10.1 RECENT ECONOMIC CONDITIONS IN THE U.S.

In recent US history, recessions have occurred in 1969-70, 1973-75, and 1981-82. In 1990, the US economy again entered a period of recession. The periods between the recessions have been times of economic growth. Recessions and periods of economic expansion have occurred from the beginning of recorded economic history, although their causes, magnitudes, and durations have varied considerably.

The 1981-82 recession was the result of high inflation at the end of the 1970s largely caused by oil price increases during 1978-80 (from $15 to $32 per barrel) introduced by the Organization of Petroleum Exporting Countries (OPEC). Since the rate of inflation is a component of interest rates, the prime rate (the rate at which banks lend short-term funds to their best commercial customers) rose from 6 percent in 1977 to 21.5 percent in 1980. While many businesses were able to pass the higher costs along to their customers, some regulated firms were not. Investors with funds in fixed-income securities (such as long-term bonds) lost considerable wealth and “subsidized” the institutions whose debt they had acquired. Savings and Loans were prevented from paying high rates of interest to depositors, and funds flowed out of them and into a wide variety of “money market”-type investments. These and other conditions prompted the Federal Reserve to take a firm position on inflation and begin regulation of the money supply so that “new” money entered the market in relation to real economic growth and not in response to political manipulation of the economy.

The effect was to reduce inflation from 12.7 percent in 1980 to 2.9 percent in 1983. The reduction in inflation adversely affected businesses which had long-term contracts for expenses (such as labor) that reflected high levels of anticipated inflation and short-term contracts for revenues which immediately adjust to changes in the price level (inflation). Many businesses had prospered during the high inflation years because increases in their costs had lagged behind revenues, but their operations had become inefficient because productivity was less important for profitability. The high interest rates also had precluded investment in new plants and equipment so that many firms had outdated and inefficient equipment particularly when compared with many foreign competitors. Existing real estate investments had been profitable despite high interest rates because prices and revenues had increased rapidly and many projects had been financed previously at low interest rates. New projects were a different matter, and construction slowed dramatically in the early eighties.

The US government passed the 1981 Economic Recovery Tax Act to stimulate investment in plants and equipment by allowing accelerated depreciation of productive capital assets (including buildings) and tax credits for certain investment. These changes stimulated the US economy, and it commenced a long period of growth so that the rest of the decade of the 1980s was a period of continued expansion. There was a boom in building construction inspired by a favorable tax code, real economic growth, low interest rates, low energy prices, and aggressive lending by recently deregulated financial institutions (which were then able to invest a higher proportion of their assets in commercial real estate). However, during the 1980s, several regions experienced substantial declines -- for example, regions which had a predominantly oil-based economy (Dallas and Houston) suffered as the price of oil declined further in real terms. These markets can be identified by a sudden increase in unemployment as employers adjusted to the new economic conditions. The effect of these changes on design professionals in the region depended on the nature of the underlying demand for their goods/services. For example, for architects, there was a decline in demand for all categories of real estate which had reached oversupply conditions as a result of continued construction during the boom years. This decline (relative to prior levels of demand) caused a major decline in the demand for architectural services in the affected regions.

In 1986 the US Congress again made substantial changes in the tax code -- under the guise of so-called tax reform -- removing the preferential treatment of real estate by eliminating reduced tax rates for capital gains and extending the depreciation term for real estate. For example, commercial real estate was depreciated over a 15-year period in 1981 and a 31.5-year period in 1986. In the second half of the 1980s it was increasingly obvious that many of the S&Ls, commercial banks, and even some insurance companies were in financial trouble with loan portfolios secured by real

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CHAPTER 10.  ECONOMIC CYCLES AND FORECASTING
estate with declining market values (a result of over-construction, declining demand, and other factors such as the 1986 Tax Reform Act). The strong US dollar produced a vast trade deficit; and a relatively stable economy, low inflation, and high real interest rates resulted in a large capital inflow from other countries. In part, these high real interest rates had been caused by the inability of Congress to balance its budget, so that debt primarily was used to fund the Federal deficit, which continued to attain record levels despite promises to the contrary from both parties. The recession and high real interest rates of the late 1980’s and early 1990’s were major factors in the restructuring of many parts of the US economy. Firms adjusted to greater competition from US and foreign businesses by increasing their efficiency - largely by “down-sizing”, achieved by reducing the number of employees.

In this new environment, lending for real estate development and investment was curtailed by the banks; and construction volume dropped rapidly. The impact on architectural firms varied across the US, depending upon the nature and condition of the local or regional economy and the extent of the oversupply of buildings accumulated from previous years. By 1991 the Northeast (and especially New England) had suffered the hardest, largely a result of reductions in construction volume and defense spending and a slowdown in high technology sales -the latter two being among the most important export-sector\(^1\) industries in the region. The West Coast, also a major producer of high-tech and defense goods/services was affected similarly.

The depressed economic conditions were very significant factors in the election of a democratic President and Congress. In 1993, Congress passed a budget that increased taxes on people with upper-level incomes and corporations, as well as further decreasing the preferential tax status/treatment of real estate. By the end of 1993, continuing low interest rates and delayed/postponed demand induced a recovery that was evidenced by increases in construction volume and higher employment levels in some sectors and regions of the country.

### 10.2 A STRATEGIC PLANNING APPROACH

Chapter Three discussed the supply and demand for design services in a simplified static framework. Strict conditions of “cerebus a paribus” (all other things being held equal) were employed, and changes in the supply and demand curves were caused by a change in only one variable (e.g. prices of complements) at a time. Adding the dimension of time and allowing a changing relationship between supply and demand as a function of numerous underlying and interrelated variables, make the economic framework dynamic. Such a model more closely approximates the conditions under which practice occurs: an uncertain and complex world where future events and outcomes are unknown. Assuming that the economic conditions confronting design-based practice are static facilitates understanding because it removes much of the complexity inherent in the economic system and isolates individual cause-and-effect relationships.

However, while such simplified models fail to provide an accurate picture of economic reality, constructing an econometric model that incorporates sufficient variables for acceptable regional, national, or international analysis is an almost impossible task. Dynamic econometric models do exist; perhaps the most well known is the Wharton Econometric Model which has over 2,000 variables and operates on a mainframe computer. Even if models of this type could be used to forecast the market conditions for design practice, their high cost and the skill required to operate them would place them beyond the capacity of all but the very largest firms. Nonetheless, it is important to forecast future market conditions so that strategies can be formulated to ensure the firm’s survival, if those conditions do eventuate.

Few firms engage in strategic planning for economic conditions other than those which exist at the time strategic planning is being undertaken. Needless to say, strategic planning of this “more of the same” type may be a matter of “closing the gate after the horse has bolted,” because by the time strategic planning is undertaken and the strategies are implemented, the economic/market conditions may well have changed or the firm may have been bankrupted or missed opportunities for growth. Further, “crisis management” strategies that are developed under the pressure of critical economic conditions may be less than optimal responses to those conditions because the survival need to “do something now” overrides effective management.

