

**Analysis of Customer Portfolio and Relationship Management Models
Bridging Managerial Dimensions**

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Abstract

This paper broadly discusses the customer portfolio theories and their implications in reference to marketing and purchasing perspectives. It provides an insight into how marketers interpret and describe companies' actions. The central theme of the paper - the tools that can be used to facilitate relationship management. The discussion in the paper provides a framework for relationship management, the central tenet of which is to enable managers to invest their resources in the most efficient and effective way. The contributions to the understanding of relationship management are critically reviewed in the following sections. The alternative models have been developed in reference to the market environment and values concepts in reference to the triadic relationship among the organization, supplier and customer has been discussed in the contemporary managerial perspectives. The paper also draws applied recommendations are made about their relevance to strategic decision making and theoretical development in the area of customer portfolio management.

The development and management of customer relationships has, in recent years, become a central focus of marketing research and conceptualization as it has been realized that they are valuable assets of a firm. Although the roots of much current thinking about relationships can be found in the early work in business marketing of the International Marketing and Purchasing (IMP) Group (Hakansson, 1982; Turnbull and Valla, 1986; Ford, 1990), important contributions have also emerged in the services marketing literature (Gronroos, 1983, 1985; Berry, 1985; Gummesson, 1985, 1987) and more recently in consumer product marketing (Christopher, Payne and Ballantyne, 1991). The management and development of relationships has also attracted a number of other significant contributions, such as those from Jackson (1985), Dwyer, Schurr and Oh (1987) and Frazier, Spekman and O'Neal (1988) and more recent contributions from Ford, Lamming and Thomas (1992) and Morgan and Chadha (1993). An implicit assumption, however, of much of this work is that having 'strong' customer or supplier relationships is necessarily 'good'. When this assumption is stated explicitly it is immediately and obviously not so - as any sales or customer account manager knows. Some customers are just not worth having, they are difficult to satisfy, are too demanding and/or will not pay a 'fair' economic price. It is therefore surprising that few research studies have addressed the key issue of customer/supplier costs and profitability and how effective management of customer/supplier relationships may contribute to the strategic development of the supplying firm. Additionally, there is also little research into the concept of how established customer relationships may provide a firm with a sustainable competitive advantage.

It can be argued that relationship management is as important to marketing management as manipulating the marketing mix. Indeed, some would argue that relationship

management is the most critical issue, particularly in a business-to-business situation where firms are often reliant on a small number of customers, their markets are relatively static and maintaining existing client relationships is often essential to their ongoing business success. It is, therefore, important to understand why such 'relationship' based perspectives have developed. It is also necessary to consider how understanding the significance of relationships with individual customers can be translated into management strategy/actions.

Review of Portfolio Models

In a market consisting of human beings, it seems logical that explanations rooted in human and social psychology would hold great promise in advancing our understanding of stock market behavior. More recent research has attempted to explain the persistence of anomalies by adopting a psychological perspective. Evidence in the psychology literature reveals that individuals have limited information processing capabilities, exhibit systematic bias in processing information, are prone to making mistakes, and often tend to rely on the opinion of others. Rabin and Thaler (2001) show that expected utility theory's explanation of risk aversion is not plausible by providing examples of how the theory can be wrong and misleading. They call for a better model of describing choice under uncertainty. It is now widely agreed that the failure of expected utility theory is due to the failure to recognize the psychological principles governing decision tasks. The modern portfolio theory assumes that markets are one-period mean–variance efficient and ignores the investor's holding period. Merton (1990) introduced the time dimension to portfolio theory and laid the theoretical groundwork for inter-temporal portfolio selection, option pricing, performance evaluation, and dynamic investment strategies. There were other models that have been developed including the two and

three dimensional axes along with single, two and three step analysis phases over the period. The Figure 1 exhibits the historical depiction of the portfolio theories.

//Figure 1 about here//

Investment related measures

Portfolio theories began within the sphere of financial investment (Markowitz, 1952), but their use as a strategic planning aid has developed into a more generalized management context. When used effectively, they provide guidance for resource allocation and the Boston Consulting Group (BCG) model despite its inherent weaknesses is probably one of the most widely used management decision aids. Although the application of portfolio theory to customer and/or supplier relationship analysis has essentially been 'borrowed' from traditional corporate and marketing strategy theory - Strengths Weaknesses Opportunities and Threats (SWOT) analysis, BCG etc., its application to customer/supplier analysis is still problematic particularly in relation to the appropriate dimensions of analysis. Despite this, the authors believe the approach to be valid and potentially very valuable. However, the development of customer and supplier portfolio planning has, to date, largely been related to business-to-business markets. This is probably due to the relative power of a small number of players in such markets; it is common for a firm serving business markets to be highly dependent on a small number of customers and, therefore, the addition or loss of a major customer can have dramatic effects on the company's turnover, profitability and indeed its viability.

