest in other concepts. This should be the next step to develop the exogenous value drivers in the economic environment.

### **Limitation**

Testing all potential economic variables would require a huge amount of analysis and interpretation, so the indirect impact that should exist in the economic environment could not be analyzed. It is certain that some economic variables, which did not have the significant cross correlations or the Granger causality, may have an indirect impact on the industry operational cash flow. For example, the consumer sentiment was not significantly correlated with the industry operational cash flow by any time lag, but Matsusaka and Sbordone (1995) found that consumer sentiment causes GNP volatility and explained between 13-16% of GNP variation, when they examined trends in US output over the period 1953 to 1988. To obtain a detailed picture for economic value drivers, path analysis, developed by Sewall Wright in 1934, may be used as a way of analyzing the direct and indirect effects of variables hypothesized as causal.

Another limitation in the study was the sample size. The study examined the causal relationship from economic variables to the operational cash flow in the casual theme restaurant industry. To find the effects of economic factors on the casual theme restaurant industry, the corporations that are not pure casual dining players were not included in this study. The limitation of data availability, which forced the study to observe public companies, prevented the study from capturing the whole casual dining market. As stated in chapter 3, these eleven restaurant companies make up 67% of total

market capitalization for casual theme restaurants that are publicly traded and 13% of sales for full-service restaurants. Therefore, the eleven casual theme restaurant companies may not embody the impacts upon the whole casual dining market, and thus the application of this analysis to the market is limited.

## **Conclusion**

The main objective of this study was (1) to provide an account of research done on economic variables having causal effects upon the casual theme restaurant industry, (2) to assess the causal relationships among key economic value drivers hypothesized to affect performance variables pertaining to an industry sector, and (3) to provide a practical and empirical way for food service managers to understand the causal effects on industry performance.

The result indicated that economic value drivers would possibly explain a significant amount of the variance of industry performance in terms of its operational performance. The causal effect of economic value drivers on the operational performance of the casual theme restaurant industry may be unavoidable, but scanning the industry's economic environment and better understanding causal relationships could reduce the unexpected risk. The study supports the conclusion that in the casual theme restaurant industry the economic environment should be scanned to gain competitive advantages and that there are economic value drivers that are likely to explain the effect of the environment. There are two channels available for a firm or industry to create and enhance their value: through improving their growth and profit or through minimizing their loss that may be possible by managing potential risks. This study would suggest to the restaurant industry to pursue the latter channel. By understanding and managing economic risks, the restaurant industry would minimize the volatility of its profitability.

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## Appendix A

### Sample of Restaurant Companies

Company	Concept	Franchised Units* (As of 2003)	Total Units (As of 2003)
APPB	Applebee's Neighborhood Grill & Bar	75%	383
BNHNA	Benihana, Haru, Ra Sushi, Doraku	23%	67
EAT	Chili's, Macaroni Grill, Maggiano's, On The Border, Corner Bakery, Big Bowl, Rockfish	18%	1,179
OSI	Outback Steakhouse, Carrabba's Italian Grill, Fleming's Prime Steakhouse and Wine Bar, Roy's, Cheeseburger in Paradise, Bonefish Grill, Lee Roy Selmon's and Paul Lee;s Chinese Kitchen	0%	868
RARE	LongHorn Steakhouse, The Capital Grille , Bugaboo Creek Steak House, Hemenway's Seafood Grille & Oyster Bar, The Old Grist Mill Tavern	-	223
STAR	Lone Star Steakhouse & Saloon or Lone Star Café, Sullivan's Steakhouse restaurants, Del Frisco's Double Eagle Steak House, Texas Land & Cattle restaurants, Frankie's Italian Grille	-	288
CHUX	O'Charley's, Ninety Nine Restaurant and Pu, Stoney River Legendary Steaks	0%	299
CBRL	Cracker Barrel, Logan's Roadhouse	-	585
MAXE	Max & Erma's	-	73
DRI	Red Lobster, Olive Garden, Bahama Breeze, Smokey Bones, Seasons 52	0%	1,303
RI	Ruby Tuesday	25%	462

\* This study excludes franchise data including operational cash flow and unit number.

## Appendix B

### Cross Correlation Coefficients

Economic Value Drivers at t-1 and IOCFPU at t

Commodity Markets		Lag				
Value Driver	4	3	2	1	0	
ipimeat	-0.036	0.510*	0.137	-0.695*	0.059	
ipibeef	0.033	0.550*	0.003	-0.608*	0.06	
ipichee	0.619*	-0.300	-0.286	0.080	0.410	
ipidair	0.630*	0.134	-0.501*	-0.273	0.639*	
ipipoul	0.244	0.600*	-0.272	-0.510	0.182	
ipibutt	0.299	-0.481*	-0.285	0.547*	0.265	
ipi	-0.229	0.546*	-0.041	-0.431*	-0.179	
ipipork	-0.205	-0.433*	0.126	0.540*	-0.251	
cpitoma	0.187	-0.443*	-0.106	0.342	0.210	
cpisea	0.269	-0.120	0.120	-0.427*	0.365	
cpidair	0.015	-0.223	-0.032	0.404*	-0.225	
cpichee	-0.163	-0.123	0.202	0.286	-0.388*	
cpiveg	0.072	-0.132	-0.347*	0.266	0.342	
ppi	-0.038	0.345*	-0.259	-0.087	-0.151	

