

**EVALUATING PRODUCT PORTFOLIO PERFORMANCE FOR A  
MANUFACTURING COMPANY IN THE AUTOMOTIVE INDUSTRY**

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**Programme : Management Engineering**

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**İSTANBUL TEKNİK ÜNİVERSİTESİ ★ FEN BİLİMLERİ ENSTİTÜSÜ**

**OTOMOTİV SEKTÖRÜNDE ÜRETİM YAPAN BİR İŞLETMEDE ÜRÜN  
PORTFÖYÜNÜN PERFORMANSININ DEĞERLENDİRİLMESİ**

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## **FOREWORD**

I have been working for a global company in the automotive industry since 2008. The economic crisis has affected directly automotive industry and with global economic crisis, I think that the importance of the “fitting products” concept for company portfolio is increasing day by day. Therefore, I would like to study on evaluating product portfolio to support to my work life in the automotive industry.

I would like to express my deep appreciation and thanks my thesis supervisors Assoc. Prof. Dr. Şebnem Burnaz and Assoc. Prof. Dr. İlker Topçu, as well as Honda Turkey’s managers for their kindness, assistance and all support provided during my study. I would sincerely like to thank TÜBİTAK for all support they give with master program scholarship which allowed me to start a master program.

Best Regards,

July 2010

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## **ABBREVIATIONS**

<b>AHP</b>	: Analytic Hierarchy Process
<b>PLC</b>	: Product Life Cycle Method
<b>BCG</b>	: Boston Consulting Group
<b>GE</b>	: General Electric
<b>GEC</b>	: General Electric Corporation
<b>OSD</b>	: Turkish Automotive Producers' Association
<b>BMI</b>	: Business Monitor International Ltd
<b>OICA</b>	: The International Organization of Motor Vehicle Manufacturers
<b>CR</b>	: Consistency Ratio
<b>CI</b>	: Consistency Index
<b>ANP</b>	: Analytic Hierarchy Process
<b>ROI</b>	: Return on Investment



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# **EVALUATING PRODUCT PORTFOLIO PERFORMANCE FOR A MANUFACTURING COMPANY IN THE AUTOMOTIVE INDUSTRY**

## **SUMMARY**

The increase rate of change in the economic, political and social environments of business today has lead to growing competitiveness, uncertainties and risks. Under this conditions, importance of effective portfolio management and the selection decision of the best portfolio is increasing day by day.

Turkey's automotive industry has been dented by the dramatic slowdown in the sector that began in the autumn of 2008 with economic crisis. After the economic crisis, total auto sales fell as much as 20% and the automotive manufacturer has been evaluating portfolio to minimize loss.

The aim of this study is to analyse the specific company's (in the automotive industry) product portfolio based on the found performance criteria which are achieved from the result of in-depth interview with the selected company's managers and to find the most appropriate products which will give the best result in the future trends by using Analitic Hierarchy Process.

Firstly, In the study the general performance criteria was presented for the portfolio based on the best known portfolio models criteria and the sector analysis data results, then the general portfolio performance criteria was privatized for the selected company in the automotive industry by using deep and comprehensive interview with the managers. After determining of the portfolio performance criteria, the most appropriate product's decision-making have been made by using Analytic Hierarchy Process. Analytic Hierarchy Process separates the goal/problem to sub goals/problems and collects each sub-goal/problem's solution in a single conclusion. This method makes decision-making easy by connecting feeling, perceiving, judgment and experience that are factors in forming the decision. In the evaluation made by Analytic Hierarchy Process, decision makers can make comparisons among alternative products by sensitivity analysis.



## **OTOMOTİV SEKTÖRÜNDE ÜRETİM YAPAN BİR İŞLETMEDE ÜRÜN PORTFÖYÜNÜN PERFORMANSININ DEĞERLENDİRİLMESİ**

### **ÖZET**

2008 yılında yaşanan küresel ekonomik kriz birçok ülkede önemli değişiklikleri beraberinde getirirken Türkiye’de birçok sektörünü olduğu gibi özellikle otomotiv sektörünü direkt olarak etkilemiştir. Yaşanan ekonomik kriz sadece ekonomik alanda değil, sosyal ve politik alanda da etkisini göstererek belirsizliği, riski ve artan rekabet gücünü de beraberinde getirmiştir. Bu koşullar altında, belirsizliği ve riski minimize ederek işletmelerin değerlerini maksimize edecek çareler aranmaya başlanmıştır.

Özellikle Türkiye’de krizden en çok etkilenen sektörden biri olan otomotiv sektöründe satışlarda 20%’ye yakın düşüşün yaşanması üreticileri ürün portföylerini tekrardan değerlendirmeye itmiş, bazıları ürünlerini pazardan çekerken bazıları üretim adetlerini düşürerek en az zararla bu dönemi geçirmeyi hedeflemişlerdir.

Çalışmamız otomotiv sektöründe üretim yapan bir işletmenin ürün portföyünü değerlendirerek portföy içerisindeki en iyi ve en kötü ürünlerini ortaya koymayı amaçlamaktadır. Amaca ulaşabilmek adına daha önce ortaya konulmuş portföy modelleri ve otomotiv sektörünün kritik başarı faktörleri incelenmiş, bu bilgiler çerçevesinde uygulama yapılacak işletmede 10 yöneticiyle derinlemesine mülakat yapılarak işletmenin ürün portföyünün değerlendirmesinde kullanılacak performans kriterleri saptanmıştır. Performans kriterlerinin amaç içerisindeki önem derecelerini ve her bir ürünün performans kriterlerine göre puanını saptayabilmek için Analitik Hiyerarşi Prosesinde yararlanılmıştır. Anket yardımıyla yöneticilerden 1-9 skalasını kullanarak kriterleri ikili karşılaştırmaları ve her bir ürüne kriterler bazında başarı puanları vermeleri istenerek çalışma amacına ulaşılmıştır.



## **1. INTRODUCTION**

The increase rate of change in the economic, political and social environments of business today has lead to growing competitiveness, uncertainties and risks. These circumstances have led to a dramatic increase in attention given to strategic planning of all kinds. Marketing planning has itself received a good deal of attention in recent years. Under such circumstances, a firm would have a better chance of success and survival by a judicious spread of its resource and investments achieved through portfolio analysis and planning (effective portfolio management).

Effective portfolio management is vital to succesfull competition. Portfolio management is about making strategic choices which markets, products and technologies our business will invest it. It is about resorce allocation; how you spend your scarce engineering, research and development and marketing resources. It focuses on product selection on which new product or development products you choose from many opportunities you face. And deals with balance having the right balance between numbers of products and the resource or capabilities you have avaiable.

In the portfolio management, the best/appropriate products are important issue and various performance metrics (from the financial to the strategic approaches) are used to evaluate performance of product portfolio. The comparison with basic models' results reveal major differences between the best and the worst.

The aim of study is to evaluate the products' performance and to find the most appropriate products in the portfolio. To reach the aim, first of all we selected challenging industry which needs tool for the evaluating of product portfolio so the automotive industry was selected for the field study because Turkey's automotive industry has been dented by the dramatic slowdown in the sector that began in the autumn of 2008 with economic crisis. After the economic crisis, total auto sales fell as much as 20% and the automotive manufacturer has been evaluating portfolio to minimize loss. So that, the manufacturing company in the automotive industry was

selected for evaluating product performance and for finding the best and worst products in the portfolio.

Firstly, at the second and third section in the study, the general information about product concept and portfolio concept will be mentioned based on literature to understand clearly portfolio management and also best known portfolio models. After the basic introduction about product and portfolio concept, the main problem will be presented for the portfolio management. And also, the best known performance criteria will be stated for solving main problem in portfolio management and mentioned on the model's advantage and disadvantage side generally.

At the fourth section, for the field study the selected automotive industry's sector analysis results will be presented with more details.

At the fifth section, the methodology of field study to evaluate products' performance in portfolio and to find most appropriate products' in portfolio will be presented in detailed.

At the sixth section, the study's results, study's limitation and future suggestion will be stated clearly.

## **2. THE PRODUCT AND RELATED CONCEPTS**

A well-structured product plan lets a company pinpoint opportunities, develop appropriate marketing programs, coordinate a mix of products, maintain successful products as long as possible, reappraise faltering products and delete undesirable products (Evans, Berman, 1997). So, The product concept is very important for portfolio management.

First of all, we start with the product and the product mix definition before portfolio management section to understand portfolio concept very well. In this section, we will explain product concept and product mix concept respectively. Then we will give information about main topic in thesis which is called portfolio management next section.

### **2.1 The Product Concept**

The product is defined as an idea, a physical entity (a good), a service or a combination of the three that is an element of exchange to satisfy individual or business objectives. From a marketing viewpoint, the key element of this definition is “to satisfy individual or business objectives” (Bennett, 1995). Individuals and businesses purchase products to solve problem or satisfy needs. That is, products provide benefits. Successful marketers focus on the benefits products supply to customers (Kotler, 2003). Products include more than just tangible goods. Broadly defined, products include physical objects, services, events, persons, places, organizations, ideas or mixes of these entities (Kotler, Armstrong, 2006).

### **2.2 Product Classification**

Marketers often classify products into specific categories. This section discusses the categories of durable, tangible and usable (consumer and business/industrial) products because each product type has different marketing product mix strategy.

Then we focus on goods (durable and tangible products)&consumer products category to evaluate portfolio for our study.

### **2.2.1 Durability and Tangibility Classification**

Products can be classified into three groups according to durability and tangibility which are defined below as nondurable, durable goods and services.

Nondurable Goods are tangible goods normally consumed in one or a few uses, like beer and soap. Because these goods are consumed quickly and purchased frequently, the appropriate strategy is to make them available in many locations, charge only small markup, and advertise heavily to induce trial and build preference.

Durable Goods are tangible goods that normally survive many uses: refrigerators, machine tools and clothing. Durable products normally require more personnel selling and service, command a higher margin, and require more seller guarantees.

Services are intangible, inseparable, variable and perishable products. As a result, they normally require more quality control, supplier credibility and adaptability. Examples include haircut and repairs. (Kotler, 2003)

### **2.2.2 Consumer - Business Classification**

Another important distinction is between consumer and business products. This categorization is based on the way a product is used, and not on the specific characteristics of the product.

#### **2.2.2.1 Consumer Goods**

Consumer products are those purchased by consumers for their own personal use. The vast array of goods consumers buy can be classified on the basis on shopping habits. We can distinguish among convenience, shopping, specialty and unsought goods.

Convenience Goods are those the customer usually purchases frequently, immediately and with a minimum of effort. Convenience goods can be further divided. Staples are goods consumers purchase on a regular basis (i.e. toothpaste). Impulse goods are purchased without any planning or search effort (i.e. magazines). Emergency goods are purchased when a need is urgent (i.e. umbrella).



Shopping Goods are goods that the customer, in the process of selection and purchase, characteristically compares such bases as suitability, quality, price and style. Homogeneous shopping goods are similar in quality but different enough in price to justify shopping comparisons. Heterogeneous shopping goods differ in product features and services that may be more important than price.

Specialty Goods have unique characteristics or brand identification for which a sufficient number of buyers are willing to make a special purchasing effort. Specialty goods do not involve making comparisons; buyer invests time only to reach dealers carrying the wanted products. Dealers do not need convenient locations; however, they must let prospective buyers know their locations.

Unsought Goods are those the consumers does not know about or does normally think of buying, like smoke detectors (i.e. life insurance, encyclopedias..). Unsought goods require advertising and personal-selling support. (Kotler, 2003)

The type of consumer product's characteristic features is stated below table 2.1. We can see each of consumer product's situation/feature with respect to customer buying behavior, price, distribution, promotion.

**Table 2.1:** Type of Consumer Product

Marketing Considerations	Convenience	Shopping	Specialty	Unsought
<b>Customer Behaviour</b>	Buying Frequent purchase, little planning, little comparison or shopping effort, low customer involvement	Less frequent purchase, much planning and shopping effort, comparison of brands on price, quality, style	Strong brand preference and loyalty, special purchase effort, little comparison of brands, low price sensitivity	Little product awareness, knowledge (or, if aware, little or even negative interest)
<b>Price</b>	Low Price	High Price	High Price	Varies
<b>Distribution</b>	Widespread distribution, convenient locations	Selective distribution in fewer outlets	Exclusive distribution in only one or a few outlets per market area	Varies
<b>Promotion</b>	Mass Promotion by the producer	Advertising and personal selling by both producer and resellers	More carefully targeted promotion by both producer and resellers	Aggressive advertising and personal selling by producer and resellers
<b>Examples</b>	Toothpaste, magazines	Major appliances, televisions, furniture, clothing	Luxury goods, such as Rolex watches or fine crystal	Little insurance, Red Cross blood donations

(Source: Bennett, P., 1995, pp.235)

#### **2.2.2.2 Industrial/Business Goods**

Industrial products are those purchased by a firm or organization for its own use. Industrial goods can be classified in terms of how they the production process and their relative costliness. We can distinguish three groups of industrial goods: production goods (materials and parts), capital items and operational goods (supplies and business services)

Materials and parts are goods that enter the manufacturer's product completely. Most manufactured materials and parts sold directly to industrial users. Price and service are major marketing considerations and branding and advertising tend to be less important.

Capital items are long-lasting goods that facilitate developing or managing the finished product. They are usually bought directly from the producers, with the typical sale preceded by a long negotiation period. The producer's sales force includes the technical personnel. Producers have to be willing to design to specification and to supply postsale services. Advertising is much less important than personal selling.

Operational Products are short-lasting goods and services that facilitate developing and managing the finished products. They are normally through intermediaries because of their low unit value and the great number and geographic dispersion of customers. Price and services are important considerations, because suppliers are standardized and brand preference is not high. (Kotler, 2003)

### **2.3 The Product Mix Concept**

After determining the type (s) of product to offer, a firm needs to outline the variety and assortment of those products. A product item is a specific model, brand, or size of a product that a company sells. Usually a firm sells a group of closely related product items as part of a product line. In each product line, the items have some common characteristics, customers, and/or uses, they may also share technologies, distribution channels, prices, related services and so on.

A product mix (also called product assortment) is the set of all products and items that particular seller offers for sale. A product mix is the total assortment of products

and services marketed by the firm. Every product mix consists of at least one product line, often more. A product line is a group individual products that are closely related in some way. An individual product is any brand or variant of a brand in a product line. Thus, a product mix is a combination of product lines, which are combination of individual products.

A product mix, relevant product lines, and individual products can be defined at different levels: corporate, business and marketing levels. At the corporate level, the product mix would be defined as all product marketed by the entire corporate entity, with each business unit typically representing one or more product lines. Each business unit, however also has its own relevant product lines made up of related products. (Evans, Berman, 1997)

**Table 2.2:** Product Mix Concept

		Width of Product Mix	
		Narrow	Wide
Depth of Product Mix	Shallow	Few Models in one or a few product lines	Few Models In each of several Different Product Lines
	Deep	Many Models in one or a few Product lines	Many Models In each of several Different Product Lines

Any product mix can be defined in the terms of width, length and consistency. We can see depth and width product mix concept at Table 2.2. As we inform about the product mix in according to Table 2.2, the width of a product mix is based on the number of different product lines a company offers. A wide mix lets a firm diversity products, appeal to different consumer needs and encourage one-stop shopping. A narrow mix requires lower resource investments and does not call for expertise in different product categories.

The depth of product mix is based on the number of product items within each product line. A deep mix can satisfy the needs of several consumer segments for the same product, maximize shelf-space, discourage competitors, cover a range of prices and sustain dealer support. A shallow mix imposes lower costs for inventory, product alterations and order processing and there are no overlapping product items.

The consistency of a product mix is based on the relationship among product lines in terms of their sharing a common end-use, distribution outlets, consumer group (s) and price range. (Evans, Berman, 1997)

The given Kodak example figure 2.1.; The camera product mix is relatively narrow, because it consists of only four product lines: consumer cameras, digital cameras, industrial cameras and motion analysis products.

Product line length refers to the number of products in a product line. In the Kodak example, the consumer cameras product line is the longest, with 35 products. The industrial cameras product line is the shortest, with only three products. It is also sometimes useful to talk about average product-line length across a firm's product mix. For Kodak cameras, the average product-line length is 15.25, since there are 61 products organized into four product lines.

KODAK CAMERA PRODUCT MIX				
PRODUCT LINE LENGTH	Consumer Cameras	Digital Cameras	Industrial Cameras	Motion Analysis Products
	Kodak Advantix 2000 Auto Camera	Kodak DC25 Digital Camera	Kodak Megaplus Camera, Model 1.4	Kodak Ektapro EM Motion Analyzer, Model 112
	Kodak Advantix 2100 Auto Camera	Kodak Digital Science 420 C Infrared Camera	Kodak Megaplus Camera, Model 1.6	Kodak Ektapro EM Motion Analyzer
	Kodak Advantix 3100AF Camera	Kodak Digital Science 420 GPS Camera	Kodak Megaplus Camera, Model 4.2	Kodak Ektapro Hi-Pack Motion Analyzer
	Kodak Advantix 3200AF Camera	Kodak Digital Science DC20 Camera		
	Kodak Advantix 3600ix Camera	Kodak Digital Science DC40 Camera		
	Kodak Advantix 3700ix Camera	Kodak Digital Science DC50 Zoom Camera		
	Kodak Advantix 4100ix Zoom Camera	Kodak Professional DCS 420		
	Kodak Advantix 5600 MRX Text-Date Camera	Kodak Professional DCS 460		
	Kodak Advantix Camera	Kodak Professional DCS 465		
	... and 26 others	... and 6 others		
PRODUCT MIX WIDTH				

**Figure 2.1** Kodak's Product Mix

Product mix consistency refers to the relatedness of the different product lines in a product mix. The product mix throughout Kodak is very consistent, because all of the products are related to imaging.

### **3. PORTFOLIO CONCEPT and PORTFOLIO MANAGEMENT**

The increase rate of change in the economic, political and social environments of business today has led to growing competitiveness, uncertainties and risks. These circumstances have led to a dramatic increase in attention given to strategic planning of all kinds. Marketing planning has itself received a good deal of attention in recent years. Under such circumstances, a firm would have a better chance of success and survival by a judicious spread of its resource and investments achieved through portfolio analysis and planning (effective portfolio management).

Effective portfolio management is vital to successful competition. Portfolio management is about making strategic choices which markets, products and technologies our business will invest in. It is about resource allocation- how you spend your scarce engineering, research and development and marketing resources. It focuses on product selection on which new product or development products you choose from many opportunities you face. And deals with balance having the right balance between numbers of products and the resource or capabilities you have available.

In this section, we will explain portfolio and portfolio management concept. For the our field study, we need to understand as well especially portfolio definition and portfolio management concept. As we will see main problem in portfolio management, determining of the performance criteria to evaluate portfolio and also measurement products performance based on selected performance criteria are main problem for the evaluation of portfolio process. So that, we focused on the main problem in portfolio management for the field study.

#### **3.1 The Role of Strategic Planning In Portfolio Management**

Strategic Planning calls for action in three key areas: the first is managing a company's businesses as an investment portfolio. The second involves assessing each business's strength by considering the market's growth rate and the company's

position and fit in that market. The third is establishing a strategy. For each business, the company must develop a game plan for achieving its long term objectives.

Most large companies consist of four organizational levels: the corporate level, the division level, the business unit level and the product level. Corporate headquarters is responsible for designing a corporate strategic plan to guide the whole enterprise; it makes decisions on the amount of resources to allocate to each division, as well as on which businesses to start or eliminate. Each division establishes a division plan covering the allocation of funds to each business unit within the division. Each business unit develops a strategic plan to carry that business unit into a profitable future. Finally each product level (product line, brand) within a business unit develops a marketing plan for achieving its objectives in its product market.

All corporate headquarters undertake four planning activities:

1. Defining The Corporate Mission
2. Establishing Strategic Business Unit
3. Assigning Resource to Each SBU
4. Planning New Businesses, Downsizing or Terminating Older Businesses

### **3.1.1 Defining The Corporate Mission**

An organization exists to accomplish something: to make cars, lend money and so on. Its specific mission or purpose is usually clear when the business starts. Over time the mission may change, to take advantage of new opportunities or respond to new market conditions.

