

In Defense of Plant Closings

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Abstract

Globalization of markets and technological advancements result in, among other things, closing of uncompetitive plants. This paper defends plant closings. We argue that a plant is not necessarily an unfortunate event; rather, it is another productive assets re-deployment alternative available to managers. Possible causes and shareholder wealth consequences of plant closings are examined. A plant closing valuation model is developed. This is followed by an example which illustrates the method to accurately compute the plant closing value.

Introduction

Plant closing has been a controversial topic during the last decade. It has been viewed as a cause of decline in the social and economic well-being of the people. Plant closing, as a means of assets re-deployment, has come under scrutiny in public and congressional debates.

Much research has been done in the areas of mergers and acquisitions, and sell-offs and spin-offs as means of productive assets re-deployment.(1) Plant closing as an efficient means of restructuring, however, has not received adequate attention in the finance literature.(2)

This paper is in defense of plant closings and advances the argument that plant closings are positive and not negative. Section II presents the economic environment that fosters corporate change. Section III continues with the argument that plant closing is a natural consequence of the firm's desires to continue to be profitable and viable in a changing economic environment, and lists possible effects of plant closings on share prices. Section IV presents a model for evaluating a plant closing value. It explains the model and its application through an example. The conclusion of this paper is presented in Section V.

The Economic Environment and Corporate Change

A firm in the twentieth century operates in a fast changing environment. Managers are involved in a continuous learning process. Vignola (1974, pp. 11-12) argues that "When industry environmental changes affect goals and objectives, it is quite usual for certain activities to no longer fit as well as they once did. The normal consequences of such changes might best be served by divestment."

Continued successful operation of an enterprise is a growing challenge for managers. The survival of a firm or its subsidiary(ies) is determined, among other things, by its ability to anticipate environmental changes and to rapidly restructure and adapt to them. Managers are under

increased pressure to keep costs low by exploiting low cost locations for labor, capital, raw material and other inputs and by achieving economies of scale.

As a result, global competition has had a substantial effect not only upon the enterprises themselves, but also on the regional and national economies in which they operate. Enterprises have been forced to restructure, streamline and rationalize their operations by acquisitions and mergers in areas where they have competitive advantages (see Mueller [1972]); by abandoning and divesting assets that are peripheral to their main activities (see Hite and Owers [1983], Schipper and Smith [1983], and Jain [1985]); and by closing down smaller and less efficient plants (see Lovejoy [1971], Vignola [1974], Harrigan [1980], Casson [1986], and Coyne and Wright [1986, pp. 1-26]).

Financial managers make difficult decisions in an environment that is dynamic, not static. The following list is reflective of the overall trends confronting financial managers in the recent past and today.

- Economic interdependence between nations increased rapidly in the twentieth century as a result of the availability of more efficient means of production and distribution.
- Multilateral reductions in tariff and non-tariff barriers accelerated the process of integration of the world as one market.
- Plant location alternatives expanded for producers, both domestically and internationally.
- Sources of supply multiplied for both producers and consumers as a result of the location alternatives mentioned above.
- Trade in intermediate and semi-finished goods within an industry increased, resulting in increased opportunities to achieve economies of scale at all stages of manufacturing.

- Technological advancement coupled with greater political stability in the post-war era stimulated the transfer of technology through joint ventures and direct foreign investments.
- Global competition and utilization of new technologies resulted in faster replacement of old products and production technologies. (See Casson [1986]).

There is apparently little in plant closings to feel happy about. Plant closings symbolize, at least outwardly, failure and financial and human loss—for managers, employees, stockholders, host communities and other affected parties.(3) It is understandable, except for the managers and consultants involved in the decision of a plant closing, for the affected parties to be unprepared to face and analyze the plant closing process—even though they must, sooner or later, face the reality of the firm's changed economic environment.

