THE HOTEL INDUSTRY CYCLE:
DEVELOPING AN ECONOMIC INDICATOR SYSTEM FOR THE HOTEL INDUSTRY

by

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under
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(ABSTRACT)

The principal objective of this study was to develop an economic indicator system for the hotel industry in order to project the industry's growth and turning points. This study developed for the U.S. hotel industry a business cycle that would cover hotel activity as broadly as possible and one that would represent the magnitude of growth of the industry. This study also identified and selected seventy economic indicators for the hotel industry by reviewing literature and testing the characteristics of each time series which are available in public. By classifying the indicators into leading, coincident, and lagging indicators, this study formed composite indices for the groups of indicators and defined the relationships in terms of time lags between the hotel industry growth cycle and the series of composite indices.

For a twenty-eight year period (1966-1993), the hotel industry experienced three cycles (peak to peak or trough to trough). The hotel industry peaked in 1967, 1973, 1980, and 1989. The industry troughed in 1969, 1974, 1982, and 1991. The mean duration of the hotel industry cycles is 7.3 years, calculated either by peak to peak or trough to trough. An interesting finding is that the hotel industry declines sharply once it reached to the peaks. In general, the mean duration for the contraction is about two years.

The hotel industry growth cycle representing the rate of growth changes was also identified by standardizing the changes, and by measuring and dating the cycles. The results showed that the hotel industry experienced high growth (a boom) every four or five years. The average expansion (L-H) period is about three years and the average contraction (H-L) period is about two years.

The performances of the composite indices for the leading, coincident, and lagging indicators were measured based on their timing differences of turning points compared with those of the industry cycles. The usefulness and effectiveness of the indicator system composed of composite indices of leading, coincident, and lagging indicators were empirically supported in this study. The results of this study imply the indicator system can be used as a forecasting tool for the hotel industry.

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CHAPTER 1: INTRODUCTION

Definition of Terms

Business cycle: A pattern of increases and decreases in overall economic activity marked by an expansion phase of increasing household and business income, a plateau of general stable economic performance, and a contraction phase of declining economy-wide income and economic activity. This is defined and discussed in the following chapter in more detail.

Deflation: A sustained decrease in economy-wide consumer and producer prices or a decrease in consumer and producer prices confined to an industrial or geographical segment of the economy.

Economic Indicators: Economic indicators are composed of leading , coincident, and lagging indicators. *Leading economic indicators* assemble signals from sectors of the economy and portend future trends in the economic cycle; *coincident economic indicators* trace patterns of economic activity that indicate the present state of the economy; *lagging economic indicators* measure economic activity that lags the economic trend and confirm leading and coincident indicators.

Economic signals: Measures of economic activity pertinent to each of the three sectors of the economy-households, business, and government.

Fiscal policy: the overall term used to describe the spending, tax, and legislative-regulatory activities of government.

Hotel industry cycle: The movement of the hotel industry's real value of total receipts. It will be sometimes called "target cycle". This is defined and discussed in the following chapter in more detail.

Hotel industry growth cycle: The movement of the magnitude of growths of the hotel industry.

Inflation: An economic pattern noted for an excess of money over goods, increasing consumer and producer prices, and growth in the money supply.

Monetary policy: Actions by The Federal Reserve System to alter the supply of money in the economy and to stabilize economic activity.

NBER: National Bureau of Economic Research

Recession: A contracting economy marked by declines in employment, business revenues, and production.

Say's Law: The classical economists argued that the invisible hand of competition produces a smoothly functioning system, always returning to equilibrium with an optimally functioning economy. In line with this view, in 1803, J. B. Say announced the law that "supply calls forth its own demand." In other words, if aggregate supply in the market increases, aggregate demand will also increase until a new equilibrium is reached at full employment.

Turning points: A turning point occurs when a time series that has been rising begins to fall, or vice versa.

Introduction

Statement of the Problem

In general, it is easy to be a successful financial manager during good times, but when times get tough the astute manager will have more chances to prosper. The astute financial manager, thus, should be someone who knows in advance how the business cycle will affect both business in general and his or her own firm in particular. Consequently, the manager should pay attention to the cycle's impact on money supply, interest rates, and stock prices, and how drastically the cycle's successive phases may change the cost and availability of borrowed funds and the firm's cost of equity capital. The manager also needs to be able to forecast how the firm's needs for funds will change over the cycle. In addition, the managers are required to develop their timing skill so that the firm's additions and retirements of fixed and circulating capital can be timed advantageously in relation to cyclical change.

In order to gain competitive advantages, financial managers in the hotel industry need to consider the industry cycle. In a sense, measuring, monitoring and forecasting business cycles are a relatively new class of methods in investigating the industry's overall phenomena. The systematic analysis of cycles in the hotel business can be applied to almost all kinds of business functions. Aside from such obvious applications as the advance purchase of inventory and borrowing, an understanding of long-wave business cycles would also provide specific information about when to be aggressive in expanding business operations, when to sell businesses, and even when to enter certain types of new

business. Monitoring and forecasting hotel industry cycles gives the manager insight into industry turning points. Moreover, a company that quickly recognizes a change in the phase of the industry cycle could use either a recession or a recovery strategy to optimize profit.

Several industries have developed economic indicators for their particular industries and developed their own industry cycles to monitor, measure, and forecast their cycles. The textile industry (Karfunkle, 1969), chemical industry (Niemira, 1982), and the energy and mineral industry (Maurer, 1985) are some examples. Up until now the hotel industry has not used these methods. A major emphasis of economic indicator analysis in the U.S. has been on the goods-producing industries, particularly manufacturing and construction. One reason for the emphasis on manufacturing and construction is that these industries are highly sensitive to cyclical fluctuations in demand and have experienced big economic fluctuations. In addition, the general emphasis of economic indicator analysis on the goods-producing activity appeared justifiable when this activity dominated the total economic activity of the U.S. market. But the relative importance of factory production has been declining for some time while the service industry including the hotel industry has been growing.

Table 1 shows the level of output and share of output in selected major sectors of the U.S. economy between 1948 and 1987. As the table illustrates, durable and nondurable goods manufacturing (and retail trade) have grown in absolute terms but are virtually unchanged in magnitude relative to the size of the whole economy. Several

sectors have diminished in relative size. Agriculture, forestry, and fisheries; mining; transportation; construction; and government account for significantly smaller portions of national output than they did in 1948. The relative decrease in those sectors has been accompanied by significant increases in the share of output contributed by communications; wholesale trade; finance, insurance, real estate; and services. The service grouping includes a wide variety of services including health, business, legal, amusement, and hotel services. The data do not show a decline in the relative contribution of manufacturing output to the U.S. national economy but, on the other hand, services industries have grown substantially in importance since the late 1940s.

The story is slightly different regarding employment by sector. Table 2 presents calculated past and projected shares of employment growth. The table demonstrates the significant role of the service sector in employment growth in the United States. It is also interesting to compare the various periods in terms of the relative contributions of services and goods-producing sectors. The 1979-1986 period shows a declining employment in the goods-producing industries. Consequently, the services sector provided more jobs than the entire net employment growth in the U.S. economy during that period. The services industry group shows striking overall contributions to employment in both the 1979-1986 period and the 1986-2000 period.

Table 1. Gross Product Originating in Selected Industries for selected Years, 1948-1987 (billions of 1982 dollars and percentage share of Gross National Product)

Sector	1948		1957		1969		1979		1984		1987	
	$	%	$	%	$	%	$	%	$	%	$	%
Real GNP	1109	100.0	1551.1	100	2423.3	100	3501.4	100	3501.4	100	3847	100.0
Agriculture, forestry, fisheries	61.3	5.5	65.9	4.2	65.3	2.7	76.1	2.2	82.2	2.3	96.1	2.5
Mining	72.4	6.5	96.2	6.2	128.9	5.3	130	3.7	133	3.8	117.5	3.1
Construction	90	8.1	142.4	9.2	183.6	7.6	173.5	5.0	159.2	4.5	175.8	4.6
Durable goods manufacturing	145	13.1	208.7	13.5	334.1	13.8	423.5	12.1	466.8	13.3	525.2	13.7
Nondurable goods manufacturing	93.5	8.4	123.8	8.0	202.6	8.4	273.5	7.8	291.1	8.3	314.3	8.2
Transportation	76.5	6.9	75	4.8	104.2	4.3	137.7	3.9	123.7	3.5	136	3.5
Communication	9	0.8	16.6	1.1	37.4	1.5	72.5	2.1	92.9	2.7	107.6	2.8
Electricity, gas, sanitation	13.2	1.2	28.3	1.8	58.6	2.4	83.3	2.4	103.8	3.0	105.9	2.8
Wholesale trade	55.8	5.0	80.8	5.2	149	6.1	217.3	6.2	250.6	7.2	291.7	7.6
Retail trade	106.1	9.6	144.3	9.3	212.7	8.8	294.4	8.4	328.3	9.4	368.3	9.6
Finance, insurance, real estate	107.7	9.7	178.3	11.5	314	13.0	459.2	13.1	506.6	14.5	559.4	14.5
Services	128.9	11.6	168.6	10.9	287.8	11.9	429.8	12.3	514	14.7	610.8	15.9
Government	155.5	14.0	229.2	14.8	340.2	14.0	376.2	10.7	392.1	11.2	415.7	10.8

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Table 2. Share of Employment Growth (percent)

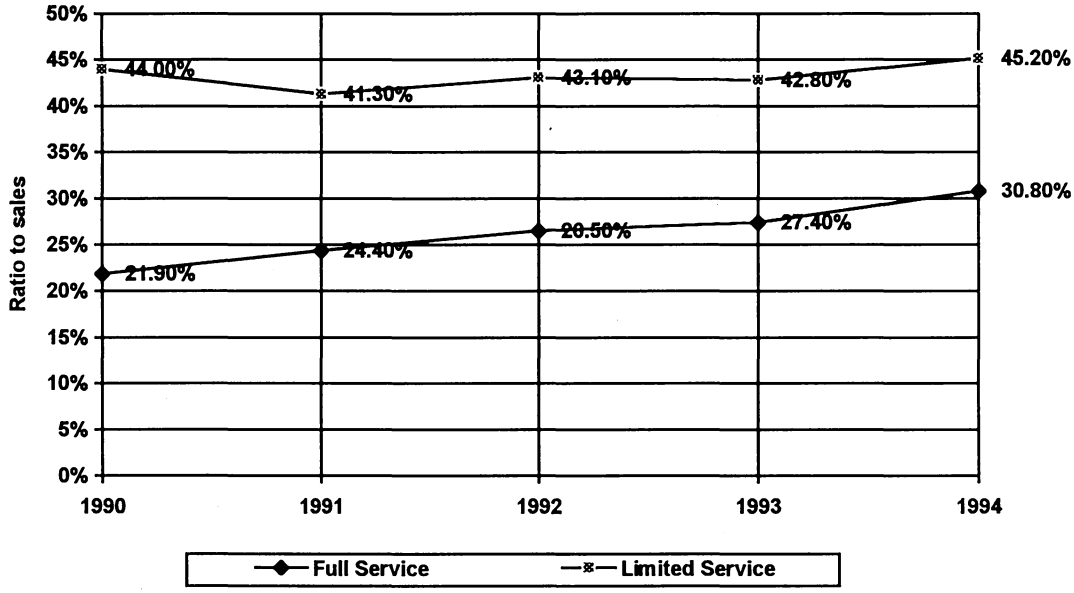
Sector	1972-1979	1979-1986	Projected 1986-2000
Service sector	82.5	118.6	100.0
Private services sector	66.0	110.6	92.0
Service industry group	29.1	60.3	49.8
Good producing sector	17.5	-18.6	0.0

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

As discussed above, the hotel industry as part of the service industry is now growing and becoming one of the important contributors to the total economy. Statistics reported by Smith Travel Research indicates the growing importance of the hotel industry. Smith Travel Research reported that the lodging segment took in $62 billion in revenues, employed over 1.5 million people full and part time, and paid $21.2 billion in taxes during 1993.

Another study by Smith Travel Research shows the importance of the hotel industry with a report of annual operating statistics in 1995. According to the report, during 1994 the U.S. lodging industry continued the trend toward increased operating efficiency that began in 1990. Figure 1 presents the trend of the gross operating profit of the U.S. lodging industry for the past five years. The gross operating profit (GOP) for the full service segment, measured as a ratio to total sales, improved from 21.9 percent in 1990 to 30.8 percent in 1994. The gross operating profit (GOP) for the limited service segment, measured as a ratio to total sales, also improved from 44 percent in 1990 to 45.2 percent in 1994. The statistics discussed above clearly demonstrate that the hotel industry in the U.S. has come to play an increasingly important role in economic growth.

Figure 1: U.S. Hotel Industry: Gross Operating Profit



Source: Smith Travel Research, 1995.

Furthermore, the hotel industry experiences high cyclical fluctuations in business performance. As an example, Figure 2 presents the cyclical fluctuation of the stock price indices of the hotel firms. According to these figures, the hotel industry has experienced great performance in June and December compared to other months and poor in August. As it is shown on the graph, the hotel industry is highly sensitive to cyclical fluctuations from seasonal demand and has experienced big economic fluctuations. These fluctuations, according to the earlier discussion regarding the size of the hotel industry and its impact on the total economy have, in turn, been largely determined by the timing and severity of economic fluctuations in the rest of the economy.

1965=10

Year	Jan	Feb.	Mar	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1990	248.17	219.33	207.81	187.06	183.53	195.74	175.55	135.43	107.09	87.38	90.00	108.09
1991	100.09	126.88	137.22	136.94	149.49	145.58	141.27	138.76	136.61	135.66	134.32	123.05
1992	145.45	147.32	149.67	148.08	154.69	150.62	147.24	148.15	158.05	163.90	174.46	178.86
1993	200.71	204.25	221.98	223.55	242.28	244.35	259.48	286.66	304.67	332.91	298.36	329.38
Avg.	**173.60**	**174.44**	**179.17**	**173.90**	**182.49**	**184.07**	**180.88**	**154.14**	**176.60**	**179.96**	**174.28**	**184.84**

Source: Standard & Poor's a Division of McGraw-Hill, Inc. 1994

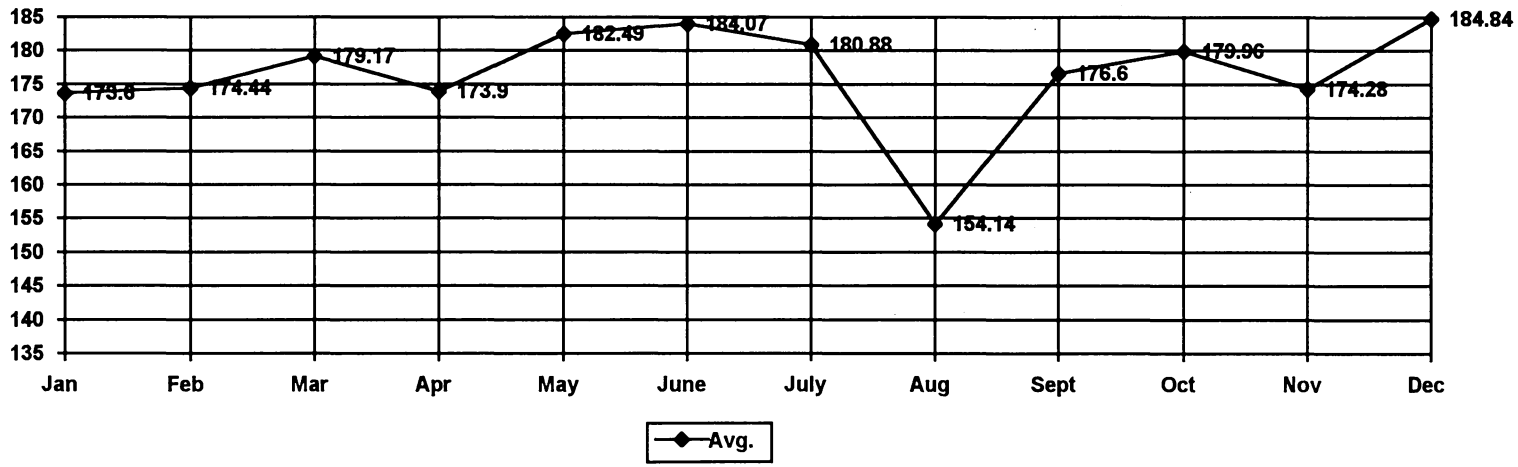


Figure 2: Hotel and Motel: Monthly Stock Price Indices (Average)

Thus, the growing importance of the hotel industry justifies more attention being devoted to the development of an indicator system that reflects its part in the overall economic picture of the service industries. Furthermore, the cyclical characteristic of the industry tells us that analyzing the time series of the economic indicators would be an effective method for examining the industry.

In this study an attempt is made to develop an economic indicator system for the hotel industry as a part of the efforts for analyzing the industry. By measuring, monitoring and forecasting hotel industry cycles, this study will try to give more realistic information regarding the industry to practitioners, especially financial managers to let them gain the competitive advantages discussed in the earlier stages of this section.

Theoretical Underpinnings

Economic Indicators: The Definition and Rationales

Definition

Economic indicators, as a general category, are descriptive anticipatory data used as tools for business condition analysis and forecasting (Zarnowitz and Moore, 1977, 476-507). There are potentially as many subsets of indicators in this sense as there are different targets at which they can be directed. For example, some indicators may relate to employment; others to inflation. This may lead to the uses of such time series as lagged explanatory variables in econometric models and regression equations. But there is a different, established meaning to what is often called the "indicator approach." This is a system of data and procedures designed to monitor, signal, and confirm cyclical changes, especially turning points, in the economy at large. The series that serve this purpose are selected for being comprehensively and systematically related to business cycles and are known as cyclical indicators (Zarnowitz, 1992, p. 283)

The term "economic indicators" is composed of three indicators: leading, coincident, and lagging. Leading economic indicators assemble signals from sectors of the economy and portend future trends in the economic cycle; coincident economic indicators trace patterns of economic activity that indicate the present state of the economy; lagging economic indicators measure economic activity that lags behind the economic trend and confirm leading and coincident indicators.

What matters particularly in the present context is the characteristic variation of cyclical indicators with respect to their relative timing (Zarnowitz 1992, p.293). Thus many economic time series, called leading indicators, tend to reach their turning points before the corresponding business cycle turns. Turns in the series of coincident economic indicators occur roughly at the same time as those of the business cycle. They go down at the peak and up at the time of the trough. There are also many series that tend to reach their turning points after the peaks and troughs in the business cycle, and they are the lagging indicators. Geoffrey Moore (1983) explains some of the particular reasons why series normally turn at different times:

> More specially, series that represent early stages of production and investment processes (new orders for durable goods, housing starts, or permits) lead series that represent late stages (finished output, investment expenditures). Under uncertainty, less binding decisions are taken first. For example, hours of work are lengthened (shortened) before the workforce is altered by new hiring (layoffs) (Moore 1983, p. 27)

Leading series anticipate impending changes in production and employment and, therefore, changes in aggregate economic activity. Some of the lagging indicators lag because they represent activities that are influenced by the cycle. Thus interest rates, for example, usually lag behind the cyclical downturn because the downturn causes emergency credit needs, which are accommodated in part but are charged at higher interest rates (Sherman 1991). In the following section, the rationales for leading indicators are discussed in more detail because it is the leading indicators that are used for forecasting future turning points of the business cycle.

Rationales for leading Indicators

To explain the rationales for leading indicators, referring to an old story that exemplifies the logic for specific industry leading economic indicators can be a good beginning. Andrew Carnegie, the steel tycoon, had his own leading economic indicator. Carnegie reasoned that if he watched the smoke from local steel factories, he could gauge the strength and weakness of business. If the smoke was billowing strong, strong business conditions would surely follow and vice versa. This story highlights three key strengths of leading economic indicators. They are (1) easy to interpret, (2) easy to communicate, and (3) relatively inexpensive to formulate (Niemira and Klein, 1994). The more specific rationales for leading indicators are presented below.

There are five rationales for using economic indicators as a forecasting tool. These are: production time, ease of adaptation, anticipation of future activity, prime mover, and change-versus-level. For these rationales, their central ideas and comments discussed by De Leeuw (1991) are presented next. The following eleven leading indicators for the general business cycle are used for the purpose of discussion.

1. Manufacturers' new orders for consumer goods and materials in constant dollars
2. Contracts and orders for plant and equipment, in constant dollars
3. Index of new private housing units authorized by local building permits
4. Average weekly hours of production workers in manufacturing
5. Vendor performance, percentage of companies receiving slower deliveries
6. Index of stock prices, 500 common stock
7. Change in sensitive materials prices
8. Money supply (M2) in constant dollars
9. Average weekly initial claims for unemployment insurance
10. Change in business and consumer credit outstanding
11. Change in manufacturing and trade inventories, in constant dollars

Each series can be justified by one of the five rationales -- some by more than one.