To define its mission, the company should address Peter Drucker's (1954) classic questions: What is our business? Who is the customer? What is of value to the customer? What will our business be? What should our business be? These simple-sounding questions are among the most difficult the company will ever have to answer. Successful companies raise these questions and answer them thoughtfully and thoroughly.

### **3.1.2 Identifying Strategic Business Unit**

Most companies operate several businesses. They often define their businesses in terms of products: they are in the auto business or the clothing business; but Levitt

argued that market definitions of a business are superior to product definitions as seen the example at Table 3.1 for specific company.

**Table 3.1:** Product-Oriented Versus Market-Oriented Definitions of a Business (Kerin, et al., 1990)

Company	Product Definition	Market Definition
Missouri-Pacific Railroad	We run a railroad	We are a people-and-goods mover
Xerox	We make copying equipment	We help improve office productivity
Standart Oil	We sell gasoline	We supply energy
Columbia Pictures	We make movies	We market entertainment
Carriers	We make air conditioners and furnaces	We provide climate control in the home

Large companies normally manage quite different businesses, each requiring its own strategy. General Electric classified its businesses into 49 strategic business units (SBUs). An SBU has three characteristics:

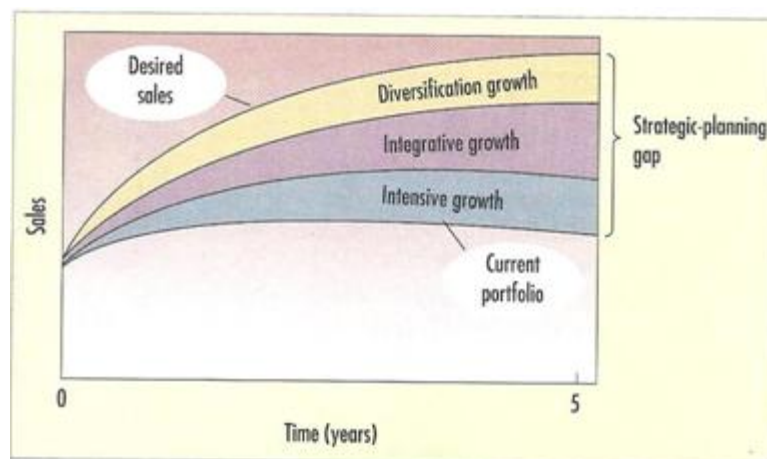
1. It is a single business or collection of related businesses that can be planned separately from the rest of the company.
2. It has its own set of competitors.
3. It has a manager who is responsible for strategic planning and profit performance and who controls most of the factors affecting profit. (Kotler, 2003)

The purpose of identifying the company's strategic business units is to develop separate strategies and assign appropriate funding. Senior management knows that its portfolio of businesses usually includes a number of "yesterday's has-beens" as well as "tomorrow's breadwinners." Yet it can not rely on impressions; it needs analytical tools to classify its businesses by profit potential (Kerin et al., 1990).

### 3.1.3 Planning For Portfolio Evaluation

The company's for its existing businesses allow it to project total sales and profits. Often, there are less than what corporate management wants them to be. If there is a gap between future desired sales and projected sales, corporate management will have to develop or acquire new businesses to fill it.

Figure 3.1 illustrates this strategic-planning gap for a major manufacturer of audio-cassette tapes called Musicale (name disguised). The lowest curve projects the expected sales over the next five years from the current business portfolio. The highest curve describes desired sales over the next five years. Evidently, the company wants to grow much faster than its current businesses will permit. How can it fill the strategic-planning gap? should be reply for effective portfolio management.



**Figure 3.1** The Strategic Planning Gap (Kotler, 2003, pp. 99)

There options are available. The first is to identify opportunities to achieve further growth within current businesses (intensive growth opportunities). The second is to identify opportunities to build or acquire businesses that are related to current businesses (integrative growth opportunities). The third is to identify opportunities to add attractive businesses that are unrelated to current businesses (diversification growth opportunities) as seen figure 3.2.

**Intensive Growth:** Corporate management's first course of action should be a review of whether any opportunities exist for improving its existing businesses' performance. Ansoff (1957) has proposed a useful framework for detecting new intensive growth opportunities called a "product-market expansion grid" (figure 3.2).

The company first considers whether it could gain more market share with its current products in their current markets (market-penetration strategy). Next it considers whether it can find or develop new markets for its current products (market-development strategy). Then it considers whether it can develop new products of potential interest to its current markets (product-development strategy). Later it will also review opportunities to develop new products for new markets (diversification strategy).



	Current Products	New Products
Current Markets	Market-Penetration Strategy	Product-Development Strategy
New Markets	Market-Development Strategy	Diversification Strategy

**Figure 3.2** Three Intensive Growth Strategies (Ansoff, 1957)

**Integrative Growth:** Often a business's sales and profits can be increased through backward, forward or horizontal integration within its industry. Musicale might acquire one or more its suppliers (such as plastic-material producers) to gain more control or generate more profit (backward integration). It might acquire some wholesalers or retailers, especially if they are highly profitable (forward integration). Finally, Musicale might acquire one or more competitors, provided that the government does not bar this move (horizontal integration). However, these new sources may still not deliver the desired sales volume. In that case, the company must consider diversification.

**Diversification Growth:** Diversification growth makes sense when good opportunities can be found outside the present businesses. A good opportunity is one in which the industry is highly attractive and the company has the mix of business strengths to be successful. There are types of diversification that are possible. The company could seek new products that have technological or marketing synergies with existing product lines, even though the new products themselves may appeal to a different group of customers (concentric diversification strategy).

Second, the company might search for the new products that could appeal to current customers even though the new products are technologically unrelated to its current product-line (horizontal diversification strategy).

Finally, the company might seek new businesses that have no relationship to its current technology, products or markets (conglomerate diversification strategy).

**Downsizing Older Businesses:** Companies must not only develop new businesses, but must also carefully prune, harvest or divest tired old businesses in order to release needed resources and reduce costs. Weak businesses require a

disproportionate amount of managerial attention. Managers should focus on growth opportunities, not fritter away energy and resources trying to salvage hemorrhaging businesses. (Kotler, 2003)

### **3.2 Portfolio Management**

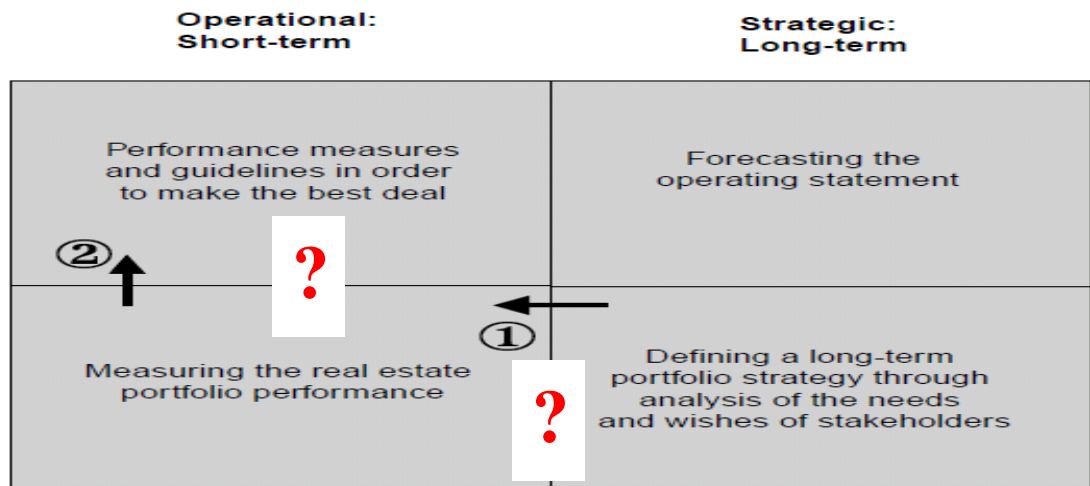
Portfolio analysis and planning will grow in the 1990s to become the powerful tool that business planning became in the 1970s and 1980s (Roussel et al, 1991). Portfolio management and the prioritization of the current products' evaluation and Research and Development projects (future trends) is vital to successful performance for many reasons;

- Portfolio management is about making strategic choices. It is one route by which senior management operationalizes their business strategy (the types of products, markets, and technologies management has chosen to attack and the relative emphasis on each).
- The new product and technologies choices that management makes today determine what the business will look like 5 years out. An estimated %32 of firms' sales today come from new products introduced within the last 5 years.
- Portfolio management is about resource allocation- allocation of scarce and vital research and development, engineering, marketing, and operational resources at a time when these resources are more stretched than ever.
- Portfolio management deals with the critical issue of balancing resources available with the numbers of products. Errors here; for example: trying to do too many products for the limited resource available- results in longer cycle time, poor quality of execution and underperforming new products. (Cooper, 1999)

### **3.3 Main Problem In The Portfolio Management Process**

Many organizations formulate a portfolio strategy, but instead of a top-down approach, in which a portfolio strategy forms a framework for operational decisions, many organisations make decisions regardless of the strategy. Hence the buildings shape the portfolio, a bottom-up approach to product management. One of the most important omissions in the portfolio management process is a lack of explicit and workable guidelines and performance measures. The long-term portfolio strategy is

not translated into performance measures (← in Figure 3.3) and consequently there are no clear guidelines for making a deal (↑ in Figure 3.3).



**Figure 3.3** Portfolio Management Process (Schaaf, Puy, 2000)

Many portfolio managers mostly use only financial criteria (except for customer satisfaction, they are all financial) to measure the performance of their organisation or the product portfolio. This is a common problem. Once a corporate portfolio manager has insight into the financial performance of his portfolio, he can concentrate more on the other ‘values’ of the portfolio. (Schaaf, Puy, 2000)

The aim of this study is to focus on this common problems (How reach the best product in portfolio? How evaluate products in portfolio? Based on which performance criteria?) for the portfolio management process and to show specific application example for the automotive sector.

### 3.4 The Best-Known Portfolio Models

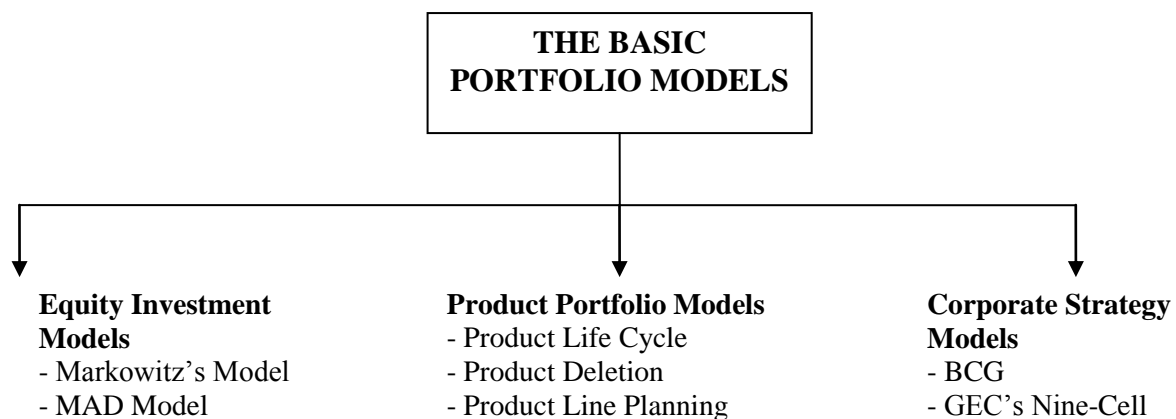
Portfolio theory was first developed to be used in financial investment decision making during the 1950s (Markowitz, 1952). The main inputs for portfolio evaluation in financial investment decisions were postulated as being “expected return” and “degree of risk”. Portfolio theory has, however, since been applied in areas other than finance. The initial area of application was in auditing product programs (Marvin, 1972), where individual products or groups of products were analyzed in terms of their current and future market share, sales, volume, costs and investment requirements.

Subsequently, the portfolio approach received increasing attention from corporate strategists (Ansoff, Leontiades, 1976) (Hofer, Schendell, 1978) (Wind, Douglas, 1981) all of whom have been primarily concerned with the classification of products and/or businesses on certain key dimensions in order to assist in the achievement of corporate strategic objectives.

Key dimensions have included market share, market growth, market attractiveness and competitive position depending on which model has been offered. Regardless of the dimensions used, the basic idea is that the positions of the units on the grid should determine the formulation of the most appropriate strategy.

Portfolio theory is essentially concerned, therefore, with facilitating decisions in the allocation of finite resources among different assets, be it financial investments, products or strategic business units. These finite resources may be used in alternative ways to achieve agreed objectives. There have also, however, been many critics of portfolio theory, who have suggested that a portfolio simply facilitates visualization rather than serving as an analytical and prescriptive tool in itself. In other words, critics say that portfolio analyses do not provide strategic answers for resource allocation and strategy formulation. They do stress, however, that they can aid decision making but would have to be used with caution. (Yorke, Droussiotis, 1994)

Basic Portfolio Models are given below at figure 3.4.



**Figure 3.4** Basic Portfolio Model (Turnbull, 1989)

### **3.4.1 Equity Investments Portfolio Models**

In the first portfolio theory to be proposed, Markowitz (1952) pointed out that the idea of maximising the expected rate of return as being the sole objective of portfolio management must be rejected. He hypothesised that rational investors will select “efficient” portfolios, i.e. portfolios which maximise the individual investor’s utilities by maximising the expected return for a given level of risk or minimising the risk for a given level of expected return.

Markowitz formulation of an efficient portfolio requires three computations for each security:

- The expected rate of return measured as the mean value of all the likely rates of return
- The risk measured by the standard deviation or variances of all the likely rates of return around the mean values
- A further measure of risk in the form of the covariance or correlation coefficient of expected rate of return with every other security under consideration.

Using quadratic programming techniques, Markowitz showed that from the available universe of securities (opportunity set) a feasible set of efficient portfolio can be determined. (Turnbull, 1989)

Markowitz Model, a classical approach for portfolio optimization problem, has been wanted to be improved because of its computational complexity, problem of consuming too much time and normality and risk aversion assumptions, and a number of alternative models have been proposed. One of these alternative models Mean Absolute Deviation Model which is based on transforming the problem of portfolio optimization to the linear programming model. (Kardiyen, 2006)

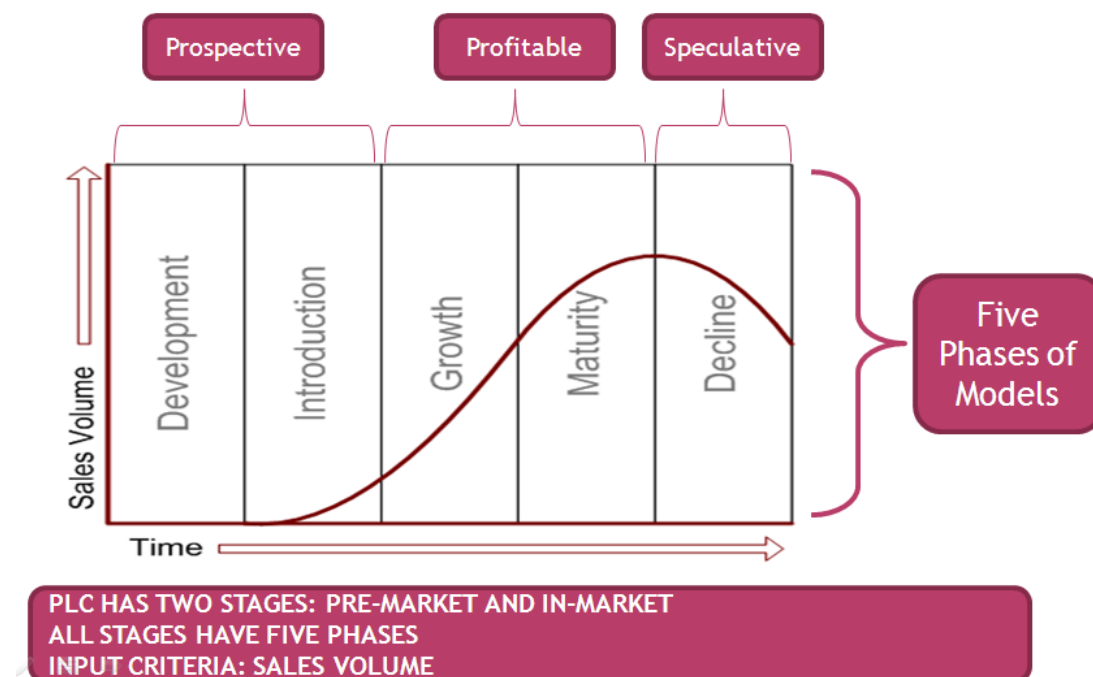
### **3.4.2 Product Portfolio Models**

#### **3.4.2.1 Product Life Cycles (PLC)**

Philip Marvin (1972) propounded a theory of product portfolio related to product life cycles. Each product is said to go through ten distinct phases. The focus of Marvin’s approach is the development of a soundly planned and well-balanced product line,

reflecting a smooth flow of products throughout the various phases of product creation, production and distribution. Analysis of the product line is done by positioning each in the product programme analysis matrix using the PLC phases as the common horizontal axis and competitive advantages, and fiscal period income and outlay as two separate vertical axes. The consequential composite picture reveals the extent to which the company is meeting objective and protecting future earnings by ensuring a continuing supply of new product to replace those becoming obsolete.

The ten phases of a PLC are classified into two categories: pre-market and in-market, each consisting of five phases as seen figure 3.5. In the pre-market category, product ideas are put through a series of screenings. These constitute the prospective, speculative and potentially profitable phases. Potentially profitable product ideas are then moved to the scheduled phase awaiting development. The developmental phase is one in which product ideas are turned into commercially feasible products. Everything that must be done to produce a saleable product takes place here. Known facts are incorporated into the development of the product. Research is undertaken to supply new understanding to enhance the product development.



**Figure 3.5** Product Life Cycle Model (Marvin, 1972)

The in-market category starts with the introductory phase when the newly developed product is being commercialised for the first time. To ensure success, each product is incorporated with one or more of the competitive advantages which Philip

Marvin (1972) termed as “competitive opportunities”. He mentioned five major competitive advantages and asserted that a soundly planned product programme should reflect new product offerings falling into each of these competitive advantages which are: lower cost ; restyling; improved performance; new markets and new uses. (Marvin, 1972)

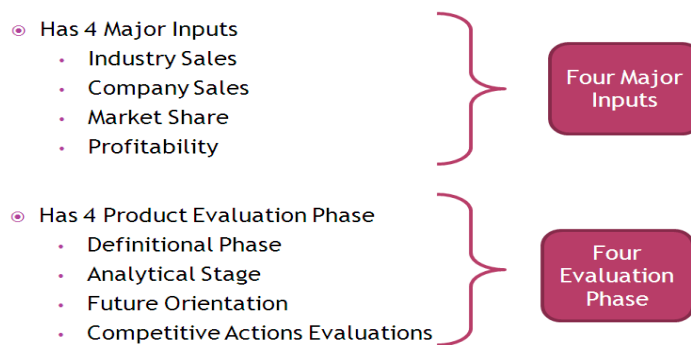
A major benefit of this programme lies in the attention it draws to the need to relate resource allocation and consequent cash flow to the risks and returns predicted, allowing resource commitment priorities to be established which are coherent with the strategic and operating objectives of the business. (Turnbull, 1989)

#### **3.4.2.2 Product Deletion**

The Product Review and Evaluation Sub-system Model called “PRESS” views the total product line as a set of interrelated elements, each of which places varying demands on the resources of the firm. The PRESS model is primarily concerned with product deletion, and hence is restrictive in scope. Therefore, management can’t rely on this model alone to make strategic decisions. Product deletion must be matched by a compatible program of product development and introduction. Even though future trends of present products are incorporated into this model it does not provide the necessary orientation of the overall business to the future. One of the most important questions for management is where the business is heading. The PRESS Model lacks the proactive features which would enable management to provide answers to this question. (Hamelman, Maze, 1972)

#### **3.4.2.3 Product Line Planning**

Wind and Claychamp (1976) proposed an integrative approach to product line planning using four major inputs: industry sales, company sales, market share and profitability as seen figure 3.6. The approach has two definitional phases and five analytical stages. Central to this model is the evaluation of every individual product in a product line using a product evaluation matrix based on the four input stages: definitional phase, analytical stage, future orientation and competitive actions evaluation.