If a plant closing were such a bad thing to happen to a firm, its workers, managers, shareholders, host community and others (directly and indirectly related with the activities of the plant), no voluntary plant closing decision would ever be made. The fact that plants are voluntarily closed, in spite of their painful consequences, indicates that firms make decisions in response to changing conditions or to achieve specific goals.

Plant closing is another abandonment alternative like a sell-off or a spin-off. In a changing, dynamic economy something has to be given up before something else can take its place. Plant closings are a natural consequence of age, technological advancements, or competition and are necessary for continued economic advancement. Plant closings, we emphasize, are a natural consequence of changes in the macroeconomic environment—either growth and development or decline and market saturation.

Plant Closing Objectives, Effects, and Decisions

Plant Closing = Failure?

A key assumption is made for this paper—that managers make plant closing decisions for shareholder welfare and that there is no serious agency problem.(4) Blackwell, et al. (1989, p. 2) argue that “In a world with value maximizing managers and without capital rationing, an unanticipated plant closing announcement can convey only bad news... plant closing announcement conveys that the firm has one less profitable operation. This may cause the market to anticipate lower present and future cash flows...” Tsetsekos and Gombola (1990) support this argument with the findings of a negative share price reaction to plant closing announcements.

It is difficult to understand how closing down a plant that is experiencing losses or will soon start incurring losses,

i.e., a plant closed to cut losses—plug a leak, can signal lower present or future cash flows. Logic suggests that the market would be delighted on receipt of the news that a (potentially) unprofitable project will not be a drain on the firm anymore.(5)

Unlike the argument of Blackwell, et al. (1989), Kalra, et al. (1990) argue that plant closing decisions are net present value, NPV, based decisions and unanticipated plant closings should be “good news”; they signal that a firm is taking actions to enhance shareholder wealth. They find that unanticipated plant closing announcements are associated with positive share price reaction.

Richard McKenzie (1985) effectively argues the middle ground. He asserts that plant closings are necessary to allow optimal integration and utilization of resources—management, technology, labor and capital. He argues against overly limiting management's freedom to close plants. He asserts (1985, p. xiv) that “America's future can only be dimmed by less reliance on market process.”

Plant closing should be an NPV decision. If the NPV is zero, then the management is indifferent about the plant. However, if a plant is experiencing continued losses, that is, NPV of continued operations is negative, plant closing is a positive NPV decision. A plant closing caused by decline in the demand may indicate further plant closures in the same product category. Such a closing may indicate “bad news,” but bad news only for the product and not for the entire firm.

A firm survives by expanding and contracting, by investing and divesting, by acquiring and abandoning. These are the actions of a healthy and responsive company and not of a sick and declining one.

Restructuring through divestment of corporate assets can take one of the following forms:

1. **Sell-off:** A sell-off is characterized by the divesting firm exchanging its operating assets for cash, other operating assets, or securities of the acquiring firm.
2. **Spin-off:** A spin-off results in the creation of a new entity through a reduction of assets for the divesting firm. The new entity's shares are distributed among the original shareholders of the parent firm on a pro-rata basis. Alternately, the divesting firm can transfer the shares of an incorporated subsidiary to its shareholders. (An equity-carve-out is included in this category because of its similarities to a spin-off.)
3. **Plant closing:** A plant closing is defined as permanent closure, idling and/or shutdown of productive assets of a plant or a subsidiary, while the parent firm continues to exist and operate more or less in its original form. The firm abandoning the produc-

tive assets receives cash or cash savings by discontinuation of operations. A plant closing may also provide the firm with cash inflows through release of working capital. Unlike spin-offs and sell-offs, where the subsidiary continues to operate under new ownership structure, plant closings result in permanent discontinuation of the activities of the plant. Key technical and managerial talent is released for productive use elsewhere (including within the firm).

Possible Effects of Plant Closing Announcements on Shareholder Wealth

There are three ways in which stock prices can react to a plant closing announcement: (a) decrease, (b) increase, or (c) remain unchanged. A number of factors(6) jointly or separately influence the stock price reaction to plant closing news.

