

Impact of Analyst Upgrades and Downgrades of Sectors on Sector Valuations

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We apply several theories advanced for the mispricing of individual stock prices to suggest the existence of mispriced sectors. We find that sector upgrades result in a positive and significant sector share price response, while sector downgrades result in a negative and significant sector share price response. The favorable valuation effects associated with sector upgrades are more favorable when there is a high level of trading activity of the stocks in the sector, the sector share price runup is relatively weak, and the prevailing price-to-fundamental ratios in the sector are relatively low. In addition, the negative valuation effects associated with sector downgrades are more favorable when there is a high level of trading activity of the stocks in the sector and the share price runup is relatively strong. Overall, the valuation adjustments in response to changes in sector ratings vary with the prevailing market prices in the sector.

Keywords: Analyst ratings, Sectors, Valuations, Mispricing

INTRODUCTION

The valuation of sectors has a major impact on investment decisions. First, it is conducted by top-down investors who attempt to identify sectors in which they will invest. The sector valuation may not dictate the specific stocks selected but will determine which sectors are eligible for further consideration. Second, the valuation of sectors is conducted by bottom-up investors who do not screen out sectors yet still rely on sector information when valuing individual stocks. Third, the valuation of sectors is conducted by investors who invest in sector exchange-traded funds (ETFs). Sector ETFs are designed to mimic a specific sector index, are traded continuously on an exchange, and can be shorted (even without a prior uptick). They allow investors a convenient means of capitalizing on a mispriced sector.

Several theories attempt to explain why stocks can be mispriced, and can be adapted to explain why sectors can be mispriced. Cutler, Poterba, and Summers [1990] and De-

Long, Shleifer, Summers, and Waldmann [1990] suggest that the stock market trading consist of some traders who have more skills or information than others and can capitalize on pricing discrepancies. Since the trading of individual stocks may commonly result from divergence of opinions about sector conditions, the repricing of individual stocks may be initiated by underlying differences of opinion about sector valuations.

Barberis, Shleifer, and Vishny [1998] and Daniel, Hirshleifer, and Subrahmanyam [1998] offer behavioral finance theories on how investors incorrectly use information when pricing stocks. In a similar manner, information may be misused when attempting to value a particular sector.

The need to conduct valuations of sectors has resulted in the creation of various sector information services. Some services such as Forrester Research, Hoovers, and Venture-Line sell information on major trends, developments, and issues on any particular industry. Yahoo offers comparable financial information across sectors, such as price/book ratio, price/cash flow, dividend yield, and return on equity.

Given the importance of proper sector valuation, investment analysts are commonly assigned to monitor specific sectors and determine whether prospects are favorable. Our objective is to determine whether the pricing of a sector is

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sensitive to analyst information about sectors, and how the sensitivity of sector pricing is conditional on the sector characteristics.

Studies by Stickel [1995], Womack [1996], Barber, Lehavy, McNichols, and Trueman [2000], and Ho and Harris [2000] suggests that changes in analyst buy and sell recommendations on individual stocks affect stock prices. However, these results may be attributable to stock-specific information, and do not necessarily indicate whether the market responds to sector information. Akhigbe, Madura, and Newman [2006] found that analyst rating revisions of firms can cause industry effects. However, our study differs from theirs in that we focus on announcements that were focused on sectors and do not constitute firm-specific ratings. Their study is focused on whether the analyst revision of a specific firm's rating can affect rivals within an industry, while our study is focused on whether the analyst assessment of a specific sector affects the market's valuation of that sector. Several other studies have assessed intra-industry effects in response to news about firms (see Slovin, Sushka, and Bendeck [1991], Lang and Stulz [1992], and Howe and Shen [1998]), but their events are firm-specific, with the potential transmission of signals to their rivals. Conversely, our study tests whether sector upgrades or downgrades provided by analysts affect the pricing of a sector.

HYPOTHESES

Impact of Analyst Assessment on the Sector Valuation

The information about a sector is not as closely tied to a specific stock as financial information about that stock. Thus, the market may not attempt to capitalize on information provided by an analysis about a sector until the industry effects on a firm's sales are evident. However, top-down investors consider industry prospects when making investment decisions. Favorable information about a sector should encourage top-down investors to invest in individual stocks in that sector, which in aggregate will raise the valuation of the sector. We expect that assessments of sectors that either explicitly reflect an upgrade or imply improved prospects will elicit favorable market valuations of sectors. In addition, we expect that assessments of sectors that either explicitly reflect a downgrade or imply weaker prospects will elicit unfavorable market valuations of sectors.