Production Time

The first three of the series - new orders for consumer goods and materials, contracts and orders for plant and equipment, and housing units authorized by building permits - are all indicators of an early stage in a production process. These series might be expected to lead economic activity simply because it takes time to translate the placing of an order, the signing of a contract, or the taking out of a permit into actual production and delivery.

That simple explanation, however, rests on an equally simple, perhaps naive, view of expectations. New orders will be a leading indicator of production if producers do not try to anticipate demand changes, but simply wait until orders come in before beginning to produce. If, instead, producers succeed to some extent in anticipating bulges or shortfalls in orders, it is not clear that a lead-lag relationship ought to hold. Production could begin to rise or fall at the same time that new orders are expected to rise or fall; whether they do is, at least in part, a matter of costs of failing to fill orders promptly versus costs of changing production rapidly. It is only in the case of unexpected bulges or shortfalls in demand that a lead-lag relationship ought clearly to hold.

Seasonal variations in orders and production probably fit the successful anticipation model more closely than the naive model. Toy manufacturers do not wait until Christmas orders come in to start production; they no doubt anticipate a bulge in

orders and plan to increase their production when orders are expected to rise. For a toy retailer, to be sure, there must be at least a short lag between placing orders with the manufacturer and actually receiving toys. But for manufacturers, it is possible to try to match the timing of production with the timing of orders.

On the other hand, complex and limited-volume products, such as large commercial aircraft or new manufacturing plants, probably fit the naive model more closely than the successful anticipation model. In these cases, attempting to produce in advance of demand could lead to huge losses if the orders or contracts do not arrive, and to expensive changes in specifications even if they do. Airlines, consequently, do not expect to buy a new fleet of carriers "off the shelf"; they expect long delays between their demand decisions and delivery of new aircraft. Which of the two models, the anticipatory or the naive, best fits business fluctuations generally is an open question.

Ease of Adaptation

The fourth and fifth leading indicators, average weekly hours and vendor performance, can be rationalized as measuring dimensions of economic activity that can change rapidly without large transitional costs. For some elements of production - employment, for example - there are sizable costs associated with changes besides the recurrent costs associated with levels. Elements without such costs - easily adaptable variables - might be expected to be used heavily to absorb fluctuations in production, and might therefore reflect these fluctuations more than elements with high costs of change.

Average weekly hours are used in this way because they have lower costs of change than employment. Delivery times (measured by the vendor performance series) are also used in this way because they have low costs of change compared with other ways of responding to a surge or a drop in demand, at least in the short run (in the long run, chronic delays or even unpredictable delivery times have the cost of driving customers away).

Questions about expectations are at least as pertinent to this rationale as to the production time rationale. Under the naive view of no anticipated change in demand, a rise in sales or orders would first cause a change in average hours or in delivery delays and later a change in employment or shipments. For demand changes that are expected, however, the case for a lead-lag relationship is less clear. A normal seasonal bulge in orders for example, could plausibly cause employment, average hours, and production all to rise at approximately the same time. Even in the case of complex, customer-designed products (construction of a new factory, for example), if production plans are known in advance it is hard to see why hours should start rising before employment. Indeed, it is conceivable that a business eager to assure itself of a capable work crew will increase employment before production and keep average hours to a minimum until full-scale production is underway.

Another problem with this rationale is that it rests entirely on demand-initiated changes - on business's response to changes in orders or sales. Supply-initiated changes

(for example, a productivity improvement leading to higher output but lower employment) might have quite different implications for the timing of easily adaptable variables.

A third problem with the view of adaptable variables as leading indicators is that, even in the simple case of an unanticipated change in demand, the case for lead-lag relationships is unclear. What might be expected is an initial change in the adaptable variable at the same time that production increases, followed by a return to a normal level. An unexpected step-up in orders, for example, may lead to an increase in overtime hours when production responds, to avoid abrupt increases in employment; but then, as employment increases, hours should return to their normal level. The first, overtime-increasing, phase is an early (but contemporaneous rather than leading) indicator of production. The second, return-to-normal, phase is not an indicator of production at all.

Market Expectations

Probably all the leading indicators are sensitive in some degree to changes in expectations about economic activity, but the sixth and seventh, stock prices and changes in sensitive materials prices, may be especially sensitive. It certainly is true that changes in expectations about economic activity are frequently cited as explanations of changes in these series. For stock prices, sensitivity to expected earnings may be at the root of the relationship. For materials prices, the anticipated degree of excess demand/excess supply may be most relevant (and might explain the use of price changes, if it is price changes rather than levels that respond to excess demand/excess supply).

Other forces besides anticipation about economic activity are doubtless important for both series. To mention obvious examples: tax changes and interest rates influence stock prices; supply developments influence commodity prices; and speculative forces affect both series, adding to their volatility. These other forces, to be sure, affect future economic activity as well, but not in the same way as anticipation. For example, an increase in commodity prices is associated with rising economic activity if it is caused by anticipation of strong demand, but not if it is caused by the restrictive activities of a cartel or by some other supply restriction. The role of factors other that anticipation about economic activity is therefore a drawback of these two indicators.

Direct measures of economic expectations, based on surveys of households or of businesses, have become available in recent years. They cannot match stock prices or commodity prices in frequency of measurement or length of historical record, but they raise fewer questions than these long-standing series about the role of non-expectation factors. Comparisons of the direct measures with the long-standing series might provide information about what the latter series are measuring.

Prime Movers

Quite different from the first three rationales is the idea that leading indicators may represent the forces fundamentally responsible for short-run economic fluctuations. Only one indicator in the index, the money supply in 1982 dollars, fits this rationale. The spirited debate in the 1960s and early 1970s about the "reduced-form" relationship of

measures of economic activity to monetary and fiscal policies was essentially about this rationale. The approach lost popularity after receiving a good deal of criticism, although it has recently been defended in a paper by Brunner (1986).

It seems wise, in developing a theory of leading indicators, to treat this rationale separately from the first three. One reason is that changes in prime movers are generally not the variables that businesses use to signal a change in conditions; the leads of prime movers might be longer and more variable that leads and lags among orders, average hours, and other elements of short-term business behavior. An analogy may be helpful: predicting when a commuter will arrive at his bus stop based on when he leaves his house resembles the short-term business behavior approach, while predicting when he will arrive at his bus stop based on changes in the rewards/penalties of arriving at work early or late resembles the prime mover approach. The second approach, although it may produce more fundamental insights, seems more uncertain than the first and is hard to combine with it.

A second reason for treating the prime mover rationale separately is that the literature on the reduced-form approach has produced its special technical complexities related to the separation of exogenous and endogenous changes, the measurement of distributed lags, and other matters. It would be quite difficult to combine these with an investigation of the first three rationales.

Changes versus Levels

For the remaining three leading indicators, the principal rationale that suggests itself is that changes in a time-series seem to be a leading indicator of levels. This generalization does not apply to all-time-series contours; it does not apply to a saw-toots contour, for example. But it does apply to the smoother contours that are typical of aggregate production and employment. Changes in business and consumer credit clearly fit this rationale. Initial claims for unemployment insurance also fit, for it is when employment is falling that initial claims are highest and when employment is rising that initial claims are lowest. The change in inventories can also be rationalized in this way, since the level of inventories is broadly related to the level of business activity. (Inventory change is also a key element in short-run business behavior, however, suggesting that this indicator may be rationalized in a different way as well.

Section Summary

In this section, economic indicators were defined and the rationales for the indicators were discussed. Each type of indicator series serves to qualify or to support the information or evidence supplied by the other two categories. The function of leading economic indicators is to warn of impending changes in economic activity. The coincident indicators are useful for helping track the course of economy but do not provide much help in predicting future turning points. The lagging indicators have no use in predicting the beginning or end of recession, but it can be useful in helping verify that a recession has

actually started or ended. Thus, each type of indicator can be a good tool to track the changes in aggregate activity of a certain economy or industry. This study applies the indicator system to the hotel industry. In the following section, the context of this study is presented.

Context of the Study

The business cycle analysis techniques have been used mainly for identifying general business activities as a whole. Between the 1920's and 1940's, the National Bureau of Economic Research (NBER) business cycle dating and analysis techniques had been criticized as a measurement without theory (Niemira and Klein, 1994, p.83). The pros and cons of this criticism are well documented in the literature. Nonetheless, the techniques survived, thrived, and are now well founded in economic theory. That these techniques stood the test of time reflects the usefulness of this approach for business and policy makers (Niemira and Klein, 1994, p.83).

In the hotel industry literature, the industry cycle and analysis technique using economic indicators does not exist. Some studies used the cyclical fluctuation of occupancy percentage to look at the trends of hotel companies. Rushmore (1992) estimated occupancy for the proposed Sheraton Hotel in his book. His method used for occupancy estimation is simple. He averaged the occupancy levels recorded during a 20-

year period (he called it "Occupancy cycle") and stabilized it based on the market demand and supply.

The Granada Group studied the London and UK hotels' cycles in January 1996. They produced the cyclical demand charts for the London and UK Provincial hotel markets. They show the annual changes in room occupancy, average room rate, and profits to accentuate the cyclical movements. However, the growth and turning points of the hotel industry can not be projected by a few internal operation indicators such as occupancy rate. This is because, as was discussed in the problem statement, the industry phenomena interact strongly with the rest of the economy.

To project the industry growth and turning points, developing economic indicator systems based on a wide-range of economic variables for the particular industry is required. This study explores this issue by attempting to develop the industry cycle and economic indicator system using statistical and mathematical techniques of analysis.

Overview of the Research Study

Research Questions

The main research questions under study here are as follow: (1) What types of cyclical fluctuations has the hotel industry experienced over the last several decades? (2) What are the leading, coincident, and lagging economic indicators for the industry? (3) Is it possible to predict the future turning points, peaks and troughs, by using the composite index of the leading indicators? The research questions that were raised through the above theoretical underpinning are framed into the following research proposition.

Proposition :

The cyclical fluctuations of the growth of the hotel industry can be projected by measuring and analyzing a series of economic indicators. Each economic indicator will have specific characteristics in terms of time lags, and thus can be classified into leading, coincident, and lagging indicators. Since no single indicator is perfect for explaining the time lag relationships with the industry cycles, the compilation of groups of indicators into composite indicators will be necessary. The composite indices can be used for forecasting the future turning points (peaks and troughs) in the industry cycle. The turning points of leading composite index series will lead the turning points of actual industry growth series by a certain time lag. The turning points of the coincident composite index series will coincide with the turning points of the actual industry growth. Finally, the turning points

of the lagging composite index will lag the turning points of actual industry growth by certain time differences.

Once the time differences of the three indices are defined, the each index can serve as a forecasting and examining tools for the industry growth. As the definition and rationales of the indicators discussed in the previous section, leading indicators are mainly the series which are concerned with business decisions to expand or to curtail output. Time is required to work out their effects, and so they tend to move ahead of turns in industry cycles. Leading indicators signal in advance a change in the basic performance of the industry as a whole. This tells us future industry turning points in advance, which is the main interest of this study and practitioners in this industry. Early warning signals provided by leading indicators aid in forecasting short-term trends in the coincident series. Coincident indicators are those whose movements coincide with, and provide a measure of, the current performance of industry activity. Hence, they inform us whether the economy is currently experiencing a slowdown, a boom, or whatever. Movements of lagging indicators usually follow, rather than lead, those of the coincident indicators.

In order to test the indicator system as a useful forecasting technique for the hotel industry, this study will evaluate the performances of the composite indices of the leading, coincident, and lagging indicator groups by comparing with the hotel industry cycle in terms of turning points for the past twenty-eight years (the longest history of data available in this study). It will be accomplished by analyzing and comparing the statistical outputs (i.e. dates of peaks and troughs, and cycle duration) between the series of

composite indices and the series of hotel growth cycle. If the leading composite index leads the target cycle for many years (at least a year) consistently, it will be a good forecasting system because it signals the changes of the industry's future in advance. The coincident composite index also will give good information regarding current industry's situation if the turning point of the index coincides with the turning points of the target cycle. The lagging index will confirm all of the above transactions. The specific objectives of this study are presented next.

Objectives

The principal objective of this study, therefore, is to develop an economic indicator system for the hotel industry to analyze the industry activities as a whole. The specific sub-objectives of this study are as follows:

1. Develop the U.S. hotel industry cycle that would cover hotel activity as broadly as possible, and date and measure the cycles.
2. Develop, for the U.S. hotel industry, a growth cycle model that would represent the change and magnitude of growth in the industry, and date and measure the cycle.
3. Develop a data base for possible economic indicators (statistical indicators) for the hotel industry.
4. Identify and select the economic indicators for the U.S. hotel industry by testing the characteristics of each time series, and classify the indicators into leading, coincident, and lagging.
5. Form the composite indices for the leading, coincident, and lagging indicators to use for defining the relationships in terms of time lags between the hotel industry cycle and the series of composite indices.
6. Use the economic indicator system (all the above) for measuring and forecasting the turning points (peaks and trough, or high and low) of the industry cycles.

Outline of Thesis

The following chapter is the literature review for the various cycles, the economic and financial strategies over the cycle, and the economic indicators in the hotel industry. The potential economic indicators reviewed in the chapter will be used as a fundamental source of analysis. Specific and detailed methodologies for the research purposes are presented in chapter three. Chapter four will present the results of this study with discussion. Finally, conclusions, limitations, and suggestions for future research are covered in chapter five.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

Chapter Preview

The purpose of this chapter is to review the literature related to U.S. business and growth cycles and the hotel industry's potential leading economic indicators to formulate the composite index of the indicators. This chapter begins with reviewing and classifying business cycle theories. This is followed by defining and explaining the business cycle, growth cycle, and Kondratieff cycle. The key definitions of those cycles are borrowed from the general business literature. Then, the characteristics of the classical business cycles are revealed by explaining key economic background and brief financial strategies for each stage of the cycles. Finally, the potential leading economic indicators for the hotel industry are selected by reviewing not only the hospitality literature but also general business literature and stock market research. The twelve leading indicators, the four coincident indicators, and the six lagging indicators of the general business cycle, which are identified by the Department of Commerce and NBER, are considered as potential hotel industry economic indicators. The economic indicators identified for other industries including the textile and chemical industries are also considered as potential hotel industry economic indicators to explore the maximum number of potential indicators that will have an impact on the industry.

Review of Cycles in the Business

Business Cycle Theory[1]

The most efforts to develop business cycle theories have come in this century. Some explanations emerged in the nineteenth century, from what Robert Heilbroner (1953) once called "the underworld of economics." Business cycle study in the United States dates back to 1790, in the United Kingdom back to 1792, in Germany back to 1866, and in France back to 1840[2]. Many of the theories for the general business cycles are summarized in Table 3. These studies were conducted at great length by early economists, but have ceased to be the focus of the attention of economists over the post-war period. The most recent emphasis has been on mathematical theory and econometric practice. One feature of econometric models has been that they tend to underestimate the cyclical behavior of the economy. They are better at following trends than identifying turning points. Consequently, there is a tendency to extrapolate trends rather than anticipate changes in direction (Coghlan ,1993).

Nimera and Klein (1994) explain the classification of Business cycle theories. According to their explanation, the main stream of economic theorists developed classical economic theory by making at least two simplified assumptions that precluded worrying very much about instability. First, they assumed that Say's law[3] of markets was

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[1] The explanation of the business cycle theory here are from the Nimera and Klein (1994), pp. 42-80.
[2] see Arthur F. Burns, the business Cycle in a Changing world, New York: NBER, 1969, Chapter 1, especially pp. 16-17
[3] see Definition of Term in page 2.

correct - that the process of producing output created the income necessary to purchase it. Second, they assumed that full employment of all resources was the economy's natural condition. Taking these two assumptions at face value would suggest that the economy could never produce more than could be sold, and that what the economy produced would be determined by what full employment could turn out at any given time relative to the stage of technological development and the amount of resources-including human resources-that existed. So viewed, it would be difficult indeed to suffer instability (Nimera and Klein 1994).

One of Keynes's great insights was to assert that Say's law of markets could not really save the economy from instability, given the way competitive (flexible) prices work. While the market value of output would be equal to the income generated in its production, no automatic regulator guarantees that people in the economy would necessarily choose to buy what had been produced. Keynes explained aggregate consumer behavior in terms of psychology. He stated the "fundamental psychological law" that "men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income" (Keynes 1936, p.96). He argued that people have a certain habitual consumption expenditure, or standard of living, out of a given level of income. If a person's income rises, he or she will -at first-continue the same standard of living, so the person will save more. That person will, however, soon adjust his or her consumption upward-so saving would still tend to rise somewhat faster than consumption in a business cycle expansion. The important

implication of the Keynesian study for business cycle theory is that in every business cycle expansion, consumption rises more slowly than income, with a growing gap between effective consumer demand and output (Sherman 1991). Many of the theories listed in Table 3 emanate from these problems in one form or another.

The current state of business cycle explanations largely reflects the basic scheme among macro theorists. In the view of modern classical economists, resource allocation, as it emerges from market deliberations, produces an essentially stable economy. Disturbances are temporary, and when left to its own devices, the economy will grow in a stable way based on its potential output, given the state of technology and resource availability.

Modern Keynesians or neo-Keynesians do not regard the state of either stability or economic growth, as it might emerge from the considerations of economic agents in unfettered markets, to be necessarily satisfactory. This debate has produced a variety of approaches leading to the conclusion that we do not need to develop better interventionist policy. At stake in the debate is the fundamental premise in the development of any theory in the social sciences. This premise is that good theory is needed so that better policy can be devised, which will enable us to achieve more satisfactory performance. In economics, this means greater stability and more rapid growth as market economies move toward the future.

Table 3: Classification of Business Cycle Theories

I. Relatively simple unicausal theories A. Agricultural (W. S. Jevons, H. S. Jevons, H. L. Moore) B. Psychological (Mills, Pigou) C. Purely monetary (Hawtrey)
II. Business economy theories A. Price/cost relations, profit margins (Mitchell, Lescure) B. Inventory cycles (Abramowitz, Stanback)
III. Theories emphasizing the saving-investment process A. Pre-Keyneisian 1. Over-investment a. Monetary (Wicksell, Hayek, Mises, Machlup, Robbins, Ropke, Strigel) b. Nonmonetary (1) Shortage of capital (Tugan-Baranowsky, Spiethoff, Cassel) (2) Innovation (Schumpeter) 2. Under-consumption (Lauderdale, Malthus, Major, Douglas, Sismondi, Foster and Catchings, Ledered, Hobson) 3. Marxian B. Keynesian C. Post-Keynesian 1. Dynamic models a. Multiplier-accelerator interaction (J. M. Clark, Aftalion, Samuelson, Fellner) b. Growth-Cycle (Harrod, Hicks, Domar, Lundberg, Kalecki, Kaldor) c. Neo-Marxian (Sherman, Evans) d. Chaos (Baumol and Quandt, Brock and Sayers)
IV. New classical theories A. Monetarist (Friedman, Brunner, Meltzer, Schwartz, Cagan) B. "Real: Business cycle (King, Ploesser, Walsh) C. "Supply side" (Laffer, Craig, et al.) D. Political business cycle (Kalecki, Nordhaus, Macrae, Meiselman) E. Rational expectations (Muth, Lucas, Sargent, Wallace, Barro)

Source: (Niemira and Klein 1994)

Absent the wish to improve economic performance, the development of theories such as the "new classical theories" become little more than exercises in rationalizing explanatory failures in basic theory. If the new classical economists argue that business cycles are due to misperceptions, imperfect information, or random shocks, other students of the cycle, who persevere in the tradition of both Keynes and Mitchell, argue that modern cycles are not unicausal in explanation but the result of a complex interaction among both real and nominal variables that make the reasons for current instability partly endogenous, partly exogenous, and in any case not unicausal but complex. As such, the research agenda for the immediate future is crowded indeed.

Business Cycle

The definition of the business cycles conducted by Burns and Mitchell (1946) is the most widely cited in the business-cycle related literature. The definition is as follows:

> Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitudes approximating their own." (p.3)

The business cycle typically consists of an interlude of prosperity rising into boom, peaking out, sliding into recession, recovering , and launching into a new phase of prosperity. Although the length and breadth of its phases have differed widely from one

cycle to another, this general pattern has repeated itself with little variation. The business cycle is accompanied by wide swings in the main economic and financial variables such as incomes, output, employment, business profits, interest rates and stock prices. Niemira and Klein (1994) explained phases within the cycle as follows:

> The popular terminology often retains only three of the four segments that Burns and Mitchell posited: recession, recovery, and expansion. The term recession refers to the period from the upper turning point (the initial peak) to the lower turning point (the trough). Recovery refers to the period from the trough to the point at which business activity returns to its previous peak level. Expansion refers to the period when the economy increases beyond previous boundaries.