Labor Markets		Lag				
Value Driver	4	3	2	1	0	
emppp	-0.384	0.104	0.557*	-0.347	-0.409*	
hrlh	0.197	-0.528*	-0.131	0.43	0.304	
hrpri	0.192	-0.518*	-0.164	0.499*	0.262	
empfull	-0.492	0.359*	0.464*	-0.384*	-0.513*	
emppart	0.448	-0.476*	-0.273	0.278	0.513*	
eciwasi	-0.498	-0.015	0.166	0.38	-0.454	
unemp	0.143	0.207	-0.494*	0.178	0.221	
emplo	-0.394*	0.147	0.492*	-0.355*	-0.367*	
empfri	-0.129	0.094	0.469*	-0.488*	-0.141	
ecicosi	-0.487*	0.096	0.068	0.386*	-0.436*	
emppris	-0.059	-0.029	0.449	-0.409*	-0.067	

hrpris	0.354	-0.441*	-0.368*	0.464*	0.417*
empt	-0.024	-0.034	0.408*	-0.410*	-0.019
hrfb	0.025	-0.381*	-0.060	0.353	0.090
ecicoso	-0.064	0.021	-0.142	0.356*	-0.069
eciwag	-0.355*	0.298	0.005	0.001	-0.210
ecicom	-0.260	0.326	-0.110	0.029	-0.151
laborf	-0.476*	0.433*	0.310	-0.391*	-0.377*

Inflation		Lag				
Value Driver	4	3	2	1	0	
cpiner	-0.077	0.522*	-0.133	-0.268	-0.231	
cpiser	0.073	0.519*	-0.335	-0.223	-0.049	
cpi	-0.008	0.516*	-0.412*	-0.074	-0.120	
cpilefe	0.101	0.223	-0.492*	0.140	0.098	
cpilefs	-0.056	0.484*	-0.286	-0.116	-0.222	
ppilefe	0.398*	-0.464*	-0.181	0.294	0.277	
ppinond	-0.084	0.391*	-0.239	-0.106	-0.200	

Stock Market		Lag				
Value Driver	4	3	2	1	0	
djin	0.432*	-0.230	0.067	-0.104	0.337	
sp500	0.365*	-0.242	0.082	-0.134	0.313	

National Input/Output		Lag				
Value Driver	4	3	2	1	0	
constr	-0.266	0.571*	0.262	-0.570	-0.314	
constfb	-0.353	0.501*	0.245	-0.450	-0.276	
constco	-0.307	0.491*	0.271	-0.435	-0.437	
constf	-0.259	0.383*	0.169	-0.373	-0.244	
nincom	0.162	-0.086	-0.206	-0.061	0.329*	
gnp	0.191	-0.322*	0.133	-0.113	0.214	
pceser	0.051	0.291	-0.316*	-0.137	0.275	

Government Related		Lag				
Value Driver	4	3	2	1	0	

tax	0.429*	0.293	-0.133	-0.608*	0.427*
taxind	0.476*	0.326	-0.234	-0.581*	0.486*
taxco	0.148	-0.035	0.282	-0.427*	0.155

Money Market		Lag				
Value Driver	4	3	2	1	0	
m1	-0.019	-0.407*	0.274	0.210	0.067	
m3	0.272	-0.397*	-0.070	0.263	0.337	
m2	-0.003	-0.233	-0.032	0.367*	0.059	

Consumer Spending		Lag				
Value Driver	4	3	2	1	0	
retfbs	0.128	-0.571*	0.271	0.213	0.123	
retail	0.142	-0.546*	0.236	0.184	0.144	
retnfs	0.153	-0.542*	0.227	0.176	0.159	
retfbp	-0.303	0.354	0.472*	-0.542*	-0.269	
retfull	-0.347	0.425*	0.453*	-0.525*	-0.328	
perinco	0.116	-0.027	-0.285	-0.046	0.346*	

\* Shows the correlation coefficients that are statistically significant at p=0.05

\*\* Small differences of correlation coefficient between in the table and in Table 6s due to the exclusion of missing values when a variable is lagged. This table is the result of cross correlation function and Table 6s are the results of the correlation analysis between IOCFPU and lagged economic variables based on the result of cross correlation function.