1. Factors Which May Force the Stock Price Downwards:

Information asymmetry between managers and investors may cause a decrease in the share price even when the plant closing decision is a positive NPV decision. If the management is aware of the problems which make the plant closing a positive NPV decision, but the market does not, the announcement of the closing signals to the market that its previous expectations were too high.

The firm is forced by government or courts to close down profitable production operation(s).

2. Factors That May Push the Stock Price Upwards:

The plant closing is announced as a part of a restructuring plan which is expected to increase the cash flows of the firm.

Management at the time of the plant closing announcement reveals more productive uses of the fixed assets and/or human capital released after the plant closing.

The plant in question had been experiencing losses and was not expected to turn profitable in the future. Earnings per share are expected to increase after the closing.

3. Factors That Cause the Stock Prices to Remain Unchanged:

The capital markets are regarded to be informationally efficient. Publicly-held information is considered to be incorporated in stock prices. If a plant closing is anticipated by the stock market and its implications are fully discounted in the stock prices, then a formal official announcement of the plant closing is not expected to significantly affect the stock price.

The plant has contributed little to the firm's overall cash flows and earnings per share are not expected to be adversely affected as a result of the closing.

Plant Closing Decision Variables

A number of factors affect a firm's decisions about opening, continuing, and closing its production operation. There is a significant body of work that provides insight in this area.(7) The brief discussion provided here highlights six possible decision variables: financial goals, assets, management, location, product life cycle, and government action.

1. Financial Goals:

A firm exists to provide to its investors what they cannot do individually—engage in activities that provide a high rate of return on invested capital. Financial considerations, therefore, direct a firm's decisions regarding engaging in or withdrawing from production activities. Some of these goals are listed below.

- Rates of returns—on invested assets.
- Sales, market share and market power.
- Cash flows and capital structure.

2. Real Asset Infrastructure:

Firms employ real assets in production and distribution. Factors that affect the continued operations of a plant follow.

- Plant obsolescence caused by technical progress.
- Highly dedicated machinery that is too costly to re-tool given industry or consumer price sensitivity.
- Smaller plants that are uncompetitive and unprofitable.

3. Management:

Investors appoint managers to maximize shareholder wealth. However, philosophy and work ethics of managers affect the direction of a firm's activities.

- Inefficient management can render a facility uncompetitive.
- Some firms depend on high capacity utilization to make profits. If the demand is not expected to go up, the management may decide to cut losses and close the plant.
- A firm may abandon a particular line of business if the business did not fit within the overall company. This strategic planning approach can lead to rationalization and selective divestment (including plant closures).(8)

- An increase in the diversity of transactions under one management eventually results in diminished marginal productivity of management (Schipper and Smith, 1983). There can be an effort on the part of managers to increase management efficiency (and consequently shareholder wealth) through abandoning (including plant closing) unrelated operating assets.
- The cost of inefficient operations is transferred from management to workers. McKenzie (1982) argues that the management should not be compelled to continue to operate a plant it would rather close. A timely decision to close actually frees workers from additional costs.
- Corporate divestitures offer the most convenient and least expensive way to fix the failure of an acquisition.
- The regulatory or tax environment of a particular plant (or activity) may be too restrictive or costly. Under these circumstances, management may choose to close a plant.

4. Plant Location:

Plant site selection is a strategic decision for a firm. Selection of a plant’s location involves many considerations, such as its proximity to raw-material and/or output markets, and its proximity to the firm’s technical, managerial, legal, or financial centers. Other considerations include the availability of skilled labor, power, water, and transportation facilities as well as legal and regulatory factors, pollution control, housing costs, taxes, and subsidiaries. Changes in the environment may render a plant site undesirable.