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1. An export sector industry is one whose products/services leaves the region. Such industries play a major role in linking the regional economy to the rest of the country (national economy) and to other regions and in creating new jobs.
Thus, the key to effective strategic planning is a forecast of future conditions and an understanding of the likelihood of those conditions occurring. For example, a firm might develop and implement a strategy that repositions it for a recession with economic growth expected to be less than two percent per year and which will be associated with a decrease in the demand for design services. The recession might have a 45-percent change of occurring within a two-year period. “Backup” strategies also might be prepared for a 40-percent chance that a recession will not occur (two-to four-percent growth per year) and a 15-percent chance that economic growth will exceed four percent per year.

However, implementing a strategy that repositions a firm for a possible recession in the future, at a time when other firms are expanding into markets that are still growing, may appear to be ill-advised and will almost certainly be poorly received by the firm’s managers. That is, if the attitude of “si fractum non sit, noli id reficare” (if it ain’t broke, don’t fix it) dominates, then forward thinking and effective planning will be frustrated. But if the forecasted recession does eventuate, the repositioned firm may recoup more “ground” than it lost earlier as other firms struggle for survival. Thus, decisions that affect the economic future of a firm hinge upon an analysis of risk and return of the set of alternative strategies for different market conditions. A firm should consider not only the most likely future economic conditions but also other market conditions that might occur, their associated probability, the firm’s responses to those conditions, and the benefits and costs associated with those strategies.

Introducing the probability that actual events will be different from what is expected introduces the element of risk. The benefits and costs of the strategies under different scenarios gives rise to the expected return or profitability. With this approach, a number of probable scenarios are evaluated in the strategic planning process, and consideration is given to the profitability of any course of action and its likelihood (probability) of being the appropriate response to the economic conditions that actually occur.

### Table 10.1  MATRIX OF OUTCOMES

<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>ECONOMIC CLIMATE probability of outcome</th>
<th>EXPECTED RETURN</th>
<th>RISK Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A 0.45</td>
<td>B 0.40</td>
<td>C 0.15</td>
</tr>
<tr>
<td>S1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>expected outcome</td>
<td>S2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>under A, B, or C</td>
<td>S3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the above example, assume that the firm develops three strategies (S1, S2,... S3), each maximizing the value of the firm in a specific economic climate (A,B, or C) while achieving lesser results in the other two. The matrix of results is shown in Figure 10.1. The values in the cells are the firm’s expected profitability in the year for a particular strategy if it is implemented and a given economic climate occurs. Strategy S1 is the “low risk” strategy, but it also has the lowest average return; while S2 has the highest return but at a much higher level of risk.

Because no risk combination is dominant (high return, low risk), the decision is complicated further and the firm must consider its own risk preferences. A risk-averse (or cautious) firm would select strategy A and “play it safe”; while one that is less averse to risk could implement a strategy such as S2 or S3 and seek high profitability and growth when the economic climate is favorable.

Implementing the “cautious” strategy (such as S1) prior to an anticipated recession does not mean that a firm always achieves a low return since it may adopt other (more aggressive) strategies when it deems them to be appropriate to anticipated economic conditions, but prefers to “play it safe” in adverse economic conditions. However, because such
strategies take resources to implement and there may be a time lag before the strategy takes effect, the firm’s profitability (in the short term) may fall below those of its more “adventurous” competitors if they are able to survive an economic downturn, or it is not as bad as expected.

It might be argued that a firm could implement strategy S1; but if the anticipated economic condition (a recession) does not eventuate, then quickly introduce an alternative strategy (S2 or S3) to increase its profitability. Such a course of action would constitute another strategy to evaluate (albeit more complicated) and would be associated with problems of time and cost as resources must be reallocated in an approaching crisis.2

10.3 STRATEGIES FOR RECESSION

In times of recession, those firms that have been well managed and are positioned for the downturn in economic activity may even be able to increase sales and profits by “filling the vacuum” that results as other firms decline and struggle to survive, or declare bankruptcy. The troubled firms (in a recession) generally lay the groundwork for their troubles in good times by bad management, overextending themselves by acquiring assets financed by debt (or lease commitments) or by reaping the profits of the firm and not reinvesting in themselves. For sound firms, strategies for recession-like conditions can include goals not only of surviving or maintaining operations but even increasing market share and profitability. However, the groundwork for the expansion strategy must be established in good times. Alternatively, a survival approach usually is found in firms with no preparation for adverse conditions.

The following guidelines for strategic planning and tactics for survival may be useful because they affect the primary concerns of cash flow: income and expenses necessary to keep the firm “alive”.

a. Develop optimistic, realistic, and pessimistic scenarios based upon the current economic conditions. That is, at any time things can get better, stay the same, or get worse.

b. Assess the firm’s capability to respond to these scenarios. Generally the greater the proportion of variable costs in the firm’s cost structure, the better it is able to react to changes in sales volume, although production may not always be achieved at the lowest possible cost. Because few firms develop contingency/strategic plans for recession in good times, the typical response to deteriorating sales and profits is to cut both operating expenses and investment in proportion to the decline in sales. Such cuts are generally across the board and may occur irrespective of any unit’s profitability or potential. A better approach is to reduce (or eliminate) the resources of the units that are least profitable on a continuing and ongoing basis. Ideally, such adjustments should occur independently of the economic conditions so that all the parts of a firm are subject to continual evaluation.

c. Maximize the cash flow. There is a tendency in many firms to focus on accounting profits at the expense of cash flow. To survive a recession, a firm must have cash flow for working capital needs. For example, for accounts receivable that are 90 days past due, try to settle for 50 percent (or more if possible) and write off the rest. This will result in an accounting loss, but it will generate cash as well as a legitimate deduction for income tax purposes. If the firm has been profitable in preceding years, then a tax-loss carry-back can be employed to generate additional cash from the IRS.

d. Manage accounts receivable. In a recession, the days outstanding for receivables will increase. The firm’s customers will endeavor to preserve their own cash flow by not paying their bills. One technique for increasing cash flow is to offer a discount on all accounts receivable that are paid immediately. The discount must be sufficient to stimulate customers to pay but not enough to adversely affect the firm. At the least, the firm needs to cover its variable expenses and contribute something to its fixed costs. The firm also needs to employ a disciplined collection system and extend “credit” to appropriate customers by categorizing its customers into structured categories such as the three groups shown below:

i. survivors - these are faithful customers who have been profitable historically and represent a good “fit” with the firm; they are well managed and secure.

2. This approach could be investigated using a highly sophisticated financial model such as simulation modelling or option pricing to ‘capture’ the options available to the firm.
ii. doubtful - these customers are less faithful, sometimes delinquent in paying bills, and are generally in businesses that are managed poorly or suffer wide fluctuations in revenues as economic conditions change.

iii. losers - these customers are usually slow in paying bills and may not survive a recession.

A collection-credit system would extend desirable credit terms to the first category of customers and restrict credit availability to those in the last. Access to credit would be determined on an individual basis for doubtful customers, and collection of accounts would be monitored on an ongoing basis.

e. Increase marketing and sales. One technique that can be used to survive a recession and even to increase market share is to increase marketing and thereby increase sales. Generally, a firm that is able to follow such a strategy has a strong focus and substantial resources while its competitors are weaker and less focused. Similarly, competition on the basis of price can lure clients away from larger firms, but it is likely that the firm's competitors will respond quickly with price cuts of their own so that any advantage will be quickly eliminated. Offering lower quality services (minimum requirements) -- at a lower price -- can also attract clients from firms that provide high-quality services. However, a firm should be very cautious about reducing service levels in a “crunch”; while such a strategy might increase sales volume in the short term, the effect on long-term profitability could be somewhat different. Other techniques include adding specialized services to take advantage of the existing client base or otherwise distinguishing the services offered from those of competing firms. Finally, the firm may benefit from increasing its sales/marketing efforts by tactics such as paying larger bonuses to employees who bring work to the firm.