## Appendix C

### Correlation Matrices for Economic Variables

#### Commodity Markets

		Correlations														
		ocfpu	LAGS(ipi meat,1)	LAGS(ipi beef,1)	LAGS(ipi chee,4)	LAGS(ipi poul,3)	LAGS(ipi butt,1)	LAGS(ipi,3)	LAGS(ipi pork,1)	LAGS(cpi toma,3)	LAGS(cpi sea,1)	LAGS(cpi dair,1)	LAGS(cpi veg,2)	LAGS(ppi,3)	cpichee	ipidair
ocfpu	Pearson Correlation	1	-.642*	-.746*	.733*	.634*	.573*	.566*	.550*	-.454*	-.428*	.405*	-.353*	.365*	-.388*	.639*
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.005	.007	.012	.032	.029	.015	.000
	N	39	38	38	35	36	38	36	38	36	38	38	37	36	39	39
LAGS(ipimeat,1)	Pearson Correlation	-.642*	1	.904*	-.648*	-.723*	-.605*	-.627*	-.441*	.405*	.373*	-.506*	.399*	-.346*	.104	-.674*
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.006	.014	.021	.001	.014	.039	.039	.534	.000
	N	38	38	38	35	36	38	36	38	36	38	38	37	36	38	38
LAGS(ipibeef,1)	Pearson Correlation	-.626*	.904*	1	-.664*	-.731*	-.750*	-.721*	-.677*	.542*	.379*	-.511*	.416*	-.317	.244	-.832*
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.001	.019	.001	.010	.060	.139	.000
	N	38	38	38	35	36	38	36	38	36	38	38	37	36	38	38
LAGS(ipichee,4)	Pearson Correlation	.613*	-.648*	-.664*	1	.716*	.505*	.688*	.565*	-.430*	-.370*	.524*	-.389*	.241	-.330	.602*
	Sig. (2-tailed)	.000	.000	.000		.000	.002	.000	.000	.010	.029	.001	.021	.164	.053	.000
	N	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
LAGS(ipipoul,3)	Pearson Correlation	.634*	-.723*	-.731*	.716*	1	.500*	.630*	.742*	-.344*	-.275	.325	-.428*	.243	-.259	.639*
	Sig. (2-tailed)	.000	.000	.000	.000		.002	.000	.000	.040	.105	.053	.009	.153	.127	.000
	N	36	36	36	35	36	36	36	36	36	36	36	36	36	36	36
LAGS(ipibutt,1)	Pearson Correlation	.573*	-.605*	-.750*	.505*	.500*	1	.640*	.507*	-.583*	-.125	.390*	-.280	.133	-.437*	.858*
	Sig. (2-tailed)	.000	.000	.000	.002	.002		.000	.001	.000	.453	.016	.093	.438	.006	.000
	N	38	38	38	35	36	38	36	38	36	36	38	37	36	38	38
LAGS(ipi,3)	Pearson Correlation	.566*	-.627*	-.721*	.688*	.630*	.640*	1	.557*	-.637*	-.033	.362*	-.283	.336*	-.404*	.789*
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.850	.030	.095	.045	.014	.000
	N	36	36	36	35	36	36	36	36	36	36	36	36	36	36	36
LAGS(ipipork,1)	Pearson Correlation	.550*	-.441*	-.677*	.565*	.742*	.507*	.557*	1	-.405*	-.104	.291	-.449*	.100	-.291	.670*
	Sig. (2-tailed)	.000	.006	.000	.000	.000	.001	.000	.000		.014	.536	.076	.005	.563	.077
	N	38	38	38	35	36	38	36	38	36	38	38	37	36	38	38
LAGS(cpitoma,3)	Pearson Correlation	-.454*	.405*	.542*	-.430*	-.344*	-.583*	-.637*	-.405*	1	-.004	-.273	.021	-.174	.547*	-.722*
	Sig. (2-tailed)	.005	.014	.001	.010	.040	.000	.000	.014		.984	.108	.903	.311	.001	.000
	N	36	36	36	35	36	36	36	36	36	36	36	36	36	36	36
LAGS(cpi sea,1)	Pearson Correlation	-.428*	.373*	.379*	-.370*	-.275	-.125	-.033	-.104	-.004	1	-.205	.348*	-.032	-.068	-.031
	Sig. (2-tailed)	.007	.021	.019	.029	.105	.453	.850	.536	.984		.216	.035	.852	.685	.854
	N	38	38	38	35	36	38	36	38	36	38	38	37	36	38	38
LAGS(cpidair,1)	Pearson Correlation	.405*	-.506*	-.511*	.524*	.325	.390*	.362*	.291	-.273	-.205	1	-.206	.229	.083	.348*
	Sig. (2-tailed)	.012	.001	.001	.001	.053	.016	.030	.076	.108	.216	.222		.179	.620	.032
	N	38	38	38	35	36	38	36	38	36	38	38	37	36	38	38
LAGS(cpi veg,2)	Pearson Correlation	-.353*	.399*	.416*	-.389*	-.428*	-.280	-.283	-.449*	.021	.348*	-.206	1	-.150	-.019	-.236
	Sig. (2-tailed)	.032	.014	.010	.021	.009	.093	.095	.005	.903	.035	.222		.382	.910	.160
	N	37	37	37	35	36	37	36	37	36	37	37	37	36	37	37
LAGS(ppi,3)	Pearson Correlation	.365*	-.346*	-.317	.241	.243	.133	.336*	.100	-.174	-.032	.229	-.150	1	-.105	.237
	Sig. (2-tailed)	.029	.039	.060	.164	.153	.438	.045	.563	.311	.852	.179	.382		.541	.163
	N	36	36	36	35	36	36	36	36	36	36	36	36	36	36	36
cpichee	Pearson Correlation	-.388*	.104	.244	-.330	-.259	-.437*	-.404*	-.291	.547*	-.068	.083	-.019	-.105	1	-.445*
	Sig. (2-tailed)	.015	.534	.139	.053	.127	.006	.014	.077	.001	.685	.620	.910	.541		.005
	N	39	38	38	35	36	38	36	38	36	38	38	37	36	39	39
ipidair	Pearson Correlation	.639*	-.674*	-.833*	.602*	.639*	.858*	.789*	.670*	-.722*	-.031	.348*	-.236	.237	-.445*	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.854	.032	.160	.163	.005	
	N	39	38	38	35	36	38	36	38	36	38	38	37	36	39	39