Sector Price Response to Upgrades Versus Downgrades

According to Womack [1996] and Ho and Harris [2000], the share price responses to downgraded firms are stronger than those of upgraded firms. Analysts have historically been overly optimistic or reluctant to downgrade stocks. Conversely, analysts are more willing to upgrade individ-

ual stocks without confirmation of positive news to support their upgrade. However, we hypothesize that sector price response to downgrades and upgrades should be similar. The asymmetric price response for stocks is likely caused by the historical resistance to stock downgrades, which makes the market believe there must be serious problems if a downgrade occurs. Such resistance should not exist for analyst announcements regarding sectors, because the information is not a direct attack on any specific stock (potential or existing client).

We also hypothesize that the analyst announcements regarding the industry lead (rather than lag) significant stock price adjustments of the sector. The announcements could lag the price movements if analyst assessments of sectors are conditioned on other information that elicits a sector price response. This is especially true for sector downgrades if analysts are reluctant to disclose their negative views that may at least indirectly affect some firms that are their potential or existing clients.

Trading Activity

Trading activity varies among sectors. To the extent that participants involved in trading activity pay close attention to analyst ratings, the sectors with more trading activity should experience more pronounced valuations in response to a change in analyst sector ratings. We expect that sectors with higher levels of trading activity will experience a more pronounced share price adjustment because there are more customary transactions that could be altered by the signal of a sector upgrade or downgrade. We measure trading activity as the ratio of shares traded to shares outstanding over the 90-day period before the announced change in the industry rating.

Price Multiples

Stock price multiples are commonly used by practitioners to determine whether stocks are in favor or out of favor. Sectors that have low price/earnings ratios are out of favor and may be more susceptible to signals of ratings changes. Thus, their values may be more sensitive to favorable signals because they were not priced to reflect such favorable information. That is, favorable information reflects a larger surprise. Conversely, downgrades would reflect less information for sectors that are out of favor, because the sectors are already priced to reflect unfavorable expectations. We use the price-book value and price-earnings ratios as proxies to measure the degree to which a sector is in favor or out of favor.

Earnings Performance

Sectors that have experienced relatively weak operating performance recently may be more susceptible to signals

of ratings changes. We measure a sector's operating performance by its return on assets.

Size

Sectors that are composed of larger firms should have less asymmetric information. Therefore, sector rating changes by analysts are expected to emit stronger signals for sectors composed of relatively small firms. Size is measured as log of mean sector market capitalization.

Financial Leverage

Sectors with a higher degree of financial leverage are better positioned to benefit from favorable signals that could enhance sector earnings but may also be more adversely affected by unfavorable signals that could reduce sector earnings. This variable is measured as the mean level of debt to total assets in the sector.

Runup

Several studies, including those by Bremer and Sweeney [1991], document reversals to large stock price movements, which are positively related to the absolute size of the initial stock price movement. To the extent that a runup in a sector is driven by noise trading rather than fundamentals, there may be a larger price response to analyst announcements about the sector. The response could serve as a partial correction to the recent sector runup. However, if the signal is reinforced by the runup, it could elicit a more pronounced market response. The sector runup is measured over the 90-day period that ends 2 days before the event date.

Analyst Tier

Analyst ratings changes are expected to have a more pronounced impact on valuations when there are initiated by analysts in the top tier.

Reason for Upgrade or Downgrade

Ho and Harris [2000] find that the effect of analyst rating changes on individual stock prices can vary with the type of information used by the analyst. We hypothesize that sector announcements by analysts that offer specific reasons for upgrades or downgrades are more informative to the market, and elicit a more pronounced sector price response. A dummy variable is assigned a value of 1.0 if a specific reason is offered for the upgrade or downgrade of a sector, and zero otherwise.

Sarbanes-Oxley Act

Investors may have relied more heavily on analyst ratings of firms before SOX than since SOX. Since there is more complete disclosure about firms since SOX, the aggregate of

the valuations for a given sector should be subject to less error. Therefore, we hypothesize that analysts' announcements about sectors result in less pronounced sector price responses after SOX than before SOX.

