

**AN ASSESSMENT OF INTERNAL STRUCTURAL ADJUSTMENT
FACTORS AFFECTING ORGANIZATIONAL PERFORMANCE: A
CASE STUDY OF ENERGY ENTERPRISES IN THAILAND AFTER
THE ECONOMIC CRISIS IN 1997**

By

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**A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in Development Administration**

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Abstract

The study focuses on major issues related to the organizational performance of energy enterprises after the 1997 economic crisis. The aim is to: 1) evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises.

The four hypotheses proposed in this study are:

1: After the 1997 economic crisis in Thailand, the organizational performance of energy enterprises would be positively influenced by organizational structure, management style, technology, the business system and the functional strategy-value chain in related to financial performance.

2: After the 1997 economic crisis, the organizational performance of energy enterprises related to customers would be positively influenced by organizational structure, management style, technology, the business system and the functional strategy-value chain.

3: After the 1997 economic crisis, the organizational performance of energy enterprises in terms of the internal business process would be positively influenced by

organizational structure, management style, technology, the business system and the functional strategy-value chain.

4: After the 1997 economic crisis, organizational performance in terms of learning and growth would be positively influenced by organizational structure, management style, technology, the business system and the functional strategy- value chain.

The study makes use of both primary and secondary data. Primary data were obtained from a questionnaire used during interviews with top executives of energy enterprises covering petroleum, electricity, gas, other businesses related to energy manufacturers, distributors, their subsidiaries, and joint ventures. Secondary data were obtained from other sources, such as the Stock Exchange of Thailand, financial statements, the Ministry of Commerce, etc. Multi-stage sampling was used to obtain data from 416 executives (response rate of 69.3 per cent) representing 52 organizations in the Thai energy enterprises. The SPSS and AMOS programs were used to test the research hypotheses and create the linear structural relationship equation model (LISREL) to explain the cause-effect relationships among the factors affecting organizational performance in energy enterprises in Thailand.

The main findings of this study were as follows:

1. Testing for hypothesis one revealed that after the 1997 economic crisis, the management style had direct positive effects on the percentage change in earnings per share and on the percentage change of net income/sales; while technology had direct positive effects on the current asset ratio and net income per total assets. The functional strategy, which consisted of supporting activities of the value chain in terms of firm infrastructure and procurement, had positive direct effects on net income/sales and net income/asset. However, the complexity of organizational structure had direct negative effects on earnings per share of the firms. The functional strategy-primary activities of the value chain in terms of logistics, as well as supporting activities in terms of firm infrastructure had direct negative effects on enterprises' current asset ratio after the economic crisis. As a result, part of the hypothesis can be accepted.

2. Testing for hypothesis two revealed that technology and research and development were positive factors directly affecting market share. Organizational

structure was also a negative factor directly affecting percentage change in sales after the 1997 economic crisis. This result indicated acceptance for part of hypothesis two.

3. Testing for hypothesis three found that technology had a positive direct and indirect influence on the variance of the dependent variable in terms of percentage change in total assets. This result indicated that hypothesis three could be partially accepted.

4. Testing for hypothesis four found that reengineering the business process had direct and indirect positive effects on the variance in employee turnover. However, reengineering the business process had direct and indirect negative effects on the variance in rates of absenteeism as the dependent variable. This result indicated that hypothesis three could be partially accepted.

According to the four hypotheses testing, this study makes three recommendations. Firstly, there should be the single organization from the public sector to be responsible for technology development concerned with the energy-related industry. This organization has authority in allocating the research and development budget, the development of human resource, elimination of the structural impediments to improve the energy industry competitiveness.

Secondly, the top management should maintain and develop the competitive advantage on technology, management style, and business process reengineering to enhance the organizational performance of energy sector.

Thirdly, top management should also develop the functional strategy—value chain on supporting activities (human resource, firm-infrastructure, research and development to gain the competitive advantage of energy sector.

Finally, directions for future research are also suggested to gain a broader understanding of factors affecting organizational performance in energy sector.

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TABLE OF CONTENTS

	Page
<u>ABSTRACT</u>	I
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	xii
 <u>CHAPTER I : INTRODUCTION</u>	 1
1.1 Significance of the Problem	1
1.2 Objectives of the Study	13
1.3 Scope of the Study	14
1.4 Expected Results of the Study	14
1.5 Definition of Terms	15
1.6 Conclusion	19
 <u>CHAPTER II : LITERATURE REVIEW</u>	 22
2.1 Organizational Performance	22
2.2 Organizational Performance-Balance Scorecard	28
2.3 Framework for Organization Analysis	31
2.4 <u>Business Systems</u>	54
2.5 Functional Strategy-Value Chain	71
2.6 Relevant Research Studies	82
2.7 Conceptual Framework of the Study	89
2.8 Causal Relationship Among Variables	95
2.9 Conclusion	98

TABLE OF CONTENT (CONTINUED)

	Page
<u>CHAPTER III : THAI ECONOMY BEFORE AND AFTER CRISIS</u>	100
AND THE ENERGY SECTOR	
3.1 Thai Economy Before and After the Economic Crisis	100
3.2 Energy Policy	106
3.3 Current Policy on Privatization of Energy Enterprises	107
3.4 Privatization of the Electricity Industry	108
3.5 Petroleum and Natural Gas	114
3.6 Conclusion	119
<u>CHAPTER IV : RESEARCH METHODOLOGY</u>	121
4.1 Research Design	121
4.2 Operational Definitions and Measurement of the Variables	122
4.3 Sampling Procedures	129
4.4 Data Collection Methods	139
4.5 Data Analysis	145
4.6 Conclusion	153
<u>CHAPTER V : FINDINGS AND RESULTS</u>	155
5.1 The evaluation of the internal factors affecting the Organizational Performance of the energy sector after the economic crisis of Thailand in 1997	156
5.2 <u>The study of the cause-effects relationship of the</u> internal factors and appropriate linear structural relationship equation model (LISREL model)	178
5.3 The results of the qualitative analysis of six energy enterprises	210
5.4 Conclusion	225

TABLE OF CONTENT (CONTINUED)

	Page
<u>CHAPTER VI : CONCLUSION AND RECOMMENDATION</u>	227
6.1 Conclusion	227
6.2 Recommendation	235
 <u>BIBLIOGRAPHY</u>	 242
<i>of</i> <u>APENDIX A</u> The Research Questionnaires	258
<u>APENDIX B</u> The Reliability Analysis	298
<u>APENDIX C</u> The Sample of Secondary Data (Financial Ratio, Employee Turnover, Absenteeism – Empirical Data)	328
<u>APPENDIX D</u> The Sample of LISREL Analysis by AMOS Program and Full Presentation Model	335
 <u>BIOGRAPHY</u>	

LIST OF TABLES

Table	Page
1.1 Thailand's Key Economic Indicators	5
1.2 Consumption of Petroleum Product (Unit = Millions Liters)	7
1.3 Power Plant Capacity in Thailand	9
1.4 Load Forecast for Thailand	10
3.1 Electricity Consumption in Per Area Unit: GWH	111
3.2 National Electricity Consumption. Unit: GWH	111
3.3 Thailand's IPP Award	113
3.4 Annual Production of Petroleum Products (Unit = Millions Liters)	115
3.5 Percentage Market Share of Petroleum Producers and Imports	117
4.1 Target population and return response to the questionnaire	131
4.2 Frequency and Percentage of Respondents Classified by Enterprise	136
4.3 Demographic Data on Respondents by Frequency and Percentage	138
4.4 Secondary Data Collected: Aspects, Sources, and Types of Data	140
4.5 Measurement level for internal factors	142
4.6 Reliability analysis	144
5.1 Mean Score of Significance of Organizational Structure	156
5.2 Mean Score of Significance Business System	159
5.3 Mean Score of Significance of Management Style	164
5.4 Mean Score of Significance of Technology	165
5.5 Mean Score of Significance of Firm Infrastructure	167
5.6 Mean Score of Significance of Human Resource Management	169
5.7 Mean Score of Significance of Logistics	172
5.8 Mean Score of Significance of Marketing and Sales	174
5.9 Mean Score of Significance of Operation	175

LIST OF TABLES (CONTINUED)

Table	Page
5.10 Mean Score of Significance of Procurement	176
5.11 Mean Score of Significance of Research and Development	177
5.12 Independent and the Dependent Variables of Hypotheses One	178
5.13 The Standardized Coefficient, T-statistic and R-square	180
5.14 Independent and the Dependent Variables of Hypothesis Two	185
5.15 The Standardized Coefficient, T-statistic and R-square	187
5.16 Independent and The Dependent Variables of Hypothesis Three	189
5.17 The Standardized Coefficient, T-statistic	191
5.18 Standardized Direct Effect, Indirect Effects and Total Effects Estimation	193
5.19 Independent and the Dependent Variables of Hypothesis Four	194
5.20 The Standardized Coefficient and T-statistic	196
5.21 Standardized Direct Effect, Indirect Effects and Total Effects Estimation	198
5.22 The Standardized Coefficient and T-statistic	200
5.23 Standardized Direct Effect, Indirect Effects and Total Effects Estimation	202
5.24 Increased Production Capacity of Utilities Production Units	214
5.25 Procurement	218
5.26 Financial Statement of National Petrochemical Public Company Limited	223
5.27 Financial Position Cogeneration Public Company Limited	223
5.28 Financial Ratio of Banpu Public Company Limited	224
5.29 Financial Ratio of PTT Exploration and Production Public Limited	224
5.30 Financial Ratio of Electricity Generating Public Company Limited	225

LIST OF TABLES (CONTINUED)

Table	Page
5.31 Financial Ratio of Petroleum Authority of Thailand (PTT)	225
6.1 The Summary of Hypothesis One	228
6.2 The Summary of Hypothesis Two	229
6.3 The Summary of Hypothesis Three	230
6.4 The Summary of Hypothesis Four	231

LIST OF FIGURES

Figure	Page
2.1 The Balance Scorecard of Four Balance Perspectives	30
2.2 Analysis of the Universality and Transferability of Management	33
2.3 General Model of the Organization as an Open System	34
2.4 The Integrated Organization System	35
2.5 Organizations as Composite of Strategic, Coordinative, and Operating Subsystems/Level	38
2.6 Scheme Showing Fit Among Manager Organization Design Variables	40
2.7 McKinsey's 7-S Framework	42
2.8 Framework for Planning Management Organization	43
2.9 Framework of Organizational Analysis	45
2.10 Theoretical Model of the Dynamics of Planned Organization Change	46
2.11 Levers Available for Affecting Change	47
2.12 Organization Analysis Model	49
2.13 The Recursive Relationship between IT Capabilities and BPR	70
2.14 The Value Chain	72
2.15 General System Model of the Training and Development Process	77
2.16 Possible Factors for Assessing Sources of Differentiation in Support Activities	80
2.17 Possible Factors for Assessing Sources of Differentiation in Primary Activities	81
2.18 Relationship Between Organizational Structures and Organizational Effectiveness	87
2.19 The Relationship of Decentralization Variables to Organizational Effectiveness	88

LIST OF FIGURES

Figure	Page
2.20 The Conceptual Framework of the Research	91
2.21 Overall Modified Conceptual Framework	92
2.22 Modified Conceptual Framework of Study	93
3.1 Stakeholders of EGCO	110
3.2 Current GSI structure	119
4.1 Linear Structural Relationship Equation Modeling (LISREL 1)	146
4.2 Linear Structural Relationship Equation Modeling (LISREL 2)	148
4.3 Linear Structural Relationship Equation Modeling (LISREL 3)	150
4.4 Linear Structural Relationship Equation Modeling (LISREL 4)	152
5.1 The Analysis of Linear Structural Relationship in Model 1	184
5.2 The Analysis of Linear Structural Relationship in Model 2	188
5.3 Linear Structural Relationship (LISREL) Model 3 (Standardized Regression Weight Estimation)	190
5.4 Linear Structural Relationship (LISREL) Model 4 (Standardized Regression Weight Estimation)	195
5.5 Linear Structural Relationship (LISREL) Model 5 (Standardized Regression Weight Estimation)	199
6.1 The Alternative Synthesis of Organizational Analysis Model for Further Research	238

CHAPTER I

INTRODUCTION

1.1 Significance of the Problem

In every country worldwide nowadays, energy plays an important role in achieving economic goals and development. This role occurs within a wide range of energy and economic strategies. Some countries import energy, while others accelerate economic growth by exporting energy. The trade in energy resources for all regions is beneficial for all countries involved (Anand Panyarachun, 1998: 3). Increased energy usage in most developing countries is closely related to economic growth for industry, motorized transport, and urban areas. Energy usage also reflects climatic, geographic, and economic factors (such as the relative price of energy). Energy enterprises in most countries consist of privatized-state-owned enterprises, state owned enterprises, their subsidiaries, joint ventures, private firms engaged in electricity generating, petroleum, electric power, and natural gas (Panetong, 1999: 20-45).

It can be asserted that energy enterprises are major players for the country's economy and its development. Where free market policy is advocated, private initiatives and competition in the new market economy is encouraged, and many governments are interested in privatizing their state-owned enterprises (SOEs). This is expected to enhance organizational performance of the state-owned enterprises to be more efficient and effective, as well as improve the national economy overall (Cragg and Dyck, 1999: 475-497).

However, organizational performance depends on all transactions in business environments (Child, 1975: 175-189), such as organizational structure, management style, the business system, and business process reengineering. In Thailand, to appraise the organizational performance of energy enterprises after the economic crisis of 1997, the performance, profitability and productivity in organizations have to be known. The

economic crisis has had the impacts, giving rise to various problems after the economic crisis in Thailand, as listed below.

1.1.1 Impact of the Asian Economic Crisis in 1997

1.1.2 Impact of the Thai Economic Crisis in 1997 on Energy Enterprises: Petroleum and Natural Gas

1.1.3 Impact of the 1997 Asian Economic Crisis on Energy Enterprises in Electricity Production

1.1.4 Problems of Improving Organizational Performance of State-Owned Enterprises

1.1.5 Causes of Organizational Decline and Related Problems

1.1.6 Various Alternative Adjustments to the Internal Factors of Organizations Coping With the 1997 Economic Crisis in Thailand

1.1.1 Impact of the Asian Economic Crisis in 1997

During 1996, it was clear that the Thai economy was losing its momentum due to the Asian economic crisis. As a result, the economy slowed down to the lowest rate of GDP growth in a decade. Thailand suddenly experienced a decline in foreign investment and reduced exports of labor-intensive goods such as footwear, textiles, garments, and plastic products. As imports continued growing, the current account deficit increased. Finally, the Baht was depreciated from 25 Baht per U.S. dollar in July 1997. The government also began restructuring the financial sector to meet growing public debts. In early 1997, the government suspended the operations of 56 financial institutions (United State Embassy, Bangkok, Thailand, 1998).

1.1.1.1 Economic Review of 1997

Thailand experienced a turbulent year in 1997 as recorded growth slumped to only 0.6 per cent in contrast to a rise of 6.4 per cent in 1996. This was attributed to inherent political, social and economic problems, which had been accumulating uncorrected for several years. Non-performing loans had increased to a

level that the central bank, commercial banks and other concerned authorities had never encountered before. They had no idea how to systematically address this new, complex problem. Policymakers were unaware or ignored the serious nature of the problems. Excessive external debt, mainly short-term loans in the private sector, and the reduced competitiveness in many production-sectors were signals that motivated speculators to attack the Baht based on the expectation that it would be devalued.

While the Central Bank (Bank of Thailand) persisted in pegging the Baht to a basket of currency, it was forced to defend the currency at the same time through aggressive use of official foreign reserves, as well as help maintain liquidity in the domestic financial market. The first 16 finance companies were suspended after the Financial Institution Development Fund (FIDF) injected a massive amount of money in an attempt to maintain the liquidity of these finance companies. The confidence of depositors and creditors in finance institutions slipped away, the financial market and the economy continued to worsen. All of these conditions put a burden on official foreign reserves and reduced confidence in the Baht, which led to continuous outflows of capital.

On July 2, the Central Bank finally had to replace the fixed exchange rate regime with a managed float, as it could no longer secure the reserves. The Baht immediately depreciated from 25.8 Bt/USD on June 30 to 27.5 Bt/USD on July 2 in the on-shore market and from 24.6 to 29.4 Bt/USD in the offshore market.

After the flotation of the Baht, the government announced it would formally enter a program of the International Monetary Fund (IMF), receiving a standby credit line to supplement reserves and alleviate pressures on the balance of payments. In 1997, the Baht recorded a new low at 49 Bt/USD on December 16 and 49.95 Bt/USD on December 18 for on-shore and offshore markets.

There was a continued outflow of funds and the Central Bank suspended another 48 finance companies, making a total of 58 finance companies. These actions put a severe strain on liquidity and shot the interest rate to a new high level, affecting all business sectors. Many firms had to suspend their operations. The Thai economy had fully entered into a deep recession.

In 1997, inflation increased to 5.6 per cent, lower than the 6 per cent expected by IMF. Many research houses expected it would increase to more than 10 per cent in 1998. The key factor was depreciation of the Baht, which would push up price levels. Export products with high import contents would also have to increase their prices because existing stocks were becoming depleted. In term of the international trade, exports had benefited from the weak Baht, while imports had, in contrast, slowed down significantly due to high costs. The trade deficit was reduced more than 50 per cent, compared to 1996. The current account deficit in the fourth quarter had improved, but it was not considered to be at a satisfactory level due to continued outflows. Implementation of the IMF package had failed to correct the economic problem as expected. (ECCO Annual Report, 1998)

1.1.1.2 Thailand Economic Outlook for 1998

The economy was expected to grow by only 1 percent or less in 1998 due to the economic crisis and the contagion effects of 1997. Inflation was still the cause for concern. It was expected to grow by more than 10 percent, while the interest rate would remain at a high level due to the higher cost of fund and a tight monetary policy. Export growth was seen as one positive factor to drive the economy. If the government was able to clean up the economic problem as well as successfully restructure the financial market, then foreign investors would regain confidence and return to provide liquidity for the recovery of the Thai economy. (Bangkok Bank, 1999:2)

As shown in Table 1.1, Thailand's Key GDP Indicators from 1995 to 2000 reflected the general environment in which energy enterprises had to operate.

Table 1.1 Thailand's Key Economic Indicators

Thailand's Key Economic Indicators	1995	1996	1997	1998	1999	2000
1. Population (million) (Average)	59.28	59.90	60.50	61.20	61.80	62.30
2. GDP						
2.1 GDP at constant 1988 price (%)	8.9	5.9	-1.7	-10.2	4.2	4.5-5.0
Agriculture						
Non-agriculture	2.9	3.6	0.4	-1.4	4.0	1.0-2.0
2.2 GDP at current price	9.7	6.2	-1.9	-11.2	4.2	5.0-5.5
(billion baht)	4,185.	4,608.5	4,727.3	4,635.9	4,702.9	N/A
(%) Change	(15.2)	(10.1)	(2.6)	(-1.9)	(-4.2)	
2.3 GNP per capita (baht)	69,316	75,103	75,991	73,056	73,771	N/A
3. Inflation						
3.1 Headline Inflation (% change)	5.8	5.9	5.6	8.1	0.3	1.6
3.2 Core Inflation 2/ (% change)	5.3	5.2	4.7	7.2	1.8	0.7
4. External Account (billion of US \$)						
4.1 Export	55.7	54.7	56.7	52.9	56.8	50.0
(%Change)	(24.6)	(-8.1)	(3.7)	(-6.8)	(7.4)	(21.6)
4.2 Import	70.4	70.8	61.3	40.6	47.5	45.6
(% Change)	(31.8)	(0.6)	(-13.4)	(-33.4)	(16.9)	(34.4)
4.3 Trade balance	-14.7	-16.1	-4.6	12.2	9.3	4.4
4.4 Current account balance	-13.2	-14.4	-3.1	14.3	12.5	7.0
(% of GDP)	(-7.9)	(-8.1)	(-0.9)	(12.8)	(10.0)	
4.5 Net Capital Movement						
Private 3/	21.9	19.5	-4.3	-9.8	-8.0	-8.2
Public	20.8	18.2	-7.6	-15.5	-13.9	-8.2
BOT	1.1	1.3	1.6	1.8	1.9	0.0
4.6 Balance of payment	-	-	1.8	3.9	4.0	0.0
4.7 International reserves (billion of US\$)	7.2	2.2	-10.6	1.7	4.6	-2.2
4.8 Swap Obligation (billion of US\$)	37.0	38.7	27.0	29.5	34.8	32.2
4.9 Total debt outstanding (billions of US\$)						
of which: Public debt 4/)	100.8	108.7	109.3	105.1	95.6	2.1
4.10 Total debt service ratio (%)						
of which: Public (included BOT since 1997)	(16.4)	(16.8)	(24.1)	(31.1)	(36.0)	(35.4)
	11.4	12.3	15.7	21.4	19.4	15.3
	(2.8)	(2.5)	(2.7)	(3.3)	(4.0)	(4.3)
5. Government Finance (fiscal Year)						
(billions of Baht)						
5.1 Cash balance	112.5	104.3	-31.1	-115.0	-134.3	-110.3
(as % of GDP)	(2.7)	(2.3)	(-0.7)	(-2.5)	(-2.9)	N/A
5.2 Total public debt outstanding 5/		735.1	936.2	1,241.8	1,96.7	(2448.9)
domestic debt		(310.3)	(316.6)	(524.4)	(1012.1)	(1185.1)

Table 1.1 Thailand's Key Economic Indicators (continued)

Thailand's Key Economic Indicators	1995	1996	1997	1998	1999	2000
6. Monetary Statistics						
6.1 M2 (billions of Baht)	3,310.6	3,726.6	4,339.3	4,753.4	4,854.7	4,910.9
(% change)	(17.0)	(12.6)	(16.4)	(9.5)	(2.1)	(2.6)
6.2 M2a (billions of Baht)	4,193.4	4,725.2	4,821.8	5,118.1	5,182.5	5,206.8
(% change)	(18.1)	(12.7)	(2.0)	(6.1)	(1.3)	(2.6)
6.3 Domestic credit (% change)	22.9	13.9	34.5	-1.2	-4.2	-9.1
Private 6/ (% change)	24.1	14.4	30.5	-7.9	-5.7	-10.5
6.4 Deposit 7/ (% change)	18.2	13.7	16.0	8.8	-0.5	1.5
6.5 Interest rate (year end) 8/ Prime rate	13.75	13.00- 13.25	15.25	11.50- 12.00	8.25-8.5	7.50- 8.25
Fixed Deposit (1 year)	10.25- 11.00	8.50- 9.25	10.00 13.00	6.00	4.00- 4.25	3.50
7. Exchange rate Baht: US \$ (EEF) average 9/	24.92	25.34	31.37	41.37	37.84	39.10

Source: [on-line] Available: www.boj.go.th/english/tid/data/BOTAMacro_e.htm

1.1.2 Impact of Economic Crisis in 1997 of Thailand on the Energy

Enterprises: Petroleum and Natural Gas

The economies of developing countries such as Thailand had been growing rapidly to become internationally competitive by taking advantage of abundant natural resources, inexpensive labor force and strong local market. Thailand's real gross domestic product (GDP) grew 4.6 per cent in 2000, and was project to grow at 4.3 per cent in 2001. The projected long-term annual growth rate beyond 2000 was in the range of 6.0 per cent. Furthermore, Thailand's rapid industrialization had created increasing demand for energy and stimulated various activities in oil and gas exploration, pipeline construction, and refinery expansion (United State Government, Energy Information Administration, 2001).

The World Energy Council (WEC) expected that global oil consumption would rise from a current level of 65 million barrels a day to 90 million barrels in 2020. This expected increase would be equivalent to the total production by the Organization of the Petroleum Exporting Countries (OPEC) in 1997 (Organization for Economic Cooperation and Development, 1999). In Thailand, energy consumption grew at an average annual rate of 14.2 per cent per year from 1987 to 1993. However, from 1993 to 1997, the

average annual growth rate dropped to 8.8 per cent (Chinanthanond, 1999: 1-2). After the economic crisis of mid-1997, consumption of petroleum products dropped, as shown in Table 1.2 Furthermore, oil consumption decreased from 741,000 barrels per day (bbl/d) in 1997 to 706,000 bbl/d in 1998. Since then, it had rebounded to an estimated 759,000 bbl/d in 2000 (United State Government, Energy Information Administration, 2001).

The economic crisis also had a significant impact on Thailand's refining sector. Thailand had five oil refineries, with a combined capacity of 704,250 bbl/d. In 2000, Thailand produced about 170,000 bbl/d, an increase of about 25,000 bbl/d from the previous year. For the first nine months of 1997, Thai Oil, which is controlled by PTT and the country's largest refiner; reported that pre-tax profits fell to \$2.2 million from \$22 million over the same period in 1996. The continuing economic problems had also forced refining companies to delay or cancel a number of refinery expansions and other projects. More than 75 per cent of Thailand's total petroleum demand was imported. However, the domestic Thai oil industry has been dominated by the state-owned Petroleum Authority of Thailand (PTT). PTT Exploration and Production (PTTEP) was the main upstream subsidiary of PTT (Ministry of Commerce, National Energy Policy Office, 1999).

Table 1.2 Consumption of Petroleum Products (unit = million liters)

Products	2000	1999	1998	1997	1996
GASOLINE	6,761.6	7,025.6	7,173.1	7,355.5	6,918.1
REGULAR	3,334.5	2,340.1	2,200.9	1,973.0	2,076.1
PREMIUM	3,427.1	4,685.4	4,972.2	5,382.5	4,842.0
KEROSENE	48.8	151.7	55.1	85.9	98.4
DIESEL	4,973.8	15,294.9	15,285.0	17,535.2	17,826.6
HSD	14,868.2	15,159.5	15,167.2	17,387.8	17,665.5
LSD	105.6 1	35.4	117.8	147.4	161.1
JP	3,493.7	3,297.7	3,314.5	3,542.7	3,393.0
FUEL OIL	6,373.4	7,931.1	7,940.5	9,094.4	9,653.1
LPG	3,902.2	3,307.7	3,207.2	3,249.0	3,140.9
TOTAL	35,553.5	36,908.8	36,975.4	40,862.6	41,030.1

Source: [on-line] Available: www.nepo.or.th/

1.1.3 Impact of the 1997 Asian Economic Crisis on Energy Enterprises in Electricity Production

Apart from petroleum and gas, electricity is another vital form of energy required for the country's economic development. The shrinkage of GDP in 1998 was about 8 per cent and that resulted in a decrease in electricity demand growth of about 2.25 per cent for the first time in 1998. Consequently, the various projects of small power producers (SPPs) and independent power producers (IPPs) were postponed. Electricity Generating PLC (EGCO), a privatized state-owned enterprise of the Electricity Generating Authority of Thailand (EGAT), accounted for about 12 per cent of total electricity production. In 1998, the net profit of EGCO and its subsidiaries amounted to 6.069 billion Baht. In 1997, it revealed a loss of 5.464 billion Baht due to its exposure in the form of U.S. dominated loans for two subsidiaries related to fluctuations in exchange rates in 1997 (EGCO, 1998: 46).

Thailand's economic crisis started with depreciation of the Baht, followed by a widening financial crisis, and stagnation of exports. The crisis had gradually spread throughout the country and caused a general lack of confidence from foreign investors. As a result, there was a liquidity problem in Thailand resulting from major withdrawals of money from the country. By 1997, the impact on the country was drastic, leading to slower growth rates and a severe decrease in GDP. The country's economic turmoil had a definite effect on energy demand and energy consumption in all sectors, even though the growth rate was usually about 25 per cent higher than the country's GDP.

In the summer of 1997, the report on peak power demand, production and purchase of electric power by Electricity Generating Authority of Thailand (EGAT), a major electricity producer and purchaser, reached an aggregate of 14,506.3 megawatts, up by 8.99 per cent from the same period of the previous year. As mentioned, economic turbulence during the last two quarters of 1997 lead to reduced energy demand and consumption. Therefore, the figure reported was 1.98 percent below the base demand projected by state energy planners.

According to the report, total generation and power purchased in the 1997 by EGAT amounted to 92,724.66 million units, up by 7.91 per cent from 1996. When compared to the 1996 growth rate of 8.93 per cent for energy generation and power purchased, a drop of 1.02 per cent was recorded in 1997. The record for fiscal 1997 showed a result that was 4.41 per cent below the base case forecast.