5. Product Life Cycle:

A firm’s product portfolio is composed of products that are at various stages of their life cycles—introduction, growth, maturity, and decline. As a product moves from one stage to the next, managers modify production, marketing, distribution and financing strategies to attain maximum value from the product. Depending on the firm’s commitment to a product, forecast of life cycle stage, and industry/market structure, management may have no other option than to permanently close a production facility.

6. Government Action:

Even in a competitive environment, local and central governments and government agencies play an important role in the future of local economies. Government policies have substantial influence on a firm’s decision to establish or shutdown manufacturing facilities.

- Government policies influence various taxes, rebates, low interest rate loans, subsidies, environmental protection laws available/applicable to a

new plant. Since these differ from area to area, companies may move factory sites to increase benefits. Unless established firms receive similar treatment/subsidies, they suffer competitive disadvantages which may force them to close down.

- An inability or unwillingness to conform to environmental and other regulations invites legal action by the enforcement agencies which, in certain situations, may seek a plant closure.

Plant closing decisions, whether perceived as negative or positive, are made frequently given the dynamic nature of the environment in which the firm operates. The model and example presented in the next section provide a method for determining the value of a plant closing at any given point in time.

Plant Closing (Abandonment) Value

A plant closing involves a number of financial considerations and consequences. The value of a plant closing to a firm can best be expressed as the present value of all incremental cash flows associated with the plant closing.(9) In other words, the plant closing value today (t = 0) is the difference between the present value of after-tax cash flows occurring if the plant is closed and the present value of the cash flows from continuing operations.

The Model:

Plant’s Value = Present Value of net operating cash flows + Present Value of cash flows (including tax gains or losses) occurring because of discontinuation, whether voluntary or involuntary, of operations. (1)

Therefore, the value of a plant from continuing operations can be expressed as:

$$\text{Plant Value}_{\text{Continuing Operations}} = \sum_{t=0}^T \text{Present Value (ATCF)} + \sum_{t=0}^T \text{Present Value (WC + MVFA + NVAUA + NVAUM + SP + TG)} \quad (2)$$

and Value of the plant closed at time t:

$$\text{Plant Value}_{\text{Discontinuing Operations}} = \sum_{t=0}^T \text{Present Value (ATCF)} + \sum_{t=0}^T \text{Present Value (WC + MVFA + NVAUA + NVAUM + SP + TG)} \quad (3)$$

Thus, the plant closing value (PCV) is the difference between discontinuing and continuing operations or (3) - (2):

$$\text{PCV} = \sum_{t=0}^T \text{Present Value of incremental (ATCF)} + \sum_{t=0}^T \text{Present Value of Incremental (WC + MVFA + NVAUA + NVAUM + SP + TG)} \quad (4)$$

where,

ATCF = After-tax operating cash flows to the firm from the continued operation of the plant.

WC= Estimated working capital that will be released as a consequence of discontinuation of plant operations.

MVFA = Estimated market value of the fixed assets on disposal. This does not include the value of the fixed assets transferred to alternative uses within the firm.

NVAUA = Estimated net value of assets transferred to alternate use within the firm.

NVAUM = Estimated net value of management and other key personnel transferred to alternative activities within the firm.

SP = Net nonrecurring severance payments—cost of cancelling employee, labor and other contracts; costs on lease cancellations; costs of dismantling and disposal of fixtures, equipment and waste, etc.(10)

TG = Estimated net tax gain (or loss) from voluntary or involuntary plant closing activity.

t = Timing of the cash flows. t can assume any value from zero to infinity.

A Simplified Example:

Let us assume that there is a plant which currently produces \$10,000 after-tax cash flows per year from continuing operations. These cash flows are expected to decline to \$5,000 per year during years 4 through 10 and to \$2,000 per year during years 11 through 20, due to increased competition, availability of substitutes and/or increased operating costs. The plant's economic life is expected to be 20 years. Whether voluntary or involuntary, the plant closing is expected to have the following consequences:

1. ATCF will be lost after the closing.
2. WC of \$20,000, consisting of \$10,000 in the closing year and \$10,000 in the previous year is released from abandonment of operations. The same amount of WC is released regardless of the timing of the discontinuation of operations.
3. Some fixed assets (land, building and equipment) released are sold upon abandonment. The MVFA declines as time to abandonment increases.
4. Some management and key supervisory personnel released can be deployed elsewhere within the organization. It is expected that these personnel will result in a \$4,000 incremental cash flow to the firm from the year after the abandonment until year 15, when they

would typically have retired.

