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*Translating Research Implications to applications: Industry's commentary*

## **Macroeconomic Variables and Hotel Performance: Good and Bad News**

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## Macroeconomic Variables and Hotel Performance: Good and Bad News

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## **Abstract**

**Purpose:** This study analyzes the relationship between select macroeconomic variables typically examined by hotel managers or investors and hotel market performance indicators (HMPIs). Time-series data (1950 to 2009) were analyzed, based on the coefficient of correlation, to identify key macroeconomic determinants of HMPIs and their relationship patterns over time.

**Originality/value:** Hotel performance studies with macroeconomic factors and other external variables have focused on management performance at the company level. Very little previous research has focused on the impact of macro economic variables on market aggregates and industry sectors such as the hotel industry. These studies did not provide statistical evidences for relationships between GDP and three performance indicators. The present research study provides a evidence of the magnitude and timing of this relationship and as such has improved our understanding of the dynamics of hotel industry performance.

**Relevance of the topic:** Investors and managers operating hospitality business enterprises closely watch macroeconomic indicators when making important strategic management decisions related to growth, expansion, development, acquisition and other decisions which put capital and resources at risk. The results of the study will be beneficial to hotel investors, market analysts and senior executives with hotel firms who regularly extrapolate hotel market performance by studying macroeconomic drivers.

**Design/methodology/approach:** The hotel indicators were obtained from PKF Hotel Industry performance statistics database represented annual data between 1950 and 2009. The macroeconomic determinants chosen for the research included The Gross Domestic Product (GDP), Unemployment Rate, and Consumer Price Index (CPI). For comparisons, all hotel and economic data were measured as a percentage annual variation. Cross-correlation analysis was employed to establish the relationships between HMPIs and economic determinants over time series.

**Key findings:** Results of correlation analysis indicate that the macroeconomic variables, Gross Domestic Product (GDP), Unemployment, and Consumer Price Index (CPI) were influential macroeconomic determinants affecting HMPIs during the 1950 to 2009 period studied. In general, these macroeconomic links with HMPIs became stronger with shorter time lags in the

past four decades. Since the lags in macroeconomic variables that are associated with HMPIs have grown shorter, managers must be more aware of the macroeconomic environment and become increasingly vigilant in their analysis of how macro changes impact their operations.

**Implications for practice and policy:** These results are both good news and bad news for Hotel managers. The good news is that macroeconomic data is a stronger predictor of hotel performance than in the past. Thus managers can more easily identify predictors of hotel performance. The bad news is that when macroeconomic conditions change, managers who are watching macroeconomic variables will have less time to alter their operating activities based upon these predictors. Investors may find the quicker response of the industry to macroeconomic changes makes it more difficult to identify good investments, since firm performance responds more quickly to changes in the macroeconomy.

**Key Words:** macroeconomic variables, hotel market performance indicators, time-series data , cross-correlation

## Introduction

The influence of factors in the environment of industries and firms on its performance has a long history of investigation in the strategic management literature (Miles and Snow, 1978; Dev, 1989; Olson, West and Tse, 2008). Industries and organizations function in two types of environments: the general and task environment. While the former impacts all businesses as a whole, the latter is particular (specific) to a subset of industries and firms. An important part of the general environment includes the macro economy and related indicators such as measures of economic output (Gross Domestic Product), measures of purchasing power (Unemployment Rate), measures of inflation (Consumer Price Index), in addition to other indicators such as monetary policy and savings rates. In aggregate these indicators provide a picture of the general health of the economy. One may safely assume that investors and managers operating business enterprises (including hospitality) closely watch these macroeconomic indicators when making important strategic management decisions related to growth, expansion, development, acquisition and other decisions which put capital and resources at risk.

The purpose of the study is to identify leading macroeconomic variables underlying hotel market performance and understand the influence of these variables on hotel market performance over different time periods from 1950 to 2009. The results of the study will be beneficial to hotel investors, market analysts and senior executives with hotel firms who regularly extrapolate hotel market performance by studying macroeconomic drivers.

