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**Author**

Gilman, J.J.

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J.J. Gilman

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University of California  
Berkeley, California 94720

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## DILEMMAS OF EXTERNAL VENTURES

John J. Gilman  
Center for Advanced Materials  
Lawrence Berkeley Laboratory  
University of California  
Berkeley, CA 94720

### INTRODUCTION

The first part of this article considers the motivations of companies for getting involved in external ventures. The second part discusses some of the dilemmas associated with the various modes for executing external ventures. Since the motivations are often very real, while the dilemmas are intensely frustrating, good methods for resolving the dilemmas are very welcome and some are described in this article.

In discussing the motivations for external venturing, I shall begin with the observation that the most important single measure of the effectiveness of a company is its return-on-equity (ROE). Therefore, the only genuine purpose for external venturing is to try to improve a company's ROE; or to ensure an adequate future ROE. Other purposes such as personal aggrandizement of a CEO, or pursuit of a fad, do little for the stockholders beyond providing expensive entertainment.

One way to increase the ROE is to reduce the equity base. But this leads to liquidation rather than development, and, therefore, is not of interest here. The other is to increase margins. Speaking of margins in connection with return-on-equity reminds me of how realtors determine the value of a piece of property. They say that the first thing to be considered is the location, and the second thing to be considered is the location, and the third thing to consider is the location! In the case of return-on-equity the first, second, and third thing of importance is gross margins. These are necessary if good net margins are to be realized.

In connection with external ventures, there are many factors to be considered that have some influence on potential margins. But most of these have small short-range effects. I plan to discuss just two factors that I think are of long-range significance. The first of these is favorable long-range input/output trends; and the second is growth-rate.

By favorable input/output trends, I mean areas of the economy where product prices are increasing relative to the rest of the economy, while the costs of raw materials, or other inputs to the business, are decreasing relatively (1). These trends are remarkably stable and they provide an indication of changes in societal needs. If a strong need exists, or is developing, in a particular segment of the economy, it will tend to strengthen prices in that segment relative to segments in which the need is less urgent, or is saturated.

Anticipation of such changes influences business success to an important extent, because such success correlates closely with filling the needs. Therefore, price trends that favor cheaper raw materials (or components) in the future, and indicate an increasing demand for products made from these inputs will enhance the climate in which a given business operates (Figure 1). This does not mean that operating in an area which has favorable price trends will ensure success, but that a better probability for success will exist because favorable trends will create an increasing spread between input and output prices. The efficiency with which the input materials are converted into saleable products will determine how much of the value added is retained by a particular business operation.

Consider the chart in Figure 2 taken from an article by Fisher (2, 3) which shows price trends in four industrial sectors. It may be seen from this chart that the trend of the input-output spread is favorable for converting plastics and synthetic materials into objects used directly for amusements. On the other hand, the trend for converting lumber and wood products into plastics and synthetic materials is unfavorable.

A favorable trend situation in which output prices are rising while input prices are declining does not ensure high selling margins, but it certainly is to be preferred over the opposite situation in which inputs are rising while outputs are falling. The ultimate in clever management cannot overcome the handicap of zero difference between output and input! This was illustrated clearly in the 70's for the chemical industry when excess production capacity caused declining output prices while increasing crude oil prices created increasing input prices.

Relative price changes from 1960 to 1970 clearly forecast the emergence of the "service economy". Services were increasing in relative prices while manufacturing and manufactured products were decreasing in relative prices. The only manufacturing sector with an increasing price trend was metal working machinery. In general, the manufacturing segments with the most favorable price trends are those that make complex machinery, aircraft engines, instruments, and the like. These segments tend to employ highly skilled and trained labor; and to require the continual input of new knowledge through research. In other words, they require large information inputs.