5. Some fixed assets released will be deployed elsewhere within the firm. Because of aging, the replacement value of these assets steadily declines as time to re-deployment increases.
6. A SP will be paid to employees and other stakeholders. This amount will also decline as time to abandonment increases. The increased time available to sever contracts is the reason for the decline in this cost.
7. The firm's marginal tax rate is 40%. The payment of severance pay and other damages, along with the loss on sale of fixed assets will save the firm a tax of 20-30% of the SP.

Four alternative scenarios under consideration are—(1) continue to operate the plant for its economic life, (2) close the plant in year 3, (3) close in year 4, and (4) close in year 5. The cash flows associated with each scenario are presented in Tables 1, 2, 3 and 4 respectively. The last columns of the tables present the total annual cash flows. Risk adjusted required rate of return for this plant is estimated at 15%.

Table 5 presents the "plant closing value" of each voluntary plant closing alternative under consideration.

From Table 1 the plant value from continuing operations, the present value of total cash flows is \$40,488.

From Table 5 the plant closing values (PCV) under the three plant closing cases are:

1. Case II : -\$4,957. 2. Case III: -\$1,713. 3. Case IV : \$3,162.

From the above analysis it follows that closing the plant in year 3 is not optimal. The net loss, in present value terms, from this strategy is \$4,957. The firm may be indifferent about closing the plant in year 4, which results in a net loss of \$1,713. Closing the plant in year 5 is the optimal strategy. The net gain from closing the plant versus continuing to operate is \$3,162.(11)

Conclusion

Managing a firm's productive asset portfolio is difficult and challenging. The macroeconomic environment is continually creating new opportunities and corresponding difficulties. Firms need to continually adapt to the corporate, regional, national and international environments.

The arguments about the nature of plant closings continue. The facts remain, however, that whether negative or positive, plants do close in today's marketplace. Many complex variables influence the plant closing decision process.

The abandonment value of a plant at any time is crucial knowledge for the financial manager. The model developed here provides one method to accurately compute the plant closing value.

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Footnotes

1. See, for example, Boudreaux (1975), Hite and Owers (1983), Kudla and McInish (1983), Miles and Rosenfeld (1983), Schipper and Smith (1983), Alexander, Benson and Kampmeyer (1984), Hearth and Zaima (1984), Rosenfeld (1984), Jain (1985), Zaima and Hearth (1985), and Schipper and Smith (1986).
2. Blackwell, et al. (1991), Kalra, et al. (1990), and Tsetsekos and Gombola (1990) have conducted studies on the effects of plant closings on shareholder wealth. The findings of these studies are briefly discussed later on in this paper.
3. Bluestone and Harrison (1982, p. 67) note the "ripple effects" of divestment. They argue that "...the impact of divestment on individual workers and their families is the correct place to begin any inquiry into the social costs ... mills and department stores or super-market chains shut down ... employees lose salaries and wages, pension and fringe benefits; supplier firms lose contracts; and the various levels of government lose corporate income and commercial property tax revenue. These in turn result in a series of secondary shocks including decreased retail purchases in the community, a reduction in earning at supplier plants, and increased unemployment in other sectors. Finally, these events produce tertiary effects in the form of increased demand for public assistance and social services, reduced personal tax receipts, and eventual layoffs in other industries, including the public sector. What begins as a behind-closed-doors company decision to shut down a particular production facility ends up affecting literally everyone in town, including the butcher, the baker and the candle stick maker. By the time all of these "ripple effects" spread through the economy, workers and families far removed from the original plant closing can be affected, often with dramatic consequences."
4. For agency issues see Jensen and Meckling (1976).
5. Unless market perceives the closing as a precursor of worst things to come.
6. Lovejoy (1971) lists a number of factors that influence share price; some important ones are mentioned here.
7. The discussion presented here draws from the works of, Lovejoy (1971), Vignola (1974), Boudreaux (1975), Business International (1976), Harrigan (1980), Kudla (1980), Lynch (1980), Felston (1981), Bluestone and Harrison (1982), Hite and Owers (1983), Miles and Rosenfeld (1983), Schipper and Smith (1983), Hearth and Zaima (1984), Roe (1984), Jain (1985), Coyne and Wright (1986), Casson (1986), Miske (1986), and Duhaime and Baird (1987) who provide valuable insights into possible causes of plant closings.
8. For discussions on strategic planning and divestments, see Business International (1976), Lynch (1980), and Roe (1984).
9. Shillinglaw (1959) sets forward the definition of abandonment value and Lovejoy (1971) has built a model for estimation of gain or loss from a corporate divestment plan (pp. 184-188). Robicheck and Van Horne (1967, 1969), Dyl and Long (1969) and Joy (1976) develop the abandonment rule for the capital budgeting procedure.