In practice, when business activity delineates in absolute levels and then rebounds, this is called a "classical business cycle" ; more frequently, it is simply referred to as a "business cycle."(Nimera and Klein, 1994).

Growth Cycles

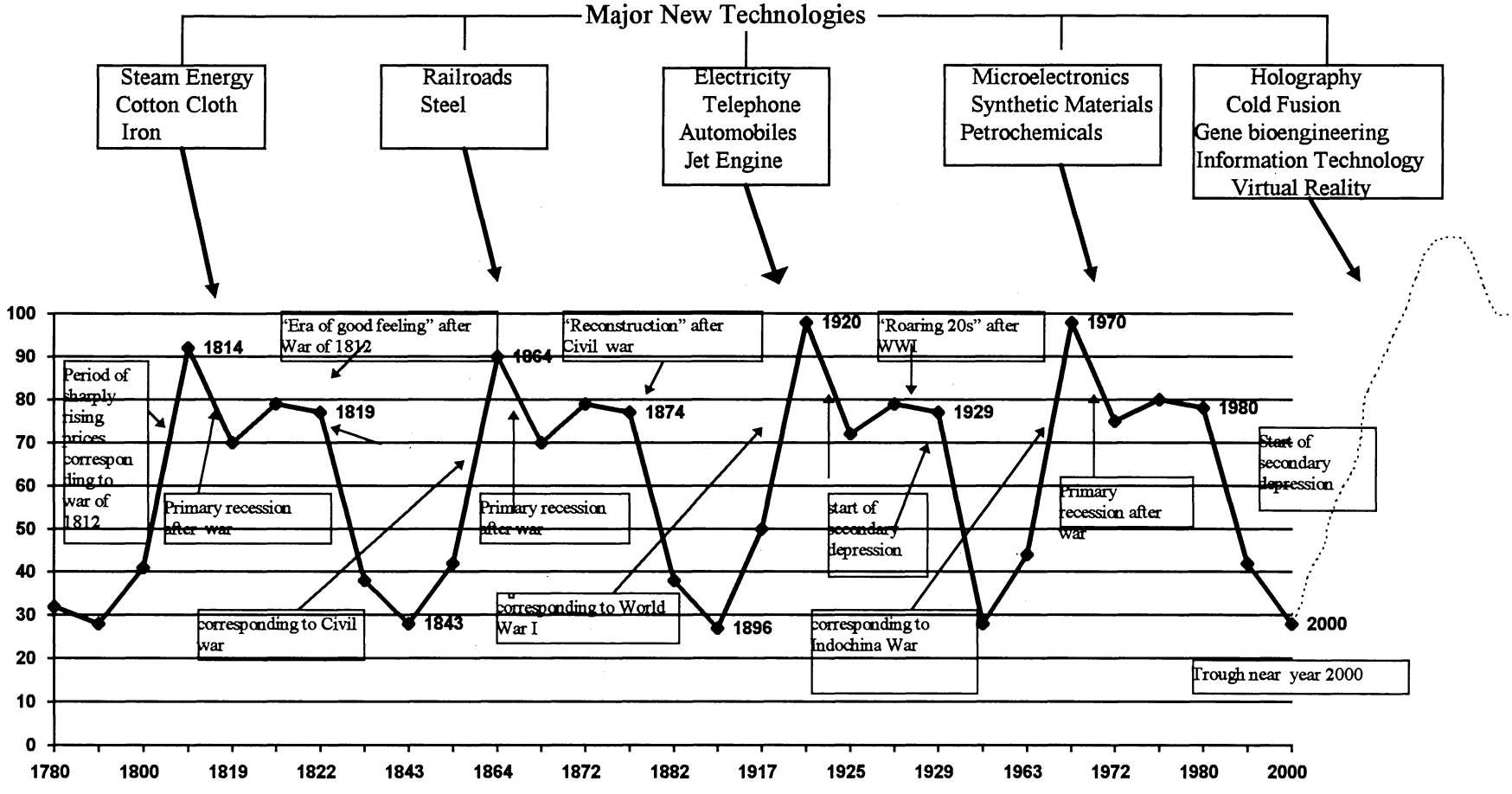
Another definition of the business cycle defined by NBER is termed the deviation cycle or, more commonly, the growth cycle. A growth cycle is a pronounced deviation around the trend rate of change. Thus this definition portrays periods of accelerating and decelerating rates of growth in the economy, a type of fluctuation that also has a long-standing history. Burns and Mitchell (1946) noted:

> If secure trends were eliminated at the outset as fully as are seasonal variations, they would show that business cycles are a more pervasive and an more potent factor in economic life... For when the secular trend of a series rises rapidly, it may offset the influence of cyclical contractions in general business, or make the detection of this influence difficult. In such instances [the classical business cycle method] may indicate lapses from conformity to contractions in general business, which would not appear if the secure trend were removed (Burns and Mitchell 1946, p.40-41)

The economic history of the last 200 years reveals a consistent repetition of a pattern of alternating prosperity and recession. This experience is not limited to the United States but has occurred with regularity in all countries. The business cycle is commonly assumed to last for four years from trough to trough (Pring, 1992). In fact, the average duration is closer to 41.6 months, or a little under four years (Pring, 1992, p.115). Economists have also noticed several other cycles in business activity. In his book about business cycles, Joseph Schumpter listed what he considered to be the three dominant ones: Kondratieff, Juglar, and Kitchin. Among these cycles the Kondratieff cycle is explained next because this cycle offers some valuable long-term perspectives and gives us some useful clues to the characteristics of the many other cycles.

Kondratieff Cycle

The so-called Kondratieff cycle, also referred to as the long-wave or super cycle, assumes a certain automaticity or inevitability. Nikolai Kondratieff was a Russian economist who was commissioned by the communist government in the 1920s to prove that capitalism would not work (Pring 1992). During the 1920s he set out to study the economic history of capitalist countries over the previous 150 years. What he found was quite different. On the basis of historical observations, he was led to conclude that capitalistic countries experience long economic cycles of approximately 50 to 60 year duration and the capitalist system could cleanse and renew itself, eventually moving on to greater strength. The Kondratieff cycle is depicted in Figure 3.



(Source: Adapted from Martin J. Pring, Technical Analysis Explained, McGraw-Hill, NY, 1991 and Peter Dicken, 1992, the Global Shift, p.99)

Figure 3: The Kondratieff Wave

(Based on annual averages with a ratio scale of 1967 = 100.)

The super cycles which Kondratieff thought he had detected were defined by three distinct phases. The first one is characterized by a long expansion period of growth and rising prices. The expansion phase was followed by a relatively much shorter period when economic activity and prices stabilized. That was succeeded by a long period of falling output, employment, and prices. The depression, in turn, would be followed by economic recovery, prosperity, and all the rest.

The task that confronts forecasters tied to the super cycle theory is how to identify or to project the various phases of the Kondratieff cycle. The problem is that no one knows exactly at which point the economy, as the locomotive force, finds itself and the difficulty of how to interpret the underlying socioeconomic forces and to make specific forecasts. The clear fact is that the Kondratieff wave is the one with the greatest long-term effect on financial markets. Thus, it is worth consideration.

Background and Strategies of Cycles

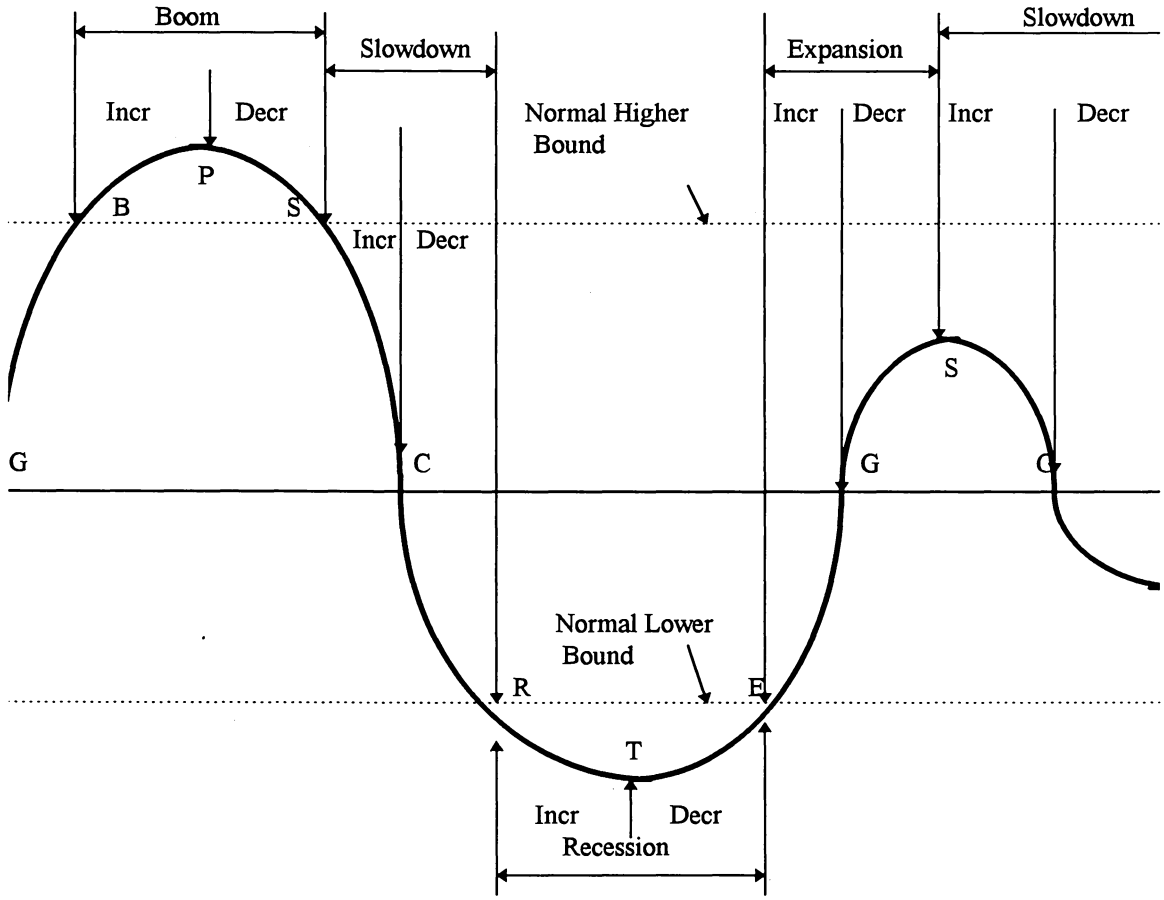
The main characteristics of the several cycles have been defined and identified above. The business and growth cycle as well as the Kondratieff cycle all tell us that there are some cyclical patterns that we might be able to predict in advance. The usefulness of the cycle study is precisely this. Especially, financial managers need to pay attention to how the financial strategies including investment and asset allocations fit into the cycles to maximize profits. Investors also need to pay attention to business cycles because 70 percent of price changes in most stocks can be linked to overall economic changes that affect an industry category (Nicholes, 1988 p.41). As Nicholes explained,

among interest-bearing investments like bonds and certificates of deposit, two or three percent interest is a normal investment yield. A higher interest rate is caused by changing economic forces.

Returns on other types of investment correlate with economic cycles (Nicholes, 1988, p.41). Pring (1992) said that the course of the three asset classes - bonds, stocks, and inflation hedge investments - is strongly influenced by the business cycle. According to Pring, the last 200 years of financial market history indicates almost without exception that there is a definite chronological sequence of events that takes place during the course of the business cycle. This progression consists of a bottoming in bond prices (peak in interest rates), then equities, and finally in commodities. It continues with the peaking out of bond prices (interest rates troughing), then stocks, and finally commodity prices.

The next section will address the economic background and brief financial strategies for each stage of the growth cycle. The growth cycles are used here because the growth cycles are common and encompass classical Business Cycles (Niemira and Klein 1994, p.6). Figure 4 represents the Phases in the Growth Cycle.

Figure 4: The Growth Cycle Representing Classical Business Cycles



NOTE: Letters distinguish the beginning and middle of the various phases. While they are not to be taken literally, the letters stands for various economic conditions generally associated with the phases to which they refer: G (Growth), B (Boom), P (Peak), S (slowdown), C (Contraction), R (Recession), T (Trough), E (Expansion), Incr (Increasing Rate), Decr (Decreasing Rate). (Source: E. Haywood, "the Deviation Cycle: A New Index of the Australian Business Cycle, 1953-1973, " The Australian Economic Review, fourth Quarter, 1973, p.34.)

Practically, the cycle is a major factor in business and financial decisions. Its massive changes lie beyond the control of the individual business manager, indeed largely beyond the control of government. Since an individual manager is powerless to alter these fluctuations, the manager must accommodate himself to their swings. A good motto to remember in thinking about the business cycle would run: "swing with business cycles, not against them." Unlike conditions inside the firm, which are susceptible to management's control, the business cycle is an intractable external influence to which, largely, a business can only adjust. The economic background and general financial strategies related to the hotel industry for each stage of the cycle are discussed as follows. The main explanation of the economic background is borrowed from Sherman (1991, pp. 248-166).

The Upswing (T - P or T -S)

Economic Background

Sherman (1991) explained economic background for this stage in the business cycle. According to his explanation, in this stage of the cycle, consumer demand rises most rapidly during recovery. This increase reflects the rise of national income, which also rises most rapidly in this phase. Investment demand also rises more rapidly in recovery than at any other time. The reason is that the rapid increase in expected profits reflect increases in present profits.

Similarly, total real labor costs (wages, salaries, and so forth) rise more rapidly in recovery than at any other time. Real labor income, however, does not rise as rapidly as

does property income, so its share declines. Positive influences on the labor share are the slow increase of wages per hour and the rapid increase in employment - though most of the increase in employment uses the unemployed, so there is little pressure on wages. But this is far outweighed by the large increase in productivity, which is more rapid in recovery than at any other time. The increase in productivity goes automatically to increase profits.

In the recovery period, aggregate demand is increasing very rapidly. At the same time, the unit cost of supply is rising relatively slowly, partly because prices of inputs are rising only slowly, but especially because productivity is rising rapidly. As a result total profit, the profit share of income, the profit rate on sales, and the profit rate on capital are all rising rapidly. The effects of this rise in profitability are (1) rising availability of internal funds for investment and (2) rising profit expectations for the future. Therefore, investment also rises rapidly. Of course, new investment leads, through the multiplier, to more income and more consumption.

Hotel Financial Strategy:

In this stage of the business cycle, the economy is emerging from recession. Interest rates are low. The demand for money has been light and money is readily available for borrowing. Consumers, long fearful of losing jobs or suffering reduced incomes, are finally now able to pursue more goods and services. Business activity rises in a kind of push-pull interplay between consumer demand and increasing incomes. The recalling of laid-off workers to their jobs adds to payrolls, wages, and spending power.

New incomes, flowing into the hands of consumers, bring a rise in traveling and hotel occupancy in general. Gradually, hotel business returns to normal, then becomes unusually good. Room demand begins to press on existing capacity. Financial managers may consider new hotel development, hotel refinancing, hotel acquisition, or hotel selling. They will consider new financing. Normally, as the downturn ends and the company is very liquid, it is a good time to begin thinking about lines of banking credit and possible future bond issues. Financial managers begin to borrow heavily at banks to finance their hotel development, and to finance hotel assets and inventories. At this stage of the cycle, bond yields are low at first, but bond yields begin to rise.

Now prosperity climbs into boom. The stock market approaches a peak. This is the time for the astute financial manager to sell new common shares for two or three times the price he could have gotten during the recession, using some of the proceeds to retire debt. Bond financing becomes very costly with tight money, high interest rates, long periods of non-refundability, and stringent indenture restrictions on borrowers. It is a good time to stay out of the bond market, and the astute financial manager will have timed his financing at this point to consist of common stocks.

Speculation now flows over into the securities and commodities markets. The stock market, which typically rises ahead of business anyway, leaps into a real boom. Speculators buy stocks not only in anticipation of better business earnings, which will lead to higher dividends, but also in the hope of selling to other speculators at inflated prices.

The general rise in prices strengthens the collateral value of all sorts of pledgible items, reinforces the confidence of both lenders and borrowers, and increases the availability of credit while lowering credit standards.

On the other hand, as a spirit of optimism takes over as incomes increase faster than the supply of goods and services, prices begin to rise. Wages also rise, and the government begins to show concern over symptoms of inflation. As the stream of recovery widens into prosperity, the capital structure should be managed well. Borrowing money beyond the capacity of solvency, without considering the next stage of the business cycle, the financial manager would be faced with big troubles soon.

The Upper turning Point (P or S)

Economic Background:

Sherman (1991) explained economic background for this stage in the business cycle. According to his explanation, in this stage of the cycle, real consumer demand rises more and more slowly in prosperity. National income growth also slows down, but not quite as much. At any rate, the growth of consumer demand, the largest part of all demand, is very limited near the cycle peak.

Real wages per hour are rising very slowly. Productivity is also rising very slowly, but still slightly faster than are hourly wages. Consequently, the share of labor usually continues to decline, but very slowly. When the labor share stops declining, because of stagnant productivity, the average propensity to consume also stops declining. But profits are already declining, so the process leading to contraction is already under way. Demand

for raw materials continues to rise to the peak. But supply in many areas is limited and it takes much time to increase supply. Hence, the price of raw materials rises rapidly at this time. Therefore, profits are squeezed more and more as the peak is approached.

Hotel Financial Strategy:

As general business reaches to boom, price-level and monetary factors play large parts in reversing the business boom in general. The central bank reacts to inflation by slowing down the growth of money supply. Money begins to get tight, and interest rates rise. As there is a sign that money becomes expensive and hard to borrow, financial managers in particular begin to think about borrowing in advance. This is because, as interest rates soar to ration an inadequate supply of funds, mortgage borrowers will be priced out of the market. With markets for corporate bonds congested, many companies heed the advice of their investment bankers and postpone their issues.

The Treasury and federal government may also restrain the boom by increasing income taxes (personal and business) and by cutting expenditures. Since a Treasury surplus withdraws funds from the economy, it can aid powerfully in putting brakes on the boom. Now, the stock market and business profits begin to suffer in the latter part of this stage. Stocks have already climbed a long way before the business boom begins. For a while during the boom they move higher. But rising interest rates and tight money make margin accounts more difficult to finance, and falling bond prices and rising bond yields make bonds an increasingly attractive alternative to stock investment. Finally, investors and speculators perceive that the rate of gain in profits for many companies is slowing

down and preparing to reverse itself. They begin to sell their stocks, and soon stock prices are falling. Falling stock prices discourage speculators who hold stocks on margin, and selling soon becomes contagious, leading to a real break in the stock market.

In the hotel industry many hotel developers have built hotel rooms during the previous stage in the business cycle. Since the hotel rooms have been built in the market at an abnormally rapid rate, the hotel capacities have become large enough to meet all foreseeable needs. At some point, profitability of the hotel capacity will reach its maximum point. When this discovery is made, a rush may develop to cancel new projects and orders already under way. This rush will not only precipitate a downturn in business, but also give the downturn much momentum.

Since the hotel supply begins to overtake consumers' demands, hotels with unused capacity will compete vigorously against each other. Meanwhile, the economy has reached the limit of its labor supply. Thus, hotel management competes vigorously against each other for a limited labor supply too, driving wages up. This puts profit margins under great pressure, and profits generally begin to fall. Some hotel companies, hit with declining profits, will cut their dividends. Reports of falling dividends, some business failures, and the still-prevailing reign of tight money all drive the stock market down at an accelerated rate.

Everyone now expects the worst to happen, and the swing of expectations from over-optimism to pessimism now drives business into a rapid decline. Sales fall, employees are laid off, and many people reduce their spending to conserve cash for a

"rainy day." It is time for financial managers to prepare for the next recovery. By entering the recession period with a comfortable equity-to-debt ratio, the company not only minimizes its financial risk, but also impresses future lenders with a large "cushion" of equity to protect their loans.

The Downswing (P-T or S-T)

Economic Background:

Sherman (1991) explained the economic background for this stage in the business cycle. According to his explanation, in this stage of the cycle, real consumer demand falls because real income is falling. But, the average propensity to consume begins to rise, so consumption falls less than income. The main reason that consumption falls less than income is that the labor share of income begins to rise. Real investment demand also falls rapidly in the crisis, reflecting the rapid decline of profit expectations and lack of available profits for investment.

Real aggregate wages decline in the crisis as a result of falling real wages per hour and rising unemployment (though unemployment usually lags behind output). Yet the labor share of income begins to rise. The labor share increases because, although real hourly wages are falling, productivity is falling much faster. Productivity falls because employment does not decline as rapidly as does output. Although some unusually skilled workers may be retained, the main reason is that most overhead workers, such as bookkeepers or guards, cannot be fired when production falls. Falling production lowers

the demand for raw materials. The supply of raw materials, however, declines very slowly because its reduction involves closing mines and planting less crops for the following year.