At December 31, 1997, the aggregated and installed capacity of EGAT's own plants and the IPPs was 17,403.60 megawatts. This was comprised of hydro power plants, thermal power plants, combined cycle power plant, gas turbine and diesel power plants, as well as purchases from the private sector as shown in Table 1.3.

Table 1.3 Power Plant Capacity in Thailand

Power Plant	Capacity (MW)	%
Hydro power plants	2,873.67	16.51
Thermal power plants	6,517.50	37.45
Combined cycle power plants	4,816.60	27.68
Gas turbine power plants	886.00	5.09
Power purchases	2,292.70	13.17
Diesel	16.60	0.1
Renewable	0.53	-
Total	17,403.60	(-)

Source: [on-line] Available: www.nepo.or.th/

Over the past 15 years, Thailand's annual energy demand and consumption had grown by an average of over 10 per cent until economic chaos struck in 1997. Consequently, it was unusual that the required generation of power for October 1997, a time when power demand was normally higher than demand in the summer, was lower than the summer peak. It was also lower than the record for the same month in 1996, which was a clear indicator of economic contraction. Nevertheless, increased power consumption was anticipated during the period of the Eighth National Economic and Social Development Plan (NESDP). It was also expected that peak demand growth would

achieve almost 9 per cent at the end of the Eighth NESDP. The new load forecast made in September 1997 following the economic crisis is summarized in Table 1.4.

Table 1.4 Load Forecast for Thailand

Fiscal Year	Peak Demand (MW)	Energy (MWh)	Load Factor%
1997	14,506	92,725	72.97
2002	19,049	124,233	74.45
2007	27,076	181,232	76.41
2012	37,047	249,045	76.74

Source: [on-line] Available: <www.nepo.or.th/>

The impact of the economic crisis in Thailand caused a sharp fall of 0.6 per cent in the GDP growth rate by the end of December 1997. In addition, the Credit Rating Agency (CRA) reduced Thailand's rating from investment grade to speculative, which added to the liquidity problems and decreases in the country's economic growth. Therefore, growth was expected to be negative, at less than 0 per cent for several years. The influence of the economic crisis also extended to the investment plans of Independent Power Producers (IPPS), especially Small Power Producers (SPPS). Their electricity was sold not only to EGAT, but also to other industries. Having signed power purchase agreements with EGAT with total capacity of approximately 5,800 MW, seven IPPs faced major financing problems, causing delays and possible cancellation of some projects (ECCO Annual Financial Report, 1999).

1.1.4 Problems of Improving Organizational Performance of State-Owned Enterprises

According to initiatives aimed at privatization of state-owned enterprises, improving the organizational performance of these state-owned enterprises faced some major obstacles. These included organizational structure, high expenses in human resources, limited capital for expansion, high debt, unreliable accounting systems, problems of labor law, ineffective corporate planning and evaluation of organizational

performance, many rules and regulations, unfair compensation, and too many control authorities (Pisitvanich, 1991: 110-140). During the restructuring of EGAT, different stages of knowledge development were found among different group of persons in charge of privatization program. There were also many more steps and procedures involved in the privatization process. In addition, employees of the Provincial Electricity Authority (PEA) recommended that significant factors affecting organizational performance included organizational structures, employee understanding and acceptance of privatization, human resource management, cooperation between state authorities and the ruling political party, and public relation about privatization policy.

1.1.5 Causes of Organizational Decline and Related Problems

Seven main causes of decline in organizational performance have been identified for both public and private organization as: poor management, over-expansion, inadequate financial controls, high costs, the emergence of powerful new competition, unforeseen shifts in demand, and organization inertia. These, in turn, related to other organizational problems, such as ineffective decision-making, high employee turnover, low morale, expensive conflict among individuals and groups, lack of employee motivation, and lack of goal accomplishment (Siafter, 1984:25-60 Quoted in Hill and Jones, 1998:337).

There have been some government initiatives to improve organizational performance of the state-owned enterprises both before and after the 1997 Asian economic crisis. For example, the Ministry of Finance outlined the various evaluation criteria for organizational performance for state-owned enterprises in 1994. These criteria were the ratio of income contributed to the government budget, the assets turnover ratio, the salary and social welfare, expenditures per cost of production ratio and profitability ratio (World Bank, 2001).

In addition, the Ministry of Finance proposed restructuring and reengineering various operation systems related to SOEs in 1994; namely, administrative and reporting system, capital budgeting decisions, price determination for goods and services produced, the role of the public sector, and policy implementation. Policy implementation relates to

organizational structure, restructuring the organization, finance, human resource planning, and the centralization of the information reporting production system (Bank of Thailand, 2000).

In 1998, the Royal Thai Government implemented the master plan for the State Enterprise Sector Reform, which provided greater scope and detail on guidelines for reforms of the future infrastructure, market structures, and reform strategies. Reforms covered the roles and responsibilities of the participants in the program, legal reforms, use of proceeds from privatization, corporate governance and performance monitoring, social and environmental concerns, and public information planning. Two evaluation systems, a good enterprise system (GES) and the performance agreement system (PAS), were adopted in the area of corporate governance and performance monitoring. A balance scorecard integrating GES and PAS would be used to measure organizational performance (EGCO Annual Financial Report, 1999).

1.1.6 Various Alternative Structural Adjustments to the Internal Factors of Organizations to Cope with the 1997 Economic Crisis in Thailand

Many scholars have proposed various alternative solutions to enhance the organizational performance. Hill and Jones (1998:444) proposed strategic change, which should consist of business process reengineering, restructuring the organization, and innovation to strengthen competitive advantage.

Pearce and Robinson (2000: 311) suggested the use of one or more of strategies which included: a) profitable business segment, b) product innovation and quality improvement, c) the production and distribution, d) harvesting the business to generate cash by cutting down on maintenance, reducing investment, and other cost reduction models.

Hoon and others (2000:10-11) advised various alternative solutions to survive in the new millennium as lessons from the Asian Crisis, including: 1) improve corporate governance; 2) professional management; 3) restructuring marketing strategy; 4) restructuring within the organization to (a) upgrade organizational structure, (b) restructure human resource management policies; 5) implementation of a new corporate

strategy, such as focusing on core competencies; and 6) changing financial the strategy. The examples involve movement from hierarchical to flat organization, functional to team processes, self-managing work groups, innovation, greater decentralization, contract employment, early retirement schemes, downsizing, layoffs, training for new knowledge, and greater investment on information technology.

Accordingly, this study aims at investigating the internal factors affecting organizational performance of energy enterprises in Thailand, including public and private firms, after the 1997 economic crisis.

The internal factors are identified as functional strategy, organizational structure, management style, business system, technology, and functional strategy – value chain. These factors have been identified as part of the internal analysis framework. The value chain developed by Porter (1985) conceptualizes the functional strategy. The balance scorecard model is used to evaluate organizational performance in order to analyze how well organizations have utilized resources to create values for future performance. Therefore, it covers the finances, customers, business processes, and learning and growth perspectives (Kaplan and Norton, 1996: 10).

1.2 Objectives of the Study

This dissertation has the following objectives:

1.2.1 To evaluate the internal structural adjustment factors affecting the organizational performance of energy enterprises after the 1997 economic crisis in Thailand.

1.2.2 To study the cause-effect relationship among the internal factors affecting the organizational performance of energy enterprises in Thailand

1.2.3 To create an appropriate linear structural relationship equation of the internal factors affecting the organizational performance in order to explain the cause-effect relationship affecting the organizational performance of the energy enterprises in Thailand.

1.3 Scope of the Study

1.3.1 This study focuses on internal structural adjustment factors affecting organizational performance of enterprises in the Thai energy sector after the economic crisis in 1997.

1.3.2 This study focuses on organizational performance in energy enterprises by using various perspectives rather than being restricted to only financial success or failure. Information on organizational performance in terms of customer, financial, internal business processes was acquired from data supplied by the energy enterprises. This data was obtained from their financial records and interviews with executives.

1.3.3 Energy enterprises cover the privatized state-owned enterprises, state-owned enterprises and private firms, which have been selected as the subject of this case study because they have an important role in achieving economic development goals and are closely linked to growth in industry, transportation, and urban areas.

1.4 Expected Results of the Study

The expected results of this study are as follows:

1.4.1 To acquire knowledge and understanding about internal structural adjustment factors affecting the organizational performance of energy enterprises in order to provide a clearer understanding of major factors affecting the achievements of energy enterprises in Thailand.

1.4.2 The theoretical significance of the study derives from the effort to discover the direct relationships among internal structural adjustment factors affecting the organizational performance of energy enterprises in Thailand. Therefore, it provides an answer to the question “which critical internal factors determine the degree of success during a period of economic turmoil in a developing country”?

1.4.3 The practical significance of the study is that it brings together the knowledge and opinion from executives of energy enterprises in Thailand and provides an answer to the question, “which internal critical factors influence the maximization of

organizational performance during a period of economic turmoil in a developing country”?

1.4.4 This study will point out the significant internal factors affecting organizational performance. This knowledge can serve as a management tool and provide an insight into options that can be pursued by management to achieve organizational objectives in the energy sector.

1.4.5 This research can be the foundation for further empirical study and future research.

In summary, the findings of this dissertation are expected to assist public policy makers and business executives involved in the Thai energy sector, as well as to provide a local application of a technique in cause-effect analysis.

1.5 Definition of Terms

In order to facilitate a better understanding of this study, key terms are defined in this section.

Energy sector: That sector of the Thai economy comprised of ventures engaged in the production and/or distribution of electricity, petroleum and gas. The term also refers to other businesses related to energy enterprises, whether they are state-owned enterprises, privatized state-owned enterprises, private firms, their subsidiaries or joint ventures.

Energy enterprises: Enterprises include state-owned enterprises, the privatized state-owned enterprises, and private firms in the energy sector of Thailand.

Electricity Industry: State-owned enterprises, privatized state-owned enterprises, private firms, their subsidiaries, or joint ventures engaged in electricity generation. For example, the Electricity Generating Authority of Thailand (EGAT), Electricity Generating Public Co., Ltd, (EGCO), small power producers, and independent power producers.

Petroleum Industry: State-owned enterprises, privatized state-owned enterprises, private firms, their subsidiaries and joint ventures engaged in production or distribution

of petroleum products including gasoline, kerosene, HSD, LSD, diesel, fuel oil, LPG. There are five oil refineries, eight oil distributors, and twenty-one middle-sized oil distributors that control about 80 percent of the market share for petroleum products in Thailand. The small oil jobbers, petroleum services stations, and LPG retail stores are excluded from the study.

Natural Gas: State-owned enterprises, privatized state-owned enterprises and private firms engaged in gas production, such as Petroleum Exploration and Production (PTTEP), Unocal, Total and their joint ventures. There is a joint ventures involving PTT, British Gas and Tractable (known as PTTNGD) which provides distribution system, services. There is no retail gas industry as yet in Thailand.

State-Owned Enterprise: Any enterprise owned by the government.

Privatized State-Owned Enterprise: Any state-owned enterprise that has decreased the role of the government by divesting government ownership. The main form of privatization is through sale of shares to the public.

Private firms: Organizations (firms or entities) owned by private investors. They may be engaged in petroleum, production and distribution, electricity generation, gas production, and other businesses related to energy. They also include private firms operating under concessions given by the government, which is another form of privatization. Examples are independent power producers and small power producers granted concessions by the Electric Generating Authority of Thailand (EGAT).

Overall Organizational Performance: Specific ends that an organization seeks to achieve by allocation of resources and measuring the key results of operations (Schermerborn, 1992:225). Hax and Majluf (1991:156-159) further defined organizational performance using quantitative indicators of the overall performance of firms for short and long-term periods.

Although there is no universally accepted set of such quantitative indicators, the two major categories are financial performance and the overall efficiency of managerial functions in the firm. The first includes quantitative financial measures related to size, growth, profitability, capital markets, and other financial variables. The second major

category measures performance in terms of the overall efficiency of the managerial functions, particularly human resources, technologies, manufacturing, and marketing.

Organizational Performance: Measurement of the organization's capabilities in both financial and non-financial aspects as related to future performance in terms of finance, performance with customer relations, the internal-business process, and a learning and growth perspective, according to the balance scorecard model (Kaplan and Norton, 1996:22:30)

Financial Performance Measurements: This measurement indicates whether a company's strategy, implementation plan, and execution contribute to improvement of the financial bottom-line. Typically, the financial objectives are profitability, economic value added, and cash flows. In this study, the financial indicators are net income / sale, net income / total asset (Return on Asset), current asset ratio, earning per share (EPS), percentage change in net profits, percentage change in earnings per share, annual percentage change in net profits, and annual percentage change in earnings per share.

Customer Performance: This indicator is designed to measure how the organization appeals to the customers, concentrates on customer satisfaction, customer relations, new customers, and profitability from adding new customers, and market share. The most commonly used indicators are market share, total sales, total sales to new customers, a customer satisfaction index, percentage of uncorrectable accounts, and bad debt expenses.

In this study, the market share, the annual percentage of change on total sales are used as the measurement indicators.

Internal Business Process: This terms means that the organization should satisfy the customers and shareholders through improvements in business operations which can be measured in terms of quality, cost, and time. The measurement focuses on two main areas: innovation (e.g. product design and development) and operational process, including production, marketing, and services after sale. The measurement indicators are time needed for order fulfillment, time needed for the product development cycle, unit costs of production, reductions in the frequency of losses, reduction in claims, safety and

accidental rate, inventory shortages as a percentage of inventory turnover, investment in new technology, and income from new products.

For this research, the annual percentage change in total sales is used as the measurement indicator.

Learning and Growth Performance: This refers to maintaining the organization's ability to change and improve for future performance. Three primary inputs to learning and growth are employees, the system process, and the organization. The measurement indicators are employee satisfaction, employee turnover, absenteeism, number of training programs per year, days in training programs, and training budget. The measurement indicators in this study are annual employee turnover, annual rate of absenteeism.

Internal Factor: The term internal factors generally means the strengths to be built upon and the weaknesses to be overcome in order to gain competitive advantage. It is specifically defined as the firm's basic capabilities, limitations, and characteristics, which are related to functional activities aimed at producing products and services (Pearce and Robinson, 2000:118). According to Collins and Montgomery, internal factors are related to tangible and intangible assets as capabilities that are used to create the competence of the firm in order to provide value to customers (Collins and Montgomery 1997:30). In this dissertation, the term internal factors relate to internal environments, which can be managed to gain the competitive advantage. Following Schlesinger and others (1992:6-12), the internal factors affecting the organization in this study are strategy, technology, organization structure, and the management style.

Strategy: The term strategy means functional strategies that are meant to directly improve the effectiveness of functional operations within a company and clearly defined by the value chain analysis of Porter (1985:20-35).

Value chain: This term refers to the framework used to analyze the chain of activities that transform inputs into outputs so that customers receive the value. It consists of two broad categories, namely primary and supporting activities. Primary activities are called line functions, such as logistics, operations, marketing and service. Supporting activities include procurement, human resource management, firm infrastructure, and

research and technology development. (Porter, 1985: 204, Pearce and Robinson, 2000:207-221, Miller, 1998: 159, and Hax and Majluf, 1992: 30)

Organization Structure: The term organization structure refers to the allocation of responsibilities, activities, communication and authority to individuals and how these individuals are coordinated vertically and horizontally. It consists of centralization, complexity, and formalization (Robbins, 1990: 30).

Technology: The term technology generally means the information, equipment, techniques, processes, and knowledge required to transform inputs into outputs in the organization (Bounds et al., 1994: 250, Robbin, 1990: 110). In this study, technology is defined in terms of technology development as presented by Porter (1985: 167), where technology is related to the development of process design improvements, equipment, computer software, telecommunications, computer-aided design, computer support, and databases.

Management Style: Management style is the distinctive way the organization's decision-making apparatus performs its function. It includes the autonomous decision-making, teamwork, and coaching the subordinate. Many researches indicate that the style of management is a rather important determinant of organizational performance.

Business System: The term business system is a broad concept, which is composed of multiple, and diverse kinds of processes, such as business, production, purchasing, and financial planning processes. Process refers to flows of products, materials, and information from one worker or workstation to another and the flow across operations (Bounds et al., 1994: 167). In this study, total quality management and business process reengineering are utilized in relation to business system.

1.6 Conclusion

The performance of the energy enterprises deserves to study the detail and analysis due to the major role that energy plays in achieving national economic goals related to development, especially in a developing the country such as Thailand. Most

developing countries must import energy to a certain extent, while some developing countries are able to export energy in order to achieve economic growth. State-owned enterprises are significant organizations involved in national economy development, and they typically play a major role in the energy sector. At present, most governments, including Thailand, are interested in privatizing state-owned enterprises in order to achieve efficient contributions to national economic development.

However, in order to enhance the contributions of organizations in the energy sector, it is important to analyze the performance, profitability and the production activities. In the case of energy enterprises in Thailand, their performance during and after the 1997 economic crisis needs to be studied. The 1997 economic crisis had a significant impact on energy enterprises. Petroleum and natural gas yields related to energy consumption in Thailand decreased from 1993 to 1997, petroleum consumption dropped in mid-1997, oil consumption fell in 1997-1998, the pre-tax profits of refineries fell in 1996. Demand for electricity also had a lower rate of growth. At the same time, small and independent power producers delayed the start or expansion of their operations. Some enterprises failed to make profits because they had loans denominated in US dollars, which were affected by the exchange rate devaluations in 1997. The Thai government also tried to promote the privatization of the power and energy enterprises in order to increase competition, reduce the investment burden of the government, promote more efficient use of energy and develop the capital market.

According to the plan, by 2005 the state-owned enterprises in the energy enterprises should transfer their ownership and management to the private sector in accordance with Thailand's obligations under the WTO agreement. The impact of the 1997 economic crisis led to the privatization of state-owned enterprises. Since the growth of Thailand's GDP had slowed, there has been a decline in foreign investment and a reduction in exports.

From the end of 1997 to the beginning of 1998, the government had been pushing to restructure the financial sector, raise revenue to meet the growing public debt, and especially to restructure the state enterprise sector. The government began to seek

international loans from the IMF, World Bank, and IFC in order to accelerate the process of privatizations of state-owned enterprises in an effort to help the country recover from the economic crisis. Signs of recovery started appearing in mid-1999.

Despite efforts to use privatization to help economic recovery, there seemed to be significant problems related to improving organizational performance of state-owned energy enterprises. In the cases of restructuring EGAT and the PEA, problems related to possible decline in organizational performance have included the organizational structure, high expenses in human resources, limited capital for expansion, high levels of debt, etc.

In the energy enterprises, the seven main causes of the declined in the organizational performance in both public and private organizations were poor management, over-expansion, inadequate financial controls, high costs, the emergence of powerful new competition, unforeseen shifts in demand, and organizational inertia. In turn, these factors led to organizational problem such as ineffective decision-making, high employee turnover, low morale, expensive conflict among individuals and groups, a lack of employee motivation, and reduced ability to accomplish goals.

Concerning these problems, it is necessary to study and analyze the factors affecting the organization performance of energy enterprises after the economic crisis. Increased knowledge and better understanding can help personnel in the energy enterprises to clearly see which alternative solutions might help improve their organization's efficiency and effectiveness. Equally important, policymakers will have a better understanding of how the performance of these energy enterprises is crucial to the role that the energy sector must play in national economic development.

CHAPTER II

LITERATURE REVIEW

The related literature and research are reviewed in order to help (1) explain the theory and (2) define the concepts that can guide an in-depth analysis related to the research problem. The first part presents the evolution of the concept of organizational performance as developed by renowned scholars since 1960. The second part presents the theoretical framework used to analyze internal factors that affect organizations and enhance organizational performance. The third part reviews relevant studies concerning internal factors related to organizational performance. Finally, the conceptual framework for making the organizational analysis in this research will be presented.

2.1 Organizational Performance

There are many difficulties involved with measuring organizational performance, since organizations have a variety of goals and use multiple criteria when measuring their performance. Firms in the private sector may evaluate their performance in terms of profits, returns on investment, sales volumes, market shares, customer satisfaction, and employee satisfaction. It is not possible for complex organizations to set forth a single measure of performance when they have multiple goals. The various meanings of organizational performance can be reviewed in order to clarify the measurement difficulties.

2.1.1 Meaning of Organizational Performance

Simon (1960:180-181) proposed that the way to measure organizational performance was in terms of efficiency derived from the output minus input. Bennis (1966) pointed that adaptation of an organization to its environment was the major determinant when measuring organizational performance. Peterson and Plowmen (1976:

45) maintained that measurement of organizational performance should consist of cost, quality, quantity, time and the method of production.

Kast and Rosenzweig (1979:21-24) defined organizational performance according to three aspects—effectiveness, efficiency, and participant satisfaction. They stated that effectiveness was concerned with the accomplishment of explicit or implicit goals related to the key result areas, such as profit maximization, customer satisfaction, employee satisfaction, and high quality services. Efficiency simply meant the utilization of resources related to the ratio of output to input or benefit to cost. Participant satisfaction concerned employee satisfaction with their jobs. However, organizational performance has remained a broad concept that also includes various aspects of transformation processes, such as financial and technical transactions, the environment, organizational structures, and development of the managerial system.

Griesinger (1990:478-488) presented eight dimensions of organizational performance according to the obligations of various stakeholders. The stakeholders included any parties that would have an interest or stake in the successful performance of a firm, such as customers, employees, and the community. The eight dimensions were:

- **Managerial Performance and Development:** rate of managerial productivity and growth.
- **Profitability:** level of profit and other indicators of financial performance.
- **Productivity:** aiming at a specific level of production efficiency.
- **Worker Performance and Attitude:** expected rate of workers' productivity and positive attitudes.
- **Marketing Standing:** desired market share and competitive niche.
- **Physical and Financial Resources:** capital and equipment required to meet other strategic goals.
- **Public Responsibility:** company responsibilities to customers and society.
- **Innovation:** efforts to develop new methods and new products.

Griesinger (1990:478-488)

Hax and Majluf (1991:156-159) defined organizational performance as corporate objectives, including both financial and non-financial measures. The former include quantitative financial measures that related to size, growth, profitability, capital markets, and other financial variables. The financial measurements address short-term as well as long-term survival and development of the firm. The non-financial measures focus on the overall efficiency of the managerial functions of the firm, particularly human resources, technology, procurement, manufacturing, and marketing.

According to Schermerborn (1992:8), organizational performance simply means productivity, which was consistent with the view of Kooontz and Weihrich (1994:9).

“The quantity and quality of work performance can measure it with resource utilization at the level of individual, group, and organization. Organizational performance is composed of effectiveness, satisfaction of employees and organization efficiency to indicate the high productivity and managerial success. Effectiveness is a measure of task output or goal accomplishment, for example, having your work unit meet daily targets of both production quantity and quality. Efficiency is a measure of the resource cost associated with goal accomplishment, that is, the realized output compared to the inputs consumed by the cost of manufacturing. Employee satisfaction is related to the quality of work life including fair pay, safety, and opportunity to learn.”

Kooontz and Weihrich (1994:9)

Gitman (1997:19-21) explained that organizational performance is intended to maximize the wealth of a firm, including share price, economic value added (EVA) by focusing on stakeholders and their achievements. Stakeholders are employees, customers, creditors, owners and others. Economic value added (EVA) is a practical, highly flexible concept used to measure organizational performance, particularly large corporations, and can substitute for earnings per share as a measurement. It can be calculated by subtracting the cost of funds used to finance investment from after-tax operating profits in order to determine whether the investment can contribute positively to the wealth of the firm (Chew, 1999:141-145).

The meaning of organizational performance in terms of economic value added is a more specific concept, which is both understandable and measurable. However, only one measurement cannot indicate the overall performance of the organization. Therefore, if

top management used it, it might mislead their efforts to do strategic planning for the organization.

2.1.2 Organizational Effectiveness

The literature review presented above shows that it is rather difficult to have one measurement of organizational performance that can be used to evaluate performance in public organizations, private firms, and privatized state-owned enterprises in a specific industry. In order to have a clearer concept of organizational performance, the concept of organizational effectiveness can be used. It can be elaborated broadly, specifically and in depth.

One early administrative idea defined organizational effectiveness at the fixed level of goal achievement for organizations (Bennis, 1966: 161). This definition is ambiguous, since the word “goal” has both technical and practical implications. It also depends on whether goals are short or long term, and whose goal is involved. Therefore, many researchers and practitioners defined “goal” as the condition of organizational achievement, which is survival of the organization. However, in governmental organizations, for example, survival does not mean effectiveness since such organizations can survive without effectiveness.

There are, however, various standards for assessing organizational effectiveness and differences depend on the organizations. The assessment of effectiveness can provide a good starting point for identifying and understanding organizational problems. Furthermore, there are various research approaches to study organizational effectiveness.

2.1.2.1 The goal-attainment approach defines organizational effectiveness as the stated level of goal achievement. The word “goal” in this context does not mean survival, but goal at the operational level, which is countable, accurate, and reasonable. It shows, therefore, that organizations are heading towards defined goals. These goals must be clear and understandable for every member of the organization; and there will be only a few manageable goals, which are measurable in progress (Robbins, 1990: 32-35).

2.1.2.2 Effectiveness is defined as the responsiveness of an organization to its constituents' preferences. A constituency is any group with preferences for organizational

action, including groups beyond organizational boundaries. By satisfying constituent preferences, organizations are legitimized by the society and gain their license to exist. The use of an evolutionary Meta criterion directs attention toward the viability of the larger system, something necessary, if any constituent preferences are to be fulfilled in the long run.

2.1.2.3 The system approach defines organizational effectiveness as an ability to provide imported resources, retain internal systems and successful relationships with the organizational environment. This approach considers goals as only a sub-element. The system approach considers an organization as a complex system with interactive elements. Organizational effectiveness is measured by the survival of the organization based on considering sufficient imported resources employed by a suitable number of workers, flexibility of organizational structure to the environment, effective internal communication within the organization (Bennis, 1966: 86-100), and job satisfaction of personnel. This measurement method is suitable for ambiguous and non-measurable goals such as in governmental organizations.

2.1.2.4 The strategic-constituencies approach is a new approach, which considers an organization as a system in an environment that has influential beneficiary groups, which control resources of the organization. Survival of the organization indicates effectiveness resulting from the ability to fulfil the needs of the related beneficiary groups. The survival principle based on the ability to provide and retain resources would be easy for organizations that can control every factor. In fact, however, non-governmental organizations can control all factors because such organizations are the environment and are affected by the external environment. This approach is a political approach measuring the ability of an organization to fulfil the needs of related beneficiary groups.

2.1.2.5 The competing-value approach offers a framework that integrates all of the three approaches mentioned above. The three basic sets or pair of value assessments includes flexibility versus control, personnel versus organization, and organizational means versus ends. These assessment pairs can be formed into four models of

organizational effectiveness, which are (1) the human relationship model, (2) the open system model, (3) the reasonable goal model, and (4) the internal organizational model with different goals.

However, Mintzberg's (1975) study revealed that organizational effectiveness means doing the right thing and doing it right by both Porterian and Peterian standards. He argued that there was more than organizational effectiveness involved, and the answer must also lie in managing the consistency of forms as well as the contradiction of forces. Organizations need emphasizing, but at the same time, they also need balance.

Meanwhile, Author and Raymond (1991) stated that assessing organizational effectiveness represents an interesting confluence of effectiveness theories stressing multiple constituencies and societal legitimization adapted to an evolutionary framework. Raymond viewed effectiveness as changes over time with changes in constituent preferences and environmental constraints. Effectiveness varies as organizations satisfy evolving constituent preferences through expanding their niches. The focus on multiple constituencies, the role of constraints on effectiveness, and the dynamic character of organizational effectiveness are central concepts in Raymond's framework and represent a more productive way of conceptualizing effectiveness than found in the more traditional goal and system formulations.

Within the context of the variation-selection-retention (evolutionary) model, constituent preferences provide variation from which the evaluative mechanism of the organization will be selected. When the selected response is evaluated as adaptive, it will be retained. For an organization to select responses adaptive to constituent preferences, its evaluative mechanism must reflect the Law of Requisite Variety (Ashby, 1996: 45). It must match the degree of variety in preferences without variety in the evaluation structure and the preferences. Without any variety of the evaluation structure, the preferences of developing constituencies will be recognized, and the organization's performance will not be adapted to these new preferences.

