11

Firm Transformation and Divesture

11.1   Industry Decline

Many industries follow life cycles that are defined by convention as pioneer, growth, mature and decline. An industry in decline either has negative growth or is not expanding at the general economic growth rate. These industries are typically identified by extreme price competition, excess capacity, a lack of innovation, a dwindling number of competitors and buyouts.

Firms within a declining industry can transition from the mature to the decline stage as a consequence of foreign competition, shifts in consumer behaviour and changes in technology and demographics. Declining revenues, margins, operating cash flows and earnings are all features of the final phase of a firm's existence. Other factors identified with declining firms include commoditized products, diminishing resources or substitutes appearing due to innovation.

Industry decline and falling market demand leads to uncertainty around the sustainability of product demand, which could either stabilize at some significantly lower level, or in the worst case, fade to where operations are no longer justified. Declining demand leads to industry-wide pressure to reduce capacity, as excess capacity diminishes profitability. Reducing capacity has significant costs, as both fixed and sunk costs can be a comparatively large percentage of an industry's total costs. These large sunk costs also create high barriers to exit and prolonged excess capacity in the industry, which can lead to lengthy periods of industry downsizing. Firms in a declining industry are also motivated to reduce investments in products when decreasing sale volumes lower profitability. This leads to a fall in product quality, and ultimately, firms exiting the industry.

11.2   Strategies in Declining Industries

The conventional strategies in declining industries are either to maximize cash flows from existing investments with no further investment or to divest. These strategies can be extended by dominating the market through increased investment, staying at these investment levels, then reducing investments, milking the cash cow, and finally, divesting.

Continuing to invest in the industry through research and development or marketing programmes has significant risks, and requires forecasts of declining product demand. In some cases, a firm can be successful in a turnaround and return to the maturity phase, or reposition itself to take advantage of new market trends. Many firms in a declining industry will, however, ultimately face liquidation. If the future for a firm appears bleak, then the best management alternative may be divesting the business and selling assets before the industry decline gains momentum.

The market for a declining industry's assets is dynamic and can diminish rapidly. A firm would focus on resale asset values to establish potential realized proceeds, and maintain the flexibility to sell before asset values significantly decline. The firm also has value if the assets have the flexibility to switch to operations for other products. Both the industry and a firm's exit barriers are also factors that will influence a firm's decision on the timing of an exit.

11.3   Industry Decline and Transformation

The newspaper industry is inundated with problems. Consumers are switching to other media such as streaming media, Internet news sites and blogs for news, while revenues from classifieds have also declined due to online classified websites. This has led to uncertainty in the industry's growth and future profit margins, with declines of 15–20% in the level of earnings. Many newspapers are shutting down operations as a result.

Attempts at increasing revenue through newspaper price increases have a significant negative influence on circulation, and therefore, the advertising charge rates that flow into revenue. There are growth areas in the newspaper industry, however, which include diversifying into niche newspaper distribution and investments in online media. Newspapers are now offsetting losses from print editions with online editions. A critical issue in this migration is the offset on the loss on revenue from traditional print media with the gains in revenue when a consumer switches to the newspaper's online content.

The Sunset Examiner is a morning newspaper based in a provincial city with a daily circulation of 180,000 on weekdays and 225,000 for a weekend edition. The newspaper is published from an editorial operations centre and printing plant in the provincial city. The publisher of *The Sunset Examiner*, Sunset Inc., is a single business newspaper firm. The circulation area covers the provincial city and surrounding counties. The firm has 1500 employees, over 1000 independent newspaper carriers, and operates on a 15% pre-tax profit margin.

The newspaper had enjoyed a monopoly on local news content for decades, with growth in circulation flowing into profit margins. In the late twentieth century, however, alternative sources of news became available—initially with cable news, and then, with Internet news sites. The newspaper's circulation started to decline as a result. While print advertising revenue had grown through to the end of the twentieth century, advertisers were aware of the declining circulation numbers and growth in advertising and classifieds revenue slowed considerably. By the start of the twenty-first century, the newspaper's advertising revenues from the print edition were declining year-on-year.

Offsetting the decline in revenue was difficult as most of the firm's costs were fixed costs. In an attempt to reverse the declining circulation, Sunset Inc. invested in marketing and redesigns to retain readers. These measures proved to be unsuccessful in reversing the decline in print circulation. Sunset Inc. was successful in establishing an online edition strategy to offset the decline in print revenues.