SAMPLE

To qualify for our sample, sector announcements during 2000–2005 period must (1) come from an investment advisory company, (2) be reported in the *Lexis/Nexis*, and (3) contain information that implied the upgrade or downgrade in the prospects for a specific sector, although an official upgrade or downgrade to a sector rating is not required. Examples of announcements from *Lexis/Nexis* that qualify for our sample are:

On July 17, 2003, JPMorgan cited an improved outlook for relative earnings momentum, attractive valuation and a favorable U.S. political environment. Analyst Carl Seiden boosted his outlook on the U.S. pharmaceuticals sector to "positive" from "neutral." On January 26, 2004, Banc of America analyst Mark Fitzgerald believes the semiconductor equipment sector has begun a correction that could send the stocks in the group down 30%. "It's not the end of the cycle but it is the beginning of the end of the momentum game," Fitzgerald said in a note to clients. "As momentum rolls over, the only support for semi-equipment will be valuation." On March 1, 2005, Lehman Brothers raised its rating on the semiconductor sector "on the belief that the beginning of inventory restocking lead to a steadier near term outlook during the first half of 2005 and support the upward momentum in the sector's stocks." On April 15, 2005, "JPMorgan analyst Gregory Burns cut his ratings to "neutral" from "overweight," saying capacity expansion in the rail sector could outpace demand."

The sample is purposely screened to remove announcements with information focused on a particular firm. There must be one or more sector firms assigned the same two-digit, three-digit or four-digit Standard Industry Classification (SIC) code as the rated sector.¹ The Center for Research in Security Prices (CRSP) database is used to generate a list of firms that have the same two-digit or three-digit SIC code as the rated sector; and (4) the sector firms must have common stock outstanding that is traded on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), or NASDAQ, with daily return data are available from *CRSP*.

Our screening process results in a final sample of 310 sector upgrades and 203 sector downgrades. Panel A of Table 1 displays the sector upgrade and downgrade revisions by year. Panel B of Table 1 provides information about the sectors in the sample. The mean market value of the upgraded sectors is almost \$3 billion, while the median market value of the upgraded sectors is almost \$2 billion. The mean and median market values of downgraded sectors are similar to those of

TABLE 1
Sample Descriptive Statistics.

The sample of 310 upgrades and 203 downgrades in industry sector is gathered from the *Lexis-Nexis* database for the sample period 2000–2005. Panel A shows the distribution of each data sample by year. Panel B provides descriptive statistics for the sector-firms, where sectors are identified using two-digit SIC codes from the *Compustat* database. Panel C provides mean and median values for characteristics of the industry sectors using the *Compustat* database. Equity market value is measured three trading days prior to the rating adjustment, Tobin's q is the ratio of common stock market value to book value, and return on assets is earnings before interest and taxes/total assets. Free cash flow is (earnings before interest and taxes plus depreciation)/total assets, leverage is the ratio of total debt to total assets, and ACTIVE is the ratio of shares traded to shares outstanding, for the two-month period prior to the rating change. Financial statement data are obtained for the calendar year end prior to the revision.

Panel A: Sample Distribution by Year				
Year	Sector Upgrades		Sector Downgrades	
2000	72		31	
2001	41		15	
2002	44		55	
2003	57		29	
2004	47		58	
2005	49		15	
Total	310		203	
Panel B Summary Statistics of Industry Sectors				
	Sector Upgrades		Sector Downgrades	
	Mean	Median	Mean	Median
Equity Market Value (\$mil)	2,859.81	1,977.10	2,871.29	2,074.71
Total Assets (\$mill)	8,368.34	1,894.08	10,337.15	2,141.13
Tobin's q	2.34	2.11	2.27	2.05
Return on Assets (%)	1.68	2.34	1.40	2.06
Free Cash Flow (%)	6.01	6.40	5.83	6.20
Leverage (%)	20.46	17.43	19.85	16.42
Price/Earnings	11.17	12.81	19.08	15.44
Trading Activity (%)	31.15	28.74	31.88	29.42

the upgraded sectors. The Tobin's q , ROA, and free cash flow of the upgraded sectors are slightly higher than those of the downgraded sectors on average. The mean leverage of the upgraded sectors is slightly higher than that of the downgraded sectors. The mean price/earnings ratio of the upgraded sectors is lower than that of the downgraded sectors, while the mean trading activity measure of the two samples is similar.