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

# Labor Markets

## Correlations

		ocfpu	LAGS(em ppp.2)	LAGS(hrhh.3)	LAGS(hrpri.3)	LAGS(eci wasi.4)	LAGS(un emp.2)	LAGS(em plo.2)	LAGS(em ppri.1)	LAGS(eci cosi.3)	LAGS(em ppris.2)	LAGS(hrp ris.3)	LAGS(em pt.1)	LAGS(hrhh.3)	LAGS(eci coso.1)	LAGS(eci wagi.4)	LAGS(eci com.3)	LAGS(lab or.3)	empfull	emppart
ocfpu	Pearson Correlation	1	.563*	-.563*	-.543*	-.533*	-.506*	-.498*	-.488*	-.102	-.456*	-.455*	-.410*	-.409*	-.358*	-.401*	-.346*	-.448*	-.513*	-.513*
	Sig. (2-tailed)		.000	.000	.001	.001	.001	.002	.002	.554	.005	.004	.011	.013	.027	.017	.038	.006	.001	.001
	N	39	37	36	36	35	37	37	37	36	37	36	36	36	36	35	36	36	39	39
LAGS(emppp.2)	Pearson Correlation	.563*	1	-.686*	-.530*	-.589*	-.839*	-.970*	-.376*	-.123	.825*	-.369*	-.351*	-.688*	.348*	-.509*	-.256	.270	-.744*	.822*
	Sig. (2-tailed)	.000		.000	.001	.000	.000	.000	.022	.476	.000	.027	.033	.000	.035	.002	.131	.111	.000	.000
	N	37	37	36	36	35	37	37	37	36	37	36	37	36	37	35	36	36	37	37
LAGS(hrhh.3)	Pearson Correlation	-.560*	-.686*	1	.883*	.771*	.701*	-.643*	-.744*	-.195	-.561*	.809*	.635*	.847*	-.294	.448*	-.406*	-.585*	.471*	-.502*
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.255	.000	.000	.000	.000	.082	.007	.014	.000	.004	.002
	N	36	36	36	36	35	36	36	36	36	36	36	36	36	36	35	36	36	36	36
LAGS(hrpri.3)	Pearson Correlation	-.543*	-.530*	.883*	1	.661*	.497*	-.524*	.529*	-.077	-.297	.949*	.370*	.592*	-.115	.335*	-.304	-.650*	.400*	-.258
	Sig. (2-tailed)	.001	.001	.000		.000	.002	.001	.001	.655	.079	.000	.026	.000	.504	.049	.072	.000	.016	.129
	N	36	36	36	36	35	36	36	36	36	36	36	36	36	36	35	36	36	36	36
LAGS(eciwasi.4)	Pearson Correlation	-.533*	-.589*	.771*	.661*	1	.790*	-.553*	.753*	-.360*	-.690*	.609*	.718*	.590*	-.165	.673*	-.441*	-.491*	.166	-.407*
	Sig. (2-tailed)	.001	.000	.000	.000		.000	.001	.000	.034	.000	.000	.000	.000	.342	.000	.008	.003	.341	.015
	N	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
LAGS(unemp.2)	Pearson Correlation	-.506*	-.839*	.701*	.497*	.790*	1	-.808*	.643*	-.253	-.933*	.395*	.652*	.582*	-.370*	.550*	-.402*	-.425*	.372*	-.654*
	Sig. (2-tailed)	.001	.000	.000	.002	.000		.000	.000	.137	.000	.017	.000	.000	.024	.001	.015	.010	.024	.000
	N	37	37	36	36	35	37	37	37	36	37	36	37	36	37	35	36	36	37	37
LAGS(emplo.2)	Pearson Correlation	.498*	.970*	-.643*	-.524*	-.553*	-.808*	1	-.347*	-.102	.788*	-.361*	-.325	-.626*	-.498*	.325*	.276	.265	-.727*	.779*
	Sig. (2-tailed)	.002	.000	.000	.001	.001	.000		.035	.552	.000	.030	.050	.000	.050	.002	.104	.118	.000	.000
	N	37	37	36	36	35	37	37	37	36	37	36	37	36	37	35	36	36	37	37
LAGS(emppri.1)	Pearson Correlation	-.488*	-.376*	.744*	.529*	.753*	.643*	-.347*	1	-.655*	-.539*	.537*	.972*	.605*	-.469*	.379*	-.624*	-.549*	.157	-.324*
	Sig. (2-tailed)	.002	.022	.000	.001	.000	.000	.035	.000		.001	.001	.000	.000	.003	.025	.000	.001	.347	.047
	N	38	37	36	36	35	37	37	38	36	37	36	38	36	38	35	36	36	38	38
LAGS(ecicosi.3)	Pearson Correlation	.102	-.123	-.195	-.077	-.360*	-.253	-.102	-.655*	1	.207	-.142	-.701*	-.020	.403*	-.031	.700*	.304	.341*	-.091
	Sig. (2-tailed)	.554	.476	.255	.655	.034	.137	.552	.000		.225	.410	.000	.908	.015	.858	.000	.072	.042	.597
