Portfolio Analysis Models: A Review

Udo-Imeh, Philip T.[1]*   Edet, William E.[2] Anani, Rajunor B.[2]

1.   Dept. of Management Tech. , Modibbo Adama University of Technology, PMB 2076, Yola, Nigeria

2.   Dept. of Marketing, University of Calabar, PMB1115, Calabar, Nigeria

*E-mail of corresponding author: udoimeh4destiny@yahoo.co

Abstract

This study, which is qualitative in nature, examined the concept of portfolio analysis with focus on business portfolio analysis. Four portfolio analysis models: Boston Consulting growth-share matrix, General Electric industry-attractiveness matrix, Shell directional policy matrix, and Arthur D. Little strategic condition matrix, were discussed in terms of their nature, characteristics, relevance and strategic implications to marketing and management. The limitations of each of these strategic tools were expounded and some newer variants of portfolio analysis models that emerged as a result of these limitations were briefly discussed. The study revealed that each of the four portfolio models has its own merits and demerits and none can be said to be superior as their proponents had advanced. Instead, each can be applied depending on the need of the organization and the environment in which it operates and they could sometime be employed in an integrative manner. It also revealed that the newer variants though theoretically sound are not popular in marketing and management literatures and in practice.   The study concluded that most of the criticisms leveled against these strategic tools are as a result of the misplaced role these tools are expected to play.   Portfolio analysis, the study concluded is not to dictate or recommend strategic decision but to provide strategists with the data needed to making informed decision**.**

Keywords: Portfolio analysis, Boston Consulting growth-share matrix, General Electric industry-attractiveness matrix, Shell directional policy matrix, Arthur D. Little strategic condition matrix

1.0 Introduction

Most business organizations are involved in more than one products or businesses. They may have started simply as uniproduct or uni-business companies but diversified along the way in respond to attractive growth opportunities. Managing these multi-businesses and diversified organizations presents great challenges. Haspeslagh (1982) opined that diversity can be a great source of competitive advantage as well as a source of fundamental difficulties. Each of these businesses in the organization portfolio have different growth potentials, operate in different competitive environment and require different strategic decisions to ensure the achievement of the organization's overall goals and objectives. In diversified company as Thompson & Strickland (1996) observed, managers have to design a multi-business, multi-industry strategic action plan for a number of different business divisions competing in diverse industrial environment.

Such strategy, West, Ford & Ibrahim (2010) argued has to do with the allocation of resources (financial, human, time, and material) between these businesses or Strategic Business Units (SBUs) to ensure the organization's overall success. This view is shared by Hooley, Saunders & Pierce (1998) which stated that any diversified organization needs to find methods for assessing the balance of businesses in its portfolio and to help guide resource allocation between them. One conceptual framework developed to guide strategic focus (COPE Analysis, 2012) and assist in the management of firms' SBUs is the portfolio analysis (Fifield, 1992; Jain, 1993; Aaker, 1995; Byers, Rue, & Zahru, 1996; Thompson & Strickland, 1996; Kotler, Armstrong, Saunders, & Wong, 1999; Agbonifoh, Ogwo, Nnolim, & Nkemnebe, 2007; Kotler & Armstrong, 2010).

Beginning from the 1960's, a number of portfolio analysis models have emerged. Some of the popular and often termed standardized (Wind, Mahajan & Swire, 1983) or 'traditional' portfolio models include:

- Boston Consulting Group (BCG) Matrix

- The General Electric/McKinsey matrix
- Shell directional policy matrix
- Arthur D. Little strategic condition matrix
- Abell and Hammond investment opportunity matrix

The Boston Consulting Group (BCG) growth-share model being the earliest, simplest (Hofer & Schendel, 1994) and best known (Wilson & Gilligan, 1992; Management Study Guide; 2012) approach to portfolio analysis, is concerned with the generation and use of cash within a business and can be used to analyze the strategic business units of an organization. The model focuses on the market growth rate and the relative market share of the SBUs, but have been criticized mostly for it simplistic nature (Hill &Jones, 1989; Jain, 1993; Hofer & Schendel, 1994; David, 1997; Technical Expert, 2011; COPE Analysis, 2012). After the emergence of the BCG model, variants followed, many of which were seen as a response to the simplicity of the Boston Box (Wensley, 1987). The General Electric/McKinsey (GE) matrix was the first of these. The model uses multiple indicators to determine both the market attractiveness as well as the strength of the business, but has been criticized for its subjective nature and the lack of standardized variables for the business units (Hill & Jones, 1989; Hax & Majluf, 1990b; Aaker, 1995; COPE Analysis, 2012). The Shell Directional Policy Matrix (DPM), another model was an improvement of the BCG matrix. It also incorporates some of the features of the GE matrix. The DPM measures company's competitive capabilities on the vertical axis and prospects for sector profitability on the horizontal axis. It has however, been criticized for assuming that the same set of factors is universally applicable for assessing the prospects of any business (Gurung, 2011) and for the complexity of its analytical process (Wilson & Gilligan, 1992). The Arthur D. Little model distinguished itself from preceding models by introducing industry life cycle dimension (Zic, Hadzic & Ikonic, 2009), and arguing for realism in strategic planning (Tudor & Valeriu, 2011). The demerits of this model, according to critics, include its lack of standard life cycle (ValueBasedManagement.net, 2012) and the difficulty in objectively evaluating the model variables (Tudor & Valeriu, 2011).

Portfolio analysis can be discussed from the perspective of product and it can also be discussed form the angle of business. The discussion in this paper is on business portfolio analysis, which InvestorWords.Com (2012a) defines as "the process of assessing a company's competitive position and business performance relative to its market, used in strategic planning to optimize investment activities and efficiently allocate resources towards the right business opportunities". (para 1). This research paper, which is qualitative in nature, focuses on the first four of these 'traditional' portfolio tools (listed above). Drawing on multiple literatures, this paper examined each of these portfolio models in terms of nature, scope, limitations, relevance and applicability, and strategic implications of each to marketing and management. Also discussed are the newer variants of models that emerged as a result of the limitations of the traditional ones. The discussion in this paper does not provide guideline for manager or strategist who is concerned with how to go about implementing the business portfolio tool. It does suggest, however, the conceptual advantages of such an approach and highlight its major components.

2.0 Concept of strategic business units

Diversified and divisionalized company is composed of different businesses, which face different markets. Managing these diverse businesses poses serious challenge to the managers at the corporate level and can be source of competitive disadvantage. A now popular way to manage this kind of situation according to Agbonifoh et al. (2007) is to separate the organization along a definite lines resulting in manageable parts known as Strategic Business Units (SBUs).