Aggregate demand is falling rapidly because of the decline in consumption demand and the very rapid fall in investment demand. Aggregate costs are falling more slowly because real wages and raw material prices decline very slowly at first. As a result aggregate profit and the rate of profit fall rapidly in the crisis. The decline in profits causes production and investment to fall even further. The decline in production and investment lower employment, consumer demand, and income once again.

Hotel Financial Strategy:

Once the downswing in business is under way, reinforcing influences accelerate its decline. It is time to require more tight asset management. Some manufacturing firms are able to sell their inventory to pay pressing debts but that is not possible in the hotel industry unless hotels are sold. Unfortunately, selling hotels at this stage in the business cycle is very difficult because everybody knows that economy is already getting worse. Thus, astute hotel financial managers should have better idea in reading and forecasting the turning points in the business cycle than other competitors. This is precisely the main purpose of studying the business cycle and the purpose of this study.

Hotel profits fall along with falling occupancy rates. Since most firms are affected by both operating and financial leverage, the percentage decline in profits is typically a multiple of the percentage decline in sales. Some firms meet the fall in profits by reducing their dividends. Some firms may experience losses that they are unable to meet bond or

bank interest on debt. Often they go into bankruptcy. In this stage, pessimistic expectations darken the outlook for both hotel management and consumers.

However, one bright spot shows up even as the downturn is underway. Interest rates begin to ease. Alarmed by signs of recession, the central bank may reverse its tight-money policy and begin an aggressive program to lower interest rates and increase the availability of lendable funds. Meanwhile, borrowers at banks and other financial institutions hasten to pay off their loans and get out of debt. Conditions gradually become super-liquid and interest rates fall to low levels. Of course, the government also uses fiscal policy to fight the recession. Taxes for individuals and corporations are cut, government spending for unemployment relief and public works is increased, and a large government deficit is fueled by massive treasury borrowings at the banks. The proceeds of the deficit are promptly spent by the government in an effort to provide jobs and to prevent an excessive slowdown in the economy.

The Lower Turning Point (T)

Economic Background:

Sherman (1991) explained economic background for this stage in the business cycle. According to his explanation, in this stage of the cycle, real consumer demand continues to fall, but very slowly (and sometimes rises in mild cycles). The decline in consumption is very slow because income is declining slowly in this phase, but also because the average propensity to consume is rising. The propensity to consume rises mainly because the labor share is rising (though the labor share rises very slowly by the

end of the depression because falling unemployment begins to affect it). Real investment continues to decline in the depression so long as profits decline since this means lower profit expectations and less available internal funds. Toward the end of the depression, profit expectations begin to rise, leading to a recovery in investment at the trough.

Financial Strategy:

The lower interest rates, and government fiscal policy to fight the recession continue in this stage. Eventually, many factors work together to end the decline and produce a gradual upturn. However, it would be invisible at first and recognized by only a few, thus the upturn gradually gathers strength as new hiring, new incomes and new sales begin to spread in ever-widening circles.

In this particular stage of business cycle, some hotel financial managers may feel that this is nothing but an opportunity. Many factors including lower interest rates, favorable government lending policy and the rise in consumer demand when combined together seem promising for future business success. However, financial managers should remember the past experiences. During the recession period of the early 1980s, too much financing in debt eventually made many firms bankrupt a few years later.

Consequently, it is very clear that the only astute hotel financial managers who can monitor the current business situations quickly and apply their strategies to the upcoming stage of business cycles can effectively maximize this unusual opportunity to strengthen their firms. The past gives us good lessons for the present and the future.

Summary

Based on the idealized phases of the cycle: peak, contraction, trough, and expansion, the economic background and financial strategies have been discussed. When the economy is expanding, investors are optimistic, general stock market averages like The Dow Jones Industrial Average, the S&P 500, the Wiltshire Index, and similar equities' market measures increase. Interest rates generally increase during economic expansions and decline during contractions. Changes in interest rates- and therefore changes in the economy- are reflected in yields on money market funds, T-bills, and certificates of deposit. When the economy enters inflation, these rates increase notably, giving a market signal of inflation to go along with economic signals.

Like interest rates and inflation, securities markets send off economic and investment signals. These signals which are called economic indicators in this study give us the benefits of what we have discussed. The signals of economic indicators are centered between plateaus of the cycles. When the cycle is expanding, leading and coincident indicators point upward, and lagging indicators will be indecisive or tending downward. The reverse is true of indicators during economic contraction.

In the next section the general characteristic of the hotel industry cycle will be defined and potential economic indicators for the hotel industry will be identified and discussed.

Hotel Industry Cycle

Definition

The hotel industry cycle is a type of fluctuation found in the aggregate business activity of the whole hotel industry. The aggregate business activity of the hotel industry is represented by the total receipts of the industry in this study. This can be justified by using the logic provided below. As defined at the early stage of this chapter, the general business cycle is a type of fluctuation found in the aggregate economic activity which is represented by the real gross national product (GNP). The GNP is not only the most widely used measure of the general health of the economy, but it is also the parameter which researchers most often use to make predictions about national economic trends (Karsten 1990 p.188). As Karsten (1990) explained, the GNP represents the market value of all final goods and services which are produced in the economy in a given year. This output can be measured either in terms of total income or total expenditures. Every expenditure is simultaneously also a receipt, i.e., what some economic unit spends, the same or another economic unit must receive as income. In other words, the market value of all final goods and services produced equal receipts or expenditures:

$$\sum \text{Re}ceipts = \text{GNP} = \sum Expenditures$$

The U.S. Department of Commerce, Bureau of the Census defined the total receipts of the hotel industry as all charges or billings for all services rendered even though payment may be received at a later date in the industry. Because the total receipts of the

hotel industry in a given period represent the market value of all final goods and services which are produced in the hotel industry in the period, it is safely said that the aggregate business activity of the hotel industry can be represented by the data of total receipts of the industry.

There are some other series that can be a good surrogate indicator such as the series of hotel industry employment to represent the aggregate business activity of the hotel industry. This study, as an exploratory study, uses the data series of total receipts only although it felt that using the single series is a less reliable than to form a composite of all other possible series which individually have cyclical turning points near the general business cycle dates as identified by the NBER. This is because the possible data series have not been identified for this purpose in the hospitality literature until now, so this study can not select any other series other than the total receipts which is based upon the above discussion. Once the potential indicators are classified into leading, coincident, and lagging indicators, the indicators classified into coincident indicators can be tested to determine which series could be used for forming the composite index to develop the hotel industry cycle. Then, more reliability for the cycle will be achieved in future study.

The Key Economic Indicators

The key economic indicators of the hotel business are reviewed in this section to support the process of selecting the leading, coincident, and lagging indicators of the industry. The potential economic indicators for the hotel industry are selected by reviewing the hospitality and general business literature. This study also considers indicators other than the indicators represented in the above literature in order to maximize the validity of the selection process. Consequently, this study considers every indicator discussed in the literature as potential economic indicators for the industry. The discussions regarding the economic indicators in the hospitality literature conducted by several scholars are presented below.

From the Hospitality Industry

Service industries such as the hospitality industry are highly sensitive to conditions in the economic sector as shown in chapter one. Factors such as unemployment, inflation, wage and price controls, energy supply and costs, and economic expansion/recession exert a profound influence on most sectors of the hospitality industry (Olsen et al., 1992). Thus, it is important for the strategic managers of the firm to identify and monitor the economic environment that has the greatest impact not only on their industry but also on their firm in order to be able to discern the various relationships between movements in the economy and the resulting changes in the market (Olsen et al., 1992). Olsen et al. listed economic environmental variables as follows: the GNP, fiscal policies (taxation, deficit spending),

monetary policies (interest rates and inflation), labor (unemployment rates, spending on welfare), trade (imports and exports), financial markets (availability of capital), purchasing power, saving rate, energy costs, and disposable income as key indicators.

Haywood (1993) stated, "Hospitality and tourism expenditures do correlate with disposable personal income. As incomes rise, so do expenditures on travel and eating out. Consumer spending patterns are also linked to the amount of time people spend working, the type of job and their overall level of employment. The macro context of the US economy also has profound effects on the hospitality/tourism sectors and their performance." Some of the key economic indicators that he mentioned are: the GDP, net exports, disposable personal income, savings rate, population, labor force, employment, unemployment rate, consumer price index, increases in minimum wages, payment of health benefits, government regulations and taxes. Another study (Wise, 1993, p.55) said that the growth rates in tourism paralleled the growth rates in the GDP.

Zhao and Merna (1992) introduced the economic factors that should be considered for scanning the environment. These are (1) the GNP- the total market value of goods and services produced in a country per year and its growth rate, (2) income distribution - the level of personal consumer income and the tendency to consume, (3) foreign exchange rates - the rate of exchange of one currency for another, (4) monetary and fiscal policies and exchange control, (5) financial and investment markets - individual consumer and corporate interest rates, the availability of credit, the rate of inflation, stock exchanges, etc., (6) taxation and tariffs, (7) trade industrial factors - import/export, measure of

activity in commerce. These can serve as indices in determining the state of the economy (e.g. prosperity, depression, recession, recovery), (8) labor markets - the level of unemployment, the labor pool, welfare spending.

On the other hand, there are often the cited causes of business failures in the lodging industry. The variables affecting the bankruptcy of the hotel business can be another source of economic indicators for the hotel industry cycle. Adams and Kwansa (1992) listed the factors affecting hotel bankruptcy. The factors include insufficient profits, high interest rates, loss of market share, lack of consumer spending, and no future growth. The financial factors discussed in Langton et al.'s (1992) study also have good potential to be leading indicators. They said the availability of needed funds to support growth in this industry has diminished considerably as a result of declining global real-estate values, lower inflation, and competition for funds (Langton, Bottorff, and Olsen, 1992, p.32).

The economic variables and the indicators discussed in the hospitality industry literature have been addressed above. The complete list of economic variables and indicators discussed in the hospitality literature are presented in Table 4.

Table 4: Economic Indicators Discussed in the Hospitality Literature (I)

Variables discussed
• GNP
• Inflation
• CPI
• GDP
• Exchange rate
• Real estate value
• Poverty rate
• Consumer spending pattern
• Stability in the value of the national currency
• Disposable income
• Tax
• Interest rates
• Saving rate
• Employment & unemployment rate
• Women in Labor Force

The current body of literature regarding the economic indicators that will be used for the composite index for the hotel industry is not developed well enough. This flaw has resulted in the need to expand the search process to the general business literature to get more potential economic indicators for the hotel industry.

From the General Business

In addition to the indicators discussed in the hospitality literature, the indicator series that are used by the Department of Commerce as leading, lagging, and coincident indicators of the general business cycle are considered. Table 5 shows the twelve leading indicators, the four coincident indicators, and the six lagging indicators.

Table 5: Economic Indicators of the General Business Cycle (II)

Leading Indicators:
- Average weekly hours of production workers in manufacturing
- Average weekly initial claims for unemployment insurance
- Manufacturers' new orders for consumer foods and materials in constant dollars
- Index of net business formation
- Index of stock prices, 500 common stock
- Contracts and orders for plant and equipment, in constant dollars
- Index of new private housing units authorized by local building permits
- Vendor performance, percentage of companies receiving slower deliveries
- Change in manufacturing and trade inventories, in constant dollars
- Change in sensitive materials prices
- Money supply (M2) in constant dollars
- Change in business and consumer credit outstanding

Coincident Indicators:
- Employees on nonagricultural payrolls
- Index of industrial production
- Personal income less transfer payments, in constant dollars
- Manufacturing and trade sales, in constant dollars

Lagging Indicators:
- Index of labor cost per unit of output, manufacturing
- Ratio, manufacturing and trade inventories to sales
- Average duration of unemployment in weeks
- Ratio, consumer installment credit outstanding to personal income
- Commercial and industrial loans outstanding, in constant dollars
- Average prime rate charged by banks

Source: Sherman (1991). The business cycle: growth and crisis under capitalism. Princeton University Press, P.18.

From the Other Industries

In the *Journal of Business Economics*, economic indicators identified for other industries, including the textile and chemical industry, have been presented. Karfunkle (1969) developed a textile reference cycle and identified leading , coincident and lagging

indicators for the textile industry. The nine textile leading indicators and seven coincident indicators are presented in Table 6. The four components of the chemical industry composite leading index which are developed by Niemira (1982) are also presented in Table 6.

Table 6: Economic Indicators of other Industries (III)

Textile Industry:

Leading Indicators:

- Textile mill products manufacturers' new orders
- Textile mill products manufacturers' new orders/inventories
- Textile mill products manufacturers' sales/inventories
- Textile weavers' stock prices
- Textile mill production workers' average weekly hours
- Textile mill products workers' total accessions
- Textile mill products workers layoffs
- Apparel production workers' average weekly hours
- retail sales-general merchandise group/inventories

Coincident Indicators:

- Textile World Index of textile manufacturing activity
- Textile mill products manufacturers' sales
- Cotton consumption
- Number of textile mill production workers
- Number of apparel production workers
- Wages of textile mill products production workers
- Wages of apparel production workers

Chemical Industry:

Leading Indicators:

- the Standard and Poor's chemical Stock Price Index
- The layoff rate for the chemical industry
- Capacity utilization in the chemical industry
- Profit margins in the chemical industry

Source: Journal of Business Economics

Karfunkle (1969) compiled all textile series that were analogous to the general business cycle's indicator series. For example, instead of "average work week of production workers, manufacturing," the series, "average work week of production workers, *textile* manufacturing" was selected, and so on.

Other Indicators

Based on the literature review, the economic variables or indicators have been addressed. Because it is better to evaluate as many as possible potential indicators to make better economic systems for the industry, other indicators (other than the indicators addressed above) that are available in other sources are also considered. In deciding what data series to include, this study developed a number of criteria. First, it was decided to use data series directly related to the hotel industry as much as possible. Second, data series having a long history and continuing to recent years would be employed. Third, this study seeks to use only data series which are easily available to the public. Fourth, this study will use data series having economic significance and applicability to the hotel industry as much as possible (for example, this study uses not only CPI-U which was discussed in the hospitality literature, but also uses CPI for food and beverage, CPI for motor fuels, CPI for transportation, and so on). The forty data series identified and selected based on these criteria are presented in Table 7

Table 7 Economic Indicators for the Hotel Industry

- ADR
- American stock exchange
- Average room sales
- Bad debt in hotel industry
- Business failure number
- Common stock price-earning ratio
- Compensation of employees
- Consumer confidence
- Consumer expectation
- CPI for food and beverages
- CPI for motor fuels
- CPI for shelters
- CPI for transportation
- Dividends Per Share
- Dow Jones industrial average
- Earning Per Share
- Federal fund rate
- GDP of service
- General business failure liabilities (per failure)
- General business failure rate
- Government surplus or deficit
- Hotel cash flow, per share data, adjusted to stock index
- Hotel failure liabilities
- Hotel failure numbers
- Hotel profit margin percentage data adjusted to stock price index
- Hotel stock index
- NASDAQ
- Net corporate dividend payments
- Net foreign investment
- Net hotel new rooms
- Net new room openings
- Net rooms under construction
- New York stock exchange
- Occupancy percentage
- Population
- Price/Earning Ratio
- Room demand
- Room supply

- Total rooms in the hotel industry
- Total Sq. Ft. of hotel construction

Chapter Summary

In this chapter, the business cycles theories and several specific cycles and key economic and brief financial strategies for each stage of the cycles have been addressed and discussed. Then, a comprehensive literature review has been conducted in order to identify the potential economic indicators of the hotel industry. The total potential indicators selected from the above process is ninety seven indicators, including fifteen indicators in table 4, twenty-two indicators in table 5, twenty indicators in table 6, and forty indicators in table 7. Among the ninety seven potential indicators, the data are available only for seventy indicators listed in the table 8. Therefore, the seventy data *series were included in the model and the remaining twenty seven indicators were* eliminated. The selected potential indicators are summarized in alphabetical order in table 8. Since many data series in each table have same characteristics or redundancy with those in other table, the sources of the indicators are classified: "I" for indicators in table 4, "II" for indicators in table 5, "III" for indicators in table 6, and "IV" for indicators in table 7.

Table 8: Potential Economic Indicators for the Hotel Industry

1. ADR(IV)
2. American stock exchange (IV)
3. Average room sales (IV)
4. Average weekly initial claims for unemployment insurance (II)
5. Bad debt in hotel industry (IV)
6. Business failure number (IV)
7. Common stock price-earning ratio (IV)
8. Compensation of employees (IV)
9. Consumer confidence (IV)
10. Consumer expectation (IV)
11. Consumer expenditures in the service industry (I)
12. CPI for food and beverages (IV)
13. CPI for motor fuels (IV)
14. CPI for shelters (IV)
15. CPI for transportation (IV)
16. CPI-U (I)
17. Discount rate on new issues of 91-day Treasury-bill (I)
18. Disposable income (I)
19. Dividends Per Share (IV)
20. Dow Jones industrial average (IV)
21. Earning Per Share (IV)
22. Federal fund rate (IV)
23. GDP (I)
24. GDP of service (IV)
25. General business failure liabilities (per failure) (IV)
26. General business failure rate (IV)
27. GNP (I)
28. Government surplus or deficit (IV)
29. Hotel cash flow, per share data, adjusted to stock index (IV)
30. Hotel employment (women) (I)
31. Hotel failure liabilities (IV)
32. Hotel failure numbers (IV)
33. Hotel profit margin percentage data adjusted to stock price index (IV)
34. Hotel stock index (IV)
35. Hours of all persons in business sector, percentage change (II, III)
36. Income taxes (I)
37. Interest rate in hotel industry (I)

38. Manufacturers' new orders in non-durable goods industries (II, III)
39. Manufacturers' unfilled orders in non-durable goods industries (II, III)
40. Money supply (M2) in constant dollars (II)
41. NASDAQ (IV)
42. Net corporate dividend payments (IV)
43. Net foreign investment (IV)
44. Net hotel new rooms (IV)
45. Net new room openings (IV)
46. Net rooms under construction (IV)
47. New housing units, value put in place (II)
48. New York stock exchange (IV)
49. Nonsupervisory-worker average weekly hours in the hotel industry (II, IV)
50. Occupancy percentage (IV)
51. Output per hour of all persons (business sector), percentage change (II)
52. Population (IV)
53. Price/Earning Ratio (IV)
54. Prime interest rate charged by banks (II)
55. Room demand (IV)
56. Room supply (IV)
57. S & P 500 stock price index (II)
58. Saving percentage of disposable income (I)
59. Saving rate (I)
60. Tax (excluding federal tax) in percentage of net sales in the hotel industry (I)
61. The value of new construction in general business (II)
62. Total employment (I, II, III)
63. Total rooms in the hotel industry (IV)
64. Total Sq. Ft. of hotel construction (IV)
65. Unemployment rate (I, II, III)
66. Unemployment rate, of persons unemployed 15 weeks and over (I, II, III)
67. Unit labor costs in business sector, percentage change (II)
68. Value of construction (I, II)
69. Value of hotel construction per sq. ft. (I, II)
70. Wages & salaries (III)

Note: "I" for indicators in table 4, "II" for indicators in table 5, "III" for indicators in table 6, and "IV" for indicators in table 7

These potential indicators are reevaluated in the following chapter, based on the theoretical criteria of selecting economic indicators and context of the study. Then, the final candidates for the indicator system of the hotel industry will be classified into leading, coincident, and lagging indicator groups for further analysis. The following chapter is a step-by-step methodology that will be employed for answering the research proposition in this study.

CHAPTER 3: METHODOLOGY

Introduction

In the first chapter, the six specific objectives of this study were presented along with the research questions. In the second chapter, the business cycle theories and several specific cycles and key economic and brief financial strategies for each stage of the cycles have been addressed and discussed. In addition to that, the seventy potential economic indicators for the hotel industry were selected by reviewing the literature and other sources. These potential indicators will be used as a foundation for constructing an economic indicator system of the hotel industry. In this chapter, the methodologies to answer the research questions and accomplish the six objectives are explained. Before we go further it is good to review the research propositions that will be answered by the methodology in this chapter.

Proposition :

> The cyclical fluctuations of the growth of the hotel industry can be projected by measuring and analyzing a series of economic indicators. Each economic indicator will have specific characteristics in terms of time lags, and thus can be classified into leading, coincident, and lagging indicators. Since no single indicator is perfect for explaining the time lag relationships with the industry cycles, the compilation of groups of indicators into composite indicators will be necessary. The composite indices can be used for forecasting the future turning points (peaks and

troughs) in the industry cycle. The turning points of leading composite index series will lead the turning points of actual industry growth series by a certain time lag. The turning points of the coincident composite index series will coincide with the turning points of the actual industry growth. Finally, the turning points of the lagging composite index will lag the turning points of actual industry growth by certain time differences.