	N	36	36	36	36	35	36	36	36	36	36	36	36	36	35	36	36	36	36	36
LAGS(emppris.2)	Pearson Correlation	.456*	.825*	-.561*	-.297	-.690*	-.933*	.788*	-.539*	.207	1	-.129	-.609*	-.556*	.348*	-.623*	.384*	.180	-.401*	.755*
	Sig. (2-tailed)	.005	.000	.000	.079	.000	.000	.000	.001	.225	.001	.452	.000	.000	.035	.000	.021	.293	.014	.000
	N	37	37	36	36	35	37	37	37	36	37	36	37	36	37	35	36	36	37	37
LAGS(hrpri.3)	Pearson Correlation	-.465*	-.369*	.809*	.949*	.609*	.395*	-.361*	.537*	-.142	-.129	1	.347*	.484*	-.067	.177	-.252	-.753*	.207	-.022
	Sig. (2-tailed)	.004	.027	.000	.000	.000	.017	.030	.001	.410	.452	.038		.003	.700	.310	.138	.000	.226	.900
	N	36	36	36	36	35	36	36	36	36	36	36	36	36	36	35	36	36	36	36
LAGS(empt.1)	Pearson Correlation	-.410*	-.351*	.635*	.370*	.718*	.652*	-.325	.972*	-.701*	-.609*	.347*	1	.550*	-.487*	.432*	-.646*	-.400*	.109	-.370*
	Sig. (2-tailed)	.011	.033	.000	.026	.000	.000	.050	.000	.000	.038	.038	.038		.001	.002	.010	.000	.515	.022
	N	38	37	36	36	35	37	37	38	36	37	36	38	38	36	38	35	36	38	38
LAGS(hrhh.3)	Pearson Correlation	-.409*	-.688*	.847*	.592*	.590*	.582*	-.626*	.605*	-.020	-.556*	.484*	.550*	1	-.310	.431*	-.237	-.258	.592*	-.650*
	Sig. (2-tailed)	.013	.000	.000	.000	.000	.000	.000	.000	.908	.000	.003	.001		.066	.010	.163	.128	.000	.000
	N	36	36	36	36	35	36	36	36	36	36	36	36	36	36	35	36	36	36	36
LAGS(ecicoso.1)	Pearson Correlation	.358*	.348*	-.294	-.115	-.165	-.370*	.325*	-.469*	.403*	.348*	-.067	-.487*	-.310	1	-.096	.542*	.065	-.336*	.436*
	Sig. (2-tailed)	.027	.035	.062	.504	.342	.024	.050	.003	.015	.035	.700	.002	.066		.584	.001	.705	.039	.006
	N	38	37	36	36	35	37	37	38	36	37	36	38	36	38	35	36	36	36	38
LAGS(eciwagi.4)	Pearson Correlation	-.401*	-.509*	.448*	.335*	.673*	.550*	-.498*	.379*	-.031	-.623*	.177	.432*	.431*	-.096	1	-.302	-.087	.240	-.539*
	Sig. (2-tailed)	.017	.002	.007	.049	.000	.001	.002	.025	.858	.000	.310	.010	.010		.584	.078	.618	.165	.001
	N	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
LAGS(ecicom.3)	Pearson Correlation	.346*	.256	-.406*	-.304	-.441*	-.402*	.276	-.624*	.700*	.384*	-.252	-.646*	-.237	.542*	-.302	1	.363*	-.150	.364*
	Sig. (2-tailed)	.038	.131	.014	.072	.008	.015	.104	.000	.000	.021	.138	.000	.163	.001	.078		.029	.383	.029
	N	36	36	36	36	35	36	36	36	36	36	36	36	36	36	35	36	36	36	36
LAGS(labor.3)	Pearson Correlation	.448*	.270	-.585*	-.650*	-.491*	-.425*	.265	-.549*	.304	.180	-.753*	-.400*	-.258	.065	-.087	.363*	1	-.046	.032
	Sig. (2-tailed)	.006	.111	.000	.000	.003	.010	.118	.001	.072	.293	.000	.016	.128	.705	.618	.029		.790	.853
	N	36	36	36	36	35	36	36	36	36	36	36	36	36	36	35	36	36	36	36
empfull	Pearson Correlation	-.513*	-.744*	.471*	.400*	.166	.372*	-.727*	.157	.341*	-.401*	.207	.109	.592*	-.336*	.240	-.150	-.046	1	-.809*
	Sig. (2-tailed)	.001	.000	.004	.016	.341	.024	.000	.347	.042	.014	.226	.515	.000	.039	.165	.383	.790		.000
	N	39	37	36	36	35	37	37	38	36	37	36	38	36	38	35	36	36	36	39
emppart	Pearson Correlation	.513*	.822*	-.502*	-.258	-.407*	-.654*	.779*	-.324*	-.091	.755*	-.022	-.370*	-.650*	.436*	-.539*	.364*	.032	-.809*	1
	Sig. (2-tailed)	.001	.000	.002	.129	.015	.000	.000	.047	.597	.000	.900	.022	.000	.006	.001	.029	.853	.000	
	N	39	37	36	36	35	37	37	38	36	37	36	38	36	38	35	36	36	36	39