BusinessDictionary.Com (2010) defined Strategic Business Unit (SBU) "as an autonomous division or organizational unit, small enough to be flexible and large enough to exercise control over most of the factors affecting its long-term performance" (para. 1). To Kotler et. al. (1999) it is "a unit of the company that has a separate mission and objectives and that can be planned independently from other company businesses" (p.97). Garuda Indonesia, Indonesian national air carrier, defines it as "an independent unit within the company that focuses on resources-optimization to maximize company value by providing products and services to internal and third party customers." According to Perrault & McCarthy (1996), a SBU is "…an organizational unit (within a larger company) that focuses on some product-markets and is treated as a separate profit center" (p.144).

InvestorWords.com (2012b) defined it as "a separately managed division or unit of an enterprise with strategic objectives that is both distinct from the parent unit and integral to the overall performance of the enterprise" (para.1). Though differently defined, these definitions show that SBUs are units of a diversified organization which help in strategically planning the overall business of the organization.

The logic of SBU is the recognition of the fact that diversity creates a challenge for top managers at the corporate level who find it increasingly difficult to become familiar with all relevant strategic aspects of each units of their organizational structure. Haspeslagh (1990) acknowledged this difficulty:

> …diversity … create a managerial gap between the corporate level,
>
> which has the power to commit resources but often only a superficial
>
> knowledge of each business, and the business level, where managers
>
> have the substantive knowledge required to make resource allocation
>
> decisions but lack the "big corporate picture". Corporate managers may
>
> often feel they are too far away to see the tree yet too close to be taken
>
> in the forest (p.266-267).

The above view is in consonance with the position of Doyle & Stern (2006) that when a company develops beyond a certain size, it needs to divide into separate business units to facilitate management performance. SBUs are created to meet this strategic challenge and to enable the organization achieve competitive advantage in the market.

Each SBU establishes its own mission statement, objectives, and strategic and marketing plan and has its own management team (Lindgren & Shimp; 1995). Though they function independently of other SBUs, corporate manager coordinates the organization's various SBUs so that they work synergistically toward the accomplishment of the total organizational goals and objectives. SBUs are the platform on which organizations analyze its portfolio of business and as Agbonifoh et al. (2007) put it, it serves as a basic unit for strategy formulation and implementation. It is regarded as a profit center because each SBU is responsible for its own profitability (Wikipedia, 2012d). It should, however, not be construed from the definitions of SBUs that an organization's SBUs can simply be determined by its business portfolio – defined by Kotler & Armstrong (2010) as "the collection of businesses and products that make up the company" (p.65). Two or three divisions (or products or brands), Wilson and Gilligan (1992) argued may overlap or be interrelate in such a way that in effect form a single SBU. Articlebase (2012) share this view and stressed that SBU is created with the application of criteria such as competitors, price models and customer groups. Consequently, business units having similar competitors and target customers are treated as a single SBU. It will therefore, be misleading for the strategist to consider them as separate businesses. To guard against this, Abell (1980) suggested that businesses should be defined in terms of:

- The customer groups that will be served, or as Doyle & Stern (2006) put it, the number of market segments the business seek to serve;
- The customer needs that will be satisfied; and,
- The technology that will be used to meet these needs.

The definition of SBUs on these criteria help not only in resource allocation but also in determining the best growth direction: Is it to go into new technology, new market or new needs (Wilson & Gilligan, 1992; Doyle & Stern, 2006)? The definition of SBUs identified three important characteristics which are of great relevance in portfolio analysis. These features according to Wilson & Gilligan (1992) are that an SBU:

- Is a single business or a collection of related businesses which offer scope for independent planning and which might feasibly stand alone from the rest of the organization;
- Has its own set of competitors;

- Has a manager who has responsibility for strategic planning and profit performance, and who has control of profit-influencing factors (p.310).

The main rational behind the concept of strategic business units is to help muli-businesses and diversified organization gain competitive advantage. Through the tool of portfolio analysis corporate managers ensure a healthy and balanced portfolio by optimally allocating limited resources among its SBUs and chart the best growth path for the organization. This paper discusses portfolio analysis on the platform of SBUs.

3.0 Concept of portfolio analysis

The various SBUs of a multi-business enterprise operate in different market, have diverse resource requirements and have different growth potentials. Left alone, these SBUs are unlikely to succeed (Hooley et al, 1998); accorded uniform strategy will result in dis-optimal mix of businesses and lost opportunities; relying on instinct judgment to manage those (Kotler et al, 1999) will spell doom for the organization given the highly complex, dynamic and competitive, business environment businesses faced. Bruce Henderson, founder of the management consultancy firm, Boston Consulting Group, BCG, had emphasized the need for managers to find "meaningful quantitative relationship" between their companies and its chosen market. Henderson advised that "good strategy should be based primarily on logic, not…on experience derived from intuition."(cited in Gurung, 2011). Agbonifoh et al. (2007) share Henderson's view and stated that "the turbulence and resulting instability in the marketing environment constitutes a critical driver that compel firms to adopt strategic marketing orientation as a means to continuously positioned themselves much more competitively" (p.287). A strategic tool which has since the mid-1960 become increasingly popular in analyzing a company's SBUs, optimally allocating resources among the various business units and charting a growth path for the organization is the portfolio analysis (Wilson & Gilligan; 1992; Jain 1993; Lindren & Shimp, 1995; Perreault & McCarthy, 1996; Kotler & Keller, 2009).

Keegan et al. (1992) defined portfolio analysis as "a way to assess the needs, allocate resources, and spread risk across SBUs which, taken together, contribute to the achievement of corporate objectives" (p.124). To the Forbes Group (2012) portfolio analysis is "a systematic way of analyzing the businesses that make up an organization portfolio." (para.2)

Portfolio analysis recognizes that a diversified company is a collection of businesses, each of which makes a distinct contribution to the overall corporate performance (Haspeslagh, 1982). Doyle and Stern (2006) share this view. To them, some SBUs offer much more attractive growth and profit opportunities than others. These SBUs will differ in terms of cash flow characteristic. Some will be net cash generators while others will require cash to grow in attractive market. Yet others would be using cash in declining market. Portfolio analysis help the diversified firm assess the balance of business in its portfolio and guide resource allocation among them. This it does by allocating strong resources into more profitable businesses – likely its core businesses – and minimal or no resources into businesses with less or no margin. ValueBasedManagement.net, (2012) enumerated the aims of portfolio analysis to include:

