

**Factors influencing aftermarket parts sales: The case of an
American manufacturer**

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ABSTRACT

The Southeast Asia vehicle market has been growing. Future Motors sees this growth as an opportunity to expand its market boundaries and be part of the growing market. To this end, it has built four manufacturing factories in five countries in the region. Service parts sales make up an important part of the vehicle business, both in revenue and profit. Despite this, Future Motors has not focused on parts sales in any of the five countries. As Future Motors enhances its vehicle sales, it is increasingly becoming imperative that it explores how it can ensure its customers receive the full after-sale service with original parts to ensure customer satisfaction and improve the company's total performance.

The objective of this research was to determine those factors that appear to affect Future Motors' service parts sales in each of the five Southeast Asian countries in which it is doing business. Data were collected for three years and regression modeling used to determine what impact variables had on service parts sales and net service parts sales. The outcome of the research found that there are key attributes of the factories that Future Motors can focus on to improve its service parts sales.

TABLE OF CONTENTS

List of Figures	iv
List of Tables	v
Acknowledgments	vi
Chapter I: Introduction	1
1.1 The Client	1
1.2 Research Problem and Objectives	3
1.3 Information and Location.....	4
Chapter II: Literature review	6
2.1 SE Asia market.....	6
2.2 SE Asia Vehicle Market.....	6
2.3 Service/Spare Parts sales.....	7
Chapter III: Conceptual Models	10
3.1 Data	10
3.2 Econometric Models	12
Chapter IV: results	14
4.1 Summary Statistics	14
4.2 Explaining Parts Sales.....	18
4.3 Strategies to Grow Parts Sales	24
Chapter V: summary & Conclusions	27
5.1 Conclusions	28

LIST OF FIGURES

Figure 4.1: Distribution of Future Motors Dealers by Country (N=349).....	14
Figure 4.2: Distribution of Future Motors Dealers by Sale of Vehicles Manufactured at the Different Manufacturing Facilities (N=349).....	15
Figure 4.3: Distribution of Dealers by Service Employees	18

LIST OF TABLES

Table 4.1 Summary Statistics on Total Parts Sales, Service Personnel and Units of Different Vehicles Sold	16
Table 4.2: Results of the Panel Regression Explaining Parts Sales in U.S. Dollars for Dealerships.....	19
Table 4.3: Results of the Panel Regression Explaining Warranty Parts Sales in U.S. Dollars for Dealerships.....	21
Table 4.4: Results of the Panel Regression Explaining Net Parts Sales in U.S. Dollars for Dealerships	23

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CHAPTER I: INTRODUCTION

1.1 The Client

Future Motors is a global manufacturer of light and heavy duty vehicles. The company started doing business in Southeast (SE) Asia in the mid-1970s. Currently the company operates four factories in the five countries managed by their SE Asia marketing office. Whole goods and service parts have always been important to Future Motors profitability, though in the SE Asia marketing area there has been limited focus on service parts sales growth.

The original business model pursued in SE Asia by Future Motors focused on selling complete goods – measured by units sold and market share. A small percentage of the dealers in SE Asia make up a majority of the service parts sales today. It has, however, become apparent that the growth area in the SE Asia market is service parts sales. Therefore, one of Future Motors' growth initiatives is to transition the dealer business model from one focused only on complete goods sales to a full service model, i.e., one that focuses on sales, parts, and service. The full service model expands the revenue sources for Future Motors from just vehicle sales to include parts sales. It also increases the revenue opportunities for the dealers by including service labor sales and service parts sales. Although the current service parts sales to complete goods sales ratio in SE Asia is only three percent (compared to about sixteen percent in the rest of the world), the region's growth in demand for vehicles suggests that a focused attention on service parts sales could result in significant growth in this segment of the company's business.

Future Motors currently maintains one major parts distribution hub and four parts distribution depots. The distribution hub is the central destination of parts for the region.

It, thus, holds inventory for the distribution depots and distributes these parts to the depots upon demand. The parts distribution hub and three of the four depots are located near the four vehicle manufacturing factories Future Motors has in SE Asia. The location of the parts depots were determined essentially by the location of the factories, with the exception of the fourth parts depot, which was selected primarily to meet client needs and overcome logistical challenges to serve that part of the region.

Parts sales in SE Asia can be very competitive, even more competitive than other markets Future Motors operates in. A factor contributing to the competition level in the market may be attributed to the design of the vehicles. Most of the vehicles in SE Asia are very simple and utilizes a common design with “off the self” parts. Because the parts are common, the customer can purchase the parts from any number of different suppliers, including Future Motors’ own suppliers. Many parts for Future Motors vehicles in SE Asia are not dissimilar to those of the competitors’. Therefore, the dealers compete to get sales from customers who have purchased Future Motors’ vehicles. Also within SE Asia, counterfeit parts can be a problem even if the part is patented.

Customers in SE Asia are very cost sensitive customers, both when purchasing vehicles and service parts. Vehicle availability is important to customers, vehicles are expected to run when needed. When a vehicle breaks down and requires repair, customers expect the service parts to be readily available. This can be a challenge for parts that are produced outside the region as transportation and customs can delay getting them to the customer. Logistics become a challenge for parts distribution, particularly for imported parts. For imported parts, two logistic companies are usually required, one to get the part into the region and a second for distribution inside of SE Asia. There are few, if any,

logistic companies that can import parts and have region wide distribution inside of SE Asia. It becomes even harder within SE Asia as most of the logistics companies are regional, so it could take working with three or four logistic companies to get good coverage across all of SE Asia.