Estimation of Sector Abnormal Returns

For each rating adjustment, we form an equally weighted portfolio of all sector firms that share the same SIC codes and that are publicly traded at the time of the announcement. The procedure of creating an equally weighted portfolio of sector firms accounts for potential cross-sectional correlation of returns in the sector. Daily return data of each portfolio are derived from the CRSP tapes. The event study methodology is used to measure the average daily abnormal stock returns (ARs) per sector in response to the analyst's announcement regarding an upgrade or downgrade of the sector. The event date, t_0 , is the date of the announcement by the analyst reported in Lexis/Nexis.

The market model is used to derive abnormal returns for each sector i and for each day t in the event period t_{-11} to t_{+11} are calculated as:

$$AR_{it} = R_{it} - (\alpha + \beta R_{mt}) \quad (1)$$

where AR_{it} is the daily abnormal return for firm i , R_{it} is the daily return for firm i , R_{mt} is the daily return on the CRSP equal-weighted index, and the parameters α and β are obtained from the market model, estimated with daily returns from the period t_{-220} to t_{-20} relative to the adjustment date. The z-statistics are computed and used to test for statistical significance of cumulative standardized average ARs of the sector portfolios.

RESULTS

Our results are partitioned by valuation effects of sectors in response to analyst upgrades or downgrades of sectors, and a cross-sectional analysis of sector valuation effects across events.

TABLE 2
Industry Average Abnormal Returns in Response to
Sector Upgrades and Downgrades.

The samples contain 310 sector upgrades and 203 downgrades in sector ratings, gathered from the *Lexis-Nexis* database for the sample period 2000–2005. The *CRSP* database is used to form an equally-weighted portfolio of all sector-firms that share the same two-digit or three-digit SIC, and that are publicly traded at the time of the rating adjustment. Abnormal return for each sector-portfolio is calculated as: $AR_t = R_t - (\alpha + \beta R_{mt})$, where AR_t is the daily abnormal return, R_t is the daily return, R_{mt} is the daily return on the *CRSP* equally-weighted index, and the parameters α and β are obtained from the market model, estimated with returns from days $(-220, -20)$ relative to the adjustment date $t = 0$. The equally weighted average of the sector portfolios AR s is computed for each day and cumulated over the event windows (CARs). We use the Z-statistic to test for statistical significance of cumulative standardized average ARs of the sector portfolios.

Interval	Sector Upgrades (N = 310)			Sector Downgrades (N = 203)		
	CAR	Z-Statistic	% Positive	CAR	Z-Statistic	% Positive
$[-11, -2]$	0.51	3.90***	55%	-0.05	-0.58	44%
$[-1, +1]$	0.29	5.16***	57%	-0.26	-2.83***	42%
$[-1, 0]$	0.31	6.17***	59%	-0.19	-2.96***	40%
$[+2, +11]$	0.17	2.03**	52%	-0.10	-0.62	47%

Note: ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Sector Valuation Effects

The mean sector valuation effects in response to analyst upgrades and downgrades of sectors are disclosed in Table 2. During the 10-day period prior to the announcement $(-11, -2)$, the mean valuation effect is $-.51\%$, which is statistically significant. Thus, there is some evidence of favorable sector pricing shortly before the upgrade is publicized. For upgrades, the mean valuation effect of sectors during the two-day announcement window $(-1, +1)$ is $.31\%$, which is significant at the .01 level. These results support the hypothesis that upgrades elicit a favorable sector price response.

For downgrades, the mean valuation effect of sectors during the two-day announcement window is $-.19\%$, which is significant. For the three-day announcement window $(-1, +1)$, the mean valuation effect of sectors is $-.26\%$, which is significant. These results support the hypothesis that downgrades elicit an unfavorable sector price response.

TABLE 3
Industry CAR Classified by Analysts and News Types.