1. Analyze the current business portfolio and decide which SBUs should receive more or less investment
2. Develop growth strategies for adding new products and business to the portfolio
3. Decide which businesses or products should no longer be retained (para.3)

Hill & Jones (1989) and Jain (1993) explained that the objective of this strategic action is to ensure the best mix of business or a balanced portfolio and the path of growth for the organization. A balanced portfolio is defined as "one that enables a company to achieve the growth and profit objectives associated with its corporate strategy without exposing the company to undue risk" (Hill & Jones, 1989; p185). The growth objective may to pursue the strategies of: holding, investing, harvesting, abandoning or disinvesting. (Wilson & Gilligan, 1992; Jain, 1993; Aaker, 1995; Byers, Rue & Zahru, 1996; Thompson & Strickland, 1996; Jobber, 2007; Bhasin, 2011; ManagementBased.net, 2012;). Hold, will be the option for SBUs that generate more cash than they need; invest, will be the strategic option for those business units that will require investment to finance their growth; and, for businesses that are net cash consumers and in declining market, abandon or divest are the most likely strategies. Marketing and management strategists carry out portfolio analysis with the aid of framework generally referred to as portfolio models or matrix (Wind et al 1983).

### 4.0 The Boston Consulting Group Growth-Share Matrix

The Boston Consulting Group Share -Matrix is a portfolio analysis model developed in the mid-1960s by Bruce D. Henderson for the Boston Consulting Group, a leading global management consulting firm (Technical Expert, 2011; Wikipedia, 2012c). The BCG matrix, which is, the earliest, simplest (Hofer and Schendel, 1994) and best known portfolio model   is concerned with the generation and use of cash within a business and can be used to analyze SBUs (Drummond & Ensor, 2011; Technical Expert, 2011). Hax & Majluf (1990a) agreed with this and stated that the objective of the BCG technique is to help strategic mangers identify the cash flow requirements of the SBUs in their portfolio. Wikipedia (2012c) broaden the uses of this model to a company to include resources allocation, as an analytical tool in brand marketing, product management, strategic management, and portfolio analysis.

The methodology used involves three principal steps given by Hill & Jones (1989) as:

1.   Dividing the company into Strategic Business Units(SBUs) and assessing the long-term prospects of each;
2.   Comparing the SBUs against each other by means of a matrix that indicates the relative prospects of each; and,
3.   Developing strategic objectives with respect to each SBU (p.186).

To visually display an organization's portfolio, the BCG developed a 2x2 (4 cells) matrix in which the SBUs are positioned in these cells, each, indicating revenue and cash utilization propensity. (See figure 1).

Figure 1: The Boston Consulting Group growth-**share** matrix
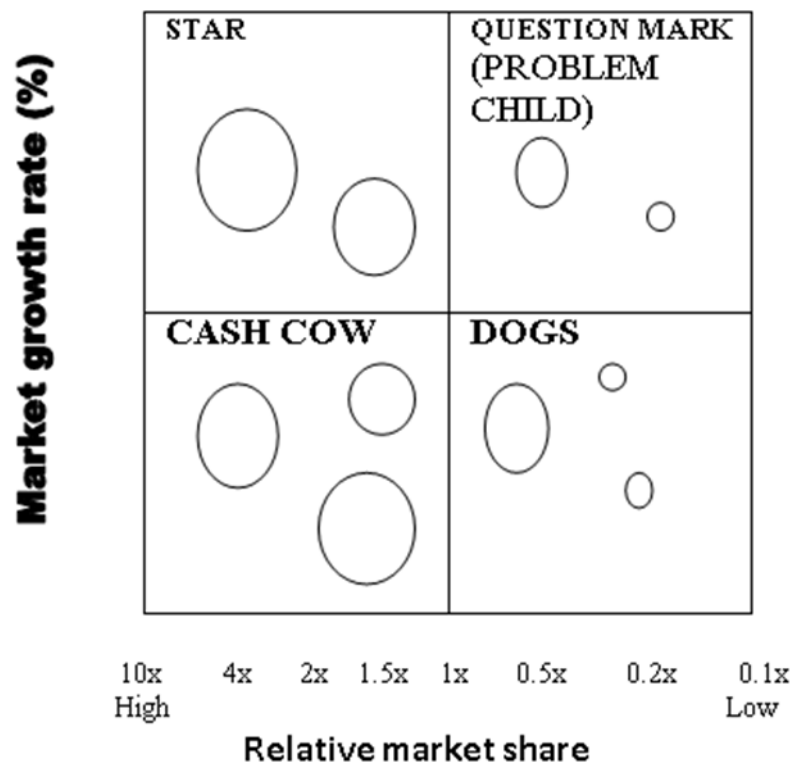
Source: adapted from Hendel B. In R.M.S. Wilson & C.   Gilligan. Strategic Marketing management: Planning, implementation and control   Oxford, England: Elsevier Butterworth Heinemann, 1992, p.31

On the vertical axis is market growth rate in the current year and indicates the attractiveness of the market for the business unit (Byers et al, 1996l). The market share for a given year is calculated thus:

Market growth rate = total market (current year) – total market (previous year) x 100

                              Total market (previous year)

On the horizontal axis, is the relative market share, which serves as a measure of company strength in the market or as Jobber (2007) puts it, 'a proxy for competitive strength' (p.306). The market share for any particular year is calculated as follows:

Relative market share (current year) =   SBU sales   / Leading competitor's sales

(Current year)   (Current year)

Of all the characteristics of a market, Aaker (1995) explained why growth is selected as an indicator of its desirability:

- Growth is perhaps the best measure of the product life cycle, a key strategic consideration (Hax & Mailuf, 1990a).
- Market share is assumed to be more easily gained in a growth context when new users with no developed loyalties are attracted to the product class. Furthermore, competitors may react less aggressively to the loss of new customers than to the loss of their base of existing customers.
- Share gain is important , in part, because of its link to the experience curve
- In a growth market, demand often exceeds supply; excess demand will support premium prices and profit levels.

By aggressively entering into a growth market and establishing competitive advantage, a firm can discourage competitors from entering the market. (pp. 156-157)

As a matter of convention, the market growth rate is arbitrary determined. In figure 1, the annual growth rate range from 0% to 20%, with 10% growth rate being the mid-point. An annual growth rate above 10% is considered high and SBUs in this section of the quadrant are said to be in high growth market, while those below the 10% demarcation line are in low growth market. The growth rate applicable to the matrix will depend on the industry in which the different SBUs compete. ManagementStudyGuide.com (2012) explained that if all the SBUs are in the same industry, the average growth rate of the industry is used. While, if all the SBUs are located in different industries, then the mid-point is set at the growth rate for the economy.