According to related theories of organizational performance, there are various measurement criteria that enable selection when evaluating within and among various

organizations in the same industry. In finance theory, particularly, the financial ratios are generally used to evaluate performance among organizations in the same industry.

However, today's organizations compete in complex environments, so that an accurate understanding of their goals and the methods for attaining those goals are essential. In this study, the concept of balance scorecard (BSC) of Robert S. Kaplan and David P. Norton (1996) is used to measure organizational performance.

The balance scorecard has recently found acceptance by private and public organizations to use for benchmarking as a way to measure performance. The individual indicators can indicate cause and effect with other indicators, and this makes it a useful management tool. In this study, the balance scorecard is used in order to measure organizational performance of energy enterprises. It should be noted, however, that it is not able to measure organizational performance without considering social impact dimensions.

2.2 Organizational Performance-Balance Scorecard

Organizational Performance-Balance Scorecard (BSC) emphasizes financial and non-financial measures as part of the information system for employees at all levels of the organization. The measures represent a balance between external measures about shareholders and customers and internal measures of business processes, innovation, and learning and growth. In addition, BSC measures past results and proceeds towards projecting future performance. BSC translates mission and strategy into objectives and measures, which provide a framework and language for communication. BSC measures organizational performance across four balanced perspectives (see Figure 2.1): financial, customers, internal business processes, and learning and growth (Kaplan and Norton, 1996: 15-20).

2.2.1 Financial performance shows whether the organizational strategies, implementation, and execution are improving the bottom-line. Typically, the objective of financial measurement is related to profitability, such as operating income, return on

investment or economic value added. Financial objectives and measures should be included with the other three perspectives of BSC and must play a dual role: to define the financial performance expected from the strategy and to serve the objectives and measures of the other three perspectives.

The financial objective can be evaluated at different stages of a business cycle: growing, sustaining, and harvesting. Businesses in the growing stage may have negative cash flow and low current return on invested capital. The overall financial objectives in the growing stage are concerned with the growth rate of revenue, sales, customer groups, and new products and services. However, the majority of businesses are usually in the sustaining stage. They are attracting investment and reinvestment in order to acquire excellency in return for the investment. Objectives during this stage are related to the profitability of the firm. The operating income and gross margin can serve as measures of these objectives. In addition, some businesses have reached the mature stage, where organizations or companies want to harvest the investment made at earlier stages. In the harvesting stage, the business does not expand, but earns just enough to maintain expenditure and equipment. However, the business can choose financial objectives related to revenue growth, productivity improvement, cost reduction, asset utilization, and risk management.

2.2.2 Customer perspective is necessary in order to focus on the targeted market and business segment. The core measures of customer outcome include: customer satisfaction, loyalty, retention, acquisition, and profitability. These outcome measures represent the targets for a company's marketing, operations, logistics and product and service development processes. In addition, companies can deliver value propositions to their targeted customer segment by selecting various attributes: product and service, functionality, quality, and price; customer relationship, quality of purchasing experience and personal relationships, and image and reputation.

2.2.3 Internal business processes perspective concerns objectives and measures that are derived from explicit strategies to meet the expectations of stakeholders and targeted customers. The internal business processes prospective includes the short and

long wave innovation cycle that sustains the business and delivers value to target customers. These cycles involve new product development and its delivery to targeted customers. In addition, the organization has to identify the process, time, cost, quality, and performance characteristics.

2.2.4 Learning and growth perspective concerns objectives that are drive towards achieving excellent outcomes in the first three perspectives. Organizational learning and growth contain three principal categories of capabilities: employee capabilities; information system capabilities, and motivation, empowerment, and alignments. However, the core employee measurements are employee satisfaction, retention, and productivity.

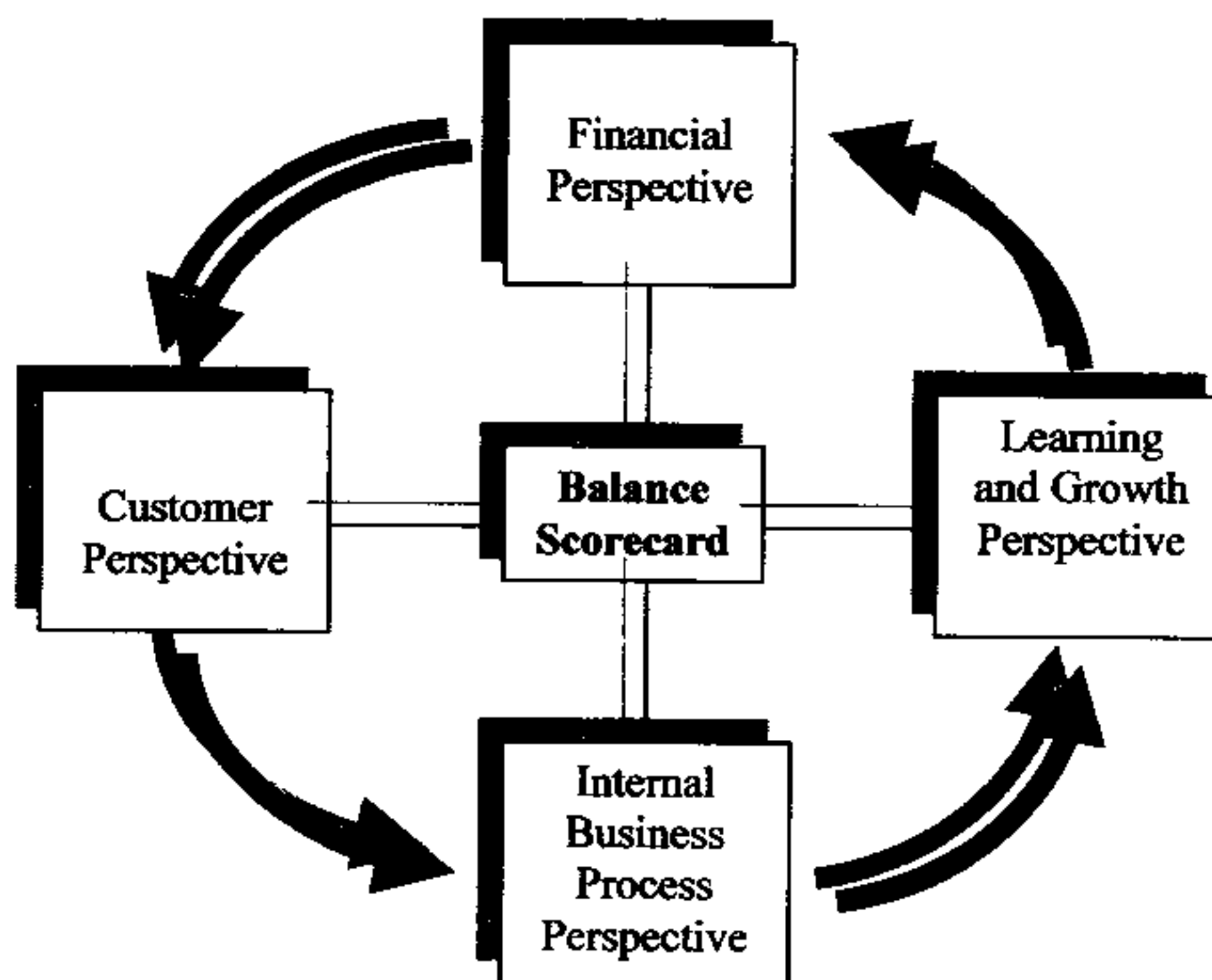


Figure 2.1 The Balance Scorecard of Four Perspectives

Source: Robert S. Kaplan and David P. Norton 1996. *Balance Scorecard*, 1st ed., Boston, Massachusetts, Harvard Business School Press, p. 65.

2.2.5 Employee satisfaction is considered as extremely important by most organizations. Furthermore, employees' overall job satisfaction is one of the success factors for organizations. Satisfied employees are a precondition for increasing productivity, responsiveness, customer service and quality. In addition, satisfied employees should serve customers to provide product or service satisfaction. This contributes to maintaining customer loyalty and on-going relationships, which lead to profitability. Employee satisfaction could be surveyed or measured by different methods such as involvement with decisions, recognition for doing a good job, access, encouragement to be creative and use initiative, support level from staff functions, and overall satisfaction with the company.

2.3 Framework for Organization Analysis

The objective of this literature review is to discover and develop the best means of understanding the problem and the best means of analyzing it. This requires development of relevant variables and results about the best ways to fill existing gaps in research.

2.3.1 Various Frameworks to Analyze the Factors Affecting Organization and Organization Performance.

The use of various frameworks can accommodate different multidimensional, broad, and specific concepts. They are intended to embrace the critical success activities which are both external and internal factors for enhancing organizational performance and gaining outstanding achievement. Reviewing some of the most important work in the field of organization analysis shows that the following critical dimensions emerge:

The study entitled "A Model for Analysis of the Universality and Transferability of Management" (Koontz, 1969: 89-95) found that the variables of management science, enterprise function, human and material resources, and the external environment directly influenced both managerial practices and non-managerial practices. These variables

further affected enterprise excellence. Figure 2.2 shows the detailed internal and external factors contributing to outstanding achievement by the organization.

2.3.1.1 Managerial Factors, Non-Managerial Factors, and the Environment.

Enterprise activities can be divided into two broad categories, managerial and non-managerial. The managerial functions consist of planning, organizing, staffing, leading, controlling, while the non-managerial functions include engineering, production, marketing, and finance. One or both can be causal factors, at least to some degree—for enterprise excellence. They are also affected by the underlying management science.

Furthermore, they are affected by the availability of human and material resources and the constraints and influence of the external environment, including education, political, legal, economic, technological, socio-cultural and ethical factors. The non-managerial factors can lead to organizational excellence, despite poor management practices, if there is brilliant marketing, strong engineering, well-operated production facilities, or astute finance. The environmental factors may be either constraints or opportunities. For example, in the category of economic endowments, a country may be short on capital but rich in natural resources (Koontz, 1969:415-419).

Farmer and Richman (1965, 20-45) likewise maintained that environmental factors including educational, social, cultural, ethical, legal, political and economic variables that can influence managerial functions and non-managerial functions. They also have significant impact on managerial excellence and management processes

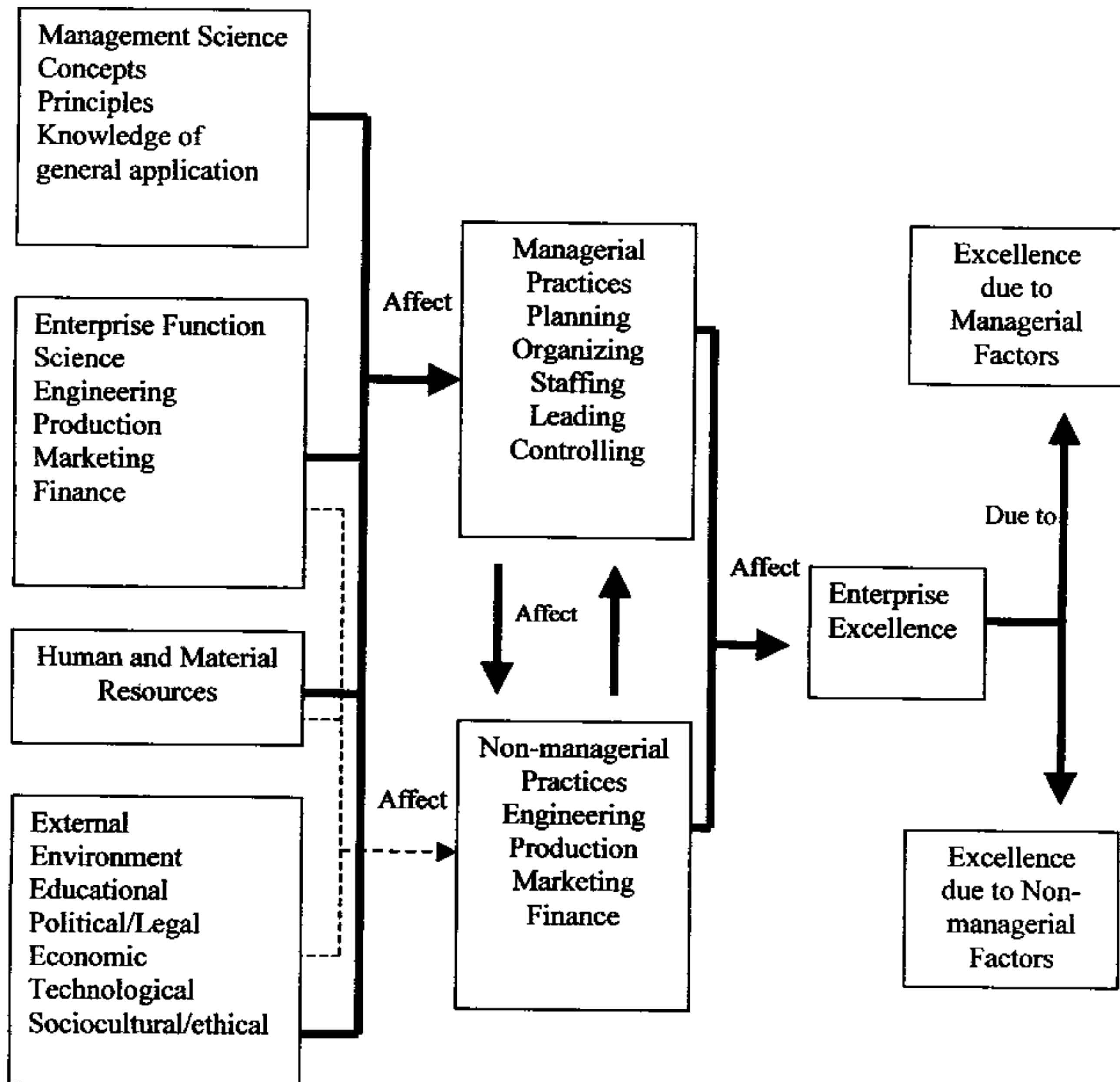


Figure 2.2 Analysis of the Universality and Transferability of Management

Source: Adapted from Harold Koontz, "A Model for Analysis of the Universality and Transferability of Management" *Academy of Management Journal* (December 1969), p. 415-429.

2.3.1.2 Organization as an Open System.

According to Berrien (1976:45 Quoted in Dunnette, 1976: 45) the organization can be evaluated as a general open-system model as seen in Figure 2.3. The open system is in continual interaction with its environment and achieves a “steady state” or dynamic equilibrium while still retaining the capacity for work and energy transformation. The survival of the system would not be possible without continuous inflow, transformation, and outflow. In a biological or social system, this is a continuous recycling process. The system must receive sufficient input of resources to maintain its operations and also export the transformed resources to the environment in sufficient quantity to continue the cycle.

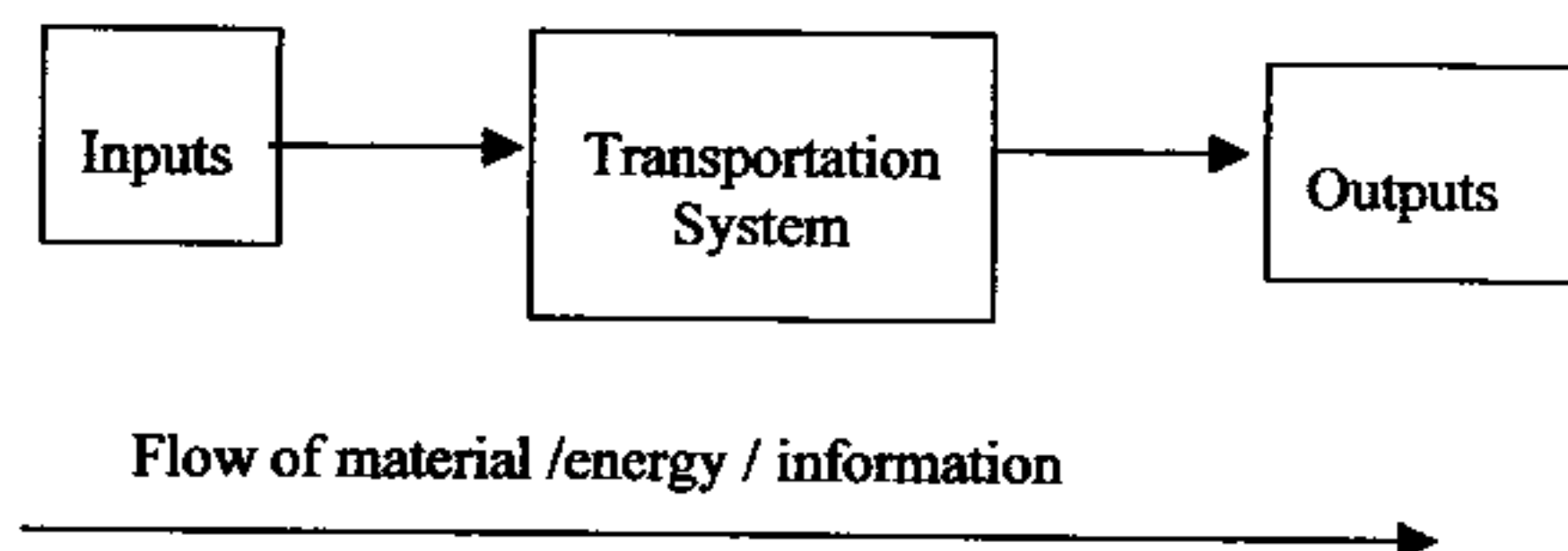


Figure 2.3 General Model of the Organization as an Open System

Source: Marvin D. Dunnette , Handbook of Industrial and Organizational Psychology, 2nd Rand McNally College Publishing Company, Chicago, 1976, p.45.

2.3.1.3 An Integrated System View of Organization.

Kast and Rosenzweig (1979:110-115) considered enterprises as open, socio-technical systems composed of subsystems, as illustrated in Figure 2.4. As a subsystem of society, the organization must accomplish its goals while overcoming the constraints that are an integral part of the environmental suprasystem. The organization receives inputs of energy, information, and materials from the environment, transforms these inputs, and returns outputs to the environment. The organization is not simply a

technical or a social system but it also structures and integrates human activities around various technologies. The technologies affect the types of inputs sent into the organization, the nature of the transformation processes, and the outputs from the system. However, the social system determines the effectiveness and efficiency during utilization of the technologies.

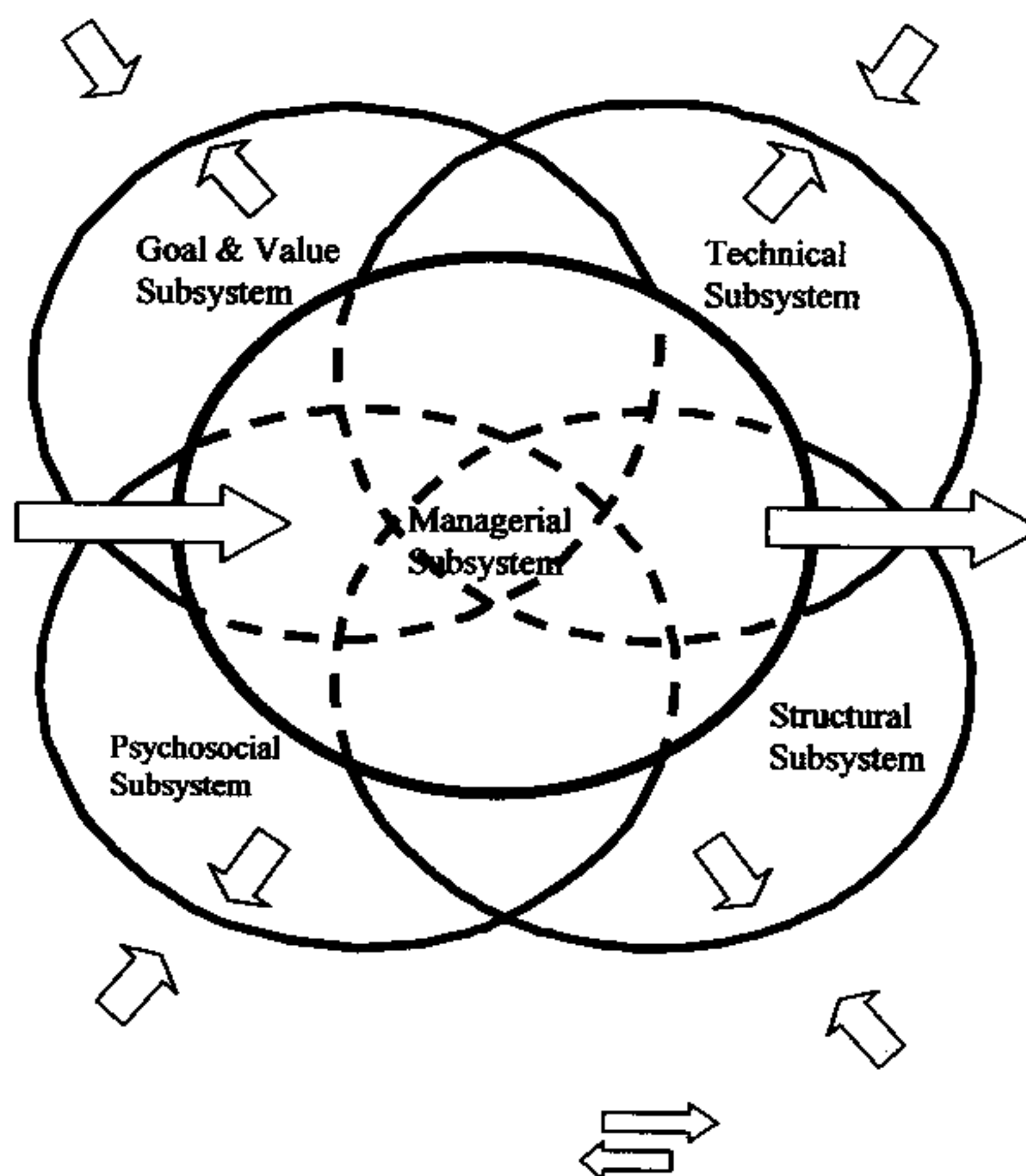


Figure 2.4 The Integrated Organization System

Sources: Fremont E. Kast and James E. Rosenzweig 1979. Organization and Management—A System and Contingency Approach, 3rd ed. New York: McGraw Hill Co., Ltd., p.111.

Goal and Values Subsystem: Values are derived from the broader sociocultural environment. The organization performs a function for the society, and it thus must conform to social requirements when achieving its goals.

Technical Subsystem: Refers to the knowledge required for the performance of tasks. This means techniques, equipment, processes, and facilities used in the transformation from inputs to outputs. The technical subsystem is determined by the purposes of the organization and will vary according to the task requirements

Psychosocial Subsystem: Composed of interacting individuals and groups and related individual behavior, motivation, status and role relationships, group dynamics, and influence systems. In addition, sentiments, values, attitudes, expectations, and aspirations of people in organization also affect the psychosocial system.

Structure: Involves the ways in which the tasks of the organization are divided (differentiation) and coordinated (integration). In the formal sense, this refers to organization charts giving positions and job descriptions, and a set structure created by rules and procedures. It also concerns patterns of authority, communication, and workflow.

Managerial System: Covers the entire organization by directing the technology, organizing people and other resources, and relating the organization to its environment. Various approaches are used to study the managerial system: management functions, various levels of organization, and managerial roles.

- (a) Management functions: Managers in all types of organizations are responsible for the managerial functions, which consist of planning, organizing, staffing, leading, and controlling. The following managerial functions are essential if organizations are to meet their primary goals:

Planning: It involves selecting missions, objectives and actions to achieve them; it requires decision making to choose future courses of action among alternatives.

Organizing; Arranging tasks, people, and other resources in order to do the necessary work.

Staffing; Filling, and keeping the filled positions in the organization structure by identifying work-force requirement; inventorying the available people; and recruiting, selecting, placing, promoting, appraising, planning careers, compensating, training, and educating.

Leading; Influencing people so that they will contribute to the organization and group goals and inspiring personnel to work hard to perform according to the plan.

Controlling; Measuring and correcting individuals and organizational performance to ensure that events conform to the plans by measuring performance against goals, plans, standards and correcting deviations. (Koontz and Weihrich, 1994: 20-21 and Schermerborn, 1993: 21-23)

- (b) Various levels of organizations: Managerial tasks can be examined within the organization at various levels or subsystems as shown in Figure 2.5. The operating subsystem is concerned primarily with economic-technical rationality and tries to create certainty by linking the technical core to many variables. The strategic level of the organization faces the greatest degree of uncertainty in terms of inputs from the environment over which it has little or no control. It includes the strategy formulation related to a comprehensive system and plans. In coordinating a subsystem—ranging between strategic and operating activities—the primary concern is integrating internal activities that have been specialized by function and /or level. For example, system management facilitates coordination of several functions, projects, or programs within the overall organization (Petit, 1967: 341-350 and Kast and Rosenzweig, 1979: 111-114).
- (c) Managerial Roles: Mintzberg (1975: 61) suggested that one useful way is to view daily managerial work as a set of roles for a good manager. Three major roles are:
- **Interpersonal roles**: Interacting through oral and written communications with persons inside and outside the work unit.

- Information roles: Information processing—by giving, receiving, and analyzing information.
- Decision roles: Using information to make decisions that solve problems and/or take advantage of opportunities.

Mintzberg (1975: 61)

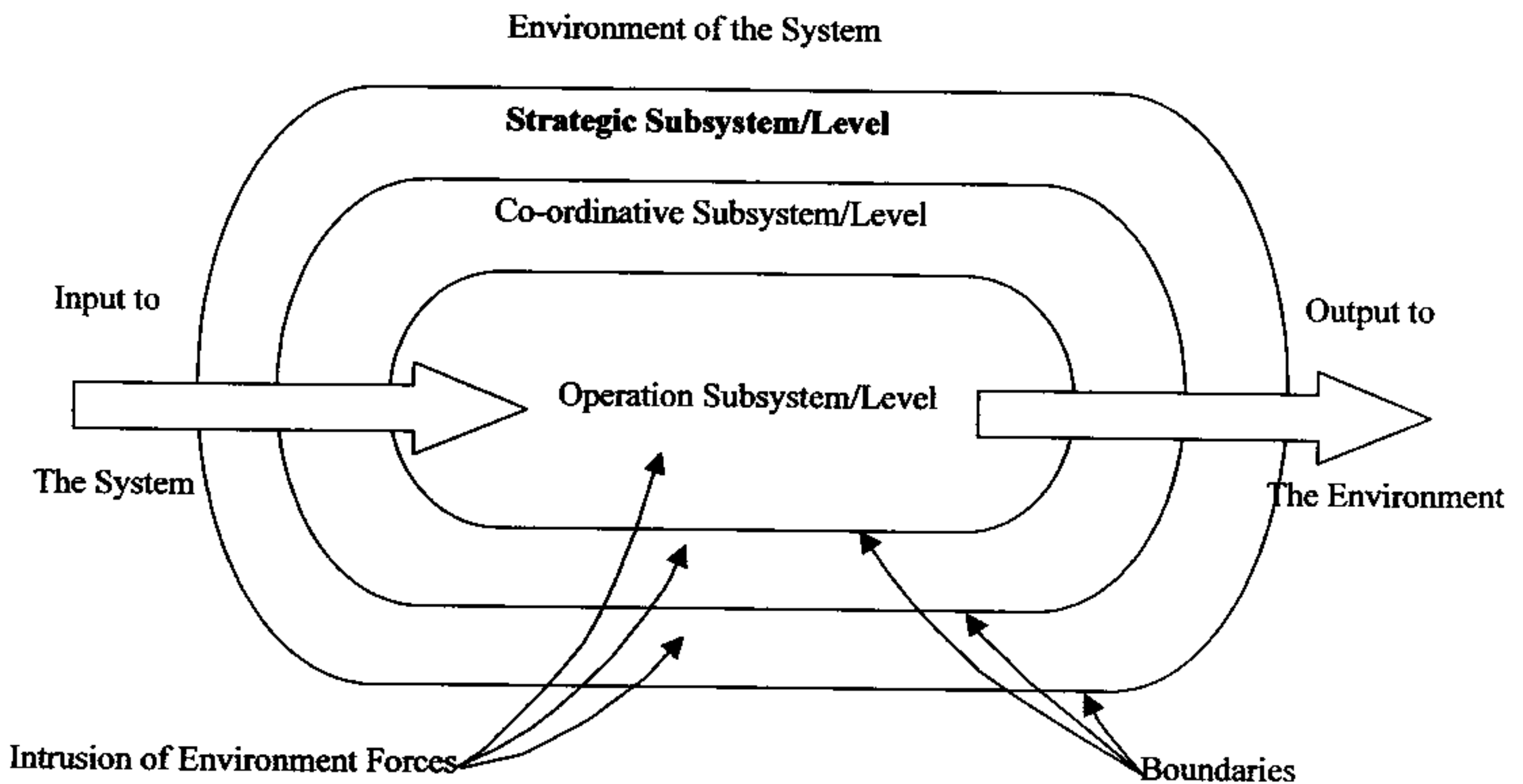


Figure 2.5 Organizations as Composite of Strategic, Coordinative, and Operating Subsystems/Level

Source: Thomas A. Petit 1967. "A Behavioral Theory of Management", Academy of Management Journal.

