Allocating Capital Within a Firm

Prakash Deo

University of Houston-Downtown

A firm must direct its resources where it can capitalize on market opportunities that offer the maximum long-term returns for its shareholders. The officers of a corporation and the board of directors cannot possibly evaluate the merits of each project, which would require a myriad of data from the business case for each project. By and large, the current literature is concerned less with managerial issues associated with resource allocation or capital budgeting at the firm level than with project oriented decision about resource allocation/capital budgeting. This article is an attempt to define in practical terms the issues of resource allocation and specifically capital budgeting at the business unit and the firm level.

Keywords: *Capital, shareholder value, operating return on assets, free cash flow, change in internal cash, capital intensity, operating margin.*

INTRODUCTION

Capital is a corporate resource which is made available and utilized based on profitable operations and growth in strategically important and attractive markets. In order to increase shareholder value, a firm must invest its resources where they will increase the most shareholder value of the firm, so that the firm can capitalize on market opportunities that offer the right long-range returns. The finance literature primarily addresses the issue of capital allocation via extensive discussions on project selection utilizing financial techniques such as net present value, internal rate of return, and other measures, which are calculated for individual projects within a business unit or a division of a firm. But, by and large, finance literature is concerned less with managerial issues associated with resource allocation/capital budgeting at the firm level than with project oriented decision about resource allocation commonly known as capital budgeting. That is to say, top down management of allocation/capital budgeting has been ignored in favor of studies of bottom-up management. This article is an attempt to define in practical terms the issues of resource allocation, and specifically capital budgeting at the business unit (BU) and the firm level.

A firm engages in hundreds if not thousands of projects each year. The officers of a corporation and the board of directors cannot possibly evaluate the merits of each project, which requires a myriad of data to perform a business case for each project. Typically, mid-size and large size firms are organized into business units where each business unit has a clear product and customer focus, a well-defined mission to

serve customer needs and a set of clearly identified competitors. Each business unit has clear accountability for results and own profit and loss statement. Therefore, it is able to direct the resources and activities that it needs to succeed. Our methodology treats each business unit/division as single business case for forward-looking resource decisions. Therefore, only limited aggregate data at the business and not at the project level is required. Of course, we assume that the business unit/division has in place a rigorous business case process for individual +project selection. In addition, our proposed forward looking view for decision making essentially deemphasizes momentum or pre-plan value, which mimics an approach similar to zero budgeting.

I. Literature Review

Most research work and textbooks focus on the capital budgeting tools for project selection. Extensive review articles (Gitman and Forrester, 1987, Kim and Farragher, 1981, Klammer, 1972) identify that researchers have focused on following aspects of capital budgeting decisions at the project level: acquisitions or abandonment (Robichek and Van Horne, 1967, Schwab and Luszig, 1969), modernization versus replacement of long-term assets (Scapens and Sale, 1981). Ryan and Ryan (2002) conducted a survey of the capital budgeting practices of the Fortune 100 companies. They conclude that discounted capital budgeting techniques are generally preferred over non-discounted techniques, and the net present value (NPV) is the most frequently cited capital budgeting tool of choice, followed closely by internal rate of return (IRR). Researchers have also focused on other aspects of capital budgeting. For instance, Baker, Dutta, and Saadi (2001) also conducted a survey of Canadian firms to learn whether they use real options and why firms do not use them. They claim that contrary to optimistic prediction; the use of real options is limited. A session at the 2010 Financial Management Association conference (Journal of Applied Finance Roundtable Discussion, 2010 Financial Management Association International European Meeting, Hamburg, German, published in Journal of Applied Finance, 2011, Volume 21, No.1. p 30 -38.) focused on various aspects of total risk in capital budgeting. Chen, Conover and Kensinger (2002) argue that a proven way to increase shareholders' wealth is to find investment opportunities that beat the market, and reducing resources committed in activities that lack competitive advantage can enhance value. They also point out that at 3M Corporation, the business unit heads are rewarded for revenue growth derived from new products. Chan, Martin, and Kensinger (1990) suggests that the capital market is discriminating in its response to capital expenditures. Michael porter (1985) offers the linkage between economic theory and business strategy. He argues that management should attain sustainable competitive advantage via directing resources towards production of goods and services at lower cost than their competition or differentiate their products to command premium prices. Weaver (2011) has summarized the panel session highlights from the 2010 FMA annual meeting related to capital budgeting procedures, policy, and practices. The session participants discussed the practical aspects of managing a capital expenditure program including the capital investment planning, project or capital evaluation, and post completion reviews. The capital project evaluation phase was the main focus of that discussion. Copeland (2002) points out that capital budgeting methodology is changing and recommends that academicians should devote more time to the capital budgeting process. In summary, the finance literature is concerned less with financial management issues associated with capital budgeting at the firm level than with project – level selection decisions. This article is an attempt to define in practical terms the issues of resource allocation and specifically capital budgeting at the business unit and the firm level.