The samples contain 310 sector upgrades and 203 downgrades in sector ratings, gathered from the *Lexis-Nexis* database for the sample period 2000–2005. The *CRSP* database is used to form an equally-weighted portfolio of all sector-firms that share the same two-digit or three-digit SIC, and that are publicly traded at the time of the rating adjustment. Abnormal return for each sector-portfolio is calculated as: $AR_t = R_t - (\alpha + \beta R_{mt})$, where AR_t is the daily abnormal return, R_t is the daily return, R_{mt} is the daily return on the *CRSP* equally-weighted index, and the parameters α and β are obtained from the market model, estimated with returns from days $(-220, -20)$ relative to the adjustment date $t = 0$. The equally weighted average of the sector portfolios AR s is computed for each day and cumulated over the event windows (CARs). We use the Z-statistic to test for statistical significance of cumulative standardized average ARs of the sector portfolios. CAR is the sector portfolio $[-11, +1]$ day cumulated abnormal return for upgrades and sector portfolio $[-1, 0]$ cumulated abnormal return for downgrades.

	Sector Upgrades (N = 310)			Sector Downgrades (N = 203)		
	CAR	Z-Stat	% Pos	CAR	Z-Statistic	% Pos
(Downgrade; upgrade)						
All (310;203)	0.80	5.74***	57%	-0.19	-2.96***	40%
Analyst						
Top Tier (144;98)	0.60	2.97***	56%	-0.33	-3.50***	30%
Lower Tier (63;55)	0.97	2.47**	53%	0.05	0.03	52%
Others (103;50)	0.97	4.52***	62%	-0.17	-1.09	48%
Reason						
Specific (138;106)	0.96	4.37***	58%	-0.07	-1.31	41%
Passive (172;97)	0.66	3.80***	56%	-0.32	-2.91***	40%

Note: ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Explaining the Variation in Sector Valuation Effects

Table 3 provides general results about the impact of sector upgrades and downgrades on sector valuations. The $(-11, +1)$ window is used for upgrades while the $(-1, +1)$ window is used for downgrades since these windows appear to capture most or all of the valuation adjustment. Results are separated by tier of the analyst that provides the upgrade or downgrade. For upgrades, the CAR is positive and significant regardless of the tier. The magnitude of the valuation effect is largest when the analysts categorized as other initiated the upgrade. For the downgrades, the CAR is only negative and significant for the subsample initiated by top-tier analysts. The upgrades and downgrades are also separated by reason. For upgrades, the mean CAR is positive and significant regardless of whether the reason was specific or passive. For

TABLE 4
Cross-Sectional Regression Results for Industry
Sector Abnormal Returns.

The sample of 310 upgrades and 203 downgrades in industry sector is gathered from the *Lexis-Nexis* database for the sample period 2000–2005. The *CRSP* database is used to form an equally-weighted portfolio of all sector-firms that share the same two-digit SIC, and that are publicly traded at the time of the rating adjustment. The dependent variable is the sector portfolio $[-11, +1]$ day cumulated abnormal return for upgrades and sector portfolio $[-1, 0]$ cumulated abnormal return for downgrades; ACTIVE = mean sector ratio of shares traded to shares outstanding, MVBV = mean sector market-to-book value; PE ratio is defined as the mean price to earnings ratio within the sector, ROA = mean ratio of earnings to total assets; SIZE = log of mean sector market capitalization; for the two-month period prior to the rating change; Leverage = mean level of debt to total assets in the sector, Runup = mean sector runup in price; Analyst = 1 if analyst is in the lower tier, 0 otherwise; Reason = 1 if a specific reason is provided for the rating change, 0 otherwise; SOX = 1 if a rating change occurs after 2002, and 0 otherwise. All the continuous independent variables are market adjusted to account for market-driven variation over time.