The importance of parts sales to the profitability of a Futures Motors dealer can be measured by looking at the metrics that are used to measure the health of a dealership. One of the key metrics is called absorption, the amount of the variable and fixed cost that is covered by the profit of the parts and service department. This is used to measure the health of a dealership to determine the ability of the dealership to survive a downturn when there are fewer new vehicle sales. Just like parts and service sales can give Future Motors dealerships stability when the market for vehicles goes down; it also does the same for Future Motors during a downward market cycle. About 45% of the absorption for a Future Motors dealer is expected to come from parts sales with the other 55% from service sales. Compounding the importance of the service department is that between 40% and 50% of parts sales for Future Motors dealership in developed countries are sold through the service department. This means that if a dealership has good trained technicians that have a high turnaround for repairs with little rework, they will create more revenue for the dealership. The profit margin on service parts is why growing parts sales in SE Asia is one of Future Motors' objectives.

1.2 Research Problem and Objectives

For the project, the objective is to determine what factors impact the amount of service parts a Future Motors dealership in SE Asia sells. A comparison will be done of Future Motors dealers to determine what factors tend to be associated with dealerships that

sell more service parts. Items that will be taken into consideration will be the location of the dealership, what complete vehicles the dealer sells, and whether the dealership is aftermarket (parts and service) focused.

This research will be important to Future Motors, in that parts sales gives the company a stable source of revenue and profit to continue operating the business when the market cycle for vehicles is down. Service parts are always needed by customers; if the vehicle is not repaired it will not be available for transportation or work. Parts sales are less impacted by cycles in the industry than are vehicle sales. By increasing the parts sales within SE Asia, this will provide the annual sales base that Future Motors can build a long lasting profitable business on.

1.3 Information and Location

The first piece of data required for the project is parts sales data. The parts sales data will be pulled out of the parts business system by dealer account number and put into excel to be merged with other data sets. Along with parts sales data, excel files that contain the vehicle sales of each factory in SE Asia will be used. The complete good sales are also tracked using dealer account number or dealer names. Most of the vehicle sales in SE Asia for Future Motors, measured on a unit basis, are of products that are produced in the factories located within SE Asia. There are eleven import dealers that do sell Future Motors products produced outside of SE Asia. Parts for products from outside of SE Asia have shown better parts sales volumes than parts for vehicles produced in SE Asia, likely attributed to the amount of captive parts on imported vehicles.

To measure the level of engagement a dealer has in the aftermarket business, dealer technician numbers will be used as a gauge. Dealer technician numbers by dealership are

tracked by the customer and product support department located in region marketing office. This data is tracked in excel, and can be merged with other data by matching the dealer account number associated with the technicians name.

Dealer location information will be needed to determine the impact of geography on service parts sales. Dealers in SE Asia are located in five countries, with the countries representing different geographical areas with different vehicle needs. The countries are a part of the dealer record and the data can be extracted from the dealer development website and imported into excel to be merged with the other data.

The final piece of data that will be needed is the value of warranty parts paid to the dealers by Future Motors. By comparing the analysis of parts sales and net part sales (parts sales minus warranty parts paid) it will show if the dealers with parts sales are selling the parts to customers or back to Future Motors through warranty. The importance of this information is that if dealers are only growing their parts sales by doing more warranty work, it will not grow profits for Future Motors.

CHAPTER II: LITERATURE REVIEW

2.1 SE Asia market

SE Asia is a large and growing region of the world. The Development Centre of the Organization for Economic Co-Operation and Development reported that real GDP growth rate in the SE Asia for 2010 was of 7.3%. (OECD 2010) The Gross Domestic Product of the region is \$1.8 trillion (Bain & Company 2011) and the population in 2010 was 593 million. (Jones 2013)

There are headwinds that would show increasing demand for vehicles in the SE Asia region, fueled by a large population which is seeing increased wages as the regions gross domestic production increases. As more and more people in the region shift from agricultural to industrial labor, they see increased earnings allowing for purchase of more luxury goods. More than 190 million people were projected to be in the middle class in 2012 and projected to double by 2020 (Nielsen 2014). As the economy in the region continues to grow, increases in income earnings would be expected to continue as well. Automobiles are one of those such luxury goods that households will purchase.

2.2 SE Asia Vehicle Market

The vehicle market in SE Asia has continued room to grow, in part from the shift from simple to more complex vehicles for transportation. This can be illustrated by the overall volume of motorcycles in the SE Asia. The region reached 3.2 million units of automobile sales in 2014 in comparison to 10.8 million motorcycle and scooters in the region. (Asean Automotive Federation n.d.)

Countries utilize different methods to protect local industry to employ their populations, including tariffs and local content requirements. The auto industry can be impacted by this just as other industries. In some cases lower tariff amounts can be achieved by having a certain percentage of the content in the vehicle be of “local” content. Manufacturers find different ways to reach such local content requirements. One method is to source raw materials or components from the country. Another is to have assembly plants in the country where labor content is added instead of physical part content. In some cases vehicles can be assembled then partially disassembled and shipped into country to then be reassembled and sold to reach content requirements. This is done in the case of low volume and high capital requirement vehicles, where having a complete factory in country would not be a viable business. In some cases the percent of local content requirement can be as high as 40%. Within SE Asia, there is the ASEAN Industrial Cooperation Scheme. Using this method and reaching the 40% content requirement the tariff level is reduced to 0-5%. (International Trade Administration n.d.)