10.4 ANTICIPATORY STRATEGIES

The strategies discussed in the preceding section are primarily ones which can be implemented as part of “crisis” management -- short-term solutions to immediate problems. A firm's ability to survive (and grow) in a recession depends upon the resources available to the firm at that time and the ability to use the resources effectively. Clearly, this requires that the firm develops strategies and acquires resources in a way that anticipates economic conditions.

Diversification Vs. Specialization.

By implementing diversification strategies, a firm may be able to effectively insulate itself from many minor economic events and significantly reduce the impact of even the most volatile fluctuations. The underlying principle of diversification is that by adding different areas of business (or asset classes) together, a large portion of the risk of each area (or asset class) is eliminated. This idea can be found as the underlying theory of much of modern finance where risk is divided into two types: diversifiable and non-diversifiable. The non-diversifiable risk cannot be eliminated by simply adding more business areas of the same (similar) type since the risk is related to overall (national) economic conditions.

For example, for a design-services business such as an architectural firm, diversification can occur in several ways:³

a. Geographic diversification - offering services in different regions of the country. For example, while one region such as the Northeast-New England region is depressed, another region such as the South Atlantic could be maintaining steady growth. Such regional economic cycles have been recognized (as evidenced in the “rolling” recession that has affected regions of the US at different times) and should form an important consideration in a firm's decision to open a branch office, etc.

b. Client diversification - adding a broader client base - even if the clients are all in the same geographic regions and have the same building type -- and type of business -- has the benefit of removing some of the risk associated with one major client or several of the larger clients failing in a recession. For example, if one client provides 50 percent of a firm's work, the loss of that client could be disastrous,

³. To decide how a firm should diversify its operations, the firm must undertake an analysis of the costs and benefits of specialization and diversification. Analysis of this type requires sophisticated computer models and a well-developed understanding of advanced financial/economic theory.
while a 10-percent loss might be tolerated.

c. **Building type/client business diversification** - This is an extension of the preceding type, but the goal is to add clients and building types that depend on different economic forces. For example, while the recession might affect the automobile and housing industries, it may not affect chemicals, farming, and education to the same degree. Thus, efforts should be made to seek clients in businesses whose industries have cyclical variation which is unrelated or inversely related. Unfortunately, few if any industries are inversely related to the general economic cycle -- although many have long leads and lags, and others have lower volatility.

d. **Service diversification** - Finally, diversification can be achieved by the type of services offered. Offering a wide range of services provides an opportunity for a firm to market itself and the services independently, taking advantage of its existing client base and adding new clients for unbundled services such as interior design, landscape design, urban planning, etc.

### 10.5 ECONOMIC FORECASTING

The fact that economic markets operate in a dynamic equilibrium places emphasis on the need to consider the possibility of future events during strategic planning. Because “we cannot know the future,” our knowledge of these events and future outcomes is uncertain; but through study and experience, it is possible to forecast events with enough accuracy for the planning process to become more effective.

**Effective forecasting,**

> “involves a knowledge and understanding of what has happened in the past, what is currently happening in the economy and why it is happening. Only when phenomena are understood is it possible to predict with any degree of accuracy what will happen, and take the proper action in the light of such prediction.”

L. Valentine, Business Cycles and Forecasting, p.12

However, it should be realized that the causal factors underlying fluctuations in the national economy and the interactions among the components of the economy are so complex that they preclude a high degree of accuracy in forecasts of any time period greater than the immediate future. Nonetheless, some level of accuracy in forecasting (and contingency-based strategic planning) is preferred to random chance and placing the firm at the mercy of any and all external forces.

The critical element in any projection for the future is the level of accuracy. The longer the forecast, the lower the accuracy and, therefore, the less confidence one has in the forecast. Nonetheless, long-term forecasting serves the important function of forcing the firm’s managers to examine other possibilities beyond a mere repetition of current and recent conditions. By undertaking the development of contingency plans for the future conditions that are considered more likely or even those outcomes that, while remote, could be disastrous for the firm, management is required to identify the direct and indirect (internal and external) factors that are critical to successful operations. Such analyses will make the firm more aware of the environment in which it operates, emphasizing the political and social framework and the potential for changes therein. Further, in forecasting future conditions, the firm usually must examine its past operations and in doing so will achieve a greater understanding of the reasons underlying the success and failure of its preceding strategies.

A key question for the firm is what should be forecasted; but an equally important question is: What can be forecasted? Often the limitations of data and modeling techniques can restrict the accuracy or even the ability to forecast an economic variable of concern. Generally, a firm needs to know the price and quantity that will “clear the market” and the share of the market that it can obtain. For example, an architectural firm might be interested in the future demand and supply for school buildings, its primary area of business. A forecast of population growth can be developed using existing population demographics (obtained from the US census) and birth rates for age cohorts (e.g., 20 to 25, 26 to 30, etc.) with an adjustment made for expected migration. The forecast of the number of children in preschool, grade school, high school, etc., that results could be quite accurate. While the firm could be fairly confident of this “demand” factor, it would probably be less confident about the ability of the community to raise the funds to build new schools.
or the level of competition it might expect from other architectural firms, particularly if the costs of entry and exit are low. In this example, the data on current population demographics and birth rates are available readily and the technique of analysis is fairly simple. For other areas of business, the data may be so sophisticated that an advanced knowledge of economics and statistics is required not only to develop the forecast but also to interpret the results and develop effective strategies.

Developing an effective (reasonably accurate) forecast does not mean that the forecast must be based on quantitative econometric models that use systems of equations to capture the relationships among economic variables or statistical analysis and extrapolation of past cycles and trends as data-smoothing and time-series modeling. Qualitative techniques or judgmental models also may be successful, although such approaches are often naive, and generally it is impossible to replicate or confirm the results.

The collection and analysis of data generally is an expensive undertaking that tends to restrict the application of forecasting for strategic planning to larger firms and to those willing to commit the necessary resources; but without effective forecasting, strategic planning is reduced to a limited exercise in “wishful thinking.”

10.6 COMPONENTS OF ECONOMIC CYCLES

For the purposes of analysis, the variation in the level of economic activity generally is subdivided into four components: a trend, one or more business cycles, a seasonal fluctuation, and an irregular or random component. There are a variety of techniques to reveal these components. All depend on sophisticated statistical analyses and computers, and vary in their ability to provide effective models of underlying form in the data. Technically, data are termed a time series because the independent variable is time and the dependent variable is the economic condition observed at that time. The analytical method that is used most often is to eliminate the trend and seasonal components first, then to study the remaining variation to discover a pattern that represents the combined effect of one or more business cycles. Once these are eliminated, only random effects should remain.

1. Trend

The trend is the long-term, underlying movement as an increase or decrease. It is derived from the linear form: in the simplest expression as a straight but sloped line: \( y = mx + b \)

where the slope \( m \) is the rate of increase or decrease.