## Theoretical Background

### *Hotel market performance and macroeconomic variables*

Hotel performance has been the important research area since 1990s (Okumus, 2002). Performance determinants have been a main stream research in this area (Sainaghi, 2010). Two sides of determinants have been focused upon: internal and external factors. Internal factors by controlled by management have been largely employed to hotel performance determinants (Sainaghi, 2010). External factors at the macro environment level, not controlled by management, have been relatively less concentrated by hotel researchers (Sainaghi, 2010). Research variables used as external factors include macroeconomic factors (Barros and Naka, 1994; Chen et al., 2005; Chen M. H., 2007; Chiang and Kee, 2009; Gallagher and Mansour, 2000; Tang and Jang, 2009; Wheaton and Rossoff, 1998), competitive market structure (Lee and Jang, 2007; Matovic, 2002; Pan, 2005; Tung, Lin, and Wang, 2010), tourism destination (Baggio and Sainaghi, 2011;

Reichel and Haber, 2005), tourism demand (Chen, 2006; Gallagher and Mansour, 2000), and real estate factors (Corgel, 2005; Chou, Hsu and Chen, 2008; DeRoos, Liu, Quan, and Ukhov, 2014; Johnson and Vanetti, 2005; Kim, Mattila, and Gu, 2002; Tang and Jang, 2008; Urtasun and Gutiérrez, 2006). Among used external factors, macroeconomic variables have been demonstrated to have a significant relationship with hotel performance. The empirical studies provided evidence of a positive relationship between performance and gross domestic product (Chen, 2010; Choi, 2003; Tang and Jang, 2009; Schubert, Brida, and Risso, 2011; Song, Lin, Witt, and Zhang, 2011; Wheaton and Rossoff, 1998), per capita income (Gallagher and Mansour, 2000; Urtasun and Gutiérrez, 2006), and volume of trade and services (Gallagher and Mansour, 2000). A negative relationship was found with Unemployment rate (Chen et al., 2005; Choi, 2003; Gallagher and Mansour, 2000), crisis events (Chen, 2011; Wang, 2009), and monetary policy (Chen, Liao, and Huang, 2009).

However, these performance studies with macroeconomic factors and other external variables have focused on management performance at the company level. Very little specific research has focused on the impact of macro economic variables on market aggregates and industry sectors such as the hotel industry. Wheaton and Rossoff (1998) analyzed the behavior of the U.S. Lodging Industry cycles from 1969 to 1995 concluding that a strong relationship exists between GDP and rooms sold. In a recent study (Woodworth and Mandelbaum, 2010) reviewed hotel revenues, Expenses, and Profit for the hotel industry from the 1930s to 2009 and documented various events during each decade to explain the cyclical performance of the hotel industry. Their study analyzed compound annual rates of change (growth change) in each decade. They did not provide statistical evidences for relationships between GDP and three performance indicators. The present research study is an extension of this work to examine the relationships between the hotel market performance indicators (HMPIs) and the macro economic variables.

Other research in the hospitality literature has focused on the importance of hotel market performance measures. Several researchers emphasize the importance of RevPAR as a financial performance indicator. RevPAR or revenue per available room is used as a measure of the competitiveness of a hotel investment (Newell and Seabrook, 2005). The concept is particularly important for market performance analysis, since it combines changes in occupancy and average daily rates (ADR). REVPAR captures the interaction of ADR and occupancy at different phases of the hotels life cycle and market economic cycles. Gallagher and Mansour (2000) use RevPAR

as an indicator of financial performance and they argue that this is reasonable because it is used widely by industry analysts.

### **Macroeconomic and Hotel Industry Performance Data**

Identification of relationship patterns for hotel market performance and key macroeconomic variables consists of three principal steps: the collection of hotel market performance data, the selection of key macroeconomic determinants, and the analysis of the variation in hotel market performance indicators with the selected macroeconomic variables.

The hotel market performance indicators (HMPIs) included ADR, Revenue per room (REVPAR), Expenses per available room, and Profit per available room. The hotel indicators were obtained from PKF trend represented annual data between 1950 and 2009. PKF Hospitality Research has a proprietary Trends in the Hotel Industry performance statistics database and the authors were provided access to this dataset for academic research.

The macroeconomic determinants chosen for the research included The Gross Domestic Product (GDP), Unemployment Rate, and Consumer Price Index (CPI). These data were analyzed using publically available government database from the Bureau of Economic Analysis ([www.bea.gov](http://www.bea.gov)) and Bureau of Labor Statistics ([www.bls.gov](http://www.bls.gov)) respectively. For comparisons, all hotel and economic data were measured as a percentage annual variation.