II. Setting Financial Objectives for Resource Allocation

First, we discuss the need for financial objectives, recommend specific objectives and then derive a methodology that utilizes these objectives to devise a new stepped resource allocation process. Capital expenditures are intended to increase production, to improve productivity, or to reduce costs. Each of these improvements is expected to improve profitability, via increase in growth rates and/or market share. Deo (2013) has reiterated that growth is an example of strategic and financial objectives because the growth may include a percentage growth in sales or market share or both. During hard economic times, a firm may need to withdraw from indefensible positions, lower its planned growth or experience a negative

growth and focus on lowering of operating costs to maintain profit margins. Managers of a firm strive to achieve the over-arching goal of shareholder value maximization through the firm's current and expected performance. This task is accomplished through setting financial objectives and then meeting or exceeding them in both short- and long-term. However, the complexity of a business leads to an organization structure that generally includes more than one performance measurement systems such as (1) cost centers, (2) revenue centers, (3) profit centers, (4) investment centers, and (5) expense centers. This, in turn, leads to a constellation of strategic and financial objectives—a consistent set of key drivers of shareholder value. A firm's financial goals and objectives are taken seriously by investors and managers only if it can demonstrated that steady, meaningful progress is being made toward objectives or targets hat are achievable in the foreseeable future.

III. A. Short- and Long-term objectives

Long-term objectives generally represent the performance typical of the best in class or top 25% of competitors in entity-specific industry segments. This group also incorporates parameters unique to a firm's business units such as functional responsibility, vertical integration, and capital intensity. Long-term objectives reflect a steady-state economic and market outlook and are not as sensitive to future economic conditions or current business unit and market performance. Long-term financial objectives offer a standard of excellence that a firm's business units should strive to meet generally within five years. Although the objectives should reflect the characteristics of the business unit and its industry segment on a long-term sustainable basis, they might not explicitly account for temporal or cyclical changes in the business unit or market segment.

Unlike steady-state objectives, short-term targets are sensitive to current performance levels and significant economic uncertainty. In developing these targets, specific attention should be given to short-term spikes and accounting changes, such as any recent write-down of assets. In addition, short-term targets should reflect major corporate developments and the entrance into new markets. Major programs should also be identified separately in the business plan. The year-over-year improvements reflected in the short-term targets must be achievable and necessary to meet leadership and shareholder expectations over their five-year planning horizon. Therefore, a firm faces the balancing act of ensuring that the entity-level short-term targets have a definitive track that leads to achieving long-term targets. The long-term financial objectives and current financial results help to derive the short-term targets.

III. B. Identification of Specific Entity and Business Unit Objectives

Deo (2010) recommends long-term objectives of revenue growth, return on invested capital, and the total shareholder value. The shareholder value is defined as the discounted value of the free cash flow less debt. Likewise, the short-term externally communicated objectives are revenue growth and one-year return on invested capital or economic value added (EVA). The business unit short- and long-term objectives are the same as the entity level objectives. The business unit chief financial officer (CFO) who conducts the monthly book closings and results with the business unit chief needs to evaluate the performance of the return on invested capital and EVA. The financial objectives for the rest of the business unit (operational) employees, who make the majority of the corporation, are derived from decomposition of the return on invested capital and EVA objectives—objectives that could amount to simple accounting measures. These objectives include revenue growth, operating return on assets, operating return on sales, and asset turnover. That is, while the business unit CFO and chief monitors the return on invested capital, EVA or shareholder value for the business unit, the operational employees are shielded from the technical jargon of calculating these somewhat complex financial and economic measures, which include various accounting adjustments. Most finance textbooks discuss the strengths and weaknesses of these accounting measures and the DuPont decomposition of operating return on assets into operating return on sales and asset turnover. These business unit employees are equally if no more focused on operational drivers specific to their functional areas, such as marketing, sales, product management, human resources, legal, customer support, production and delivery. Some of the associated metrics are quality, Market share, customer churn, customer satisfaction, cycle time, and other

performance measures related to production and delivery. Although the criticism of accounting measures is a common knowledge, these measures have their own benefits. They are simple to use and are routinely reported and reviewed during the monthly book close process. These measures are reported externally on a quarterly and annual basis consistent with GAAP. As such, the business unit accounting teams, which conduct the monthly book closings and results review with the business unit operational teams for each of the functional areas, usually evaluate the performance of these simple accounting measures and routinely report it. Understanding the value drivers for each business unit and their impact on the total and incremental plan values certainly helps to firm up the objectives and provides a sanity check to ensure the desired shareholder value creation. We proceed to discuss the framework for resource allocation within a firm.