2.3.2 Framework of Internal Factors Affecting Organizational Performance.

The following framework seems to be the most productive for analyzing internal factors affecting organizational performance.

2.3.2.1 Organization Design Variables: Use the framework of organization design variables established by Lorsch and Allen (1973), Lorsch and Morse (1974), Galbraith (1977) who identified the major design variables to be considered when matching organizational forms to strategies, as shown in Figure 2.6. The product-market strategy chosen by the firm determines to a large extent tasks diversity and uncertainty with which the organization must cope. The people are matched with tasks through selection, recruiting, training and development practices, while the structure is chosen to fit to the task and people. Finally, the reward system must be matched with the task, structured through choices of compensation, career paths, leader behavior, design of work. In sum, all of these choices must create an internally consistent design to enhance organizational performance.

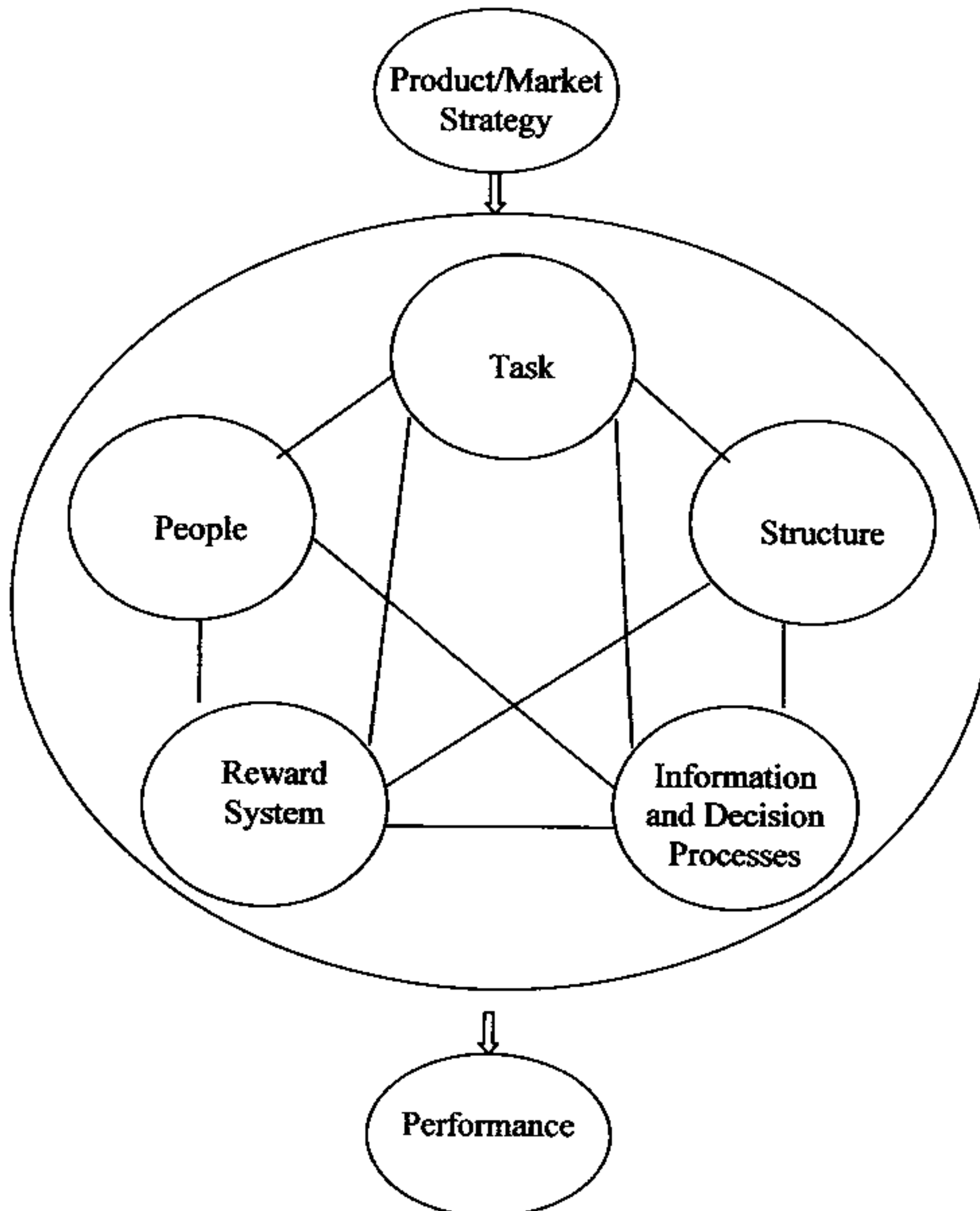


Figure 2.6 Scheme Showing Fit Among Manager Organization Design Variables

Source: J. Galbraith 1977. Organization Design, Reading, and Mass: Addison-Wesley.

2.3.2.2 McKinsey's 7-S Approach. According to Pascale and Athos (1981) and Waterman (1984:333-339), the 7-S framework for management analysis was developed by the consulting firm of McKinsey & Company, which determined that structure, systems, style, staff, shared values, and skills are the key productive factors for enhancing organizational performance. Their general meanings are:

- i. **Strategy:** Systematic action and allocation of resources to achieve the company's aims.
- ii. **Structure:** Organizational structure and authority/responsibility relationships.
- iii. **Systems:** Procedures and processes such as information systems manufacturing process, budgeting and control processes.
- iv. **Style:** The way that management behaves and collectively spends its time to achieve organizational goals.
- v. **Staff:** The people in the enterprise and their socialization into the organizational culture.
- vi. **Shared value (super-ordinate goals):** The values shared by the members of an organization.
- vii. **Skills:** Distinctive capabilities of an enterprise are generally referred to as the strengths and weaknesses of the firm.

2.3.2.3 Pearce and Robinson (2000: 399-400) added that McKinsey's 7-S was a widely accepted framework to identify the key factors for superior performance and to ensure effective execution of strategy. Figure 2.7 shows the factors that have direct and indirect relationships among themselves, thus making these factors interdependent. Changes in one part of the organization affect other parts.

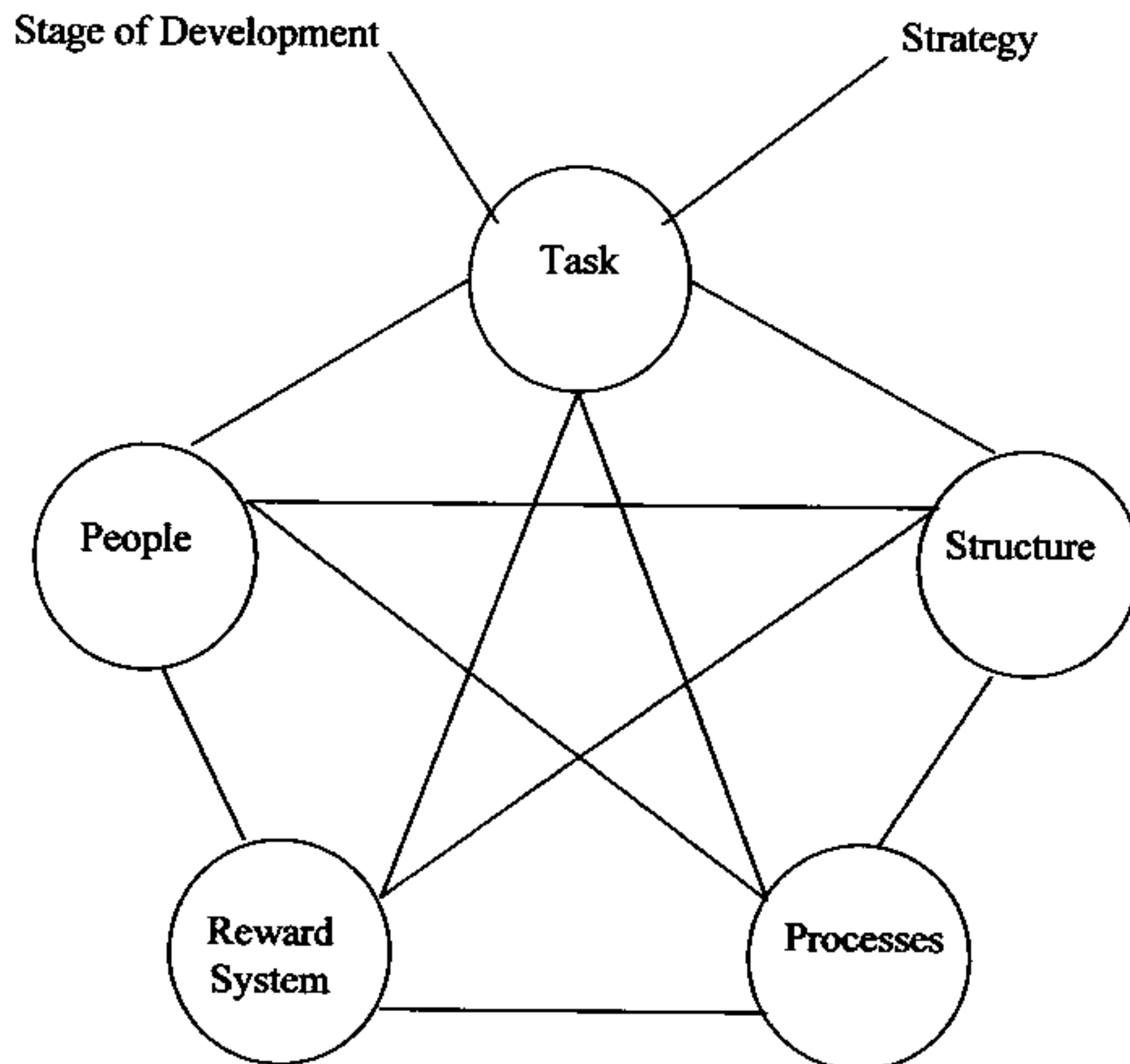


Figure 2.7 McKinsey's 7-S Framework

Source: John A. Pearce and Richard E. Robinson, Jr., 2000. Strategic Management: Formulation, Implementation, and Control, 7th ed., New York: McGraw-Hill Inc.

2.3.2.4 Walton (1986:226-231, quoted in Miller, 1998; 98-112) established the framework of planning management organization to analyze the organization. The inputs into the design process and value outcomes of the organization are added, while the design elements within the organization are the same as the major

components of organization analysis of an innovating organization as developed by Jay R. Galbraith.

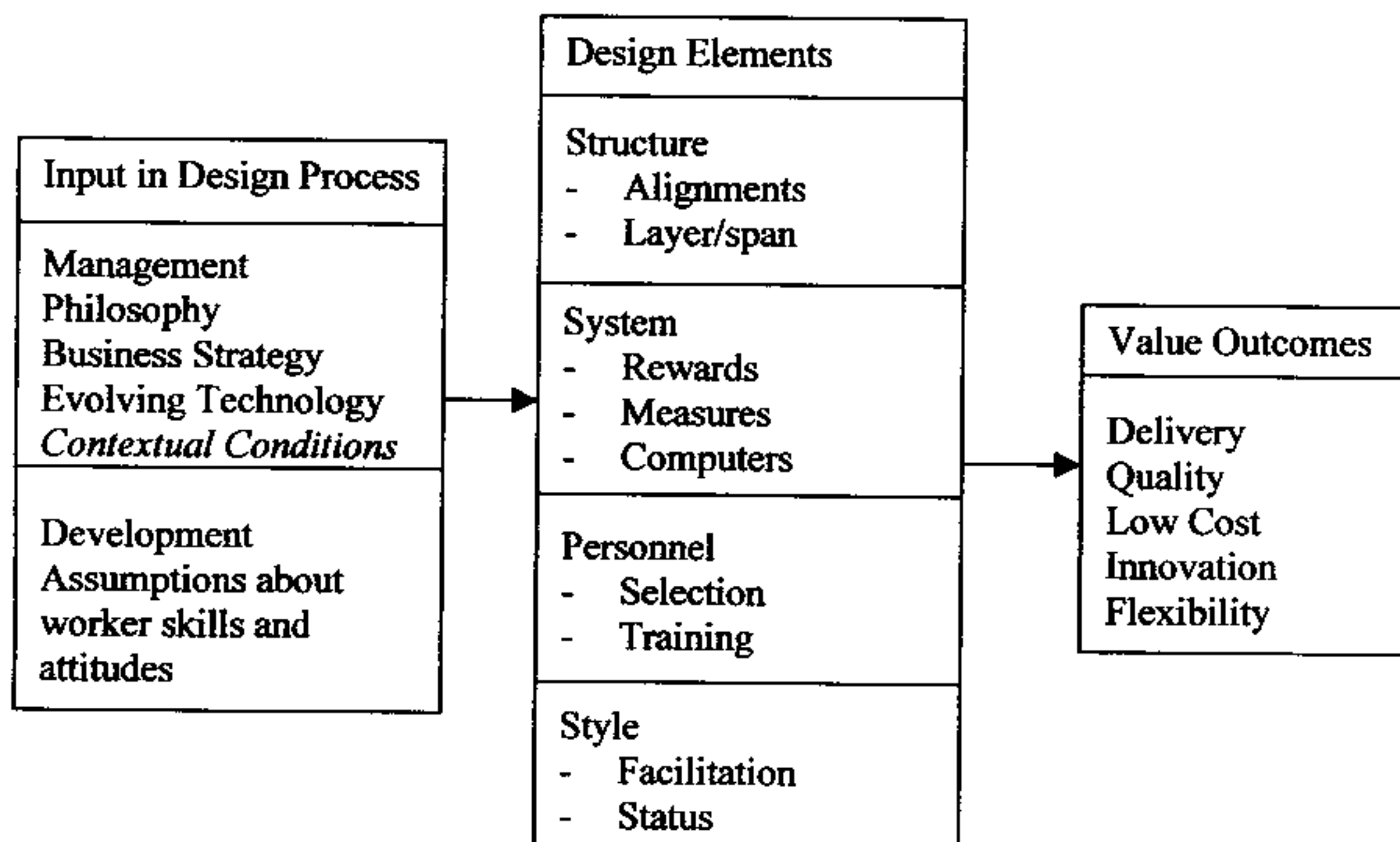


Figure 2.9 Framework for Planning Management Organization

Source: Alex Miller 1998. *Strategic Management*, 3rd ed., New York: McGraw-Hill Co., Ltd.

2.3.2.5 Walton (1986) concentrated on the vision leading to management restructuring and focused on the external environmental variables, such as management philosophy, business strategy, contextual conditions, and evolving technology. The external environmental variables would be the input into the organization as a system. Figure 2.8 shows the inputs in the design process, design elements and value outcomes in more detail.

2.3.2.6 Robbins (1990) presented the framework for analyzing organizations by concentrating on the impact of various organizational structures and applications of current managerial issues to organizational effectiveness.

Organizational structures are affected by five determinants, including strategy, the number of employees, technology, the environment, and power and control. The components of organizational structures include complexity, formalization and centralization, which influence organizational design options, such as bureaucracy and advocacy, which in turn, have impacts on organizational effectiveness. In addition, current managerial issues are included in terms of managing the environment, organizational change, organizational culture (management style), organizational conflicts and evolution.

The application of current managerial issues, organization structure, organizational designs influence organization effectiveness as indicated in Figure 2.9.

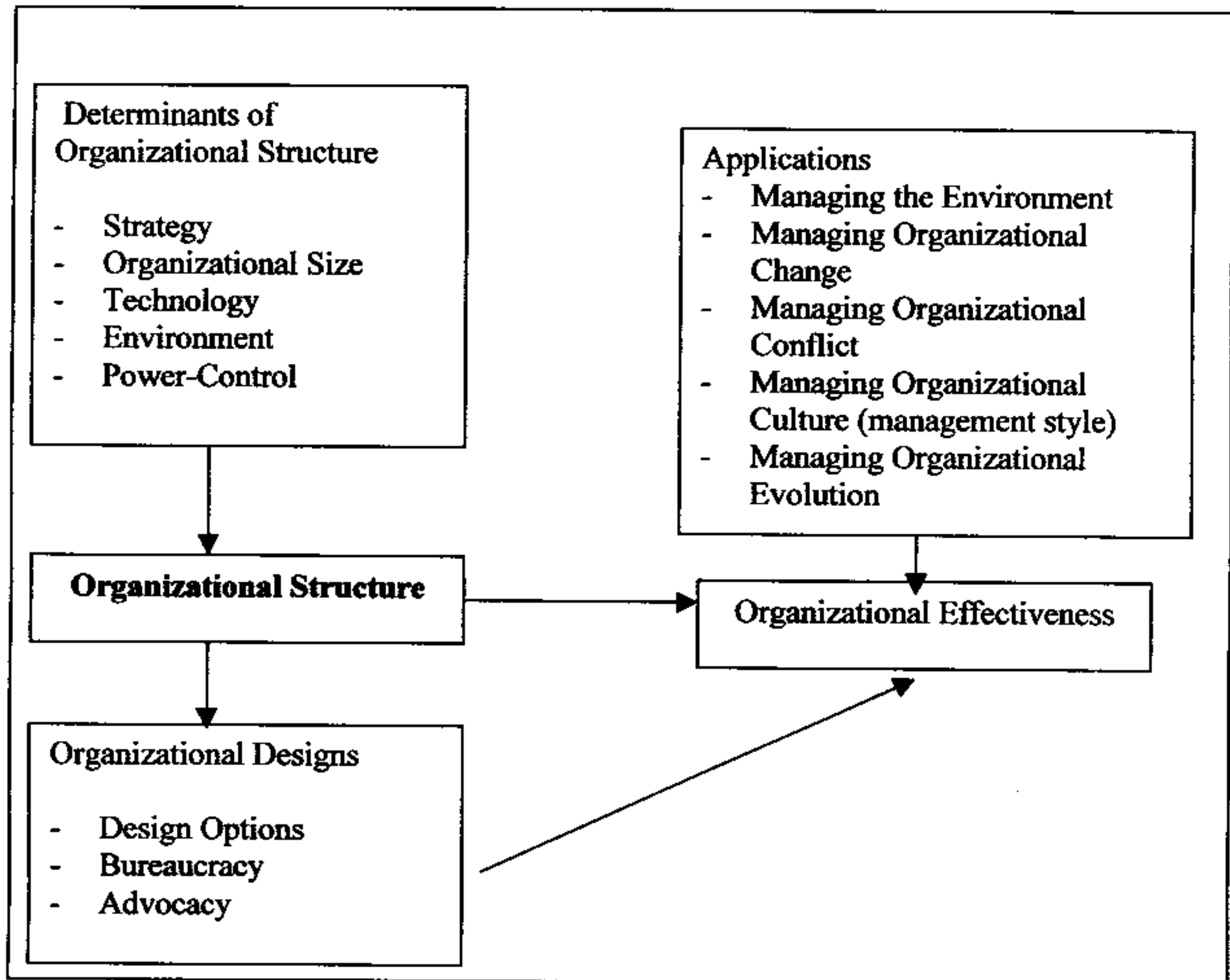


Figure 2.9 Framework of Organizational Analysis

Source: Stephen R. Robbins 1990. Organization Theory: Structure, Design, and Application, 3rd edition, New Jersey: Prentice Hill, 1990, p84-85.

2.3.2.7 Robertson and his colleagues (1993) developed the theoretical model of the dynamics of planned organization change. Figure 2.10 illustrates the interconnectedness of elements affecting organizational change.

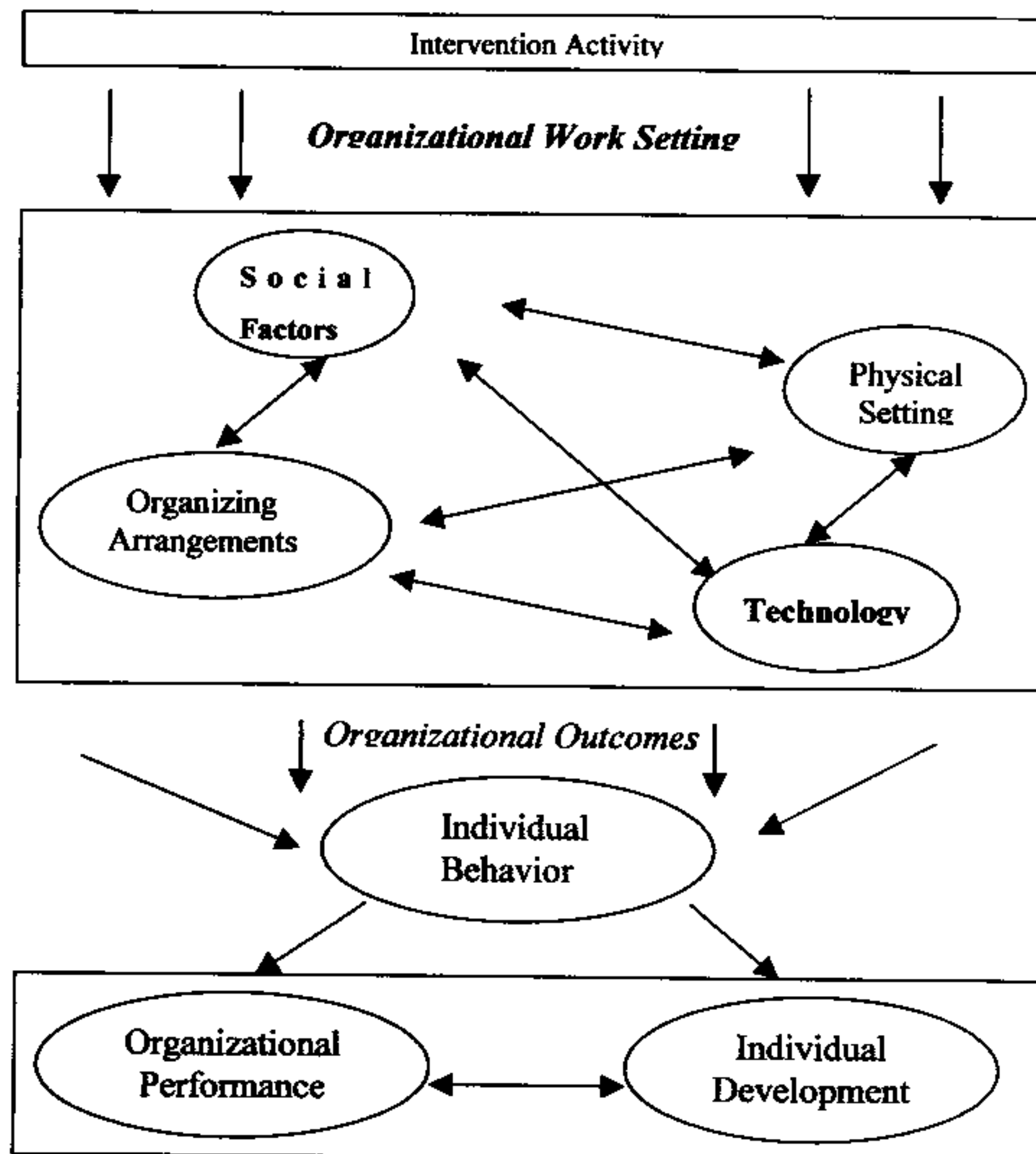


Figure 2.10 Theoretical Model of the Dynamics of Planned Organization Change

Source: Peter J. Robertson, Darryl R. Roberts, and Jerry I. Porras. 1993. "Dynamics of Planned Organizational Change: Assessing Empirical Support for A Theoretical Model," *Academy of Management Journal*, 36 (June 1993), 619-639, Reprinted by permission.

Organizational work setting consists of social factors, organizational arrangements, physical settings, and technology, which influence individual behavior. In turn, individual behavior has an impact on organizational outcomes in terms of

organizational performance and individual development (Robertson and Robert, 1996:110).

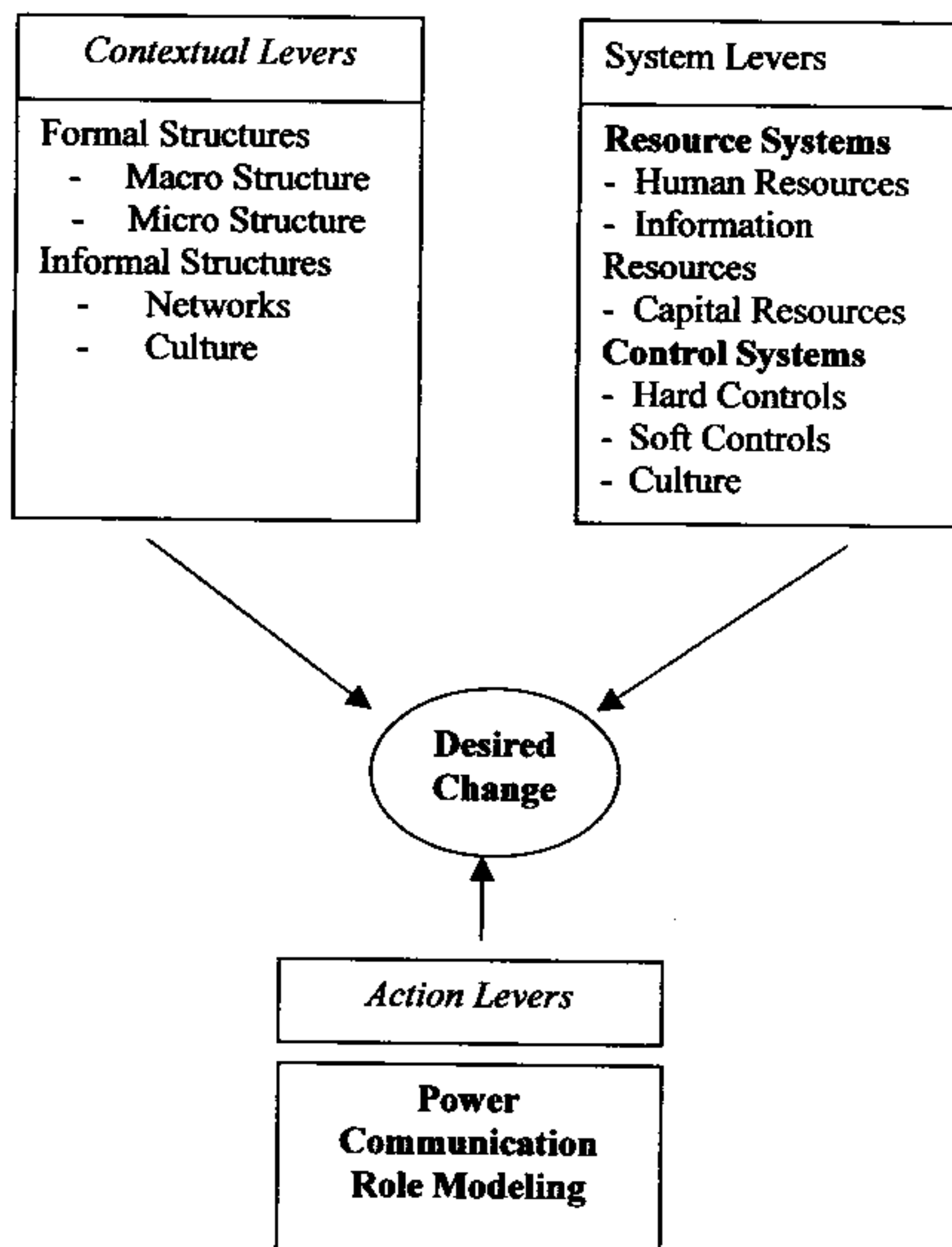


Figure 2.11 Levers Available for Affecting Change

Sources: Alex Miller 1998. Strategic Management, 3rd ed., New York: McGraw-Hill Co., Ltd.