Aaker (1995) also explained the choice of relative market share as the single indicator of a firm's competitive position to include:

- The largest-share firm will very likely enjoy advantages of size such as economy of scale, high brand recognition, channel dominance, and the strongest bargaining position with customers and suppliers.

- Market leader is in the best position to exploit the experience curve because it will accumulate experience faster than competitors. The experience model suggest that cumulative production experience will result in lower unit cost because of learning effects, technological improvement in production/operations, and product redesign.

- Empirical evidence indicates that market share is related to profitability (p. 158)

One renowned empirical study that has correlated profitability with market share is the PIMS (Profit Impact of Market Strategy) study. The PIMS finding shows a strong positive relationship between Return on Investment (ROI) and market share (Aaker, 1995). Hooley et al (1998) commented on the relationship between market share and profitability: "Higher market shares, relative to competitors, are associated with better cash generation because of economies of scale and experience curve effects".

The strategic implication of the experience curve was analyzed in a paper by Hax and Majluf (1990a) stated:

Higher market share → higher accumulated volume → lower cost → higher profitability

Studies by Buzzell & Gale; and Doyle (cited in Hooley et al. 1998) also showed strong relationship between market share and profitability. The relative market share is plotted on a logarithm scale in order to be consistent with the experience curve effect which implies that profit margin or rate of cash generation differences between two competitors tends to be proportionate to the ratio of their competitive positions (Jain, 1993). The mid-point is usually taken at 1.0, at which, a firm's market share is exactly equal to that of its largest competitor. A relative market share of 0.1 implies that the SBU's sales are only 10 per cent of the leader's share; a share of 2 means that the SBU is the leader and has twice the sales of its nearest follower (Doyle & Stern; 2006).Putting the two dimensions - market

growth rate and relative market share – together, the area of the circle in each of the four quadrants is proportional to the sales volume (in Naira) of each of the company's SBUs. SBUs in each quadrant exhibits different financial characteristics and offer different strategic choices.

Cash Cow: These are SBUs in low growth market but have a high market share and a strong competitive position in mature market (Hill & Jones, 1989). Their competitive strength, Hill & Jones (1989) explained, comes from being furthest down the experience curve. They are the company's core businesses (ManagementStudyGuide.com, 2012) and enjoy cost leadership and economies of scale. They generate considerable sum of cash but because of the lower rate of market growth, use relatively little cash, hence, higher profit margin (Wilson & Gilligan, 1992, Lindren & Shimp, 1995; Kotler, et al., 1999, Technical Expert, 2011). The excess cash it generates is used to pay the company's bills and support other SBUs that need investment. The strategic objective for the cash cow is to hold sales and market share.   Cash cows are what Drucker called 'Today's breadwinner' (cited in Hooley et al. 1998).

Stars: These are SBUs with high relative market share position in high-growth market. They are the market leaders. While they generate considerable income, they require substantial investments to sustain growth (Boone & Kurtz, 1995; Thompson & Strickland, 1996;   Agbonifoh et al, 2007; Technical Expert, 2011).The substantial investment, Thompson   & Strickland, (1996) pointed out is needed to expand production facilities and meet working capital needs. Stars offer excellent long-term profit and growth opportunities.   Drucker called these SBUs 'Tomorrow's breadwinners' (as cited in Hooley et al.1998). Agbonifoh et al. (2007) posited two strategies for stars: protection of existing market shares and acquisition of equal or greater proportion of the expanding market in order to maintain their leadership position. Bhasin (2012) warned that "unlike Cash Cow, Stars cannot be complacent when they are on top because they can immediately be overtaken by another company which capitalizes on the market growth rate" (para. 11). As the market becomes mature and the annual growth rate falls below 10 per cent, the star becomes a cash cow.

Dog: Dogs are SBUs that have weak market share in a low-growth market. Their progress on the experience curve is slow and thus they will generate either low profit or return a loss (Wilson & Gilligan, 1992; Aaker, 1995). They face cost disadvantage and have low long-term potentials. Strategies for the Dogs according to Agbonifoh et al (2007) include:

- Niching: The company could target unique portions of the total market in which it has specialized competencies and capabilities that will help it dominate and protect the market.
- Harvesting: The company can drastically reduce all promotional costs and indeed every other supportive costs on the SBU to a level that would permit optimization of the available cash flow.
- Divest/Withdrawal: The SBU may be sold as a going concern, or the company may withdraw it from the market when the cost of keeping it becomes excessive (p.289).

Question Mark: Question mark – also called Wild Cat or Problem Child – are SBUs operating in high growth market but with low relative market share. They generally require considerable sum of cash since the firm needs to keep up with market development (Wilson & Gilligan, 1992) with the hope of turning it into cash cow. If nothing or less than required is done to increase market share, Question Mark will absorb large amount of cash in the short-run and later, as growth slows down, becomes a Dog (Jain, 1993). The major problem associated with having a Question Mark, Bhasin (2011) explained is the amount of investment which it might need and whether the investment will yield returns in the end or whether it will be completely wasted. Hence, this SBU is tagged, 'Question Mark', because of the uncertainty management faced in deciding whether to continue in the business or withdraw it from the market. Given the peculiarity of this business and the circumstance of the company, management could intensify investment in the SBU, divest/withdraw, or follow a niching strategy (Agbonifoh et al, 2007).

4.3 Strategic implications of the BCG model

The primary objectives of multi-business company, implicit in the conceptualization of BCG, are growth and profitability (Henderson & Zakon, 1980). This view is shared by Hill and Jones (1989) that "the objective of the BCG's portfolio is to identify how corporate cash resources can be used to maximize a company's growth and profitability" (p, 189). A diversified organization has this advantage and can employ the BCG model to actualize its growth and profit objectives.

To ensure optimal cash resource allocation and a balanced portfolio, BCG made the following recommendations as outlined by Hill & Jones (1989):

1. Use the cash surplus from any Cash Cow to support the development of selected Question Marks and to nurture emerging Stars. The long-term objective is to consolidate the position of Stars and to turn favored Question Marks into Stars, thus making the company's portfolio more attractive.

2. Question Marks with the weakest or most uncertain long-term prospects are divested so that the demands on the company's cash resources are reduced

3. The company should exit from any industry where the SBU is a Dog – by divestment, harvesting market share, or liquidation.

4. If the company lacks sufficient Cash Cows or Question Marks, it should consider acquisition and divestment to build a more balanced portfolio. Such a portfolio has to contain enough Stars and Question Marks to ensure a healthy growth and profit outlook for the company and enough Cash Cows to support the investment requirements of the Stars and Question Marks (p.189-190).