For a time series, the trend has the basic form: \( y_t = my_{t-1} \)

While the trend often is illustrated as a straight line, this is not necessary. Many industries are identified with an initial period of faster growth, a stabilized growth rate related to the growth trend of the overall economy, and as a decreasing growth or decline as the industry matures and demand is reduced. Thus, the form of the long term trend could change depending upon the life cycle stage of the industry. For the overall economy and for separate industries, the trend is related to such primary factors as population level, technological advances, and the capital stock. Once the industry matures, (and for the overall economy as well) the rate of population growth may be the most important factor in predicting long-term trends. The statistical technique of linear regression usually is employed to extract the trend from the data.

2. Seasonal Fluctuation

The seasonal fluctuation is a cyclical movement that repeats every year. The cycle is related to either calendar events or to the seasons and is fairly regular; for example, the different effects of summer and winter on productive activity, or Christmas on retail sales. The repetitive and regular nature of this cycle is such that it can be removed or eliminated from the data, leaving the business cycles and random effects. Simply comparing the data from one time period against that from the previous year, at the same time in the year, will reveal the seasonal effect. This technique is termed seasonal differencing.
3. Business Cycle(s)

The business cycle is a recurrent cycle of economic expansion and contraction. Although business cycles exhibit some regularity, they do not necessarily have the same period, recurring at the same intervals and with the same duration. Further, the degree of expansion and contraction is not constant. The business cycle is the area of most interest in forecasting because while it provides a high proportion of the total fluctuation in economic activity, it does not arise from pure chance and random events. Business cycles will be discussed further in the following section.

4. Random Movement

The random movement is non-cyclical and is composed of fluctuations that result from unpredictable and irregular forces such as the weather, technological and political changes, or even an influenza epidemic.

10.7 THE BUSINESS CYCLE

While the term “business cycle” suggests a systematic repetition, it is intended to capture the fluctuations in economic activity during expansion and contraction (or peaks and troughs) without requiring the duration of the phases of the cycles to be the same. There are two different approaches to business cycle analysis. The first approach was proposed by Joseph A. Schumpeter when he observed that there were three overlapping cycles: long waves or Kondratieff cycles of 54 years average duration; Juglar cycles of 9-10 years, and Kitchen cycles of about 3.5 years. Each of these cycles is named for its discoverer, and they are the result of different economic forces. Major recessions occur when the troughs of all three cycles coincide; for example, the Great Depression. For some economists, the recession of 1981-82 gained considerable importance since it appeared at the “right time” for a similar coincidence of cycles, though its effects were less devastating.

The second approach was formulated by the economic cycle research organization, the National Bureau of Economic Research (NBER). They propose that there is only one business cycle apparent in aggregate economic activity. This cycle is the result of expansions and contractions occurring at a similar time in many different activities of the economy. These fluctuations are recurrent rather than periodic, varying from one to twelve years in length. Since the cycle is not periodic, it is not possible to use prior movements to forecast future activity; however, since some cycle patterns do develop from similar causes, there is an opportunity for improved forecasts and better understanding of the complex forces at work.

Analytical Techniques

There are several techniques to reveal the business cycles. One of these is the residual method which eliminates the trend and seasonal components by multiplying the trend and seasonal factors to form a “normal” factor which is then used to divide the original data. The residual (as deviations from the norm) contains both cyclical and random factors. The random factor is smoothed out by using a moving average of three months duration. Another technique is that used by the NBER which identifies the cycle directly. The cycle is measured from trough to trough and is established by eliminating the seasonal variation.4

Regional Economic Activity

If, as the NBER theory suggests, aggregate economic activity (e.g., the Gross National Product) is the cumulative effect of all the different industries in the nation, then the economic activity in one region may be different to that of another area if the industrial base (or mix) is different. This concept is referred to as the (regional) economic base theory.

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4. Another method uses several B-splines (segmented curved lines) with polynomial equations (cubic, quartic etc.) and variable knots that are calculated so as to provide the best fit to the data. Turning points (as peaks and troughs) in the cycles are identified using differentiation of the equations.
According to this theory, the connection between the economy of a region and that of another, or the nation as a whole, is provided by the exports and imports of the region. A key component of economic base theory is the identification of export-sector industries (industries in a region whose output - or part thereof- leaves the region).

Regional economic activity may be responsible for much of the work undertaken by architects because the business of most clients is a direct function of economic activity in their regions. Even public sector clients such as governments, charities, etc., are affected by fluctuations in the regional economy since they depend on taxes or contributions. The exceptions, or those clients who are insulated from regional effects, have businesses primarily national or international in scope, including both public and private sectors. This difference in regional economic activity and the fundamental contribution of the economic base have been exemplified by the recent conditions experienced in Texas when the “oil” economy was depressed and later in New England and the Northeast, and followed by the West Coast, with the reduction in defense spending and declining high-technology expenditures.

10.8 WHY BUSINESS CYCLES HAPPEN: A THEORY OF MULTIPLIER-ACCELERATOR ITERATION

This section will endeavor to describe some of the reasons why business cycles occur without entering into the complexities of Keynesian and Classical Economic Theories. First, to simplify the analysis we will concentrate primarily on the level of investment and use the interaction of the multiplier process and the acceleration principle to relate the level of investment to changes in the interest rate and national income.

A Multiplier Approach.

The investment multiplier concept is central to Keynesian economics and conveniently states that an increase in private investment or government spending has a multiplied effect on the level of income of the nation. However, the multiplier will not produce business cycles by itself. An investment function that utilizes the multiplier approach has the form:

\[
I_t = I_t + iY_{t-1}
\]

where:

- \(I_t\) is the level of investment in year \(t\).
- \(I_t\) is an autonomous investment parameter that represents the amount of investment which is unrelated to the level of income.
- \(i\) is the investment multiplier which represents the relationship between changes in income and investment
- \(Y_{t-1}\) is the national income in the previous year

National income is used to provide both consumption \((C_t)\) and investment \((I_t)\) and is expressed as:

\[
Y_t = C_t + I_t
\]

Further, current consumption is a function of the preceding period’s income:

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5. One approach is being developed by the author for examining regional economies and their industrial bases. It employs quarterly and monthly employment data for a variety of industries (disaggregated at the two-digit SIC level) in metropolitan statistical areas (MSA) throughout the United States. Several modeling techniques are used to find the relationships among industries in a region, with the industry as a whole, with the aggregate economic activity of the region, and with the economy of the nation. Other important economic indicators and variables also are included; for example, interest rates, oil prices, international exchange rates, etc. While techniques such as this are restricted in their ability to forecast, they do serve to highlight and explain the relationships among industries and their contributions to regional economic activity. Further, they may help to identify geographic areas and industries which are less correlated and which, therefore, present opportunities for effective diversification.
where: \( b \) is the marginal propensity to consume. In the Keynesian model, the marginal propensity to consume decreases as income decreases. \( 1-b \) is the marginal propensity to save and is related to the interest rate and expectations about the future.

\( a \) is a minimum level of consumption that occurs when income is zero, though such a concept may be irrelevant because zero income does not occur.