2.3.2.8 Miller (1996:360-362) proposed that the major factors influencing significant change are: formal structures, informal structures, resource systems, and control systems. All of them will have significant effects upon desired change as shown in Figure 2.11.

2.3.2.9 Khandwalla (1992:68-69) asserted that comprehensive key factors of organizational excellence can explain common and different concepts affecting organizational performance. The common concepts are: 1) style of management, 2) structure and system, 3) strategic management, and 4) mission, vision and core values. The different concept is the organizational renewal process, which includes organizational learning, creativity, innovation, leadership, and mobilization for new tasks.

2.3.3 Theoretical Framework for Organization Analysis of Internal Factors Affecting Organization Performance

Schlesinger and others. (1992:6-12), in agreement with Koontz and Weihrich (1992:102), Bounds and others (1994:615), Kast and Rosenzweig (1979:119-135) and Michael and others (1981:12), examined the external and internal factors which affect organizations and organizational performance. The organizational analysis model that they developed has been chosen as the most appropriate for understanding the factors affecting organizational performance of energy enterprises before and after the economic crisis.

The external factor is the environment of the organization. The internal factors are strategy, technology employed, organization structure, operating system, information relationships and management style, and employee characteristics needed to achieve organizational performance. These factors are shown in Figure 2.12.

Schlesinger and others (1992: 140) enumerated the various design variables for organizational analysis. They consist of the external environment, strategy, technology, formal organization design, culture (management style), and employees that provide the framework for organizational analysis. The organization is then designed in order to have a fit and congruence among these components (see Figure 2.12).

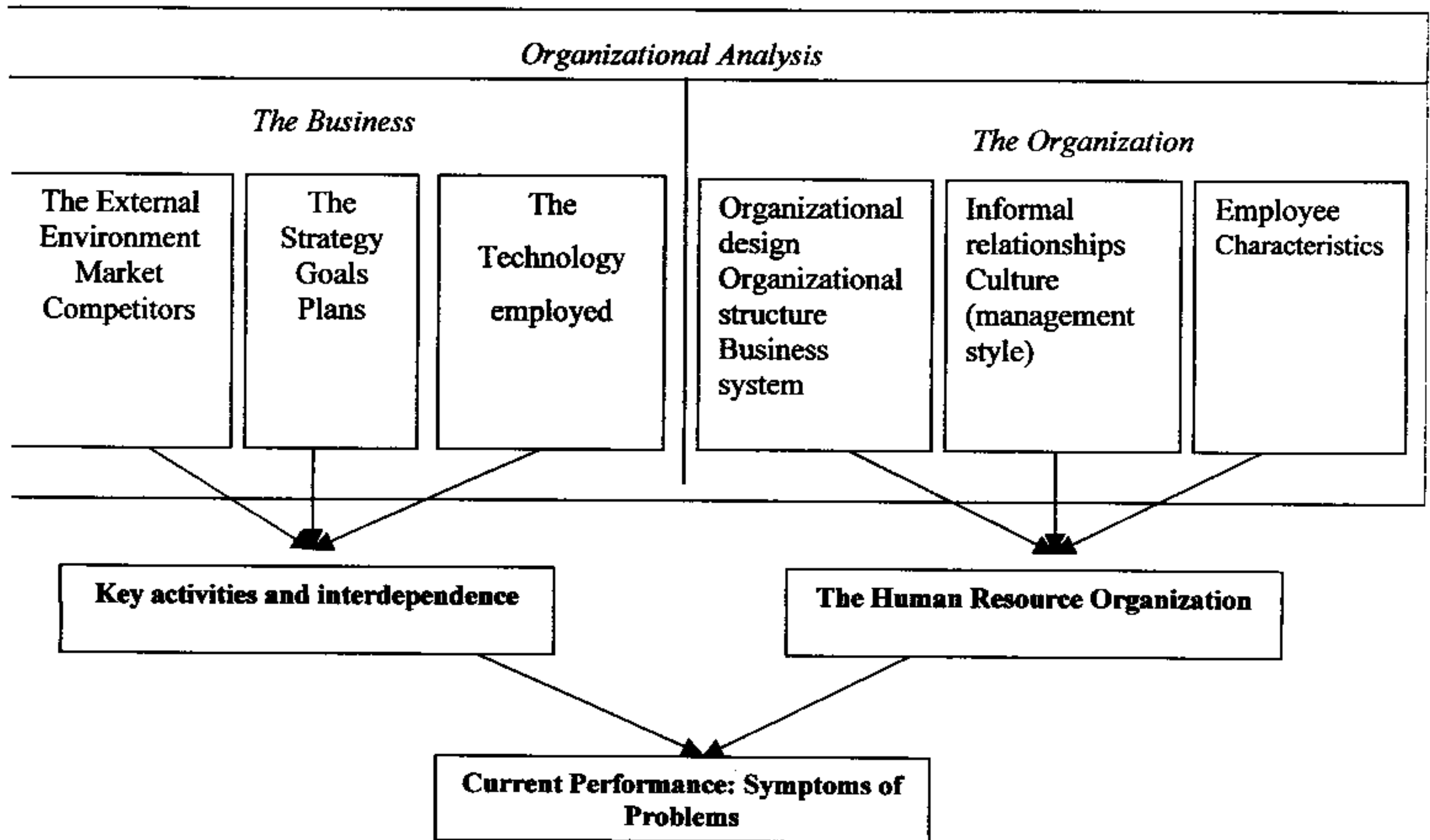


Figure 2.12 Organization Analysis Model

Source: Phyllis R. Schlesinger and Vijay Sathe 1992 *Organization*, 3rd ed., Boston: Irwin, Inc. pp. 27, 110-124

Schlesinger et al. (1992:40) further identified the set of key success factors needed to make the organization survive. These included, for example, maintaining product innovation in a high-technology industry, maintaining quality control in the production line, and so forth. Contextual factors have some influence on the key success factors. They are composed of the environment, physical settings, history, political and social milieu and strategies.

The organizational design factors are people in jobs, tasks they perform in the formal organizational structure, and operating systems, such as the reward system, and the recruiting and selection systems. The form of analysis can be summarized in the following steps:

a) To identify companies' key activities, diversity and interdependence. The key success factors, including the external environment, company technology, and strategy or goals are thoroughly examined.

b) To identify the human resources in terms of staff characteristics, formal arrangements, and informal relationships, organizational cultures (referred to in this research as management style).

c) The next step is to make a judgment regarding how well the formal organizational structure fits management systems and business processes.

d) The final step is to identify alternative organizational designs that might solve organizational problems. It should be noted that this will help define the concept of the "fit" and congruence between the components.

In summary, this mode of analysis involves making difficult judgments and takes considerable time. Definitions of factors are as follows:

- 1) **Employee characteristics:** Includes age, education, expectations, native ability, special skills, needs, drives, motives, values, and adaptability (Schlesinger et al, 1992:17).
- 2) **Management Style** (also referred to as Organizational Culture): According to Schwartz (1981), this is defined as a pattern of beliefs and expectations shared by organization members. These beliefs and expectations produce norms that shape the behavior of individuals and groups or organizations in powerful ways.

Many researchers indicate that management style is a significant determinant of organizational performance. The building blocks of different management styles can be considered as modes of management. These various modes are: conservative, entrepreneurial, professional, bureaucratic, organic, authoritarian, participatory, intuitive,

familial and altruistic. This study emphasizes the participatory mode of management, because it involves policies and practices that facilitate reaching consensus decisions by groups, which consist of superiors, colleagues and subordinates. There are also important process requirements: free and frank discussion among all concerned, sharing of ideas and information, the right of everyone to participate and speak up. The norm of expecting that everyone should speak up and the emphasis on reaching consensus decisions that take the legitimate concerns of all the participants into account in the decision process. The emphasis is placed on involving staff in decisions, mutual trust, creating a climate of collaboration, and team building and team management.

The participatory mode is powered by two core beliefs. The first belief is that a group can make better decisions than an individual because the group has more information, brains and skill available to it than any single individual. The second belief is that people will work harder to implement something they have collectively designed or decided upon. The participatory mode may be a somewhat slow mode for reaching decisions. However, it leads to better solutions because it ensures that more information is shared and many options are considered.

The participatory mode is thus especially useful when taking significant policy decisions in a complex environment, or when seeking changes and innovations in systems that may have become apathetic. The participation mode may have some weaknesses, such as the time needed for taking decisions often implies a significant cost. It could also degenerate into a system of delay through committees.

Each of the management modes differs according to its potential for organizational excellence. For the participatory mode, the related excellence indicators are: morale of employees, innovativeness, adaptability to environment, performance stability and social impact (Khandwalla, 1973)

The management style is the distinctive way the organization's decision-making apparatus performs its function. It can include autonomous decision-making, teamwork, and coaching the subordinates. Many researches argue that the style of management is a rather important determinant of organizational performance

Anthony (1999: 20) defined an organization's culture as consisting of deeply imbedded values, beliefs, philosophies, attitudes, and operating norms, which essentially boils down to "how things are done around here". However, organizational culture can refer to the following factors:

- Culture is a social construction: the elements of culture, such as values, beliefs, and understanding are held in common by all group members.
- Culture provides members with a way of making sense of events through customs and traditions.
- Within a culture, patterns of values, beliefs, expectations, understandings, and behavior emerge and evolve over time.
- Culture guides behavior: customs or traditions form the glue that holds organizations together and ensures that members behave according to the norms. Each organization's culture is unique.

Thus, culture is defined as a pattern of artifacts, behaviors, values, beliefs, and assumptions that a group develops as it learns to cope with internal and external problems of survival and prosperity (Bounds and others. 1994: 191). For example, participation, involvement, empowerment, and cross-functional teamwork are important organizational cultures identified as appropriate to implement total quality management and make business process reengineering successful. This is because people perceive similar things and trust each other, and then tend to accept the same proposed solutions. Organizational cultures help management change the course of human behavior. Informal relationships consist of informal communication, informal groups, and informal organizations. Such relationships are helpful for avoiding conflict among personnel within the organization.

3) Formal Organizational Design consists of organizational structure and business systems. a) Organizational structure is generally defined as the allocation of responsibilities, activities, and authority to individuals and subordinates. These individuals are allocated vertically and horizontally within an organization chart that describes the basic arrangement of work positions, formal authority and communication (Schlesinger, 1992: 7 and Schermerborn, 1993:271). The elements of the structure

include subunits, such as departments or divisions, a management hierarchy, rules and plans, and committees and task forces (Schlesinger, 1992:3). Three dimensions of the organizational structure are complexity, formalization, and centralization.

Complexity refers to the degree of differentiation that exists within an organization, including horizontal, vertical, and spatial differentiation. Horizontal differentiation refers to the degree of horizontal separation between units based on the orientation of members, the nature of the tasks they perform, job titles and their education and training (Hage and Aiken, 1967:72-97 and Robbins 1990:83-85). A good measurement of horizontal differentiation is the number of different occupations within an organization that require specialized knowledge and skills (Hage, 1965:285; Robbins 1990:84). Diverse orientations make it more difficult for organization members to communicate and for management to coordinate their activities. The most visible evidence of horizontal differentiation is specialization and departmentalization. Specialization refers to the particular grouping of activities performed by individuals. The functional specialization or division of labor means that the jobs are broken into simple and repetitive tasks. It creates high substitutability among employees and facilitates their easy replacement by management. A grouping of specialists is called departmentalization. Vertical differentiation refers to the depth in the structure and the number of hierarchical levels in the organization. Spatial differentiation refers to the degree to which the location of an organization's offices, plants, and personnel are dispersed geographically (Robbins 1990:84-86).

Centralization can be described more specifically as the degree to which the formal authority to make discretionary choices is concentrated in an individual unit or level within the organization, thus allowing employees (usually at lower levels in the organization) to provide minimum inputs into their work. The degree of control that an individual holds over the full decision-making process can be used as a measure of centralization. The five steps in this process are: 1) collecting information to pass on to the decision maker about what can be done, 2) processing and interpreting that information to present advice to the decision maker about what should be done, 3)

making the choice about what is intended to be done, and 5) executing or doing it. Decision-making is most centralized when the decision-maker controls all these steps.

Formalization refers to the extent to which rules, policies, procedures, formal training, norms, socialization and traditions serve to standardize employees' behavior in an organization. Standard behavior is a primary method for coordinating and controlling employee activities (Bedeian and Zammuto, 1991:129 and Robbins, 1990: 93-96). The formalization can be explicit or implicit, including written records and employee perceptions. Socialization refers to an adaptation process by which individuals learn the values, norms, and expected behavior patterns for their jobs and the organization of which they are a part (Robbins, 1990:97-100).

2.4 Business Systems

Business systems are routine and standardized ways of performing significant management functions, such as planning and goal setting, choosing investments, coordination, control, buying, marketing, financing, human resources, scheduling, operations, quality control, plant maintenance, public relations, etc. (Khandwalla, 1992:176). It is generally agreed that there are many ways to view the system of the business organization. Bounds (1994:304-308) noted that the most comprehensive concept for differentiating the key elements of the organizational system covers processes, operations, policies and motivators, and technology.

2.4.1 System versus Process: a system differs from a process in several ways. The scope of systems is broader. A system is composed of multiple and diverse kinds of processes, such as marketing, production, engineering, and finance. Furthermore, the flow of work is not simply sequential from one operation or process to another. Rather, the processes are interdependent and influence each other in what can be a complex inter-connection of relationships.

2.4.2 Policies, Motivators, and Technology: Technology includes the knowledge and tools needed for doing the work to add value to the goods and services produced.

making the choice about what is intended to be done, and 5) executing or doing it. Decision-making is most centralized when the decision-maker controls all these steps.

Formalization refers to the extent to which rules, policies, procedures, formal training, norms, socialization and traditions serve to standardize employees' behavior in an organization. Standard behavior is a primary method for coordinating and controlling employee activities (Bedeian and Zammuto, 1991:129 and Robbins, 1990: 93-96). The formalization can be explicit or implicit, including written records and employee perceptions. Socialization refers to an adaptation process by which individuals learn the values, norms, and expected behavior patterns for their jobs and the organization of which they are a part (Robbins, 1990:97-100).

2.4 Business Systems

Business systems are routine and standardized ways of performing significant management functions, such as planning and goal setting, choosing investments, coordination, control, buying, marketing, financing, human resources, scheduling, operations, quality control, plant maintenance, public relations, etc. (Khandwalla, 1992:176). It is generally agreed that there are many ways to view the system of the business organization. Bounds (1994:304-308) noted that the most comprehensive concept for differentiating the key elements of the organizational system covers processes, operations, policies and motivators, and technology.

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2.4.2 Policies, Motivators, and Technology: Technology includes the knowledge and tools needed for doing the work to add value to the goods and services produced.

Policies and motivators are means used by leaders to transfer their vision and encourage people to behave appropriately.

2.4.3 Process versus Operations: Operations involve work performed by people and machines on materials or information. Process refers to the flow of products, materials, or information from one worker or workstation to another; the flow across operations. For example, the strategic planning process may involve many operations, including forecasting, market analysis, financial analysis, and customer analysis. Process exists in many business functions. Production processes are characterized by the flow of materials across operations. In contrast, business processes are characterized by the flow of information across certain decision points, or the flow of paper from one operation to another. Some of the processes for various functions are as follows:

- Distribution process of receiving, shipping, storing, expediting, and transportation.
- Financial planning process of cost estimating, transfer pricing, and contract management.
- Production control process of parts planning and ordering, scheduling management, and new product planning

(Harrington, 1991).

2.4.4 Technology employed: Technology refers to the information, equipment, techniques, and processes required to transform inputs into outputs in the organization. That is, technology addresses how inputs are converted into outputs (Robbins, 1990:150).

Woodward (1965:40) proposed three types of production technology: unit, mass, and process in which the effectiveness of firms is related to the “fit” between technology and structure.

According to Powell (1992:194-208), the more routine the technology is, the more highly structured the organization should be. Kast and Rosenzweig (1979) concluded that the technical system is directly related to the environmental supra-system and to the goals and values of the organization. It also has an important impact on the structure, social relationships, and managerial systems. For routine technology, the stable-mechanistic structure is appropriate. However, for a complex, changing technology, the adaptive-organic form is more effective. In addition, organizations utilize

an increasing variety of social and behavioral technologies that are directed toward improving effectiveness, efficiency, and participant satisfaction. Job design-job enrichment represents an important example of this technology. In summary, the importance of organizational design is the development of an appropriate fit between the technology and other subsystems. The different technologies require different adaptations, which means that there is no one best design.

2.4.5 Environment: Schlesinger et al (1992:6-12) agreed with Kootz and Weihrich (1992:102), Bounds and others (1994:615), Kast and Rosenzweig (1979:119-125), Michael and others (1987:12) that environmental factors directly affect an organization, including managerial practices, non-managerial practices and organizational performance. The research by Powell (1992:119-134), Venkatraman and Prescott (1990:1-23) and Miller (1998:74-102) showed that the environment-strategy link was a consistently important factor in explaining differences in business-financial performance levels. Powell further explains that the environment influences the firm's direction, action, organizational structure and internal process.

Therefore, the management must first consider the environment in which a firm operates and the alignment of that firm's strategy, action, structure, and internal process to that environment. The external environment is defined as the external factors affecting organization and organizational performance. The environment can be divided into the general environment and the competitive environment.

The general environment comprises factors that originate beyond, and usually irrespective of, any single firm's operating situation, and this includes: 1) economic factors, 2) social factors, 3) political factors, 4) technology, 5) ecology, and 6) globalization (Pearce and Robinson 2000:71) Their general meanings are:

1) Economic factors concerned the nature and direction of the general economy in which a firm operates at both domestic and international levels. This includes the availability of credit, level of disposable income, interest rates, inflation rates, gross national product, and other economic indicators.

2) Social factors that affect a firm include the beliefs, values, attitudes, opinions, and lifestyles of people in the firm's external environment developed from cultural, ecological, demographic, educational and ethnic conditioning, such as changing work values, alterations due to geographic shifts in population.

3) Political factors refer to the legal and regulatory parameters within which the firm must operate, such as fair trade decisions, antitrust laws, tax programs, minimum wages, and the political environment.

4) Technological factors are related to technological change affecting the industry. Creative technological adaptations can suggest possibilities for new products, improvements to existing products, manufacturing and marketing techniques, such as fiber optic, wireless communication, and genetic engineering.

5) Ecological factors refer to the relationships between human beings and other living things, the air, soil, and water that support them.

6) Globalization involves growing similarity in consumer tastes and preferences, the opening of Eastern Bloc countries, powerful economic alliances, debt problems of developing countries, and the growing competitive strength of businesses in newly industrialized countries.

The general environment contains many potentially significant opportunities and threats that the firm must cope with. Miller (1998:76-78) mentioned the situation facing an organization within its specific area of operation. The five-force framework of Michael E. Porter can be used to analyze the competitive environment, including threat of new entrants, rivalry among existing firms, bargaining power of buyers, threat of substitute products, and bargaining power of suppliers. This research focuses only on the economic factors of the general environment affecting the organization and organizational performance.

7) Strategy has been seen as a multidimensional concept that embraces all of the critical activities of the firm, providing it with a sense of unity, direction, and purpose, as well as facilitating the necessary changes induced by the firm's environment.

Hax and Majluf (1991:6) proposed a comprehensive definition of strategy. They said that strategy:

- is a coherent, unifying, and integrative pattern of decision;
- determines and reveals the organization's purpose in terms of long-term objectives, action programs, and resource allocation priorities;
- selects the lines of business that the organization is in or will be in;
- attempts to achieve a long-term sustainable advantage in each of its business areas by responding properly to the opportunities and threats in the firm's environment, and the strengths and weaknesses of the organization;
- engages all hierarchical levels of the firm (corporate, business, functional) and
- defines the nature of the economic and non-economic contributions that it intends to make for its stakeholders.

2.4.6 Hierarchical Levels of Planning. There are three basic conceptual hierarchical levels, which have always been identified as the essential layers of any formal planning processes: corporate, business, and functional levels.

The corporate level described the pattern of decisions in a company that determines and reveals its objectives, purposes, or goals. Furthermore, it produces the principal policies and plans for achieving those goals and defines the range of business areas that the company will pursue.

The business level encompasses the overall competitive theme that a company chooses to stress, the way it positions itself in the marketplace to gain a competitive advantage, such as cost leadership, differentiation, and focus strategies.

A functional strategy not only consolidates the functional requirements demanded by the composite of businesses of the firm, but also constitutes depositories of the ultimate competitive weapons needed to develop the unique competencies of the firm. The value chain is used to define the key managerial functions of the firm, and consists of

financial, human resource, technology, procurement, manufacturing, and marketing strategy.

The theoretical assertion justified by Pinches (1992:16-18) is consistent with Brigham and Gapenski (1997:28-29), Koontz and Weihrich (1994:40), Hax and Majluf (1991:286), and Porter (1980:34-40). Pinches observed that the factors affecting the value of the firm include external factors and strategic policy decisions controlled by the management. Included among the external environment factors are financial markets, government rules and regulations, tax structure, competitors, general business conditions, and the world economy, all of which directly affect functional strategies. Strategic policy decisions under management control include products or services offered, marketing, production, investment, dividends, personnel and other functional strategies, which directly affect the value of the firm. The functional strategies are categorized as non-managerial practices that directly affect the organizational performance of the firm, creating the competitive advantage and supporting corporate and business strategies.

In this research, the functional strategy is included as the independent variable, while the corporate and business strategies are excluded. However, in this study, the general environment is analyzed as affecting organizational variables and the organization performance both before and after the economic crisis in 1997.

Research based on the theoretical framework suggested Schlesinger and others (1992) generally support the proposition that the environment, strategy, technology, organizational structure, management style, business systems and processes, and employee characteristics have an influence on organization variables and organizational performance. However, the hypothesis of this study is that the general environment, functional strategy, technology, organizational structure, organizational culture, management systems and processes, and employee characteristics have an influence on organizational performance in terms of finance, customer relations, the internal business process, and learning and growth.

2.4.7 TQM and Business process reengineering

In this study, the concepts of total quality management and business process re-engineering are included in the business system and process following the organizational analysis proposed by Schlenger et al (1992).

2.4.7.1 Total Quality Management (TQM)

2.4.7.1.2 Definition of Total Quality Management:

Total Quality Management (TQM) has been adopted by successful organizations in today's business environment in order to provide quality products and services to customers. It views quality as competitive advantage and emphasizes strategic planning by the organization. The definition of TQM is defined in the three words. Total means made up of the whole; quality is the degree of excellence in a product or service provided. Management is an act, art, or manner of handling, controlling, and directing, etc. Thus, TQM is the art of managing the whole to achieve excellence. In addition, TQM is frequently referred to as any collection of changes, techniques and programs that managers choose to institute in the name of improvement. The above definition cannot provide more understanding or give one clear explanation of the basic concept of Total Quality Management. Due to the complex and confusing meaning of quality, there is no consensus on what constitutes TQM. Almost every organization defines it differently or calls it something other than TQM. For instance, Japanese writers (e.g. Ishikawa, 1985: 251) use the term "Total Quality Control" and "Company Wide Quality Control" for what American managers call Total Quality Management. In the United States, Total Quality Management is the management approach developed as Strategic Quality Management. It indicates more than a quality program. The various definitions of TQM are spelled out as follows:

Sashkin (1993: 3) defines TQM as the organization's cultural commitment to satisfy customers through the use of an integrated system of tools, techniques, and training. TQM involves the continuous improvement of organizational processes,

resulting in high quality products and services. This definition covers the essence of W. Edward Deming's philosophy of quality that will be explained below.

Besterfield and others (1995: 2) have further emphasized the role of quantitative methods and human resources in the successful implementation of TQM. They explain TQM as a philosophy and a set of guiding principles that represent the foundation of a continuously improving organization. It is the application of quantitative methods and human resources to improve all processes within organization in order to exceed customer needs now and in the future. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach.

Under a disciplined approach, TQM programs that range from lower-level to top management are: 5-S activities, quality control circles (QCC), suggestion system, employee involvement, industrial engineering, value engineering, value analysis, just in time, International Standards Organization (ISO 9000,14,000), total quality management, and total productivity improvement. The basic quality tools include management by facts, data collection, brainstorming, why-why diagrams, how-how diagrams, 5W 1H principles, work flow diagrams, Osborne's check list, and PDCA (Deming Cycle).

A study group at the 1992 Total Quality Forum defined total quality as a people-focused management system that aims to continually increase customer satisfaction at continually lower real costs. TQM is a total system approach (not a separate area or program), and an integral part of high level strategy. It works horizontally across functions and departments, involving all employees, top to bottom, and extends backward and forward to include the supply chain and the customer chain (Rampey and Roberts 1992:3).

This meaning of TQM is good enough to convert many variations of TQM, although not everyone might agree with this definition. According to this definition of TQM, it is not only the quality program but also the strategic planning of quality management. All employees throughout all functions and levels of an organization are responsible for pursuing quality, including management processes, product design,

manufacturing, marketing, finance and so on. In short, Total Quality Management is a never-ending process of improvement to bring about quality results.

It should also be noted that there is no complete agreement on the definition of TQM or how to put the concept into practice. Moreover, TQM is an evolving concept because of changes in new concepts and methods. Different organizations are at different stages of transforming to TQM. Finally, different organizations may require different forms of TQM.

2.4.7.1.2 Historical View of Total Quality Management. The history of quality control is as old as industry itself. Specialization through division of labor was introduced during the Industrial Revolution. Improved productivity decreased costs, resulting in lower customer expectation. As the product became more complicated and jobs more specialized, it became necessary to inspect products after manufacture. In 1924, statistical quality control began when W.A Shewhart of Bell Telephone Laboratories developed statistical quality control. By 1942, the American Society for Quality Control was formed and has promoted the use of quality control for all types of production and services, through the conferences and training sessions.

In 1950, Demming provided statistical methods to Japanese engineers and emphasized the role of top management in having quality responsibility. Joseph M. Juran also emphasized management's responsibility to achieve quality. According to these concepts, the Japanese set the quality standards for others to follow. In 1960, the concepts of quality control circles were adopted for quality improvement with simple statistical techniques.

2.4.7.1.3 TQM Philosophy. W. Edward Deming contributed the idea that quality is management's responsibility. Deming's philosophy made people considered him to be a father of quality control in Japan. The important steps toward improving quality, together with fourteen points of quality are as follows:

- Decrease costs because of less reworking, fewer mistakes, fewer delays, and better use of time and materials.
- Productivity improves.
- Market share increases with better quality and prices
- Company increases profitability

- Number of jobs increases

Fourteen points of quality are:

- Create constancy of purpose: allocate resources for long-term planning, research, education, and maintenance,
- Learn the new philosophy: we cannot longer live with defective materials and poor workmanship,
- Require statistical evidence of process control from suppliers,
- Reduce the number of suppliers,
- Use statistical methods to detect the sources of problems,
- Institute modern aids to training on the job,
- Improve supervision,
- Drive out the fear to express ideas and report problems,
- Break down barrier between departments,
- Eliminate production quotas,
- Create work standards that account for quality,
- Institute a training program in statistical methods,
- Institute a program for retraining people in new skills,
- Emphasize the above 13 points every day

(Lee J. Krajewski 1993: 116).

Joseph Juran: Although Juran's ideas were close to Deming's concept, the two disagreed on the amount of change needed in the management approach in order to increase a total quality system. Deming believed quality required big changes and revolution, while Juran believed that the change to quality happens much like other shifts within a company, such as the current framework for organizational decisions and actions. His quality trilogy of quality planning, quality control, and quality improvement were similar to financial planning, financial control, profit improvement. Furthermore, Juran maintained that managing for quality was not easy (Stones, 1995: 220).