Variable	Sector Upgrades		Sector Downgrades	
	Coefficient	T-Statistic	Coefficient	T-Statistic
Intercept	-0.0006	-0.03	-0.0383	-2.75***
ACTIVE	0.0812	3.93***	-0.0106	-1.82*
MVBV	-0.0137	-4.27***	0.0011	0.69
PE Ratio	-0.0002	-1.68*	-.0001	-1.03
ROA	-0.0754	-1.54	0.0089	0.34
Size	0.0018	0.50	0.0042	2.34**
Leverage	0.0117	0.42	0.0156	1.52
Runup	-0.0495	-3.36***	-0.0150	-1.63*
Analyst	0.0081	1.77*	0.0046	1.93**
Reason	0.0064	1.39	0.0029	1.29
SOX	-0.0060	-1.09	-0.0005	-0.20
N	310		203	
R ²		0.1634		0.1307
Adj. R ²		0.1353		0.0850
F-Value		5.82***		2.86***

Note: *** indicates statistical significance at the 1% level.

downgrades, the CAR of the subsample categorized by specific reason was negative but not significant, while the CAR of the subsample categorized as passive was negative and significant.

The results from conducting a cross-sectional analysis of sector valuation effects in response to sector upgrades and downgrades are provided in Table 4. The CAR during the announcement period $(-11, +1)$ is used as the dependent variable. For the sample of sector upgrades, the activity variable is positive and significant, which supports the hypothesis

of a more favorable effect for sectors in which there is more active trading. The price-book value variable is negative and significant, which implies a stronger sector valuation of sectors that are out of favor in response to sector upgrades. The PE variable is negative and significant at the .10 level, which reinforces the finding that out of favor sectors experience more pronounced valuations in response to sector upgrades.

The run-up variable is negative and significant, which suggests that the sector upgrade elicits a more pronounced share response of sector stock prices when the sector runup is lower. The market appears to discount the signal emitted by a sector upgrade when its component stocks have experienced a stronger runup before the upgrade. The analyst variable is positive and significant, implying more favorable results for analysts in the lower tier. All other variables are not significant.

For the sample of sector downgrades, the activity variable is negative and significant, which implies that sectors representing more actively traded stocks experienced a more pronounced negative share price response. The size variable is positive and significant, which supports the hypothesis that sectors composed of larger firms experience a less pronounced valuation effect in response to sector downgrades. The runup variable is negative and significant, which suggests weaker results for firms that experienced a more favorable runup prior to the sector downgrade. This result is consistent with that found for upgrades in that it suggests larger sector valuation corrections when the change in sector rating is in disagreement of the size of the runup. The analyst variable is positive and significant, implying more unfavorable effects when sector rating changes are initiated by analysts in the higher tier. The other variables are not significant.

SUMMARY

The influence of analyst ratings on stock valuations has been thoroughly analyzed. However, little attention has been given to sector ratings. The consideration of an aggregate rating of an entire sector may be especially important to top-down investors or to traders who focus on specific sector indexes. We apply the theories of mispriced stocks by Cutler, Poterba, and Summers [1990]; DeLong, Shleifer, Summers, and Waldmann [1990]; Barberis, Shleifer, and Vishny [1998]; and Daniel, Hirshleifer, and Subrahmanyam [1998] to suggest why entire sectors can be mispriced.

Our objective is to determine whether the pricing of a sector is sensitive to analyst upgrades or downgrades of sectors, and to explain how the sensitivity of sector prices to analyst upgrades or downgrades is conditioned on sector-specific characteristics. We find that sector upgrades result in a positive and significant share price response for stocks in aggregate in the corresponding sector. There is some evidence of

a price adjustment to sector upgrades in the 10-day preannouncement period, along with the three-day announcement period. Sector downgrades result in a negative and significant share price response for stocks in aggregate in the corresponding sector. The valuation effects associated with sector downgrades appears to be concentrated in the three-day announcement period.

A cross-sectional analysis finds that the favorable valuation effects associated with sector upgrades are more favorable for sectors that have a high level of trading activity, experience a relatively weak stock price runup, and the prevailing price-to-fundamental ratios in the sector are relatively low. In addition, the negative valuation effects associated with sector downgrades are more favorable for sectors that have a high level of trading activity, are composed of relatively large firms, and experience a relatively strong stock price runup. Taken together, the results suggest that trading activity exacerbates the effects of sector upgrades or downgrades, while sectors with high prevailing stock prices are penalized.

NOTE

1. For example, the auto sector is represented by SIC codes 3711, 5511, and 5599; energy sector is represented by SIC codes 1300, 4911, 4931, and 4932; technology is represented by SIC codes 3570, 3690, 3820, and 3840; and Internet sector is represented by 7370, 7372, and 7373. All other sectors are defined at the two-digit SIC level.

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