**Figure 3.6** Product Line Planning (Wind, Claychamp 1976)

The attractiveness of this model lies in the flexibility of analysis at different levels which can be tailored to the varying requirements of different product/market situations. It is a dynamic model which incorporates the future orientation of the company under a variety of the company's marketing strategies, competitive actions and changes in environmental conditions. (Wind, Douglas, 1981)

### 3.4.3 Corporate Strategy Models

#### 3.4.3.1 Boston Consulting Group (BCG)

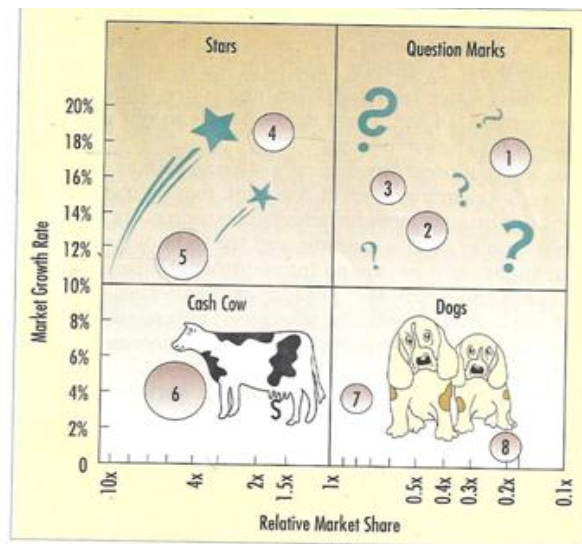
BCG model is based on two fundamental parameters which, it is argued, determine the strategy of an individual business within the context of the company's overall "business portfolio". These are the company's competitive position measured by its market shares relative to its largest competitor in the industry and the growth potential of the business. The "Growth-Share Matrix" is the core of the BCG approach. It consists of two dimensions: business growth on a linear scale and relative competitive position on a logarithmic scale. The matrix is divided into four quadrants: Stars, Cash Flows, Question Marks and Dogs.

Although growth and share are very important influences on a business, to use them as the sole guidelines for strategic decisions is ignore the complexities and realities of the business environment. However, some improvements can be incorporated into the model by projecting the business portfolio based on the company's marketing strategies, competitive actions and and changes in environmental conditions. Despite this approach has limitations which other approaches overcome at least partially. (Hedley, 1977)



The Boston Consulting Group (BCG) a leading management consulting firm, developed and popularized the growth-share matrix shown in figure 3.7, the eight circles represent the current sizes and positions of eight business units in a hypothetical company. The size of the circle depends on the dollar volume of each business. Thus, the largest businesses are 5 and 6. The location of each business unit indicates its market growth rate and relative market share.

The Growth-Share Matrix: The market growth rate on the vertical axis indicates the annual growth rate of the market in which the business operates. In figure 3.7, it ranges from 0 percent to 20 percent. A market growth rate above 10 percent is considered high. Relative market share, which is measured on the horizontal axis, refers to the SBU's market share relative to that of its largest competitor in the segment. It serves as a measure of the company's strength in that market segment.



**Figure 3.7** The Boston Consulting Group's Growth-Share Matrix

(Source: Long Range Planning, (Feb 1977, Elsevier Science Ltd.))

The growth-share matrix is divided into four cells, each indicating a different type of business:

**Question Marks:** Businesses that operate in high-growth markets but have low relative market shares. A question mark requires a lot of cash because the company has to spend money on plant, equipment and personnel to keep up with the fast-growing market, and because it wants to overtake the market leader. The company has to think hard about whether to keep pouring money into this business. The

company in figure 3.7 operates three question-mark businesses, and this may be too many.

**Stars:** The market leaders in a high-growth market. A star does not necessarily produce a positive cash flow for the company. The company must spend substantial funds to keep up with the high market growth, and to fight off competitors' attacks. In fig 3.7, the company has two stars.

**Cash Cows:** Stars with a falling growth rate that still have the largest relative market share and produce a lot of cash for the company. The company does not have to finance expansion because the market's growth rate has slowed. Because the business is the market leader, it enjoys economies of scale and higher profit margins. The company uses its cash cows to pay bills and support other businesses. The company in fig 3.7 has only one cash cow and is therefore highly vulnerable. If this cash cow starts losing relative market share, the company will have to pump money back into it to maintain market leadership.

**Dogs:** Businesses that have weak market shares in low-growth markets. The company in fig 3.7 holds two dogs and this may be too many. The company should consider whether it is holding on to these businesses for good reasons (such as an expected turnaround in the market growth rate or a new chance at market leadership).

After plotting its various businesses in the growth-share matrix, a company must determine whether its portfolio is healthy. An unbalanced portfolio would have too many dogs or question marks and too few stars and cash cows.

### SBU Strategies

The company's next task is to determine what objective, strategy, and budget to assign to each SBU. Four strategies can be pursued: build, hold, harvest or divest. Building is appropriate for question marks whose market shares must grow if they are to become stars. The hold strategy is appropriate for strong cash cows if they are to continue yielding large positive cash flows.

The objective of the harvest strategy is to increase short-term cash flow regardless of long-term effect. Harvesting generally involves eliminating Research and Development expenditures, not replacing the physical plant, not replacing salespeople, reducing advertising expenditures and so on. This strategy is appropriate

for weak cash cows whose future is dim and from which more cash flow is needed. Harvesting can also be used with question Marks and dogs.

The objective of the divest strategy is to sell or liquidate the business because resources can be better used elsewhere. This strategy is appropriate for dogs and question Marks that are acting as a drag on the company's profit.

Companies must decide whether harvesting or divesting is a better strategy for a weak business. Harvesting reduces the business's future value and therefore the price at which it could be sold later. An early decision to divest, in contrast, is likely to produce fairly good bids if the business is in relatively good shape and of more value to another firm.

#### The SBU Life Cycle

As time passes, SBUs change their position in the growth-share matrix. Successful SBUs have a life cycle. They start as question Marks, become stars, then cash cows and finally dogs. For this reason, companies should examine not only their businesses' current positions in the growth-share matrix (as in a snapshot) but also their moving positions (as in a motion Picture). If a given SBU's expected trajectory is not satisfactory, the corporation should ask its manager to propose a new strategy and the likely resulting trajectory.

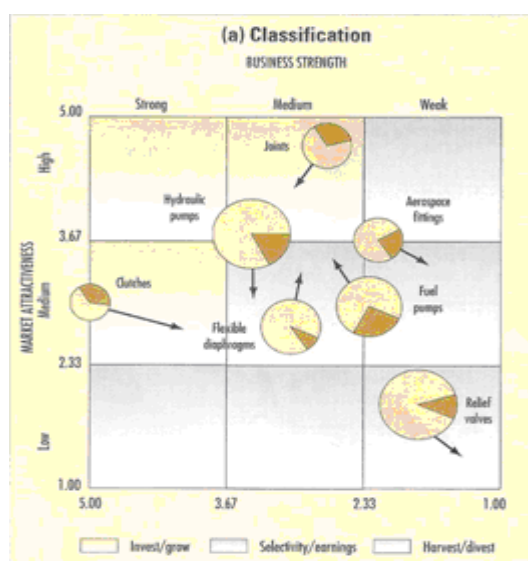
The worst mistake a company could make would be to require all its SBUs to aim for the same growth rate or return level. The very important point of SBU analysis is that each business has a different potential and requires its own objective. Other mistakes include leaving cash cows with too little in retained funds (in which case the company weak) or leaving them with too much in retained funds (in which case the company fails to invest enough in new businesses with growth potential); making major investments in dogs in hopes of turning them around, but failing each time; and maintaining too many question Marks and underinvesting in each. Question Marks should either receive enough support to achieve segment dominance or be dropped. (Kotler, Armstrong, 2006)

#### **3.4.3.2 GEC'S Nine Cell Strategic Business Screen**

A more fundamental and comprehensive model for portfolio analysis was advanced by General Electric called the Nine-cell Strategic Business Screen. In this approach

the company is divided into SBUs which are positioned in the “business screen” against two composite dimensions. The vertical axis is the industry attractiveness comprising intensity, business cyclicity, seasonality and scale economies. The horizontal axis is the business strength of the SBU relative to the industry, based on factors such as relative market share, relative competitiveness, product quality, knowledge of customer/markets, sales effectiveness and the geographical location of the business. (Hofer, Schendell, 1978)

An SBU’s appropriate objective cannot be determined solely by its position in the growth-share matrix. If additional factors are considered, the growth-share matrix can be seen as a special case of a multifactor portfolio matrix such as that pioneered by General Electric (GE). This model is shown in Figure 3.8, where one company’s seven businesses are plotted. This time the size of each circle represents the size of the relevant market rather than the size of the company’s business. The dark brown shaded part of the circle represents that business’s market share. Thus, the company’s clutch business operates in a moderate-sized market and enjoy approximately a 30 percent market share.



**Figure 3.8** Market Attractiveness-Competitive Position Portfolio Classification and Strategies

(Source: Analysis for Strategic Marketing Decisions, George S., 1986, pp202-204)

Each business is rated in terms of two major dimensions, market attractiveness and business strength. These two factors make excellent marketing sense for rating a business. Companies are successful to the extent that they enter attractive markets

and posses the required business strengths to succeed in those markets. If one of these factors is missing, the business will not produce outstanding results. Neither a strong company operating in an unattractive market nor a weak company operating in an attractive market will do very well.

To measure these two dimensions, strategic planners must identify the factors underlying each dimensions and find a way to measure them and combine them into an index. Table 3.2 Lists two possible sets of factors making up the two dimensions for the hydraulic-pumps business in Figure 3.8 (each company has to decide its own lists of factors.) For the hydraulic-pumps business, market attractiveness varies with the market's size, annual market growth rate, historical profit margins and so on. Business strength varies with the company's market share, share growth, product quality and so on.

**Table 3.2:** Factors Underlying Market Attractiveness and Competitive Position in GE Multifactor Portfolio Model: Hydraulic Pumps Market

		WEIGHT	Rating (1-5)	Value
<b>Market Attractiveness</b>	Overall Market Size	0,2	4	0,8
	Annual Market Growth Rate	0,2	5	1
	Historical Profit Margin	0,15	4	0,6
	Competitive Intensity	0,15	2	0,3
	Technological Requirements	0,15	4	0,6
	Inflationary Vulnerability	0,05	3	0,15
	Energy Requirements	0,05	2	0,1
	Environmental Impact	0,05	3	0,15
	<b>TOTAL</b>	<b>1</b>		<b>3,7</b>
<b>Business Strength</b>	Market Share	0,1	4	0,4
	Share Growth	0,15	2	0,3
	Product Quality	0,1	4	0,4
	Brand Reputation	0,1	5	0,5
	Distribution Network	0,05	4	0,2
	Promotional Effectiveness	0,05	3	0,15
	Productive Capacity	0,05	3	0,15
	Productive Efficiency	0,05	2	0,1
	Unit Costs	0,15	3	0,45
	Material Supplies	0,05	5	0,25
	R&D Performance	0,1	3	0,3
	Managerial Personnel	0,05	4	0,2
	<b>TOTAL</b>	<b>1</b>		<b>3,4</b>

(Source: Strategic Manegement, La Rue T. Hosmer, 1982, pp.310)

Note that the two BCG factors- market growth rate and share – are subsumed under the two major variables of the GE model. The GE model leads strategic planners to

look at more factors in evaluating an actual or potential business than the BCG model does.

### 3.4.4 The Comparison of The Best Known Portfolio Models

The best known portfolio models were described at the previous section in detail based on Turnbull (1989) study . When we summarize all of models, we can achieve Table 3.3 which is named “The Comparison of Portfolio Models”.

With respect to table 3.3, the presented portfolio models have some disadvantage for evaluating portfolio as seen at the basic issue section. Generally, the best known portfolio models are evaluating portfolio based on financial criteria or marketing criteria. For example, equity investment models are evaluating portfolio based on financial criteria but corporate strategy models are evaluating portfolio based on marketing criteria.

And also, the best known portfolio models do not include the criteria which is coming from future trends and strategies for a long time, have standart (no change) structure for calculation and evaluation. So that the presented portfolio models have some disadvantage which is changed from viewpoint to viewpoint.

**Table 3.3:** The Comparison of Portfolio Models

	MODEL	STUDY	METHOD	BASIC ISSUE
Equity Investment Models	Classical Approach (Markowitz)	Markowitz, 1952	Quadratic Programming	Computational complexity, problem of consuming too much time and normality-risk aversion assumptions, only based on financial criteria
	Mean Absolute Deviation Model	Konno&Koshizuka 2005	Linear Programming	Eliminated Markowitz Model's assumption but, Ignore covariance matrix so may occur big variance
Product Based Models	Product Life Cycle	Philip Marvin, 1972	Philip Marvin's Approach	Known facts are incorporated into the development of the product in to development product in pre-market phase. Used for product development process.
	Product Deletion	Hamelman, P.W. and Maze, E.M. 1972	Product Review and Evaluation Sub-system Model called "PRESS"	Future trends of present products are incorporated into this model, to evaluate products based on present criteria, no proactive feature
	Product Line Planning	Wind&Claycham, 1976	Wind&Claycham's Approach	Based on only 4 major input criteria to evaluate products.
Corporate Strategy Models	Boston Consulting Group	BCG, 1977	Growth-Share Matrix	Matrix included in two dimensions-seen limited area.
	GEC's Nine Cell	Hofer, C.W. and Schendell, 1978	General Electric's Approach	Based on no change in the company's strategies

As can be seen at Table 3.3, the stated best-known models have some disadvantage for evaluating products in portfolio. Based on the model's viewpoint, input criteria to evaluate changes from the model to model.

#### **4. INFORMATION ON TURKISH AUTOMOTIVE INDUSTRY AND THE SELECTED COMPANY**

The aim of study is to evaluate the products' performance and to find the most appropriate products in the portfolio. To reach the aim, first of all challenging industry which needs tool for the evaluating of portfolio should be selected so the automotive industry was selected for the field study because Turkey's automotive industry has been dented by the dramatic slowdown in the sector that began in the autumn of 2008 with economic crisis. After the economic crisis, total auto sales fell as much as 20% and the automotive manufacturer has been evaluating portfolio to minimize loss.

After the selection of industry, a manufacturing company was chosen in the automotive industry to evaluate the manufacturing company's product portfolio and to find the most appropriate performance product.

In this section, the informations which is about Turkish automotive industry, automotive industry's drivers, the selected company's general informations are expressed step by step.

##### **4.1 The Automotive Industry**

The automotive industry in Turkey plays an important role in the manufacturing sector of the Turkish economy. The companies operating in the Turkish automotive sector are mainly located in the Marmara Region. In 2008 Turkey produced 1,147,110 motor vehicles, ranking as the 6th largest producer in Europe and the 15th largest producer in the world. (Ulasimonline, 2009)

###### **4.1.1 History**

In 1959 the Otosan factory was established in Istanbul to produce the models of the Ford Motor Company under licence in Turkey.

In 1961 the Devrim sedan was manufactured at the Tülomsaş factory in Eskişehir. It was the first indigenously designed and produced Turkish automobile.

In 1964 the Austin and Morris vehicles of the British Motor Corporation began to be produced under licence at the BMC factory in İzmir. The BMC brand was later fully acquired by Turkey's Çukurova Group in 1989, which currently produces all BMC models in the world.

In 1966 Anadolu became the first mass-produced Turkish automobile brand. All Anadolu models were produced by the Otosan factory in Istanbul.

In 1968 the Tofaş factory was opened in Bursa for producing Fiat models under licence.

In 1969 the Oyak-Renault factory was established in Bursa for producing Renault models.

Other global automotive manufacturers such as Toyota, Honda, Opel, Hyundai, Mercedes-Benz and MAN AG produce automobiles, vans, buses and trucks in their Turkish factories. There are also a number of Turkish bus and truck brands, such as BMC, Otocar and TEMSA.

By 2004, Turkey was exporting 518,000 vehicles a year, mostly to the European Union member states. (Goliath, 2005)

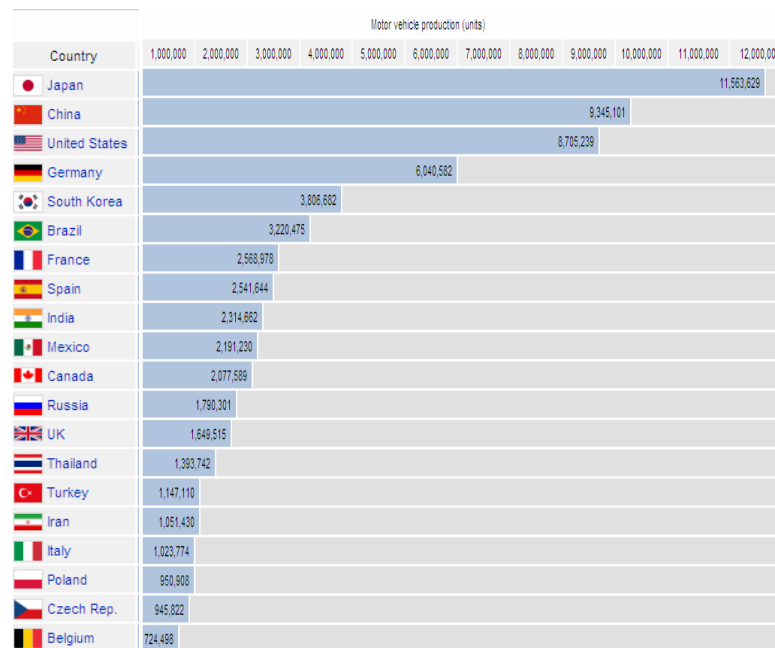
In 2006, the European Investment Bank loaned Tofaş €175 million to jointly develop and produce with PSA Peugeot Citroën and Fiat Auto small commercial vehicles for the European market. The loan, part-financing for total investments estimated at €400 million, was intended to result in an important expansion of the company's production capabilities and create around 5,000 new jobs. The vehicles will be produced at the manufacturing plant of Tofaş in Bursa with an additional, initial, annual capacity of 135,000 cars, due to roll off the assembly line in late 2007. (The EU Bank, 2006)

Like in many countries, the car manufacturing industry has been significantly affected by the global financial crisis. In March 2009, Turkey's Automotive Industry Association (OSD) said the automotive production fell by 63% on year in the first two months of 2009, as exports dropped by 61.6% in the same period. (Businessneweurope, 2009)



#### 4.1.2 Production

Turkey produced 1,024,987 motor vehicles in 2006, (OSD, 2009) ranking as the 7th largest automotive producer in Europe; behind Germany (5,819,614), France (3,174,260), Spain (2,770,435), the United Kingdom (1,648,388), Russia (1,508,358) and Italy (1,211,594), respectively (OICA, 2006). In 2008 Turkey produced 1,147,110 motor vehicles, ranking as the 6th largest producer in Europe (behind the United Kingdom and above Italy) and the 15th largest producer in the world as seen figure 4.1 (Ulasimonline, 2009).



**Figure 4.1** Production Statistics

(Source: OICA <http://oica.net/category/production-statistics/> Retrieved 2009-06-24)

The combined capacity of the 6 companies producing passenger cars stood at 726,000 units per year in 2002, reaching 991,621 units per year in 2006. (Özpeynirci, 2006). In 2002, Fiat/Tofaş had 34% of this capacity, Oyak/Renault 31%, Hyundai/Assan and Toyota 14% each, Honda 4%, and Ford/Otosan 3%.