Once the time differences of the three indices are defined, the each index can serve as a forecasting and examining tools for the industry growth. As the definition and rationales of the indicators discussed in the previous section, leading indicators are mainly the series which are concerned with business decisions to expand or to curtail output. Time is required to work out their effects, and so they tend to move ahead of turns in industry cycles. Leading indicators signal in advance a change in the basic performance of the industry as a whole. This tells us future industry turning points in advance, which is the main interest of this study and practitioners in this industry. Early warning signals provided by leading indicators aid in forecasting short-term trends in the coincident series. Coincident indicators are those whose movements coincide with, and provide a measure of, the current performance of industry activity. Hence, they inform us whether the economy is currently experiencing a slowdown,

a boom, or whatever. Movements of lagging indicators usually follow, rather than lead, those of the coincident indicators.

In order to test the indicator system as a useful forecasting technique for the hotel industry, this study will evaluate the performances of the composite indices of the leading, coincident, and lagging indicator groups by comparing with the hotel industry cycle in terms of turning points for the past twenty-eight years (the longest history of data available in this study). It will be accomplished by analyzing and comparing the statistical outputs (i.e. dates of peaks and troughs, and cycle duration) between the series of composite indices and the series of hotel growth cycle. If the leading composite index leads the target cycle for many years (at least a year) consistently, it will be a good forecasting system because it signals the changes of the industry's future in advance. The coincident composite index also will give good information regarding current industry's situation if the turning point of the index coincides with the turning points of the target cycle. The lagging index will confirm all of the above transactions.

In short, this study is an exploratory study developing an economic indicator system for projecting and forecasting future growth and turning points of hotel industry cycles by employing the indicator technique. The step-by-step procedures of the methodology with justifications are presented below.

Methodologies

Formulating the Hotel Industry Cycles (the Reference Cycle)

The Data

The definition of the industry cycle was defined in the previous chapter. By definition, the hotel industry cycle is the cyclical fluctuations of the total output of all activities in the industry. This study employs the data of total receipts as the representation of the total output of the industry. The U.S. Department of Commerce, Bureau of Census reports the total receipts in nominal terms (current dollars). This study converted the nominal data series to real data series (constant dollars) to track the real changes in the industry cycle. Using the data series for this purpose was justified in the previous chapter (see page 52-53).

As Burns and Mitchell (1946) point out at great length, data given daily, weekly, or even monthly tend to have too much static; in a different metaphor, they lose the forest and show only the trees. On the other hand, annual data leave out many cyclical turning points and are not sufficiently detailed (cited in Sherman, 1991). Knowing this fact, this study will utilize annual data anyway, not monthly data, because data for every month is not available. Thus, dating peaks and troughs of the hotel industry cycle in this study would be less accurate than dating cycles by using monthly data.

The Dating of the Industry Cycle

A business cycle is usually measured from peak to peak. According to the Department of Commerce, for a period of economic fluctuations to be classified as a business cycle, it should be at least fifteen months long with any significant upward or downward movement in economic activity being at least five months in duration (Karsten 1990). So this study followed this rule for analyzing hotel industry cycles.

The criteria for cycle dating described in Burns and Mitchell's Measuring Business Cycles remains the cornerstone of the traditional NBER method of determining cyclical turning points in a time series. A specific cycle is a set of turning points observable in a particular series; these turns may or may not correspond to the overall business cycle turning point dates. Niemira and Klein (1994) say the selection of a turn must meet the following criteria:

1. The cycle duration must be at least 15 months, as measured from either peak to peak or trough to trough.
2. If the peak or trough zone is flat, then the latest value is selected as the turn.
3. Striking activity or other special factors generally are ignored, if their effect is brief and fully reversible.

In 1971, these decision rules were formalized by Bry and Boschen (B-B) and incorporated into a computerized routine for determining cyclical turning point dates. The main steps in the B-B computerized routine to select specific cycle turning point dates are:

1. Smooth the data after first adjusting the time series for any outliers.
2. Select preliminary turning points using the smoothed series and then search for turning points in the raw series around the dates found in the smoothed series.

3. Once these tentative dates are selected in the raw series, a check is made of the duration. If the duration criteria are not met, then one pair of cycle dates is eliminated.

4. Although it is not part of the B-B methodology, a final check of the amplitude can be made using the Haywood (1973) amplitude criterion, which is based on a moving standard deviation of the series.

5. After the series has passed through all these tests, a statement of the turning point dates is given

The NBER turning point selection method has largely been done by visual inspection or can be done using a computer program. But the method is no less effective in summarizing the cyclical movement of a time series than turning points from spectral analysis or some other purely statistical technique (Niemira and Klein, 1994, p.136)

In this study, the above dating rules are considered but applied differently since the data used in this study are not monthly or quarterly series. If this study is time series analysis for forecasting linear trends, the data representing the entire year can be converted to monthly terms by the method of least squares for an annual trend equation. But this study is trying to forecast the turning points in the hotel industry cycle not trying to forecast linear trends of the time series. In order to track the turning points in a cycle the original data series should be used even though the data are on an annual basis. Because of this limitation this study can not follow the above dating rule exactly in terms of measuring the number of months. For this reason the study may lose a certain level of accuracy to the analysis. The future study can improve it by overcoming this limitation.

Recognizing the limitation, this study tries to minimize the loss of accuracy by developing number of criteria. First, according to the selection rule of a turn presented

above, the cycle duration must be *at least* 15 months, as measured from either peak to peak or trough to trough. Since a cycle duration should be at least 15 months, this study using annual data series restricts the cycle inclusion to the cycles formed within no less than two years. In other words, the cycle duration must be at least twenty-four months to be considered a cycle in this study. Second, the duration of contraction or expansion has to be at least 1 year (6 months in the NBER rule). Third, the growth change for a year should be more than the mean absolute deviation of the hotel growth cycle. If the above duration criteria are not met, then one pair of cycle dates is eliminated. The dates of peaks and troughs of the hotel growth cycle are used as benchmark dates against which the specific cycles of the various candidates for inclusion in the model as hotel indicator series are matched.

Formulating the Hotel Industry Growth Cycle

The hotel industry cycle is reformed based on year-over year growth rate. The reformed cycle is called the hotel industry growth cycle. Dating rules discussed above are applied also to this cycle. However, there is additional rule for defining turning points. As it was defined in chapter two, a growth cycle is a pronounced deviation around the trend rate of change(see page 38). Thus, in order to be considered as a cycle the accelerating and decelerating rates of growth should be at least greater or equal to mean absolute deviation of the growth. The growth rate change of the hotel industry growth cycle is a symmetric percentage change. The reason for using the symmetric percentage is

illustrated in page 88. The dates of peaks and troughs are used as benchmark dates against with the specific cycles of the various indicators.

Selecting Potential Economic Indicators for the Hotel Industry

The indicators that will be used in this study were selected in the previous chapter based on the literature review. Based upon the literature review in chapter two, the seventy potential economic indicators for the industry were selected (see Table 8).

Selecting Cyclical Indicator that will be included in the model

Selecting cyclical indicators in forming a composite indicator is the most important task in constructing the hotel industry cycle. Thus, the selection of indicators requires some judgment and a knowledge of data sources and the hotel industry itself. Frank de Leeuw's (1991) suggestions for the selection of leading economic indicators guided the selection process of this study. His suggestions are as follows: indicators should (1) lead the production process (e.g., new orders), (2) reflect rapid economic adjustment (e.g., weekly hours), (3) reflect market expectations (e.g., consumer buying plans), (4) serve as policy levers (e.g., monetary and fiscal policy indicators), and (5) have a mathematical lead (e.g., a growth rate versus a level). Nimera and Klein gives some useful rules for screening cyclical indicators. These are:

1. Search for leading and lagging indicators based upon a causal relationships- they are most likely to be robust over numerous cycles.
2. Look for data with the highest frequency; for example, if there is an option, use monthly rather than quarterly data.

3. Look for a series with the longest history
4. Do not overlook reliable coincident indicators or lagging indicators. While these coincident and lagging indicators, by themselves, will not help to forecast, they can confirm and forecast when used in other forms

This study follows these selection rules. The selection process in this study, however, has data limitations for following these rules. The monthly data for the hotel industry are not available. This generates a fundamental limitation for improving accuracy of the proposed cycle. Although the selection rules give a useful guideline, it is still difficult to say what should or should not be included in a composite indicator (Nimera and Klein, 1994). Therefore, it was the goal in this study to find as many possible potential economic indicators as possible. In the previous chapter, the potential indicators were selected based on the four different sources including the hospitality literature, other industries, general business cycle study, and the other sources available to this study. These indicators were evaluated in terms of data availability and the series with the longest history of the data. The final indicators that will be evaluated in the following chapter were presented in Table 8.

All of the data used in this study are gathered from secondary sources including the *Department of Commerce (Bureau of Economic Analysis), the Almanac of Business and Industrial Financial Ratios, the S&P Official Series, the Analyst's Handbook, National Income and Product Accounts of the United States, Economic Indicators Handbook, and Economic Report of the President, Business Failure Record, Survey of Current Business, U.S. Department of Labor, Bureau of Labor Statistics, Smith Travel*

Research/Laventhol & Horwath; The Seidler Companies Incorporated Estimates, Smith Barney, Industry Report, Standard & Poor's Stock Price Indices

Determining Leading, coincident and lagging indicators

Once the indicators are selected, they are then classified into leading, coincident, or lagging indicators. There are three typical techniques to determine whether a series leads, lags, or coincides with movement of another indicator. These methods are (1) cross spectral analysis, (2) the NBER turning point criteria, (3) statistical correlation. Before these methods are discussed it may necessary to review the characteristics of each indicator category: leading, coincident , and lagging.

Leading indicators are mainly the series which are concerned with business decisions to expand or to curtail output. Time is required to work out their effects, and so they tend to move ahead of turns in industry cycles. Leading indicators signal in advance a change in the basic performance of the industry as a whole. This tells us future industry turning points in advance, which is the main interest of this study and practitioners in this industry. Early warning signals provided by leading indicators aid in forecasting short-term trends in the coincident series. Coincident indicators are those whose movements coincide with, and provide a measure of, the current performance of industry activity. Hence, they inform us whether the economy is currently experiencing a slowdown, a boom, or whatever. Movements of lagging indicators usually follow, rather than lead, those of the coincident indicators.

To determine whether a series leads, lags, or coincides with movement of another indicator, the cross-spectral analysis can be considered at first. Cross-spectral analysis is the two-series counterpart of spectral analysis. This assesses the strength of the wave length relationships between pairs of economic indicators. To determine the lead or lag between pairs of economic indicators, two cross-spectral statistics are used: coherence and phase. However, this technique has some limitations. To apply cross-spectral analysis, it is desirable to have a minimum of 200 observations, which is not available in this study, and the economic indicators must be stationary, that is, the mean and variance must be constant over time. Another method is the NBER turning point criteria.

The NBER turning point criteria is a method using the "two-thirds rule" to select leading , coincident, and lagging indicators. The two-thirds rule is applied as follows: "A series is considered an acceptable indicator of revivals if its specific cycle troughs led the corresponding reference troughs at two-thirds or more of the reference troughs it covered; or if it is "roughly coincident" (turned within 3 months of the reference trough) at two-thirds or more of the troughs; or even if it lagged at two-thirds or more or the troughs." Similarly, the process is also applied to the determination of peaks (Moore, 1961). The NBER turning point criteria may lose accuracy in determining the turning point dates because the technique is based on visual inspection. The other method is the statistical correlation method.

A statistical correlation is a technique used to determine the average relationship between two (or more) series over the entire time series. The coefficient of correlation, r,

ranges between -1 and +1, where 0 means no relationship, -1 is a perfect inverse relationship, and +1 is a perfect positive correlation. Alternatively, r^2, is often presented; this statistic can range between 0 and 1. The r^2 measure can be interpreted as the amount of variation accounted for from a linear relationship with another series. Instead of just looking at turning points, correlation techniques answer the question: What is the typical relationship between A and series B?

Correlation, in and of itself, should not be thought of as suggesting that series A causes series B movement or vice versa; it is only a measure of the strength of comovement between the two series. However, since this method can assess the degree of association between the two series over time, it can be used to support the claim that series A should lead (or lag) series B by quantifying the timing relationship. Although this may seem like a trivial distinction, it is not. A high correlation between two series can be the result of a third factor or simple randomness that the technique can not pick up.

To examine the relationships between two time series, cross-correlation functions are computed. Cross-correlation functions are useful for determining whether one series can be predicted from another and what orders of lags may be most useful. When current values of one series are used to predict future values of a second series, the first series is known as a leading indicator. For example, current dollars spent on marketing may be a leading indicator for future sales. Cross-correlation plots are also useful as diagnostics for evaluating the relationships between residuals and other variables in time series models.

In order to use the cross-correlation function, the two series should be stationary- that is, that the mean and the variance of each of the series stay about the same during the series. One way to make a series stationary is to difference it - replace each value of the original series by the differences between adjacent values in the original series. To make the series in this study stationary, this study will transform the time series by using the natural logarithm (base e) of the series and by calculating the difference between successive values in the series. If any values in a pair of series are less than or equal to 0, the natural log transform method can not be used because non-positive values cannot be log transformed. In that case only the difference transform method will be employed. This study will use the statistical correlation technique while considering the NBER Turning point Criteria technique.

Formulating a Cyclical Indicator System For the Hotel Industry

Composite Indicator

The first step in the process of formulating a cyclical indicator is to answer the paramount question that Mark Watson (1989) posed about leading indicators, which for this application can be stated as: What are industry leading indicators supposed to lead? Since no single leading indicator is perfect as discussed above, the compilation of groups of indicators into composite or diffusion indicators is necessary.

Arthur Burns (1961) has offered a rationale for using composite indicators in his discussion of forecasting principles. He wrote: "Since the cyclical timing of single

processes cannot be implicitly trusted, a measure of protection against surprises of the individual cases may be won by combining the indications of numerous series."

Frank de Leeuw (1991) suggests the five rationales for the selection of leading economic indicators: indicators should (1) lead the production process (e.g., new orders), (2) reflect rapid economic adjustment (e.g., weekly hours), (3) reflect market expectations (e.g., consumer buying plans), (4) serve as policy levers (e.g., monetary and fiscal policy indicators), and (5) have a mathematical lead (e.g., a growth rate versus a level). Although the Frank de Leeuw's rationale guides the selection process, the indicator selection process can not be a correct method unless it overcomes poor quality data and a faulty theory.

Zarnowitz and Boschan (1975) suggest the criteria used to select economic indicators. The criteria, in brief, are that an indicator: (1) be a significant economic variable; (2) be statistically adequate; (3) not be subject to significant revisions; (4) reveal consistent relationships over time with business (both classical and growth) cycle peaks and troughs; (5) be associated with the general cyclical movements between peaks and troughs; (6) not be dominated by irregular, erratic and noncyclical influences; and (7) be promptly, frequently, and regularly available.

The composite approach may prove more stable in determining turning point dates on an ongoing basis (Niemira and Klein, 1994, p.314). Nimera and Klein said "not every industry economic indicator has the same cyclical turning points. Hence, selecting the turning points in a composite index is equivalent to determining turning points from a

consensus of indicators. Another advantage of using several indicators jointly as a measure of the industry activity is that the turning point dates are less sensitive to data revisions - a benefit for analytical purposes" (p.315).

Forming Composite Indicators [4]

Forming composite industry leading indicators is mainly because no "leading" indicator is 100% reliable-the "ideal indicator" simply does not exist (Nimera, 1982). The composite leading indicators will reduce variability from any single leading indicator. The composite approach may also prove more stable in determining future growth and turning point dates on an ongoing basis (Niemira and Klein, 1994, p.314). They said "not every industry economic indicator has the same cyclical turning points. Hence, selecting the turning points of industry growth in a composite index is equivalent to determining turning points from a consensus of indicators. Another advantage of using several indicators jointly as a measure of the industry activity is that the turning point dates are less sensitive to data revisions-a benefit for analytical purpose" (p.315). Niemira and Klein explained two methods for forming composite indicators: the simple method and the commerce department/NBER method. This study will use the commerce department/NBER method. The simple method is briefly discussed below because it is necessary to justify why this study employs the other method.

1. The Simple Method:

4 The discussion of composite indicators follows that of Nimera and Klein (1994, pp.165-202).

The simple method appears to be simple and easy to form a composite index, and it works while being easy to apply in practice. In the simple method a composite index can be formed by summing the change in the individual composite while accounting for the component's importance and volatility. This can be written as:

$$\Delta\%(composite) = \sum w_i s_i \Delta\%(component_i)$$

Where *i=1 to n (n* being the maximum number of components), *W* is the component's weight, which represents the component's relative importance, and *s* is the factor that adjusts the component's volatility to a standardized amplitude for all the components. The reason it is necessary to use the standardization weight, is that it minimizes the potential dominating influence from any single component.

As an illustration of this method, the three indicators - real disposable personal income, dividend per share, and employment are selected here. See Table 9 below.

1. Assign Relative Importance Weights. The economists at the NBER examine each indicator and subjectively assign a score from 0 to 100 to every indicator in each of 6 categories: (1) economic significance, (2) statistical adequacy, (3) historical conformity to business cycles, (4) cyclical timing record, (5) smoothness, and (6) promptness of publication. The scores assigned are rather arbitrary and are based more on subjective opinion than on any sophisticated statistical analysis. Once a score is assigned to every indicator in each of the above six categories, the average of the scores assigned in each categories is calculated. The average scores are used to determine which indicators should be included in the index and how those that are

included should be weighted (Kenkel 1989, p.896). In this example, assume that the relative importance weights are assigned such that employment and income each are 1.25 and dividend per share is assigned a weight of .50. The sum of the weights equals the number of components. However, if there is no reason to expect one indicator to be any more or less important, then equal weighting ($Wi = 1$ *for* all components) is desirable. The Commerce Department's composite cyclical indices currently weigh the components equally, although this has not always been true.

2. Determine the Volatility. In this example, the average absolute deviation around the average growth rate is calculated for each of these indicators and is shown in column three of Table 9.
3. Determine the component Weights. Convert the three entries in column one of Table 9 into a relative importance weight by dividing each assigned weight by the sum of all weights. For example, the relative importance weight for employment, in this example, is 100 X (1.25/3). Then determine the standardizing weight, which can be derived from column three volatility measures. To do this, divide each volatility by the sum of column three. The result is shown in column four. Then take the inverse of column three entries and place these results as shown in column five. Finally, the standardization weights are the entries of column five as a share of the total, and the result is shown in column six. The combined relative importance and standardization factor are determined by multiplying entries in column two by those in column six (and shown in column seven) and then taking the ratio of each entry in column seven to the

sum of all entries in that column. This determines the final weights shown in column eight.

4. Calculate the Composite Index. The composite index is calculated by using the weights determined in the previous step and using the equation:

   Composite = 0.597 x Employment + 0.072 x Production + 0.331 x Income.

Table 9: Weighing Components of a Composite Indicators

Series	(1) Assigned Weight	(2) % of Column 1 Sum	(3) Average Deviation	(4) % of Column 2 Sum	(5) Inverse of Column 3	(6) % of Column 5 Sum	(7) Column 2 x Column 6	(8) % of Column 7 Sum
Employment	1.25	41.67	1.25	16.34	4.00	53.86	2244	59.66
Dividend Per share	0.50	16.67	1.83	54.25	1.20	16.22	270	7.19
Income	1.25	41.67	1.45	29.41	2.22	29.92	1247	33.15
Column Total	3.00	100.00	1.53	100.00	7.43	100.00	3761	100.00

2. The commerce department and NBER method

The Commerce Department/ NBER method of forming composite indicators uses a refinement of the simple method just described. This study will use this methodology not only because this method is used by the Commerce Department and NBER, who are the dominant organizations in terms of constructing business cycles with a long history of credibility, but also because the methodology, in the author's point of view, can construct the composite index more scientifically than the simple method. The main steps followed by the Commerce Department in compiling their composite indices are to (1) compute the standardized and weighted average changes, (2) modify the average changes and cumulate these changes into an index, and (3) trend-adjust the index. The steps of the methodology are as follows:

1. Calculate the symmetrical Percentage Change. Julius Shiskin noted that when forming an index built on percentage changes, an arithmetic average of growth can introduce a bias if nothing is done to correct for the situation. Shiskin's example of this point is shown in Table 10.