III. C. The Framework for Decision Making

The framework for resource allocation should meet the dual, i.e. corporate and business unit/division perspectives of the firm's executives. The procedure should be designed to provide relevant information to senior executives, who will make decisions based upon their judgement and intuition of perceived tradeoffs. This strategically-based framework for resource decisions will assume that a market and product/services are defined for each existing business unit. In addition, it assumes that along with industry fundamentals like (1) industry attractiveness and the business unit's (2) competitive position, (3) strategy, (4) profiles/roles and, (5) its financial targets are delineated and encompassed in a BU business plans. In a nutshell, our methodology embodies several steps to ascertain appropriateness of resources requested. The business unit plan assessment compares the resource reinvestment rate in the plan with its competitor-analog-determined objective (step 1), and with the business unit revenue growth rates - both the plan and objective (step 2). Next, at the corporate level resource affordability contrasts cash flow representing all business units/divisions' resource requirements with its objective and constraint such as cash neutrality or minimum desired cash position (step 3). Finally, resource efficacy introduces shareholder value created by the plan and attempts to measure change in value associated per resource, viewing the ensemble of all business units and divisions (step 4). These four broad assessments form the basis of a framework for resource decisions. The methodology also suggests a variety of screens or tests for resource efficiency that could aid resource alignment, but is centered about the concept of treating the business unit business plan as one business case. All decisions are to be based on a lattice of different methodologies and tools, primarily judgmental. In summary, we propose a framework for resource alignment/allocation decisions, which (1) emphasizes senior executive judgement, (2) is applicable to the prevailing or current business plans, (3) incorporates a strategic as well as financial perspective, and (4) utilizes a minimum set of relevant available data bat business unit/division level only. Of course, to achieve the end goal of shareholder maximization, the executives first need to jointly concur on guiding principles and the recommended practices for resource alignment/allocation. Any suggested framework faces some key challenges: (1) The executives need to realize that a compelling need exists for a disciplined resource planning framework to ensure that the firm's shareholder value is maximized, especially when resources are scare and/or constrained, (2) Resource alignment/allocation must be introduced as a part of the firm's strategic/business planning/budgeting guidelines, and (3) Resource alignment/allocation should be viewed as disciplined procedure to provide relevant information to executives who will make decisions based on their judgment of perceived tradeoffs among resource utilization alternatives. Some guiding principles for such a resource allocation process are: (1) Resource alignment/allocation results from both a balancing of competing demands from business units/divisions and the need to execute the overall corporate strategy, (2) Resources should be allocated with full recognition of an approved business unit strategy and business unit profile/role, (3) Resource allocation is not just a matter of budgeting; it is a matter of industry positioning, (4) Resources should be allocated with explicit recognition of (a) long-term as well as short-term consequences, (b) market position, and (c) business unit performance, both past and projected, and finally (5) Resource decisions should achieve management consensus around shareholder value-creating strategies but utilize a matrix of other methodologies. How to do we make resource decision utilizing such a framework? Decisions are to be

based on a matrix of different methodologies, including judgment, shareholder value, financial objectives, historical performance, and business plan assessment. The business unit resource requirements, emanating from BU/industry potential to create value, are "assessed for appropriateness" relative to strategy, business unit profit/role, and planned realization of creation of value in the business plan by four techniques: (1) reinvestment plan values versus financial objectives (operating return on assets, operating cash return on assets), (2) reinvestment rate versus revenue growth rate, (3) resource affordability (consolidated cash flow objective or funding constraint), and (4) resource efficacy or marginal resource contributions to shareholder value. Of the four stages in conceptual planning framework, including the four resource alignment assessments, the first two techniques are applicable to individual BUs and the last two assessments to ensemble of all business units, i.e. the entire firm.

IV. A. Business Units/Divisions Profiles from Business Unit business plans

In order to support a resource allocation process which knowledgeably chooses to align scare resources among business opportunities, each business unit/division is classified into one of four DuPont-like profile categories. The business unit classification is based on comparative assessment of business unit and its market, which includes market attractiveness, competitive position and business risk. Note that the business unit and the market it serves also yield business strategy appropriate to overall firm strategy, business unit role and its financial objectives, which are discussed in the sections to follow. We create four Business Unit profiles/categories for BU classification. We define these categories as follows:

Category I – Desirable profitability /growth in attractive market and established business

These business units are characterized by strong market position, generally demonstrated by high market share, in an attractive or high growth market, with desirable profitability.

Category II – Startup: Embryonic business

These business units are either new entrants in an established high growth market or leaders in creating a new high growth market.

Category III – Cash generator in low growth/investment market

These business units are usually sustaining their position in a stable or declining market, while generating cash.

Category IV – Turnaround: Diminishing business or not in category I to III

These are business units that are financially or strategically weak. They fail to meet categories I, II, or III criteria. That is, are generally characterized by failure to achieve planned performance, weak market position, and/or cash flow. They require close attention to determine if re-direction can improve he likelihood of achieving satisfactory long term performance. We proceed to classify the BUs into these defined categories/profiles.

IV. A. 1. Business unit classification into profiles

Business unit classification into profiles is based on market attractiveness, business strength relative to competitors and business risk – industry fundamentals with the potential to create shareowner value. We select several measurable parameters: market growth rate, capital or resource intensity (capital expenditures to revenue ratio), cash flow return on assets measured by free cash flow divided by assets (FCF/A), and finally operating return on assets (ORA). The BU and firm data from the current end-of-the year view of the 5-year plan, and the outlook for the current year are used as the sources of data to measure the current year performance.