With a cluster of car-makers and parts suppliers, the Turkish automotive sector has become an integral part of the global network of production bases, exporting over \$22,944,000,000 worth of motor vehicles and components in 2008. (Haberler, 2008)

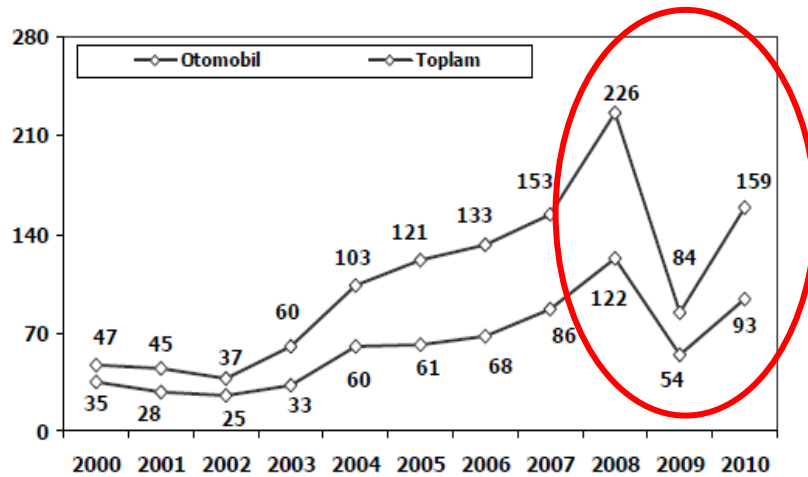
Turkey's automotive sector has been dented by the dramatic slowdown in the sector that began in the autumn of 2008. Early in the year, analysts were predicting total

auto sales to fall as much as 20% during the year due to a collapse in exports that forced many manufacturers to suspend production. In recent months, however, the market has begun to improve. Domestic sales have been propped up by tax cuts, and while exports are still suffering, they are at least stabilising. For the first two months of the year (2010), total market reached ~53.000 units, up 22,7% from the same two months of previous year as seen Table 4.1. (OSD, 2010)

**Table 4.1:** The Market-Production-Export of the 2010 (OSD, 2010)

ITEMS		January			February-January		
		2009	2010	(%)	2009	2010	(%)
Production	Total	44.900	82.521	83,8	83.675	159.086	90,1
	Passenger Car	30.192	46.365	53,6	54.030	93.175	72,5
Export	Total	39.253	66.336	69,0	71.468	126.335	76,8
	Passenger Car	26.757	39.333	47,0	46.010	76.751	66,8
Market	Total	22.846	32.316	41,5	43.477	53.363	22,7
	Passenger Car	14.492	20.651	42,5	27.665	33.245	20,2

For the first two months (Jan-Feb) of the year (2010), total production reached up 90,1% from the same two months of previous year as seen figure 4.2 in according to OSD for 2010-Feb Report. May be we say that the market is going to normal level as before the crisis.



**Figure 4.2** Total Production of Passenger Cars From The Year of 2000 to 2010 (OSD, 2010)

**Table 4.2:** SWOT Analysis for Automotive Industry (Fahlbusch, 2005) (BMI, 2009)

<b>Strengths</b>	<b>Weaknesses</b>
Apart from Iran, which faces domestic and international constraints on growth, there is no other significant regional producer. This provides Turkey with a clear market advantage	High taxes and bureaucratic hurdles could hamper plans for increasing foreign investment in the autos sector
Turkey's geographic proximity to Europe and Asia makes the country a strong export base	The rising cost of living is set to dampen sales growth over the short term
There is a low-cost base and a relatively well-trained workforce	
Four of the country's top 10 overall exporters are automotive firms, reflecting the importance of the industry to the economy	
The tax treaty with the EU reduces tariffs on exports	
<b>Opportunities</b>	<b>Threats</b>
An increase in the minimum wage will boost consumer spending power	Much of the recent growth in Turkish auto production is because of its status as a prospective EU member. While membership appears likely, it is not yet assured
The opening of Iraq's borders provides Turkey with an opportunity to become a major supplier and increase exports	The large fiscal overhang in the economy is one area which hinders progress towards EU membership, and tax increases to meet IMF demands could limit sales growth
The export-oriented nature of the Turkish automotive industry and its geographical concentration provides plenty of opportunities for suppliers	Preparations to join the EU and bring industry in line with other members could see Turkey lose its competitiveness
	An increase in the minimum wage would erode Turkey's advantage of a lowcost labour pool, which currently attracts manufacturers
	Dependence on EU markets has made Turkey's automotive industry vulnerable to the economic downturn

Based on Dr. Martin Fahlbusch's (2005) study and BMI Q4 2009 report, SWOT analysis results are achieved as seen table 4.2. For the field study, the SWOT analysis result will be very important to determine industry's critical success factor.

### **4.1.3 Major Drivers of Automobile Trends**

Over the last decade, the industry has experienced major organisational change. In addition, there have been major changes to manufacturing and vehicle technology (MacNeill et al., 2002). The main drivers for automotive industry are global competition, the growth of the supply industry, legislation and consumer demand.

#### **4.1.3.1 Competition**

Intense competition requires operations to be carried out with maximum efficiency. The key is large-scale production to reduce the value of fixed costs per vehicle. With increasingly sophisticated vehicles and rising investment costs, the optimum economic scale increases (Rees, 1999). Companies have sought to achieve economies by maximising volumes and standardising parts across their model ranges. The outcomes are investment in high capacity, an on-going trend towards mergers and acquisitions, and a rising number of cooperative ventures, for example, sharing research and development costs (EUCAR, 2000).

For increasing of competition, we can select the following strategies:

- Consolidation of Car Maker (Mergers and Acquisitions)
- Cooperation (Alliances)
- Mass Production-Min Cost
- Lean Manufacturing

#### **Consolidation of Car Makers**

Throughout its history, the automobile industry has undergone mergers and acquisitions (M&As). Recent M&As include the control of Chrysler (1998) and Mitsubishi (2000) by Daimler-Benz; the purchases of Jaguar (1989), Volvo (1999) and Land Rover (2000) by Ford; and of Seat (1986) and Skoda (1990) by Volkswagen, plus the alliance between Renault and Nissan (1999). Manufacturers have also used M&As to enter expanding markets such as Korea, for example Renault's purchase of Samsung (2000), General Motor's purchase of Daewoo (2003), and DaimlerChrysler's 20% stake in Hyundai. Some analysts predict that only six global producers will survive: two in Europe, two in Japan and two in the US. This prediction is fast becoming true in Japan and the US, but Europe still retains six major car and five major truck producers.

## Cooperation

Not all consolidations have been successful. The best-known recent failure is probably the BMW purchase of Rover in 1994 that ended in 2000. The jury is still out on some others. For example, the share value of DaimlerChrysler is currently less than that of Daimler-Benz before the merger. Some, however, have been successful, such as the Seat and Skoda purchases by Volkswagen and the Renault-Nissan alliance. Alternative strategies, such as alliances on particular models or engines, are also emerging. Examples include the cooperation between Peugeot- Citroën and Toyota to build a new small car in Kolin in the Czech Republic; or that between General Motors and Fiat to share platforms and engine and transmission operations. Peugeot-Citroën is also working with Fiat on passenger vans, and with BMW on engines. It may be that a web of cooperative ventures will become a prevalent pattern for European car assemblers.

## Overcapacity

Manufacturers plan capacity to achieve economies of scale. In western Europe, there is an estimated car capacity of 18.8 million (Rees, 1999) against production of 15.2 million in 2002. Companies are often over-confident in sales predictions. Fiat, Ford and General Motors' subsidiary Opel have all seen sales fall over the last few years. This has resulted in cutbacks including plant closures and almost 45,000 lay-offs or redundancies. General Motors has closed the Luton factory (UK) and reduced production at Antwerp (Belgium) and Bochum (Germany) with lay-offs totalling 20,000. Ford has closed five out of 11 European plants, ended car production at Dagenham (UK) and closed a shift at Genk (Belgium), resulting in 3,000 redundancies. Ford is now operating at above 90% capacity in Europe.

Optimism about new markets has led to investments in emerging markets, which have so far refused to materialise. For example, predictions of Brazilian annual production at 2.5 million vehicles and sales of 4 million units have not been realised, with an actual production of 1.5 million and sales of 1.6 million in 2002. Similar investments are being made in other markets, such as China and in the new EU Member States. The continued investment in capacity makes it more difficult for western Europe to export its surplus.

The capacity issue has a strong influence on industry economics as vehicle prices are calculated on forecast capacities and reduced capacity means higher unit costs. Vehicle makers, therefore, often attempt a balancing act where a proportion of the excess is discounted heavily through the dealerships. Another outlet is through cut-price deals to the hire and leasing industry.

However, the picture is complex. Excess capacity in some plants is mirrored by shortages elsewhere. Volvo, another part of Ford, is expanding production in its Ghent plant (Belgium) and taking on 800 additional workers. Others suffer from capacity shortages when sales are high. Peugeot-Citroën, for example, on the basis of two shifts, is operating at 117%. Another success story, BMW's Mini production (UK), is running at maximum for the plant. Also, some spare capacity is necessary – as shown by Volkswagen's ability to shift Polo production from Bratislava in the Czech Republic to Spain when sales of the Touareg SUV (sports utility vehicle) exceeded forecasts.

#### Lean manufacturing

In Europe, the drive for efficiency was, originally, thought best addressed through automation. However, at the time (1980s), the reliability and accuracy of robots was insufficient to meet the challenge of matching Japanese quality. To face this challenge successfully, the best approach consisted of a better work organisation and the adoption of the Japanese model of 'lean manufacturing' (Womack et al, 1990). This seeks to reduce waste through the best possible

utilisation of resources including:

- Human resources: through better work organisation, teamwork, flexibility and devolved responsibility;
- Capital investment: by maximising machine and factory utilisation, and reducing 'dead' resources tied up in stock by means of a 'just-in-time' delivery system;
- Factory space :by organising production based on a logical flow of materials;
- Materials : by ensuring high 'right first time' quality and minimising waste.

The system of just-in-time parts delivery has transformed the organisation of the supply industry. Logistics and material movement has become a skill in itself with

the growth of firms that specialise in the field, and that are increasingly taking over functions previously undertaken by car manufacturers, such as the delivery of components to the production line. Secondly, the efficient use of human resources has seen the integration of quality control and maintenance into the assembly process. This has meant the removal of a number of separate job functions and the introduction of flexible working. Efficiency gains have enabled a reduction in the time to produce a car from 37 hours in 1990 to around 24 hours today (Nelissen, 2002).

#### **4.1.3.2 The Supply Industry**

Another major development has been the restructuring of the supply industry and the growth of major 'mega-suppliers'. The supply industry is a major employer. The 'lean' paradigm has brought about major changes in working practices and organisation at all levels. (MacNeill et al., 2002)

#### **4.1.3.3 Legislation**

European legislation is a major driver of the industry. Emissions and recycling legislation have a strong impact both on vehicle technologies and construction.

##### **Environmental legislation**

The EU emissions standards are compulsory in all EU Member States. The current Euro IV standard must be reached by 2006. It covers emissions of CO<sub>2</sub>, N<sub>2</sub>O, and hydrocarbon particulates for both diesel and petrol engines. Sulphur emissions are not covered but are addressed through the introduction of low sulphur fuels. CO<sub>2</sub> is not covered either but is subject to a voluntary agreement which commits automobile manufacturers to reduce CO<sub>2</sub> emissions by means of improved vehicle technology. This requires more efficient vehicles and lower weights, and also the development of market-oriented measures such as improvements in the level of consumer information.

##### **Recycling legislation**

The second main area addressed by law is recycling and the End-of-Life Vehicle Directive (or ELV Directive). Member States must set legislation increasing re-use, recycling and other forms of recovery of 'end-of-life vehicles' (ELVs) and components, and phase out certain hazardous substances by 2007. About 25% of

each ELV currently goes into landfills; the target is to reduce this to below 5% by 2015. A further requirement is 'free-take-back' of ELVs, which enables owners to take their vehicles to an authorised treatment facility at no cost to themselves. (MacNeill et al., 2002)

#### **4.1.3.4 Consumer Demand**

The last driver of change is the consumer. There is a growing demand for more choice. Volume production may become similar to that for premium cars, with a greater number of vehicles being made to order on the basis of a multi-option choice, i.e. 'batches of one'. Online vehicle purchase will accelerate this trend. At the same time, the market for niche vehicles is growing, i.e. more variation of body shape and styling. This has led to a variety of body shapes being constructed on standard platforms. Examples include the Renault Scenic, Fiat Multipla, the Opel VX220, and the VW Beetle and Audi TT. Furthermore, there is an increased awareness of occupant and pedestrian safety, and tests of the New Car Assessment Programme (NCAP) have become the accepted standard in Europe. European consumers also look for greater fuel economy, exemplified by the growing popularity of diesel power units in Europe. This may not be the case in the US or Japan.

Another trend has been a move 'up-market' in specifications and the inclusion of more on-board electronics and telecommunications systems. Through increased specification, carmakers can extract higher margins. Nevertheless, sales patterns have been significantly affected. Volume producers, such as Ford and Opel, have marketed models that overlap the price bands of premium producers. In this context, consumers have often opted for the prestige marques. Hence, sales of vehicles such as the Ford Mondeo and Opel Vectra have suffered. In 2002, the Mercedes C-Class and BMW 3-series sales exceeded those of the Mondeo and Vectra. (MacNeill et al, 2002)

All of these issues have significantly impacted on both vehicle and manufacturing technology.

Car makers seek to take advantage of sophisticated technology to:

- Address the competitive pressure and to meet increased customer expectations on quality and cost;



- Add value to their vehicles to offset the squeeze on costs and profit margins. For example, the electronics content of a passenger car averages about 30% of its sale value. Meanwhile the value of the mechanical parts decreases;
- Meet the demands of environmental legislation;
- Address consumer demands for increased safety and sophistication.

In terms of the vehicle, the major change is likely to be a continued move to more electronics and telematics, and a shifting value base from mechanical to electrical/electronic parts. A possible change is the move to a 42-volt electrical system, which would save energy and could enable engine downsizing. A 42-volt system would also enable safety improvements with the integration of electrically controlled steering, braking, ABS and suspension to provide driver assistance.

There will be continued development of electric, hybrid and fuel cell drives, especially for city cars and fleet vehicles. However, the internal combustion engine will continue to dominate in the foreseeable future. Further refinements will produce improvements to the efficiency of both diesel and petrol engines. A major interest is in alternative synthetic fuels that are made from biomass which would be more or less CO<sub>2</sub> neutral. They could also have wide-reaching consequences for the European agricultural environment.

There will be a revolution in vehicle telematics affecting both the 'in-vehicle' experience and mobility. The industry, along with planners and policymakers, is concerned about the waste of energy and knock-on costs to business (plus inconvenience and irritation) caused by traffic congestion. Features likely to be introduced include more sophisticated route guidance, inter-model route planning, lane guidance and proximity radars for speed control and warning systems. Europe, with a lead in communication technologies, is in a strong position. In-car entertainment systems may also take off, though the market has been slow to date.

The pressure to reduce emissions and fuel consumption is driving vehicle weight reductions through material changes such as increased use of aluminium, magnesium plastics and composites. Changes in the use of materials will also facilitate cheaper modes of assembly, enhanced occupant and pedestrian safety, and recycling. (MacNeill et al, 2002).

In 2000, approximately 1.2 million people worldwide died as a result of road traffic injuries, and another 7.8 million were seriously injured. In Europe, every year road traffic accidents kill more young people aged 5 to 29 than any other cause of death. (World Health Organisation - [www.who.int](http://www.who.int)). The number of road deaths by inhabitant sharply rises in the early stages of motorization when people can afford to buy motorcycles first, and then cars as is happening in India and China. The World Health Organisation in Europe considers speed as the single most important determinant for safety in road transport systems. They call for new road safety thinking that builds safety into the transport system, and improving implementation mechanisms and tools to achieve this.

In the developed and developing worlds, strategies should aim at achieving significant reductions of road traffic injuries from current levels and curbing the growth rate in deaths and injuries. Either through regulation or by market forces, car manufacturers are already facing pressure to make cars less dangerous, not only for the drivers and occupants of the vehicle but also for those on the street (e.g. pedestrians, bicyclists).

The following measures can be taken by car manufacturers to meet the EU regulations :7

- 1) creating more space between the front grill and the so-called hard points (such as the engine) to absorb the energy from a collision ;
- 2) redesigning the car's hood to make it a better energy absorber and fitting the car with active safety systems such as airbags ; and
- 3) equipping the car with active safety systems such as night vision, adaptive lighting, active braking systems and run-flat tires to prevent accidents.

#### **4.2 The Selected Company: Honda Turkey A.Ş.**

A specific manufacturing company in the automotive industry, Honda Turkey A.Ş., was selected within the study in order to determine and evaluate Honda Turkey's portfolio performance situation for our field study.

As we know that Honda Motor Company, Ltd. is a Japanese multinational corporation primarily known as a manufacturer of automobiles and motorcycles.

Honda Motor Company has global operation in six region (in Japan, in South America, in Asia-Ocenia, in North America, in Europe-Middle East-Africa, in China) and main region's net sales are seen figure 4.3.

Geographic Region	Total revenue (in millions)
Japan	¥1,681,190
North America	¥5,980,876
Europe	¥1,236,757
Asia	¥1,283,154
Others	¥905,163

**Figure 4.3** Honda's Net Sales and Other Operating Revenue by Geographical Regions in 2007

The company has assembly plants around the globe. These plants are located at China, USA, Pakistan, Canada, England, Japan, Belgium, Brazil, New Zealand, Indonesia, India, Thailand and Turkey. Honda Turkey A.Ş. is a one of the manufacturing location in Europe-Middle East-Africa region.

Firstly, in this section we will give information about global Honda and then we will focus on Honda Turkey A.Ş.

#### **4.2.1 About Global Honda**

Honda is the world's largest manufacturer of motorcycles as well as the world's largest manufacturer of internal combustion engines measured by volume, producing more than 14 million internal combustion engines each year.

Honda surpassed Nissan in 2001 to become the second-largest Japanese automobile manufacturer. As of August 2008, Honda surpassed Chrysler as the fourth largest automobile manufacturer in the United States. Honda is the sixth largest automobile manufacturer in the world.

Honda was the first Japanese automobile manufacturer to release a dedicated luxury brand, Acura in 1986. Aside from their core automobile and motorcycle businesses, Honda also manufactures garden equipment, marine engines, personal watercraft and power generators, amongst others. Since 1986, Honda has been involved with artificial intelligence/robotics research and released their ASIMO robot in 2000. They have also ventured into aerospace with the establishment of GE Honda Aero

Engines in 2004 and the Honda HA-420 HondaJet, scheduled to be released in 2011. Honda spends about 5% of its revenues into Research and Development.

When we check the current market situation for Honda, With high fuel prices and a weak US economy in June 2008, Honda reported 1% sales increase while its rivals, including the Detroit Big Three and Toyota, have reported double-digit losses. Honda's sales were up almost 20 percent from the same month last year. The Civic and the Accord were in the top five list of sales. Analysts have attributed this to two main factors. First, Honda's product lineup consists of mostly small to mid-size, highly fuel-efficient vehicles. Secondly, over the last ten years, Honda has designed its factories to be flexible, in that they can be easily retooled to produce any Honda model that may be in-demand at the moment.

Nonetheless, Honda, Nissan, and Toyota, were still not immune to the global financial crisis of 2008, as these companies reduced their profitability forecasts. The economic crisis has been spreading to other important players in the vehicle related industries as well. In November 2009 the Nihon Keizai Shinbun reported that Honda Motor exports have fallen 64.1%.

#### **4.2.2 About Honda Turkey A.Ş.**

At the 21 September 1996, Honda Turkey Factory was established in Gebze (Şekerpınar)/Kocaeli. Until the 1997, Honda Civic has been producing as serial production. Honda Turkey gained in becoming the second largest factory in the Europe.

Honda's output more than doubled to over 50,000 units as a result of a decision by the carmaker to expand its Turkish unit in order to become a regional production and export base, thus addressing its supply deficit in Europe. According to Honda's chairman, Takeo Fukuki, the competitive advantage of its UK plant had been lost by the country's failure to adopt the euro, which meant the Japanese manufacturer will invest in its Turkish plant instead. Honda Türkiye's investment of US\$100mn raised the Gebze-based plant's annual production capacity from 30,000 units to 50,000 by 2008. Expansion to 100,000 units with the introduction of a new model was mooted, but now seems unlikely given the global market downturn.