5.0 The General Electric multifactor portfolio model

In the early 1970s, the management consultant McKinsey & Co in conjunction with General Electric in the USA developed a comprehensive portfolio planning tool (Hax & Majluf, 1990b; Aaker, 1995; Jobber, 2007). The General Electric (GE) model was inspired by the need to develop a method of evaluating the plans of GE different business units in order to fund the plans with the greatest potential for success and also by the need to overcome the limitations of the BCG model (Byers et al, 1996). Like the BCG matrix, it is plotted on a two-dimensional grid. But unlike the BCG, which classifies a business unit on only two criteria (relative market share and market growth rate); the GE model employs composite measures in classification of business units (Wikipedia, 2012b; Lindren & Shimp, 1995; Wilson & Gilligan, 1992).

SBUs are plotted against two dimensions: industry attractiveness on the vertical axis and competitive position on the horizontal axis. To assess industry attractiveness, a number of, "critical external factors, which are not controllable by the firm, are used.… (Hax & Majluf, 1990b, p.73)." These factors must be relevant and appropriate to the industry under consideration. Weights are assigned to each of these set of criteria, with the variables that are more important having higher weight. Next, the company rates the attractiveness of each industry in its portfolio according to the various criteria. Finally, each weighting is multiplied by corresponding rating, and then summed. A total score indicating the overall attractiveness of the industry obtained (see Table 1)

To arrive at the competitive position, "critical internal factors, which are largely controllable by the firm and relevant to the business unit, are identified (Hax & Maijluf, 1990b). These variables are then manipulated in the same way like the industry attractiveness factors to arrive at the competitive position. (See Table 2).The development of a multifactor matrix involves the difficulties of identifying relevant factors, relating factors to the industry attractiveness and business strengths, and weighing. In recognition of this problem, Hax & Majulf (1990b) came up with a methodology for developing and using attractiveness-strength model:

1. Definition of critical internal and external factors

2. Assessment of external factors

3. Definition of critical internal and external factors

4. Assessment of external factors

5. Positioning of the business in the attractiveness-strength matrix (p.75).

Table 1: An industry attractiveness assessment using the weighted score approach. Under weighting some criteria may be of the GO/NOGO type. Ratings are on a scale of 1 (very unattractive) to 5 (highly attractive)

Attractiveness criterion	Weight	Rating	Weighted score
Size	.15	4	.60
Growth	.12	3	.36
Pricing	.05	3	.15
Market diversity	.05	2	.10
Competitive structure	.05	3	.17
Industry profitability	.20	3	.60
Technical role	.05	4	.20
Inflation vulnerability	.05	2	.10
Cyclicality	.05	2	.10
Customer financial	.10	5	.50
Energy impact	.08	4	.53
Social	GO	4	-
Environmental	GO	4	-
Legal	GO	4	-
Human	.05	4	20
	1.00		3.38

Source: Hax, A. C. and Maijluf , The use of Industry Attractiveness-Business Strength Matrix in strategic planning. In R.G. Dyson (Ed.), *Strategic planning: Models and analytical technique* (p.97), Chischester, England: John Wiley & Sons

On the basis of the analysis of the industry attractiveness and business strength dimensions, the SBUs are positioned in a 3x3, 9 cells GE industry attractiveness-business strength matrix. The area of the circle is proportional to the size of the industry, and the pie slices within the circle reflect the SBU's market share (Wilson & Gilligan, 1992; Thompson & Strickland, 1996; Drummond & Ensor, 2001). This is depicted in Figure 2

5.1 Strategic implications of the GE model

One important distinguishing feature of the GE model, according to Hooley et al. (1998), is it uses Return on Investment (ROI) as a criterion for assessing an investment opportunity. Based on the ROI criterion, GE model assign investment priorities to each of the company's SBU (Thompson & Strickland, 1996). SBUs in the three cells at the top left corner of the matrix, labeled '1', '2' and '4', where long-term industry attractiveness and business position are strong are given top investment priority. The strategic prescription for business units in these three cells is 'grow and build', with cell '1' receiving the most investment. SBUs in the diagonal cells tagged '3', '5', and '7', are accorded steady investment to maintain and protect their positions. SBUs in the lower right corner of the matrix labeled '6', '9', and '8' are candidates for harvesting and divestment – except they can be overhauled and repositioned by a turnaround strategy (Thompson & Strickland, 1996). Figure 3, shows the specific strategies for each of the nine cells.

Table 2: A business-strength assessment with the weighted score approach. Under weight, x indicates that the factor does not affect relative competitive position. Here, in rating the factors, 1 indicates a weak position, and 5 a very strong competitive position

Critical success factor	Weight	Rating	Weighted score
Market share	10	5	.50
SBU growth rate	X	3	-
Breadth of product line	.05	4	.20
Sales distribution effectiveness	.20	4	.80
Proprietary and key account advantages	X	3	-
Price competitiveness	X	4	-
Advertising and promotion effectiveness	.05	4	.20
Facilities and location and newness	.05	5	.25
Capacity and productivity	X	3	-
Experience curve effects	.15	4	.60
Raw materials costs	.05	4	.20
Value added	X	4	-
Relative product quality	.15	4	.60
R&D advantages/position	.05	4	.20
Cash throw-off	.10	5	.50
Caliber of personnel	X	4	-
General image	.05	5	.25
	1.00		4.30

Source: Hax, A. C. & Maijluf , The use of Industry Attractiveness-Business Strength Matrix in strategic planning. In R.G. Dyson (Ed.), *Strategic planning: Models and analytical technique* (p.80), Chischester, England: John Wiley & Sons

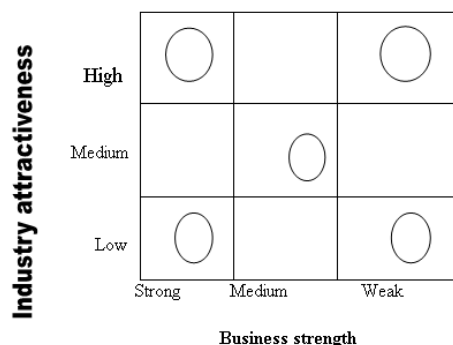Figure 2: The General Electric industry-attractiveness portfolio matrix

Figure 3: Prescribed strategies for businesses in different cells (NB: the number labels in the cells done by the writer for explanatory purposes)