2.3 Service/Spare Parts sales

An important part of the vehicle industry is the service parts business, both for companies producing vehicles and the purchasers of those vehicles. Service parts make up 17% of total vehicle sales. About 17% of revenues from spare parts is important as it comes with a 25% margin on those sales in contrast with only 2-3% margins on complete good sales (Gebauer, et al. 2011). Within the automobile industry, one auto company had 5% of its revenues from service parts, which accounted for 31% of their profits (PingQing, et al. 2008). The impact of profitability of a dealership by service parts is reinforced by findings in the US and UK, where 8% of profit comes from new sales vs. 57% from service and parts (Wile 2012).

Literature also leads to the belief that service departments have an impact on the amount of service parts a dealership sells. In general, each dollar in service sales should lead to a dollar in parts sales (Keller 2012). This also can be demonstrated based on the size of the service department. Size of a service department can be measured by the footprint of the shop and also the efficient use of that space. Industry expectation for shop space is \$100 per month in revenue per square foot of shop space (Zanan 2016).

Dealerships outside of SE Asia know that parts are important to the profitability of their operations and look for ways to increase those parts sales. A dealership can use the internet to promote parts to their customers. Internet sales is a business model that could be used for selling parts directly to customers, reducing the length of the supply chain. This could fulfill a customer need which is that service parts availability is very important to them. When a vehicle breaks down, if a service part is needed, until the part is available the vehicle will not be able to do productive work. Other parts of the world are demonstrating the impact of online sales for auto parts through sites like Amazon and Google. Online auto parts sales have grown from just over \$3 billion in 2011 to over \$6 billion in 2015 and is expected to continue (Hedges & Company 2016). This illustrates the fact that spare parts sales to customers are about getting the parts wanted when wanted.

Stocking of spare parts is an important part of the spare parts business. There is a delicate balance of having enough part in a parts warehouse to satisfy the customer's needs while not overstocking to the point that inventory cost make the business unprofitable. Additionally, the types of parts to stock and where to stock them are all questions of interest. The further the part is away from the customer, the longer it takes to supply the part when a vehicle breaks down. The time to get parts to customers is also impacted by

the infrastructure in the country to move parts. Along with in-country infrastructure constraints, if the market has a high population of imported vehicles, it could take longer to get parts to a customer if the part must be imported into the country before selling to the customer.

CHAPTER III: CONCEPTUAL MODELS

Future Motors dealers produce revenue and profit from three sources: vehicle sales, parts sales, and service labor sales. It can be challenging for dealerships to determine how to divide their resources in order to achieve their business objectives. Generally, dealers in SE Asia tend to believe that their best strategy is to focus on complete good sales, with little focus on the aftermarket parts and labor business. This view may be legitimate if these dealers believe that they are not competitive in the aftermarket because of its structure and conduct characteristics as described in the introductory chapter. This research, then, seeks to develop a better understanding of the factors that define the incorporation of part sales in the business of dealers so that: (1) Future Motors would understand how to cultivate new dealers to enhance the utilization of part sales as part of the value proposition; and (2) develop specific strategies to help current dealers who do not have part sales as part of their value offerings to incorporate it to enhance their performance.

This chapter focuses on explaining the models that are used to address the objectives and also the data that were used to operationalize the models. The chapter is divided into two main parts. The first part presents a description of the data so that the results may be placed in the right context. The second part focuses on the econometric models that are developed with an explanation of their economic and business rationales along with the assumptions driving the models to help the interpretation of the results to influence strategy development.

3.1 Data

The data used in this research are collected from company's dealer reports. The data are grouped into two areas to describe dealers: aftermarket service and complete goods offerings. Aftermarket services is made up of three variables: number of service

technicians, value of parts purchased from Future Motors, and value of parts purchased by Future Motors to cover warranty obligations provided by the dealers. Complete goods sales are tracked by the factory that manufactures particular products as well as imported products. There are four types of vehicles that are manufactured in SE Asia plus one category that covers imported vehicles. The domestically-manufactured equipment are:

- Plant A: This factory produces medium size cars.
- Plant B: This factory produces small cars.
- Plant C: This factory produces small trucks
- Plant D: This factory builds large commercial trucks which are similar to the vehicles imported into SE Asia from other factories.

The fifth category of products are those that are imported to SE Asia. These are the larger commercial vehicles. Most of the vehicles imported into SE Asia are categorized as commercial vehicles with higher capacities and larger engines. These products are shipped directly from factories outside of SE Asia to the import dealer located in the region. These dealers have a monopoly on selling these imported vehicles.

Future Motors' sales division is responsible for managing the relationship between the company and its dealers. All vehicles sales from Future Motors' manufacturing facilities flow through the sales branch. Only sales made in SE Asia are counted in the data used for this research. The assumption was made that any units not assignable to a SE Asia factory were units imported into SE Asia from a Future Motors factory outside of SE Asia and captured in the model by import dealer designation. A dummy variable indicating import dealers was, therefore, used to represent all the vehicle sales that did not originate from SE Asia but sold through select Future Motor dealers, labeled import dealers.

For older sales records where a dealer account number was not associated with the sales record and only a dealer name was assigned to the sales record, the dealer's names were matched to records that included both the dealer name and the dealer account number, allowing the older sales records to be matched with newer records to facilitate inclusion in the data set. Also, during the time period under consideration, a transition was being made from an old factory to a new factory C. Because the products in both the factories were the same, the sales volumes for those two factories were grouped together into one variable.