Table 10: Symmetric versus Asymmetric Growth Rates (Shiskin Example)

Data	Asymmetric (Traditional) Percentage Change	Symmetric (Shiskin) Percentage Change
40	-	-
80	+100.0	+66.7
40	-50.0	-66.7
80	+100.0	+66.7
40	-50.0	-66.7
80	+100.0	+66.7
40	-50.0	-66.7
Arithmetic Average	+25.0	0.0
Geometric Average	0.0	-4.9

Shiskin proposed an alternative method to calculate the growth rate, which was defined as, $200(X_t - X_{t-1})/(X_t + X_{t-1})$, where X is the value of the time series at time period t. This expression will be referred to as C_i , where i is the number of series. As Shiskin observed, the average of growth rates for the traditional formula for period-to-period percentage change was + 25.0%, while his alternative formula averaged to 0%. Hence, the Shiskin alternative eliminated the arithmetic bias. As also shown in Table 10, the easier way to average the standard percentage changes would have been to use a geometric average- not an arithmetic average- which would eliminate that bias. Nonetheless, the Shiskin method is used by the Commerce Department to calculate percentage change in the components of the series. However, if the time series is already expressed as a ratio or percentage change, then the change is calculated as a first difference: $C_i = X_t - X_{t-1}$.

2. Amplitude = Adjust Changes or Percentage Changes. The values derived from step 1 are standardized by dividing each observation by the mean absolute change, calculated using the formula: $S_{it} = (C_{it} / A_i)$, where:

$$A_i = \frac{\sum |C_{it}|}{(N-1)}$$

and N equals the number of observations. The A's do not change from period to period, but are fixed for a given period. The effect of this calculation is to amplitude-adjust the components of the index so that each component's change over the long run equals one. This will ensure that no single indicator will dominate movement in the indicator.

3. Weight Amplitude-Adjusted Changes. Individual indicators are scored according to a scheme including: their economic significance (their importance in business cycle theory or broadness of coverage), statistical adequacy (how good the indicator is from a technical standpoint), conformity to the business cycle, consistency in its timing relationship with the business cycle, the promptness of reporting the data, and the smoothness of the series. Based on these criteria, each indicator can be assigned a composite score, which is used as a second weight on each individual indicator included in the composite. The formula for this process is:

$$R_t = \frac{\sum S_{it} W_i}{\sum W_i}$$

where W is the weight assigned to each component. In this study all the indicator components will be equally weighted because it is impossible to judge the importance of each indicator such as economic significance at this time.

4. Adjust the weighted yearly averages in the leading and lagging indices. Calculate the average absolute change for the sum of the components of the leading, coincident, and lagging composites. Then determine the ratios of the average absolute change for the leaders relative to the average absolute change in the coincident composite. Do the same for the lagging indicator. This can be expressed as:

$$F = \left[\left(\sum_{t=2}^{n}|R|\right)/(N-1)\right] / \left[\left(\sum_{t=2}^{n}|P|\right)/(N-1)\right]$$

where P is the coincident index counterpart of R, which was defined in Step three. Note that adjustment is calculated only for the leading and lagging indicators since F = 1 for the coincident index.

Next derive the adjusted weighted monthly changes r_t as follows: $r_t = R_t / F$. Once this is done, accumulate the standardized average changes r_t into an index using this formula: $I_t = I_{t-1}\left[(200+r_t)/(200-r_t)\right]$, where the initial value of I is arbitrarily set equal to 100 as a base point. This then yields the raw index, which will be subject to two further adjustments.

5. Reverse Trend Adjustment. The purpose of the leading and lagging indicators is to provide the forecaster with information on the status of the coincident series. Julis Shiskin proposed a method known as reverse trend adjustment, which reduced the number of false signals in the leading indicators. His method was to impose a second trend adjustment to the leading and lagging composites, so that they would have the same trend as the coincident composite (or growth in real total receipts in this study). This is accomplished by deriving a trend growth rate between the initial C*i* and the terminal C*t* specific cycle peaks, using the formula:

$$T = \left(\sqrt[m]{C_t / C_i} - 1\right) x100$$

where m is the number of months between the initial peak and the terminal peak. Previously, this was calculated for the individual components of the coincident indicators and then averaged. However, the current Commerce Department methodology performs this calculation on real GNP and uses the result "G" as the target trend instead of the average of the individual component trends. The target trend "G" (growth in real total receipts in this study) is constant for all three composite leading , coincident, and lagging indices.

A trend-adjustment factor is then determined as the difference between the target trend G and the trend in the raw index T, where T exists for each raw composite index r. Then the trend-adjusted composite r' equals r*t* +(G-T). Finally, the r' observations are cumulatively summed over time to form an index, and the result is rebased to a specific desirable base period.

Forecasting Cycles

A business or an economic action taken today is based on yesterday's plan and tomorrow's expectations. Plans for the future cannot be made without forecasting events and the relationships they will have. Not only can forecasting be made for a given line of activity independently, the forecast of one type of event can also be made on the basis of other forecasts. Thus, the projection of population growth for the next decades is an element in the forecast of the future demand for hotel rooms which, in turn, is the basis for plans for constructing new hotels. Similarly, forecasts of national income have been used by the government to estimate its future tax revenue, and by various industries to predict their relative shares of the national market.

One of the basic aims of constructing an economic indicator system for the hotel industry is forecasting. Forecasting is much more than projecting a time series mechanically into the future. It involves making assumptions about the future course of business activity when economic planning is formulated by a firm, an industry, or a government. Assumptions regarding the future are made on the basis of observations of the past. Here lies the basic difficulty in attempting to forecast the future conditions of business. The future may be some sort of extension of the past, but it can hardly be expected to be an exact replica. Forces responsible for economic change are numerous and complex. They are often difficult to discover and to measure. They may appear in all kind of combinations. Furthermore, they may be constantly changing. Even if the response mechanism of an industry or of the economy remains essentially the same

through the passage of time, it is not always easy to know how business conditions will respond to new stimuli whose effects we have failed to observe before. The basic difficulty-that the past can never be a perfect guide to the future- warns us that forecasting should not be thought of as a routine application of some techniques or theoretical ideas to a list of unchanging variables.

Numerous forecasting techniques with varying degrees of complexity have been devised during the past few decades. Most of these fall into one of three broad categories: the naive method, the barometric method, and the analytical method. Among these methods the method that is being developed and will be used for forecasting the characteristics of the hotel industry cycles is categorized into the barometric method. The barometric method implies that past historical patterns tend to repeat themselves in the future and it embraces the idea that the future can be predicted from certain happenings in the present. Thus, past statistical behavior that seems to be associated regularly with fluctuations in particular series or general business conditions is discovered and used as the basis for forecasting. Leading series are searched to provide an advance reading of what is expected to follow in the series to be forecasted. The search for leading series is not based on the leads actually revealed by historical data alone. Theoretical considerations as to the leads and lags in various series are also employed. Cross-checking between empiricism and theory in the search for leading series is the best for establishing the thesis that the future does not represent a break from the past but that changes are largely determined by present conditions. The leading series selected serve as

barometers of future changes in industry conditions. The barometric method, therefore, involves the use of statistical indicators or indicators that would provide an indication of the direction in which the hotel industry cycle is heading.

Over the years, several methods have been developed to spot turning points in the economy. Some of the simplest rules for spotting turning points in the economy based on the Commerce Department's composite index of leading indicators include watching when the indicator declines (for recessions) or increases (for expansions) for two or more consecutive months. The rules for spotting a turning point in either the growth or classical business cycles include: (1) a 2-month reversal in the direction of the indicator, (2) a 2-month reversal in direction and breaking of a minimum threshold level, (3) a 3-month reversal in direction, and finally, (4) a 3-month reversal rule plus a threshold criterion.

The above rules for spotting turning points can not fit this study because this study is analyzing annual data series. Thus, in order to test the indicator system as a forecasting technique for the hotel industry, this study will evaluate the performances of the composite indices of the leading, coincident, and lagging indicator groups by comparing them with the hotel industry cycle in terms of turning points for the past twenty-eight years (the longest history of data available in this study). It will be accomplished by analyzing and comparing the statistical outputs (i.e. dates of peaks and troughs, and cycle duration) between the series of composite indices and the series of hotel growth cycle. If the leading composite index leads the target cycle for many years (at least a year) consistently, it will be good forecasting system because it signals the changes of the industry's future in advance. The coincident composite index also will give good information regarding

current industry's situation if the turning point of the index coincides with the turning points of the target cycle. The lagging index will confirm all of the above transactions. The following chapter is a presentation of the results of this study and a discussion of the results within the context of the above propositions.

CHAPTER 4: RESULTS AND DISCUSSION

Introduction

The previous three chapters have provided the basis for developing a statistical indicator system of the hotel industry. In chapter one, the basic framework for this study was constructed. The various cycles and key economic background and brief financial strategies for each stage of the cycles were reviewed and discussed in chapter two. The chapter was highlighted by selecting potential statistical indicators for the hotel industry. Chapter three explained the specifics of the research and how it will be conducted. In this chapter the results of this study will be presented. The results are for each of the six objectives of this study. The performance of the system (how accurately the system tracks actual turning points of the hotel industry cycle (target cycle) will be presented. The problems met in various stages of the system development will be addressed and the implications in terms of statistical bias as well as how the results apply to the hotel industry will be discussed.

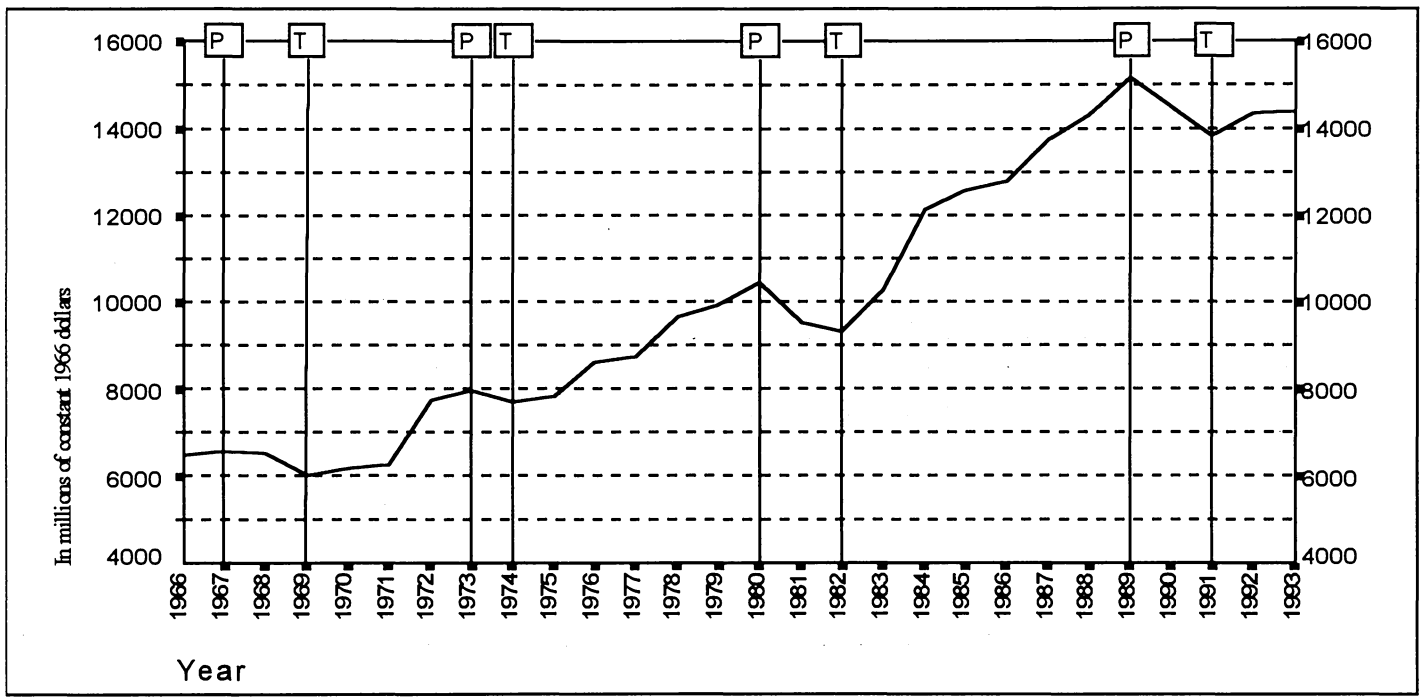
Results

Objective One: Develop the U.S. hotel industry cycle that would cover hotel activity as broadly as possible, and date and measure the cycles.

The first objective was to form the hotel industry cycle. The cycle is a time series representing the total activity of the hotel industry. Figure 5 portrays the hotel industry cycle(hereafter HIC) as measured by real total receipts in the hotel industry. The identified and dated peaks and troughs of HIC are also plotted in the figure 5. Since the

U.S. Department of Commerce, Bureau of Census reports the total receipts in nominal terms (current dollars), this study converted the nominal data series to real data series (constant dollars) to track the real changes in the industry cycle. The CPI-U data series used for the conversion are presented in the table 12. The total receipt data in nominal terms and real terms, and their symmetric percentage changes are also presented in table 12. Figure 6 shows the difference between trends of the current dollars and those of the constant dollars which were made by different CPI-U in different time periods.

The cycle covers the twenty-eight year period (from 1966 to 1993). During this period the hotel industry demonstrated three cycles (peak to peak or trough to trough). The rules of dating the cycles were explained in the previous chapter. The trends for the cycles are analyzed in Table 11. The hotel industry peaked in 1967, 1973, 1980, and 1989. The industry troughed in 1969, 1974, 1982, and 1991. The mean duration of the hotel industry cycles is 7.3 years, calculated either by peak to peak or trough to trough. This means the next peak would be 1996 or 1997 if the past trends take the same track. According to the mean expansion figure the next peak would be also 1996 of 1997. The hotel industry declined sharply after it reached the peaks. It can be seen by a visual analysis of figure 5 and table 11. The mean duration for the contraction is about two years (1.7).



Note: "P" stands for Peak and "T" stands for Trough

Figure 5. Hotel industry cycle: Long-Term Cyclical Fluctuation (Total Receipts adjusted by CPI-U)

Table 11. Turning Points of Hotel industry cycle

Hotel Industry		Cycle Duration (years)			
Peak	Trough	Peak to Peak	Trough to Trough	Expansion (T-P)	Contraction (P-T)
1967	1969				2
1973	1974	6	5	4	1
1980	1982	7	8	6	2
1989	1991	9	9	7	2
Mean		7.3	7.3	5.7	1.7
SD		1.5	2.1	1.5	0.6

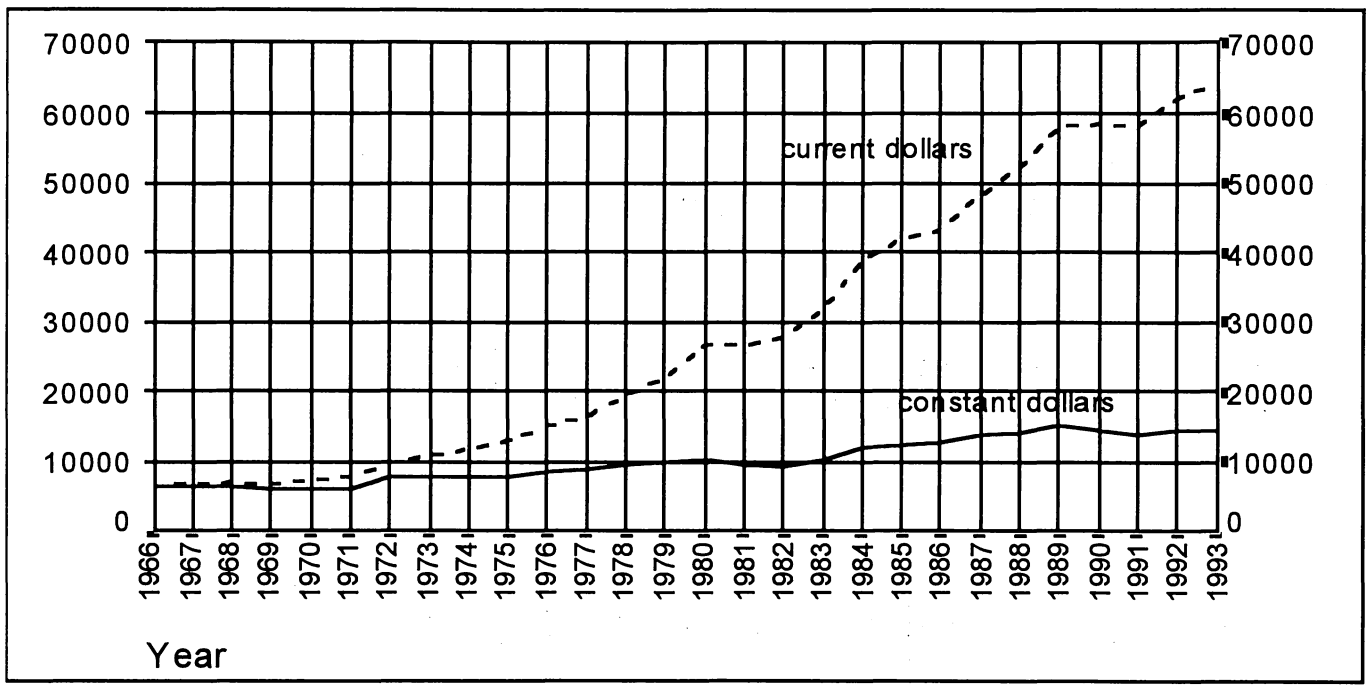


Figure 6. Total Receipts: constant dollars vs. current dollars (millions of dollars)

Table 12. Symmetric Percentage Change of the Total Receipts

Year	Total Receipts* (current dollars)	CPI-U**	Total Receipts (constant 1966 $)	Symmetric Percentage Change
1966	6,506	32.4	6,506.00	-
1967	6,805	33.4	6,601.26	1.45
1968	7,010	34.8	6,526.55	-1.14
1969	6,823	36.7	6,023.57	-8.02
1970	7,417	38.8	6,193.58	2.78
1971	7,856	40.5	6,284.80	1.46
1972	10,027	41.8	7,772.12	21.16
1973	10,955	44.4	7,994.19	2.82
1974	11,757	49.3	7,726.71	-3.40
1975	13,002	53.8	7,830.20	1.33
1976	15,129	56.9	8,614.76	9.54
1977	16,413	60.6	8,775.27	1.85
1978	19,430	65.2	9,655.40	9.55
1979	22,227	72.6	9,919.49	2.70
1980	26,637	82.4	10,473.77	5.44
1981	26,719	90.9	9,523.60	-9.50
1982	27,716	96.5	9,305.68	-2.31
1983	31,624	99.6	10,287.33	10.02
1984	38,917	103.9	12,135.81	16.49
1985	41,837	107.6	12,597.76	3.74
1986	43,317	109.6	12,805.39	1.63
1987	48,238	113.6	13,758.02	7.17
1988	52,379	118.3	14,345.56	4.18
1989	58,138	124.0	15,190.90	5.72
1990	58,494	130.7	14,500.43	-4.65
1991	58,289	136.2	13,866.11	-4.47
1992	62,138	140.3	14,349.76	3.43
1993	64,312	144.5	14,420.13	0.49

Source of data: *: U.S. Department of Commerce, Bureau of Census. **: Economic Report of the President, Feb. 1994

Objective Two: Develop the U.S. hotel industry growth cycle that would represent the magnitude of growth of the industry, and date and measure the cycles.

The HIC was reformed with hotel industry growth cycle (hereafter HGC) based on year-over-year growth rate. This is because this study is trying to find out the yearly fluctuation of the cycle and then develop an economic indicator system. Especially, this study is interested in forecasting turning points of the growth cycle by developing an economic indicator system for the hotel industry. The HGC was plotted and dated as it shown in Figure 7. The growth rate change of the HGC is a symmetric percentage change.

As figure 7 and the table 13 present, the hotel industry experienced high growth (boom) every four or five years. The average expansion (L-H) period is about three years and the average contraction (H-L) period is about two years. Note that the growth change should be more than 4.75, the mean absolute deviation of the HIC to be consider as a cycle. For example, it appears the HGC experienced a growth cycle during 1967 through 1970, but adjacent contraction (1970-1971) is only 1.32, which is less than 4.75. So, it was not considered as a cycle and was eliminated. Other dating criteria were explained in the previous chapter. The dates of peaks and troughs in the table 13 were used as benchmark dates against which the specific cycles of the various candidates for inclusion in the model as hotel indicator series were matched.