Price differentials are one way to estimate the relative intensities of needs. Another is provided by relative growth-rates. In this connection I have studied the correlation between return-on-equity (ROE) and sales-growth-rates (SGR). A convenient data base is provided by the Forbes magazine's "Annual Report on American Industry"; in particular, the one published on January 2, 1984. This reports five-year averages of the ROE's and SGR's for 1000 American companies. The data are grouped into 46 industries, with sub-groupings provided for some of the industries. The data are significantly correlated on an overall basis. Some of the industrial groups also have significant internal correlations; some do not; and a few have negative correlations between ROE and SGR.

The results for the industry averages are shown in Figure 3. It may be seen that there is a reasonably good correlation. The correlation coefficient is 0.59, and the regression line indicates that ROE increases with SGR on average. The airline industry was omitted from the figure because it showed an average deficit for the five year period.

Similar correlations for the individual industry groups represented by each point in Figure 3 are found. The ten with the highest correlation coefficients are given in Figure 4; and those with the lowest in Figure 5.

It may be noted that the dependence of ROE on growth rate is greatest for industries that are capital intensive. In these industries, when sales are growing, utilization factors are high so capital equipment tends to be used efficiently yielding good margins and returns. The same pattern is present in small companies that have only been in business for a few years. If successful, they tend to fully (or over) utilize their capital plants and equipment.

I have now argued for two propositions. One is that, from a strictly business viewpoint, the purpose of external ventures is to increase return-on-equity. The second is that return-on-equity is statistically related to relative price changes and sales-growth-rates. In a mature market, sales-growth-rate can be obtained by increasing market share. But this is likely to be a transient effect because the market will soon establish a new equilibrium following a perturbing disturbance. I think that a better approach for obtaining high growth-rate is to enter a relatively new market where sustained growth is expected for a long period of time. Best of all, but least probable, is to make an invention that generates an entirely new market. Then one can experience not only the joys of growth, but also the joys of monopoly. I have been involved in both the case of me-too marketing and in monopoly marketing, protected by patents, and must report that it is much easier to be enthusiastic about fighting off competition with a court injunction, than it is to do it by cutting prices.

In the absence of an attractive internally generated monopoly, one can look for external ones. Perhaps the simplest way is to buy a patent and technology license. But this brings us to our first dilemma. How do we identify technology that has a high probability of yielding sustained growth, if we are not already in the business? And, how do we become sufficiently aware of whatever the competition is, to make an assessment if we are not tied into the technical community that surrounds the particular invention that we are interested in? These questions are difficult to confront and answer successfully. All too many companies have bought licenses where the evidence of effectiveness was only the word of the inventor.

If an invention is defined explicitly, it is relatively easy to test whether it can be reduced-to-practice. But most are not well-defined, and even if one is, there still remains the question of how it fits into the marketplace.

Often companies try to solve this first dilemma by taking a minority interest in a company that sells to the marketplace of interest. A common rationale is that this will give them a "window" to the business area; and if they like what they see they can buy a majority position later. But this leads to a second dilemma. Part of the dilemma is that they don't really get a clear view of the business. As a minority owner, their participation is vicarious. They may get a board seat, or two, but the board only gets to know what is presented to it by the management; and the outside board members do not participate in day-to-day activities at all.

Furthermore, whatever resources are put into the external company get diluted. For example, suppose a company owns 20% of an external company and it puts a new product into it as a means of exploiting the product. Then its potential earnings from the product are diluted 4:1. Even worse, suppose that the product is a huge success so it doubles the earnings of the external company and increases its P/E ratio by 50%. Then the cost of buying further equity in the external company will have increased by a factor of three. Using one company's cash to create prosperity in another one is not likely to be considered prudent by the first company's stockholders.



If the external company is small with relatively few public stockholders, purchasing a substantial minority of it privately (say 20%) is treacherous even as a pure investment, particularly if the purchaser is a much larger company. Such investments are often very difficult to liquidate. First, because the thin market makes the price volatile. Second, because sales of private shares will undermine confidence in the company. And third, because both of the above are likely to infuriate the other stockholders, and this may lead to litigation.