Cross-correlation analysis was employed to establish the relationships between HMPIs and economic determinants over time series. Unlike simple correlation, cross-correlation is lagged correlation between two time series shifted in time relative to one another (Campbell, Lo, & MacKinlay, 1996). Thus, cross-correlation is adequate to characterize relationship patterns over time at the macro level. However very few hotel performance studies have used cross-correlation to examine relationships between macro-economic variables and hotel market performance at the industry level. HMPIs data was prepared to lag the economic determinants in one-year intervals for three years. The coefficient of correlation was used as a measure the strength of relationship between key determinants and hotel performance indicators. While correlation does not prove a causal relationship it is reasonable to assume that the overall economy drives the hotel industry rather than the hotel industry driving the macroeconomy.

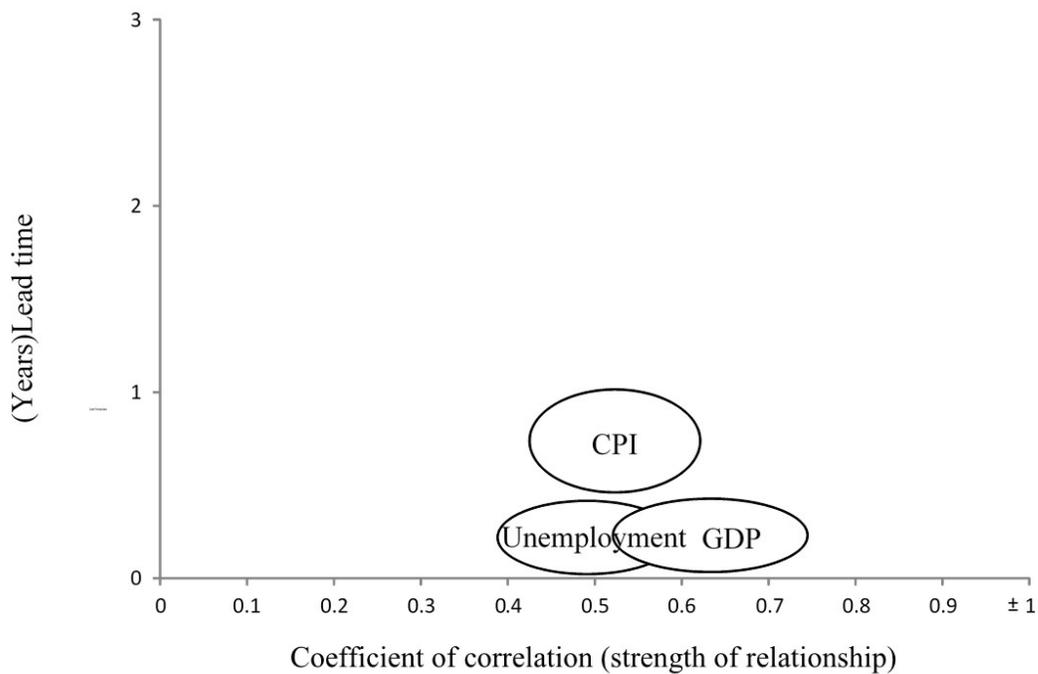
**Analysis of Results**

*Determining macroeconomic variables for hotel market performance*

Figure 1 illustrates the timing and strength of relationships demonstrated by key economic variables and the U.S. hotel market performance indicators (HMPIs). Figure 1 shows that GDP and Unemployment indicate the most significant relationship with hotel market performance at a zero-year time lag. The strength of the relationship between HMPIs and CPI also appears as a significant relationship at a zero-year time lag or one-year time lag.

**Figure 1**

U.S. hotel performance indicators (1950-2009) versus key macroeconomic determinants



*Pattern analysis*

The data were analyzed for each 10-year time series within the 60-year time period from 1950 to 2009. Thus a series of data was analyzed for the time series between 1950-1959, 1960-1969, 1970-1979, 1980-1989, 1990-1999, and 2000-2009. The relationship between separate macroeconomic variables and HMPIs is shown in Figure 2, Figure 3, and Figure 4. In each figure, the table details the lead times at which HMPIs were most closely associated with the economic

variables and the correlation coefficients for the most significant lead time period. The tables below each graph in figures 2-4 show the most significant correlations in each period.