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## Inflation

Correlations

		ocfpu	LAGS(cpi ener,3)	LAGS(cpi ser,3)	LAGS(cpi,3)	LAGS(cpi lefe,2)	LAGS(cpi lefs,3)	LAGS(ppi lefe,3)	LAGS(ppi nond,3)
ocfpu	Pearson Correlation	1	.564**	.554**	.577**	-.515**	.556**	-.503**	.412*
	Sig. (2-tailed)		.000	.000	.000	.001	.000	.002	.013
	N	39	36	36	36	37	36	36	36
LAGS(cpiener,3)	Pearson Correlation	.564**	1	.467**	.764**	-.320	.901**	-.258	.842**
	Sig. (2-tailed)	.000		.004	.000	.057	.000	.128	.000
	N	36	36	36	36	36	36	36	36
LAGS(cpi ser,3)	Pearson Correlation	.554**	.467**	1	.841**	-.754**	.701**	-.421*	.387*
	Sig. (2-tailed)	.000	.004		.000	.000	.000	.011	.020
	N	36	36	36	36	36	36	36	36
LAGS(cpi,3)	Pearson Correlation	.577**	.764**	.841**	1	-.634**	.953**	-.262	.684**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.123	.000
	N	36	36	36	36	36	36	36	36
LAGS(cpilefe,2)	Pearson Correlation	-.515**	-.320	-.754**	-.634**	1	-.525**	.643**	-.257
	Sig. (2-tailed)	.001	.057	.000	.000		.001	.000	.130
	N	37	36	36	36	37	36	36	36
LAGS(cpilefs,3)	Pearson Correlation	.556**	.901**	.701**	.953**	-.525**	1	-.238	.809**
	Sig. (2-tailed)	.000	.000	.000	.000	.001		.162	.000
	N	36	36	36	36	36	36	36	36
LAGS(ppilefe,3)	Pearson Correlation	-.503**	-.258	-.421*	-.262	.643**	-.238	1	-.108
	Sig. (2-tailed)	.002	.128	.011	.123	.000	.162		.529
	N	36	36	36	36	36	36	36	36
LAGS(ppinond,3)	Pearson Correlation	.412*	.842**	.387*	.684**	-.257	.809**	-.108	1
	Sig. (2-tailed)	.013	.000	.020	.000	.130	.000	.529	
	N	36	36	36	36	36	36	36	36

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## Stock Market

Correlations

		ocfpu	LAGS(djin,4)	LAGS(sp 500,4)
ocfpu	Pearson Correlation	1	.457**	.388*
	Sig. (2-tailed)		.006	.021
	N	39	35	35
LAGS(djin,4)	Pearson Correlation	.457**	1	.941**
	Sig. (2-tailed)	.006		.000
	N	35	35	35
LAGS(sp500,4)	Pearson Correlation	.388*	.941**	1
	Sig. (2-tailed)	.021	.000	
	N	35	35	35

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## National Input and Output

Correlations

		ocfpu	LAGS(co nstr,3)	LAGS(co nstfb,3)	LAGS(co nstco,3)	LAGS(co nstf,3)	LAGS(gnp,3)	LAGS(pc eser,2)	nincom
ocfpu	Pearson Correlation	1	.606**	.514**	.532**	.399*	-.346*	-.336*	.329*
	Sig. (2-tailed)		.000	.001	.001	.016	.039	.042	.041
	N	39	36	36	36	36	36	37	39
LAGS(constr,3)	Pearson Correlation	.606**	1	.721**	.947**	.596**	-.105	-.262	.211
	Sig. (2-tailed)	.000		.000	.000	.000	.544	.123	.217
	N	36	36	36	36	36	36	36	36
LAGS(constfb,3)	Pearson Correlation	.514**	.721**	1	.763**	.732**	-.151	-.239	.203
	Sig. (2-tailed)	.001	.000		.000	.000	.380	.161	.234
	N	36	36	36	36	36	36	36	36
LAGS(constco,3)	Pearson Correlation	.532**	.947**	.763**	1	.646**	-.083	-.194	.138
	Sig. (2-tailed)	.001	.000	.000		.000	.629	.256	.422
	N	36	36	36	36	36	36	36	36
LAGS(constf,3)	Pearson Correlation	.399*	.596**	.732**	.646**	1	-.213	-.148	.195
	Sig. (2-tailed)	.016	.000	.000	.000		.213	.388	.253
	N	36	36	36	36	36	36	36	36
LAGS(gnp,3)	Pearson Correlation	-.346*	-.105	-.151	-.083	-.213	1	.327	.079
	Sig. (2-tailed)	.039	.544	.380	.629	.213		.052	.647
	N	36	36	36	36	36	36	36	36
LAGS(pceser,2)	Pearson Correlation	-.336*	-.262	-.239	-.194	-.148	.327	1	.013
	Sig. (2-tailed)	.042	.123	.161	.256	.388	.052		.941
	N	37	36	36	36	36	36	37	37
nincom	Pearson Correlation	.329*	.211	.203	.138	.195	.079	.013	1
	Sig. (2-tailed)	.041	.217	.234	.422	.253	.647	.941	
	N	39	36	36	36	36	36	37	39