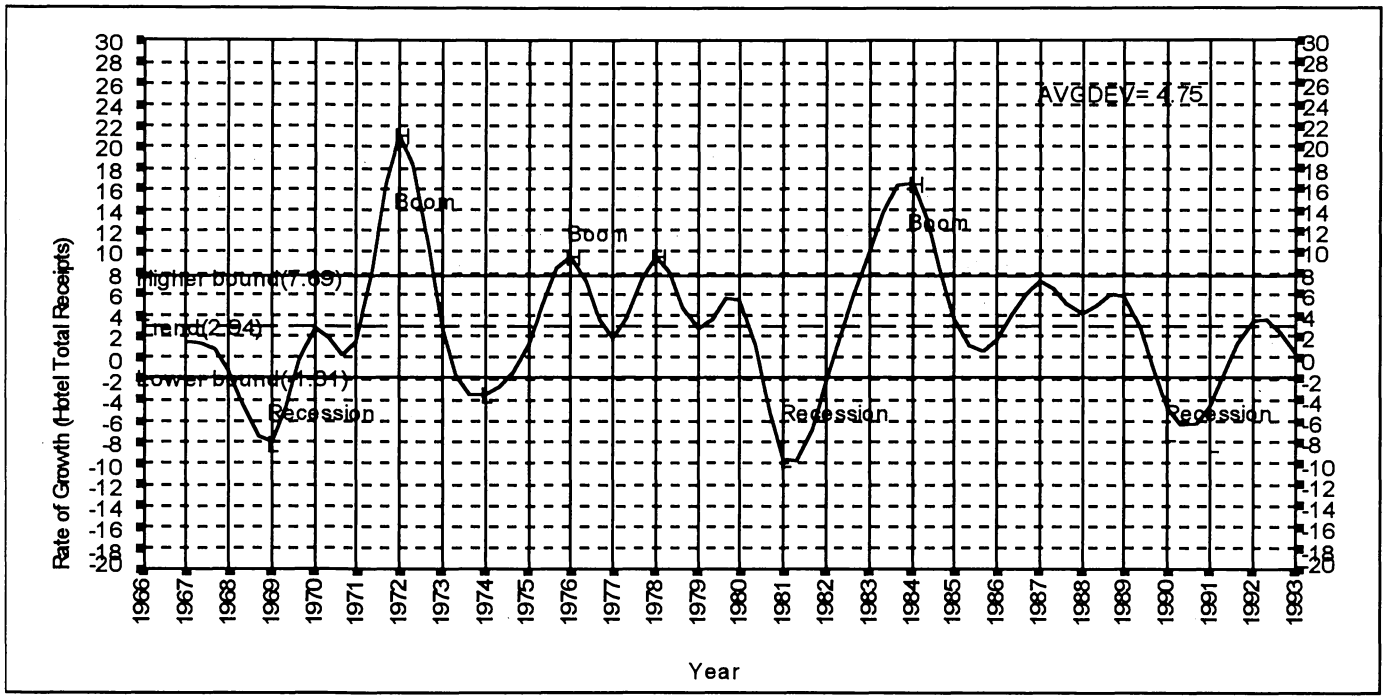


Figure 7. Hotel Industry Growth Cycle (symmetric percentage change, year-over-year)

Table 13. Turning Points of Hotel Industry Growth Cycle

Hotel Industry		Cycle Duration (years)			
High	Low	High to High	Low to Low	Expansion (L-H)	Contraction (H-L)
1967	1969				2
1972	1974	5	5	3	2
1976	1977	4	3	2	1
1980	1981	4	4	3	1
1984	1986	4	5	3	2
1989	1991	5	5	3	2
Mean		4.4	4.4	2.8	1.7
SD		0.5	0.9	0.4	0.5

Note: SD: Standard Deviation

Objective Three: *Develop the possible economic indicators for the hotel industry.*

A complete step by step procedures for selecting the possible economic indicators were presented in chapter two (see pages 54-65). A set of economic indicators for the hotel industry were identified after the statistical evaluation of the ninety-seven possible economic indicators. Among the ninety seven potential indicators, seventy indicators were included in the model and the remaining twenty seven indicators were eliminated because of data availability. The selected potential indicators are summarized in alphabetical order in table 14. This study analyzed the seventy data series for final inclusion in the model of the economic indicator system for the hotel industry. Each of the data series was tracked back to the year 1966 and all series are annual. Table 14 presents the seventy candidates for the system development.

Table 14 The Final Candidates as Economic Indicators for the Hotel Industry

1. ADR
2. American stock exchange
3. Average room sales
4. Average weekly initial claims for unemployment insurance
5. Bad debt in hotel industry
6. Business failure number
7. Common stock price-earning ratio
8. Compensation of employees
9. Consumer confidence
10. Consumer expectation
11. Consumer expenditures in service industry
12. CPI for food and beverages
13. CPI for motor fuels
14. CPI for shelters
15. CPI for transportation
16. CPI-U
17. Discount rate on new issues of 91-day Treasury-bill

18. Disposable income
19. Dividends Per Share (hotel DPS adjusted to stock price index level)
20. DowJones industrial average
21. Earning Per Share (hotel EPS adjusted to stock price index level)
22. Federal fund rate
23. GDP
24. GDP of service
25. General business failure liabilities (per failure)
26. General business failure rate
27. GNP
28. Government surplus or deficit
29. Hotel cash flow, per share data, adjusted to stock index
30. Hotel employment (women)
31. Hotel failure liabilities
32. Hotel failure numbers
33. Hotel profit margin percentage data adjusted to stock price index
34. Hotel stock index
35. Hours of all persons in business sector, percentage change
36. Income taxes (hotel income taxes adjusted to stock price index level)
37. Interest rates in the hotel industry

38. Manufacturers' new orders in non-durable goods industries
39. Manufacturers' unfilled order in non-durable goods industries
40. Money supply (M2) in constant dollars
41. NASDAQ
42. Net corporate dividend payments
43. Net foreign investment (U.S. total exports minus total imports of goods and services)
44. Net hotel new rooms
45. Net new room openings
46. Net rooms under construction
47. New housing units, value put in place
48. New York stock exchange composite index
49. Nonsupervisory-worker average weekly hours in the hotel industry
50. Occupancy percentage
51. Output per hour of all persons (business sector), percentage change.
52. Population
53. Price/Earning Ratio (hotel P/E ratio adjusted to stock price index level)
54. Prime interest rate charged by banks
55. Room demand
56. Room supply
57. S & P 500 stock price index

58. Saving percentage of disposable income

59. Savings rate

60. Tax (exclude federal tax) in percentage of net sales in hotel industry

61. The value of new construction in general business

62. Total employment

63. Total room in hotel industry

64. Total Sq. Ft. of hotel construction

65. Unemployment rate

66. Unemployment rate, persons unemployed 15 weeks and over

67. Unit labor costs in business sector, percentage change

68. Value of construction

69. Value of hotel construction per sq. ft.

70. Wages & salaries

Sources:

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5, 37,60: the Almanac of Business and Industrial Financial Ratios,
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42, 43,58, 70: National Income and Product Accounts of the United States,
2,4,27, 41: Economic Indicators Handbook,
7, 11, 12,13,14,15,16,20,23,24,26, 28,35,38,39,47,48,51, 52,54,57, 61,67: Economic Report of the President.
6,25,31,32: Business Failure Record
9,10,17,22,40,65,66: Survey of Current Business
8,30,49,62: U.S. Department of Labor, Bureau of Labor Statistics
1, 50, 55,56,: Smith Travel Research/Leventhol & Horwath; The Seidler Companies Incorporated Estimates
44,45,46,63,64, 68,69: Smith Barney, Industry Report
34: Standard & Poor's Stock Price Indices

Objective Four: *Identify and select the final economic indicators, and classify the indicators into leading, coincident, and lagging indicators.*

After constructing a data base, all data series were analyzed for classification into leading , coincident, and lagging indicator groups. The statistical program SPSS generated the outputs for the cross-correlation between the HIC and candidate data series. Again, these results were reevaluated by comparing the actual charts and cross correlation results, and dating every single series one by one.

Among seventy data series twenty-one were classified into leading, sixteen were coincident, and thirty-three were lagging indicators. The results are presented in the table 15. The indicators in each category were again evaluated based on data availability, data consistency, and economic significance in the hotel industry. For convenience and efficiency this study restricts the total number of indicators in each category to no more than a dozen or so. For the coincident and lagging indicator categories, this study selected ten of the strongest indicators in terms of correlation. However, all of twelve leading indicators in the leading category were included in the model for better performance of the leading group, which is one of the objectives of this study. The final indicator series included in the model were presented in the table 16.

Table 15. Cross correlation of the Component Series of the Hotel Indicators, 1966-93

A. Leading Indicators

Series	lag	CCF
American stock exchange	-2	-0.473
Business failure number	-3	0.3
CPI for motor fuels	-4	0.415
Dividends Per Share	-5	0.424
GDP of service	-2	0.456
Hotel stock index	-2	0.429
Money supply (M2) in constant dollars	-1	0.333
New York stock exchange	-2	-0.348
Prime interest rate charged by banks	-1	0.547
S & P 500 stock price index	-2	-0.325
Saving percentage of disposable income	-5	0.394
Wages & salaries	-1	0.474

B. Coincident Indicators

Series	lag	CCF
Average room sales	0	0.398
Average weekly initial claims for unemployment insurance	0	-0.437
Consumer confidence	0	0.632
Consumer expenditures in service industry	0	0.441
GDP	0	0.571
General business failure rate	0	-0.363
Hotel cash flow, per share data, adjusted to stock index	0	0.358
Hotel employment (women)	0	0.353
Hotel failure liabilities	0	-0.504
Manufacturers' unfilled order in non-durable goods industries	0	0.412
Net foreign investment	0	-0.41
Occupancy percentage	0	0.576
The value of new construction in general business	0	0.513
Total sq. ft. of hotel construction	0	0.499
Value of construction	0	0.465

C. Lagging Indicators

Series	lag	CCF
Bad debt in hotel industry	3	0.245
Common stock price-earning ratio	3	-0.355
Consumer expectation	1	-0.484
CPI for food and beverages	2	0.466
CPI for shelters	2	0.394
CPI-U	2	0.327
Discount rate on new issues of 91-day Treasury-bill	1	0.515
Disposable income	3	0.424
Dow Jones industrial average	3	0.277
Federal fund rate	1	0.536
General business failure liabilities (per failure)	2	0.416
GNP	1	0.547
Government surplus or deficit	1	0.482
Hotel profit margin percentage data adjusted to stock price index	2	-0.251
Hours of all persons in business sector, percentage change	2	-0.544
Income taxes	2	-0.313
Interest rate in hotel industry	3	0.501

Manufacturers' new orders in non-durable goods industries	1	0.38
NASDAQ	1	-0.398
Net hotel new rooms	1	0.448
Net new room openings	1	0.493
Net rooms under construction	2	-0.247
New housing units, value put in place	2	-0.594
Nonsupervisory-worker average weekly hours in hotel industry	4	0.303
Output per hour of all persons (business sector), percentage change.	2	-0.439
Tax (exclude federal tax) in percentage of net sales in hotel industry	2	0.345
Total employment	1	0.499
Total rooms in hotel industry	2	0.485
Unemployment rate, persons unemployed 15 weeks and over	1	-0.651
Unit labor costs in business sector, percentage change	2	0.592

* The maximum number of lags plotted: 5

Table 16. The Final Indicators for the Hotel Industry to use for forming composite Indices, (selected based on the top ten strongest cross correlation)

A. Leading Indicators
Prime interest rate charged by banks
Wages & salaries
American stock exchange
GDP of service
Hotel stock index
Dividends Per Share
CPI for motors fuels
Saving percentage of disposable income
New York stock exchange
Money supply (M2) in constant dollars
S & P 500 stock price index
Business failure number

B. Coincident Indicators
Consumer confidence
Occupancy percentage
GDP
The value of new construction in general business
Hotel failure liabilities
Total Sq. Ft. of hotel construction
Value of construction
Consumer expenditures in service industry
Average weekly initial claims for unemployment insurance
Manufacturers' unfilled order in non-durable goods industries

C. Lagging Indicators

Unemployment rate, persons unemployed 15 weeks and over
New housing units, value put in place
Unit labor costs in business sector, percentage change
GNP
Hours of all persons in business sector, percentage change
Federal fund rate
Discount rate on new issues of 91-day Treasury-bill
Interest rate in hotel industry
Total employment
Net new room opening

Objective Five: *Form the composite indices for the leading, coincident, and lagging indicators to use for defining the relationships in terms of time lags between the hotel industry cycle and the series of composite indices.*

As stated in previous chapters, the compilation of groups of indicators into composite indicators is necessary since no single leading indicator is perfect. The cyclical timing of single processes cannot be implicitly trusted. A measure of protection against surprises of the individual cases may be won by combining the indications of numerous series (Arthur Burns, 1961). The results of the analysis for forming composite indices are presented in the Table 17. These indices are the key results of this study. These are used for testing the proposition of this study by comparing the actual turning points of the hotel industry cycle (or called here target cycle) and those of indices' cycles for the past twenty-eight year period. The final indices for the leading, coincident, and lagging indicators and their symmetric percentage changes are in Table 17.

Table 17. The Composite Indices of the Leading, Coincident, and Lagging Indicators for the Hotel Industry and their Symmetric Percentage Change

Year	Target Index	Target SPC	Leading Index	Leading Index SPC	Coincident Index	Coincident Index SPC	Lagging Index	Lagging Index SPC
1966	100.00	.	100.00	.	100.00	.	100.00	.
1967	101.46	1.45	103.52	3.46	101.34	1.33	99.96	-0.04
1968	100.32	-1.14	105.56	1.95	103.12	1.74	101.55	1.58
1969	92.58	-8.02	107.12	1.46	104.77	1.59	103.03	1.44
1970	95.20	2.78	108.20	1.01	105.63	0.82	102.80	-0.22
1971	96.60	1.46	110.22	1.85	107.18	1.46	103.27	0.46
1972	119.46	21.16	111.88	1.49	109.96	2.57	104.73	1.39
1973	122.87	2.82	113.47	1.41	111.92	1.76	106.29	1.48
1974	118.76	-3.40	113.91	0.38	111.52	-0.35	106.58	0.28
1975	120.35	1.33	115.95	1.77	112.07	0.49	106.04	-0.51
1976	132.41	9.54	118.16	1.89	113.90	1.62	106.99	0.89
1977	134.88	1.85	119.54	1.16	115.69	1.55	108.05	0.99
1978	148.41	9.55	122.26	2.25	118.05	2.03	109.53	1.36
1979	152.47	2.70	126.41	3.34	120.23	1.83	110.85	1.20
1980	160.99	5.44	130.62	3.27	120.72	0.40	111.22	0.33
1981	146.38	-9.50	133.59	2.25	121.37	0.54	112.13	0.81
1982	143.03	-2.31	134.44	0.64	121.43	0.05	111.47	-0.59
1983	158.12	10.02	137.01	1.90	123.22	1.47	112.59	1.00
1984	186.53	16.49	139.43	1.75	125.50	1.83	114.43	1.63
1985	193.63	3.74	141.90	1.75	127.05	1.23	114.80	0.32
1986	196.82	1.63	143.95	1.43	128.30	0.98	115.19	0.33
1987	211.47	7.17	145.73	1.23	129.74	1.12	116.36	1.01
1988	220.50	4.18	148.00	1.55	131.08	1.02	117.42	0.90
1989	233.49	5.72	150.03	1.36	132.03	0.72	118.09	0.57
1990	222.88	-4.65	150.93	0.60	131.95	-0.06	117.57	-0.44
1991	213.13	-4.47	151.99	0.70	130.88	-0.82	116.60	-0.83
1992	220.56	3.43	152.10	0.07	131.70	0.63	115.44	-1.00
1993	221.64	0.49	152.05	-0.04	131.76	0.05	115.44	0.00

Objective 6: Use the economic indicator system for measuring and forecasting the turning points (peaks and trough, or high and low) of the industry cycles.

The composite indices are used for measuring and forecasting the turning points of the industry cycles. The performance of the system for the hotel industry is presented in the Figures 8, 9, 10 and table 18. As it shown in table 18, the leading economic indicator system performed very well. The leading indicator system leads the peaks of the HGC by one year throughout the whole cycle. The coincident economic indicator system coincides the peaks and troughs of the HGC almost perfectly. The turning points of the lagging indicator system lagged those of HGC by one or two years.