Relationship portfolio concepts

During the last twenty years a number of portfolio models have been specifically developed to address this situation, they have taken the relationship as the unit of analysis and can be assumed to be based upon an understanding that long-term, interactive relationships are often the norm in this type of market structure. These models include those proposed by: Cunningham and Homse (1982), Fiocca (1982), Campbell and Cunningham (1983), Yorke (1984a), Shapiro et al., (1987), Krapfel, Salmond and Spekman (1991), Rangan et al., (1992), Yorke and Droussiotis (1994) and Turnbull and Zolkiewski (1997).

Fiocca (1982) suggests a number of mechanisms for assessing the proposed axes: 'Difficulty in managing the customer' is a function of the level of competition for the customer, customer buying behaviour and the characteristics of the product bought by the customer. 'Strategic importance' is determined by the value/volume of purchases, the potential and prestige of the customer, customer market leadership, and the overall desirability to the supplier in making strategic improvements and adaptation to customer specifications. This mixture of subjective and actual values makes such calculations difficult especially when the main point of using such analysis is surely to produce data which can be used for comparison. 'Business attractiveness' is determined by considering a number of factors that are related to the customer's market (growth rate, competition, maturity, changes in the environment, etc.) and the status/position of the customer's business within the market. Such calculations are particularly difficult to assess and Fiocca does not take into account factors which can be critical in doing business internationally such as distance and cultural factors. The strength of

supplier/customer relationships is again measured by applying a mix of objective, judgmental or subjective factors that include:

- Length of relationship,
- Importance of the customer,
- Friendship,
- Co-operation in product development,
- Social distance

Customer profitability was calculated by taking the revenue from that customer (gross value of sales minus the commission paid) and subtracting from it direct costs, pseudo-direct costs (those costs which could be attributed to groups of similar customers and therefore apportioned accordingly) and indirect costs. When the profitability of each customer was calculated they found that about 20 per cent of customers accounted for 80 per cent of profits. Perceived strength of the relationship was calculated using the variables: technical ability, experience, pricing requirements, speed of response, frequency of contact, degree of cooperation, trust, length of relationship, friendship and management distance (frequency of contact). Their analysis of two key customers showed that while both were profitable, the company was currently not supplying even half of the customers' requirements and could potentially significantly increase their own net revenues. A criticism of the Fiocca model put forward by Yorke and Droussiotis (1994) is that it does not recognize the importance of considering customer profitability. It simply assumes that different cells can be associated with different levels of profitability. The authors suggested that such an analysis can be especially useful if strength of relationship is assessed vis-à-vis that of competitors. This empirical

test of customer analysis is interesting, but it is also problematic in a number of respects; it was conducted over a very short timescale (two months) and the authors recognize that it may not be representative of the usual situation in the industry and the company. In reality it will vary from industry to industry and market to market, with high technology companies perhaps needing to assess customer profitability quarterly while other industries probably need to consider it as part of their yearly planning cycle. Secondly, the way indirect and direct costs are allocated raises important questions; very often it is not easy to simply apportion management time and costs or even sales time and costs to a particular customer or contract. This assumption that customers are profitable simply because management perceive them to be was identified by Turnbull and Zolkiewski (1997) as a general problem in much analysis. In reality, customers were often found to be not as profitable as managers believed them to be (once full account was taken of real selling costs).

Campbell and Cunningham (1983) proposed a three step portfolio analysis strategy for marketing management. The Figure 2 exhibits the power balance factors and their impact in the making the portfolio decisions. Using a case study of a major packaging supplier, they suggest a three step analysis using two variables at each stage. The *first step* focuses on the nature and attractiveness of the customer relationship using customer life cycle stage on one axis and various customer data on the other. The customer life cycle stage is divided into tomorrow's customers, today's special customers, today's regular customers and yesterday's customers.

//Figure 2 about here//

The other dimension of analysis is multivariate, involving sales volume, use of strategic resources, age of relationship, supplier's share of customer's purchases and profitability of customer to supplier. They believe that this type of categorization will facilitate the understanding of how "strategic resources, which will ensure the future health of the business, are allocated among customers" (Campbell and Cunningham, 1983). Two major problems arise in respect of this approach. Firstly, the conceptual validity and practicality of using a life cycle approach to customer analysis can be challenged. Secondly, the choice of appropriate variables for analysis can be difficult; obtaining the required data on the variables can also present major problems. The *second step* of analysis focuses on the customer's own performance as an important aspect of customer portfolio planning. The third, and *final step* involves the selection of the key customers for analysis. Another two-dimensional grid is proposed for this stage with growth rate of Customer's market (high, medium, low and decline) on the vertical axis and competitive position (relative share of customer's purchases) on the horizontal axis. Companies are placed on the matrix and represented by a circle that represents their sales volume. However, such a framework provides a useful conceptual starting point for undertaking strategic analysis of an organization's customer portfolio. This type of analysis is complicated by another problem that may be as how often in business-to-business marketing situations are there accurate figures for market share available; companies often do not have accurate figures for their own market share let alone the ability to collect this data from all but their closest customers (and this assumes that these customers have the data). Another potential difficulty arises from how the product is used by the customer; if it is utilized in the customer's final product, then this type of estimation is inherently useful though difficult. However, if capital goods or services are being supplied then the estimations are unlikely to be as meaningful.