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## Government Revenue, Spending, Debt, and Taxes; Money Supply; and Consumer Spending

Correlations

		ocfpu	LAGS(tax,1)	LAGS(tax ind,1)	LAGS(tax co,1)
ocfpu	Pearson Correlation	1	-.608**	-.581**	-.429**
	Sig. (2-tailed)		.000	.000	.007
	N	39	38	38	38
LAGS(tax,1)	Pearson Correlation	-.608**	1	.974**	.691**
	Sig. (2-tailed)	.000		.000	.000
	N	38	38	38	38
LAGS(taxind,1)	Pearson Correlation	-.581**	.974**	1	.535**
	Sig. (2-tailed)	.000	.000		.001
	N	38	38	38	38
LAGS(taxco,1)	Pearson Correlation	-.429**	.691**	.535**	1
	Sig. (2-tailed)	.007	.000	.001	
	N	38	38	38	38

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## Money Supply

Correlations

		ocfpu	LAGS(m1,3)	LAGS(m3,3)	LAGS(m2,1)
ocfpu	Pearson Correlation	1	-.428**	-.417*	.375*
	Sig. (2-tailed)		.009	.011	.021
	N	39	36	36	38
LAGS(m1,3)	Pearson Correlation	-.428**	1	.536**	-.260
	Sig. (2-tailed)	.009		.001	.125
	N	36	36	36	36
LAGS(m3,3)	Pearson Correlation	-.417*	.536**	1	-.151
	Sig. (2-tailed)	.011	.001		.378
	N	36	36	36	36
LAGS(m2,1)	Pearson Correlation	.375*	-.260	-.151	1
	Sig. (2-tailed)	.021	.125	.378	
	N	38	36	36	38

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## Consumer Spending

Correlations

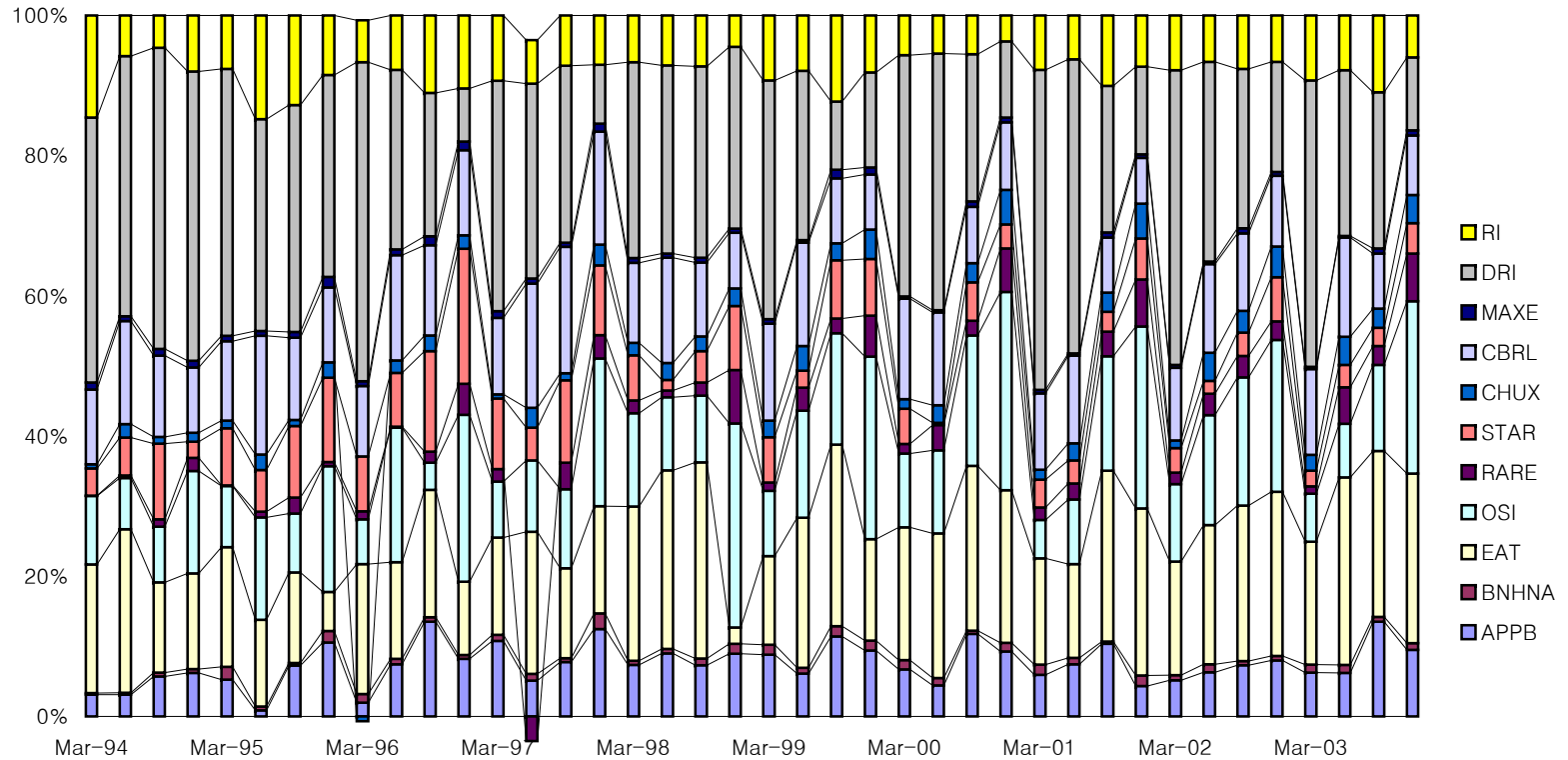
		ocfpu	LAGS(retfbs,3)	LAGS(retail,3)	LAGS(retnfs,3)	LAGS(retfbp,1)	LAGS(retfull,1)	perinco
ocfpu	Pearson Correlation	1	-.593**	-.569**	-.566**	-.545**	-.531**	.346*
	Sig. (2-tailed)		.000	.000	.000	.000	.001	.031
	N	39	36	36	36	38	38	39
LAGS(retfbs,3)	Pearson Correlation	-.593**	1	.979**	.978**	.639**	.487**	-.094
	Sig. (2-tailed)	.000		.000	.000	.000	.003	.587
	N	36	36	36	36	36	36	36
LAGS(retail,3)	Pearson Correlation	-.569**	.979**	1	1.000**	.639**	.474**	-.078
	Sig. (2-tailed)	.000	.000		.000	.000	.003	.653
	N	36	36	36	36	36	36	36
LAGS(retnfs,3)	Pearson Correlation	-.566**	.978**	1.000**	1	.646**	.479**	-.076
	Sig. (2-tailed)	.000	.000	.000		.000	.003	.660
	N	36	36	36	36	36	36	36
LAGS(retfbp,1)	Pearson Correlation	-.545**	.639**	.639**	.646**	1	.968**	-.154
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.355
	N	38	36	36	36	38	38	38
LAGS(retfull,1)	Pearson Correlation	-.531**	.487**	.474**	.479**	.968**	1	-.196
	Sig. (2-tailed)	.001	.003	.003	.003	.000		.239
	N	38	36	36	36	38	38	38
perinco	Pearson Correlation	.346*	-.094	-.078	-.076	-.154	-.196	1
	Sig. (2-tailed)	.031	.587	.653	.660	.355	.239	
	N	39	36	36	36	38	38	39