TABLE 1 PANEL 1

ASSESSMENT OF BUSINESS UNITS

BU	Current revenue Growth Rate (%)		Capital Intensity (%)	Current Year Ratios (%)	
	Industry/Market	BU		(FCF/A)	ORA
A	7.0	5.5	15.9	14.7	20.5
B	6.1	6.1	6.6	3.6	13.5
C	6.0	9.4	4.5	63.3	63.8
D	6.0	6.5	4.8	(45.8)	(62.8)
E	9.0	7.9	12.2	(24.0)	(27.0)

TABLE 1 PANEL 2

APPRAISAL OF BUSINESS UNITS

BU	ANALYSIS				ASSESSMENT		APPRAISAL		
	Growth	Capital intensity	Cash flow ratio (FCF/A)	Operating return on assets	Market Characterization	Category (Cat.)/ BU Profile	BU Strategic Importance	BU Classification	BU Strategic Thrust
A	Low	High	High	Medium	Attractive: Stable, profitable, cash-generating	Cat. I, Desirable Business	High	Full Support	Sustain
B	Low	Low	Medium	High	Attractive, Stable	Cat. III, Low Investment	High/Med.	Full Support	Sustain Domestic Mkts., and grow in New Mkts.
C	High	Low	Low	High	Attractive, High Growth	Cat. II Start Up	High/Med.	Full Support	Become profitable, Attain critical mass. Grow
D	Low	Low	Low	Low	Unattractive, Low growth	Cat. IV Turnaround	Low	Critical review	Restructure/ Divest
E	Low	High	Low	Low	Unattractive, Capital Intensive	Cat. IV. Turnaround	High/Med	Critical review	Limit portfolio; Constraint growth to internal demand

As shown in the Panel 1 of Table 1, we have performed an assessment of each of the five business units designated as "A" through "E." Additionally, as shown in Panel 2, Table 1, we have also conducted our appraisal. That is, we utilize the business units' assessments and their strategic importance for business unit classification and identify individual BU strategic thrust.

IV. A. 2. Step 1: Framework for Decision Making: **Comparative Assessment of Business unit Plan and Objectives for reinvestment and revenue growth rates, and Step 2: Comparative Assessment of reinvestment versus revenue growth rates in Business unit Plan and its Objectives**

Since both steps 1 and 2 are closely linked with each other, we discuss these two steps together to unravel their interconnections, and achieve our goal of effective alignment of resource allocation. First, we compare a business unit's reinvestment rate in the plan with its set objective. Next we perform similar comparison for the revenue growth rate. Finally, we compare the plan and objective reinvestment rates with the corresponding revenue growth rates. Our intent is to understand BU resource

alignment/appropriateness, and make specific recommendation for each BU capital spending or the reinvestment rate, and for the revenue growth rate.

The profitability and cash flows are generally measured by operating income and free cash flow. The difference between the book income and the free cash flow represents the resources the firm reinvests in assets of the company, such as property, plant and equipment, inventory and receivables. When the operating income and free cash flow are normalized by average assets, they lead to operating return on assets and free cash flow on assets. The difference between these two measures is the reinvestment in the business expressed as percentage of assets, and is known as the reinvestment rate. The reinvestment rate also signifies the rate of growth of the asset base. High growth businesses typically display high reinvestment rates, i.e., their cash flow returns are lower than income returns, while cash cows and shrinking businesses exhibit low or negative reinvestment rates, i.e., the cash flow returns are close to or exceed operating income returns.

FCF = Operating Income – Reinvestment, where

FCF is the free cash flow, and Reinvestment equals capital expenditures less depreciation plus new working capital requirements.

Dividing both sides by average assets, we get

FCA = ORA – Reinvestment Rate, where,

FCA is the free cash flow return on assets, i.e. FCF expressed as percentage of average assets. The ORA is the operating return on assets, or ORA = Operating income after-taxes expressed as percentage of average assets.

Reinvestment rate = (Capital expenditures - Depreciation +

Net Working Capital Requirements)/Average Assets.

The primary drivers of reinvestment rate are the revenue growth rate and capital or plant intensity of the business. For instance, the higher the growth rate, the higher the capital expenditure requirements. In a steady-state the capital expenditure rate net of depreciation represents the net investment growth rate. The revenue growth rate is also a main driver of working net working capital requirements as higher volumes lead to higher inventories, receivables and payables. The higher the plant intensity of the business, the higher the capital expenditure rate. Some businesses are inherently capital intensive. Finally,

Annual objective reinvestment rate = Annual objective ORA – Annual objective FCA.