Customer-supplier relationship theories

Shapiro *et al.* (1987) in developing a customer classification matrix focus on customers as profit centres. Three variables - costs to serve suppliers, customer behaviour and management of customers - were used to investigate the profit dispersion of the customer portfolio. Four types of costs - presale, production, distribution and post-sale service costs - were used to define the cost to serve axis. Combining this calculation with the net price charged they found that such analysis identified a wide range of profit margins both by customer and type of product sold.

//Figure 3 about here//

Shapiro *et al.* suggest that while many suppliers believe that if they analyze the breakdown of their accounts, most accounts will fall into the 'carriage trade' and 'bargain basement' quadrants. Yet, when analysis is actually performed, it will usually show that over half a suppliers' accounts fall into the 'passive' and 'aggressive' quadrants as exhibited in Figure 3. They contend that "Four aspects of the customer's nature and position affect profitability: customer economics, power, the nature of the decision-making unit, and the institutional relationship between the buyer and seller" (Shapiro *et al.*, 1987). They further developed the approach and demonstrated that the grid can be successfully used to segment customers in mature industrial markets. Turnbull and Zolkiewski (1997) also tested this matrix using a case study of a UK-based Computer Systems house and identified a scatter of customer projects across the matrix.

Krapfel, Salmond and Spekman (1991) also use a portfolio approach to analyse customer-supplier relationships and propose a relationship classification matrix based upon the concepts of 'relationship value' and 'interest commonality'. Krapfel, Salmond and Spekman, define relationship value as a function of four factors: criticality, quantity, substitution and slack..

$$RV_i = f[C_j Q_j R_j S_j]$$

Whereas,

RV_i is the value of the relationship to the seller

C_j is the criticality of the goods purchased by the buyer

Q_j is the quantity of the seller's output consumed by this buyer

R_j is the replaceability of this buyer (i.e. the switching cost of accessing other buyers)

S_j is the cost savings resulting from the buyer's practices and procedures".

Turnbull and Zolkiewski (1997) tested the Krapfel, Salmond and Spekman (1991) matrix. They used a customer-supplier perspective and utilized data from the same UK-based Computer Systems house as used in the test of the Shapiro et al., matrix. Following their analysis based upon the Shapiro *et.al.* and Krapfel, Salmond and Spekman matrices, Turnbull and Zolkiewski (1997) proposed a three-dimensional basis for customer portfolio analysis. This proposal resulted from a consideration of the differences in the nature of the matrix axes (i.e. the variables being used), with the Shapiro *et al.*, axes of the matrix being relatively easy to measure while with the Krapfel *et al.*, axes are much more subjective. They argue that three-dimensional

analysis based upon cost to serve, net price and relationship value, is appropriate when segmenting the customers of any firm, especially because such an analysis provides a more comprehensive overview than can be gained from simply using two variables. These portfolio theories have been tested over the period with variety of data sets and improved subsequently. The major criticisms on the current models include as following:

- Is it viable to transpose product life cycle concepts into a 'customer life cycle' and then use this as a basis for planning? While a number of authors have discussed this concept at length, its application to this sort of analysis can be problematic.
- There are a wide range of variables and potential ways to calculate the dimensions of analysis, which mitigates against easy comparison of analyses.
- The actual analysis may be easily distorted by a number of factors, including:
 - lack of accurate data
 - suppliers being reliant on one or two major customers
 - data being collected over too short a period
 - the subjective basis of many of the variables.
- Many of the models do not explicitly include customer profitability; experience shows that customer profitability data is difficult to collect: although direct costs should be apportioned directly on a customer-by-customer basis, many companies do not have adequate mechanisms for allocating indirect costs.
- When matrix positioning involves a mixture of actual and subjective data, the results may prove unsuitable for use in future comparisons. Although weighting of variables may go some way to alleviating this.
- Generally, the scales proposed for axes are imprecise; for instance, what are low and high values? Again, such values implicitly involve subjective judgements and therefore become more difficult to assess. However, they can be very useful if it is accepted that they simply provide a rough conceptual guide to sorting out the major customers from the mass of customers, especially when it is not very clear what to do because the majority of customers occur in a large cluster.

In a dynamic framework where franchise value is determined endogenously, we show how different sources of rents (under-priced deposit insurance, super-normal returns on loans, and imperfect competition for deposits) affect the risk taking behaviour of the financial institution, the probability of default and the value of deposit insurance liability. The model predicts that bank behaviour will depend on the sources of its rents (Pelizzon 2001). The paper discusses that in case the disciplinary effect of the loss of

the franchise value disappears and, in general, the value of the deposit insurance liability increases because the bank fails less often but with a large deficit. The critical dimensions of the portfolio theories emerged during the late 20th century is summarized in the Table 1.