Raw parts sales data were pulled from Future Motors parts ordering system. These data have dealer account numbers associated with each purchase and the dealer purchase value for the parts. Raw parts data for each dealer were collected from the parts system for three years, from 2010 to 2012, inclusive. The data were organized into a panel to facilitate an analysis across dealerships as well as through time. It allowed an assessment of changes in a dealership's introduction of services over time to capture the effect of these changes on parts sales and other variables of interest. The primary advantage of organizing the data this way is to enable the analysis to get rid of any unobserved heterogeneity that may be present in the data. Thus, organizing the data this way allows for more information to be presented, information that generally presents more variability and less collinearity in the estimation process. It also allows for the time ordering of sales.

3.2 Econometric Models

To address the primary research question of this research, there was a need to develop some econometric models. It is hypothesized that parts sales at each dealership in each period is determined by the number of service personnel available in the dealership, the country of the dealership, the sales volume of the types of vehicles that are sold by the dealership and whether or not the dealer is an importer. The countries represent the

geographical area that a dealership is located in and takes into account the types of customer needs the dealership does business with. It is also argued that parts sales would increase with warranty sales since they create revenue for the dealership without any cost to the customer. The model is structured as follows:

$$S_{it} = f(P_{it}, D_{ij}, M_{it}, I_i) \quad \forall j = 1, 2, 3, 4, 5 \quad (3.1)$$

where S_{it} is value of parts sales in U.S. dollars for dealer I in time t , P_{it} is the number of service personnel at the dealership, M_{it} is the number of each of the type of vehicle that is sold by the dealership and W_{it} is warranty sales at the dealership in time t . The variable D_{ij} refers to the country in which the dealership operates, j 's labeled 1, 2, 3, 4 and 5 and I is whether or not the dealer is an importer. If the dealer is an importer, then $I_i = 1$, otherwise, 0.

Warranty parts sales create revenues for dealers but no cost to customers. A second model was ran to investigate the characteristics of dealerships that contribute to warranty parts sales. The model was the same as the earlier model for total parts sales except that the left hand side variable is replaced with warranty parts sales. It is specified as follows:

$$W_{it} = f(P_{it}, D_{ij}, M_{it}, I_i) \quad \forall j = 1, 2, 3, 4, 5 \quad (3.2)$$

These two models are used to identify potential opportunities for enhancing parts sales to improve dealers' revenues. The ultimate benefit of improving parts sales is that it increases the bond between customers and the dealership and leads, ultimately, to increasing the likelihood of future sales and the development of brand loyalty.

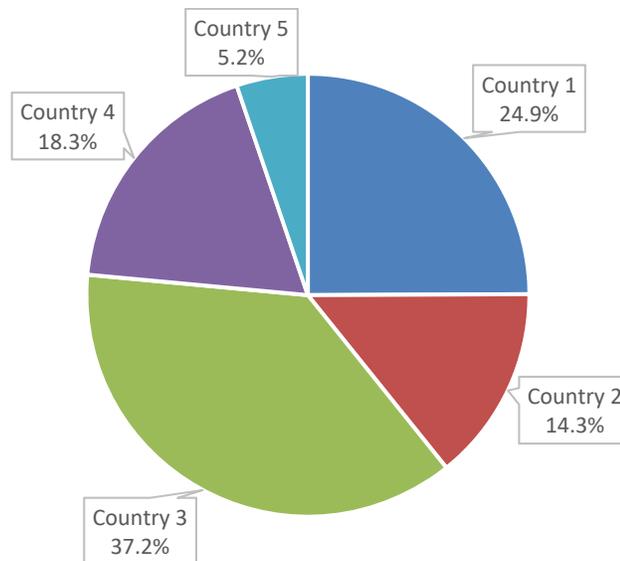
CHAPTER IV: RESULTS

In this chapter, the results of the analyses are presented. The chapter is laid out as follows. First, a summary of the data employed is presented. Then, the results of the econometric estimations are presented and discussed. The final section of the chapter presents the strategies that emerge from the analyses and how they may be implemented by the company to increase sales and build brand loyalty in a new market.

4.1 Summary Statistics

There were 349 dealerships and their distribution across the countries is presented in Figure 4.1. While nearly a quarter of the dealerships are located in country 1, approximately 37.2 percent of them are in country 3. Only about 5 percent of the dealerships are located in country 5. Country 4 accounts for about 18 percent of the dealerships while country 2 has only 14.3 percent of them.

Figure 4.1: Distribution of Future Motors Dealers by Country (N=349)



About 3.2 percent of the dealers are classified as importers. This is the group that is able to import completely assembled vehicles for sale. The analyses covered three years – 2010, 2011 and 2012 – and 349 dealerships across the countries. The distribution of dealerships by the types of vehicles they sell is presented in Figure 4.2. It shows that more than 51 percent of the dealerships sold vehicles manufactured at Plant A over the three years. This compares with 45.7 percent for Plant B, 40.1 percent for Plant C and 4.2 percent for plant D.

Figure 4.2: Distribution of Future Motors Dealers by Sale of Vehicles Manufactured at the Different Manufacturing Facilities (N=349)