Genichi Taguchi: Quality Engineering Quality engineering involves combining engineering and statistical methods to achieve improvements in cost reduction and quality improvement by optimizing product designs and manufacturing processes. A follow-up experiment should be conducted at the optimal setting to verify the results.

Kaoru Ishikawa: Total Company Involvement His contribution was the concept of quality control circles and their use. He also developed the fishbone diagram,

which assists to identify causes of quality problems. Ishikawa concluded that quality control in the West is generally delegated to only a few staff specialists and usually only in response to a serious problem. In Japan, on the other hand, managers were committed to quality, and the commitment would last throughout the life of the organization.

Malcolm Baldrige National Quality Award: The Baldrige criteria have been used to define the new management model, not as a business theory but as an assessing reality that provides the best guide to understanding, assessing, controlling and improving the organization. It was created to promote understanding of the requirements for quality excellence. Its core values and concepts foster TQM behavior and define the culture. They include customer-driven quality, leadership, continuous improvement, employee participation and development, fast response, design quality and prevention, long-range outlook, management by fact, partnership development, corporate responsibility and citizenship.

The core values and concepts are classified into the following structure of criteria:

- Leadership in collecting and sustaining a visible quality culture,
- Effectiveness in collecting and analyzing information for quality improvement and planning,
- Effectiveness in integrating quality requirements into the strategic planning process,
- Success in utilizing the full potential of the work force for quality improvement,
- Effectiveness of the company's systems for assuring quality control, with results of quality achievement and improvement demonstrated by quantitative measures,
- Effectiveness of customer satisfaction systems to determine customer requirements and meet them

(Besterfield, 1995: 20-28).

In conclusion, every TQM philosophy has emphasized total management commitment to quality, but each philosophy has its own points of focus. Moreover, Malcolm Baldrige's concept categorised TQM as strategic planning which is a new dimension for modern management models to cope with dynamic environments today and in the future. Various successful corporations in the United States use Malcolm

Badrige's model for total quality management. However, the total quality management of Demming's 14 points is accepted by various organizations in Thailand to build the firms' strengths.

2.4.7.2 Business Process Reengineering

Business process reengineering (BPR) is a major procedure of change in the internal dimension of organizations, assisting them to face the competitive and customer-oriented environment (Motwani, 1998). Hammer and Champy (1994) gave a formal definition: "Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance, such as cost, quality, service, and speed".

BPR looks at the nature of the process and tries to rearrange the work, starting from a clean slate. BPR by definition radically departs from other popular business practices such as total quality management, lean production, downsizing, or continuous improvement. Reengineering, also known as business process redesign or process innovation, refers to discrete initiatives that are intended to achieve radically redesigned and improved work processes in a bounded time frame (Yogesh, M, 1998).

The key process attributes of BPR are interfaces; that is, customers, inputs, outputs, due dates; flows: volumes, cycle times, queuing delays, information flows; Organizational support involves functional units, measurements and incentives, feedback and monitoring. There are various reasons for BPR, such as requirements for major structural changes, increased economic pressures, complex (risky) price-profiles, and service and quality needs. In addition, it is important to know about other key attributes of BPR, such as business process, business process redesign, and activities.

The business process is a set of logically related tasks performed to achieve a defined business (Davenport and Short, 1990: 10). The process concerns how the organizational activities are logically interrelated with their human resources, with an emphasis on educational training, promotion, activity rather than seniority with technology at the workplace in order to produce a specified end result (Ho, 1998: 10). For instance, the processes include developing a new product; ordering goods from a

supplier; creating a marketing plan; processing, and paying insurance claims. In addition, some of the key characteristics of business processes are: they have customers, which are defined as business outcomes; cross organizational boundaries; repetitive structures of input processing output; and performance measurement in terms of value creation (Kim Young Ho, 1998). Business processes improve and put the various minor jobs into the larger, important scope, which can accomplish many functions and various objectives.

A core business process is a set of linked activities related to cross-functional boundaries. Whenever the core business process is reengineered, the operational, technical, and business knowledge are combined to create the organization's capabilities to accomplish what the market expects and needs. Even if there are many core business processes, the business's strategic thinking will be able to meet the competition, cost, cycle time, service, and quality, which are classified as value metrics and are the objectives of business process reengineering.

Business process redesign related to specific work processes is a subset of BPR. Business Process Redesign is "the analysis and design of workflows and processes within and between organizations" (Davenport & Short 1990). Teng (1994) defined BPR as "the critical analysis and radical redesign of existing business processes to achieve breakthrough improvements in performance measures." Eight redesign 'rules' were emphasized by Hammer (1990) for improvement of processes (Hammer, 1990: 35).

- Organize around outcomes not tasks.
- Have those who use the output of the process perform the process.
- Treat geographically dispersed resources as though they were centralized, creating hybrid centralized/decentralized organizations.
- Link activities in a natural order and perform them in parallel.
- Perform work where it makes most sense, particularly decision making, information processing, checks and controls making them part of the process.
- Capture information once and at the source, minimizing reconciliation.

- Combine several jobs into one, possibly creating a case manager or case team as a single point of contact.
- Create multiple versions of processes when appropriate.

Furthermore, Hammer has characterized some commonalities of the reengineering process that are encountered in BPR. These are discussed here briefly in order to understand the process.

- *Several jobs are combined into one*

Most of the jobs or tasks are integrated and compressed into one.

This eliminates handoffs, which usually entail the errors, delay and rework. It also reduces process administration overhead and customer response time. This also improves control over the job, because the new process involves fewer people, assigning responsibility for them and easier monitoring of performance. This is called horizontal compression.

- *Workers make decisions*

A vertical compression occurs in the process by having the decision making become part of the new work. Under the mass-production paradigm, the tacit assumption is that the people actually performing work have neither the time nor the inclination to monitor and control it and that they lack the depth and breadth of knowledge required to make decisions about it. The reengineering process develops the workers' capabilities by tools and knowledge through the application of information technology, which enables them to make decisions. The benefits of compressing work vertically as well as horizontally include fewer delays, lower overhead costs, better customer response, and greater empowerment for workers.

- *The steps in the process are performed in a natural order*

Reengineering does not follow a sequentially process. It follows the natural order instead of creating an artificial line and affects speed in two ways. First, many jobs get done simultaneously. Second, reducing the amount of time that elapses between early and late steps of the process narrows the window for major change that might make the

earlier work obsolete or make the later work inconsistent with earlier. Organizations are thus less likely to encounter reworking, which is another major source of delay.

- *Process has multiple versions*

Traditional one-size-fits-all processes are usually very complex, since they must incorporate special procedures and exceptions to handle a wide range of situations. A multi-version process, by contrast, is clean and simple, because each version needs to handle only the case for which it is appropriate. There are no special cases and exceptions. The processes are designed to handle a diverse range of input and output rather than a standardized range of input and output.

- *Work is performed where it makes the most sense*

Traditional organizational work is expensive and it revolves around the specialist and not just the factory floors. In this process, it has customers, who can do some work. Involving customers in the process reduces the time consumed and makes sense for improving overall process performance. Much of the work done in the organizations consists of integrating related pieces of work that are independent of organizational unit performance. Relocating work across organizational boundaries eliminates the need for this integration.

- *Controls, checks and other non-value added work is minimized*

Conventional processes use checking and controlling, which add no value but are included to ensure that people are not abusing the process. This means that all the checking is to make sure that person is authorized to acquire the requisitioned goods in the specified amount and verify that the department's budget is good for the bill. Most organizations fail to recognize the costs associated with such strict control. It takes time and labour to do all this checking. Reengineering processes exhibit a more balanced approach to non-value added work, such as checks and controls. It often has aggregated or deferred controls. By design, these control systems will tolerate modest and limited abuse by delaying the point at which abuse is detected or by examining aggregate patterns rather than compensate for any possible increase in abuse by dramatically lowering the costs and other encumbrances associated with the control itself.

- *Reconciliation is minimized*

This is yet another form of non-value-added work that the reengineering processes minimize in its reconciliation. This is done by cutting back the number of external contact points in the process, thereby reducing the chances that inconsistent data requiring reconciliation will be received.

- *A case manager provides a single point of contact*

This is another characteristic feature, where a case manager has total responsibilities from the start to the end of the process. The case manager needs access to all information systems about how people actually perform, the process used and the ability to contact those people with questions for further assistance when necessary.

- *Hybrid centralized/decentralized operations are prevalent*

Increasingly, information technology enables companies to operate as if their individual units were fully autonomous, while the organization still enjoys the economies of scale that centralization creates. The decentralized structure ensures that each division focuses on the products and services with which it has the most expertise, and simultaneously promotes real entrepreneurial autonomy. Information technology, especially company-wide databases, makes it possible for each unit to act with freedom and with independently coordinated activities.

Reengineering profoundly changes all aspects of the business and people. Parts of the organization will be easy to change by reinventing a new way to work. However, where people are the other part, it may be very difficult to make changes. In particular, it requires not only jobs and skills to change but also people's styles - the ways in which they think and behave and their attitudes - what they believe is important about their work. These are indispensable factors for determining whether reengineering succeeds or not. Leaders must help people cope with these changes.

Information Technology (IT) acts as an enabler that allows organizations to work in radical ways which have recursive relationships (see Figure 2.13) with BPR. IT should be considered in terms of providing capable information technology. Traditionally, computer technology has played a supportive role in bringing automation to the existing

process. BPR puts more emphasis on the capabilities of IT to support a new process rather than automation alone. In BPR, IT plays an enabling role, which can bring a radical change to the process itself.

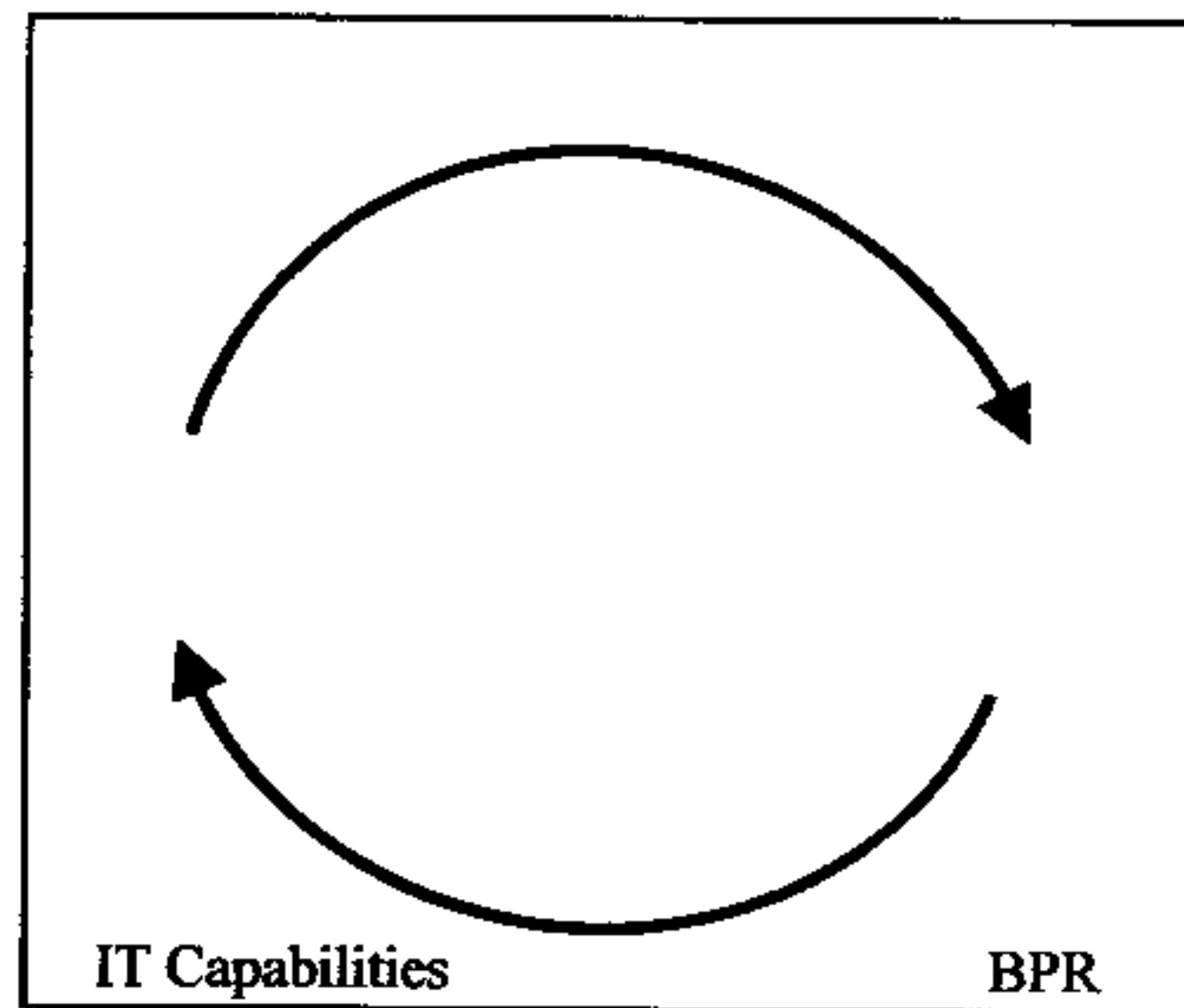


Figure 2.13 The Recursive Relationship between IT Capabilities and BPR

Source: T. H. Davenport and J. E. Short (1990 summer). "The New Industrial Engineering: Information Technology and Business Process Redesign," Sloan Management Review, pp. 11-27.

Co-ordination and integration are the key themes when redesigning the processes by utilizing IT capabilities (Davenport, 1990: 27). Business Process Reengineering is the popular term for re-optimization of the organizational processes and structures following the introduction of new information technologies into an organization. There is considerable anecdotal evidence that even small changes in the use of information technology (IT) in an organization may require major restructuring of the organization in order to take full advantage of the efficiencies created by the technology.

2.5 Functional Strategy-Value Chain

Pearce and Robinson (2000:207-211) concurred with Miller (1998: 96-111), Hill and Jones (1998: 67-78), Hax and Majluf (1992: 90) by emphasizing that the value chain is one framework for analyzing the strengths and weaknesses of key internal factors, which are related to a firm's basic capabilities, limitations, and characteristics needed to formulate its strategies, particularly the functional strategy to increase competitive advantage.

Research has shown that a firm's overall strengths and weaknesses and its ability to execute may be more important than its performance in relation to environmental factors. For example, one statistical study compared the relative importance of the overall industry variables versus business-specific variables in influencing profitability. The results indicated that a firm's actions and its ability to execute are much more important in determining its financial performance than the conditions in the surrounding industry.

Pearce and Robinson (2000:207-211) explained the value chain as follows. Value chain describes a way of looking at a business as a chain of activities that transform inputs into outputs that customers put value to. Customer's values derive from three basic sources: activities that differentiate a product's lower cost and meet the customer's need quickly. It identifies the firm's strengths and weaknesses by looking at the business as a chain process of activities.

The value chain analysis (VCA) divides the firm into sets of activities that occur within the business, starting with the inputs that a firm receives and finishing with the firm's products or services and after-sales services to the customers. VCA attempts to look at costs across the series of activities that the firm performs in order to determine where costs are low across a series of activities that the firm should perform and to determine where low-cost advantages exist. It looks at the attributes of each of these different activities to determine in what ways each activity that occurs between purchasing inputs and after-sale service helps differentiate the company's products and services.

Two broad categories, namely primary activities and support activities, are presented in Figure 2.14. Primary activities (sometimes called line functions) are those involved in the physical creation of the product, marketing and transfer to buyer and after-sales support. Support activities (sometimes called staff function or overhead function) assist the firm as a whole by providing infrastructure or inputs that allow the primary activities on an ongoing basis.

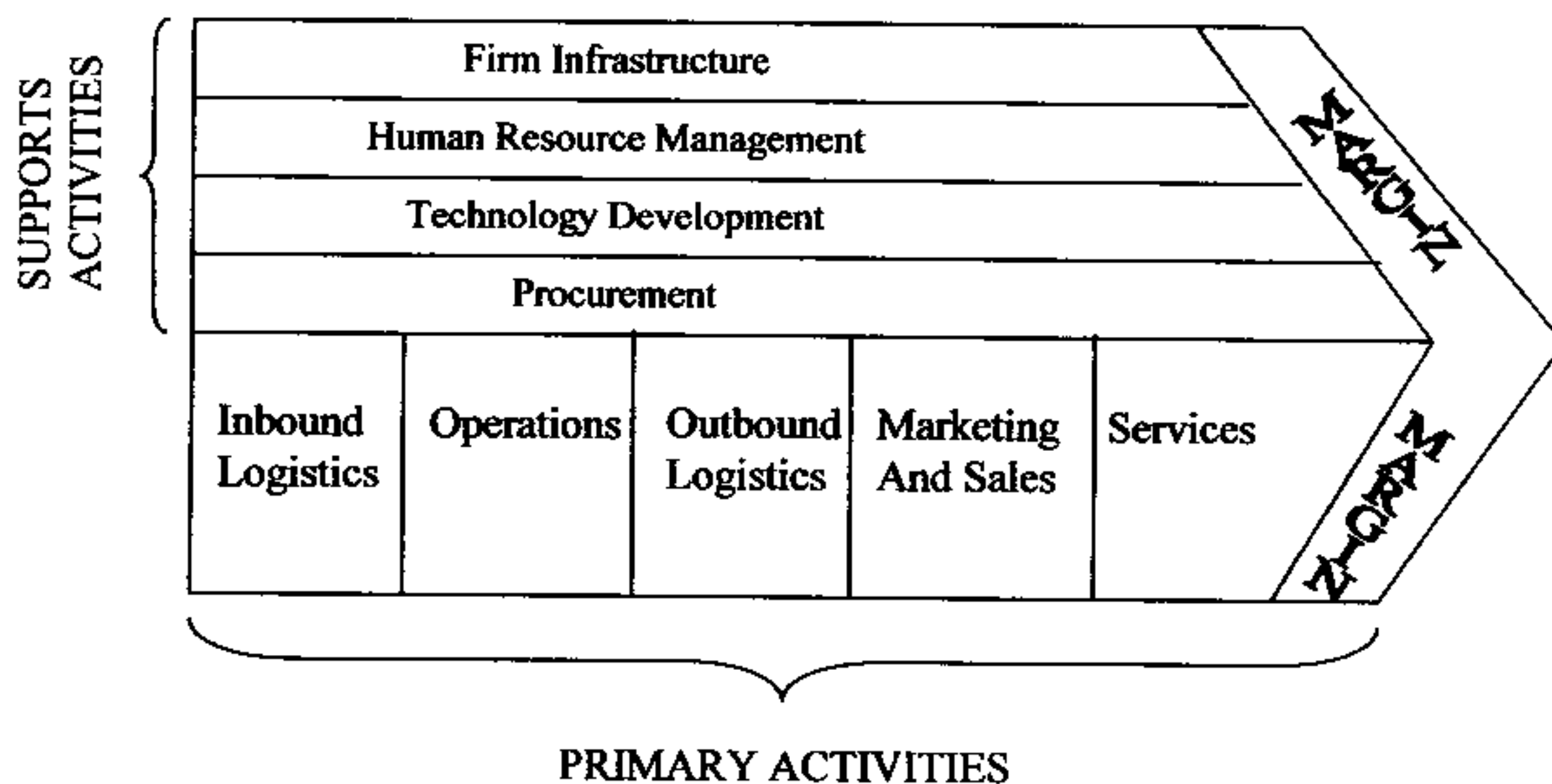


Figure 2.14 The Value Chain

Source: Adapted from Michael E. Porter. 1985. Competitive Advantage: Creating and Sustaining Superior Performance, New York: The Free Press.

2.5.1 Primary Activities

2.5.1.1 Inbound Logistics: Activities, costs, and assets associated with obtaining fuel, energy, raw materials, parts, components, merchandise, and consumable items from vendors; receiving, storing, and disseminating inputs from suppliers; inspection; and inventory management.

2.5.1.2 Operations: Activities, costs, and assets associated with converting inputs into final product form (production, assembly, packaging, equipment maintenance, facilities, operations, quality assurance, environmental protection)

2.5.1.3 Outbound Logistics: Activities, costs, and assets dealing with physically distributing the product to buyers (finished goods warehousing, order processing, order picking and packing, shipping, delivery vehicle operations)

2.5.1.4 Marketing and sales: Activities, costs, and assets related to sales force efforts, advertising and promotion, market research and planning, and dealer/distributor support.

2.5.1.5 Service: Activities, costs, assets associated with providing assistance to buyers, such as installation, spare parts delivery, maintenance and repair, technical assistance, buyer inquiries, and complaints.

2.5.2 Supporting Activities

2.5.2.1 Firm Infrastructure—Activities, costs, and assets relating to general management, accounting and finance, legal and regulatory affairs, safety and security, management information systems, and other so-called overhead functions.

2.5.2.2 Human Resource Management—Activities, costs, and assets associated with the recruitment, hiring, training, development, and compensation of all types of personnel; labor relations activities; development of knowledge-based skills.

The term human resources refer to the people in an organization. In addition, human resources are the people who are ready, willing and able to contribute to the organizational goals. Human resource departments exist to help people and determine every organization's success. Actions by human resources contribute directly to improving productivity by finding better and more efficient ways to meet objectives and, indirectly by improving the quality of work life for employees. Managers and human resource departments achieve their purposes by meeting objectives, which are the benchmarks against which action is evaluated (William and Keith 1996: 78-90). In the study of manufacturing organizations by Casio (1998), it was found that human resources systems could substantially influence performance when aligned with appropriate

manufacturing strategies, thereby supporting a contingency view of HR. Establishing such a link is only one of the many steps needed to gain a deeper understanding of how firms can manage human capital to improve their competitiveness.

The human resources manager must be concerned with five major activities: staffing, retention, development, adjustment, and managing change. The responsibilities of carrying out these activities are highly interrelated. Human resource activities taken together constitute the human resources management system (Cascio, 1998: 62).

A poor decision about staff recruitment can lead to problems in employment, placement, legal compliance, union management relations, and compensation. Most government studies and audits to date have concentrated on traditional staffing activities. Little has been done to study the use of activities that are peripheral to traditional staffing methods. In the staffing of an organization, it is important to consider its development, stage-embryonic, high growth, mature or ageing- in order to align staffing decisions with business strategies.

Staffing is comprised of activities to identify work requirements within an organization; determine the number of people and skills necessary to do the work; then recruiting, selecting, and promoting qualified candidates.

Organizations commonly screen applicants through recommendations and references, and check information about applicants. In the context of managerial selection, numerous techniques are available such as mental ability tests, objective personality tests, interest inventories, and peer assessments. In choosing the right candidate for a given situation, careful attention should be paid to four factors: the nature of the job, the estimated validity of the predictors, the selection ratio, and the cost of the predictors.

There are various alternatives for staffing or finding human resources, such as bringing people in, moving people about, and promoting people in the organization. First, bringing people into the organization covers seasonal, part-time and full-time employees, who can be hired for terms or indeterminate positions. Secondly, moving about within the organization to perform other duties either permanently through transfers and

deployments, or temporarily through assignments and secondments. Finally, employees can also be promoted in the organization, with or without competition.

Retention is another managerial activity that consists of rewarding employees for performing their jobs effectively, thereby ensuring harmonious working relations between employees and managers, and maintaining a safe and healthy work environment.

Development is the managerial activity of preserving and enhancing employees' competency in their jobs by improving their knowledge, skills, abilities, and other characteristics. Various training programs can be provided to do this. In addition, in order to maximize the effectiveness of human resources, training programs should follow three phases: needs assessment, implementation, and evaluation.

In the study by Michael (1997: 67-85) about traditional employee development programs, employers pay tuition for a variety of classes, including degree granting programs, job-related skills, personal interests, and new careers. In most cases, these programs are not related to employees' career development in the company and the employees choose their own courses and levels of participation. They have proposed that continuing education would be related to skill development (including basic education, where needed) and job paths. The manager and the worker jointly decide what courses would be useful to take and how they relate to the person's overall career development, including preparing for a job outside the company. This will facilitate flexibility and reduce dependency on lifelong employment.

William and Keith 1996: 78-90) have argued that if corporations, both large and small, lack job security, it seems that employees might be creating a structure with low inertia that could ultimately result in poor performance and perhaps their own demise

Assessment phases serve as a foundation of the entire training effort. The purpose of the assessment phase (see Figure 2.16) is to define what the employees should learn in relation to desired job behaviour (William and Keith, 1996: 98-114). In addition, it diagnoses the current problems and future challenges that can be met through training and development (Cascio, 1998: 67-70). The human resources department uses different

approaches to needs assessments such as surveys of potential trainees, group discussions, group recommendations, and the Delphi technique.

The various approaches to assessment are implemented according to the organization's needs. These needs clearly define what is to be learned before choosing particular methods. However, they depend on the objectives of the organization, which require continuing cycles of organizational analysis, operations analysis, and analysis of the training needs of employees. Training needs then are related to achievement of the broader organizational goals. Beyond these fundamental concerns, the principles of learning, goal setting, behaviour modelling, feedback and transference, relevance, repetition, and participation are essential considerations when designing any training programs.

In evaluation programs, the human resources department measures changes in terms of four levels, that is, reaction, learning, behavior, and results. These levels need to be measured to contend with employee obsolescence, international and domestic workforce diversity, technological change, affirmative action and employee turnover. In addition, evaluations indicate the performance of the workforce in the organization and provide an accurate picture of the individual.

The human resources department sets various performance standards based on job-related criteria that determine the most successful job performance. The most widely used performance appraisal techniques are rating scales, checklists, forced choice methods, the critical incidental method, accomplishment records, field review method, performance tests, and observations. Nevertheless, employees are awarded for compensation and benefits based on their abilities and capabilities [1].

Compensation includes direct and indirect payment in the form of employee benefits, and incentives to motivate employees to strive for higher levels of productivity. In addition, payment systems are tied to the strategic mission of the organization. However, the actual wage levels depend on labour market condition, legislation, collective bargaining, management attitudes, and the organization's ability to pay. Furthermore, the incentives are linked to individual performance and rewards. Many

different incentive systems exist, such as piecework, production bonuses, commission, maturity curves, pay-for-knowledge compensation, and non-monetary and executive incentives (Cascio, 1998).

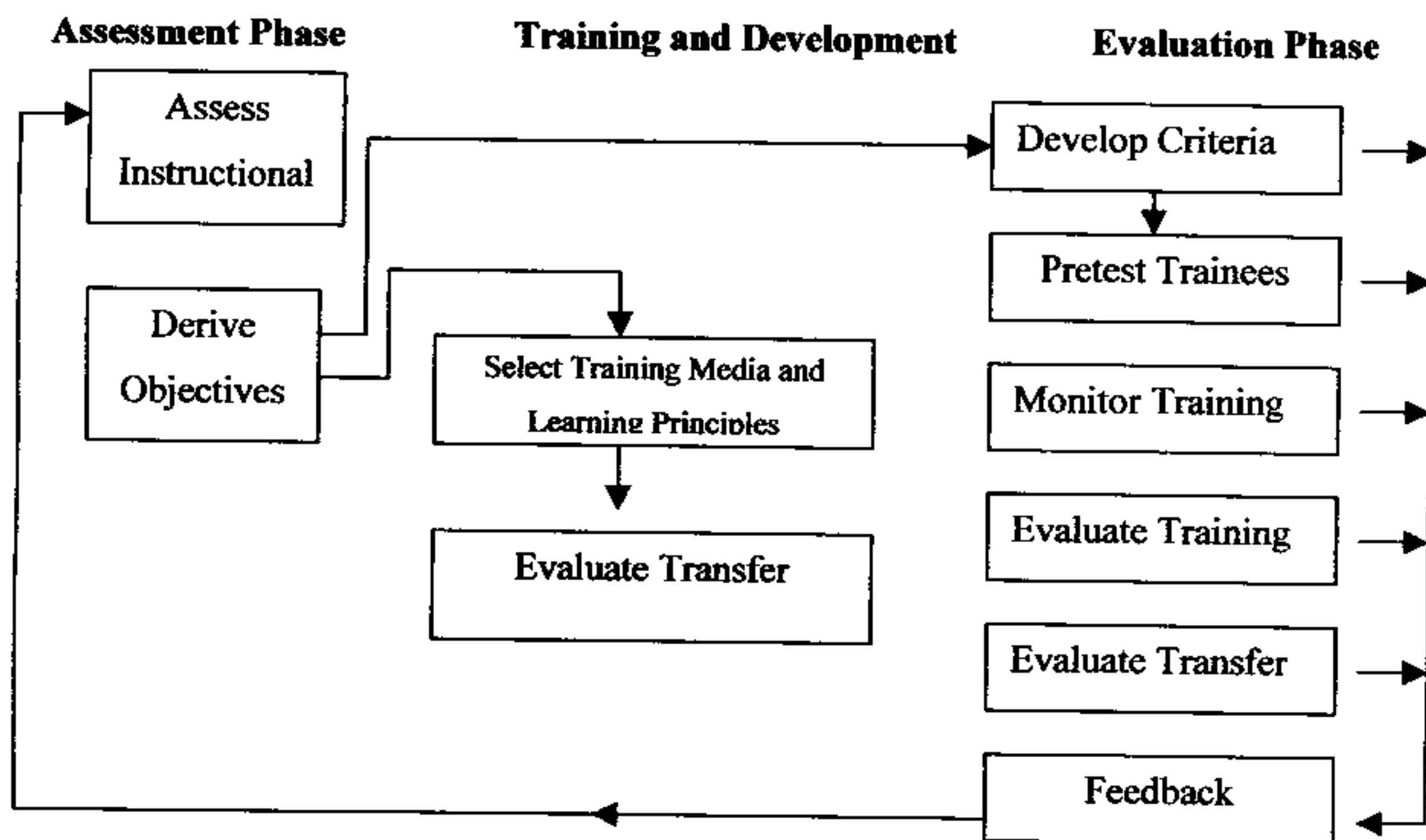


Figure 2.15 General System Model of the Training and Development Process.