First, we compare the annual reinvestment rate in the plan to its annual objective. For instance, if for the next year the objective reinvestment rate is 6.9% and the plan reinvestment rate is 8.9%, then the business unit needs to curtail the reinvestment rate by 2.0% percentage points via reduction the capital spending by a specific dollar amount, which can be calculated using the financial data. Second, we compare the annual revenue growth rate in the plan to the annual objective reinvestment rate. For example, if the plan revenue growth rate is 3.1% then the critical reinvestment rate corresponding to this revenue growth rate is 4.9%. However, if the objective reinvestment rate is 6.9%, then it implies an additional reduction in the reinvestment rate of 2.0% (6.9% less 4.9%) percentage points achievable through capital spending cuts of a specific amount of dollars using the financial data. This is summarized in Table 2 Panels 1 and 2.

So far, in steps 1 and 2 we have accomplished the analysis at the BU level with a proposed total capital cuts of $1.1B, and now proceed to perform step 3 at the firm/corporate level.

III. A. 2. Step 3: Framework for Decision Making: Corporate Resource Affordability

We identify the firm's cash surplus/shortfall relative to revenue growth. From a cash perspective, the treasury department within a firm usually sets an objective for the change in internal cash, where the change in internal cash equals free cash flow less dividends paid. That is, it excludes any external financing from interest-bearing debt, preferred stock and common stock. A zero or no change in internal cash implies that the firm is generating just enough cash to meet its various obligations (capital requirements, interest, taxes and dividends) without assuming additional debt or new equity and without drawing on the pool of funds. A positive change in internal cash allows a firm to improve its capital structure via reduction in preferred equity and debt. In continuation of our example, the firm's objective for the forthcoming year is zero or a no change in internal cash, and the projected change in internal cash in the plan is $ (1.5) B, resulting in a potential shortfall of $1.5B in cash. We have already recommended total capital cuts of $1.1B for the upcoming year based on reinvestment rate and revenue growth. Then from the firm's affordability perspective at the consolidated level, the firm needs to cut its capital expenditures further by $0.4B.

TABLE 2 PANEL 1

BU	BU Strategic Thrust	Net Reinvestment (Projection for Next Year)		Next Year's Projected Cut in Capital expenditures
		Objective	BU's request/submission for capital requirement in plan	
A	Sustain	6.9% or $1, 075	8.9% or $1, 365	2% or $290M
B	Sustain Domestic Mkts., and grow in New Mkts.	$160	$140	$(20)
C	Become profitable, Attain critical mass. Grow	$(145)	$85	$230
D	Restructure/ Divest	$20	$ (20)	$(40)
E	Limit portfolio; Constraint growth to internal demand (includes cost centers, eliminations, adjustments etc.)	$960	$1,340	$380
Total		$2,070	$2,910	$840

TABLE 2 PANEL 2

BU	BU Strategic Thrust	Revenue Growth			Next Yr. Capital Cuts	Total Cuts in Capital Requirements (From Panel 1 and 2)
		Objective	Current view of the plan			
			Next Year	Next 5 years		
A	Sustain	5.5%	3.0%	4.0%	$280	$570
B	Sustain Domestic Mkts., and grow in New Mkts.	4.8%	4.8%	5.0%	-	**$(20)**
C	Become profitable, Attain critical mass. Grow	1.2%	2.6%	6.7%	-	**$230**
D	Restructure/ Divest	6.5%	2.4%	6.7%	-	**$(40)**
E	Limit portfolio; Constraint growth to internal demand (includes cost centers, eliminations, adjustments etc.)	(3.8)%	1.2%	8.0%	-	$380
Total						$1,100

A. 2. Step 4: Framework for Decision Making: Resource Efficacy

A. Resource Allocation Methodology & Assumptions Underlying Shareholder Value Assessment

In this step we focus on efficient deployment of scare resources subject to maximizing shareholder returns on investments and overall value of the firm. In turn, this will also help to achieve increase in asset utilization and resolve the claims on the firm's limited cash resources. The categorization of BU profiles and the first two steps of comparison of the plan and objective reinvestment rates and revenue growth rates assure competitor-analog-based appropriateness of additional resources invested for each business unit. However, only comparative assessment of each business unit's value contribution per resource requirement will satisfy value maximization and affordability constraints among all business units simultaneously. As shown in Table 3, the first step in this business unit resource efficacy procedure will compare the business unit resource requirements over the planning horizon with the corresponding benefits in revenue growth, and identify the associated risks and incremental profitability.

TABLE 3
RESOURCE EFFICACY

Business Unit	Mkt. Characterization	BU Strategic Thrust	INPUT Capital Expenditures ($ Million)		OUTPUT		
			Plan	Objective	Plan Years		Associated Risk
					Revenue Growth	Return on Sales Range	
A	Attractive: Stable, profitable, cash-generating	Sustain	$3, 500	$2, 800	5.5%	16.5% - 15.0%	Low
B	Attractive, Stable	Sustain Domestic Mkts., and grow in New Mkts	410	440	6.1%	8.9% - 11.1%	Low
C	Attractive, High Growth	Become profitable, Attain critical mass. Grow	315	100	9.4%	(7.5)% - 11.1%	Medium
D	Unattractive, Low growth	Restructure/ Divest	105	90	6.5%	(18.5)% -5.4%	High
E	Unattractive, Capital Intensive	Limit portfolio; Constraint growth to internal demand (includes cost centers, eliminations, adjustments etc.)	180	225	7.9%	(20.2)%- 6.3%	High

This identification of revenue growths, return on sales, and the associated risks pave the path to the next step of resource efficacy analysis, where we address the issue of incremental value derived from the added resources and compare the corporate/firm expectations with the market expectations.