A firm as a going concern assumes that it will continue operations indefinitely, and firm value is based on this assumption. Managers and investors can, however, consider other values. A firm's liquidation also has value if the firm ceases operations and the assets are sold off. The firm as a going concern is one strategy while selling off the assets is another. Firm value is then either the maximum of the value as a going concern or the value in liquidation.

Sunset Inc.'s management and shareholders examined the value of the newspaper in liquidation while there was still a market for the newspaper's physical assets. The printing plant assets have the potential to be switched into alternative print media such as direct marketing and niche media markets.

A liquidation analysis involves valuing each asset in a sell off. Percentages for assets in liquidation founded on comparable firms are established. The sum of these asset values is netted against the liability redemptions and associated liquidation costs. A positive result provides a maximum value from which the investors' required return is deducted.

Table 11.1 illustrates Sunset Inc.'s liquidation analysis using balance sheet data. Percentages of asset values in liquidation were determined and the net

Table 11.1 Sunset Inc. liquidation analysis ($000)

Assets		Liquidation (%)	Values
Cash	50,000	100%	50,000
Accounts receivable	22,000	72%	15,840
Inventory	2000	55%	1100
	74,000		66,940
Plant & equipment	125,000	54%	67,500
Goodwill	(1000)	0%	–
	198,000		134,440
Liabilities & shareholder equity			
Short-term debt	50,000	100%	(50,000)
Other liabilities	50,000	100%	(50,000)
	100,000		(100,000)
Shareholder equity	100,000	Cost of shutdown	(5000)
	200,000		(105,000)
		Net liquidation value	29,440
		Shares outstanding	3,000,000
		Value per share	9.81

liquidation value calculated. The investors' required rate of return would consider the range in the percentage estimates for the assets in liquidation, the rate at which the firm is consuming cash and the probability of other firms also analysing the value in an acquisition.

The discount-to-book value of $29.4 million in liquidation value compared to the equity of $100 million reflects the value of the firm as a going concern. The book value per share is $33, while the value to investors is $9.81 per share. If the assets take six months to liquidate, then the present value at a 15% internal rate of return is $9.13 per share.

11.4   Investor Valuation of the Abandonment Option

The value to investors in a firm's liquidation can be defined as an option to abandon the firm for its exit value. This option can be valued as an American put on a dividend paying stock, where the stock price is the equivalent to a firm's cash flows and the strike is an uncertain exit value. The value of this option increases along with the firm's exit value. Structural change within an industry may therefore persuade investors to value and even exercise this option. The data in a firm's balance sheet can be used to value the option to abandon the firm for the exit value of its assets.

Berger, Ofck and Swary (BO&S) (1996) present a method for assessing the value of the abandonment option. The following equation defines the rela-

tionship between firm value and those attributes that determine the value of the abandonment option:

$$VALUE = PVCF + P(PVCF,EXIT,SDEV) \qquad (11.1)$$

where,

VALUE = the firm's market value, or market capitalization
PVCF = the firm's present value of expected operating cash flows
P = American put option
EXIT = the firm's assets exit value
SDEV = standard deviation of the PVCF/EXIT ratio

The investors' decision to sell the firm is illustrated by Eq. (11.1), where firm market value is equal to the total of the value of the expected operating cash flows and the abandonment option value. Equation (11.1) can be redefined as a function of the option's parameters, where the value of the abandonment option is expressed as the percentage by which firm value exceeds the PVCF:

$$(VALUE / PVCF - 1) = P(1,EXIT / PVCF,SDEV) \qquad (11.2)$$

The value of the abandonment option is now the percentage by which the value of equity is greater than the after-interest cash flows for a firm as a going concern. There is no closed form solution available for the abandonment option; however, the relationships in Eq. (11.1) can be used to determine the option payoff. This option value is a function of the EXIT/PVCF ratio, which is defined as the excess exit value. The excess exit value in Eq. (11.2) is a put option's stochastic strike with the underlying stock value normalized to one.

The abandonment option value is at-the-money when the excess exit value is equal to one, in which case, a firm's exit value is equal to its expected cash flows. The option moves to in-the-money with an increase in the exit value, and out-of-the-money with an increase in the value of the expected cash flows. There is therefore a positive relationship between a firm's excess value and the value of the abandonment option.