Now, combining equations 10.1, 10.2, and 10.3, we can obtain:

\[
Y_0 = \frac{a + I}{1 - b - i} \tag{Equation 10.4}
\]

We now have sufficient information for the role of the multiplier to be demonstrated in an example. The parameters are given:

\[ a = 30 \quad b = .8 \quad I_0 = 50 \quad I_1 = 60 \quad i = .10 \]

The above equations are used to find the level of equilibrium consumption and investment at \( t = 0 \)

\[ Y_0 = \frac{a + I_0}{1 - b - i} = \frac{30 + 50}{1 - 0.80 - 0.10} = 800 \]

\[ C_0 = a + bY_0 = 30 + 0.8 \times 800 = 670 \]

\[ I_0 = I_0 + iY_0 = 50 + 0.10 \times 800 = 130 \]

Then, for \( t = 1 \):

\[ C_1 = a + bY_{t-1} = 30 + 0.80 \times 800 = 670 \]

\[ I_1 = I_1 + iY_{t-1} = 60 + 0.10 \times 800 = 140 \]

\[ Y_1 = C_1 + I_1 = 670 + 140 = 810 \]

and so on. The results are shown in Table 10.1:
Table 10.1  Multiplier Model for periods t = 0,1,2....n

<table>
<thead>
<tr>
<th>Period</th>
<th>Y</th>
<th>C</th>
<th>I</th>
<th>Ii = iY</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>800.00</td>
<td>670.00</td>
<td>50.00</td>
<td>80.00</td>
<td>130.00</td>
</tr>
<tr>
<td>1</td>
<td>810.00</td>
<td>670.00</td>
<td>60.00</td>
<td>80.00</td>
<td>140.00</td>
</tr>
<tr>
<td>2</td>
<td>819.00</td>
<td>678.00</td>
<td>60.00</td>
<td>81.90</td>
<td>141.00</td>
</tr>
<tr>
<td>3</td>
<td>827.10</td>
<td>685.20</td>
<td>60.00</td>
<td>82.71</td>
<td>142.71</td>
</tr>
<tr>
<td>4</td>
<td>840.59</td>
<td>697.51</td>
<td>60.00</td>
<td>83.44</td>
<td>143.44</td>
</tr>
<tr>
<td>5</td>
<td>846.86</td>
<td>702.76</td>
<td>60.00</td>
<td>84.10</td>
<td>144.10</td>
</tr>
<tr>
<td>6</td>
<td>852.97</td>
<td>707.49</td>
<td>60.00</td>
<td>84.69</td>
<td>144.69</td>
</tr>
<tr>
<td>7</td>
<td>861.28</td>
<td>715.58</td>
<td>60.00</td>
<td>85.70</td>
<td>145.70</td>
</tr>
<tr>
<td>8</td>
<td>865.46</td>
<td>719.33</td>
<td>60.00</td>
<td>86.13</td>
<td>146.18</td>
</tr>
<tr>
<td>n</td>
<td>900.00</td>
<td>750.00</td>
<td>60.00</td>
<td>90.00</td>
<td>150.00</td>
</tr>
</tbody>
</table>

This example is provided by Lloyd Valentine, Business Cycles and Forecasting, pp. 247-49.

Using these parameters and initial values, it can be seen that an increase of $10 in the level of autonomous investment in Period 1 causes a multiplied increase in national income, consumption, and total investment, which is far greater than the initial increase itself and which approaches a new equilibrium level only after some time has passed.

The Accelerator Approach

A similar approach can be used to demonstrate the effect of the acceleration principle using the equations 10.2, 10.3, and 10.4 and the accelerator-type investment function:

\[
\hat{I}_t = I_t + A(Y_{t-1} - Y_{t-2})
\]

*Equation 10.5*

*where:* A is the “accelerator”, a function of such factors as the productivity of capital, the speed at which changes in demand for output can be addressed, the time period required to add new capital, and the level of utilization of existing capital.

The parameter values here are

\[ a = 30, \quad b = .8, \quad I_0 = 130, \quad I_1 = 140, \quad \text{and} \ A = 1, \]

and the results are provided in Table 10.2.
Table 10.2 Multiplier And Accelerator Model

<table>
<thead>
<tr>
<th>Period</th>
<th>Y</th>
<th>C</th>
<th>I</th>
<th>Ii = iY</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>800</td>
<td>670</td>
<td>130</td>
<td>0</td>
<td>130</td>
</tr>
<tr>
<td>1</td>
<td>810</td>
<td>670</td>
<td>140</td>
<td>10</td>
<td>150</td>
</tr>
<tr>
<td>2</td>
<td>850</td>
<td>692</td>
<td>140</td>
<td>18</td>
<td>158</td>
</tr>
<tr>
<td>3</td>
<td>872</td>
<td>710</td>
<td>140</td>
<td>22</td>
<td>162</td>
</tr>
<tr>
<td>4</td>
<td>889.6</td>
<td>727.6</td>
<td>140</td>
<td>22.6</td>
<td>162</td>
</tr>
<tr>
<td>Peak</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>899.3</td>
<td>741.7</td>
<td>140</td>
<td>17.6</td>
<td>157.6</td>
</tr>
<tr>
<td>8</td>
<td>899.1</td>
<td>749.3</td>
<td>140</td>
<td>-0.2</td>
<td>139.8</td>
</tr>
<tr>
<td>9</td>
<td>871.3</td>
<td>741.3</td>
<td>140</td>
<td>-10</td>
<td>130</td>
</tr>
<tr>
<td>10</td>
<td>849.2</td>
<td>727</td>
<td>140</td>
<td>-17.8</td>
<td>122.2</td>
</tr>
<tr>
<td>11</td>
<td>826.9</td>
<td>709</td>
<td>140</td>
<td>-22.1</td>
<td>117.9</td>
</tr>
<tr>
<td>12</td>
<td>809.2</td>
<td>691.4</td>
<td>140</td>
<td>-22.3</td>
<td>177.9</td>
</tr>
<tr>
<td>Trough</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>800.3</td>
<td>669.8</td>
<td>140</td>
<td>-9.5</td>
<td>130.5</td>
</tr>
<tr>
<td>15</td>
<td>810.8</td>
<td>670.2</td>
<td>140</td>
<td>+0.6</td>
<td>140.6</td>
</tr>
</tbody>
</table>

This model demonstrates a cyclical movement with a peak occurring in Period 6 and a trough in Period 13. The most important factor is the accelerator, A, which is related to the productivity of capital and expresses the effect of technology and capital efficiency in connecting the input of capital and the output of production. Depending on the size of A relative to b, the cycle can be divergent or convergent. Other factors that affect A include the speed at which changes in demand for output can be addressed, the time period required to add new capital, and the level of utilization of existing capital. In addition, the relative price of capital (or interest rate) can also affect the size of the accelerator. As a generalization, industrialized societies are likely to have higher accelerator values than underdeveloped countries; and, thus, business cycles tend to present greater problems in the industrialized and well developed economies.

The acceleration principle also can be applied directly to consumer demand and the demand for new investment. This is particularly important for durable goods since the degree or magnitude of acceleration depends on the life of the capital equipment. The application of this approach to architecture and construction markets is revealed in the following example, the demand for office space. The initial demand is 10,000 and traditionally increases by three percent every year. However, in the third year, demand surges by an additional three percent which is unanticipated by those who supply the market.