If, for the reasons described above, minority equity purchases do not make attractive external ventures, it might be thought that straight "buy-outs" would be better. But it is well-known that such buy-outs almost always lead to severe personnel problems in the external firm. This creates our third dilemma. To the extent that the buy-out makes people in the external firm financially secure (sometimes described as rich), it also makes them psychologically independent (that is, prone to quit). Also, ownership produces an irresistible urge in the owner to treat the owned according to the Golden Rule. The modern statement of this being "he who has the gold, makes the rules". This decimates the morale in the external company, and it happens in about the length of time it takes for an auditor to open his notebook.

A mode of operation that bypasses many of the problems of straight buy-outs and minority equity positions is that of joint-venturing. In this case a jointly-held company is set up in which the external firm has a minority position. Thus, the initiating company has operating control. Typically, the initiating company puts cash into the joint venture while the external company puts in some of its stock plus some technology, or other expertise. A small external company is usually cash-short so it cannot be expected to contribute cash to the joint venture, but a stock contribution from it is very important because it generates a serious interest in the success of the joint venture.

As a mode of operation, joint ventures do not appear to have fundamental flaws, but success depends on satisfying some constraints if the two companies that are involved are widely disparate in size; or have distinctly different expertise in the business area of interest.

For example, consider a venture between two companies; Huge and Tiny. Tiny's interest in the deal will probably be based on a need for money, while the interest of Huge will probably be to increase its long-term ROE by entering a business that is growing more rapidly than itself.

The natural tendency of Huge will be to constrain the joint venture thereby reducing its growth-rate below that of Tiny (which was what attracted Huge in the first place). In the meantime, Tiny will probably be growing rapidly in its remaining activities. It can fund these through internal cash flow, or other sources. Under such circumstances, Tiny will soon lose interest in participating in the joint venture. As the ratio of its equity in the joint venture to its total equity decreases, so will its interest tend to decrease. But, since Tiny's technical expertise is probably crucial to the success of the joint venture's product in the marketplace, a lack of interest has devastating effects.

Thus, it is crucial for Huge to manage the joint venture as a decentralized subsidiary, in order not to destroy local morale, or decrease rapid decision-making. It is also important for Huge to ensure that the joint venture is not dependent on Tiny for technical knowledge, manufacturing, or marketing if it does not wish to be vulnerable to the "empty shell syndrome." All three companies should cooperate, of course, but the joint venture should be able to operate nearly independently.

It can be seen that a joint venture may easily evolve into a dilemma if it is not managed skillfully. But dilemmas in this case can be avoided if those involved are sensitive to the fact that they must carry out a delicate balancing act.

As a successful joint venture matures, the problems outlined above will tend to disappear, so the discussion I have just given is directed at the early stages of its development.

Products for joint ventures may come from a variety of sources: including a joint R&D project; an invention from either of the participating companies; a division of the smaller company; or elsewhere.

The final mode of external venturing that I will say a few words about is that of a staged buy-out. I got involved in this mode unintentionally, as a means for solving a problem. During the process, I learned that it has some virtues.

In an area of rapid technical growth, I placed a contract for the design and construction of piece of hardware that could be sold as a product if the hardware item met the design specifications. The contract was with a small start-up company, and the plan was for us to work together on applications of the hardware, as well as on the marketing of it.

The design phase was quite successful, but---, as a result of the rapid growth of the area, the marketplace had changed by the time the hardware had been developed. Therefore, my company did not want to simply try to market the prototype. We had spent about one million dollars on the project by this time, so we also did not want to scratch the project thereby sacrificing our investment. Thus, we faced a quite concrete dilemma. For the reasons I have just discussed, we did not want to take a minority position in the small company that developed the hardware, nor did we want to buy it outright. We considered setting up a joint venture but did not think that we had enough people on our side with the necessary technical skills to run the joint venture successfully. In brief, we had worked ourselves into a very tight corner. This was effective in causing us to concentrate our thoughts on finding a solution to the dilemma.