Figure 2 shows most HMPIs have stronger relationships with GDP by increasing correlation coefficients over time series. In earlier time series (1950s through 1960s), there were no significant relationships between HMPIs and GDP. Since the 1970s, most HMPIs conversely has been shown to have significant correlations with GDP at only zero-year time lag.

**Figure 2**  
Pattern analysis – correlations between HMPIs and GDP

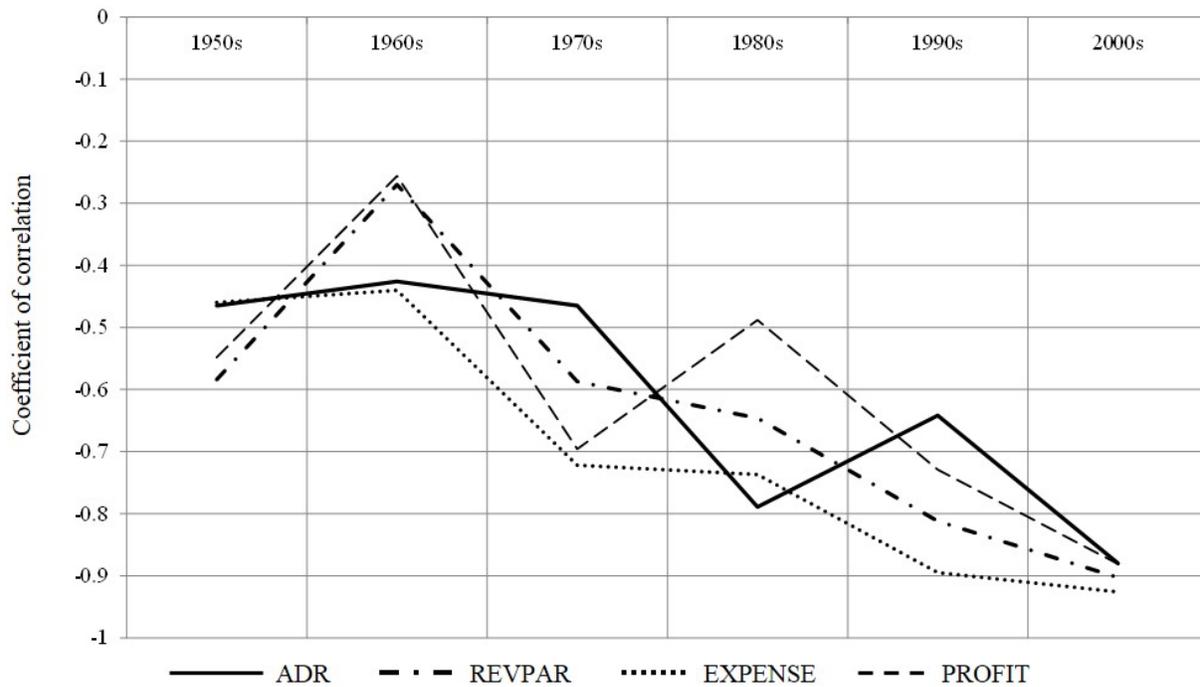


	1950s	1960s	1970s	1980s	1990s	2000s
ADR	.574 (3)	.598 (0)	.557 (1)	.637* (0)	.776* (0)	.852* (0)
REVPAR	.509 (3)	.433 (0)	.706* (0)	.759* (0)	.738* (0)	.861* (0)
Expense	.471 (0)	.478 (0)	.792* (0)	.846* (0)	.803* (0)	.915* (0)
Profit	.383 (0)	.629 (0)	.752* (0)	.803* (0)	.727* (0)	.820* (0)

\*significant at  $p < .05$ ; numbers in parenthesis indicate lead time year(s)

In each time series in Figure 3, there are negative relationships between Unemployment and all HMPIs. Most HMPIs have been demonstrated to have a significant increase in correlations with Unemployment even if slight decreases are shown during certain periods. In terms of timing, Unemployment’s relationships with HMPIs are shown to be significant at a zero-year time or a one-year time lag.