Table 10.3 Office Space Demand and Supply (thousands of sq. ft.) Regional Market

<table>
<thead>
<tr>
<th>Period</th>
<th>Office Space Demand</th>
<th>Percent Change</th>
<th>Available Office Supply</th>
<th>Excess Supply or Demand</th>
<th>Replacement of Buildings</th>
<th>Normal Growth</th>
<th>Additional Demand plus/minus</th>
<th>Total Demand Office Space Construction</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td></td>
<td>3.0%(i)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td></td>
<td>3.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>10,000</td>
<td>3.0%</td>
<td>10,000</td>
<td>0.0</td>
<td>243.0(iii)</td>
<td>300.0(iv)</td>
<td>0.0</td>
<td>543.0</td>
<td>-</td>
</tr>
<tr>
<td>n+1</td>
<td>10,300</td>
<td>3.0%</td>
<td>10,300</td>
<td>0.0</td>
<td>250.0</td>
<td>309.0</td>
<td>0.0</td>
<td>559.0</td>
<td>2.9%</td>
</tr>
<tr>
<td>n+2</td>
<td>10,918</td>
<td>6.0%(ii)10,609</td>
<td>309.0</td>
<td>257.0</td>
<td>318.0</td>
<td>309.0</td>
<td>874.0</td>
<td>56.3%</td>
<td></td>
</tr>
<tr>
<td>n+3</td>
<td>11,245</td>
<td>3.0%</td>
<td>11,236</td>
<td>9.0</td>
<td>265.0</td>
<td>328.0</td>
<td>-319.0</td>
<td>274.0</td>
<td>-68.6%</td>
</tr>
</tbody>
</table>

i. Office demand normally increases three percent per year (a long-term trend).

ii. In Period 2 (n+2) there is a sudden increase in demand of an additional three percent that is unanticipated by the suppliers of office space.

iii. The life of a building is assumed to be 40 years. The longer the time period, the more dramatic the
change in derived demand. For simplicity, assume that replacement is 1/40th of the available supply of the preceding year.

iv. While the supply of office space should lag behind the demand because of the time required to design and construct buildings, under “normal” conditions, the growth rate of three percent is both anticipated and provided by suppliers during the preceding period so that it is available at the time it is required.

The results of the analysis depend upon the assumptions about the rate at which the existing building stock deteriorates (in the example, buildings have a “life” of 40 years), the degree to which suppliers anticipate future demand levels, and the time taken to construct additional office space to meet unforeseen needs. However, it can be seen that a relatively small unexpected change causes dramatic swings in the total demand for the construction of new office buildings. For those architecture firms supplying to this market, such volatility can be amplified even further, producing wide fluctuations in the quantity and price of its own inputs and the level of profitability.

10.9 INDICATORS OF ECONOMIC CONDITIONS

While all areas of economic activity are affected by the general business cycle that is revealed in a series such as the gross national product or national income, some series are found to move in less-than-perfect unison. That is, they may lead or lag the general movement of the reference cycle. Such differences may be due to underlying conditions or variables that have a more profound effect on some components of the economy or cause them to be affected earlier or later than others. Economic indicators or indexes are subdivided into three categories: coincident, leading, and lagging.

Coincident Series

The more aggregated a series, the more likely it will move in phase with the general business cycle (as it is determined by the National Bureau of Economic Research). For example, the total employment and the hours-of-work indexes usually are related although short leads may occur at the peaks and troughs of some parts of the reference cycle. However, as might be expected, the hours-of-work are found to have a slightly longer lead since management generally will reduce the hours worked by its employees (cutting back overtime) before reducing the number of employees. Similarly, in times of expansion, management tends to increase overtime before additional employees are added to the payroll.

Leading Indicators

These indicators tend to reflect series that are a function of long-term decisions and include building construction, industrial materials, industrial durable goods, new incorporations, and business failures.

Construction leads the reference cycle because of the time taken to construct buildings and the effect of the accelerator (described earlier) which causes significant decreases in building construction even when the rate of increase in the demand begins to slow. The effect of overbuilding also can produce an unbalanced cycle, and there is an extreme sensitivity to interest rates because of the large amount of long-term debt used to finance real estate. The construction industry often plays such an important role in lifting the economy out of the trough, that it has been associated with its own cycle.

Lagging Indicators

These indicators lag behind the reference cycle because the underlying decisions are made in an environment that requires knowledge of the current state of the economy. For example, consumer income and spending tend to lag, although they are less pronounced in the post-WWII period. Interest rates also exhibit a tendency to lag because of the contractual nature of interest payments (three months to many years). There also may be a slow adjustment of interest rates in some markets because of government policy or the conservative nature of financial institutions with respect to
economic conditions. However, expectations of future inflation, the inherent uncertainty about future inflation rates during the late 1970s and early 1980s, and deregulation of banks brought greater volatility to interest rates, and any lagging effect(s) now may be difficult to observe.

THE BUILDING INDUSTRY

The building/construction industry (for both residential and nonresidential sectors) represents a significant portion of the total gross national product of the U.S., although it is relatively small compared to personal consumption expenditures. However, if the industries that supply materials, etc., to the building industry are included, its potential impact is very important. For example, in 1990⁶ gross private domestic investment was $741 billion or 13.6% of GNP. Of this investment, 30 percent was for residential investment and 19.8 percent was for nonresidential structures. The role of building construction in national-level employment is similarly important. For 1990, construction employment was 4.7 percent of the total nonagricultural employment; but this does not reflect the full influence of the industry since there are many others employed in construction-related industries such as timber, mining, and manufacturing of building materials.

Unlike many other industries, the building industry has the important characteristics of producing a product which has a long life span and which takes a long period of time to manufacture. These two characteristics combine to produce cycles of some length and severity. The cycles for aggregate construction since 1861 have been between 15 and 20 years long (except for a short cycle of 11 years in 1933-41). The expansion phase typically has been about 12.5 years long and the contraction phase about 4.8 years. It should be noted that some categories of construction exhibit more variation and have different periods, etc. For example, residential construction has fluctuated more than aggregate construction in the period following 1933. Kuznets identified a cycle in the building industry of between 16 and 22 years and explained the cyclical pattern by changes in demographics (migration, etc.) although there is little recent support for immigration occurring in the cycles. However, using the accelerator principle, it is evident that minor changes in population levels can cause dramatic changes in the demand for new housing.

Another factor of importance to the construction industry is the availability of credit. Since most building construction and investment is undertaken with borrowed capital, it is reasonable to expect interest rates and credit availability to play a significant role. With the decline in real estate values in the late 1980s and early 1990s, many savings and loans and commercial banks (which provide the majority of funds for real estate) were forced into insolvency. Lending institutions quickly became very cautious; and in 1991, when interest rates were low and construction should have been stimulated, the reluctance of lenders to supply capital continued to keep construction volume low.

Because of these factors, it is difficult to forecast construction volume well into the future. For example, oversupply conditions, credit availability, and uncertain taxation environments could provide counteracting forces to the stimulating effect of low interest rates (a condition that existed from the end of 1991 to 1993).