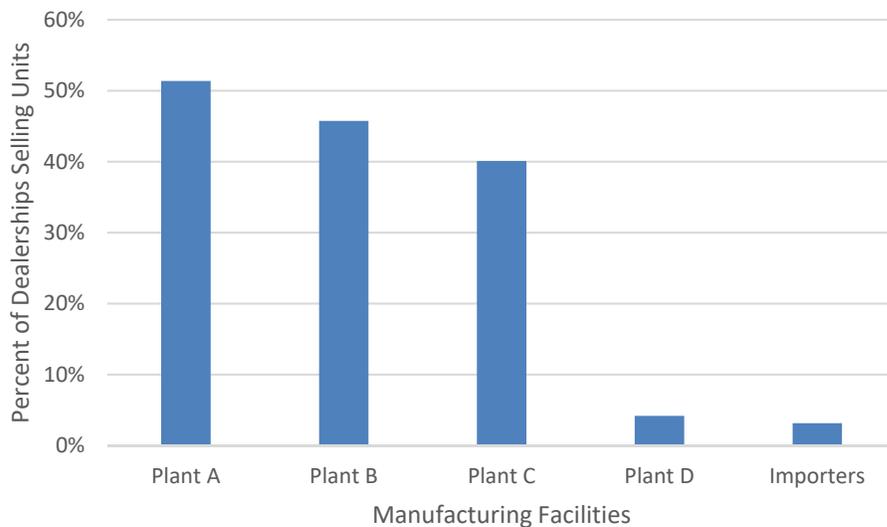


Table 4.1 presents the summary statistics for the variables used in this research. Panel data present two sources of variation: between and within observations, i.e., the dealerships. The range of service personnel was zero to 27 with an average of about four people. On the other hand, parts sales within dealerships ranged from -\$25,768 to about \$2.33 million with a standard deviation of about \$234,610 while the between dealerships range was \$26,121 to \$83,591. The overall average parts sales was approximately \$59,681.

A negative value of parts sales results when dealers return more parts to the company than what they sold in any year. This may result from parts that were ordered but were not used as well as parts that were ordered but were wrong.

Table 4.1 Summary Statistics on Total Parts Sales, Service Personnel and Units of Different Vehicles Sold

Variable	Mean	Std. Dev.	Min	Max	Observations
Parts Sales (US\$)	59,681	235,695	(1,858)	2,351,293	762
Warranty Parts Sales (US\$)	13,902	27,636	-	210,874	521
Net Parts Sales (US\$)	60,058	256,952	(103,683)	2,290,006	501
Number of Service Personnel	4	3	-	27	639
Plant A Units Sold	59	100	-	1,116	642
Plant B Units Sold	168	732	(11)	9,611	572
Plant C Units Sold	42	164	-	2,388	495
Plant D Units Sold	1	4	-	58	467

The negative value of units sold results when originally purchased vehicles are returned by the customer for one reason or another. This is recorded in the books as a negative sale to account for the increase in inventory resulting from the return. For example, the average number of units sold from plant D was one, with a range of zero to 58 over the three years. The range within dealerships is -3.1 units to about 55 units while the range between dealerships is 0 to about 4 units.

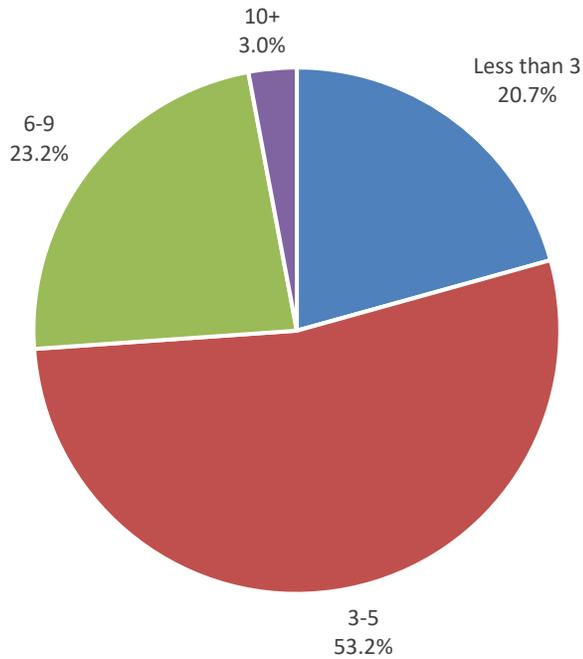
Parts sale correlated positively with the number of service personnel and with the number of units sold by plant D. The correlation coefficient between parts sales and the number of service personnel was 0.43 and it was significant at the 5 percent level. The correlation with the units sold by plant D was about 0.29, and it was also significant at the 5 percent level. There is possible multicollinearity in the model because the number of service personnel was correlated with the number of units sold from all the different plants.

This would make sense in that as the number of units sold increase, so does the likelihood of increasing the number of service personnel available in the service department of the dealership.

The number of service personnel at the dealership is an important variable in this research because it is seen as a critical explanatory variable for parts sales. However, not all dealership had information on their service personnel in the data files that were used to construct the data for the analyses. Of the 349 dealers, only 213 indicated having information on service personnel. Of these 10 indicated not having any personnel on staff while 203 indicated having between one and 27 service personnel. The remaining 136 dealers were treated as missing data for the purposes of this analysis.

Figure 4.3 shows the distribution of dealerships that provided information on their service personnel status. It shows that although the upper limit of the number of service personnel in the data was 27, dealerships with 10 or more service personnel account for less than 3 percent of all dealerships while those with no more than two service employees account for about 20.7 percent of all dealerships. Dealers with between three and five employees in the service department accounted for 53.2 percent of all dealerships while those with between six and nine accounted for about 23.2 percent. This suggests that for the majority of dealerships with service personnel, there are only a few people in that department.

Figure 4.3: Distribution of Dealers by Service Employees



4.2 Explaining Parts Sales

Parts sales in UD dollars was modeled as a function of service personnel, the number of the different types of vehicles sold, the country in which the dealership is located and a dummy variable indicating whether the dealer is an importer. The results, presented in Table 4.2, indicate that there is no significant difference between parts sales in country 1 and country 2 and country 1 and country 5. However, the differences in parts sales between country 1 on the one hand and country 3 and country 4 on the other are both statistically significant at the 5 percent level. In both of these cases, parts sales in country 1 exceeded those in country 3 and country 4 significantly by more than \$23,180. In both of these situations, the 95 percent confidence interval for parts sales is negative on both the lower and under limits.