After much discussion, we decided to sell our technology (the hardware) back to the company that had designed and built it. Not for cash, because they didn't have any. But for stock. We also bought additional stock for cash in order to give us a substantial but not a majority interest. Furthermore, we agreed to repeat this process for a few years until we reached full ownership. That is, we agreed to place hardware development contracts with them each year for items that we selected. Then, given a successful piece of hardware, we would sell it back for more stock at predetermined prices. This scheme was designed to keep us involved in the technology during a period when our fractional ownership was increasing. Also, during this period Huge could not smother Tiny because it did not have control. And the owners of the small company were kept involved because they did not get a large payoff until the end of the process; and the size of the payoff was designed to depend on the progress of the business in the meantime.

Staged buy-outs are not a universal solution for the dilemmas of external venturing, nor are they easy to negotiate, but they do help to solve some of the problems.

REFERENCES

1. J.J. Gilman - "Price Trends as a Guide to Research Planning", Research Management, 23, 27 (1980)
2. W.H. Fisher - "The Anatomy of Inflation; 1953-1975" Scient. Amer. 225, 15 (1971).
3. W.H. Fisher, A. R. Buhr, and K.S. Smith - "Relative Price Trends, 1958-85", Battelle Research Report, May 25, 1979.

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FIGURE TITLES

Figure 1 Schematic price trends illustrating favorable (A) and unfavorable cases (B).

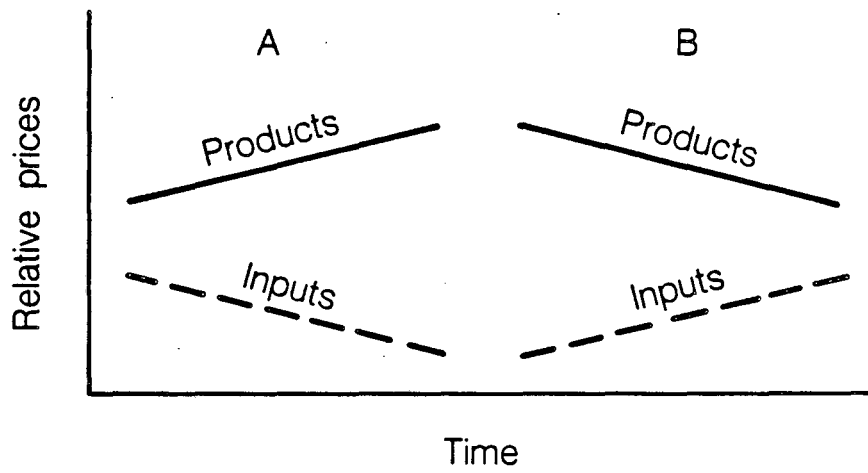
Figure 2 Sample price trends for four sectors of the U.S. economy for the period from 1953 to 1975. All follow a linear trend except amusements. The numbers in parentheses refer to Sectors in the input-output model of the Office of Business Economics.

Figure 3 Relationship between sales-growth-rate and return-on-equity for the 45 Forbes industry groups (1979-1983 data averages). The least-squares regression with a correlation coefficient of 0.59 is the dashed line.