**Figure 3**  
Pattern analysis – correlations between HMPIs and Unemployment

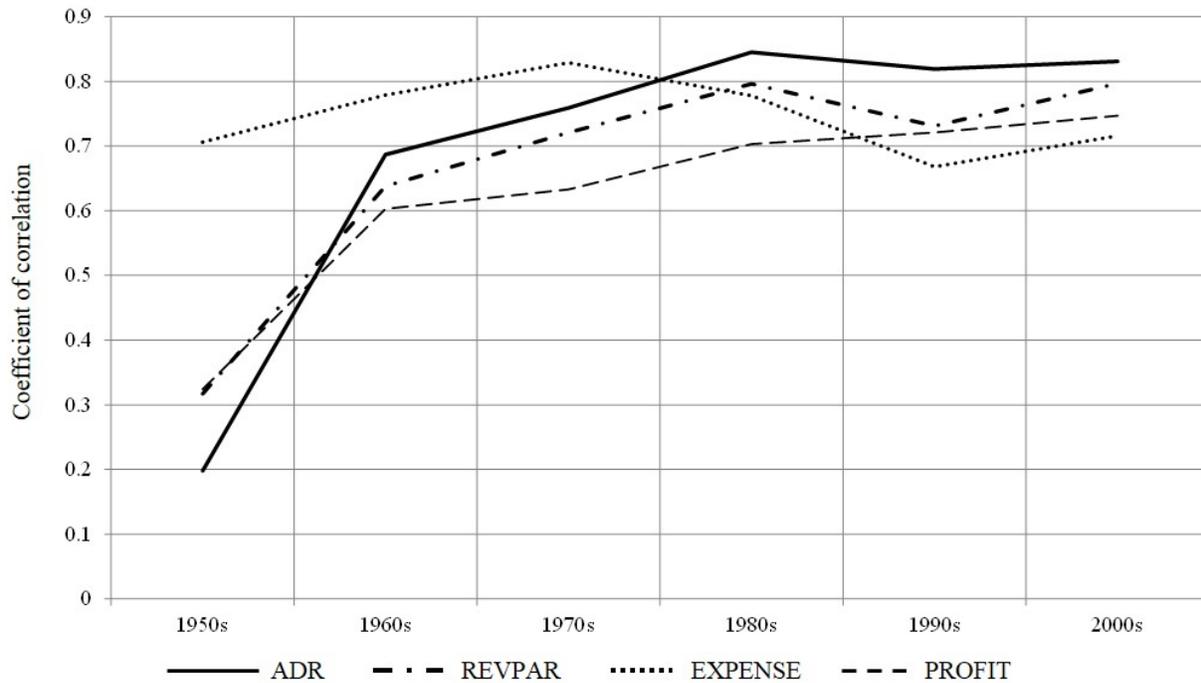


	1950s	1960s	1970s	1980s	1990s	2000s
ADR	-0.465 (0)	-0.426 (0)	-0.465 (1)	-0.789* (1)	-0.642* (0)	-0.880* (1)
REVPAR	-0.584 (0)	-0.270 (0)	-0.587 (0)	-0.646* (1)	-0.812* (0)	-0.903* (0)
Expense	-0.460 (0)	-0.440 (0)	-0.722* (0)	-0.737* (1)	-0.895* (0)	-0.926* (0)
Profit	-0.548 (0)	-0.256 (0)	-0.696* (0)	-0.488 (0)	-0.729* (1)	-0.881* (0)

\*significant at  $p < .05$ ; numbers in parenthesis indicate lead time year(s)

Figure 4 shows the relationship of CPI with hotel indicators. It is most significant in Expense, where the relationship appears in every time series. Change in coefficient of correlation appears to have remained stable in Expense. The ADR, REVPAR, and Profit data demonstrate a progressive increase in CPI over time series. Unlike GDP and Unemployment, CPI shows a change in relationship, which significantly appears to be lagged at from the long term (3 years) to the short term (0 year).

**Figure 4**  
Pattern analysis – correlations between HMPIs and CPI



	1950s	1960s	1970s	1980s	1990s	2000s
ADR	.198 (3)	.687* (1)	.759* (0)	.845* (0)	.819* (0)	.831* (0)
REVPAR	.317 (3)	.638* (2)	.721* (2)	.796* (1)	.731* (0)	.797* (0)
Expense	.706*(3)	.779* (1)	.829* (0)	.778* (0)	.668* (0)	.716* (0)
Profit	.324 (3)	.603 (2)	.633* (1)	.703* (1)	.721* (0)	.747* (0)

\*significant at  $p < .05$ ; numbers in parenthesis indicate lead time year(s)

The relationships strengthen through time, although there are some minor exceptions to this trend. GDP and Unemployment have significant relationships with HMPIs at a zero lead time (no time lag effect). CPI was different in that lead times moved from the long-term to the short-term with relation to HMPIs.