Table 4.2: Results of the Panel Regression Explaining Parts Sales in U.S. Dollars for Dealerships

Variables		Coefficient	Std. Error	z	P>z	[95% Confidence Interval]	
Country							
	2	(10,016)	12,374	-0.81	0.418	(34,269)	14,237
	3	(23,180)**	,212	-2.52	0.012	(41,234)	(5,126)
	4	(23,618)**	1,254	-2.1	0.036	(45,676)	(1,561)
	5	(19,988)	6,077	-1.24	0.214	(51,499)	11,523
Service Personnel		7,027***	1,614	4.35	0.000	,864	10,191
Import Dealer		387,893***	9,062	13.35	0.000	330,931	444,854
Plant A Units Sold		50	49	1.02	0.307	(46)	147
Plant B Units Sold		(7)	5	-1.29	0.198	(18)	4
Plant C Units Sold		148***	40	3.67	0.000	69	227
Import Dealer #							
Plant D							
	0	5,094***	1,787	2.85	0.004	1,591	8,597
	1	34,122***	1,417	24.08	0.000	31,346	36,899
Intercept		6,316	8,816	0.72	0.474	(10,964)	23,595

*** = 0.01; ** = 0.05

Table 4.2 shows that an increase in the number of service personnel by a unit would result in parts sales increasing by about \$7,027, a coefficient that is significant at the 1 percent level. An increase of a unit sale of plant C vehicles is expected to increase parts sales by \$148, also statistically significant at the 1 percent level. The other vehicle types did not present coefficients that were statistically different from zero. Being an import dealer results in parts sales of nearly \$388,000 more than not being an import dealer, a coefficient that is statistically significant at the 1 percent level. Finally, being an import dealer and also selling the SKD vehicles produced in plant D increases parts sales by \$34,122 while selling only the SKD products produced in plant D without being an import

dealer only increases parts sales by \$5,094. Both of these are statistically significant at the 1 percent level.

The model had an overall R-squared value of 0.7639, meaning that 76.39 percent of the variability in parts sales could be explained by the variables included in the model. The R-square within observations was 0.7674 compared to 0.9909 for within observations. This is not surprising given that the activities of the dealerships do not change very much across the timeframe used in this research. The number of eligible observations used in the estimation was 505 in three groups, one each for each year included in the model. The minimum observations per group was 137 while the maximum was 197. Thus, the model did not use all the data that were available because of the missing data in some of the variables. The Wald Chi-square (with 11 variables) was 1,595.45, with a Probability > Chi-Square of 0.00. This would suggest that the overall model is statistically significant.

It was noted that warranty sales can also increase dealer revenues because they get to perform the work on the vehicles using parts that are paid for by Future Motoes. To this end, the second model sought to identify the dealer characteristics that influence warranty parts sales. The results, presented in Table 4.3, show that a unit increase in service personnel leads to an increase of \$2,543 in warranty parts sales, a coefficient that is significant at the 1 percent level. On the other hand, being an import dealer does not seem to affect warranty parts sales. This would imply that both domestic and import dealers use warranty sales in their business model.

Unlike the first model where only country 3 and country 4 differed from country 1 in parts sales, all four countries differed from country 1 in this model with warranty parts sales as the dependent variable. Country 3 and country 4 had coefficients of -\$14,818 and -

\$17,406 respectively and were both significant at the 1 percent level. The coefficients on country 2 and country 5 were -\$8,812 and -\$10,097 and they were statistically significant at the 5 percent level.

Table 4.3: Results of the Panel Regression Explaining Warranty Parts Sales in U.S. Dollars for Dealerships

Variables	Coefficient	Std. Error	z	P>z	[95% Confidence Interval]	
Country						
2	(8,812)**	3,656	-2.41	0.016	(15,977)	(1,646)
3	(14,848)***	2,790	-5.32	0.000	(20,316)	(9,381)
4	(17,406)***	3,590	-4.85	0.000	(24,442)	(10,370)
5	(10,097)**	4,715	-2.14	0.032	(19,339)	(855)
Service Personnel	2,543**	473	5.37	0.000	1,616	3,470
Import Dealer	(8,945)	7,140	-1.25	0.210	(22,940)	5,051
Plant A Units Sold	2	14	0.13	0.895	(25)	29
Plant B Units Sold	(3)	2	-1.93	0.053	(6)	0
Plant C Units Sold	70***	12	6.04	0.000	47	93
Import Dealer#						
Plant D						
0	95	508	0.19	0.852	(900)	1,090
1	2,530***	394	6.42	0.000	1,758	3,302
Intercept	11,085***	2,735	4.05	0.000	5,725	16,445

*** = 0.01; ** = 0.05

Units sold from Plant C were the only ones that presented a statistically significant coefficient among the types of vehicles sold. A unit increase in Plant C vehicles results in about \$70.27 increase in warranty parts sale, statistically significant at the 1 percent level.

Selling Plant D vehicles by non-import dealers did not yield a statistically significant coefficient. That is, Plant D vehicles sold by non-import dealers does not contribute to warranty parts sales. Contrarily, Plant D vehicles sold by import dealers had a positive effect on warranty parts sales. A unit increase in Plant D vehicle sales by an import dealer increases warranty parts sales by \$2,530.