10.10 THE IMPACT ON ECONOMIC CONDITIONS ON EMPLOYMENT IN DESIGN FIRMS.

Most firms generally respond to periods of economic downturn by reducing their variable costs to meet the decreased demand for services. In the absence of long-term employment contracts, labor is the primary variable cost for a firm, providing a close correlation between the level of employment and economic conditions. Approaches such as this are applied not only to product-oriented firms but also to service-based firms, including many design firms. It is particularly applicable for those firms whose underlying demand primarily is a function of macro- and regional economic forces. Many architectural design firms fall into this category because of the characteristic nature of the building industry and the highly speculative nature of the real estate development process. However, the fluctuation in architectural employment may precede or lead general economic conditions because of the underlying relationships over time among design, and the underlying demand for architectural design services, including regional factors such as the

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6. Source: Economic Indicators, September, 1991
demand for space, and other factors in the overall economy such as interest rates and economic growth/productivity. Further, because of accelerator-multiplier type effects, these fluctuations are usually magnified and as a result, we have become accustomed to profound variation in the labor market for architects. “Boom-bust” conditions often are accepted as a problem which is inherent in the profession. Unfortunately, it also a problem which is felt most commonly by younger, inexperienced employees.

Considering the impact of economic conditions from a simplistic managerial perspective of controlling variable costs to maximize profitability fails to include the very significant human or personal costs of unemployment which affect individuals, an in the long term, the design profession as a whole. The effect of unemployment on families during periods of recession can be extreme, with substantial deprivation and psychological damage. Fixed obligations such as mortgage payments for a house or car, rent payments, property taxes, and utilities become difficult to meet and are exacerbated by deflation -- a decline in the general level of prices (or a decline in the rate of increase) that is associated with a recession. Foreclosure and bankruptcy can become real threats in a prolonged downturn. Similarly, the difficulty experienced by recent graduates in obtaining employment for the first time is a problem; the frustration and uncertainty may force many to enter other professions or to relocate away from family and friends to more prosperous regions of the country.

The overall effect of the “boom or bust” uncertainty of employment in the design professions cannot be measured or quantified. Firms that expand and contract their employment levels to meet the demand for their services do so to ensure their own survival; but in the long term, even those firms must suffer the consequences of low employee morale, high personnel selection and training costs as well as the costs of “down-sizing,” the fashionable term for firing or laying off.

10.11 IF ALL ELSE FAILS: BANKRUPTCY

If economic conditions become too bad, all but the strongest firms will fail; but even in slight downturns, firms that are overextended can fail. Failure is defined as the inability to meet the obligations to creditors; and creditors may include a variety of parties ranging from the Internal Revenue Service, to banks, to suppliers of materials, etc., and even employees. The signs of impending failure include delaying payments to unsecured creditors and, most often, to the firm’s suppliers of office materials and employees. Once the firm’s creditors begin to demand payment, the reality of bankruptcy begins to emerge. Generally, if a firm does not meet its obligations to creditors, the secured creditors can take court action to seize the buildings and equipment that have served as collateral7 for their loans. The unsecured creditors must sue the firm and will eventually take the remaining assets (bank accounts and other assets) after secured creditors are paid fully, but this is a more lengthy process than for the secured creditors. Under either of these scenarios, the firm is liquidated and forced out of business.

The alternative available to the firm is to seek protection under bankruptcy law. Chapter 7 provides for a firm to liquidate its assets and distribute the proceeds to its creditors. While the firm’s business activities are terminated, the firm is still able to maintain control over the liquidation process than it would have had under the action of its creditors acting separately to recover their debts.

Chapter 11 provides time and opportunity for the firm to recover, reorganize, and restructure itself. The firm is required to develop a repayment plan for the creditors that does not necessarily mean liquidation. The firm can continue to do business and probably will not even have a trustee overseeing the company. All creditor lawsuits and collection actions will be halted as soon as the firm files a petition for Chapter 11 with the bankruptcy court; and the firm has 90 days to develop the repayment plan that meets outstanding obligations for unpaid taxes and secured creditors -- based on the collateral, the current value of the collateral, or the value of the secured debt. While there is no fixed time limit for the repayment of secured creditors, five years is typical. Unpaid or outstanding taxes must be paid within a five-year period as well. The firm must provide for unsecured creditors if they would have received some proceeds if the firm had liq-

7. That is, secured creditors have liens on specific assets
uidated under Chapter 7. The repayment plan is filed with the court, and the secured and unsecured creditors vote separately -- a 51-percent majority must support the plan in each class for it to be adopted. Even if a plan is rejected, if it is fair and equitable, the judge can “cram it down the throats” of the creditors.

Yet another opportunity provided under Chapter 11 is for the termination of “burdensome or unprofitable leases and contracts.” For example, a firm might occupy space that commands a high rent on long-term lease, preventing it from relocating to less costly accommodations. This lease could be terminated and the firm would have no further obligation to the lessor.

Chapter 11 bankruptcy is suited to firms whose operations are sound but subject to a temporary or short-term problem of insufficient cash flow. Chapter 11 provides the necessary time to reorganize and adjust to that problem. For example, a firm may have had a major client default on its bill or had a verdict against it for negligence or personal injury. However, it should be realized that less than 10 percent of small to mid-sized businesses survive Chapter 11; and the court costs and legal fees may be the “last straw,” making recovery impossible.

Finally, it should be realized that there are alternatives to bankruptcy. Good planning, management, and productivity may overcome the short-term problems; investors may be found to provide additional capital or even to buy the firm outright; and informal agreements can be reached with creditors out of court. Whatever happens -- do NOT use the funds from taxes withheld from employees to pay creditors. You are personally liable for these taxes if the business fails.
ARCHITECH INCORPORATED

Allyn Bradley dropped the monthly financial statement for September, 1991, on the desk and pushed her chair back. She looked up to the accountant. "It's that bad. I doubted you last month. I guess we should have let a few go, but I hate to take that step unless it's absolutely necessary." The accountant nodded, "Allyn, the way we're going, it is necessary. Unless we can cut our expenses by at least $35,000 a month, the firm will be broke by Christmas."

Allyn Bradley stood up. "After all our work it comes to this. Where did we go wrong, John?" John Anderson, the accountant, replied thoughtfully, "Well Allyn, you know we never did recover from losing that $250,000 on the Bailey-Stevens account. It drained all of the retained earnings, and we had to borrow to cover our shortfall. Just the interest on that loan itself is $1,000 a month. Then, with the recession, all of our clients either are putting their projects on hold or not paying their bills. We should have seen it coming, I guess, but it came on so quickly."

Allyn nodded and walked over to the window, "Well, let's get together with the others tomorrow morning and see what we can do about layoffs." John Anderson left the room quietly as Allyn began to reflect on recent events in the firm's history.

Architech had been formed in 1979 when three young graduates left a major Midwest architecture/engineering company and started their own firm. One of those founding partners was Allyn Bradley's husband, Peter. Peter Bradley was an engineer who was largely responsible for the unique design approach followed by Architech. Under his leadership and inspiration, the firm developed a style not unlike that of several of the well-known "high tech" firms of the day (for example, Hardy Holtzman Pfeiffer and Piano and Rogers) but applied that approach to everyday commercial and institutional buildings instead of to the high-visibility projects to which the original expressions had been restricted.