Honda announced in December 2008 that it was putting on hold plans announced two months earlier to increase production at Honda Turkey. Low global demand

prompted the firm to cancel a TRL22.4mn (US\$18.04mn) investment to take the annual production capacity of the plant near Istanbul from 50,000 units to 63,000 units by mid-2009, and also expanding the workforce from 500 to 1,700 people. Production capacity had already been raised from 30,000 to 50,000 units in January 2008. The increased output was intended to accommodate growing demand for Honda's Civic model in export markets. The plant produces the Civic and City models for export mostly to Europe, and a statement from Honda claimed that demand for the Civic in Russia is one of the driving forces behind the expansion. However, the sudden and largely expected slump in Honda's key markets prompted it to abandon all of its expansion programmes worldwide. (BMI, 2009)

When check the Honda Turkey's current Turkish market situation, Honda Turkey has nine brand in Turkey Automotive Market as seen figure 4.4. At the end of 2009, Honda Motor Company announced that Honda S-2000 model (you can see figure 4.5) has not been manufactured for new years. But the field study includes the given nine products and also S2000 model. So, S2000's performance can be seen in according to the study finding and Honda Motor Company's decision can be checked if it was correct or not.



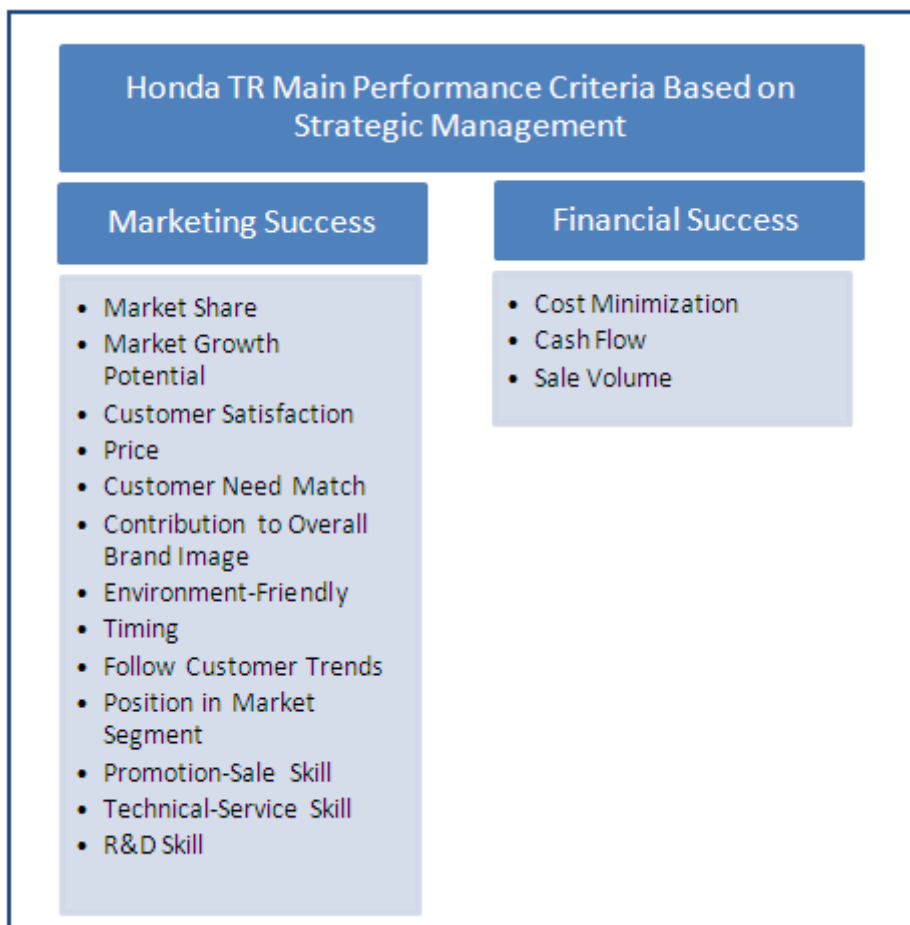
**Figure 4.4:** Honda Turkey's Current Products in Turkey Automotive Market



**Figure 4.5:** Honda S2000 Model

The aim of the study is to evaluate Honda Turkey's products performance which are included S2000 and to find the most-appropriate products in the portfolio based on the found performance criteria.

Before the methodology of the study, it may be useful to present Honda Turkey's main performance criteria based on strategic management. The stated performance criteria are not only for evaluating of portfolio, these are Honda Turkey's general main performance tool to help any issue at strategic making decision.



**Figure 4.6:** Honda Turkey Main Performance Criteria Based on Strategic Management

For Honda Turkey, the marketing and also financial success are very important to make decision as seen figure 4.6. Decision Making process depends on both financial and marketing success. For Honda Turkey, marketing success and financial success includes many sub criteria as seen figure 4.6.

When check the marketing success's sub-criteria, 12 sub-criteria (market share, market growth potential, customer satisfaction, customer need match, contribution to

overall brand image, environment-friendly, timing, follow customer needs, position in market segment, promotion-sale skill, technical-service skill, research and development skill) are seen under marketing success. All of them are related criteria for product level. For example, market share means that product's share in market or market growth potential means that if have any opportunity for product's market growth or not.

When check the financial success's sub-criteria, 3 sub-criteria (cost minimization, cash flow, sale volume) are seen under financial success. All of them are related criteria for product level.

As mentioned before, the stated in figure 4.6 performance criteria are general performance criteria for Honda Turkey to make decision on strategic management. These are very general and also need to specialize on evaluation products' performance in portfolio for the field study.





## **5. FIELD STUDY ON FINDING MOST APPROPRIATE PRODUCTS IN PORTFOLIO FOR HONDA TURKEY**

The aim of this study is to evaluate the products' performance and to find the most appropriate products in the portfolio. To reach the aim, a manufacturing company was selected in the automotive sector for evaluating its portfolio performance. The study was presented with three phase which are named structuring phase, modelling phase and analysis phase. At the structuring phase, the design of the finding performance criteria was presented in detailed. At the modelling phase, the method of the study (AHP) and data collection process were presented. At the last phase: analysis phase, the finding of the study was presented.

The approach for the field study step by step was summarized as seen figure 5.1 which is called "Design of the study":

As seen figure 5.1, Structuring phase consists three step as called 1., 2. ,3., 4. and 5. step in fig 5.1, modelling phase consists 6. step in fig 5.1 and anaylsis phase consists last two step (7-8) in fig 5.1.

First step of finding performance criteria for automotive industry: The best-known portfolio models are investigated and presented based on literature. The performance criteria are changing from one model to another in according to model's viewpoint. For the equity investment models, financial criteria are important and performance criteria include only financial performance criteria but corporate strategy models include only related marketing performance criteria to evaluate portfolio. So that, performance criteria depend on models viewpoint, with respect to model's aim performance criteria are changing to evaluate portfolio.

Second step of finding performance criteria: the automotive industry's information was investigated and presented for the study, because some critic success factor for only selected sector may be achieved from the sector analysis. From the best-known portfolio model, only general performance criteria may be achived but specific performance criteria should be find via the data results of sector analysis. So,

automotive industry's general information (history, production, growth ratio..), trends, major drivers of trends were investigated.

Third step of finding performance criteria: For Honda Turkey's strategic management process, Honda Turkey uses performance criteria to help for making decision. The performance criteria are very general performance criteria but they reflect Honda Turkey's viewpoint. So that, the structure of our field study depends on the situation of Honda Turkey. Some performance criteria may be added or modified but general structure will be kept as much as possible.

The fourth step of finding performance criteria: From the the best-known portfolio models, from the industry analysis results and from Honda Turkey's general general performance structure, many performance criteria were found but the performance criteria structure should be specialized for the selected company in the automotive industry. So that, the in-depth interview with Honda Turkey's managers was preappeared to get expert opinion about specific performance criteria on evaluating of products in portfolio. The collected performance criteria from best-known models and sector analysis were used for supporting tool to help brainstorming.

After the finding of specific performance criteria for specific company via in-depth interview with managers, the performance criteria's relative importance and the products' ratings were determined by the developed expert survey via AHP method.

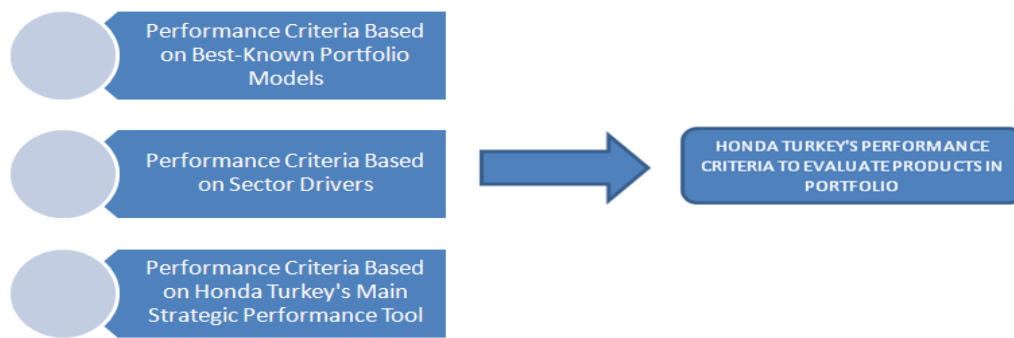
In this section, three pahases which are named sructuring, modelling and analysis phase will be explained in detail.

## **5.1 Structuring Phase**

The performace criteria for Honda Turkey to evaluate products' performance in portfolio includes three main inputs as seen figure 5.2. First input is performance criteria which were achieved from best-known porfolio models with literature review, the second input is performance criteria which were achieved from sector analysis, the third and last input is performance criteria which were achieved from Honda Turkey's main strategic performance criteria to help decision making.



**Figure 5.1** The Design of the Study



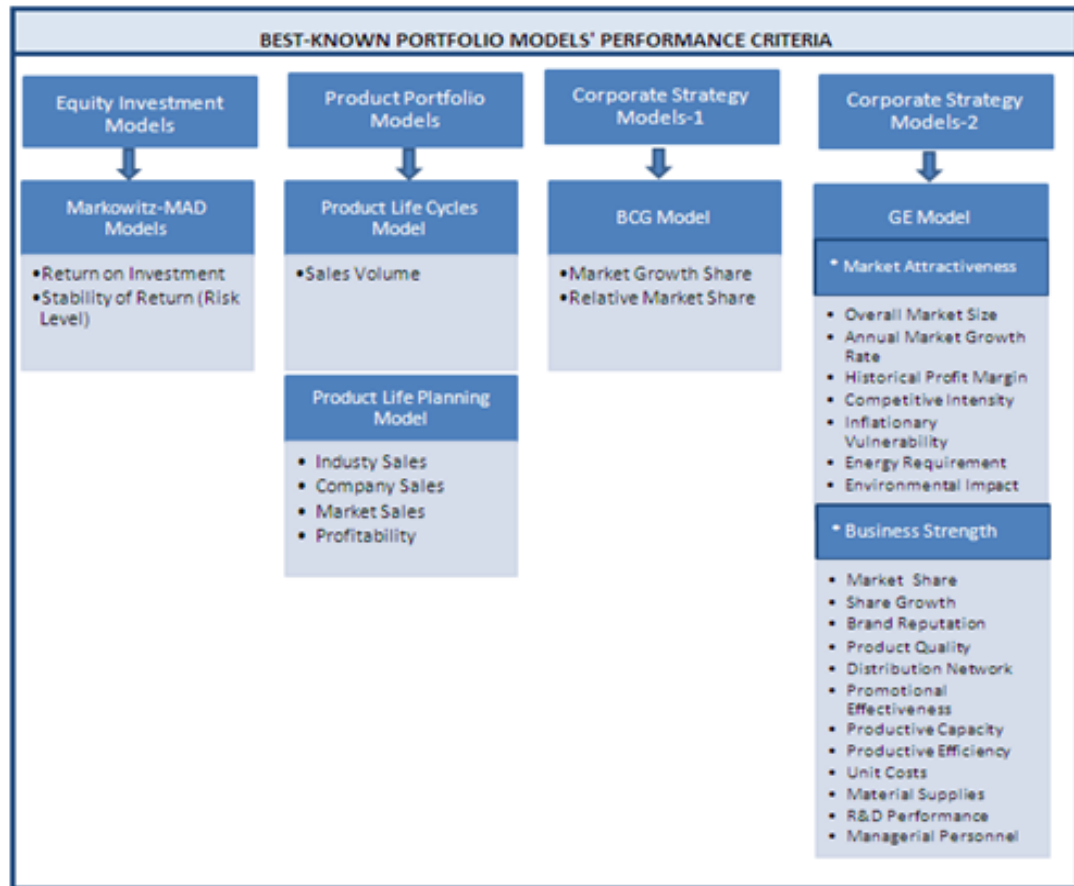
**Figure 5.2** Main Input to Evaluate Products in Portfolio For Honda Turkey

Three main inputs were presented to Honda Turkey's managers during the in-depth interview and the performance criteria for evaluating products' performance in portfolio were found after the in-depth interview with managers, then the specific performance criteria for Honda Turkey and for the study were achieved.

### 5.1.1 Performance Criteria Based on Best-Known Portfolio Models

For finding of performance criteria to evaluate products in portfolio, the first input is performance criteria from best-known portfolio models which were found with literature review. As seen figure 5.3, the three models were presented at the previous sections and each model's viewpoint is different from another, so that performance criteria structure is changing from one model to another model.

As seen figure 5.3, all models' performance criteria structure was presented based on best-known portfolio models. The portfolio models were mentioned at the previous section based on literature review and the figure 5.3 summarized literature review's results. The performance criteria structure is changing from one model to another model. For example, Return on Investment (ROI) and Risk Level are used for the equity investment models but the product life cycles models focus on only sales volume. The stated above performance criteria may be used in our field study to evaluate products' performance for Honda Turkey. So that, the stated above performance criteria which were achieved from best-known models are very important brainstorming tool for in-depth interview process to specialize performance criteria with respect to Honda Turkey's viewpoint.



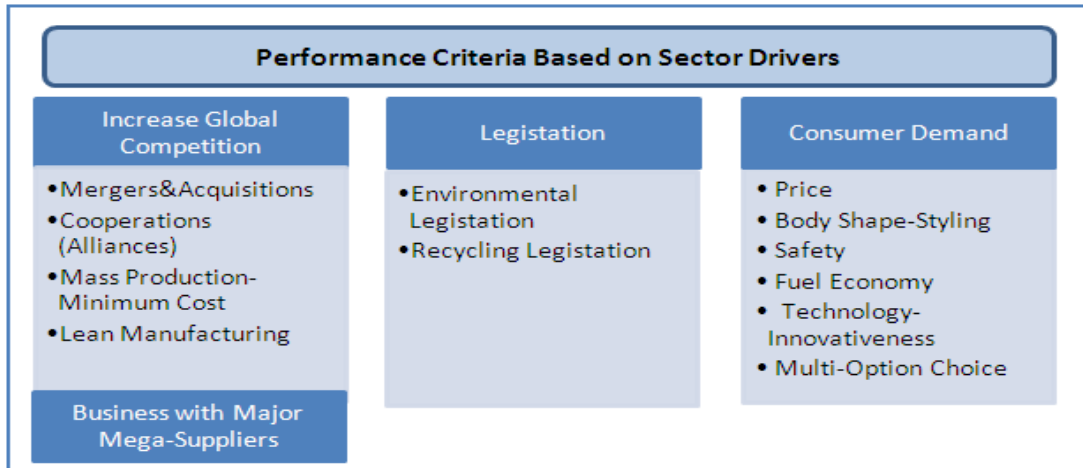
**Figure 5.3** Performance Criteria Based on Best-Known Models

The stated above performance criteria based on best-known portfolio models show situation before in-depth interview. After the in-depth interview process, some performance criteria has been selected for the study but some performance criteria has not been used for the study. So, before in-depth interview with managers, the seen figure 5.3 performance criteria were achieved from the literature.

### 5.1.2 Performance Criteria Based on Sector Major Drivers

For finding of performance criteria to evaluate products in portfolio, the second input is performance criteria based on automotive industry's sector drivers. From the sector analysis, four main performance criteria were found as seen figure 5.4 ( increased global competiton, business with major mega-suppliers, legislation and consumer demand). The main drivers are very important for the success in the automotive industry.

The main criteria includes the sub criteria, for example legislation criterion occurs two sub criteria which are called environmental and recycling legislation. And also customer demand occurs six sub criteria which are called price, body shape-styling, safety, fuel economy, technology/innovativeness and multi option choice for car.

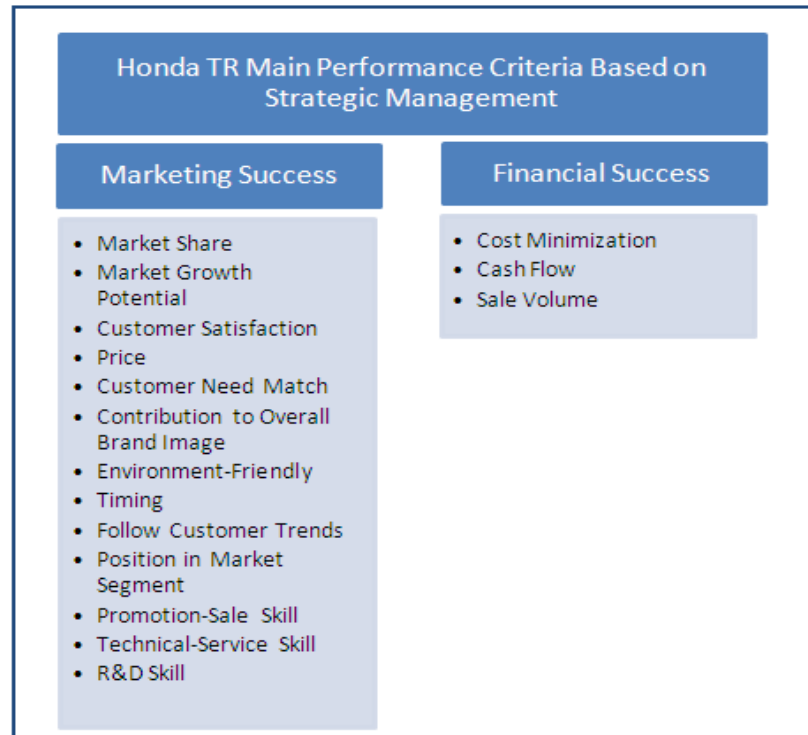


**Figure 5.4** Performance Criteria Based on Sector Drivers

All stated above performance criteria in figure 5.4 were described in detail at the fourth section. The stated above performance criteria based on sector analysis show situation before in-depth interview. After the in-depth interview process, some performance criteria has been selected for the study but some performance criteria has not been used for the study. The stated above performance criteria which were achieved from sector analysis (secondary data) are very important brainstorming tool for in-depth interview process to specialize performance criteria with respect to Honda Turkey's viewpoint.

### 5.1.3 Honda TR Main Performance Criteria Based on Strategic Management

For finding of performance criteria to evaluate products in portfolio, the third input is performance criteria based on Honda Turkey's general performance structure based on strategic management to help making decision. The stated below performance criteria are not only for evaluating of portfolio, these are Honda Turkey's general main performance tool to help any at strategic decision making.