It is important to note that unlike the first model, the intercept is statistically significant in the model with warranty parts sales as the dependent variable. This would suggest that there may be explanatory variables that have been omitted from the model. Indeed, this is so because the overall R-square is only 0.3753 compared to 0.7639 in the parts sales model. The Wald Chi-square is 264.89, which was significant at the 1 percent level. The foregoing results are not surprising, though, since warranty sales are but a portion of total parts sales.

Through the research project, it was determined that more would be learned by running a third model for net parts sales. The model was the same as the earlier model for total parts sales except that the left hand side variable is replaced net parts sales, calculated by subtracting warranty parts sales from total parts sales. It was noted that net parts sales, total parts sales minus warranty parts sales, not only increases the dealers revenue, it also increase the profitability of Future Motors. The third model sought to identify the dealer characteristics that influence net parts sales. The results, presented in Table 4.4, show that a unit increase in service personnel leads to an increase of \$4,162 in net parts sales, a coefficient that is significant at the 5 percent level. Also being an import dealer showed that going from non-import dealer to import dealer leads to an increase of \$396,355 in net parts sales, a coefficient that is significant at the 1 percent level.

In the net parts model, none of the countries were statistically significant, while in the warrant parts model, all the countries were significant. This leads to the belief that in the total parts model were country 3 and 4 were statistically significant, this impact was coming from the warranty sales that were included in the total parts sales.

Table 4.4: Results of the Panel Regression Explaining Net Parts Sales in U.S. Dollars for Dealerships

Variables		Coefficient	Std. Error	z	P>z	[95% Confidence Interval]	
Country							
	2	(515)	13,847	-0.04	0.970	(27,654)	26,624
	3	(12,312)	10,623	-1.16	0.246	(33,132)	8,509
	4	(6,121)	13,661	-0.45	0.654	(32,896)	20,655
	5	(13,855)	17,687	-0.78	0.433	(48,521)	20,810
Service Personnel		4,126**	1,798	2.30	0.021	612	7,661
Import Dealer		396,355***	31,090	12.75	0.000	335,419	457,292
Plant A Units Sold		56	54	1.05	0.295	(49)	162
Plant B Units Sold		(4)	6	-0.71	0.475	(16)	7
Plant C Units Sold		76	44	1.74	0.083	(10)	161
Import Dealer#							
Plant D							
	0	4,782**	1,904	2.51	0.012	1,051	8,514
	1	31,621***	1,503	21.04	0.000	28,675	34,567
Intercept		(411)	10,317	-0.04	0.968	(20,632)	19,810

*** = 0.01; ** = 0.05

Units sold from Plant D were the only models that presented a statistically significant coefficient among the types of vehicles sold. A unit increase in Plant D by a non-import dealer results in about \$4,782 increase in net parts sale, statistically significant at the 5 percent level, while a unit increase in Plant D vehicles by an import dealer results in about a \$31,621 increase in net parts sales. From the market, there are some indicators on why imports and Plant D vehicles have a significant relationship to parts sales. The imported vehicles do not have many common parts with other vehicles produced in country, leaving only the Future Motors dealers as a source for repair parts. Much is the opposite for domestic products, were the competitors could be using the same parts and suppliers as Future Motoes does, allows for multiple brands of dealerships to sell the same

part. Also with the smaller volume of sales of imported products, there is less incentive for counterfeiters to make false parts as there are fewer units to sell those parts to.

Much like the total parts sales, the intercept is not statistically significant in the net parts sales model. This leads us to believe that the independent variables in the model do a relatively good job of explaining the variability in the dependent variable. The R-squared value of the net parts sales model was 0.7427, and the Wald Chi-square is 1191.84, which was significant at the 1 percent level. One finding is that all the independent variables in the net parts sales model which are significant at the 5 percent level or greater are also significant in the total parts sales model.

4.3 Strategies to Grow Parts Sales

The third objective of the research aims to use the results to develop some strategic thrusts to increase parts sales at SE Asia dealers. Increasing revenues dealers receive is critical for dealer success and enhanced performance of the company in SE Asia. To this end, the following observations are made for consideration by Future Motors in helping its dealers enhance revenue through parts sales.

The models show that increasing service personnel leads to increased parts sales – in total or in warranty parts sales. Therefore, the company should double its efforts to encourage its dealers to expand their aftermarket service offerings. This could involve providing stories of revenue enhancement resulting from increasing the services provided by the service department. That means working on showing the overall impact of increasing the aftermarket service activities on total dealership profits and not just parts sales. It is believed that when dealers understand the relationship between their profits and the service department, they would seriously consider this brand loyalty enhancing

initiative. This would lead to increased parts sales by default without focusing directly on parts sales. For as long as these dealers see parts sales as marginal value – and the foregoing estimates show that they do not make huge impacts on even total parts sales – they may not be inclined to pursue them. However, focusing attention on total profits may show a larger impact than just on parts sales as showed in this research.

Next, the results show that the best place to grow parts sales is Country 1. This country sold more parts than any other country looking at both total parts sales and warranty parts sales. While its sales were not statistically different from those of Country 2 and Country 5 for total parts sales, they were statistically different from all countries for warranty parts sales. Therefore, initial efforts may be invested in Country 1 to encourage dealers there to enhance their aftermarket offerings. Their success in improving parts sales and warranty parts sales (and their revenues and profits) could be used to encourage dealers in the other countries. As indicated above, of the 177 dealerships with service personnel, 150 of them have three or more people in that department. And of the 18 dealerships with 10 or more people in the service department, 50 percent of them are in Country 1. A focused analysis of Country 1, encompassing the profits, revenues and other activities in the country could provide important insights for the company in developing solutions to enhance parts sales in the other countries. Strategically, if dealers can build up aftermarket service departments that provide a better service than competing service providers in their areas, they will create a positive feedback effect that extends beyond parts sales.