B. Resource Efficacy Analysis

We assume that our objective is (1) the deployment of resources among business units to maximize shareholder value of the firm, and (2) resource allocation is performed at corporate/firm headquarters to determine deployment across business units and divisions. We do not address resource allocation within a business unit as it will require a myriad of project specific data. The firm/corporate head office receives and can effectively manage limited business unit data at the aggregate level. Under these circumstances, the business unit is treated as essentially a single business case, and it is forward looking as we attempt to remove momentum or pre-plan value.

We start with input/output table, which displays each business unit's market characterization and strategic thrust from the earlier steps. The input is in the form of a resource expenditures or capital expenditures in plan as well as objective values. The outputs are in the form of revenue growth, profitability or return on sales, and associated risk. Again, in this step we are taking the ensemble of business units and not singly as in previous steps, and then comparing input/output "ratios" for business units with maximum contribution.

To that end, we introduce shareholder value contribution including the total value and value created in the plan. We identify the shareholder value associated solely with revenue growth and with the cost structure improvements. Next, we assess the role of capital as driving force for each business unit. Finally, "shareholder value created per added resource" is recommended as a vital tool for value-added resource alignment. Shareholder value is a metric that measures in dollars the impacts of contemplate management actions and long-term strategies as embodied in five-year business plan. Equity investors earn returns in form of dividends and price appreciation. While the stock price is security market's estimate of present value of expected future stream of cash flows, the shareholder value is the discounted sum of same shareholder cash flows, but based on internal financial projections. We assume that over the long run, shareholder value is a surrogate for stock price. The cash flow valuation supplements or replaces accounting-based measures like return on assets and earnings per share, which are focused on near-term profitability, ignore time-value of money and risk. The shareholder value may be expressed as the discounted sum of free cash flows plus the cash reserves (which is the total firm value) less the market value of debt. The free cash flows represent the cash available to compensate debtholders and shareholders, and therefore are relevant for estimation of total firm and subsequently shareholder values. The annual free cash flow is defined as follows:

Free cash flow = [(sales in prior Years) X (1+sales growth rate) (operating profit margin) x (1 – cash income tax rate)] – [incremental fixed or long-term capital plus working capital investments]. For the 5-year planning horizon, the free cash flows are estimated from the strategic business plan projection. For the post-planning period, we assume that the company's earnings have stabilized and the incremental investor capital earns only the cost of capital. For valuation, this post-planning period perpetuity assumption is equivalent to assuming that the free cash flow for any year beyond the planning horizon is equal to the operating income at the end of the planning period. The total shareholder value can also be parsed into pre-plan value and value attributable to the plan. In the simplest case, the pre-plan value may be estimated by making the perpetuity assumption as of now or the present time-period. The pre-plan value reflects the cash flows associated with a baseline view of the business representing today's operational efficiencies (operating margin, cost structure, and asset utilization ratios) and today's business volume. The perpetuity assumption for post-planning

period cash flows serve as a good approximation, specifically for stable and mature businesses. However, in a business with rapidly changing technology and short-product life cycles, it is not easy to construct a baseline view that is viable but distinctly different from a planning view. For such cases, the assumptions of growth perpetuity or a combination of growth followed by a no-growth perpetuity in cash flows may be more appropriate. Once again, the analyst's judgment plays an important role in calculating the pre-plan value of the business. In analyzing the marginal contributions to the shareholder value from the operational factors or value drivers, we express the shareholder value as a function of revenue growth (R), operating margin (M), capital investment **(I)**, and financial assumptions (A), where each of these parameters is time vector:

Shareholder Value= *F(R, M, **I,*** A).

The total investment (I) is assumed to accomplish three objectives: maintenance of the current volume of business, revenue growth, and operating margin improvement. The incremental investment is the requirement for revenue growth (lr) and margin improvement (Im). To estimate the contribution to value from revenue growth, we assume that there is no margin improvement beyond the current level and the incremental investment has been reduced to reflect only the revenue growth component. The incremental investment for revenue growth is assumed to be a specific cents for each dollar of revenue (based on the average capital and working capital requirements of businesses corresponding to firm's portfolio). Hence, value due to revenue growth =*F(R, M*= current operating margin,

I - Im, A).

To estimate the contribution to value from operating margin improvement, we assume that the revenue growth is zero, and the incremental investment has been reduced to reflect only the improvement in margin. That is,

value from margin improvement= *F(R* = 0, *M, I-Ir, A)*.