### Discussions and Implications<sup>1</sup>

Results of the study conclusively demonstrate a strong relationship between the key indicators of hotel performance and GDP from the 1970s to the 2000s. This relationship has progressively strengthened in the past four decades. Due to the stability and strength of this relationship over a long period of time and zero time lag, forecasters and market analysts may

<sup>1</sup> This study examines correlations between macro-economic indicators and HMPIs. As such, the results of this study are a starting point for further thought, discussion and statistical analysis. Correlations indicate possibilities for relationships. These correlations do not predict hotel sector performance help identify indicators that are likely to be useful for researchers and managers to follow. Therefore the results presented provide an interesting pattern, and story that has not been verified by rigorous causality arguments and testing.

safely use changes in GDP when estimating changes in hotel performance indicators, in particular Expenses.

A similar but negative correlation pattern exists between Unemployment and HMPIs. A decrease in Unemployment has a particularly strong influence in determining changes in REVPAR and Expenses. As with GDP, the close alignment has been relatively strong and consistent over the past four decades. However, in the 1980s the relationship between Unemployment and Profit was not statistically significant and relatively weak. This could be partly explained by a large influx of hotel rooms due to regulatory changes which resulted in many hotels being constructed for non-economic reasons. The primary regulatory change in the 1980s relate to the passage of the Depository Institutions Deregulation and Monetary Control Act (DIDMCA, 1980) and the Garn-St Germain Act of 1982. These acts expanded the deposit taking and asset-investment powers of Savings & Loan Institution. The net result was an oversupply of capital for hotel development. As a result, Expenses increased and Profit decreased. This period may be viewed as an anomaly in an otherwise consistently aligned relationship of Profit, Expenses, and Unemployment.

Finally, the relationship between CPI and hotel performance supports the long held view of hotel investments being an inflation hedge. However the characteristics of this relationship are different for each of the indicators. For the past four decades ADR and CPI have been closely aligned indicating in general the ability of hotels to adjust rates with inflation with 0 time lag. However, in the earlier decade of 1960s this came with a one year time lag and in the 1950s the relationship was very weak and not significant. Hotel Expenses and CPI have been closely aligned with CPI for the past 4 decades, with strong positive correlations indicating a growth in Expenses commensurate with rising prices. However, in the 1950s, while the correlation was strong, positive, and significant, it came with a 3-year lag meaning hotel Expenses were adjusted slower than the national inflation index. The 1960s displayed a similar phenomenon but with a narrower lag of 1 year of hotel Expenses adjusting to the CPI. The explanation for this lagged relationship between CPI growth and hotel Expense growth is unclear but could either be attributed to hotels controlling their Expense growth and/or the industry transitioning to a growing supply of smaller motels and budget hotels in the 1950s and 1960s.

While in general practitioners expected to see a relationship between macroeconomic variables and hotel performance indicators this study provides evidence of the magnitude and

timing of this relationship and as such has improved our understanding of the dynamics of hotel industry performance. These results are both good and bad news for hotel managers. The good news is that macroeconomic data are stronger predictors of hotel performance than in the past. The rise in the importance of U.S. macro-economic factors to HMPIs may be that from the 1950s onward the national economy has become increasingly more unified. That is, increased mobility of assets, increased communication and the internet have led to an internal U.S. economy with few barriers so that macroeconomic changes impact not just some hotel assets but all hotel assets simultaneously. Thus, managers can more easily identify predictors of hotel performance. The bad news is that when macroeconomic conditions change managers who are watching macroeconomic variables will have less time to alter their operating activities based upon these predictors. They must be more aware of the macroeconomic environment and more vigilant in their analysis of how macro changes impact their operations. Finally, investors may find the quicker response of the industry to macroeconomic changes makes it more difficult to identify good investments since firm performance responds more quickly to changes in the macroeconomy.

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