//Table 1 about here //

An active portfolio management is concerned with objectives related to the out performance of the return of a target benchmark portfolio. Browne (2000) considers a dynamic active portfolio management problem where the objective is related to the trade-off between the achievement of performance goals and the risk of a shortfall. Specifically, we consider an objective that relates the probability of achieving a given performance objective to the time it takes to achieve the objective. This allows a new direct quantitative analysis of the risk/return trade-off, with risk defined directly in terms of probability of shortfall relative to the benchmark and return defined in terms of the expected time to reach investment goals relative to the benchmark. The resulting optimal policy is a state dependent policy that provides new insights. As a special case, our analysis includes the case where the investor wants to minimize the expected time until a given performance goal is reached subject to a constraint on the shortfall probability.

Decision Making Theories and Relation with the Customer Portfolio Models

The decision-making under uncertainty is, at least partly case-based. Schmeidler and Itzhak (1995) discuss a model in which cases are primitive and which provides a simple

axiomatization of a decision rule that chooses a 'best' act based on its past performance in similar cases. Each act is evaluated by the sum of the utility levels that resulted from using this act in past cases, each weighted by the similarity of that past case to the problem at hand. The formal model of case-based decision theory naturally gives rise to the notions of satisfying decisions and aspiration levels. The starting point of hedonistic influence on consumer choice is the discrepancy between modern choice theories which cast themselves as psychology-free and textbook choice theory (especially consumer theory) which is characterized by a high level of hedonistic influence. Three possible explanations for this discrepancy were suggested: (1) Pedagogic Reasons, (2) Friedman's Thesis and (3) Implicit psychology in choice theory itself. The third explanation is put forward as the most plausible one. This is supported by a discussion of choice theories and by some recent developments in the literature. Clearly the implicit (and sometimes explicit) existence of hedonistic notions cast serious doubts on the alleged psychological neutrality of modern choice theories (Drakopoulos, 1990).

It has been argued that developments in information technology affect the performance of marketing decision-makers through different routes. Advances in information technology enhance the possibilities to collect data and to generate information for supporting marketing decision-making. Potentially, this will have a positive impact on decision-making performance. Managerial expertise will favour the transformation of data into market insights. However, as the cognitive capabilities of marketing managers are limited, increasing amounts of data may also increase the complexity of the decision-making context. In turn, increased complexity enhances the probability of biased decision processes (e.g., the inappropriate use of heuristics) thereby negatively affecting decision-making performance. Marketing management support systems, also

being the result of advances in information technology, are tools that can help marketers to benefit from the data explosion. These systems are able to increase the value of data and, at the same time, make decision-makers less vulnerable to biased decision processes (Bruggen, Smidts and Wierenga, 2000). The analysis leads to the expectation that the combination of marketing data, managerial judgment, and marketing management support systems will be a powerful factor for improving marketing management.

The links between customer satisfaction, repurchase intentions, purchase behavior, and customer profitability with empirical data on attitudes, behavior, and profitability at the customer level of analysis have been explored through one of the empirical studies (Magnus and Vilgon, 1999). Purchase behavior and profitability data, derived from the accounting system of a firm, are matched with the responses of the firm's customers to survey questions distributed prior to the behavior and profitability outcomes. The analysis reveals a strong link between customer behavior and customer profitability, while modest links exist between repurchase intentions and subsequent behavior. Only a weak and non-significant direct link can be observed between customer satisfaction and customer profitability. This study, then, questions customer satisfaction's commonly assumed role as a proxy for profitability.

Haynes and Dinc (2003) extension of the shift-share model identifies regional industrial sectors for analysis based on their scale, productivity and sources of productivity change. By employing Data Envelopment Analysis (DEA), the efficiency of these lead sectors is investigated and the future competitiveness of these sectors is evaluated. By

incorporating input-output analysis, the impact of inter-sectoral transactions on sectoral efficiency is assessed. Since in most cases state economic development planning and implementation processes also involve political judgements, based on the findings of the above models, the study suggests a decision support framework which combines the above mentioned quantitative tools with other qualitative decision factors. An Analytical Hierarchy Process (AHP) is employed as a multi-objective decision making device to integrate the relevant policy components. These multi-stage decision models compute optimal closed-loop sales policies based on subjective assessments of the probability distributions of future prices. The first approach assumes that the decision maker is risk indifferent. Later on, the model is expanded in order to maximize expected utility to capture risk aversion as well. The impacts of different degrees of risk aversion on the optimal policy are analyzed and conclusions are drawn with respect to the model application in practical decision making.

A framework for the formulation, analysis, and computation of solutions to spatial network problems in which the firms are multi-criteria decision-makers and the consumers are as well has been developed by (Ding, *et.al* 2002). In particular, the firms, which are involved in the production of a homogeneous commodity, are spatially separated and weigh the two criteria of profit maximization and total output maximization in distinct fashion. They are faced with the selection of modes/routes (which are modelled in an aggregated manner) to transport the commodity to the demand markets where consumers, consisting of different classes, consider the price charged by the producers and weigh the transportation cost and the transportation time of the product on the links in an individual manner. We derive the governing equilibrium conditions and present the variation inequality formulation. We provide

qualitative properties of the equilibrium commodity shipment and generalized price pattern and then propose an atonement process, which we formulate as a projected dynamical system. We give an algorithm for computational purposes and apply it to several numerical examples for illustration purposes. This paper is the first to integrate multi-criteria decision-making on the production side and on the consumption side in a basic network context.