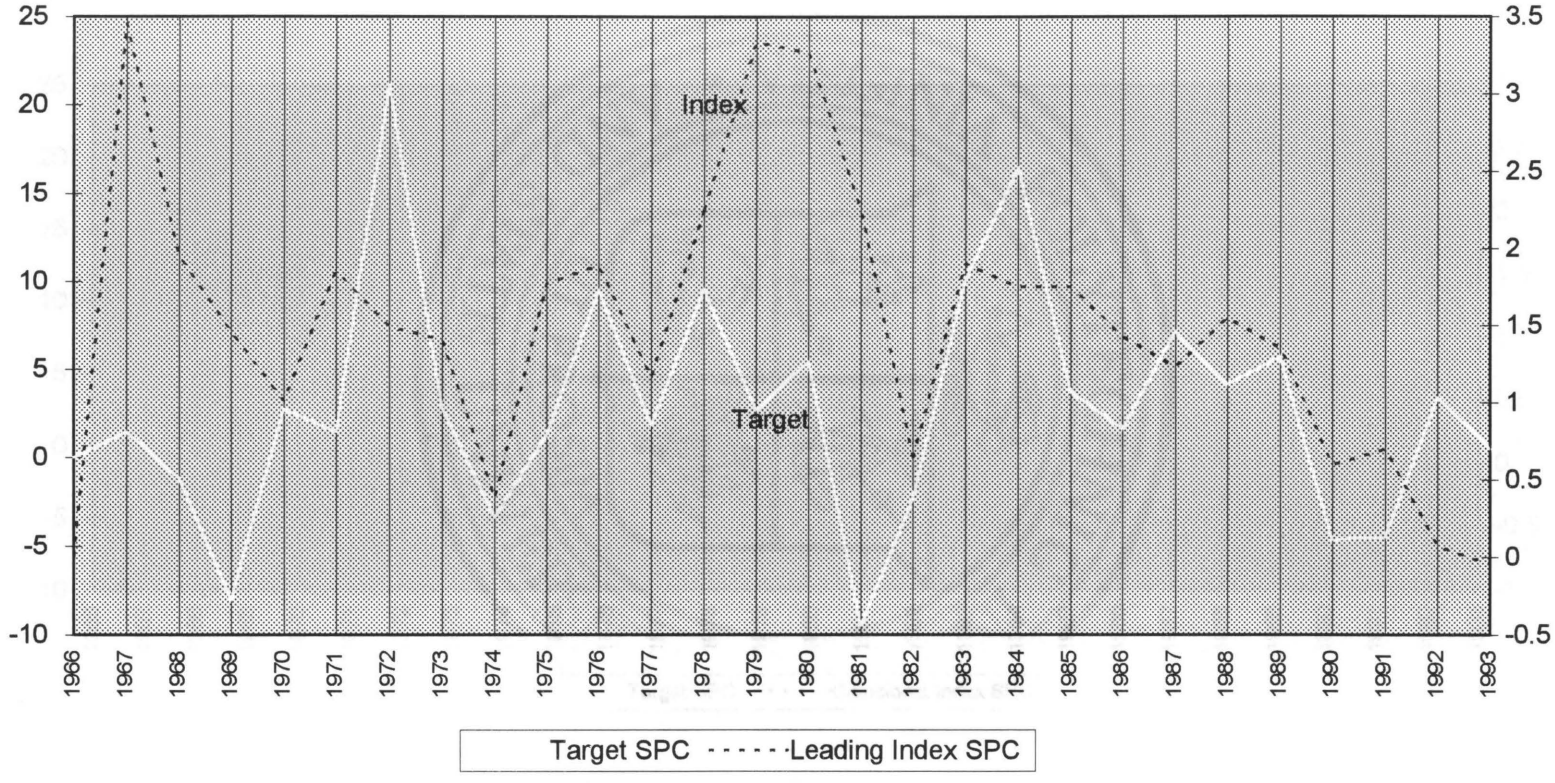

Figure 8. Performance of Leading Composite Index

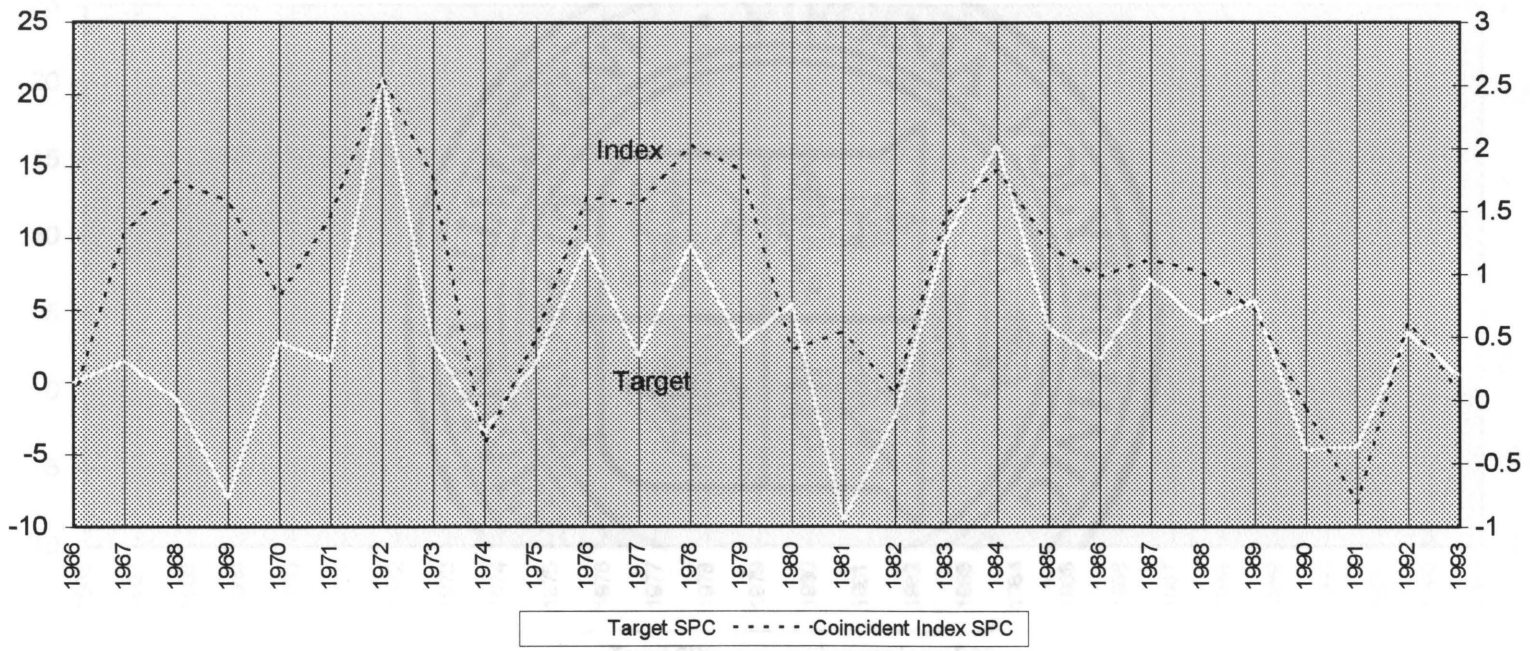

Figure 9. Performance of Coincident Composite Index

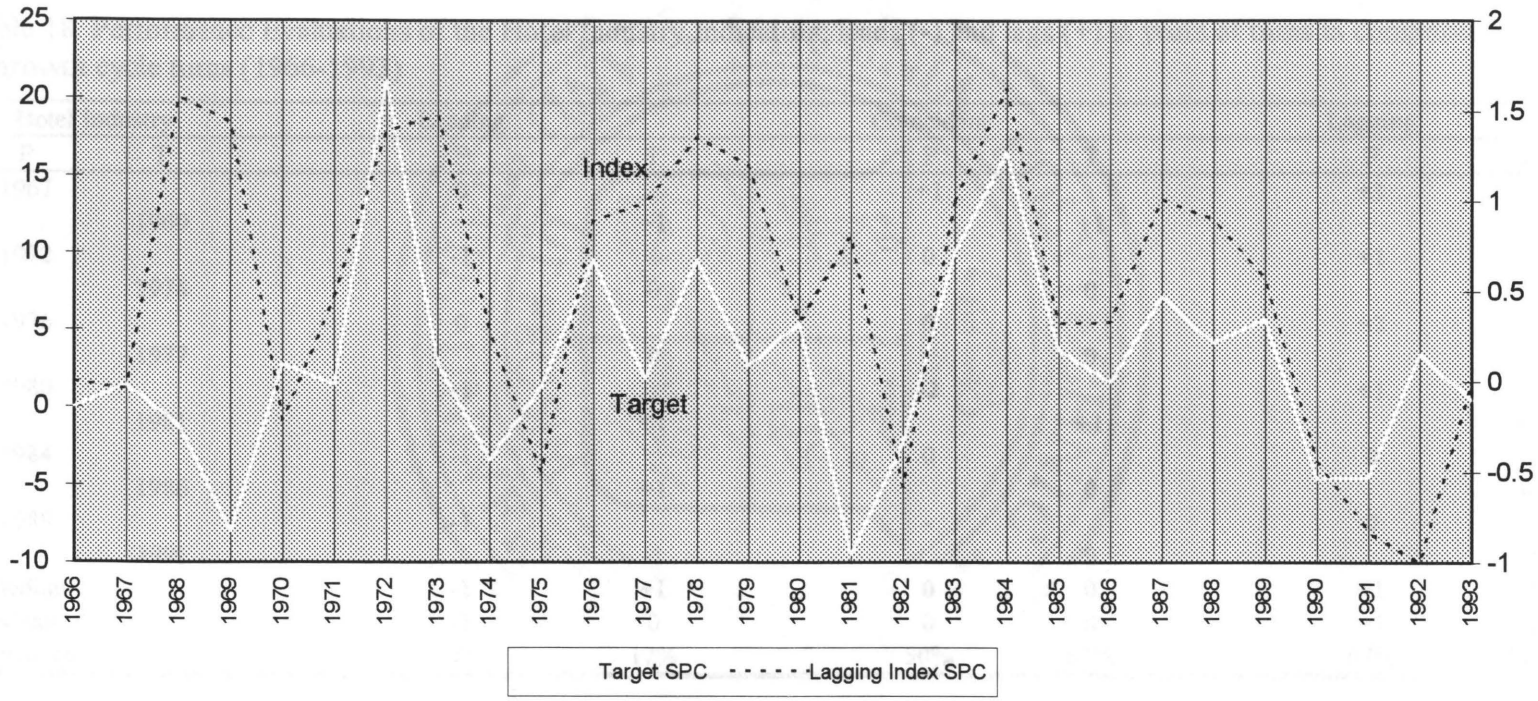

Figure 10. Performance of Lagging Composite Index

Table 18. Performance Evaluations of the Hotel Industry Indicators: leads (-) and lags (+) in years of turns in composite indices at growth cycle turns (1966-1993)

Hotel Industry		Leading		Coincident		Lagging	
P	T	P	T	P	T	P	T
1967		0		+1		+1	
	1969		+1		+1		+1
1972		-1		0		+1	
	1974		0		0		+1
1976		0		0		+2	
	1977		0		0		+3
1980		-1		-2		+1	
	1981		+1		+1		+1
1984		-1		0		0	
	1986		+1		0		0
1989		-1		-		0	
	1991		-1		0		+1
Median		-1	+1	0	0	+1	+1
Mean		-1	0	0	0	+1	+1
Accuracy		67%	17%	50%	67%	67%	83%

Chapter Summary

This chapter presented the results from a developing economic indicator system for the hotel industry. The results are the answers for the six sub objectives of this study. First of all, the hotel industry cycle was constructed by measuring and dating the peaks and troughs of the cycle. Second, the hotel industry growth cycle representing the rate of growth changes was developed by standardizing the changes and measuring and dating the cycles. The brief historical backgrounds for the cycles were also illustrated. Third, the 70 potential statistical indicators for the hotel industry were reported in this study. The selection was based on the comprehensive literature reviews and applicability for the hotel industry. Fourth, the potential seventy statistical indicators were classified into leading, coincident, and lagging indicator groups through conducting cross-correlation analysis and more importantly through evaluating data series and actual charts for every single indicator one by one. The classified indicators were reported in this chapter. Fifth, the indicator groups were then compiled into composite indices by statistical and mathematical analysis. The complete lists of composite indices for the leading, coincident, and lagging indicators were reported in this chapter. Finally, the performances of the composite indices for the leading , coincident, and lagging indicators were measured in order to test the possibility of using the indicator system for future industry forecasting. The results were reported in this chapter. The next chapter discussed all of these results and a synthesis thereof.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Introduction

In the previous chapter, the results of all the analysis performed on six objectives of this study were reported. In this chapter those results are discussed with reference to the major proposition of this study and the associated objectives that were set up in the earlier chapter. The limitations of this study and some of the insights gained while conducting the analysis will be presented. After suggesting future research, this chapter will summarize all of the results and discussions achieved in this study.

Research Proposition Revisited

In order to discuss the results of this study effectively, it is necessary to revisit the proposition developed in the chapter. The proposition is as follows:

> The cyclical fluctuations of the growth of the hotel industry can be projected by measuring and analyzing a series of economic indicators. Each economic indicator will have specific characteristics in terms of time lags, and thus can be classified into leading, coincident, and lagging indicators. Since no single indicator is perfect for explaining the time lag relationships with the industry cycles, the compilation of groups of indicators into composite indicators will be necessary. The composite indices can be used for forecasting the future turning points (peaks and troughs) in the industry cycle. The turning points of leading composite index series will lead the turning points of actual industry growth series by a certain time lag. The turning points of the coincident composite index

series will coincide with the turning points of the actual industry growth. Finally, the turning points of the lagging composite index will lag the turning points of actual industry growth by certain time differences.

Once the time differences of the three indices are defined, the each index can serve as a forecasting and examining tools for the industry growth. As the definition and rationales of the indicators discussed in the previous section, leading indicators are mainly the series which are concerned with business decisions to expand or to curtail output. Time is required to work out their effects, and so they tend to move ahead of turns in industry cycles. Leading indicators signal in advance a change in the basic performance of the industry as a whole. This tells us future industry turning points in advance, which is the main interest of this study and practitioners in this industry. Early warning signals provided by leading indicators aid in forecasting short-term trends in the coincident series. Coincident indicators are those whose movements coincide with, and provide a measure of, the current performance of industry activity. Hence, they inform us whether the economy is currently experiencing a slowdown, a boom, or whatever. Movements of lagging indicators usually follow, rather than lead, those of the coincident indicators.

In order to test the indicator system as a useful forecasting technique for the hotel industry, this study will evaluate the performances

of the composite indices of the leading, coincident, and lagging indicator groups by comparing with the hotel industry cycle in terms of turning points for the past twenty-eight years (the longest history of data available in this study). It will be accomplished by analyzing and comparing the statistical outputs (i.e. dates of peaks and troughs, and cycle duration) between the series of composite indices and the series of hotel growth cycle. If the leading composite index leads the target cycle for many years (at least a year) consistently, it will be a good forecasting system because it signals the changes of the industry's future in advance. The coincident composite index also will give good information regarding current industry's situation if the turning point of the index coincides with the turning points of the target cycle. The lagging index will confirm all of the above transactions

In the context of this proposition, this study has yielded the following results for the six sub objectives developed in previous chapter.

I. Hotel Industry Cycle

First of all, the hotel industry cycle was constructed by measuring and dating the peaks and troughs of the cycle. The hotel industry peaked in 1967, 1973, 1980, and 1989. The industry troughed in 1969, 1974, 1982, and 1991. The historical backgrounds of the each cycle are discussed below.

I-1. Historical Backgrounds

In the late 1960's budget motels were introduced and flourished during the building boom of the early 1970s. As budget motels began to inundate the market in the 1970s, the entire lodging industry experienced the start of a construction boom reminiscent of the 1920s (Rushmore,1992). Rushmore explained the situations of the 1970 hotel boom as follows: "The combination of readily available financing and aggressive hotel chains eager to sell franchises resulted in overbuilding and the development of poorly located, undercapitalized hostels managed by inexperienced owners. The bubble burst on the lodging industry when inflation caused construction costs and interest rates to escalate; the 1973 energy crisis drastically reduced travel, and the accompanying recession curtailed business trips, conference, and conventions."

The end of the 1970's and the early stage of 1980's was a period of relative calm for the hotel industry. After the decline in 1980, 1981, and 1982, the environment appeared suitable for a period of renewed hotel expansion. Rushmore explained: "The Federal Reserve tightened the money supply in the 1980s, sending the prime interest rate up to record levels. Most of the projects that were in the preliminary planning stages but lacked sensible financing were put on hold. Eventually, monetary and fiscal policies, along with declining energy prices, were successful at reducing the national rate of inflation. This produced a downtrend in hotel interest rates beginning in 1983 and suddenly massive amounts of capital were available for real estate investments."

From 1989 to 1991, another trough of the cycle occurred, the hotel industry could not keep up with the change of inflation. Smith (1992) said that the between 1987 and

1990, room rate increases failed to keep pace with inflation. In 1990 alone, the Consumer Price Index rose 6.1 per cent while room rates rose a mere 2.9 percent. For this or other reasons, the hotel industry experienced a deep trough after a seven-year expansion.

I-2. Implications for the Future

According to the results of this study, the mean duration of the hotel industry cycles is 7.3 years, calculated either by peak to peak or trough to trough. What are the implications for the future? One application of the indicator system is the ability to answer such question as: "what is the outlook for the hotel industry if it follows its past historical cyclical pattern?" According to the analysis in this study, the result of this study means the next peak would be 1996 or 1997 unless there are big changes in its trends. The mean expansion figure also implies that the next peak would be also 1996 or 1997. An interesting finding is that the hotel industry declined sharply once it reached its peaks. In general, the mean duration for the contraction was about two years.

II. The Hotel Industry Growth Cycle

The hotel industry growth cycle representing the rate of growth changes was developed by standardizing the changes and measuring and dating the cycles. The results show that the hotel industry experienced high growth (boom) every four or five years. The average expansion (L-H) period is about three years and average contraction (H-L) period is about two years. The growth cycle is a short-term fluctuation in aggregate

performances of the hotel industry. Note that the mean duration of the hotel industry cycles (long-term fluctuation) is 7.3 years, calculated either by peak to peak or trough to trough, and the mean duration of the hotel industry growth cycle is 4.4 years. This implies the growth cycle fluctuates about twice while the industry cycle fluctuate once. In fact, industry can experience the peak, although the growth rate for the particular year has not increased significantly, if the growth rate has increased consistently no matter how much it is. In the same token, industry cannot experience the peak, although it experience high growth for the particular year, if the growth rate of next year is higher or equal to that of this year. This makes the difference of the cycle duration between the industry cycle and industry growth cycle. Then, what are the patterns of the cycle? Of course, hotel industry has experienced irregular fluctuation. However, there are some important trends as it presented in table 11 and 13. The growth cycle fluctuates about twice while the industry cycle fluctuate once. Unless there are big changes in its trends, it is possible to say that industry reach to the peak point as well as the beginning of the recession after the industry experience the peak growths twice.

III. Indicators for the Hotel Industry

The seventy potential statistical indicators for the hotel industry were reported in this study. The selection was based on the comprehensive literature reviews and applicability for the hotel industry. The potential 70 statistical indicators were classified into leading, coincident, and lagging indicator groups through conducting cross-

correlation analysis and more importantly through evaluating data series and actual charts for every single indicator. The classified indicator groups were then compiled into composite indices.

IV. Composite Indices

The performances of the composite indices for the leading , coincident, and lagging indicators were measured in order to test the possibility of using the indicator system for future industry forecasting. The leading economic indicator system performed very well. The leading indicator system led the peaks of the hotel growth cycle by one year throughout the whole cycle with 67 per cent accuracy. The system, however, led only one out of six troughs in the cycle. The coincident economic indicator system coincided with the peaks and troughs of the hotel growth cycle with 50 and 67 per cent accuracy. The lagging indicator system also performed well. It's peaks and troughs lagged those of hotel growth cycle by one or two years with 67 and 83 per cent accuracy.

V. Indicator System

As it has been shown, all of the results of this study support the proposition developed for this study. Particularly, the performances of the indicator system for the hotel industry have demonstrated that the system has great potential as a forecasting method. It is concluded that the indicator system composed of composite indices of

leading, coincident, and lagging indicators is valuable as a forecasting tool, though not foolproof. The proposition of this study was empirically supported.

Limitation

The true test of a forecasting system is in how well it predicts the future. This same claim also might be made about statistical models and techniques. The techniques used in this study suggests ways to understand the workings of the economic cycles for the hotel industry. But alas, even with perfect knowledge of past cyclical patterns and the reasons for their occurrence, there can be no guarantee of an accurate forecast - no matter which technique is used (Nimera and Klein, 1994). The biggest disadvantage of the indicator technique as a forecasting tool is that cyclical fluctuations can be extremely sensitive to "random" or short-lived changes in economic movement. Moreover, the appearance of extra cycles in the leading indicator can mislead the users about the likelihood of a recession or recovery.

The practical and fundamental limitation of this study is data availability. Ideally, monthly or quarterly data for certain time periods are required to improve the accuracy of the analysis. Unfortunately, data on a monthly basis for key economic variables (to permit a comprehensive study of the economic fluctuations in the hotel industry) are very limited as far as the hotel industry is concerned. Short-term data on the hotel industry are either not available or, where they are available, did not begin until quite recently. No detailed data on output are available for the hotel industry on less than an annual basis. Caution

needs to be exercised in assessing the suitability for economic indicator analysis of series available for only a relatively short period. This is because their performance as a leading, coincident, or lagging indicator may vary from one cycle to another.

Development of HIC by using multiple statistical indicators such as hotel employment and hotel profits may be ideal to cover the hotel activity as broadly as possible. This is because a single statistical indicator can not represent the industry activities as a whole. By compiling the multiple data series, the miscaptured turning points of the industry by a single indicator can be revealed, thus the accuracy of the system can be improved. Unfortunately, those data series are not available in this study, thus this study used the data series of hotel total receipts to represent the total output of the hotel industry. A future study can construct the hotel industry cycle by compiling many possible data series.

Another limitation of the indicator system is that the indicators are selected mainly in accordance with their historical performance. It is not clear if there are any causal relationships between indicators and hotel industry activities, although there may be some logical basis as to why a series tends to lead or to lag. These relationships, therefore, cannot be considered as stable ones. Their timing patterns will change with changes in the structure of the economy, in consumers' preferences, in managerial decision procedures, and in the reactions of business and government to changing business conditions. Because of these limitations, the indicators must be used together with other data and with full

awareness of the background of business and consumer confidence and expectations, governmental policies, and international events.

Contribution of This Study

This research should be beneficial in terms of contribution to both the hotel industry and the academic community. Benefits to the hotel industry will be gained from a better understanding the characteristics of the cyclical fluctuations of the industry activity analyzed by the economic indicator system. The economic indicator system for the hotel industry includes dated U.S. hotel industry cycles and growth cycles, clearly identified and classified economic indicators for the industry, scientifically formed composite indices for the leading, coincident, and lagging indicators of the industry, and forecasting techniques using the economic indicator system. All of the above procedures and methods will allow for a better understanding of the industry phenomena in terms of the turning points (peaks and trough, or high and low) of the industry cycles.

The results of this study will allow the financial managers or other hotel managers to have the scope of advantages that were discussed in the early stage of the problem statement. It will also improve the managers' insight into the industry turning points.

The academic community, specifically disciplines of study focusing on hospitality and tourism, can benefit from research that attempts to quantify time relationships between various economic indicators and the hotel industry that have never been addressed in the past.

Agenda for Future Study

Future research possibilities, directly related to this study, would include development of the hotel industry cycle by using multiple statistical indicators such as hotel employment, hotel profits, etc. The future study can construct the hotel industry cycle by compiling many possible data series. By compiling the multiple data series, miscaptured turning points of the industry by a single indicator can be revealed, thus the accuracy of the system can be improved.

Another area of research that needs to be explored is tracking the performance of individual indicators continuously. By conducting the research the answer for which indicators (especially leading indicators) are really good indicators for the hotel industry can be given. Of course, the good leading indicators are those that lead the turning points of the hotel industry cycle with many time lags. Once the good indicators are defined and selected, the indicator system should improve its accuracy of forecasting and usefulness.

Some areas of interest that have risen as a result of this study would include developing a statistical indicator system for specific interest groups such as individual firms, regions, states, and countries. As stated through this study the indicator system is not universal. Different individuals or organizations will have a different system that can fit for their own structures, just like different industries have different indicator systems.

Another possible area that can be explored is analyzing the relationships among indicator groups. Possibly, there could be some causal relationships among leading,

coincident, and lagging indicators. If the future study can find some causal relationships among them the results could contribute to the hotel industry's research.

Concluding Remarks

Successful forecasting requires expert blending of economic theory, significant statistical expertise, and thorough familiarity with the relevant statistical data. It should utilize both quantitative and qualitative information. The users must have the ability to distinguish between new facts that are important and those that are not. They must be competent to judge under what conditions past relationships can be relied upon and when they cannot. They must be able to appreciate the effects of nonmeasurable socioeconomic and political forces upon business activities. In other words, forecasting is, and, probably will remain, more an art than a science.

Clearly, indicators provide a sensitive and revealing picture of the ebb and flow of industry tides that a skillful analyst of the industry can use to improve his or her chances of making a valid forecast of short-run industry trends. If the analyst is aware of the limitations discussed above, and alert to the world around, the analyst will find the indicators useful guideposts for taking every possible advantage of the system.

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