In assessing the impact of options that could potentially increase the shareholder value, we increase the corresponding value drivers (revenue growth, margin and investment) to their objective levels. For example, to estimate the value when revenue growth increases from 7 percent in the plan to the objective of 14 percent, we solve for

shareholder value= *F(R* = 14 percent, *M, I+i* , A), where

i is the additional investment requirement to boost the revenue growth rate to 14 percent. We perform similar computations at the business unit/division level to identify the critical value driver(s) revenue growth, margin improvements or both. This is shown in Table 4. This approach enables resource allocated to be based on changes in business unit value contribution. It also allows for marginal adjustments to business unit requirements under overall corporate cash flow objectives and capital constraints.

TABLE 4
BUSINESS UNITS AND THEIR CONRIBUTIONS TO THE FIRM'S SHAREHOLDER VALUE

Business Unit	Total Value Per Share			Value Created Per Share			Comments
	From Revenue Growth	From Cost Structure Improvements	Total	From Revenue Growth	From Cost Structure Improvements	Total Value Created	
A	$16.20	$0	$16.20	$0.31	$0	$0.31	Very low value created from revenue growth, but must take into account immense total value (momentum)
B	4.51	$.68	5.19	0.55	0.72	1.27	Value created from a combination of margin improvements and revenue growth.
C	0.81	$0.45	1.26	1.44	1.50	2.94	Value created from a combination of revenue growth and cost structure improvements
D	(0.65)	0.85	0.20	0.17	1.03	1.20	Value created from cost structure improvements
E	0.22	0.12	0.34	1.00	0.82	1.82	Plan value created from a combination of revenue growth and cost structure improvements

From Table 4, the large total value contribution from business units "A" and "B" signify the importance of the core businesses to the firm's viability and help to preserve the firm's current shareholder value. However, business unit "A" creates very little added shareholder value. When looking for options to enhance value, revenue growth is the necessary and dominant driver. The business unit "B" creates value from a balanced combination of revenue growth and cost structure improvements. The remaining business units "C" to "E" are in the midst of turning around. Whereas the core business units primarily help to preserve firm's current shareholder value, the large value created by the turnaround business units helps the firm to increase its shareholder value. For business unit "D" cost structure improvement is the dominant driver for value created by the plan, as well as for future enhancing value. For the business units, "C" and "E" both revenue growth and cost structure improvements play critical role in value creation. Based on the analysis of the data in Table 4, we proceed to identify the role of capital as the driving force, and the effect of this capital (value driver) on revenue growth and cost structure improvement, and is shown in Table 5.

TABLE 5
VALUE CREATION AND CAPITAL EXPENDITURES

Business Unit	Industry			Dominant Value Driver			Capital as Driving Force	
	High	Medium	Low	High	Medium	Low	Factor	Comments
A	X			Volume		Cost Structure	Primary	Suggested by high capital intensity and high volume
B		X		Volume		Cost Structure	Important	Combination of medium capital intensity and high volume
C			X	Cost structure and volume			Not critical	Combination of low capital intensity and lack of critical mass
D			X	Cost structure			Not critical	-
E		X		Cost structure	Volume		Not critical	-

In summary, the capital plays a vital role in value generation for Bus, "A" and "B." Next we derive a resource efficacy measure, and is shown in Table 6.

TABLE 6
RESOURCE EFFICACY MEASURE

Business Unit	Market Characterization	Business Strategic Thrust	INPUT Capital Expenditures		OUTPUT Plan Years			EFFICIENCY(RE) Value per Capital $	
			Plan	Objective	Revenue Growth	Profit Margin Range	Risk	Total	Incremental
A	Attractive: Stable, profitable, cash-generating	Sustain	$3, 500	$2, 800	5.5%	16.5% - 15.0%	Low	0.80	0.10
B	Attractive, Stable	Sustain Domestic Mkts., and grow in New Mkts	410	440	6.1%	8.9% - 11.1%	Low	2.0	2.5
C	Attractive, High Growth	Become profitable, Attain critical mass. Grow	315	100	9.4%	(7.5)% - 11.1%	Medium	0.9	Not critical to value creation Turnaround BU
D	Unattractive, Low growth	Restructure/ Divest	105	90	6.5%	(18.5)% -5.4%	High	(1.5)	Not critical to value creation Turnaround BU
E	Unattractive, Capital Intensive	Limit portfolio; Constraint growth to internal demand (includes cost centers, eliminations, adjustments etc.)	180	225	7.9%	(20.2)%- 6.3%	High	0.35	Not critical to value creation Turnaround BU

So far, based on earlier steps, which involved comparison with the reinvestment rates and revenue growths, we have recommended capital cuts of $840million and $280 million respectively with a total capital cuts of $1.1B. The corporate resource affordability analysis indicates a need for total capital cuts of $1.4B. Therefore, to meet the cash objective, we require additional cuts of $400M. To accomplish this task, we utilize the incremental and total shareholder value metric from Table 4, the value creation potential of capital ("RE" measure) as shown in Table 6, strategic thrust, and associated risk along with good judgement and intuition. This is summarized in Table 7.