The theory that competition generates reputation-building behavior in repeated interactions when the product quality observed by consumers is a signal of firms' effort level has been discussed in one of the models (Horner 2002). There are two types of firms and "good" firms try to distinguish themselves from "bad" firms. Although consumers get convinced that firms which are repeatedly successful in providing high quality are good firms, competition endogenously generates the outside option inducing disappointed consumers to leave firms. This threat of exit induces good firms to choose high effort, allowing good reputations to be valuable, but its uncompromising execution forces good firms out of the market. The common precept of decision analysis under uncertainty is the choice of an action, which maximizes the expected value of a utility function. The axioms for subjective expected utility provide a normative foundation for this principle of choice. This study shows that the same set of axioms implies that one should select an action, which maximizes the probability of meeting an uncertain target. This suggests a new perspective and an alternate target-based language for decision analysis (Bordly and Licalzi, 2000). The study explores the implications and the advantages of this target-based approach for both individual and group decision-making.

Alternate Dimensions in Portfolio Models

Reviewing upon the existing portfolio models and analysing the gaps thereof it may be required that the customer portfolio models be structured in reference to the market environment and value determinants. The portfolio decisions of customers depend on subjectivity of the market environment that appears in different forms. In constructing the portfolio decision model, the expectation formation processes is based on the market environment factors like industry and product attractiveness, risk, customer life cycle and variables of human behaviour and the economic factors. There are some portfolio decision models discussed in the following text that may be considered as a supplement to the existing models and a contribution to the topical knowledge base. These models illustrate using real-life framework for managing customer portfolio decisions in which the marketing opportunities are described in terms of a set of attributes and part of this set is intended to drive the customer decisions.

Market environment related portfolio concept

The market environment related factors affect the customer portfolio decisions to a large extent in a given market conditions. The customer-organization (C-O) fit has been exhibited in the model and the major attributes of the factors involved in customer decisions (Rajagopal, 2002). The model may also be explained as an instrument to analyze the individuals' attraction to functional variables of marketing like competition, brand life cycle, diffusion and adaptation of innovation and technology

that determine the strength of industry attractiveness. The construct of the model has been built around the market environment factors by operationalizing the C-O fit as the similarity between customers and business organizations on five points of comparison: behavioural dimensions of the customers, attractiveness, competition, economic variables and brand performance. The risk factor is predominant in marketing so as is also associated with the industry attractiveness and influencing the customer lifecycle in making portfolio decisions.

//Figure 3 about here//

The strength of the business organizations in effective diffusion of innovations and technology and inducing the responsive behaviour towards its adaptation would help in building the industry and product attractiveness. The industry attractiveness is measured in terms of its competitive gains that reflects in terms of the relative market share, growth and sales. The brand life cycle in association with product life cycle that determines the product attractiveness factors (Rajagopal and Sanchez, 2004). The fusion of variables of brand life cycle and competitive dimensions emerging form the pool of economic determinant that play significant role in customer portfolio decisions. The economic determinants consists of 4As (accessibility, approachability, affordability and adaptability), 4Cs (convenience, comprehension, cost to customers and care) and price and non-price factors leading to quality and services (Rajagopal 2000). The risk factor in portfolio decisions may drive the customers towards higher prices and lower risk premiums for an isolated portfolio while for the repeat decision, lower prices with low premiums may turn out to be favourable.

Value based portfolio model

This model analyzes optimal portfolio choice and consumption with values management in the organization-supplier-customer triadic relationship. The value concept in the above relationship governs the customer portfolio decision in terms of formulation of recursive utility over time. It shows that the optimal portfolio demand for products under competition varies strongly with the values associated with the brand, industry attractiveness, knowledge management and ethical issues of the organization. The extent of business values determines the relative risk aversion in terms of functional and logistical efficiency between the organization and supplier while the switching attitude may influence the customers if the organizational values are not strong and sustainable in the given competitive environment. The model assumes that a high functional value integrated with the triadic entities would raise the market power of organization, sustain decisions of customer portfolios and develop long-run relationships thereof. The customer value concept is utilized to assess product performance and eventually to determine the competitive market structure and the product-market boundaries.

// Figure 4 about here //

The model explains that the value based customer portfolios would enhance the customer value as the product efficiency viewed from the customers perspective, i.e., as a ratio of outputs (e.g., resale value, reliability, safety, comfort) that customers obtain from a product relative to inputs (price, running costs) that customers have to deliver in exchange. The derived efficiency value can be understood as the return on the

customer's investment. Products offering a maximum customer value relative to all other alternatives in the market are characterized as efficient. Market partitioning is achieved endogenously by clustering products in one segment that are benchmarked by the same efficient peer(s). This ensures that only products with a similar output-input structure are partitioned into the same sub-market. As a result, a sub-market consists of highly substitutable products.