The product model mix can affect the parts sales business based on the findings of the model. Imported vehicle dealers have a big impact on parts sales. However, they also tend to sell more demanding use vehicles and may thus attract higher service opportunities.

The results show that holding all others constant, a dealer selling Plant D vehicles as well as importing generates higher parts sales as well as higher warranty parts in contrast to Plant D dealers who are not importers. This one is a tricky one because the SE Asia governments offers large subsidies to companies that produce “Made in SE Asia” goods. This would suggest that Future Motors should identify ways of growing both the domestic content of its products in SE Asia even as it creates opportunities for its dealers to import SKD vehicles from elsewhere that could qualify for the subsidy. It may seem that imports draw more care from owners which encourage dealerships in the import business to focus on providing such services, and hence generate higher total parts and warranty parts sales. Thus, increasing the number of dealers in the import category may be a good strategic move. Additionally, doing this in ways that allow such dealers to remain competitive against the government subsidy that is provided would be the most ideal approach. Finally, it is critical that Future Motors finds a path to import dealership status for its non-import dealers. Given that only 3 percent of the current dealers are in this category, a carefully designed and transparent strategy to grow non-import dealers could create opportunity for significant growth across the dealership network as current non-importers work hard to meet the qualification for becoming import dealer and in so doing, contribute positively to total parts and warranty parts sales. This would require a careful analysis of their ability to succeed as import dealers regardless of their size. This analysis has not been performed in this research and would significantly augment the results from this research if performed.

CHAPTER V: SUMMARY & CONCLUSIONS

Future Motors has been doing business in SE Asia for about 30 years. Over that time, the amount of vehicles sold in SE Asia has increased. Currently SE Asia has less than 10 percent parts to complete goods sales ratio, while other parts of the world are at closer to sixteen percent. The vehicle business can be cyclical based on economic times, while the parts business is more stable across time. It is important to the dealers and Future Motors to have a good parts business to carry the business through lower complete goods sales times. The purpose of this research was to determine what factors impact parts sales in SE Asia and provide strategic options to improve parts sales.

The approach was to use current available data and published research to develop a model that could explain the factors that influence parts sales. Using econometrics, panel data, and regression, a mathematical model was estimated to identify those factors that influence parts sales. Knowing that dealers could sell parts to two sources, a second model was developed to evaluate if the same factors that influence parts sales also impact warranty parts sales. Using the information from the two models, a group of strategic suggestions were developed to be used by the company in developing plans to increase parts sales.

From the research results, it was found that the variables included explained more than three-quarters of the variability in total parts sales and only 37.53% of the variability in warranty parts sales. Geographically, Country 1 had the most influence on service parts sales, while Country 3 and Country 4 being lowest in comparison to Country 1. However, with respect to warranty parts sales, Country 1 was determined to be statistically higher than all the other countries. The impact of a dealer having service personnel was also a

positive influence on parts sale while being statistically significant. Lastly selling import vehicles or import type vehicles from plant D, whether through an import dealer or not, was found to be positive on parts sales.

Based on the foregoing results, three suggestions for increasing parts sales were presented:

1. Grow the business in Country 1 and let its outcome provide the foundation to enhance aftermarket service across the SE Asia
2. Encourage all dealers to introduce aftermarket service. However, instead of focusing it on parts sales, focus it on total profits from operations. The results from this study only provide an indication of the effect of increasing aftermarket service could have on the whole business performance judging from its effect on parts sales. Because effective service builds loyalty and loyalty contributes directly to profits, Future Motors helping its dealers in SE Asia understand this would be extremely beneficial to both the company and its dealers.
3. Develop a path to import dealership for the 97 percent of dealers who are currently not import dealers. The results show that import dealers generate higher parts sales and also sell more demanding use vehicles. Helping dealers navigate this path to import dealership without risking the loss of government subsidy could be the best approach to growing parts sales across the region.

5.1 Conclusions

The objective of the research was to determine what variables influence parts sales in SE Asia. From the findings, it is found there are some key areas of focus that if improved would increase service parts sales. The impact of this research is that with refocusing constrained resources, the same resources could have a larger impact on

increasing service parts sales. The findings will help the company grow sales in a disciplined way by effectively utilizing resources.

A major limitation of this research was that it depended completely on secondary data and they were not as good as they could have been. As a result, the findings from the research are not as strong as they could have been. Therefore, it is suggested that a broader research effort that encompasses the revenue and costs situations of the dealers, including their revenues and costs from their aftermarket departments, be conducted to ascertain some of the extensions that have been made with the results in the study. This could be achieved by altering the reporting systems at Future Motors to allow dealers to report their activities at a more granular level. However, to gain in implementing these results quickly and more efficiently, it is argued that the company undertakes a survey of its dealers and collect the foregoing information so that these results can be confirmed and the strategies tightened to deliver the desired results of improving dealer profits through enhanced aftermarket support service.

While the current study showed that the number of service technicians is significant in explaining parts sales, there was no information on their competence as technicians. To this end, it is strongly recommended that a survey of the competence of dealer technicians be conducted to help identify the knowledge gaps in these service providers. This would help Future Motors to work with its dealers in developing skills enhancement and professional development programs to help the technicians perform at exceptional levels. The principal advantage of this is that it would reduce warranty costs if service work is performed correctly and effectively. It could also lead to brand loyalty among customers who get the right service rapidly from their dealers. All these would contribute directly to

increasing parts sales and stabilize the profitability of dealership as well as Future Motors' operations in SE Asia.

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