Source: Wayne R. Cascio 1992. Managing Human Resources—Productivity, Quality of Work Life, Profits, 3rd ed., St. Louis, McGraw Hill, p100-120.

Benefits and services are indirect compensation because they are usually extended as a condition of employment and are not directly related to performance” (William and Keith, 1996: 147). This is the fastest growing component of compensation. There are various major components of the benefits package, such as security and health benefits or

insurance, payment for time not worked or time-off, employee services, and scheduling benefits.

2.5.2.3 Research and Development (R&D)—Activities, costs, and assets relating to product R&D, process R&D, process design improvement, equipment design, computer software development, telecommunications systems, computer-assisted design and engineering, new data-base capabilities, and development of computerized support systems.

2.5.2.4 Procurement—Activities, costs, and assets associated with purchasing and providing raw materials, supplies, services, and outsourcing necessary to support the firm and its activities (Porter, 1985, Miller, 1998: 125-127 and Pearce and Robinson, 2000: 200-215).

Sometimes, this activity is classified as part of a firm's inbound logistic purchasing activities. Figure 2.16 and 2.17 show the possible factors for assessing sources for primary and support activities' differentiation and contribution, adapted from Alex Miller, *Strategic Management* (Burr Ridge, IL: Irwin /McGraw-Hill, 1998). In this study, the questionnaires were developed regarding the functional strategy based on the literature in Figure 2.16 and 2.17.

Linkages within the value chain relate value activities. Linkages are the relationship between the way in which a value activity is performed and the cost or performance of another. For example, in a fast food chain, the timing of promotional campaigns can influence its capacity utilization. Competitive advantage derives from linkages among activities just as it does from the individual activities themselves. Linkages can lead to competitive advantage in two ways: optimization and coordination. Linkages often reflect tradeoffs among activities to achieve the same overall result. For example, a more costly product design, more stringent materials specifications, or greater in-process inspection may reduce service costs. Linkages may also reflect the need to coordinate activities. On-time delivery, for example, may require coordination of activities in operations, outbound logistics, and services (e.g. installation). The ability to coordinate linkages often reduces costs and enhances differentiation. Exploiting linkages

usually requires information or information flows that allow optimization of coordination to take place. Thus, information systems are often vital to gaining competitive advantages from the linkages. (Porter, 1985:50-52)

• Capability to identify new product market opportunities and potential environmental threats • Quality of the strategic planning system to achieve corporate objectives • Coordination and integration of all value chain activities among organizational sub-units • Ability to obtain relatively low-cost funds for capital expenditure and routine decisions • Timely and accurate management information on general and competitive environments • Relationships with public policy makers and interest groups • Public image and corporate citizenship	FIRM INFRASTRUCTURE
• Effectiveness of procedures for recruiting, training, and promoting all levels of employees • Appropriateness of reward systems for motivating and challenging employees • A work environment that minimizes absenteeism and keeps turnover at desirable levels • Relations with trade unions • Active participation by managers and technical personnel in professional organizations • Levels of employee motivation and job satisfaction	HUMAN RESOURCE MANAGEMENT
• Success of research and development activities in leading to product and process innovations • Quality of working relationships between R&D personnel and other departments • Timeliness of technology development activities in meeting critical deadlines • Quality of laboratories and other facilities • Qualifications and experience of laboratory technicians and scientists • Ability of work environment to encourage creativity and innovation	TECHNOLOGY DEVELOPMENT
• Development of alternate sources for inputs to minimize dependence on a single supplier • Procurement of raw materials (1) on a timely basis, (2) at lowest possible cost, (3) at acceptable levels of quality • Procedures for procurement of plant, machinery, and buildings • Development of criteria for lease-versus-purchase decisions • Good, long term relationships with reliable suppliers	PROCUREMENT

Figure 2.16 Possible Factors for Assessing Sources of Differentiation in Support Activities

Source: Alex Miller, Strategic Management, 3rd ed., New York: McGraw-Hill Co., Ltd. 1998.

				
INBOUND LOGISTICS	OPERATIONS	OUTBOUND LOGISTICS	MARKETING AND SALES	CUSTOMER SERVICE
• Soundness of material and inventory control system • Efficiency of raw material warehousing activities	• Productivity of equipment compared to that of key competitors • Appropriate automation of production processes • Effectiveness of production control systems to improve quality and reduce costs • Efficiency of plant layout and workflow design	• Timeliness and efficiency in delivery of finished goods and services • Efficiency of finished goods warehousing activities	• Effectiveness of market research to identify customers, segments and needs • Innovation in sales promotion and advertising • Evaluation of alternate distribution channels • Motivation and competence of sales forces • Development of an image of quality and a favorable reputation • Extent of brand loyalty among customers	• Means to solicit customer input for products • Promptness of attention to customer complaints • Appropriateness of warranty and guarantee policies • Quality of customer education and training • Ability to provide replacement parts and repair services

Figure 2.17 Possible Factors for Assessing Sources of Differentiation in Primary Activities

Source: Alex Miller, Strategic Management, 3rd ed., New York: McGraw-Hill Co., Ltd, 1998.

2.6 Relevant Research Studies

Bowers and Seashore (1966), studied 40 agencies of an American life insurance company with an interest in how the style of the organizations' leader influences the performance of the organization. Bowers and Seashore developed several measures of performance for these agencies. They then tried to relate these measures to four dimensions of leadership: the extent to which the leader extends support to his subordinates; the degree to which he facilitates interactions between them through, for example, group decision making; the extent to which the leader facilitates the work of his subordinates through planning, scheduling of work, etc.; and the degree to which the leader emphasizes the achievement of organizational goals. Bowers and Seashore found that all of these dimensions of leadership were correlated with decreasing business costs, that is efficiency.

Thune and House (1970) tried to determine whether or not formal long-range planning, an important component of professional management, contributes to corporate performance. They found that although the pairs were initially matched for size and growth rate, the planners significantly outperformed the non-planners. Indeed, the planners surpassed their own performance before they took to planning.

Khandwalla (1973) noted that over the years, a number of elements of management have been offered as panaceas: decentralization, participative management, control systems, management information systems, vertical integration, etc. Khandwalla was interested in probing whether any of these actually contributed to corporate performance. In a study of 79 American manufacturing companies, he found that none of these was correlated with the long-term profitability of the company. He noted a tendency for complex organizational designs to work in uncertain, complex environments (competition on many fronts, rapid technological change), while relatively simple organizational designs seemed to give good results in more certain, simpler environments.

A high level of decentralization, participative management, sophisticated control systems, sophisticated intelligence systems, etc. constituted organizational complexity while low levels of these features indicated simpler organizational designs. In an extension of this study, he also found that organizational complexity

seemed to give good results in mass production organizations producing goods to customers' specifications.

Child (1974) sought to understand the relationship between the nature of a company's business environment and the kind of organizational structure the company needed. He studied 82 British companies in 6 different industries. His had two measures of corporate excellence: the company's growth rate and its profitability. He found that invariably, in changing operating environments companies with a relatively less formalized structure had higher growth rates than those with a highly formalized structure. On the other hand, in relatively stable operating environments, companies with relatively highly formalized structures tended to have higher growth rates.

Structural flexibility thus seemed to facilitate rapid growth in a changing, turbulent environment. Structural rigidity seemed to facilitate growth in a stable environment. He also found that in a variable environment selective centralization of decision-making seemed to facilitate profitability, while in a more stable environment selective decentralization seemed to facilitate good performance. Child also found a positive relationship between size, formal structure, and corporate performance.

William Hall (1980) found it intriguing that in many highly competitive, mature, declining American industries like steel, construction equipment, automotive, and cigarette, there were at least a few companies with excellent profitability well above the average for the industry. He found that they single-mindedly followed one of two basic strategies: achieve the lowest unit costs relative to competitors, coupled with an acceptable product quality, and a pricing policy to gain profitable volume and market share growth (that is, a relatively low price policy based on low unit costs); or, achieve the highest product/service/quality differentiated position relative to competition, coupled with both acceptable unit costs and a pricing policy that yielded sufficient margins (that is, a relatively high price policy based on perceptions by customers of premium product quality). The high prices identified niches in which their products commanded premiums.

Ganesh (1980) studied six Indian academic institutions, all teaching management, with a view to finding the relationship between institution building processes and the performance of the institution. The stronger these processes, the

better the overall performance of the institution. Also, different groups of processes contributed to excellence on different performance indicators. For instance, strong recruitment, enculturation, regeneration and redefinition processes resulted in superior performance on capability development; strong processes vis-à-vis choice of model, decision making, structure, etc. led to excellence in innovative thrust. There were strong processes concerning choice of early leadership, leadership style, dissemination of information about the institution etc., which led to excellence in the market or domain penetration.

Paul (1982) studied six large, successful developmental programs in as many countries and found that successful programs invested heavily in a learning strategy. They started with one rather than many goals and only later diversified their goals and activities sequentially and in a phased manner. Thus, organizational learning and support building were found to be preconditions for major, successful growth initiatives. Paul also found that the organizational structure needed to be flexible and to adapt to the overall strategy for program success. He argued that all of these factors—learning, earning credibility, motivating, building commitment with beneficiaries, networking and performance monitoring—needed to be synchronized, and this orchestration was the heart of strategic management of such development programs.

Miller and Friesen (1984) inquired whether changes in organizational structure lead to change in organizational performance. And if so, what sort of organizational changes occurred. They examined changes in such uncertainty reduction variables as use of capital budgeting and environmental scanning, differentiation variables such as decentralization and departmentalization, and integration variables such as coordination committees, participative management, and sophisticated control systems in samples of North American and Australian companies. Miller and Friesen found that organizational changes were more significantly correlated among the relatively more successful companies than among the less successful companies. Thus, organizations need concerted changes in the ways they reduce decision-making uncertainty, differentiate activities for greater efficiency and control, and integrate and coordinate these activities. This would enable the organization to improve its performance in a significant way; because piecemeal or isolated changes may not lead

to excellence. In other words, for organizational changes to improve performance, these changes must reinforce one another in a synergistic fashion.

Khandwalla (1989) tried to identify the kind of management needed in developing country conditions to regenerate sick organizations. The more successful group reported far more numerous attempts at enforcing management control over operations early in the turnaround effort and many more attempts at quick pay-off projects, quick or immediate reduction in costs, and attempts at increasing sales revenues. They were also far more aggressive in mobilizing staff for turnaround through such devices as sharing the facts about the organization's sickness with them, getting staff members to participate in decision making, forming task forces to look into problem areas and to recommend solutions and help out in the implementation, etc. The more successful managements also paid more attention to better coordination of operations by forming coordination committees and setting up forums to review performance and actions in various areas of the organization.

Enthemkuzhy (1989) conducted a survey of human resource development (HRD) practices in 68 Indian organizations. He tried to measure various elements, such as HRD profile (HRD-oriented training, promotion, rewards, etc.), HRD climate (an organizational climate of trust, collaboration, authenticity, etc. in which human growth becomes likely, and the perception of existing personnel practices as development inducing). He found that while HRD profile was not correlated with organization performance, HRD climate was. Thus, while HRD as a formal system may not contribute much to organizational performance, the widespread perception of employees that they can grow in the organization may contribute. Put differently: It is not enough to have a good personnel management system; it is important that it is seen by the staff to be useful for the growth of individual staff and the organization.

Singh and Bhandarkar (1990) studied intensively five Indian transformational leaders who had effected substantial changes in the operating cultures of their organizations as well as in their performance. A number of managers in each organization rated the culture of the organization before the leader took charge and what it was some years after he took charge. These leaders apparently changed the organizational culture towards more open vertical and horizontal communications,

participative target setting, teamwork, role clarity, meritocracy, decentralization, innovativeness, risk taking, results orientation, dynamism, and concern for tasks as well as people, etc. The work of Singh and Bhandarkar suggests that the transformational leader in a developed country setting must be an effective human relations leader; he/she must also be good at boundary management, entrepreneurship, planning, and stress management.

Kingporn Thengbai (1990) studied the relationship between organization characteristics and organizational effectiveness in public sector -- the Thai bureaucracy. The organizational characteristics were classified along three dimensions: organizational structure; organizational design; and administrative characteristics. Organizational structure consists of three components: complexity, formalization and centralization. Organizational design is based on the typology proposed by Henry Mintzberg. The management style consists of six components: decision-making technology; reduction of uncertainty; management of change or conflict; organizational culture and organization growth. Multiple regression techniques were used to analyze the data. Results showed that the complexity component of organizational structure explained 42 percent of the variance when the dependent variable was effectiveness in making use of budgets and overall organizational effectiveness (significant at the 0.05 level). The relationships are summarized in Figure 2.18.

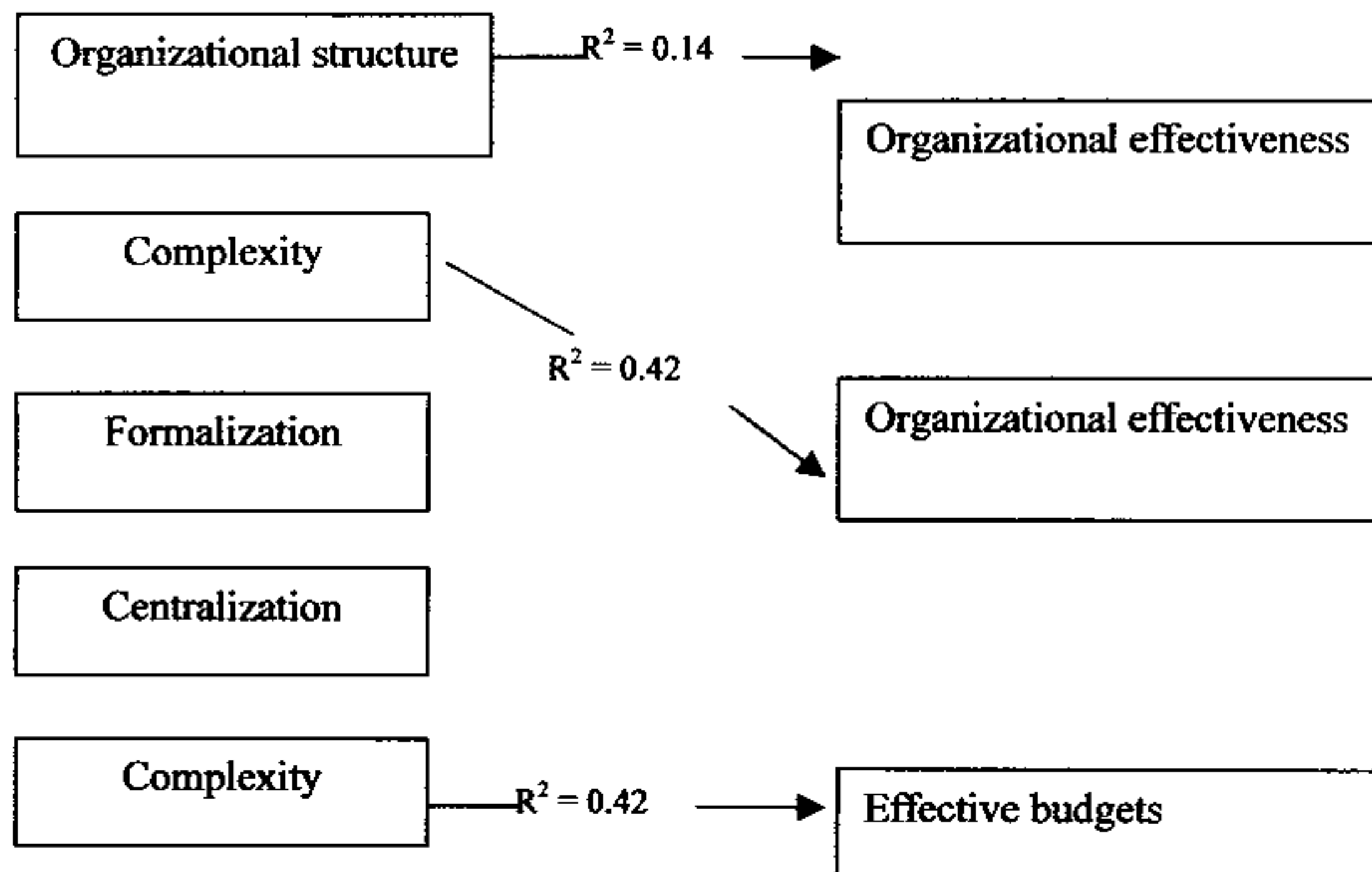


Figure 2. 18 Relationship Between Organizational Structures and Organizational Effectiveness

Furthermore, it was found that organizational design could not explain the organizational effectiveness at .05 significant level, as shown in Figure 2.18.

Alongkot Vorakee (1997) did research entitled “The relationship between decentralization and effectiveness in organizations: Case study of Thai Municipalities”, which focused on the decentralization factors within the organization and how they influenced effectiveness. Four sets of variables for decentralization were identified, namely: (1) authority and responsibility, (2) participation, (3) unity of command and (4) monitoring and control. Effectiveness, on the other hand, was measured by using three approaches: the goal approach, the system resource approach and the multiple criteria of effectiveness approach. Multiple regression analysis found that all decentralization variables positively affected organizational effectiveness, which explained 38 percent of the variance in organizational effectiveness. Authority and responsibility had the most impact on organizational effectiveness, followed by

participation, monitoring and control and unity of command and control as shown Figure 2.19.

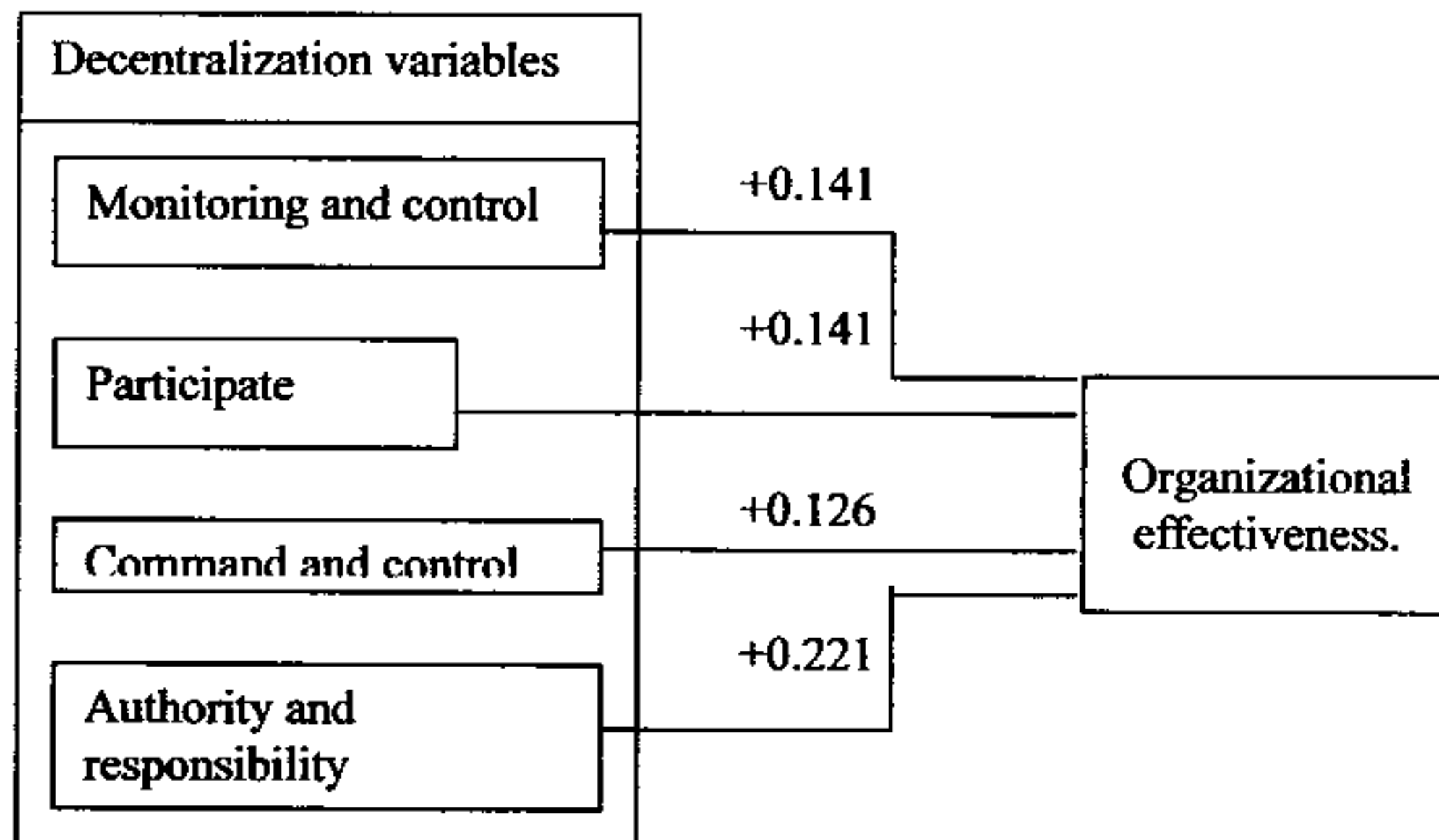


Figure 2.19 The Relationship of Decentralization Variables to Organizational Effectiveness

Aukwat Pibonvarachat (1997) did a research entitled “Privatization: A Case Study of Privatized Provincial Electricity of Authority of Thailand”. The results indicated that the key success factors for privatization were organizational restructuring, acceptance of privatization by employees, cooperation between the government officers and political parties, human resource management, and good public relation with the general public.

Zhang (1998) examined certain key internal factors of firms (e.g. distinctive organizational competencies) as a possible source of sustainable competitive advantage. He found that IS support for organizational innovation explained significant variance in firm performance. However, IS support marketing innovation was positively related to return on sales, while IS support of the business process was negative related to return on sales and return on assets.

Frydman (1999) compared the performance of privatized firms and state firms in the transition economics of Central Europe in a study entitled “When Does Privatization Work? The Impact of Private Ownership on Corporate Performance in Transition Economies”. It was found that the effects of privatization on corporate performance, while often quite powerful, were not automatic or uniform across different types of firms or different performance measures. Further, they found that privatization was effective in enhancing revenue and productivity performance of firms that come to be controlled by outside owners.

In the studies of Cragg and Dyck (1999), it was found that privatization was associated with an increased sensitivity or resignation to change in financial performance. There was also no apparent relationship between turnover and financial performance using accounting returns in the early years of privatization. Furthermore, their analysis of management replacement in the United Kingdom indicated that the replacement of human capital was an important part of the privatization process.

In a research paper entitled “ Understanding Performance Differences in Small Family Firms: A Resource-Based View” (1999), Runge examined the resource-based view of the firm to explain differences in performance among family businesses. The Structural Equation Model (LISREL 8) was used to test the patterns of relationships among the study’s constructs. He found that human resources were linked to performance when measured as information processing capacity and strategic perspective and performance. In the nest model comparison process, support was found for additional linkage between reputation and performance.

2.7 Conceptual Framework of the Study

From the literature review, the conceptual framework for guiding this study is developed in the hypothesized process diagrammed in Figure 2.20. The figure shows the overall conceptual framework of this study. There are five groups of independent factors including internal factors affecting organizational performance, which is the dependent variable in this study with a focus on the period after the economic crisis in 1997. According to the related theories of prominent scholars and related studies in

Thailand and elsewhere, this study identified some internal factors, which were not studied before as significant determinants affecting organizational performance.

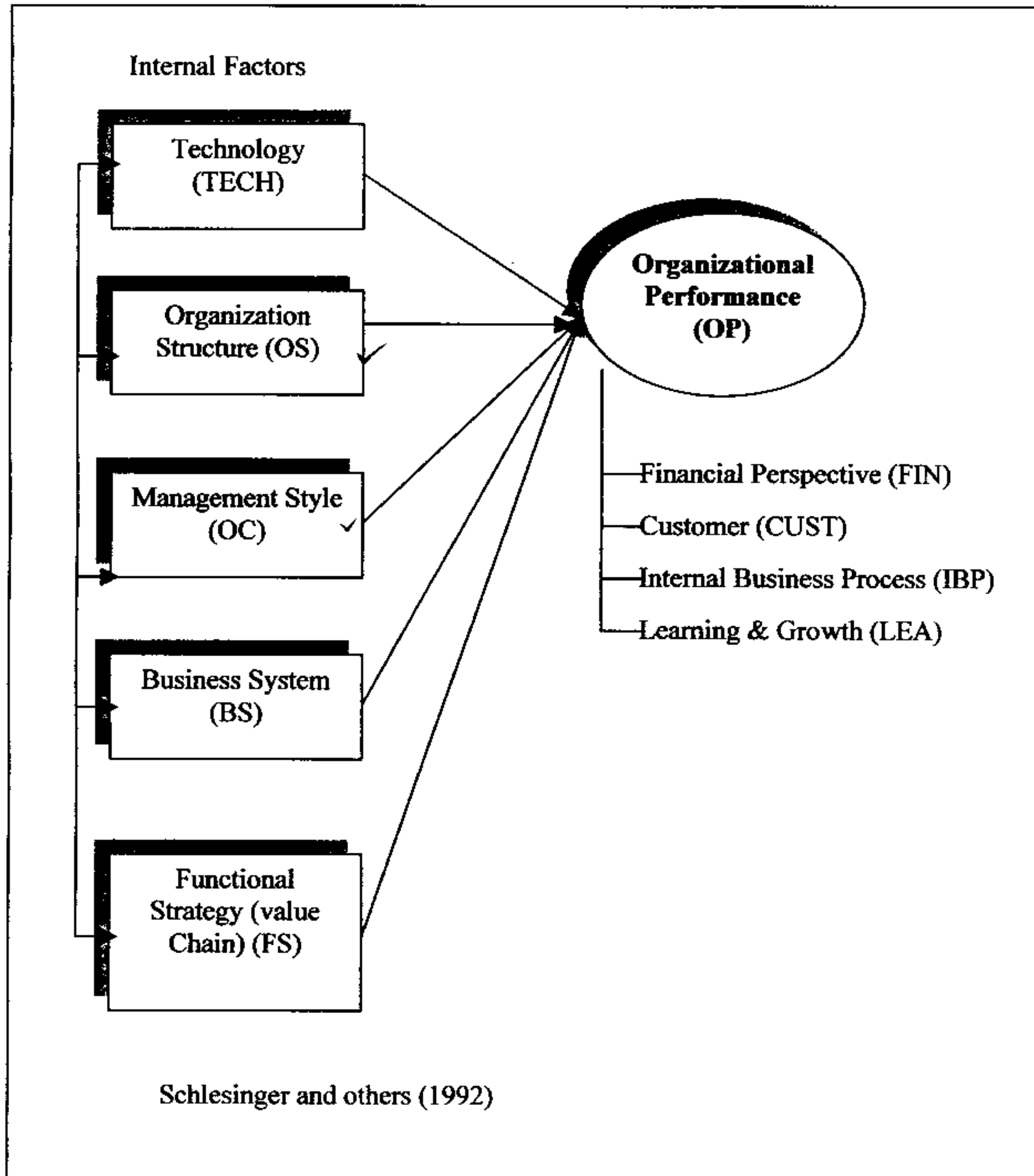
The researcher of this study has been in management of several companies for more than ten years and has attended many seminars regarding management tools and management practices to improve the organization performance. Therefore, he identified two important factors for this study: total quality management and business process reengineering, because these would help build the competitive advantage of the firm. Pearch and Robinson (2000:345), Miller (1998:234) and Hill and Jones (1998:476) validated this concept with the research they conducted.