The value brand portfolio model illustrates the customer portfolio management (CPM) within the triadic relationship of the organization-supplier and customer. The customer values are reflected in their competitive gains, perceived use values, volume of buying and level of quintessence with the customer relationship management services of the organization. If these variables do not measure significantly, there emerges the development of switching attitude among the customers. If the organizational values are low the supplier relationship may be risk averse due to weak dissemination of values from organization to the suppliers.

Synthesis and Managerial Applications

This review clearly shows that customer portfolio analysis can provide strategic input into a firm's planning processes and may also be the key to a successful relationship management strategy (managing the corporate social capital). However, the use of portfolio analysis should only be undertaken after due consideration has been given to the limitations inherent in the analysis and particularly the identification and definition of the important criteria for analysis. There are two main issues which result from the review of literature :

- How can subjective (management) values be incorporated into the calculations?

Many of the examples showed to a greater or lesser extent the difficulties of this.

- Which variables are the most pertinent? In conjunction with this, it seems that apart from calculations of the profitability of the various projects and customers, quantitative measures of customer/portfolio management have not been easy to identify.

It is apparent from the various practical attempts to use the portfolio models that although these models are inherently appealing as a means for analysis, in practical terms they are extremely difficult to define. The real problem lies in the fact that the definitions simply do not involve easily collected 'hard' data; for example, many organizations do not have mechanisms which allow them to calculate the real 'cost to serve' individual customers or even market segments. All firms want profitable customers and valuable relationships. The difficulty comes with the associated calculations. In view of a firm being embedded in three types of relationship portfolio and believing that portfolio analysis provides the key to successful relationship management we may have unwittingly described the inherent constituents of corporate social capital: customer relationships, supplier relationships and indirect relationships. Many of the variables that are proposed in the models reviewed in this paper are clearly related to the revenues and capital assets of the firm.. It may be of importance to further recognize the conceptualization and empirical research that more explicitly integrates the contributions of sociology and business-to-business marketing.

The concept of the indirect portfolio needs further development in reference to the competitor portfolios. The models focusing on this aspect should allow a strategist to map the links from competitors to an organization's customers and suppliers, when considered in totality. Such concept should be able to discuss the competitor actions. Likewise the supplier or potential customer portfolios could be introduced and applied in deriving decisions about targeting new customers or selecting new suppliers. Advances in technology mean that modelling such data should be easily accomplished. The electronic databases and interchanges should be able to record qualitative data alongside this to allow their decision making processes to be audited and available for future comparison. There is further scope for empirical testing and for conceptualization. In particular, rigorous comparisons of the various axes proposed in the different models needs undertaking along with the provision of definitive descriptions of the component, especially when qualitative issues are at hand. The standardization of such definitions is essential if the models are to be effectively and efficiently used as a strategic decision making tool.

The above discussion on the customer portfolio models raises the issues as how relationship portfolios can provide a mechanism for developing a coherent relationship management strategy. However, choice of models or dimensions is complex, it will partly depend on the nature of the company and partly micro-environment that is perceived by the company in reference to the relationship management; competitors' share; emergence of new markets etc. However, the two-dimensional matrices do not provide enough depth of analysis. The answer may lie in the step-wise analysis (Fiocca, 1982; Campbell and Cunningham, 1983) or in multidimensional analysis (Turnbull and Zolkiewski, 1997). The choice of model must also be made with a full consideration of

the limitations of using portfolio modelling. It has been observed through variety of applications of the models that these models are inherently appealing as a means for analysis, in practical terms they are extremely difficult to define. The real problem vests in the fact that the definitions simply do not involve easily collected 'hard' data; for example, many organizations do not have mechanisms, which allow them to calculate the real 'cost to serve' individual customers or even market segments. The issue of customer profitability and relationship value has an inherent appeal in all the models. All firms want profitable customers and valuable relationships. The difficulty comes with the associated calculations. However, it is imperative that Shapiro *et al* (1987) suggestion that the real costs of supporting various customers should not be considered in isolation by managers and that they should be aware that high variations in these costs do often exist. It is also crucial that the data used to calculate customer profitability takes into account adaptation/development costs for new products/services as well as the more 'tangible' indirect costs such as sales expenses. Yorke (1984) notes how infrequently management attention is paid to the effects in terms of net profit of applying resources to a particular segment or even a particular customer.

An appropriate portfolio model can be used for optimizing portfolios of credit for return and volatility characteristics and marginal contribution to the credit expected loss and credit value-at-risk measures due to adding or reducing exposures in specific names by the financing institutions. The portfolio models have the predict power and allows the default probability that can be used as credit ranking tool that feeds off observable parameters, and more frequently updated market data such as equity prices. The application of these models needs a strong support of data base and computation skills. The models can also be used by the corporate managers for forecasting the consumer

preferences, demand, brand switch probabilities, response to pricing strategies and impact on the innovations. However, a manager needs to be able to respond to the data collected. This should be done following the age old management practice as given below:

- Identify the corporate needs
- Define the problem for analysis
- Analyze the nature of data-discrete, clustered, time series etc
- Choose the appropriate model with assumptions
- Testing the model
- Analysing results
- Undertake repeated analysis of the data
- Prepare appropriate action plans
- Implement the plans
- Monitor and evaluate the outcomes of the plans, and
- Feed the results back into the planning process.