10. Rosen (1988) summarizes the costs to consider in plant closing decisions.
11. We realize that the above example is probably too simplistic. However, the purpose of the example is to explain the model and its application.

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Table 1.

This table presents cash flows to the firm from continued operations.

Case I--Continued Operations								
Year	ATCF	WC	MVFA	NVAUA	SP	NVAUM	TG	TOTAL CF
0	0	0	0	0	0	0	0	0
1	10000	0	0	0	0	0	0	10000
2	10000	0	0	0	0	0	0	10000
3	10000	0	0	0	0	0	0	10000
4	5000	0	0	0	0	0	0	5000
5	5000	0	0	0	0	0	0	5000
6	5000	0	0	0	0	0	0	5000
7	5000	0	0	0	0	0	0	5000
8	5000	0	0	0	0	0	0	5000
9	5000	0	0	0	0	0	0	5000
10	5000	0	0	0	0	0	0	5000
11	2000	0	0	0	0	0	0	2000
12	2000	0	0	0	0	0	0	2000
13	2000	0	0	0	0	0	0	2000
14	2000	0	0	0	0	0	0	2000
15	2000	0	0	0	0	0	0	2000
16	2000	0	0	0	0	0	0	2000
17	2000	0	0	0	0	0	0	2000
18	2000	0	0	0	0	0	0	2000
19	2000	10000	0	0	0	0	0	12000
20	2000	10000	10000	5000	-15000	0	3000	15000

Table 2.

This table presents cash flows to the firm from discontinuing operations in year 3.

Case II--Close the Plant at t=3								
Year	ATCF	WC	MVFA	NVAUA	SP	NVAUM	TG	TOTAL CF
0	0	0	0	0	0	0	0	0
1	10000	0	0	0	0	0	0	10000
2	10000	10000	0	0	0	0	0	20000
3	10000	10000	25000	20000	-100000	0	30000	-5000
4	0	0	0	0	0	4000	0	4000
5	0	0	0	0	0	4000	0	4000
6	0	0	0	0	0	4000	0	4000
7	0	0	0	0	0	4000	0	4000
8	0	0	0	0	0	4000	0	4000
9	0	0	0	0	0	4000	0	4000
10	0	0	0	0	0	4000	0	4000
11	0	0	0	0	0	4000	0	4000
12	0	0	0	0	0	4000	0	4000
13	0	0	0	0	0	4000	0	4000
14	0	0	0	0	0	4000	0	4000
15	0	0	0	0	0	4000	0	4000
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0

Table 3.

This table presents cash flows to the firm from discontinuing operations in year 4.