	Competitive position		
	Strong	**Medium**	**Weak**
High	**Protect position (1)** • Invest to grow at Maximum digestible rate • Concentrate effort on maintaining strength	**Invest to build (2)** • Challenge for Leadership • Build selectively on strengths • Reinforce vulnerable areas	**Build selectively (3)** • Specialize around limited strengths • Seek ways to overcome weaknesses • Withdraw if indications of sustainable growth are lacking
Medium	**Build selectively (4)** • Invest heavily in most Attractive segments • Build up ability to counter Competition • Emphasize profit-ability by raising productivity	**Selectivity/manage for growth (5)** • Protect existing program • Concentrate investments Segments where profita-bility is good and risk is relatively low	**Limited expansion or harvest (6)** • Look for ways to expand without high risk; otherwise, minimize investment and rationalize investment
Low	**Protect and refocus (7)** • Manage for current earning • Concentrate on attractive strengths • Defend strengths	**Manage for earning (8)** • Protect position in Most profitable segments • Upgrade product line • Minimize investment	**Divest (9)** • Sell at time that will maximize cash value • Cut fixed cost and Avoid investment meanwhile

(Vertical axis label: Industry attractiveness)

Source: adopted from George S. Day, Analysis for strategic business decisions (1986),Cincinnati, OH: South-Western publishing company. (p.204) In addition to the investment decisions on the different SBUs in the matrix, the GE model has other desirable's features. Thompson & Strickland (1996) listed them as follows:

• It allows for immediate ranking between high and low, and between strong and weak
• It incorporates explicit consideration of a much wider variety of strategically relevant variables
• It stresses the optimal allocation of corporate resources with a view to achieving competitive advantage and superior performance.

6.0 Shell Directional Policy Matrix

The Shell Directional Policy Matrix (DPM) was a technique originated for systematically analyzing the qualitative factors present in the organization, which had an impact on corporate planning. It was also developed to compare business sector and company positions in a way that was independent of financial forecasts. It has two dimensions, the company's competitive capabilities on the vertical scale and the prospects for sector profitability on the horizontal scale. Similar to the GE matrix, each dimension subdivided into three categories. The company's competitive capabilities are categorized as weak average and strong; and the business sector prospects are categorized as unattractive, average, and attractive (Wilson & Gilligan, 1992; Jain; 1993). This gives a 3x3, 9 cells quadrants (see figure 4).

Figure 4: The Shell directional policy matrix

Source: Shell Co. (1975)

The determination of the business sector prospect is based on certain considerations which include: market growth rate, market quality, industry situation and environmental consideration. The company competitive capability is based on market position, product research and development and production capability. These criteria are not exhaustive and the particular variables considered depend on the company involved. As with the GE model, the location of a SBU in any cell of the matrix implies different strategic decisions. It should however be understood that in practiced, as noted by. The zones are in irregular shape and do not tend to be accommodated by box shapes. Instead they blend into each other.

6.1 Strategic implication of the Shell Directional Policy Matrix

Unlike the BCG matrix in which management is looking for a balance of business opportunities spread amongst growth and maturing markets, in the Shell Directional Policy Matrix the concentration of business opportunities should be focused around the 'Leader' domain, i.e. the bottom right hand area of the matrix (Bank, 2011). The strategies for each of the zones are summarily described by Bank (2011) as follows:

- **Leader** – major resources – even from other areas – should be focused upon the SBU. The strategy should be to maintain the position of the Leader
- **Try harder** – could be vulnerable over a longer period of time, but fine for now.
- **Double or quit** – SBUs with the best prospects should be selected for full backing and development; the rest should be abandoned. It is worthy to note that tomorrow's breadwinners among today's R&D may come from this area.
- **Growth** – investment should be made to allow the business to grow with the market. Generally, the business will generate sufficient cash to be self-financing and should not making demand on other corporate cash resources.
- **Custodial** – just like a cash cow, milk it and do not commit any more resources.
- **Cash generator** – these are usually SBUs closer to the end of their lifecycles with no long-term future. They should be milked for cash for other areas.
- **Phased withdrawal** – move cash to SBU's with greater potential.
- **Divest** – liquidate or move these assets on a fast as you can (para.2)

7.0 Arthur D. Little Strategic Condition Matrix

Arthur D. Little is an international management consulting firm headquartered in Boston, Massachusetts, United State, and founded in 1886 by Arthur Dehon Little, a 23 year old chemist from Massachusetts Institute of Technology (Wikipedia, 2012a). In the late 1970s, the company developed a portfolio management approach which is dependent on the life cycle of the industry. The portfolio model like the three earlier discussed is structured like a matrix and also based on two but different performance indicators of environmental assessment and business strengths. The environmental measure is an indication of the industry life cycles, which in a certain period of time may be in one of the following four stages: introduction, growth, maturity and decline. The business strength measure is a categorization of the organization's SBUs in to one of five (6) competitive positions: dominant, strong, favorable, tenable, weak (and non-viable) (Mason, 2010; Value-BasedManagement.net, 2012).

To assess the competitive position held by a company that operates in a given market, Florescu, Constantin & Malcomete (cited in Tudor & Valeriu, 2011) gave the following list:

- Supply factor: long-term contracts, labor costs and payment terms;
- Production factors: production flexibility and capacity, experience, technical skills, environmental protection, quality of management, skill of expertise, labor productivity and production cost;
- Commercialization factors: the power and quality of distribution network, credit conditions, the image of the product, product range, market share, sales force and price;
- Financial factors: profitability, financial stability, cash flow and technological protection

Tudor & Valeriu (2011) pointed out that these "performance indicators represented by market competitive position are valued by reference to competition, using qualitative and quantitative variables, which make up a set of determinant factors of success (p.755)". On the industry life-stage, each specific stage within the product life-cycle is identified, assessed, quantified and characterized by a system of indicators, added, Tudor & Valeriu (2011). Popa (cited in Tudor & Valeriu, 2011) explained that the competitive position are weighted and scored and this results in several competitive positions according to company forces in relation to competitors on a given market. What Popa is saying, explained Tudor & Valeriu (2011) is that these factors change over time, the business gain or loss ground in terms of competitive advantage, and eventually they will identify with one of five competitive positions. Wilson and Gilligan (1992) gave these categories of competitive positions as:

1. **Dominant**. This is a comparatively rare position and in many cases is attributable either to a monopoly or a strong and protected technological leadership. The implications are that the firm is able to exert considerable influence over the behavior of others in the industry and has a wide variety of competitive position.
2. **Strong**. By virtue of this position, the firm has a considerable degree of freedom over its choice of strategy and is often been able to act without its market position been unduly threatened by competitors.
3. **Favorable**. This position, which generally comes about when the industry sis fragmented and no one competitor stands out clearly, results in the market leaders having a reasonable degree of freedom.   Companies with a favorable market position often have that can be exploited by particular strategies and hence a greater than average opportunity to increase market share
4. **Tenable**. Although a firm within this category are able to perform satisfactory and can justify staying in the industry, they are generally vulnerable in the face of increased competition from stronger and more proactive companies in the market. The opportunities for an organization to strengthen its position tend to lower than average. The profitability of tenable firm is best achieved and sustained through a degree of specialization.
5. **Weak**. The performance of firms in this category is generally unsatisfactory although opportunities for improvement do exist. . Often, however, the firm is either too big and inefficient to compete with any real degree of effectiveness, or it is too small to cope with competitive pressure. Unless he firm changes, it is ultimately likely to be forced out of the market or exit of its own accord.