**Figure 5.5** Performance Criteria Based on Honda Turkey Strategic Management Tool

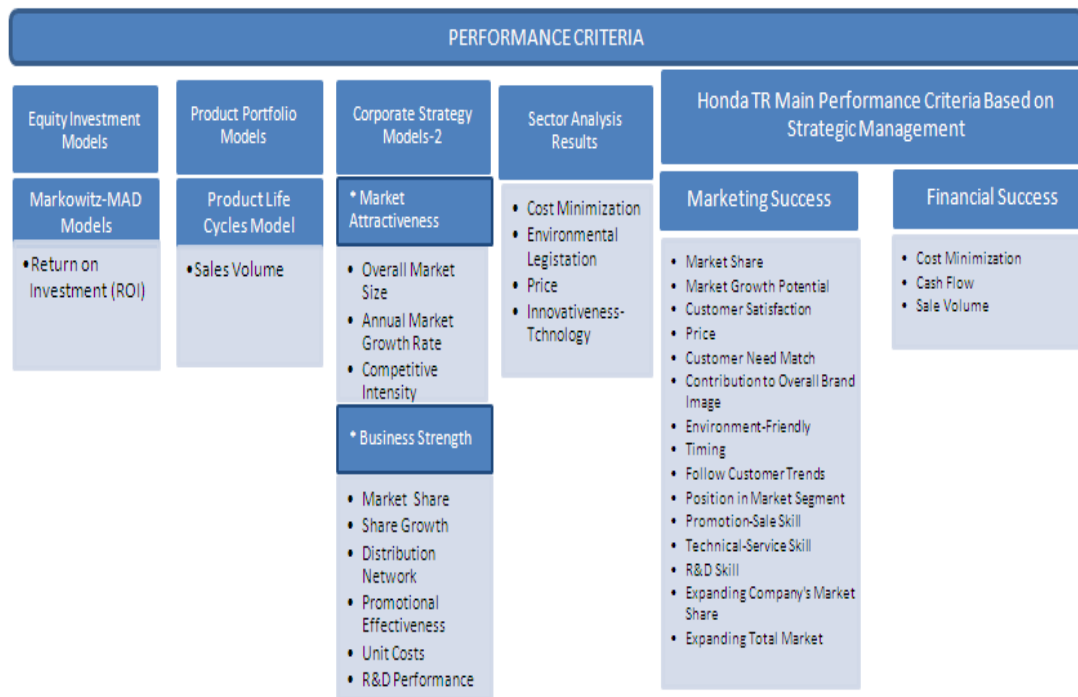
For Honda Turkey, the marketing and also financial success are very important to make a decision as seen figure 5.5. Decision Making proses depends on both financial and marketing success. For Honda Turkey, marketing success and financial success includes many sub criteria as seen figure 5.5.

All stated above performance criteria in figure 5.5 were described in detail at the fourth section.

#### **5.1.4 Overall Performance Criteria Before In-Depth Interview**

The performace criteria for Honda Turkey to evaluate products' performance in portfolio includes three main inputs as seen figure 5.2 as mentioned before. First input is performance criteria which were achieved from best-known portfolio models with literature review, the second input is performance criteria which were achieved from sector analysis, the third and last input is performance criteria which were achieved from Honda Turkey's main strategic performance criteria to help decision making.

When overall performance criteria based on best-known models, based on sector analysis and Honda Turkey's general performance structure are summarized, the stated below figure 5.6 is achieved.



**Figure 5.6** Overall Performance Criteria Before In-depth interview

As seen figure 5.6, the study has three main inputs for performance criteria to evaluate products' performance in portfolio. First input is coming from best-known portfolio models, second input is coming from sector analysis's results and third/last input is coming from Honda self for using like tool in strategic management. The figure 5.6 shows situation before the in-depth interview, as seen there are a lot of performance criteria to evaluate products in portfolio but re-check, minimization of performance criteria' number and managers confirmation are needed to go on the study. So that, in-depth interview with managers was done to re-check, to minimize of performance criteria and confirm performance criteria structure for Honda Turkey.

## 5.2 Modelling Phase

At the structuring phase of study, for the finding performance criteria three performance inputs were presented. First input is coming from best-known portfolio models and was collected by secondary data (literature review). Second input is coming from automotive sector analysis results and was collected by secondary data.



And third input is related Honda Turkey's general performance criteria to use tool for helping making decision.

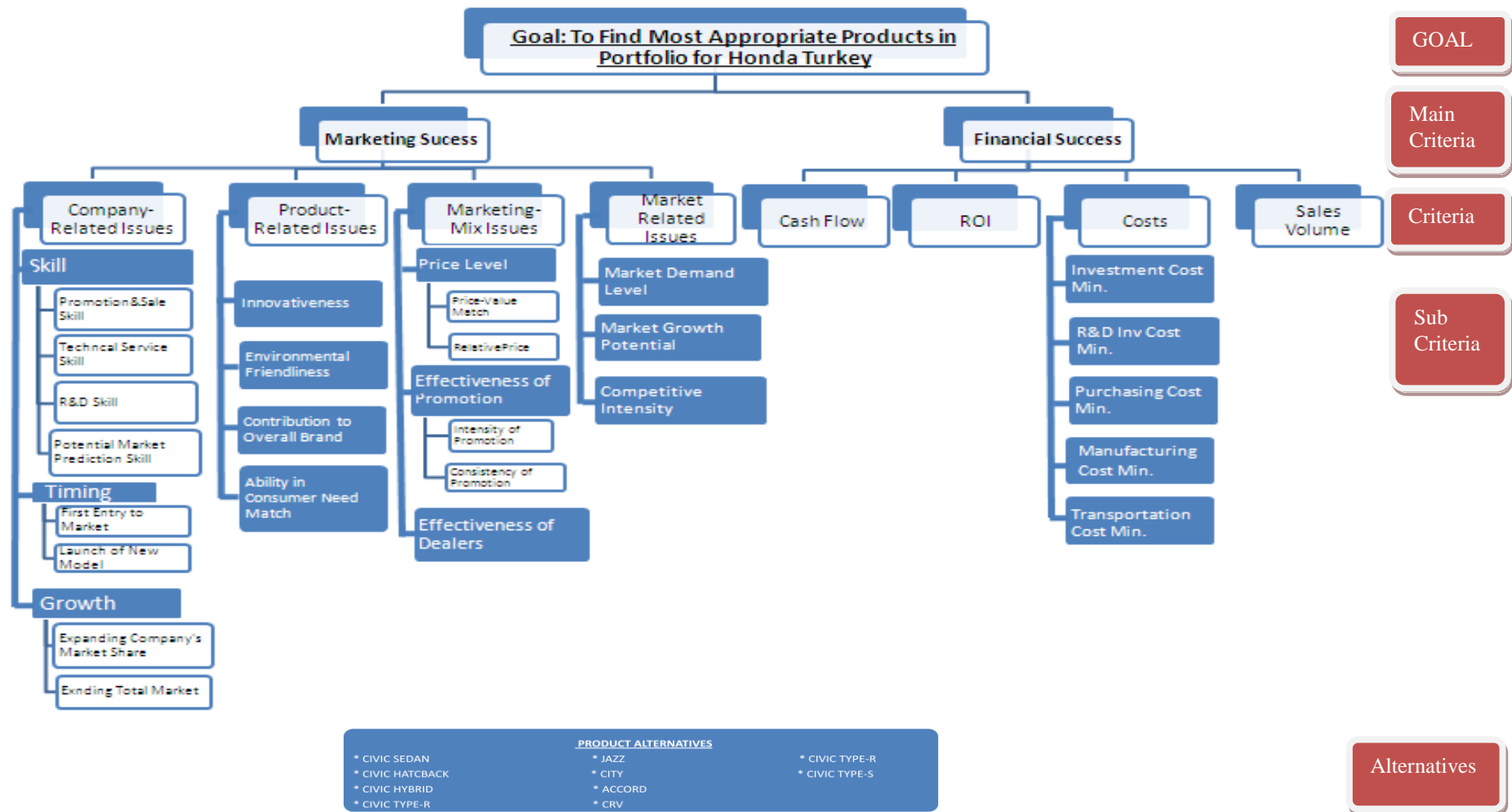
After the structuring phase, a lot of performance criteria were achieved from best-known portfolio models review, automotive sector analysis and Honda self general performance structure. Specialized performance criteria should be found for the selected company in the automotive industry. And also, re-check, minimization of performance criteria' number and managers confirmation are needed to go on the study.

At the beginning of the field study, five top managers were depth interviewed in order to re-check, to minimize of performance criteria, confirm performance criteria structure and specialize performance criteria for Honda Turkey. These managers are;

- Purchasing Department Manager
- Finance Department Assistant Manager
- Marketing Department Chief
- Marketing Department Manager
- Quality-Manufacturing Department Chief

The specific questions were asked to managers (the in-depth interview's content questions are seen appendix A.1) in according to the interview content. The managers which are stated above were joined in-depth interviewed. The interview contents continued based on performance criteria which were collected by secondary data source. To achieve performance criteria for evaluation of the portfolio, firstly asked managers to submit critical success criteria for evaluating portfolio without support secondary data, then used secondary data tool for brainstorming later in interview. Then after the in-depth interview with five managers, the performance criteria for the selected manufacturing company in the automotive industry were achieved as seen below figure 5.7.

Based on in-depth interview results, managers classified critical success performance criteria as two main criteria which are called Marketing Success and Financial Success. The classification is appropriate Honda Turkey's strategic management viewpoint.



**Figure 5.7** Performance Criteria After In-depth Interview

Marketing success which is called main criteria has four criteria: company related issues, product related issues, product mix issues and market related issues. Also criteria has sub criteria. i.e. Company related issues has three sub criteria. The performance criteria table's logic is going on like that.

The aim of the study is to evaluate portfolio and to find best performance products in the portfolio. So that, after the finding performance criteria by in-depth interview with managers, evaluation of products' performance in portfolio is needed to reach the aim of the study. Analytic Hierarchy Process (AHP) is used for evaluating products' performance in portfolio for Honda Turkey. AHP is selected for the study's method because the study's performance criteria structure

- includes qualitative and quantitative performance criteria
- is appropriate for multi attribute decision-making
- has hierarchy based on criteria level
- has alternatives for evaluating performance with respect to the found performance criteria

So that, AHP method is used for evaluating products' performance with respect to the found performance criteria via in-depth interview.

### **5.2.1 Analytic Hierarchy Process**

The Analytic Hierarchy Process (AHP) is a powerful and flexible decision-making process to help people set priorities and make the best decision when both qualitative and quantitative aspects of a decision need to be considered. By reducing complex decisions to a series of one-on-one comparisons and then synthesizing the results, AHP not only helps decision makers arrive at the best decision, but also provides a clear rationale that it is the best. Designed to reflect the way people actually think, AHP was developed in the 1970's by Dr. Thomas Saaty, while he was a professor at the Wharton School of Business, and continues to be the most highly regarded and widely used decision-making theory. (Liu, Kong, 2005)

The Analytic Hierarchy Process (AHP) is one of the most widely used multi criteria decision making method utilized ([www.expertchoice.com](http://www.expertchoice.com)) AHP captures priorities from paired comparison judgments of the elements of the decision with respect to each of their parent criteria (Saaty, 1980). Paired comparison judgments can be

arranged in a matrix. Priorities are derived from this matrix as its principal eigenvector. Thus, the eigenvector is an intrinsic concept of a correct prioritization process. AHP allows the decision-maker to include intangibles along with tangible numerical data from many sources to make a decision. It also helps decision maker to deal with many factors at the same time as it breaks the problem into parts and then synthesize the parts together in a valid way. AHP provides a transparent framework of analysis leading to rational results and recommendations. On the other hand, stakeholder participation is necessary for large scale problems treated in decision conferences and AHP allows group decision making in a convenient way.

AHP is appropriate for the study because our performance criteria is not in standart structure based on portfolio model so we can not use any portfolio models for our study, we found new performance criteria which is included financial and also marketing criteria after the in-depth interview with managers, so we can use AHP method like as the GE's study (1982).

The AHP comprises of six steps (Chung et al., 2005):

- (1) Define the unstructured problem. The problem should be stated clearly, and the objective and the outcomes should be included.
- (2) Decompose the problem into a hierarchical structure. The AHP decomposes a complex problem into a decision hierarchy, which is much like a decision tree.
- (3) Employ pairwise comparisons. Decision elements at each hierarchy level are compared pairwise, and relative ratings are assigned. Saaty (1980) recommended the use of a nine-point scale to express preferences between options as equally, moderately, strongly, very strongly, or extremely preferred (with pairwise weights of 1, 3, 5, 7 and 9, respectively) and values of 2, 4, 6 and 8 are the intermediate values. A matrix can be formed to represent the pairwise comparisons as seen fig 5.8 (Saaty, 1980).

9	7	5	3	1	Importance of elements are <b>equal</b> Decision maker is indifferent between elements
9	7	5	3	1	First element is <b>moderately</b> more important than second one First element is moderately preferred to second one
9	7	5	3	1	First element is <b>strongly</b> more important than second one First element is strongly preferred to second one
9	7	5	3	1	First element is <b>very strongly</b> more important than second one First element is very strongly preferred to second one
9	7	5	3	1	First element is <b>extremely</b> more important than second one First element is strongly preferred to second one

**Figure 5.8** AHP Pairwise Weights

- (4) Calculate the maximum eigenvalues and eigenvectors. In order to estimate the relative weights of the decision elements in a matrix, the priority of the element is compared by the computation of eigenvalues and eigenvectors with the following formula:

$$A \cdot w = \lambda_{\max} \cdot w \quad (5.1)$$

- (5) Check the consistency property of the matrix. The consistency ratio (CR) is applied to examine the consistency of judgments in the pairwise comparison. The consistency index (CI) and CR are defined as (Saaty, 1980):

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

$$CR = \frac{CI}{RI} \quad (5.2)$$

- (6) Obtain an overall rating of decision alternatives by aggregating the relative priorities of the decision elements. An overall priority ranking of the decision alternatives can be obtained by combining the criterion priorities and priorities of each decision alternative relative to each criterion. (Chen et al., 2006)

AHP's first step is that the problem or aim should be stated clearly and the objective/the outcomes should be included. For the study, the aim is decided as "To find the most appropriate products in portfolio".

Second step of AHP is to decompose the aim/problem into a hierarchical structure like a decision tree. As seen figure 5.7, the performance criteria structure is available for AHP hierarchical structure.

Third step of AHP is to employ pairwise comparisons. Decision elements (our each performance criteria) at each hierarchy level are compared pairwise and relative ratings are assigned. Saaty (1980) recommended the use of nine point scale to express between options. For collecting pairwise comparison score and product's ratings with respect to each performance criteria from managers, the expert survey was prepared. The data collection process was described in detailed next section.

### 5.2.2 Data Collection Process

Based on Saaty nine point scale, expert survey was prepared to get pairwise comparison questions for each performance criteria and also to get relative ratings for the company's each current products as seen prepared expert survey at appendix A.2. The response of the expert survey was collected from managers which has been working at marketing, finance, purchasing and quality-manufacturing department in the company. The distribution of the managers are seen table 5.1.

**Table 5.1:** Manager Distribution for Expert Survey

DEPARTMENT	JOB DEFINITION
<b>Marketing</b>	Marketing Chief
	Marketing Assistant Manager
	Marketing Manager
<b>Purchasing</b>	Purchasing Chief
	Purchasing Chief
	Purchasing Assistant Manager
<b>Finance</b>	Finance Chief
	Finance Assistant Manager
<b>Quality&amp;Manufacturing</b>	Quality Chief
	Manufacturing Chief

The response of the survey was collected for ten managers from marketing, purchasing, finance and quality manufacturing department in the company. But the survey's financial related questions were replied from only finance department's managers because the other department managers has no enough information about finance and also financial related question. The other questions except related financial were replied from all managers. And also the comparison question about

relative priority for the goal between marketing success and financial success was not asked to managers, asked financial and marketing success priority in the goal to the assistant of the general managers. They replied the comparison of relative importance between marketing success and financial success in the goal: to find the most appropriate products in portfolio.

**Table 5.2:** Honda Turkey's Current Products in the Portfolio

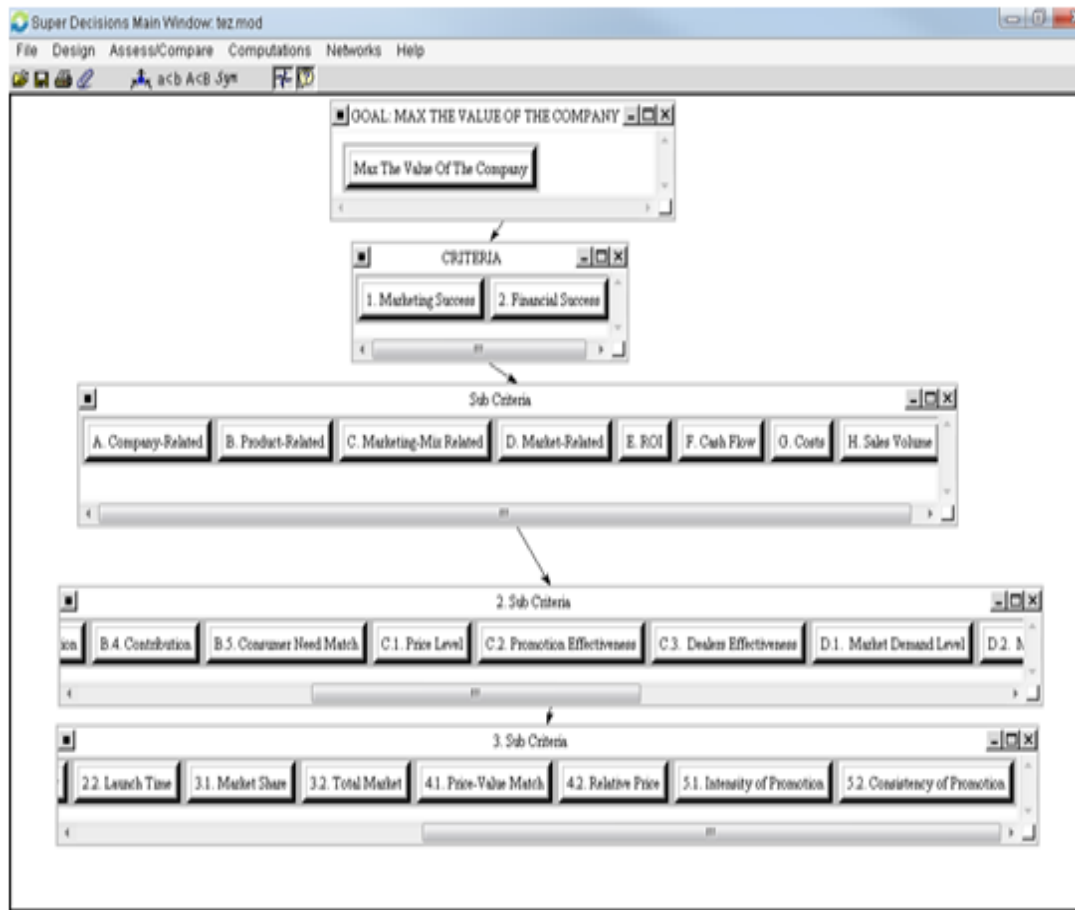
1	<b>CIVIC SEDAN</b> <i>1.6 Dream</i> <i>1.6 Premium/Elegance</i> <i>1.8 Executive Premium/Elegance</i>
2	<b>CIVIC HATCHBACK</b> <i>1.4 Sport</i> <i>1.8 Sport</i>
3	<b>CIVIC HYBRID</b>
4	<b>CIVIC TYPE-R</b>
5	<b>CIVIC TYPE-S</b>
6	<b>JAZZ</b> <i>1.4 Joy+</i> <i>1.4 Fun+</i>
7	<b>CITY</b> <i>1.4 LS</i> <i>1.4 ES</i>
8	<b>ACCORD</b> <i>2.0 Executive</i> <b>LEGEND</b>
9	<b>CRV</b> <i>2.0 Executive</i> <i>2.2 i-CTDi Executive</i>
10	<b>S2000</b> <i>2.0 Executive</i>

Honda Turkey has ten products in the automotive industry as seen table 5.2. Each product rank will be stated in according to the found performance criteria and determine the products with the fit performance (most appropriate) in the portfolio to reach the aim of the study.