Case III--Close the Plant at t=4								
Year	ATCF	WC	MVFA	NVAUA	SP	NVAUM	TG	TOTAL CF
0	0	0	0	0	0	0	0	0
1	10000	0	0	0	0	0	0	10000
2	10000	0	0	0	0	0	0	10000
3	10000	10000	0	0	0	0	0	20000
4	5000	10000	22000	19000	-85000	0	24000	-5000
5	0	0	0	0	0	4000	0	4000
6	0	0	0	0	0	4000	0	4000
7	0	0	0	0	0	4000	0	4000
8	0	0	0	0	0	4000	0	4000
9	0	0	0	0	0	4000	0	4000
10	0	0	0	0	0	4000	0	4000
11	0	0	0	0	0	4000	0	4000
12	0	0	0	0	0	4000	0	4000
13	0	0	0	0	0	4000	0	4000
14	0	0	0	0	0	4000	0	4000
15	0	0	0	0	0	4000	0	4000
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0

Table 4.

This table presents cash flows to the firm from discontinuing operations in year 5.

Case IV--Close the Plant at t=5								
Year	ATCF	WC	MVFA	NVAUA	SP	NVAUM	TG	TOTAL CF
0	0	0	0	0	0	0	0	0
1	10000	0	0	0	0	0	0	10000
2	10000	0	0	0	0	0	0	10000
3	10000	0	0	0	0	0	0	10000
4	5000	10000	0	0	0	0	0	15000
5	5000	10000	20000	18000	-70000	0	22500	5500
6	0	0	0	0	0	4000	0	4000
7	0	0	0	0	0	4000	0	4000
8	0	0	0	0	0	4000	0	4000
9	0	0	0	0	0	4000	0	4000
10	0	0	0	0	0	4000	0	4000
11	0	0	0	0	0	4000	0	4000
12	0	0	0	0	0	4000	0	4000
13	0	0	0	0	0	4000	0	4000
14	0	0	0	0	0	4000	0	4000
15	0	0	0	0	0	4000	0	4000
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0

Table 5.

This Table presents total cash flows to the firm from the four alternatives under consideration. Plant closing values of the three voluntary plant closing alternatives are then exhibited.

Year					PLANT CLOSING VALUE		
	(1)* Case I	(2)* Case II	(3)* Case III	(4)* Case IV	Case II (2) - (1)	Case III (3) - (1)	Case IV (4) - (1)
	Total CF	Total CF	Total CF	Total CF	Incremental CF	Incremental CF	Incremental CF
0	0	0	0	0	0	0	0
1	10000	10000	10000	10000	0	0	0
2	10000	20000	10000	10000	10000	0	0
3	10000	-5000	20000	10000	-15000	10000	0
4	5000	4000	-5000	15000	-1000	-10000	10000
5	5000	4000	4000	5500	-1000	-1000	500
6	5000	4000	4000	4000	-1000	-1000	-1000
7	5000	4000	4000	4000	-1000	-1000	-1000
8	5000	4000	4000	4000	-1000	-1000	-1000
9	5000	4000	4000	4000	-1000	-1000	-1000
10	5000	4000	4000	4000	-1000	-1000	-1000
11	2000	4000	4000	4000	2000	2000	2000
12	2000	4000	4000	4000	2000	2000	2000
13	2000	4000	4000	4000	2000	2000	2000
14	2000	4000	4000	4000	2000	2000	2000
15	2000	4000	4000	4000	2000	2000	2000
16	2000	0	0	0	-2000	-2000	-2000
17	2000	0	0	0	-2000	-2000	-2000
18	2000	0	0	0	-2000	-2000	-2000
19	12000	0	0	0	-12000	-12000	-12000
20	15000	0	0	0	-15000	-15000	-15000
					NPV -4957	-1713	3162

* These cash flows are taken from the last columns of Tables 1, 2, 3 and 4 respectively.