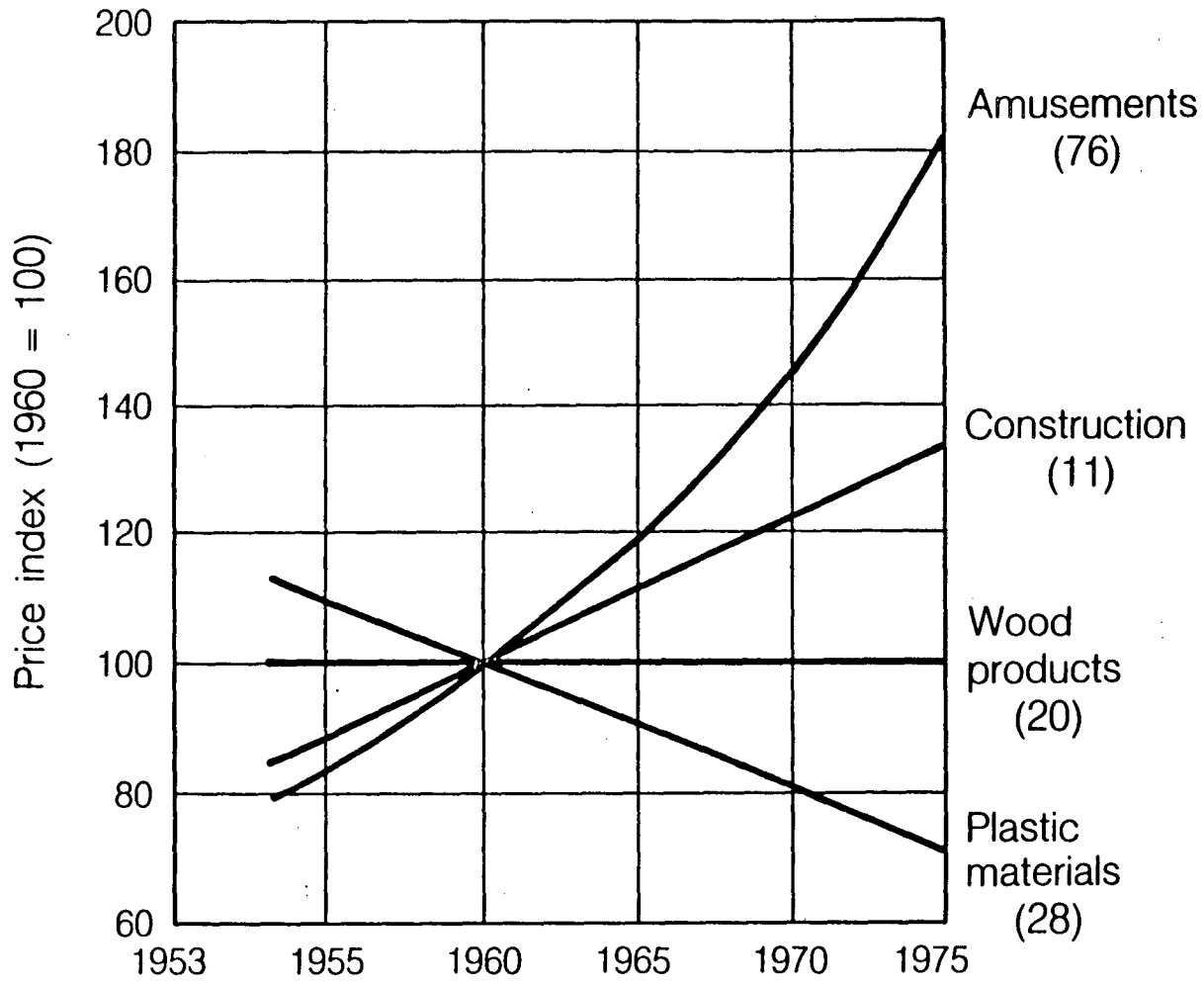
Figure 4 Industries with highest correlation between ROE and Sales-Growth-Rate (1979-83 averages).

Figure 5 Industries with lowest correlation between ROE and Sales-Growth-Rate (1979-83 averages)