Agbonifoh et al (2007) and Tudor & Valeriu (2011) argued that a sixth positioned, that of non-viability, can be added to the list and this applies when the firm's performance is unsatisfactory   and there are few , if any, opportunities for investment.

Plotting the ADL matrix against the two principle dimensions, the position of the SBU is represented by the circle sizes proportionate to the size of the industry where they belong, while the company market share is represented by the slices (zic et al, 2009) as depicted in figure 5.

Figure 5: The Arthur D. Little strategic condition matrix

		Industry life cycle stage			
		Introduction	**Growth**	**Maturity**	**Decline**
Competitive Position	Dominant	• Rapid development • Act offensive	• Rapid development • Defend position • Act offensive • Cost leadership	• Defend position • Act offensive	• Defend position • Focus • Consider retreat
	Strong	• Rapid development • Differentiation	• Cut costs • Differentiation • Attack small competitors	• Cut costs • Differentiation • Focus	• Harvest
	Favourable	• Rapid development • Differentiation	• Cut cost • Differentiation • Attack small competitors	• Focus • Differentiation • Attack small competitors	• Harvest
	Tenable	• Market development • Focus	• Maintain or retreat • Identify a niche • Aim growth	• Maintain or retreat • Identify a niche	• Retreat
	Weak	• Identify a niche • Follow the competitors	• Identify a niche • Retreat	• Retreat	• Retreat

Source: Wilson, M.S. & Gilligan, C. (1992). Strategic marketing management: Planning. Implementation and control (2nd ed.).Elsevier Butterworth-Heinemann, p.318

8.0 Criticism of the portfolio models

When it first came out in the 1960s, it was embraced as the panacea for strategic management of multi-business firms. The attraction of the logic of this strategic tool is evident by its rapid growth and adoption by marketing and management strategist. Scholars, researchers and academics were equally caught up in the romance with these tools. But over the years it was discovered that portfolio analysis did not deliver on the promises made by its advocates and developers. Thus, enthusiasm turns to disillusion, resentment and criticisms. Even it core value which is balancing the portfolio of an organization was attacked.

Bianchi & Sedehi (1995) were more scathing in their criticism. They criticized all traditional portfolio models of being normative, instead of descriptive; partial, instead of systematic; static instead of dynamic; and, deterministic, instead of stochastic. They went further to debunk the theory that the traditional portfolio models help multi-business and diversified organization achieved a balanced portfolio. To them, the portfolio may still be unbalanced:

….unbalanced, as they (traditional models) refer only to some variables

as, for example, sales, revenues cash flow, market share, ROI (Return On

Investment), ROE (Return On Equity), instead of being well balanced both

referring to key variables and to the levers through which it is possible to

affect product portfolio performance (p.380).

This paper shall discuss the criticisms of the traditional portfolio matrix, the limitations of which saw the emergence of newer variants.

8.1 Criticism of the BCG matrix

The BCG matrix has had a greater share of the criticisms leveled against portfolio matrix in the literature of portfolio analysis.   Critics have attacked this strategic planning tool on the following grounds:

1. Simplicity, which is BCG greatest strength, is also its greatest weakness. Assessing the attractiveness of a business unit based only on two indicators - market share and industry growth - is too simplistic and misleading. A lot of other relevant factors which determined market attractiveness (e.g. market size, industry profit margin, entry barriers) and competitive strengths (e.g. price competitiveness, product quality, geographical advantage) are not taken into account.
2. A four-cell matrix on high-low classification system hides the fact that many businesses are in markets with an average growth rate and have market shares that are neither high nor low, but in between or intermediate (Thompson & Strickland, 1996). They therefore wonder which cells these average businesses belong in the BCG classification scheme. Sharing this view are Hofer & Schendel, (1994) who argued that the use of four-cell matrix ignored the fact that the world contains not only high and low, but middle position as well.
3. The relationship between market share and profitability does not always hold true. This link between market share and profit is based on scale economies and experience curve. But the "…profit potential of high market share businesses may be overestimated" (Hooley et al, 1998; p.63) if each SBU has "...its own manufacturing operation and operate on its own experience curve….uses a differentiated technology…. (and) has a different market structure" (Aaker, 1995; p.164). Though the BCG share-profitability relationship may be theoretically supported, empirical evidence, however, questioned such link. Furthermore, the link between market share and profitability is premised on cost leadership strategy. But there are other ways an SBU can compete – differentiation strategy and focus strategy.
4. Concentrating on market share and market growth rate may becloud marketing strategists from paying attention to fundamental issues like developing a sustainable competitive advantage. In the event of competitive retaliation to share gain, for example, the costs to the company may outweigh it gain.
5. The analysis is highly sensitive to how the market is defined (Doyle & Stern, 2006), which is often vague.   Hax & Majluf (1990a) commented:

    Relative market share compares a business's strength to its competitors.

    If the market is defined too narrowly the business invariably ends up as

    the leader of the segment; it is defined too broadly the business is

    unrealistically represented as weak. Proper market definition is a very

    subtle issue, and unfortunately, this approach to business analysis rests

    heavily on this difficult matter (p.64)

6. The model erroneously assumes that SBUs are independent. A good strategic decision, therefore, on one business unit may be a bad one for another business unit, which invariably becomes dangerous for the company as a whole
7. The matrix assumes that all SBUs have the same lifecycle which is not the reality. Thus, some Stars facing a short lifecycle, Drummond & Ensor (2001) advised should be harvested than committing further investment.
8. The BCG matrix was developed principally to balance cash flow in a multi-business company. But Jain (1993) is not comfortable with the priority given to cash flow balancing. A contrary position to the advocacy of the BCG was given by Marakon, a management consulting firm. Marakon, (1980) argued that "…ideal business portfolio are not necessarily balanced in terms of internal cash flow." The result of a study carried out by the

company shows that "…a highly profitable portfolio may well be out of cash balance, while a rather poor portfolio may be perfectly balanced".