### 5.3 Analysis Phase

For the study's data analysis phase, super decisions software is used. When mentioned super decisions software's structure, The Super Decisions software can be utilized to treat AHP based multi criteria decision problems. Super Decisions extends

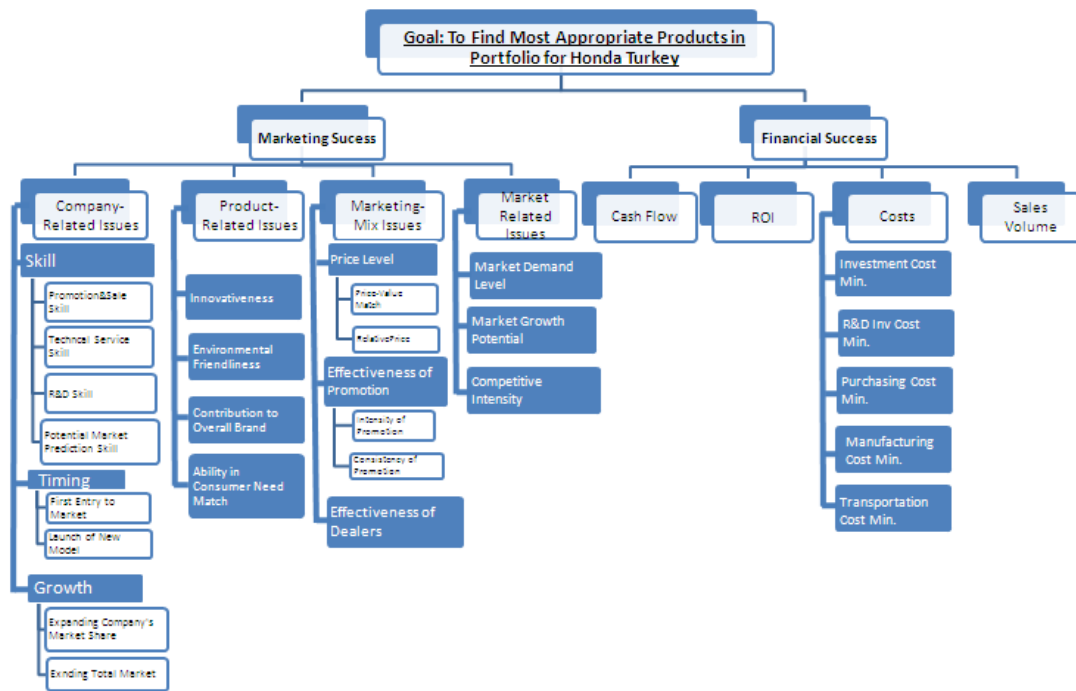
the Analytic Hierarchy Process (AHP) that uses the same fundamental prioritization process based on deriving priorities through judgments on pairs of elements or from direct measurements. So, the super decisions software is used for data analysis tool to achieve each product's priority based on finding of performance criteria(www.superdecisions.com). As can be seen hierarchic decision structure via superdecision programs for the study in figure 5.9.



**Figure 5.9** Super Decisions Programs' Decision-Making Structure

After the in-depth interview with ten managers from Honda Turkey Marketing, Purchasing, Finance and Quality Manufacturing Department, the performance criteria was achieved to find the most products in portfolio as seen figure 5.10.





**Figure 5.10** The Found Performance Criteria

When explain the found performance criteria's hierarchical structure, the goal of the study is to find performance criteria for evaluating Honda Turkey's portfolio. There is two main criteria to reach the goal, first main criteria is "success in marketing" and second main criteria is "success in financial". In according to reach marketing success, the success in four criteria (1. Company Related Issues, 2. Product Related Issues, 3. Marketing Mix Issue, 4. Market Related Issues) should be achieved. The criteria which are related the company's feature and skill, were stated under the company related issues. If the criteria are related to product's feature and skill, the criteria were stated under the product related issue and if the criteria are related marketing mix item except product, the criteria were stated under the marketing mix issue and lastly if the criteria are related to product market's feature, the criteria were stated under the market related issues.

In according to reach Financial Success, the success in four criteria (ROI (Return on Investment), Cash Flow, Costs and Sales Volume) should be achieved. And also cost criterion has five sub criteria (Investment Cost Minimization, Research and Development Minimization, Purchasing Minimization, Manufacturing Minimization and lastly transportation cost minimization).

After the determination of the performance criteria for evaluating products in the portfolio, the expert survey was prepared as seen appendix A.2 to get priorities for each performance criteria in goal and also to get each products ranking result with respect to performance criteria.

### 5.3.1 Importance of Performance Criteria

Ten managers from Honda Turkey Purchasing, Quality, Manufacturing, Marketing and Finance Department answered survey's pairwise comparison question and ranking question for each product with respect to each performance criteria.

In according to survey results, marketing success is more important than financial success as seen table 5.3.

**Table 5.3:** Importance for Marketing Success and Financial Success

	Priority Grade	Percentage (%)
<b>Marketing Success</b>	1	55 %
<b>Financial Success</b>	2	45%

In according to table 5.3, the importance percentage for marketing success is 55% and also the importance percentage for financial success is 45%.

When check the criteria importance degree for marketing success, the results can be achieved as seen table 5.4. As stated previously, the survey response was taken from four department's manager so the importance values for each criteria are seen table 5.4 in according to each department separately and also overall departments' average. For all departments, product related issue is more important than the others. Second priority grade is changing from department to department. Although for marketing department, market related issue has second rank, for finance department, market related issue has fourth rank in according to survey results. Based on overall results, the most important criterion is product related issue, follow by company related issue ( 10%), market related issue (9%) and marketing mix related issue (9%).

**Table 5.4:** The Importance Degree of The Criteria For Marketing Success

	Marketing		Purchasing		Quality- Manufacturing		Finance		AVERAGE	
	Priority Grade	Percentage (%)	Priority Grade	Percentage (%)	Priority Grade	Percentage (%)	Priority Grade	Percentage (%)	Priority Grade	Percentage (%)
Product-Related	1	26,12%	1	23,56%	1	27,89%	1	30,69%	1	26,66%
Company Related Issue	4	7,73%	3	11,65%	2	10,20%	2	9,86%	2	9,89%
Market-Related	2	11,14%	2	11,68%	4	8,02%	4	5,88%	3	9,46%
Marketing-Mix Related	3	10,02%	4	8,11%	3	8,89%	3	8,58%	4	8,99%

In according to survey results which are related financial success, ROI (Return On Investment) is more important than the others for financial success as seen table 5.5. The importance rank for ROI is 19% in financial success and follows by sales volume with 15%, costs 7%, cash flow with 4% respectively.

**Table 5.5:** The Importance Degree for Financial Success Criteria

	Percentage (%)
<b>ROI</b>	19 %
<b>Sales Volume</b>	15 %
<b>Costs</b>	07 %
<b>Cash Flow</b>	04 %

In according to survey results which are related to marketing success sub criteria, the criterion which has lowest level in the hierarchy structure is stated table 5.6. As can be seen table 5.6, for purchasing (PU) , marketing (MA), quality manufacturing (QM), finance (Fi) department managers the consumer need match criterion is more important than the others. The criterion which has second rank is changing from department to department as seen table 5.6. Based on the overall department result, consumer need match is followed by innovativeness of the product and contribution to overall brand image.

At the table 5.6, some abbreviations are used and the used abbreviations definitions are stated below:

MA: Marketing Department Managers Responses' Avarage

PU: Purchasing Department Managers Responses' Avarage

QM: Quality-Manufacturing Department Managers Responses' Avarage

Fi: Finance Department Managers Responses' Avarage

**Table 5.6:** Importance Degree for Marketing Sub Criteria

	MA (%)	PU (%)	QM(%)	Fi (%)	AVARAGE (%)
<b><u>COMPANY-RELATED ISSUES</u></b>					
<b>Skill</b>					
Promotion&Sale	1,80%	1,30%	1,36%	1,42%	<b>1,59%</b>
Technical Service	0,50%	0,23%	0,94%	0,87%	<b>0,55%</b>
R&D	0,46%	1,36%	1,36%	1,83%	<b>1,14%</b>
Market Prediction	1,23%	3,21%	2,79%	2,71%	<b>2,46%</b>
<b>Timing</b>					
First Entry	1,17%	0,87%	0,96%	0,85%	<b>1,03%</b>
Launch Time	0,30%	0,66%	0,21%	0,25%	<b>0,36%</b>
<b>Growth</b>					
Market Share	1,00%	1,75%	1,07%	0,71%	<b>1,15%</b>
Total Market	1,27%	2,27%	1,50%	1,22%	<b>1,60%</b>
<b><u>PRODUCT-RELATED ISSUES</u></b>					
Innovativeness	4,26%	3,75%	4,68%	6,66%	<b>4,87%</b>
Environmental Friendliness	2,96%	0,94%	1,48%	1,41%	<b>1,68%</b>
Product Position	5,36%	3,49%	2,28%	3,23%	<b>3,82%</b>
Contribution	6,77%	1,92%	6,09%	5,25%	<b>4,59%</b>
Consumer Need Match	6,77%	13,45%	13,35%	14,14%	<b>11,70%</b>
<b><u>MARKETING MIX ISSUES</u></b>					
<b>Price</b>					
Price-Value Match	4,23%	1,52%	4,74%	3,85%	<b>3,55%</b>
Relative Price	1,28%	4,00%	1,37%	1,57%	<b>2,17%</b>
<b>Promotion</b>					
Intensity of Promotion	1,27%	0,46%	0,95%	1,03%	<b>0,90%</b>
Consistency of Promotion	1,61%	1,29%	0,95%	0,73%	<b>1,21%</b>
Dealers Effectiveness	1,63%	0,83%	0,88%	1,40%	<b>1,16%</b>
<b><u>MARKET RELATED ISSUES</u></b>					
Market Demand Level	3,35%	3,59%	2,63%	1,35%	<b>2,79%</b>
Market Growth Potential	3,30%	4,05%	2,09%	2,39%	<b>3,07%</b>
Competitive Intensity	4,49%	4,04%	3,30%	2,14%	<b>3,61%</b>

**Table 5.7:** The Importance Degree for Cost Sub Criteria

	Percentage (%)
Manufacturing Cost Min	2,1 %
R&D Cost Min	1,9 %
Inv Cost Min	1,0 %
Transpor Cost Min	1,0 %
Purchasing Cost Min	0,6 %

In according to survey results which are related financial success's sub criteria which is called cost, manufacturing cost minimization's importance degreee (2,1%) is higher than the others as seen table 5.7, follows by research and development cost minimization (1,9%), transportation cost minimization (1%), investment cost minimization (1%) and purchasing cost minimization (0,60%).

### 5.3.2 Ratings of Alternatives

In according to survey data results which are related ranking of product with respect to each performance criterion in financial success, Type-s performance score (9,38) over ten score is higher than the other products score based on financial success criteria as seen table 5.8.

**Table 5.8:** Products' Score Based on Financial Success

	Finance Success	
	Fi	OVERALL
<b>CIVIC SEDAN</b> <i>1.6 Dream</i> <i>1.6 Premium/Elegance</i> <i>1.8 Executive Premium/Elegance</i>	7,56	7,56
<b>CIVIC HATCHBACK</b> <i>1.4 Sport</i> <i>1.8 Sport</i>	6,10	6,10
<b>CIVIC HYBRID</b>	5,23	5,23
<b>CIVIC TYPE-R</b>	4,15	4,15
<b>CIVIC TYPE-S</b>	9,38	9,38
<b>JAZZ</b> <i>1.4 Joy+</i> <i>1.4 Fun+</i>	5,34	5,34
<b>CITY</b> <i>1.4 LS</i> <i>1.4 ES</i>	7,48	7,48
<b>ACCORD</b> <i>2.0 Executive</i> <b>LEGEND</b>	8,35	8,35
<b>CRV</b> <i>2.0 Executive</i> <i>2.2 i-CTDi Executive</i>	7,91	7,91
<b>S2000</b> <i>2.0 Executive</i>	3,11	3,11



**Figure 5.11** The Most Appropriate Products Based on Financial Success

S2000's score is worst score in the portfolio based on financial success and type-r followed S2000 with 4,15 score over ten maximum score. As seen figure 5.11, the most appropriate products are civic type-s, accord and crv based on financial success. The other hand, S-2000, civic type-r and civic hybrid's performances are not in the most appropriate products based on financial success.

In according to survey results which are related ranking of product with respect to each performance criterion in marketing success, as can be reached table 5.9 results. As can be seen table 5.9, Accord has first rank for purchasing and also quality manufacturing side, but in according to overall results Civic Sedan has first rank based on marketing success criteria. Products' performance is changing from department to department.

**Table 5.9:** Products' Score Based on Marketing Success

	MARKETING SUCESS				
	PU	QM	Ma	Fi	OVERALL
<b>CIVIC SEDAN</b> 1.6 Dream 1.6 Premium/Elegance 1.8 Executive Premium/Elegance	6,26	2,15	2,91	4,81	4,03
<b>CIVIC HATCHBACK</b> 1.4 Sport 1.8 Sport	5,87	2,00	2,76	4,47	3,77
<b>CIVIC HYBRID</b>	6,34	2,40	3,43	3,77	3,93
<b>CIVIC TYPE-R</b>	5,91	1,92	2,48	2,25	3,10
<b>CIVIC TYPE-S</b>	5,93	1,92	2,75	1,74	3,07
<b>JAZZ</b> 1.4 Joy+ 1.4 Fun+	6,42	2,19	2,76	4,03	3,84
<b>CITY</b> 1.4 LS 1.4 ES	4,95	1,68	2,41	3,59	3,15
<b>ACCORD</b> 2.0 Executive <b>LEGEND</b>	6,50	2,22	2,21	3,74	3,64
<b>CRV</b> 2.0 Executive 2.2 i-CTDi Executive	6,37	2,19	2,51	3,95	3,72
<b>S2000</b> 2.0 Executive	5,55	1,82	1,11	3,28	2,97



**Figure 5.12** The Most Appropriate Products Based on Marketing Success

As seen figure 5.12, the most appropriate products are civic sedan, hybrid and jazz based on marketing success. The other hand, S-2000, civic type-s and civic type-r performances are not in the most appropriate products based on marketing success.

S2000 has the final rank based on marketing success same as financial success. As stated previously, S2000 will not be in market for future, Honda global decided to not manufacture for future. With respect to products score, can be seen that Honda global's decision about S2000 is correct based on survey results.

Finally, in according to survey results which are related ranking of product based on each performance criterion (both marketing success and financial success) in goal, Type-S has first rank (score: 5,91) over ten maximum score. Type-S has no enough best performance based on marketing side, but Type-S financial performance is better than all other products, so that Type-S achieves first rank in portfolio, Accord (score: 5, 76) and Civic Sedan (score: 5,62) follows Type-S as seen table 5.10.

**Table 5.10:** Products' Score Based on both Marketing and Financial Success

	OVERALL
<b>CIVIC SEDAN</b>	
1.6 Dream	
1.6 Premium/Elegance	
1.8 Executive Premium/Elegance	5,6181
<b>CIVIC HATCHBACK</b>	
1.4 Sport	
1.8 Sport	4,8158
<b>CIVIC HYBRID</b>	4,5135
<b>CIVIC TYPE-R</b>	3,5695
<b>CIVIC TYPE-S</b>	5,9057
<b>JAZZ</b>	
1.4 Joy+	
1.4 Fun+	4,5141
<b>CITY</b>	
1.4 LS	
1.4 ES	5,0967
<b>ACCORD</b>	
2.0 Executive	
<b>LEGEND</b>	5,7594
<b>CRV</b>	
2.0 Executive	
2.2 i-CTDi Executive	5,6081
<b>S2000</b>	
2.0 Executive	3,0302



**Figure 5.13** The Most Appropriate Products Based on Marketing and Financial Success

As seen figure 5.13, the most appropriate products are civic type-s, accord and civic sedan based on marketing and financial success. The other hand, S-2000, civic type-r and civic hybrid performances are not in the most appropriate products based on marketing success.



## **6. CONCLUSIONS and FURTHER SUGGESTIONS**

The major aim of this study was to analyze the product portfolio of a company in terms of finding the most appropriate products that can be considered as a measure of portfolio performance. The performance criteria for evaluating Honda Turkey's current products in the portfolio were obtained through the field study and the most appropriate products for the portfolio were determined with respect to these performance criteria.

Based on the literature review for portfolio models, it is seen that while some models focus only on marketing criteria, some other models deal only with financial criteria to evaluate the portfolios. Based on the portfolio models, the performance criterion changes from one model to another for evaluating products in the portfolio. In according to the preliminary research results, Honda Turkey's performance criteria for evaluating portfolio include marketing and also financial related criteria. Therefore, performance criteria include qualitative and quantitative items and various inputs coming from portfolio models. Also, performance criteria found in this study take account of the sector critical success factors that are important for Honda Turkey's managers. Thus the performance criteria involve some inputs from portfolio models analyzed in the literature, items from automotive sector analysis results and also Honda Turkey's strategic management tool.

Based on the findings of this study, it is seen that marketing success is more important than financial success for Honda Turkey to evaluate the products in the portfolio. Although, financial success shows current financial situation for the products, marketing success shows current situation and also customer expectation for the future trends. Therefore, return on marketing is slightly more important than financial related gains for Honda Turkey.

Based on the marketing success, Honda Turkey's best three products are Civic Sedan, Civic Hybrid, Jazz respectively and worst three products are S2000, Civic Type-S, Civic Type-R respectively. But based on the financial success, Honda Turkey's best three products are Civic Type-S, Accord, CRV respectively and the worst three products are S2000, Civic Type-R, Civic Hybrid. As can be seen, Type-S is evaluated as the best product for financial success, however it is considered as among the worst products for marketing success. Type-S's return

on investment and cash flow are much better than the others but especially based on the price level, the 'customer need match' feature is weaker than the others. Although Type-S is in the best product based on the financial success, it is in the worst group from the marketing success point of view. It is highly recommended that the marketing criteria, especially customer need match should be improved for this product model of Honda Turkey.

According to overall success, Honda Turkey's best three products are Civic Type-S, Accord and Civic Sedan based on both marketing and financial success. In fact, the performance criteria have to include both marketing and financial criteria for evaluating products in portfolio. As seen the study results, the most appropriate products based on only financial or marketing success are different from based on both marketing and financial success. Therefore, if use any best-known portfolio models which are investigated in the field study, the results might not be given accurate results in the case of using only financial criteria or only marketing criteria. The performance criteria includes both financial and marketing criteria.

Honda Turkey has recently announced that S2000 will not be manufactured after the year of 2009. S2000 is found as the worst product for Honda Turkey based on the study results, both at financial and marketing sides. Thus one of the main findings of this study is overlapping with the real market situation.

On the other hand, Civic Hybrid is one of the most popular product for Honda Turkey. Environmental friendliness is going to be very important criterion for customer in near future. It is expected that customers would like to have innovative cars with economic fuel. So, Honda wants to expand the market with Civic Hybrid which is innovative and very economic car. The Civic Hybrid's engine won the International Engine of the Year award in "1 litre to 1.4 litre" size category for three consecutive years from 2002 through 2004, as well as the "Best Fuel Economy" category for 2003 and 2004. It has won Motor Trend 2006 Car of the Year award, along with the rest of the Civic range. In accordance with the study results, Civic Hybrid is in the best three products based on the marketing success. Hybrid has innovativeness, ability in consumer need match and also environmental friendliness as product features, but cost minimization feature is the very weak side for Civic Hybrid, that is probably why it was considered as among the worst products based on the financial success. Research and development cost is much higher than the other models and cost minimization is much lower. If Honda wants to keep this model in its portfolio, it should find ways to minimize the cost for Civic Hybrid.

When each product's situation is checked with respect to each performance criterion, the product's strong and weak features could be revealed.

One of the main contributions of this study is to enable to see product's weak features and focus on improvements for the future success.

The study includes also some limitations. All survey results depend on managers' opinions although they occupy executive positions, so the findings might be different if other managers were integrated in the study. The study could not be generalized for all automotive industry; its findings reflect the situation only for the selected company: Honda Turkey.

As further studies, the general performance criteria in the automotive industry may be investigated. Also, the relationship between managers opinion and current market situation results may be investigated.



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## **APPENDICES**

**APPENDIX A.1 : In-Depth Interview Content**

**APPENDIX A.2 : Expert Survey For Managers**





## **APPENDIX A.1**

### **IN-DEPTH INTERVIEW CONTENT**

#### **Critical Success Factor for Automotive Industry**

1. General Information About Automotive Industry
  - Opportunities?
  - Threats?
2. Honda Turkey's Current Situation in Market
  - Products?
  - Which customers for which products?
  - Potential competitors in the market?
  - Products' market share and sales?
  - Competitor's market share and sales?
3. Critical Success Factors
  - The company's mission?
  - How maximize the company's value?
  - How measure products' performance in the market?
  - Which criteria affect directly product's performance and product's survival success?
  - What are bases of success for product in the automotive industry?



## APPENDIX A.2

### EXPERT SURVEY

The attached survey is prepared to obtain information for the graduate study at the Istanbul Technical University Management Engineering Program.

#### IMPORTANT NOTE:

For the accuracy and reliability of the data, please firstly you read carefully the given information on filling survey and then answer the questions in complete.