FIGURE 1



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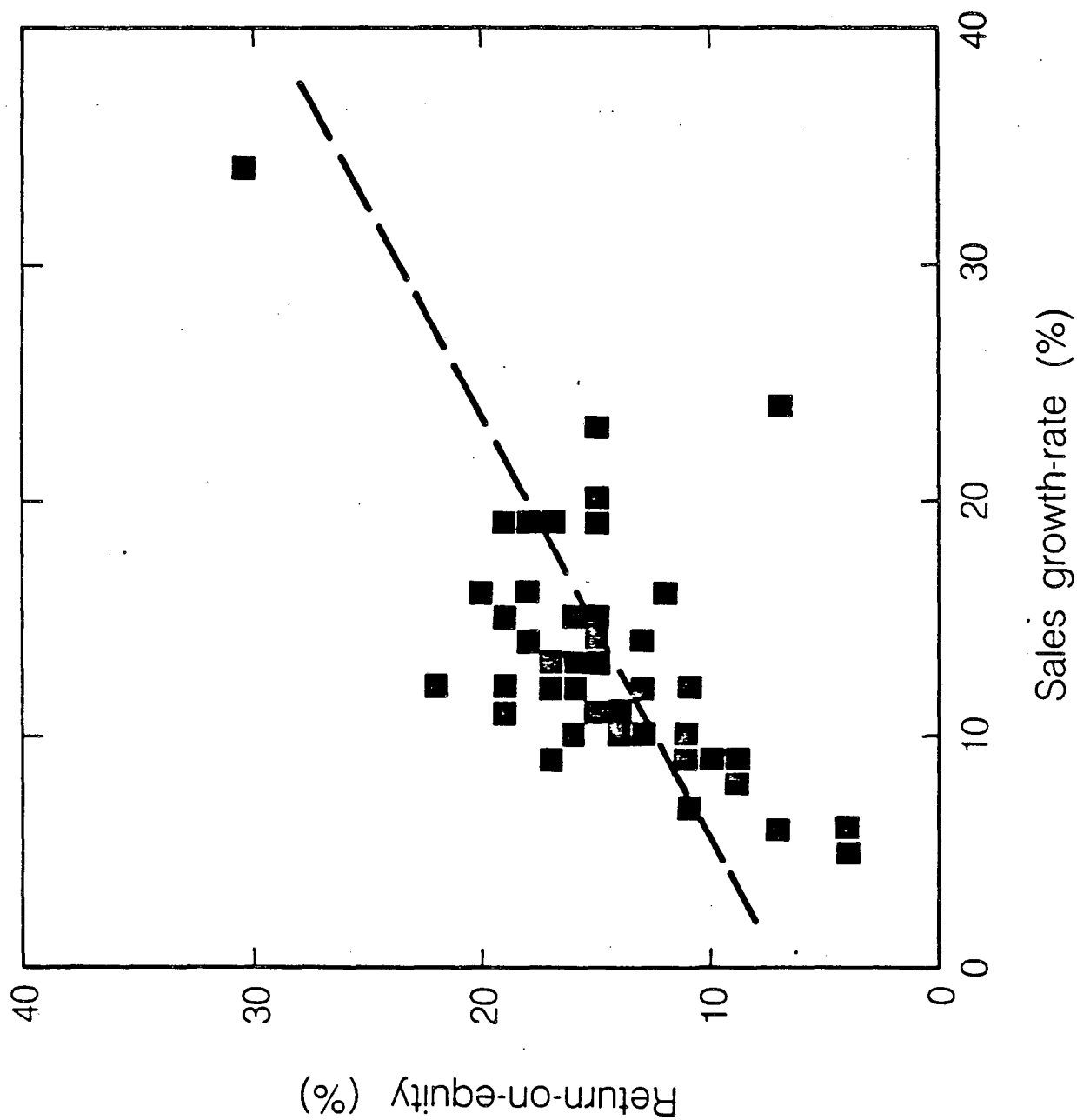


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FIGURE 2



FIGURE 3



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FIGURE 4

<u>Industry</u>	<u>Correlation Coefficient</u>
Apparel-Shoes	0.99
Autos/Trucks	0.95
Telecommunications	0.95
Computers	0.94
Thrifts	0.93
Beverages	0.80
Steel	0.76
Financial Services	0.74
General Retailers	0.73
Heavy Equipment	0.71

FIGURE 5

<u>Industry</u>	<u>Correlation Coefficient</u>
Electric utilities	0.03
Broadcasting	0.04
Toiletries/Cosmetics	0.12
Food Processors	0.14
Diversified Companies	0.15
Household Goods	0.18
Truckers/Shippers	0.19
Insurance	0.20
Railroads	0.21
Electronics	0.23

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TECHNICAL INFORMATION DEPARTMENT  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA 94720*