Observable exit values for the assets of firms as going concerns are typically unavailable. The focus, however, is on the relationship between balance sheet data and the value of the abandonment option. BO&S derive estimates for the relationships between the book value of assets and the exit value, and find, on average, exit values of $0.72 on the dollar for receivables, $0.55 for inventory and $0.54 for fixed assets.

BO&S derive the cash flow present value (PVCF) proxy through analysts' earnings forecasts. The use of earnings forecasts instead of cash flows has advantages and disadvantages. Earnings are measured for firms as going concerns, and therefore, a PVCF proxy based on earnings forecasts does not include the value of the abandonment option. Forecasts of distributed cash flows would include the expected cash flows from occurrences outside the going concern assumption such as a firm's exit.

The main disadvantage, however, is that earnings are not the same as cash flows, and therefore, the present value of earnings from a going concern should be modified to arrive at the PVCF as a going concern. These adjustments are required as capital expenditures may not match depreciation and working capital growth is not deducted from earnings. No adjustments are made for changes in the capital structure as these are unknown.

The specification of the PVCF proxy is:

$$PVCF = \sum_{t=1}^{n} \frac{EARN_t}{(1+r)^t} + \sum_{t=n+1}^{10} \frac{EARN_2 * (1+gr)^{t-2}}{(1+r)^t} + \frac{EARN_2 * (1+gr)^9}{(r-tg)}$$

$$* \frac{1}{(1+r)^{10}} - CAPEX\_ADJ - WC\_ADJ$$

(11.3)

where,

$PVCF$ = present value of analysts' forecasted going concern cash flows
$EARN_t$ = the forecast at year t of the analyst's after-interest earnings
r = the expected CAPM (Capital Asset Pricing Model) return
gr = the five-year earnings growth consensus forecast
tg = the terminal growth rate for earnings
n = number of years for the earnings forecast
t = year index
$CAPEX\ ADJUST$ = present value of analysts' earnings forecasts adjustment down for the capital expenditures and depreciation difference
$WC\ ADJUST$ = present value of analysts' earnings forecast adjustment down for working capital growth

The *CAPEX ADJUST* is specified as:

$$CAPEX\ ADJUST = \frac{(CAPEX_0 - DEPN_0)/(r-g)}{EQUITY_0}$$

where,

$CAPEX_0$ = the year 0 capital expenditures
$DEPN_0$ = the year 0 depreciation expense
$EQUITY_0$ = the year 0 market value of equity
g = the growth rate of excess capital expenditures

The *WC ADJUST* is specified as:

$$WC\ ADUST\ =\ \frac{\left(\left[0.5(gr)+0.5(tg)\right]*9.5\left[NETWC_0\right]\right)/r}{EQUITY_0}$$

11.5   An Abandonment Option Case Study

The estimates in Sect. 11.3 provided *The Sunset Examiner*'s exit value. The BO&S dollar book exit value estimates for receivables, inventory and fixed assets were used for each book value component and the book values of debt and payables were deducted. A ratio of one was used for cash and short-term marketable securities in non-inventory current assets. The exit value is therefore equal to the sum of $29.44 million.

The BO&S PVCF equation as specified in Eq. (11.3) has five components. The first is the sum of the analysts' discounted expected earnings forecasts up to two years. The second term represents the sum of the discounted earnings forecasts from three to ten years, based on analysts' long-term five-year earnings growth projections. The third variable is the present value of a perpetuity for earnings greater than ten years, with the assumption of a constant nominal terminal growth rate *(tg)*.

The fourth component deducts an adjustment for the net present value of future capital expenditure after subtracting future depreciation. Earnings forecasts are not cash flows that can be distributed, and growth in earnings usually requires capital investments that are greater than depreciation. BO&S arrive at a value of 12% for the capital expenditure adjustment. The fifth item, the working capital adjustment, is a similar adjustment representing the present value of the growth in working capital. BO&S derive a value of 5.5% for the working capital adjustment.

Table 11.2 illustrates Sunset Inc.'s condensed income statements. The decline in circulation has created a downward trend in net income, while advertising was stable due to Sunset Inc.'s online venture.