Thanks inadvance for your kindness and assistance.

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We would like you to answer all questions in complete for attached survey. The informations about how you answer the questions in survey, are explained under the title of evaluation method.

The aim of this study is to evaluate the products' performance and to find the most appropriate products in the portfolio for Honda Turkey. There are two main criteria to reach the study's goal, first main criterion is "success in marketing" and second main criterion is "success in financial". And also, each main criterion is composed of criteria, each criterion composed of sub-criteria as seen below table.

TO FIND MOST APPROPRIATE PRODUCTS IN THE PORTFOLIO	
MARKETING SUCCESS	FINANCIAL SUCCESS
<b>COMPANY-RELATED ISSUES</b>	<b>1. ROI</b>
<b>1. Skills</b>	<b>2. Cash Flow</b>
Promotion & Sales Skill	<b>3. Costs</b>
Technical Service Skill	Investment Cost Minimization
R&D Skill	R&D Investment Cost Minimization
Potential Market Prediction Skill	Purchasing Cost Minimization
<b>2. Timing</b>	Manufacturing Cost Minimization
First Entry to Market	Transportation Cost Minimization
Launch of New Model	<b>4. Sales Volume</b>
<b>3. Growth</b>	
Expanding Company's Market Share	
Expanding Total Market	
<b>PRODUCT-RELATED ISSUES</b>	
<b>1. Innovativeness of the Product</b>	
<b>2. Environmental friendliness of the Product</b>	
<b>3. Product Position in the Market Segment</b>	
<b>4. Contribution to Overall Brand Image</b>	
<b>5. Ability of the Product in Consumer Need Match</b>	
<b>MARKETING MIX ISSUES</b>	
<b>1. Price Level of the Product</b>	
Price-Value Match of the Product	
Price Relative to Competitors	
<b>2. Effectiveness of Promotion in Marketing the Product</b>	
Intensity of promotion	
Consistency of promotion	
<b>3. Effectiveness of Dealers in Selling the Product</b>	
<b>MARKET-RELATED ISSUES</b>	
<b>1. Market Demand Level</b>	
<b>2. Market Growth Potential</b>	
<b>3. Competitive Intensity</b>	

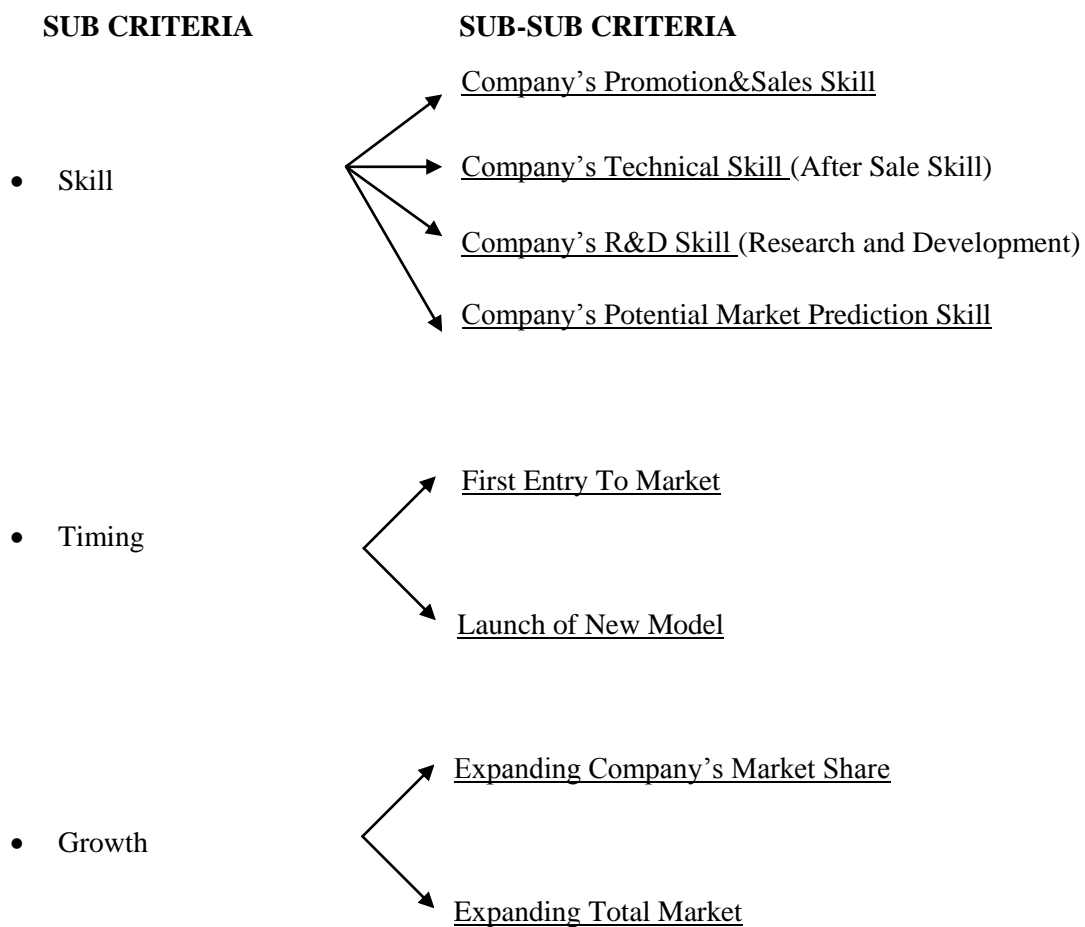
## THE EXPLANATION OF CRITERIA

**Marketing Success:** To reach this study's goal, two main performance criteria are achieved after the in-depth interview with Honda Turkey's top managers in order to evaluate products performance in the portfolio. One of main performance criteria is marketing success. Marketing Success consists of four criteria are stated below.

### Marketing Success's Four Criteria

- Company-Related Issues
- Product-Related Issues
- Marketing Mix Issues
- Market-Related Issues

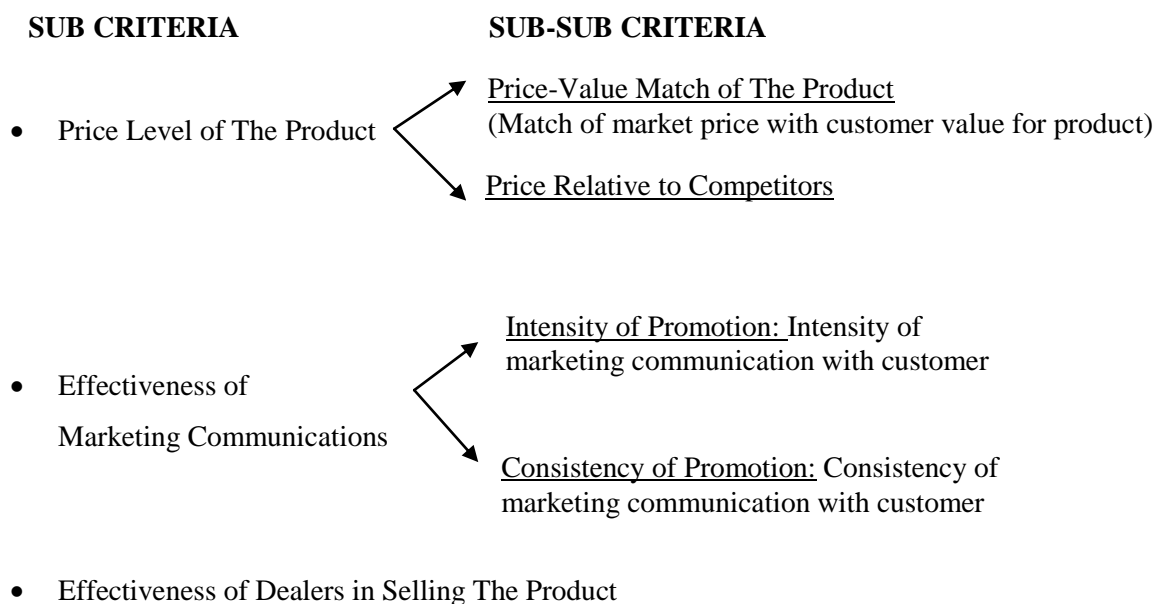
**Company-Related Issues:** The criteria which are related to company's skill and feature are grouped under these title: company-related issues. Company-related issues has three sub-criteria and each sub-criterion has some sub-sub criteria as seen below.



**Product-Related Issues:** The criteria which are related to product's skill and feature are grouped under these title: product-related issues. Product-related issues has five sub-criteria as seen below.

- Innovativeness of the Product
- Environmental Friendliness of the Product
- Product Position in the Market Segment
- Contribution to Overall Brand Image
- Ability of the Product in Consumer Need Match

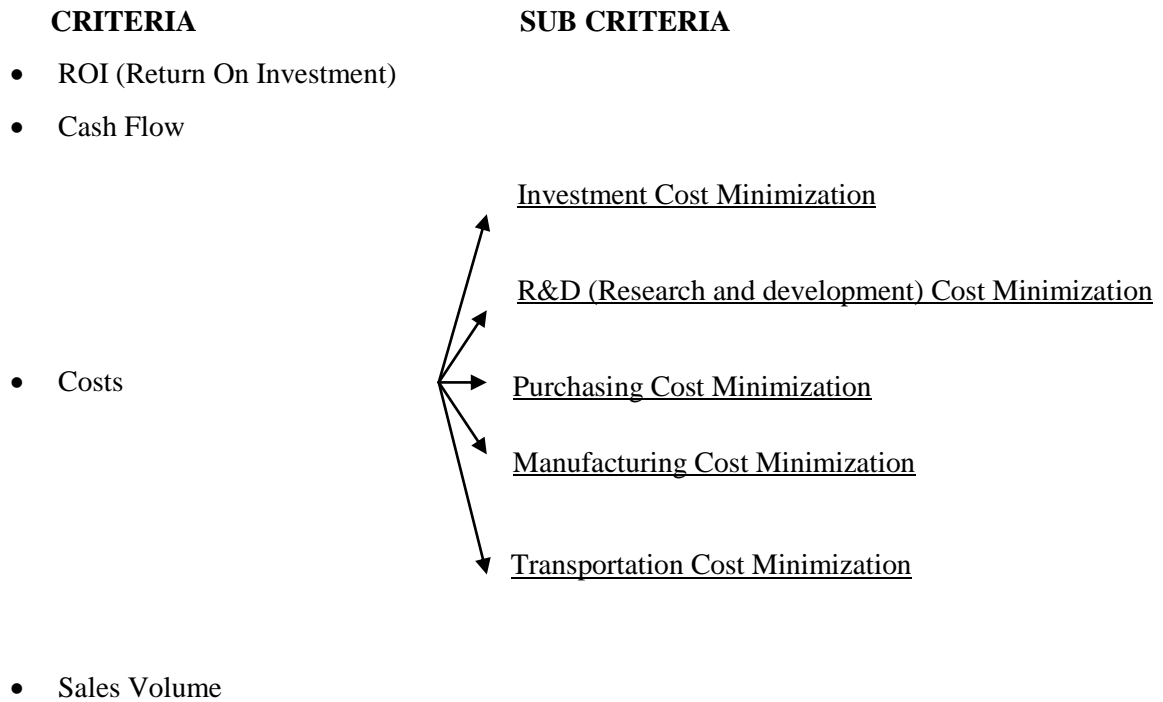
**Marketing-Mix Issues:** The criteria which are related to marketing mix's any item except product are grouped under these title: marketing mix issues. Marketing mix issues has three sub-criteria and sub criteria have some sub-sub criteria as seen below.



**Market Related Issues:** The criteria which are related to product's market are grouped under these title: market-related issues. Market-related issues has three sub-criteria as seen below.

- Market Demand Level
- Market Growth Potential
- Competitive Intensity

**FINANCIAL SUCCESS:** To reach this study's goal, two main performance criteria are achieved after the in-depth interview with Honda Turkey's top managers in order to evaluate products performance in the portfolio. One of main performance criteria is marketing success and the another main criterion is financial success. Financial success is composed of four criteria and only cost criterion has sub-criteria as seen below.



## THE EVALUATION METHOD OF SURVEY

During the evaluation of survey, we would like you to mark the relative importance of criterion with respect to main criterion with pairwise comparison questions.

Please put tick mark at a point, which is nearer to your opinion, in each of the following scales (1-9).

1=Equal 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

9	7	5	3	1	Importance of elements are <b>equal</b> Decision maker is indifferent between elements
9	7	5	3	1	First element is <b>moderately</b> more important than second one First element is moderately preferred to second one
9	7	5	3	1	First element is <b>strongly</b> more important than second one First element is strongly preferred to second one
9	7	5	3	1	First element is <b>very strongly</b> more important than second one First element is very strongly preferred to second one
9	7	5	3	1	First element is <b>extremely</b> more important than second one First element is strongly preferred to second one

**Example Question 1:** Mark the relative importance of “ marketing success’s sub-criteria” with respect to marketing success using the following scales. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for marketing success?

1=Equal 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Company-Related Issues	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Product-Related Issues
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### Example Evaluation 1

If you think that company-related issues and product-related issues are equally important, put tick mark on center portion of the scale.

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Company-Related Issues	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Product-Related Issues
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### Example Evaluation 2

If you think that company-related issues are very strongly important than product-related issues, please use the left hand side of scale and put tick mark on the 7=very strongly point.

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Company-Related Issues	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Product-Related Issues
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### Example Evaluation 3

If you think that the product-related issues are between slightly and strongly important than company-related issues, please use the right hand side of scale and put tick on the 4 point.

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Company-Related Issues	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Product-Related Issues
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## SURVEY SHEET

**Question 1.** Mark relative importance of “ marketing success’s sub criteria” given on the two sides of the scale with respect to marketing success. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for marketing success?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Company-Related Issues	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Product-Related Issues
Product-Related Issues	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Marketing Mix Issues
Marketing Mix Issues	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Market Related Issues
Market Related Issues	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Company-Related Issues

**Question 2.** Mark relative importance of “ company-related issues’ sub criteria” given on the two sides of the scale with respect to company-related issues. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for company-related issues?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Skills	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Timing
Timing	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Growth
Growth	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Skills

**Question 3.** Mark relative importance of “ skills’ sub criteria” given on the two sides of the scale with respect to skills. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for skills?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Promotion&Sale Skill	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Technical Service Skill
Technical Service Skill	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	R&D Skill
R&D Skill	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Potential Market Prediction Skill
Potential Market Prediction Skill	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Promotion&Sale Skill

**Question 4.** Mark relative importance of “ timing’s sub criteria” given on the two sides of the scale with respect to timing. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for timing?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

First Entry To Market	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Launch of New Model
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**Question 5.** Mark relative importance of “ growth’s sub criteria” given on the two sides of the scale with respect to growth. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for growth?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Expanding Company’s Market Share	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Expanding Total Market
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**Question 6.** Mark relative importance of “ product-related issues’ sub criteria” given on the two sides of the scale with respect to product-related issues. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for product-related issues?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Innovativeness of The Product	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Environmental friendlinessof The Product
Environmental friendlinessof The Product	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Product Position in The Market Segment
Product Position in The Market Segment	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Contribution to Overall Brand Image
Contribution to Overall Brand Image	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ability of The Product in Consumer Need Match
Ability of The Product in Consumer Need Match	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Innovativeness of The Product

**Question 7.** Mark relative importance of “ marketing mix issues’ sub criteria” given on the two sides of the scale with respect to marketing mix issues. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for marketing mix issues?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Price Level of The Product	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Effectiveness of Promotion in Marketing The Product
Effectiveness of Promotion in Marketing The Product	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Effectiveness of Dealers in Selling The Product
Effectiveness of Dealers in Selling The Product	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Price Level of The Product

**Question 8.** Mark relative importance of “ price level of product’s sub criteria” given on the two sides of the scale with respect to price level of product. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for company-related issues?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Price-Value Match of The Product	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Price Relative to Competitors
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**Question 9.** Mark relative importance of “effectiveness of promotion in marketing’s sub criteria” given on the two sides of the scale with respect to effectiveness of promotion in marketing. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for effectiveness of promotion in marketing?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Intensity of Promotion	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Consistency of Promotion
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**Question 10.** Mark relative importance of “ market-related issues’ sub criteria” given on the two sides of the scale with respect to market-related issues. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for market-related issues?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Market Demand Level	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Market Growth Potential
Market Growth Potential	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Competitive Intensity
Competitive Intensity	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Market Demand Level

**Question 11.** Mark relative importance of “ financial success’s sub criteria” given on the two sides of the scale with respect to financial success. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for financial success?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

ROI (Return On Investment)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Cash Flow
Cash Flow	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Costs
Costs	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sale Volume
Sale Volume	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	ROI (Return On Investment)

**Question 12.** Mark relative importance of “ costs’ sub criteria” given on the two sides of the scale with respect to costs. Please put tick marks on the number of your choice on each scale.

Among each pair of given criteria, which is more important for costs?

1=Equally 3=Moderately 5=Strongly 7=Very Strongly 9=Absolutely

Investment Cost	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Purchasing Cost
Purchasing Cost	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Manufacturing Cost
Manufacturing Cost	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transportation Cost
Transportation Cost	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	R&D Investment Cost
R&D Investment Cost	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Investment Cost

**Question 13.** Please, score the given below each product over the maximum ten points with respect to each marketing success's sub criteria.

**(10 Points= Maximum Point= Very Good**

**1= Minimum point= Very Bad)**

CRITERIA	Promotion&Sales Skill	Technical Service Skill	R&D Skill	Potential Market Prediction Skill	First Enter To Market	Launch Of New Model	Expanding Company's Market Share	Expanding Total Market	Environmental friendliness of the Product	Product Position in the Market Segment	Contribution to Overall Brand Image	Ability of the Product in Consumer Need Match	Price-Value Match of the Product	Price Relative to Competitors	Intensity of promotion	Consistency of promotion	Effectiveness of Dealers in Selling the Product	Market Demand Level	Market Growth Potential	Competitive Intensity
<b>BRANDS</b>																				
<b>CIVIC SEDAN</b>																				
1.6 Dream																				
1.6 Premium/Elegance																				
1.8 Executive Premium/Elegance																				
<b>CIVIC HATCHBACK</b>																				
1.4 Sport																				
1.8 Sport																				
<b>CIVIC HYBRID</b>																				
<b>CIVIC TYPE-R</b>																				
<b>CIVIC TYPE-S</b>																				
<b>JAZZ</b>																				
1.4 Joy+																				
1.4 Fun+																				
<b>CITY</b>																				
1.4 LS																				
1.4 ES																				
<b>ACCORD</b>																				
2.0 Executive																				
<b>LEGEND</b>																				
<b>CRV</b>																				
2.0 Executive																				
2.2 i-CTDi Executive																				
<b>S2000</b>																				
2.0 Executive																				

**Question 14.** Please, score the given below each product over the maximum ten points with respect to each financial success's sub criteria.  
**(10 Points= Maximum Point= Very Good                      1= Minimum Point= Very Bad)**

CRITERIA	ROI	CASH FLOW	Cost Minimization a) Invest. Cost	Cost Minimization b) R&D Invest. Cost	Cost Minimization c) Purchasing Cost	Cost Minimization d) Manufacturing Cost	Cost Minimization e) Transportation Cost	SALE VOLUME
<b>BRANDS</b>								
<b>CIVIC SEDAN</b> <i>1.6 Dream</i> <i>1.6 Premium/Elegance</i> <i>1.8 Executive Premium/Elegance</i>								
<b>CIVIC HATCHBACK</b> <i>1.4 Sport</i> <i>1.8 Sport</i>								
<b>CIVIC HYBRID</b>								
<b>CIVIC TYPE-R</b>								
<b>CIVIC TYPE-S</b>								
<b>JAZZ</b> <i>1.4 Joy+</i> <i>1.4 Fun+</i>								
<b>CITY</b> <i>1.4 LS</i> <i>1.4 ES</i>								
<b>ACCORD</b> <i>2.0 Executive</i> <b>LEGEND</b>								
<b>CRV</b> <i>2.0 Executive</i> <i>2.2 i-CTDi Executive</i>								
<b>S2000</b> <i>2.0 Executive</i>								

**THANK YOU VERY MUCH FOR YOUR ASSISTANCE**



## **CURRICULUM VITA**



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