8.2 Criticism of the GE matrix

1. The GE matrix looks at the current position of SBU but does not take into account how their future positions might change due to changes in the industry. It does not also consider how their positions might change due to change in their lifecycle (Hill & Jones, 1989).

2. The selection and weighting of factors and the subsequent development of both firm's position and market attractiveness are subjective process. Individual bias and historical perspective cannot be ruled out in the process (Aaker, 1995).

3. Many factors are involved in determining both indicators on which the matrix is based. Aggregation of the indicators is difficult

4. There is no standard list of critical external and critical success factor to be used by all business units. This creates inconsistencies and ambiguity in the classification of business unit.

5. The result of the analysis is sensitive to the definition of the business market.

6. Like the BCG matrix it ignores the interdependence of the SBUs in a company's portfolio.

8.3 Criticism of the Shell Directional Policy Matrix

There have been problems arising, especially from the complexity of the analytical process when adapting the DPM to industries outside the petrochemical (and petroleum) industry where it was designed for. Gurung (2011) outlined these and the general weaknesses of the model:

1. There is need to change the questions for companies not in the petroleum industry and the questions regarding the factors that should be customized for the companies doing the design. (Lancaster & Massingham [1998] explained this weakness clearer: The DPM "assumes that the same set of factors is universally applicable for assessing the prospect of any product/business" [para.2]).
2. Shell advocated equal weighting for the criteria on each of the axes. This worked for Shell but other companies may feel that certain factors are more important than others and therefore, the weights should be adjusted accordingly.
3. The environment was the fourth factor on the business sector prospects axis yet Shell often left this factor out altogether.
4. When using the Shell DPM methodology, it was found that the star rating system added very little value.
5. Lancaster & Massingham (1998) criticized the model for failing to give guidelines on how to implement the strategy, as mentioned in the cell of the matrix. This 'lack-of-guideline-criticism', explained Wilson and Gilligan (1992) description of the DPM as "a well-known but under-utilized and misunderstood planning tool" (p.321).

8.4 Criticism of the Arthur D. Little Model

1. Some factors, especially those influencing the competitive position indicator are qualitative in nature and this makes it difficult to objectively evaluate a company's competitive position. This gives room for bias.
2. There is no standard length of the life cycle
3. The model does not consider issues that can "generate long-term involution in the product life cycle of the company."

9.0 Other portfolio models

The limitations and problems associated with the 'traditional' portfolio tools have lead to the emergence of many newer models which proponents argued will be more useful aids in strategic decision-making. Some of these are:

1. **Strategic Position and Action Evaluation (SPACE) Matrix**: was developed by strategy academics, Alan Rowe, Richard Mason, Karl Dickel, Richard Mann & Robert Mockler (Simister, 2011). The SPACE Matrix is a four-quadrant framework which indicates whether aggressive, conservative, defensive, or competitive strategies are appropriate for a given company (Caroline, 2008). The matrix functions upon two internal (financial strength

and competitive advantage) and two external (environmental stability and industry strength) strategic dimensions in order to determine the organization strategic posture in the industry.

2. **The strategic triangle of 3C's:** Kenichi Ohmae, a famous Japanese strategy guru, introduced the 3C's model. According to him, in the construction of any business strategy, the main three players which are: the corporation itself, the customer, and the competition (the three 'Cs') must be taken into account. He argued that competitive advantage only exists when these three variables are factored in the business strategy.

3. **Market Economics and Competitive Position (ME/CP) Strategic Framework:** the MP/CP framework was developed by Marakon Associates. The framework theorizes that a company strives to participate in the most attractive markets possible and should be agile enough to enter and exit markets whenever desirable and necessary. At the same time, it strive to develop core capabilities and other strengths that improve its competitive position

Still others include: Diversification risk model (Keegan et.al. (1992), Internal-External matrix (David, 1997), Hofer's product-market evolution model (Kazmi, 2008); Ansoff product/market expansion grid (Jobber, 2007; Kotler &Armstrong, 2010) and COPE analysis (COPE analysis, 2012). Most of these newer models though theoretically sound are nonetheless, neither well documented in marketing and management literatures nor popular among practicing strategists relative to the standardized models.

10.0 Conclusion

Business portfolio analysis is a strategic tool that gives strategic mangers an overview of the long-term prospects and competitive strengths and weaknesses of a company's various businesses, enabling them to evaluate whether the portfolio is adequate from the perspective of long-term corporate growth and profitability (Hooley et al, 1998). It does not provides provide strategic recommendation or is it a panacea to the problems and challenges of managing the businesses of a diversified and divisionalized organization as it was sold when it first came out in the 1960s. Instead, Business portfolio analysis facilitate the strategic planning process and help management to understand the company's overall position, lead to improvements in strategies and control. Their role, Aaker (1995) and Doyle & Stern (2006) argued, is not to dictate strategic choices but to summarize information and give managers important insight into the balance of their businesses, their relative strength and the opportunities open to them.

Most of the criticism leveled against this strategic tool resulted from this misplaced role they are expected to play. Though there are many variants of portfolio matrixes, none can be said to be superior. Each may find relevance depending on the organization's position and the competitive environment faced. As these strategic planning tools proliferate, it is strategically wise as suggested by Wind et. al. (1983) for an organization to avoid using a single portfolio model, instead, it should integrate two or more models to overcome their individual limitations while taking advantage of their unique capabilities. The greatest challenge facing the concept of portfolio analysis model is its often complex analytical process which makes implementation at the organizational level difficult. The soundness of the theories as compared to its operational difficulties made McDonald (1990) to describe the portfolio analysis model as 'well-known but under-utilized and misunderstood planning tool(s)'. It is its simplicity rather its pioneering status that the BCG matrix is regarded the most popular of all the portfolio models. To make the portfolio planning tools relevant and practical to organizations, writers, scholars and researchers in this field of study should bridge the existing gap between theory and practice. One way this could be achieved according to McDonald (1990) is 'to attempt to explain the strategic methodologies underpinning the techniques of portfolio models.'

As consumer tastes and preferences changes; as the business environment becomes increasingly dynamic, competitive and globalized, management and marketing strategists would need improved and better tools not only to meet these challenges but also to exploit the profit and growth potentials offered by the evolving environment. As a consequence, the business portfolio tools would constantly be modified, expanded and improved at both its conceptual and methodological aspects.

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