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## Appendix D

**Selected Firm's Share of Operational Cash Flows in Sample**



\* Firm's proportion of aggregated operational cash flows    \*\* Applebee's International Inc (APPB), Benihana Inc (BNHNA), CBRL Group Inc (CBRL), O'Charleys Inc (CHUX), Darden Restaurant (DRI), Brinker International Inc (EAT), Max & Ermas Restaurants (MAXE), Outback Steakhouse Inc (OSI), Rare Hospitality International Inc (RARE), Ruby Tuesday (RI), and Lone Star Steakhouse Saloon (STAR)

Selected Firm's Share: Market Capitalization and Sales

	Sales			Market Cap.		
	(As of 2003, \$ in millions)	Market Share		(As of 2004, \$ in millions)	Market Share	
Total Restaurant Industry	291,899	100%		149,333	100%	
Full Service***	147,767	50.62%				
Casual****				27,989	18.74%	
Selected Restaurant Industry	18,982	*12.85%	100.00%	18,890	**67.49%	100.00%
APPB	990	0.67%	5.22%	2,311	8.26%	12.23%
BNHNA	203	0.14%	1.07%	46	0.16%	0.24%
EAT	3,707	2.51%	19.53%	3,341	11.94%	17.69%
OSI	3,202	2.17%	16.87%	3,313	11.84%	17.54%
RARE	843	0.57%	4.44%	1005	3.59%	5.32%
STAR	670	0.45%	3.53%	542	1.94%	2.87%
CHUX	759	0.51%	4.00%	451	1.61%	2.39%
CBRL	2,381	1.61%	12.54%	2034	7.27%	10.77%
MAXE	183	0.12%	0.96%	38	0.14%	0.20%
DRI	5,003	3.39%	26.36%	4258	15.21%	22.54%
RI	1,041	0.70%	5.48%	1551	5.54%	8.21%

\* The proportion of full service industry \*\* The proportion of casual restaurant industry

\*\*\* Including private and publicly traded firms \*\*\*\* Including publicly traded firms

## VITA

Yea Sun Chung was born in Seoul, Korea. She attended Dae-il Foreign Language High School, and studied business administration and German language and literature at Sogang University in Korea. After achieving undergraduate degree, she worked in Korea Exchange Bank Futures Co., Ltd., as a market analyst and financial specialist for corporations and institutional investors. Yeasun Chung has been engaged in the hospitality industry, such as foodservice in the US and Korea. She taught the lab of Food and Beverage Management at Virginia Tech University. She earned her Master's degree in Hospitality and Tourism in May 2005 and is now in the doctoral program at Virginia Tech, focusing on financial strategy in the hospitality industry.