TABLE 7
RESOURCE EFFICACY MEASURE

Business Unit	Business Unit Shareholder Value				Business Unit Strategy		Capital Expenditures			
	Shareholder Value		Dominant Driver For Value Creation	Value Creation Potential Of Capital	BU Strategic Thrust	Risk	Objective Capital Expenditures	Suggested Capital Cuts		Comments
	Total	Created						%	$M	
A	$16.20	0.31	Revenue Growth	High	Sustain	Low	$2, 800	10%	$280	
B	5.19	1.27	Revenue growth and profit margin	Medium	Sustain Domestic Mkts., and grow in New Mkts	Low	440	5	22	
C	1.26	2.94	Revenue growth and profit margin	Low	Become profitable, Attain critical mass. Grow	Medi um	100	20	20	
D	0.2	1.2	profit margin	Low	Restructure/ Divest	High	90	20	18	
E	0.34	1.82	Revenue growth and profit margin	Low	Limit portfolio; Constraint growth to internal demand (includes cost centers, eliminations, adjustments etc.)	High	225	27	60	
									$400	

It shows the additional capital spending cuts by BU, which add up to a total cuts of $400M at the firm level. The combined results of all our four steps lead to a grand total of $1.4B in capital spending cuts.

Conclusion

We have proposed a theoretically sound stepped methodology, which is consistent with firm's goal of shareholder value maximization. It encompasses a firm's business plan which includes business unit specific short-term financial performance and long-term financial projections, industry environment, and a firm's business unit profiles, strategies and short- and long-term objectives. The relationship between capital investment and associated revenue growth is unraveled in a manner that allows the full utilization of business unit plan data and hence successful implementation within a firm. It identifies key value driver(s) for each business unit, and the role of capital expenditures in generation of incremental and total shareholder value, paving a path for a systematic approach for curtailing capital spending while ensuring shareholder value maximization. Finally, this method is not only robust, but allows the necessary flexibility for successful roll out within a firm.

References

Baker, Kent H., Dutta, Shantanu, and Saadi, Samir 2011, "Management Views on Real Options in Capital Budgeting," Journal of Applied Finance, Volume 21, No. 1, p. 18 – 29.

Copeland, Thomas E., 2002, "What do Practitioners Want?" Journal of Applied Finance, Spring/Summer, Volume 2, No. 3, p. 5- 12.

Chen, Andrew H., James A. Conover, and John W. Kensinger, "Proven Ways to increase Share Value," Journal of Applied Finance, Spring/Summer, Volume 2, No. 3, p. 89- 97.
Chan, Su H., John D. Martin, and John W. Kensinger, 1990, "Corporate Research and Development Expenditures and Share Value," Journal of Financial Economics 26 (NO. 2, September), 255 - 276.
Deo, Prakash, 2010, "Setting Financial Objectives for a Firm Part II: Financial Performance Measures for a Firm" Corporate Finance Review, May/June, 2010
Deo, Prakash, 2013, "Setting Revenue Growth Objectives for a Firm." Journal of Applied Business and Economics, October.
Gitman L. J. and Forrester Jr., J. R., 1987, "A Survey of Capital Budgeting Techniques Used by Major U.S. Firms, "Financial Management, Fall, pp. 66 -71.
Kim, S. H. and Farragher E. J., 1981, "Current Capital Budgeting Practices." Management Accounting, June, pp. 26-30.
Klammer T., 1972. "Empirical Evidence of the Adoption of Sophisticated Capital Budgeting Techniques," Journal of Business, July, pp. 387-397.
Porter, Michael, 1998, Competitive Advantage, New York, NY, Free Press.
Robichek A. A., and Van Horne J. C., 1967, "Abandonment Value in Capital Budgeting, Journal of Finance, December, pp. 577 – 590.
Ryan Patricia A., and Ryan Glenn P. (2002), "Capital Budgeting Practices of Fortune 1000: How Have Things Changes?" Journal of Business and Management, Volume 8, No.4, winter.
Schall, L.D., Sundem G.L., and Geijsbeek W. R., 1978, "Survey and Analysis of Capital Expenditure Controls in Divisionalized Companies," Journal of Finance (March), pp. 282-287.
Scapens R. W., and Sale J. T., 1981, "Performance Measurement and Formal Capital Expenditure Controls in Divisionalized Companies, autumn, pp. 389 - 420.
Schwab B. and Luszig, 1969. "A Comparative Analysis of the Net Present Value and the Benefit-Cost Ratios as Measures of the Economic Desirability of Investment," Journal of Finance, June, pp. 507 - 516.
Weaver Samuel C., 2011, "Capital Budgeting Procedures, Policy, and Practices," Journal of Applied Finance, Volume 21 (No. 1), p. 39 - 43.

About the Author

Prakash Deo, Ph.D. is an Associate Professor of finance at the University of Houston-Downtown. He has received his doctorate in corporate finance from the Ohio State University. He has over 20 years of business experience in major U.S. corporations and has held many management responsibilities, including the position of financial director. He has completed executive education at Duke and Northwestern Universities. He has published in more than 35 leading applied and pedagogical journals.