Table 11.2 Condensed income statements for Sunset Inc. ($000)

Revenues	2XX1	2XX2	2XX3	2XX4
Advertising	120,000	120,000	120,000	120,000
Circulation	35,000	33,000	32,000	30,000
Total revenue	155,000	153,000	152,000	150,000
Total operating costs	140,000	140,000	140,000	140,000
Net income	15,000	13,000	12,000	10,000

Table 11.3 PVCF earnings projections

Year	First term	df	Second term	gr
2XX5	8,571,429	0.9524	–	1.0200
2XX6	8,163,265	0.9070	–	1.0404
2XX7	–	0.8638	11,056,328	1.0612
2XX8	–	0.8227	11,841,328	1.0824
2XX9	–	0.7835	12,682,062	1.1041
2X10	–	0.7462	13,582,488	1.1262
2X11	–	0.7107	14,546,845	1.1487
2X12	–	0.6768	15,579,671	1.1717
2X13	–	0.6446	16,685,827	1.1951
2X14	–	0.6139	17,870,521	1.2190
2X15	–	0.5847	–	1.2434

Note: The third term in Eq. (11.3) is the perpetuity which is derived as $17,520,119

Table 11.3 illustrates the calculation of the first two terms in Eq. (11.3) using an earnings forecast of $9 million, which is based on a decline in circulation revenues from $30 million to $29 million for 2XX5. The earnings forecast to ten years and perpetuity for earnings from year 11 assume a constant 2% nominal terminal growth rate. The present value of future cash flows is then derived by adjusting the present value of future earnings with the deduction of the present value of future capital expenditures minus future depreciation and working capital growth. A CAPM discount rate of 5% is used for illustration.

The total of the sum for each of the first two terms, $16.7 million and $113.9 million, and the third term perpetuity of $17.5 million results in the unadjusted PVCF of $148.1 million. Deducting the capital expenditure adjustment of $17.8 million and the working capital adjustment of $8.2 million provides an adjusted PVCF of $122.2 million. Table 11.3 illustrates the PVCF earnings projections.

BO&S's research provides results for the variables in the valuation of the abandonment option. The median sample value of the abandonment option is 11.5% with an excess exit value of −0.761. Using the Sunset Inc. example,

the market capitalization value of the firm is $136.2 million and the excess exit value is −0.759. As the exit value of $29.4 million is less than the PVCF of $122.2 million, the value of the abandonment option is out-of-the-money for investors.

The factors that can influence the value of the abandonment option include the degree of specialization in a firm's assets. The option has greater value when the assets are less specialized. Current assets are less specialized than fixed assets, and therefore, provide greater option value, while land is less specialized than other fixed assets and also provides greater option value.

The model in Eq. (11.3) was stressed tested to identify the sensitivity of the model variables. The at-the-money value of the abandonment option was derived by adjusting the advertising revenue forecast, the discount rate and growth rate forecast. The earnings forecast for 2XX5 was adjusted down to $2.2 million based on a decline in 2XX5 advertising revenues of approximately 5.7%. The discount rate was increased to 8% and the growth forecast lowered to minus 1%.

Table 11.4 illustrates the calculation of the stressed test first two terms in Eq. (11.3) using an earnings forecast of $2.2 million, the 8% discount rate and growth forecast of minus 1%. The sum of the first two terms, $3.9 million and $27.4 million, and the third term perpetuity of $4.3 million resulted in an unadjusted PVCF of $35.6 million. Subtracting the $4.3 million capital expenditure adjustment and $2 million working capital adjustment resulted in an adjusted PVCF of $29.4 million. As the exit value is $29.4 million, the stressed abandonment option is therefore at-the-money. The PVCF was found to be most sensitive to declines in advertising revenue, and therefore had a significant influence on the value of the abandonment option.

Table 11.4 At-the-money abandonment option PVCF earnings projections

Year	First term	df	Second term	gr
1	2,027,778	0.9259	–	0.9900
2	1,877,572	0.8573	–	0.9801
3	–	0.7938	2,676,831	0.9703
4	–	0.7350	2,862,068	0.9606
5	–	0.6806	3,060,123	0.9510
6	–	0.6302	3,271,883	0.9415
7	–	0.5835	3,498,298	0.9321
8	–	0.5403	3,740,380	0.9227
9	–	0.5002	3,999,214	0.9135
10	–	0.4632	4,275,960	0.9044
11	–	0.4289	–	0.8953

Note: The third term perpetuity value from Eq. (11.3) is $4,319,151

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