Another of the founding partners was Sean Richards, an architect whose primary experience before joining Architech had been working closely with developers of speculative office buildings. Ray Ellis was the third partner. His previous work was in a project-manager capacity in the design of schools. Both architects had previously worked closely with John Bradley, and they had been impressed by his engineering skill and understanding of architecture. Their projects had been personally fulfilling and were the result of ongoing collaborations, so it was difficult to tell where the engineering began and the architecture finished. Before forming Architech, they had continued to work together in the evenings and had entered no fewer than ten national competitions during a two-year period. Finally, their scheme for a city hall and library for a small Midwest town was awarded first prize, and Architech was formed to undertake the commission. By the time the working drawings for the project were 50-percent completed, they had resigned from the A-E firm and were working fifty to sixty hours a week to finish the project and obtain new clients. Allyn Bradley joined the firm at this time as secretary and business manager, her background in marketing being of considerable value as the firm began to grow.

For several years the firm had grown quickly. By 1983 the firm had not only survived the 1981-82 recession but had increased its billings by over 40 percent. Then, in 1984, a Japanese auto manufacturer announced plans to build a major new plant about ten miles south of the city. Bailey-Stevens, one of the largest developers in the region approached Architech to design an industrial part and office complex that adjoined the site of the new plant. By mid-1986, Architech was at the forefront of a regional boom in construction. There were 25 architects, 13 engineers, 18 draftspersons and technical assistants, and 5 secretaries/typists. The firm also had employed an accountant to assist Allyn Bradley, and there was a marketing staff of three people. The firm was confident of future long-term growth, and by the end of 1986 had instituted a profit-sharing plan for any employee with more than three years with the firm. Employees with more than five years were given stock and had the right to vote at shareholder meetings. Future plans included the distribution of more stock to several selected employees, raising them to the status equivalent to junior partner and increasing the firm's billings by at least ten percent every year. The firm also intended to add additional services -- interior design, graphic design, and landscape architecture -- to take advantage of its existing client base and improve the level and quality of its service.
During the next two years, the Bailey-Stevens' work accounted for an ever-increasing share of their market as Bailey-Stevens became involved in residential and retail projects in the region of the auto plant and extended into projects throughout the Midwest. The excitement and difficulties of such high growth caused the firm to concentrate on meeting the immediate demands placed upon it. They tended to ignore the growing size of the Bailey-Stevens accounts and the fact that bills were being paid later and later.

In 1988 Bailey-Stevens was overextended; and one project, consisting of 250 apartments, was terminated in the construction phase. Several of the unpaid subcontractors sued to recover their costs; and within two weeks, many Bailey-Stevens projects were encumbered with mechanics' liens. The developer declared Chapter 11 bankruptcy in an endeavor to restructure the failing business; but as real estate values declined, the firm's lenders became more anxious. They did not accept the restructuring plan, and Bailey-Stevens was bankrupted. After the finished and partially finished projects were sold or taken to meet the primary obligations to secured creditors, there was little left for any others. Architech lost just over $250,000; and over a two-month period, 65 percent of its market had been eliminated.

During the period of growth, Architech had typically invested thirty to forty percent of its profits back into the business so that sufficient funds were available to cover all but $100,000 of the loss. During the period following the collapse of Bailey-Stevens, almost twenty-five percent of the firm's employees were “let go”; and all of those who remained received a 12-percent reduction in salary. Some benefits were also eliminated. During 1988 Allyn Bradley and the marketing team worked very hard to obtain additional clients; and by the end of the year, the firm's condition appeared to have stabilized with the majority of the billings (65%) coming from work for other developers of speculative office buildings.

Through 1989 and 1990, Architech managed to expand slightly, increasing to its current size of 20 architects, 10 engineers, 7 draftspeople/technical assistants, four secretaries and the management/marketing/accounting staff of four people. Then, in 1991, it was apparent that the firm was entering another troubled time as accounts receivable increased, and the backlog of work decreased from 45 days to 14 days.

During the rest of the day, Allyn Bradley and John Anderson prepared exhibits to present to the firm's board of directors. They focused their initial efforts on the southern region (near the auto plant) to see what was occurring there since it seemed to reflect the performance of other areas in which the firm now worked.

Exhibit 1 illustrates demand for total office space in the southern region during the period 1979-1990, and Exhibit 2 shows the firm's market share for the same period. Use this information to develop a forecast for the next two years for the southern region. Typically, a period of at least three years is required from the time the project is started to the time the building is completed and ready for occupation.
### Figure 10.1 Office Space Demand And Supply (000’s Sq. Feet Omitted)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Office Space Demand</th>
<th>Total Office Space Available (after demolitions etc.)</th>
<th>Office Space Completed in Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>9,873</td>
<td>10,216</td>
<td>345</td>
</tr>
<tr>
<td>1980</td>
<td>10,300</td>
<td>10,561</td>
<td>883</td>
</tr>
<tr>
<td>1981</td>
<td>10,620</td>
<td>10,800</td>
<td>316</td>
</tr>
<tr>
<td>1982</td>
<td>11,682</td>
<td>11,167</td>
<td>297</td>
</tr>
<tr>
<td>1983</td>
<td>12,324</td>
<td>11,455</td>
<td>288</td>
</tr>
<tr>
<td>1984</td>
<td>12,910</td>
<td>11,904</td>
<td>493</td>
</tr>
<tr>
<td>1985</td>
<td>13,232</td>
<td>12,391</td>
<td>487</td>
</tr>
<tr>
<td>1986</td>
<td>13,732</td>
<td>12,897</td>
<td>506</td>
</tr>
<tr>
<td>1987</td>
<td>13,978</td>
<td>13,112</td>
<td>464</td>
</tr>
<tr>
<td>1988</td>
<td>13,950</td>
<td>13,576</td>
<td>480</td>
</tr>
<tr>
<td>1989</td>
<td>13,908</td>
<td>13,944</td>
<td>432</td>
</tr>
<tr>
<td>1990</td>
<td>13,436</td>
<td>14,356</td>
<td>312</td>
</tr>
<tr>
<td>to 3rd Qtr. 1991</td>
<td>13,500</td>
<td>14,668</td>
<td>204 (adj. to full year)</td>
</tr>
</tbody>
</table>

### Figure 10.2 Archtech Market Share of Speculative Office Space in the Southern Region (000’s sq. ft. omitted)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Office Space</th>
<th>Speculative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Commissions</td>
<td>Office Work</td>
</tr>
<tr>
<td>1979</td>
<td>425</td>
<td>305</td>
</tr>
<tr>
<td>1980</td>
<td>366</td>
<td>366</td>
</tr>
<tr>
<td>1981</td>
<td>205</td>
<td>156</td>
</tr>
<tr>
<td>1982</td>
<td>307</td>
<td>307</td>
</tr>
<tr>
<td>1983</td>
<td>478</td>
<td>254</td>
</tr>
<tr>
<td>1984</td>
<td>685</td>
<td>435</td>
</tr>
<tr>
<td>1985</td>
<td>566</td>
<td>505</td>
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<tr>
<td>1986</td>
<td>510</td>
<td>510</td>
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<tr>
<td>1987</td>
<td>396</td>
<td>396</td>
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<tr>
<td>1988</td>
<td>402</td>
<td>308</td>
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<tr>
<td>1989</td>
<td>305</td>
<td>305</td>
</tr>
<tr>
<td>1990</td>
<td>195</td>
<td>155</td>
</tr>
<tr>
<td>To 3rd Qtr. 1991</td>
<td>175 (adjusted)</td>
<td>175</td>
</tr>
</tbody>
</table>