On a tactical level managers need to consider what is the optimum spread of customers on a matrix. This needs careful attention and the application of managerial judgement and experience. It cannot be prescribed by a text. They should also be prepared to vary their management style in response to the analysis they prepare. For example a different style may well be needed to deal with customers who do not yield much profit and present high costs to serve. All of these have postulated that portfolio theory is a useful theoretical approach to the analysis, categorisation and management of supplier-customer relationships. Despite this, there has been relatively little empirical research

reported that informs other researchers, academic or managerial, about the reality of relationship management. It is currently not clear what methods companies actually use for managing relationships or whether they include a formal, academic system. At the moment it is not known how systems for managing relationships, academic or otherwise, are physically put into practice within companies.

One of the most frequently used and most important key figures for customer valuation is customer profitability. Customer profitability is most easily calculated as the difference between revenue and costs. The customer portfolio analysis is more useful to perform detailed customer contribution margin analysis including different revenue types, product costs, costs to acquire, costs to serve and cost to retain in order to produce a better coherent picture. An appropriate model will help in customer scoring exercises that combines multiple aspects of customer into a coherent evaluation, which enables somebody e.g. in the interaction center to quickly understand the meaning of this customer for the success of your business. To fully utilize this functionality, the following products should be evaluated. The computer based analysis of customer portfolios may yield customer portfolio optimization results that are presentable using graphical displays in the analysis of the customers making up customer portfolio. It allows to consider aspects such as share of wallet, customer attractiveness, or customer satisfaction, and manage your portfolio accordingly.

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**Figures,
Boxes and
Tables**

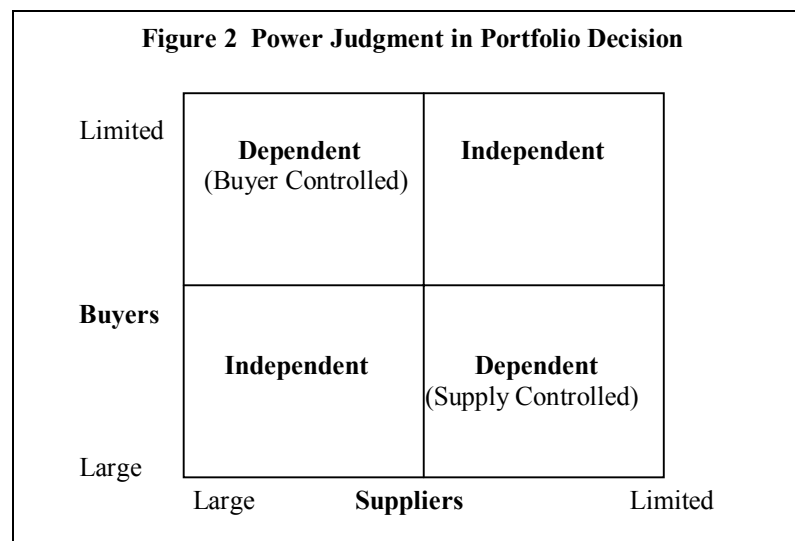
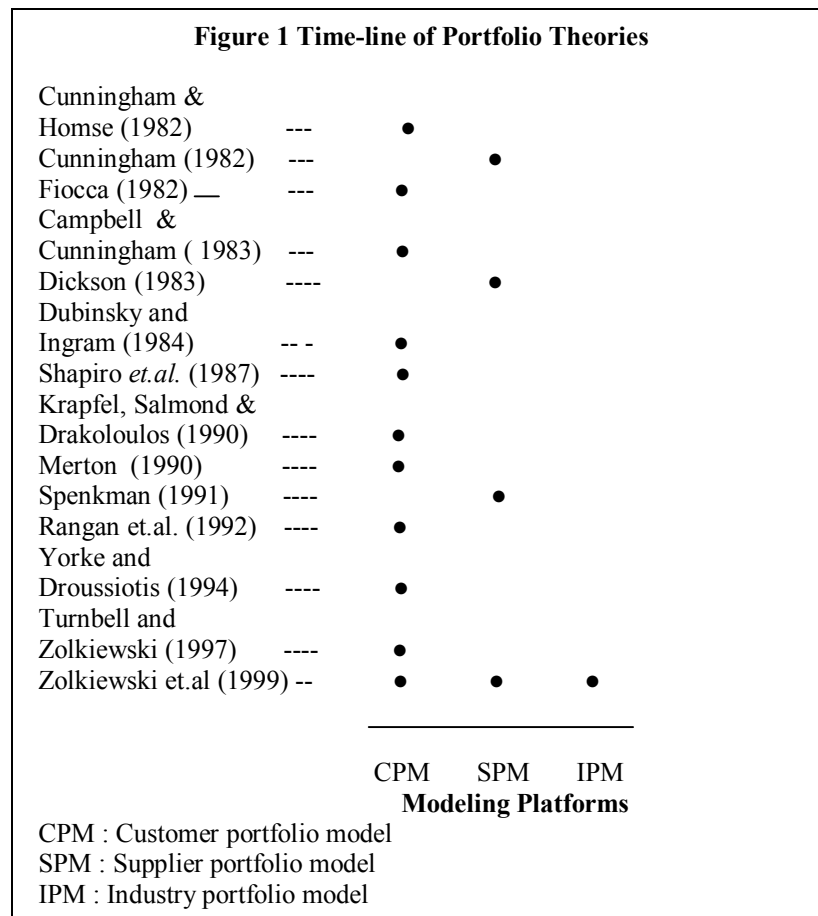


Figure 3 Customer Satisfaction Matrix by Shapiro

Net Price	High	Passive	Carriage Trade
	Low	Bargain Basement	Aggressive
		Low	High
		Cost to Serve	

Table 1 Critical Dimensions of the Portfolio Theories

Contribution	Core Issues
Fiocca (1982)	Customer portfolio management is a function of level of competition for customers, buying behaviour and product attributes in use. The model does not take into account the distance and cultural factors and overlooks the significance of the customer profitability.
Campbell and Cunningham (1983)	Relationship between customer life cycle and customer data on various buying parameters are the core issues addressed in the portfolio model. The customer preferences and the portfolio planning, customer market and level of competition are the basic determinants of the model.
Shapiro <i>et. al.</i> (1987)	The model emphasizes the customer as the profit centres. It is a function of the factors that include cost to serve suppliers, customer behaviour and management of customers.
Drakoulouos (1990)	The model emphasizes on the discrepancies in the hedonistic influence with reference to the consumer choice. The identified discrepancies were based on pedagogical reasons, Friedman's thesis and implicit psychological factors of choice theory.
Krapfel <i>et.al</i> (1991)	This portfolio model analyzes the customer –supplier relationships and proposes a relationship classification matrix based on the relationship value and interest commonality. The model discusses four classifications –partner, friend, rival and acquaintance emerging from the relationship value and interest commonality variables.
Gilboa and Schmeidler (1995)	The theory of axiomatization of decision making that chooses a best act in accordance with its past performance.
Olsen and Ellram (1997)	This model discusses the three step analysis of supplier relationship. The first step involves the portfolio analysis of the purchases of the company on the matrix bond with purchase situation on one axis and strategic importance on the other. The second stage is build around 3x3 matrix with high , medium and low as the categories on each axis. One of the axes represents relative supplier attractiveness while the other depicts strength of relationship. The last stage involves in comparing the results of the earlier matrices.
Turnbull and Zolkiewski (1997)	The model discusses the profitability and rate of customers in order to realize the sales volume. The customer portfolio matrix has been designed considering three dimensional analysis of the variables- cost to serve, net price and relationship value.
Browne (2000)	Dynamic active portfolio management related to the trade-off between achievement of performance of goal and risk of short fall forms the thesis of the model.

Figure 3 . Market Environment Related Portfolio Model

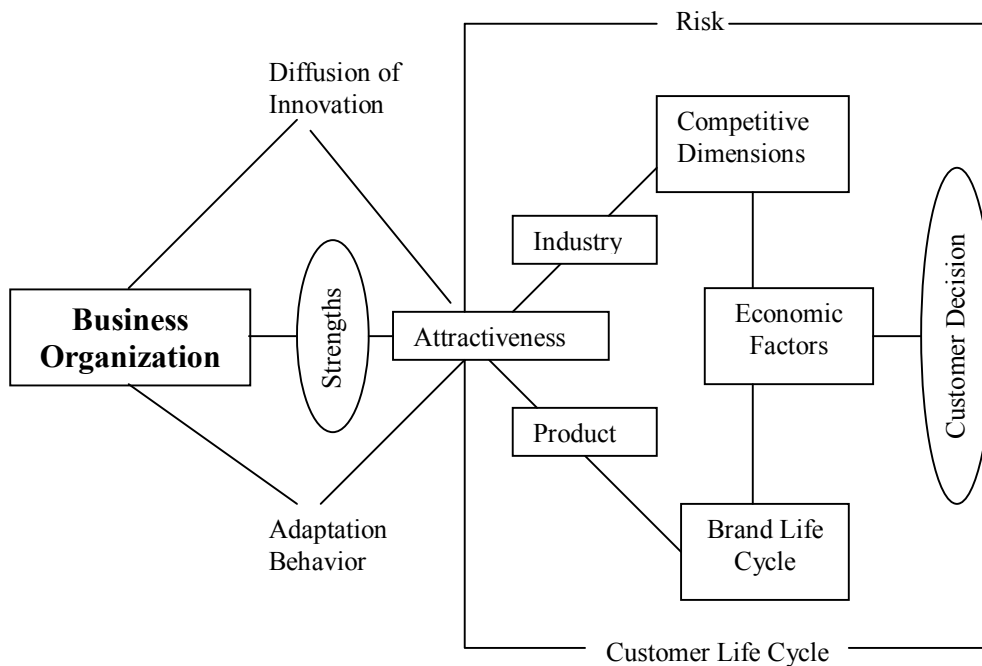


Figure 4 Value Based Portfolio Model