From the literature review and personnel experiences, there needed to be an effort to analyze the determining factors which explain organizational performance in Thailand. To date, there has not been such an organizational framework model that could be used as a management tool in order to enhance the organizational performance in various organizations. For this reason, this research would study and develop an organizational model of the internal factors affecting organizational performance, which could predict the internal factors affecting organizational performance after the national economic crisis in 1997. As a result, organizations could reduce costs of operation and help the survival of the organizations.

Schlesiger and others (1992) created this basic conceptual framework from the research. Figures 2.21 and 2.22 shows the modified conceptual framework of this research.

The conceptual framework of the study is adapted from the organizational analysis model of Schlesiger and others (1992), particularly the internal structural adjustment factors as independent variables affecting organizational performance. Figures 2.20 and 2.21 show the modified conceptual framework of this study. Moreover, organizational performance was designed as a dependent variable, which is modified from various scholars in the literature (Galbraith 1997: 120, Walton, 1986:226-231, Robbin, 1990, Roberston, 1993, Schelsinger, and others: 1992). Organizational performance is considered as the outcome of the internal structural adjustment factors affecting the organization. Furthermore, organizational performance in this study was modified from the concept of a balance scorecard developed by Norton and Kaphlan (1996) to measure organizational performance in

terms of financial perspective, customer perspective, internal business process, and learning and growth perspective.



Linear Structural Relationships Equation Modeling (LISREL)

Figure 2.20 The Conceptual Framework of the Research

2.7.1 Independent Variables

Internal Factors: The internal factors are specifically defined as the firm's capability, limitation, characteristics, strength and weaknesses to create the competence provide values to the customers.

Independent Variables

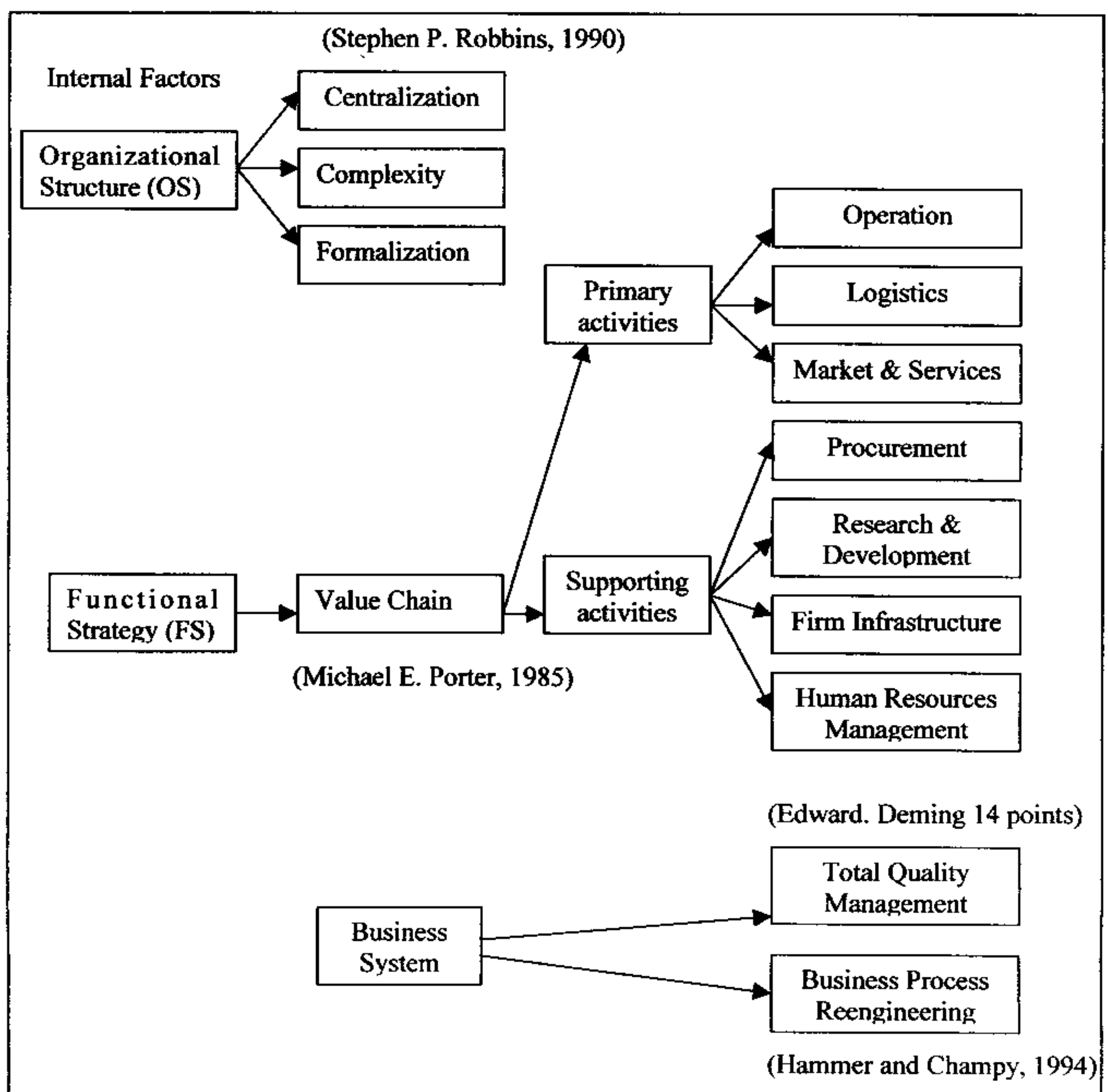
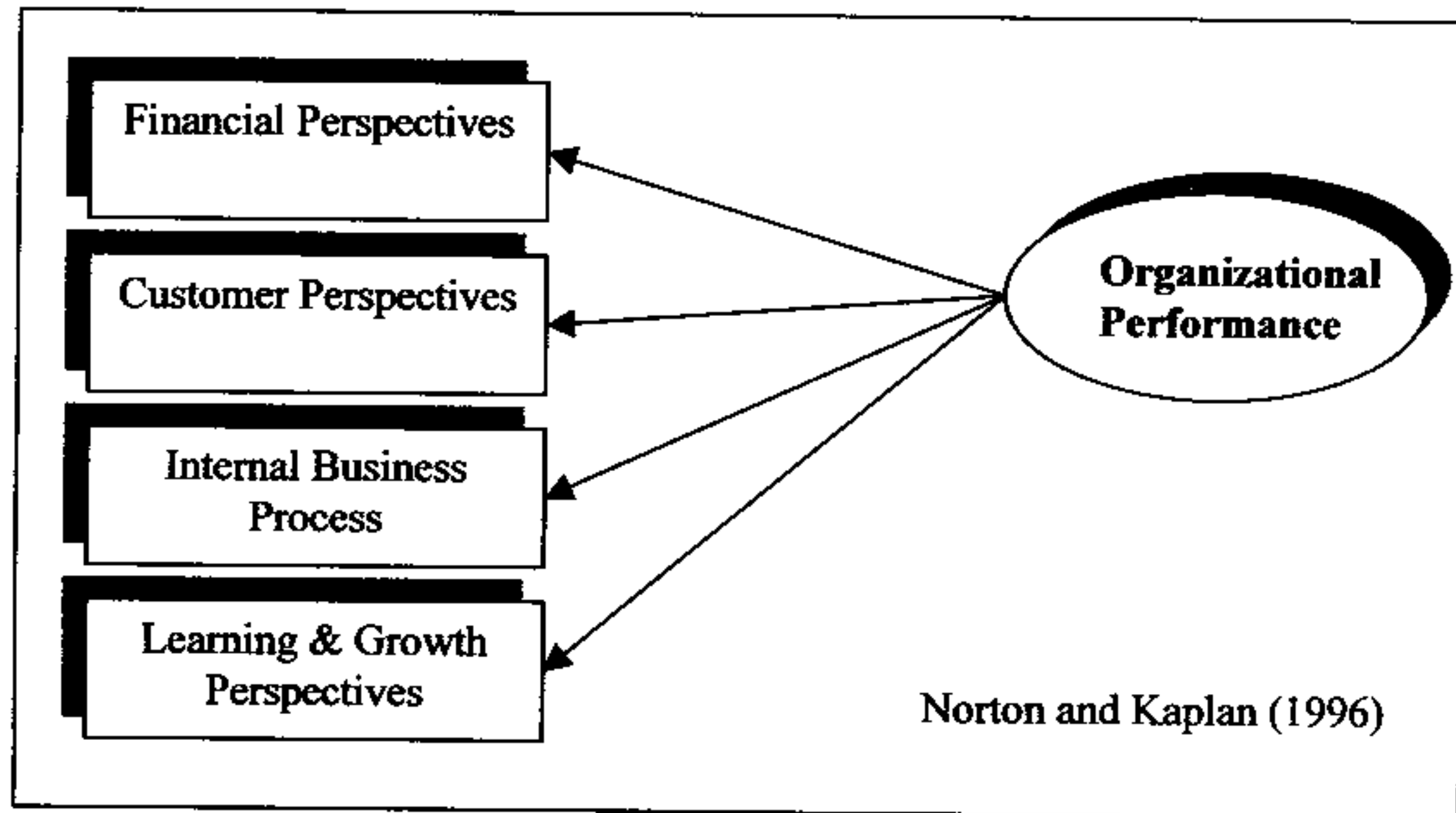


Figure 2.21 Overall Modified Conceptual Framework

Dependent Variables



Linear Structural Relationships Equation Modeling (LISREL)

Figure 2.22 Modified Conceptual Framework of Study

The first set of independent variables covers the technology employed by the firm. This concept is based on the technology development of the value chain approach developed by Porter (1985).

The second set of independent variables is concerned with organizational structure, which consists of formalization, centralization, and complexity affecting organizational performance. The theory and concepts of Schlesinger (1992), Schermerborn (1993), Robbins (1992), Waterman, (1984), and Khandwalla (1992) are included.

The third set of independent variables relate to the management style, including team work, autonomous decision making, coaching the employee.

The fourth set of independent variables is concerned with the business system within the organization. The concept in this study has a broad scope, but the focus is on total quality management (Deming 1986 Quoted in Bestfield and others, 1995:9-

13) and business process reengineering (Hammer, 1996), which are applied to improve organizational performance.

The fifth set of independent variables is related to functional strategy, while the corporate and business strategies are excluded from this study. The functional strategy is a significant factor to build competitive advantage in order to achieve increased superior performance by the organization. The theories of Porter, (1985:40-46), Miller (1998:50), Hill and Jones (1998:110-115), Pearce and Robinson (2000:115-120), Robbins (1990:56) and Hax and Majluf (1992: 145) are included. The functional strategy includes marketing and services, operations, outbound logistics, inbound logistics, firm infrastructure, human resources, and procurement. In fact, the specific function of functional strategy theoretically affects organizational performance.

2.7.2 Dependent Variable —Organizational Performance

The dependent variable is organizational performance, which means the specific ends that the organization seeks to achieve by allocating resources. It consists of four perspectives: financial, internal-business process, customer, learning and growth (Kaplan and Norton, 1996).

Financial performance of the organization is measured to evaluate the impact of the external environment and internal factors on the organization. In this study, the financial performance measures indicate whether a company's strategy, implementation, and execution are contributing to bottom-line improvement. It includes net income/ sales, net income/ total assets, current asset ratio, percentage change in net profit, earnings per share, and percentage change in earnings per share.

Customer performance of the organization is measured as annual market share and annual percentage change in sales.

The internal business process aspect of organizational performance is measured in terms of asset turnover and percentage change in total assets.

Learning and growth of organizational performance are measured in terms of employee turnover rate and absenteeism rate.

2.8 Causal Relationship Among Variables

2.8.1 Relationship between External Factors, Internal Factors, and Organizational Performance

Bounds, et al. (1994) agreed with Berrien, (1976), Katz and Kahn, (1978), Senge (1990) and described an organization as an open system related to the environment, and strategic, technological, human-culture, structural, and managerial subsystems that are in dynamic interaction with each other. Changes in one subsystem are likely to spill over and affect the behavior of other systems. They further affect the organizational performance of the organization.

The theory and concepts of Pearce and Robinson (2000:399-400) were consistent with those of Schlesinger et al. (1992), Galbraith (1997), Lorsch and Allen, (1973), Lorsch and Morse (1974), Pascale and Athos (1981), and Waterman (1984) and Khandwalla (1992), which concluded that internal factors comprising strategy, structure, technology, organization culture (management style), business system, technology, and demographic of employee have direct and indirect relationships among themselves and are interdependent factors. They further asserted that the internal factors should have a fit and congruence among the components themselves in order to enhance the organizational performance.

2.8.2 Relationship with Functional Strategy on Value Chain Analysis

According to Porter (1985: 88-82) the competitive advantages that enhance organizational performance are derived from the linkages among the value chain activities through development of information systems. These systems allow the optimization and coordination within organization. Therefore, the functional strategies should have linkages among themselves to improve organizational performance.

2.8.3 Relationships among Organization Performance Variables

Kaplan and Norton (1996: 30-31) concurred with Pearce and Robinson (2000), Miller (1998) and Hill and Jones (1998) by stating that the chain of cause and effect

should pervade all four perspectives of the balanced scorecard as the vertical vector. Learning and growth perspectives relate to employee satisfaction and skills of employees from training, which could improve the quality and reduce the cycle time of the internal process. On the other hand, the internal business process should be able to lead customer loyalty in the form of increased total sales. Thus, the return on investment is improved. The organizational performance on the financial perspective is derived from organizational performance on customer perspectives.

Model of Analysis

$$\begin{aligned}
 &\text{Organization Performance} = Y, & \text{Financial Perspective} = Y1, \\
 &\text{Customer Perspective} = Y2, & \text{Internal Business Process} = Y3, \\
 &\text{Learning \& Growth} = Y4, \\
 &Y = Y1 + Y2 + Y3 + Y4 \\
 &\text{FIN - ORP} = F(\text{TECH, OS, OC, BP, FS})
 \end{aligned}$$

Equation 1

Wherein, ORP = Organization performance, TECH = Technology, OS = Organization Structure, OC = Management Style, BP = Business system, FS = Functional Strategy – Value Chain: primary and supporting activities.

$$\begin{aligned}
 \text{FIN - ORP} &= \text{Financial Organization Performance} \\
 \text{CUST - ORP} &= \text{Customer Organization Performance} \\
 \text{IBP - ORP} &= \text{Internal Business Process Organization Performance} \\
 \text{LE\&G - ORP} &= \text{Organization Performance on Learning and Growth Perspectives} \\
 \text{CUST - ORP} &= F(\text{TECH, OS, OC, BP, FS}) & \text{Equation 2} \\
 \text{IBP - CRP} &= F(\text{TECH, OS, OC, BP, FS}) & \text{Equation 3} \\
 \text{LE\&G - CRP} &= F(\text{TECH, OS, OC, BP, FS}) & \text{Equation 4}
 \end{aligned}$$

Hypotheses

The four hypotheses proposed in this study are:

1: After the 1997 economic crisis in Thailand, the organizational performance in terms of the financial perspective (net income/ sales, net income/ total asset, current asset ratio, percentage change in net profit, earning per share, percentage change in earnings per share) of energy enterprises would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering), and the functional strategy-value chain (primary activities, supporting activities).

2: After the 1997 economic crisis, organizational performance in terms related to customers (market share, percentage change in sales) of energy enterprises would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering) and the functional strategy-value chain (primary activities, supporting activities).

3: After the 1997 economic crisis, the organizational performance of energy enterprises in terms of the internal business process (percentage change in total assets) would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering), and the functional strategy-value chain (primary activities, supporting activities).

4: After the 1997 economic crisis, organizational performance in terms of learning and growth (employee turnover, absenteeism) would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering), and the functional strategy-value chain (primary activities, supporting activities).

The SPSS and AMOS programs were used to test the research hypotheses and to help create the linear structural relationship equation model (LISEREL model) which can explain the cause-effects relationship of the factors affecting the organizational performance of energy enterprises in Thailand. Primary data was

obtained from questionnaire interviews with the top executives of the energy enterprises covering the petroleum, electricity, gas, and other businesses related to energy, such as manufacturers, distributors, their subsidiaries, and joint ventures. Secondary data was acquired from other sources, such as the Stock Exchange of Thailand, financial statements, Ministry of Commerce, etc. Investigation of the internal factors affecting organizational performance required analysis of the primary data generated by the questionnaire interviews as well as analysis of secondary data also obtained from the same sources.

2.9 Conclusion

In summary, the work of previous scholars and the related literature review lead to the conclusion that various meanings of organizational performance can enable other researchers to clarify the difficulties in measuring the organizational performance such as economic value added. However, there is no single measurement able to indicate the overall performance of the organization. Therefore, if top management uses a single approach, it might be misleading for drawing the strategic plan for the organization.

From the above literature review, it is rather difficult to have one measurement of organizational performance that can help to evaluate public organization, private firms, and state-owned enterprises. In order to have a clear concept of organizational performance, organizational effectiveness should be defined. According to the related theories of organizational performance, there are various measurement criteria that enable selection for evaluating within and among various organizations in the same industry. From finance theory, in particular, financial ratios are generally used to evaluate the performance among the organizations in the same industry.

Moreover, the balance scorecard has recently been accepted among private and public organizations to use for benchmarking to measure their performance. The individual indicators can be used for statistical analysis that is able to show cause and effect relationships. This can be considered as a useful management tool as well. In this study, the balance scorecard is used as the measurement of organizational performance for enterprises in the energy industry. Nevertheless, it should be noted

that the technique is not able to measure the public and social aspects of organizational performance.

According to the related theories of scholars and related studies in Thailand and foreign countries, the research of this study has identified some internal factors, which are not studied as significant determinants affecting organizational performance. In sum, the related studies did not cover the internal factors that will be discussed in this research, especially the integrated internal factors affecting organizational performance after the economic crisis in 1997 in case of energy enterprises in Thailand.

The two important factors included in this study are total quality management and business process reengineering which would build the competitive advantage of the firms. Pearce and Robinson (2000:345), Miller (1998:234) and Hill and Jones (1998:476) validate the use of these concepts for doing research.

Furthermore, finding the causal relationship was recommended by various researchers and scholars to measure the relationship between external factors, internal factors and organization performance, between functional strategy on value chain analysis, and between organization variables such as Porter (1985), Bound (1994), Pearce and Robinson (2000), etc.

The following concepts have been derived from the above literature review:

1. Organization structure: complexity, centralization, and formalization
2. Management Style
3. Technology
4. Business system: Total quality management, business process reengineering
5. Functional strategy-value chain: primary activities (logistic, operation, marketing and sales), and supporting activities (human resource management, firm infrastructure, procurement, and research and development)
6. Balance scorecard

CHAPTER III

THE THAI ECONOMY BEFORE AND AFTER THE CRISIS AND ENERGY ENTERPRISES

This chapter reviews the Thai economy before and after the 1997 economic crisis and covers the period from 1995 to 2000. The focus is on energy enterprises in Thailand, plus the government's energy policy, current policy on privatization of energy enterprises, privatization of the electricity industry, and the petroleum and natural gas industry.

3.1 Thai Economy Before and After the Economic Crisis

3.1.1 Thai Economy 1996 – 1999: The world economy in 1997 expanded at a satisfactory rate, and all major industrial economies, except the Japanese economy, experienced healthy economic growth. The average inflation rate was lower than the 1996 rate. Growth in world trade was higher due to a rise in exports from developed countries. Unemployment figures also declined.

Meanwhile, the economies of Southeast Asian countries grew at a much slower pace in 1997. Several countries were becoming heavily burdened by short-term foreign debts and experienced strong attacks on their currencies. Starting in Thailand, this spread to other countries in the region, namely, Indonesia, Malaysia, the Philippines and South Korea. The effect was a rapid, drastic drop in the value of all their currencies. Furthermore, this currency crisis also affected Japan, Hong Kong, Singapore and Taiwan, economies that have been closely linked to ASEAN member countries and South Korea. The United States of America and Europe were also affected as evidenced by sharp declines in sales for some industries, especially commercial aviation and computers. The currency crisis had become a major problem for countries throughout the Asian region in the second half of 1997. (Bangkok Bank Public Co., Ltd., 1997: 1).

In 1997, the Thai economy was unable to receive the full benefits of an expansion in the world economy and international trade. The major reasons were the structural problems in both the real and the financial sectors and the failure to rectify them in time. The chronic current account deficit; the failure to improve the exchange system used since the end of 1984 to be more in line with changing conditions; and the slow pace of moving industries up scale in line with rising wages were cases in point. The introduction of the Bangkok International Banking Facility (BIBF) in 1993, despite the lack of necessary financial infrastructure and the business sector's inadequate skills in financial management under the free and open market system, resulted in excessive and risky borrowing of funds from abroad.

The excessive and unproductive use of foreign funds by private enterprises resulted in serious macroeconomic imbalances. The Thai economy's decade-long high growth rate created strong pressure on prices and external balances, with a rapidly increasing dependence on short-term funds from overseas. In 1996, the Thai Government had set up new economic and trade policies in order to increase competition in line with trade liberalization and to strengthen Thai companies' competitiveness in the international market through efficiency in production, transportation and marketing. The government had also been encouraging the services sector in view of its growing economic significance to the country, to play a more active role and adjusted relevant laws and regulations in compliance with international practices for convenience and flexibility in business undertakings (Bank of Thailand, 1996: 2)

Before the 1997 financial crisis, the Thai economy had begun to slow down in 1996. A clear signal had been coming from the export sector, where, after several years of average growth above 20 per cent, actually shrank slightly for the first time. This trend continued into the first half of 1997. Meanwhile, various businesses failed to meet their foreign debt obligations. This prompted foreign investors to start losing confidence, causing a massive outflow of funds since the second quarter 1997. Furthermore, 58 finance companies were ordered to temporarily suspend their operations in the middle of the year without clear corrective measures. This finally resulted in the permanent closure of 56 finance companies at the beginning of December. The financial system thus underwent a severe liquidity crunch.

Thailand's currency in 1997 led to a crisis that uncovered financial sector weaknesses and forced the government to float the Baht. It had long been pegged at 25 Baht to the dollar. As a result of the float, the Baht reached its lowest point of 56 to the dollar in January 1998 and the economy contracted by nearly 10 percent at the same time.

Thailand appeared to enter a recovery stage in 1999. Preliminary estimates indicated that the economy expanded by about 4 percent, and most forecasters were expecting similar growth in 2000. Beginning in 1999 the Baht stabilized and inflation and interest rates began coming down. The government of Mr. Chuan Leekpai had cooperated closely with the International Monetary Fund (IMF) and adhered to its agree upon recovery program, including passage of new bankruptcy and foreclosure laws. The regional recovery boosted exports, while fiscal stimulus helped domestic demand. However, there has been slow progress in recapitalizing the financial sector. Tough measures, such as implementing a privatization plan and forcing the private sector to restructure, remained undone. (Bangkok of Thailand, 1997:16)

In 1998, the Thai economy contracted by 8 percent due to decreased domestic spending through both consumption and investment by the private and public sectors. Private consumption fell because of reduced purchasing power and greater caution in spending, which was linked to higher unemployment and job uncertainties. Private investment decreased as no new investment was necessary due to the prevailing excess production capacity. Moreover, the level for interest rates was high throughout the first half of the year, while the credit supply was inadequate to satisfy business needs. Meanwhile, government expenditure also decreased as the budget was cut to contain the cash deficit within the limit agreed with the International Monetary Fund (IMF) in line with lower revenue collections. Economic stability in terms of the current account balance and inflation improved significantly. The current account recorded a surplus of US\$ 14.3 billion, equivalent to 12.3 percent of GDP. Pressure from exchange rate depreciation on inflation eased, resulting in a decline in inflation from a peak of 10.7 percent in June 1998 to 4.3 percent in the last month of the year. These improvements mirrored, in part, the sharp contraction of economic activities.

The total value of exports fell by 6.8 percent, as a result of a slowdown in the world economy and financial crises in other Asian countries, which were major

trading partners with Thailand. The value decline was caused mainly by reduced export prices, while the export volume increased at a lower rate than in the previous year. Imports contracted in all categories in line with the economy's contraction and reductions in stocks of raw materials. This was, in part, because businesses suffered from the shortage of liquidity and working capital.

Private capital continued to record a significant outflow because of loan repayments by BIBF, commercial banks, and private businesses. There were, however, net inflows of portfolio investment and foreign direct investment for business acquisitions, to increase equity holdings in joint ventures with Thai companies, and to provide financial assistance from foreign parent firms to affiliated companies in Thailand. At the end of 1998, international reserves amounted to US\$ 29.5 billion, with foreign exchange forward obligations declining to US\$ 6.6 billion. Total external debt amounted to US\$ 86.2 billion, comprised of US\$ 54.7 billion in private debt and US\$ 31.5 billion in public debt.

The value of the Thai Baht stabilized after volatile movements during 1997 and January 1998 when the Baht value was weakest. The improvement was partly the result of the current account surplus, which increased the supply of US dollars in the domestic market, increased confidence in the exchange rate compared to the previous year, and the abolition of two-tier foreign exchange markets since the end of January.

The liquidity situation was very tight in the first quarter of 1998, but improved gradually on account of a continued expansion of deposits reflecting higher savings and greater caution in spending. Meanwhile, financial institutions were cautious in extending credits and their ability to extend credit was reduced by problems of non-performing loans and inadequate capital funds. Moreover, there continued to be uncertainties in the financial environment, difficulties with recapitalization, the repayment of foreign debt by the private sector, and providing for sub-standard loans according to BIS guidelines as required by the banking authorities. The expansion of liquidity led to successive reductions in deposit rates, lending rates, and money market interest rates. They declined significantly, particularly in the latter half of the 1998.

Despite greater liquidity in the financial system and falling interest rates, businesses continued to suffer from a severe shortage of funds. This was the result of

cautious credit extension by domestic financial institutions and call backs of loans by foreign financial institutions. Moreover, poor business confidence led to decreases in inter-firm domestic trade credits. These factors contributed to an economic contraction that was sharper than expected, which was exacerbated by the problem of non-performing loans, which accelerated during the second half of 1998. The stock market index and trading volume decreased continuously during the first three quarters of the year, reflecting poor profitability of listed companies, particularly commercial banks.

In addition, foreign investors generally became more cautious about investing in emerging markets as the financial crisis spread from Asia to other regions. Market conditions improved, however, in the last quarter of the year when foreign investors regained confidence in the Thai economic and financial situation and started to buy up inexpensive stocks. Other parts of the capital market were also active, due primarily to the issuance of government bonds, amounting to Baht 400 billion to restructure the liabilities of the Financial Institutions Development Fund (FIDF), the recapitalization of financial institutions in compliance with the authorities' guidelines, and the debt-to-equity conversion of financial institutions which borrowed from FIDF in line with restructuring of financial institutions implemented by the government.

Despite several budget cuts, the government fiscal position recorded a higher cash deficit than in the previous year owing to the significant fall in revenue, particularly corporate income tax and import duties, in tandem with the economic contraction. In contrast, personal income tax increased from the collection of tax on interest income, which rose in line with deposit expansion, while the value added tax went up when the rate was increased from 7 to 10 percent starting August 1997. While total government expenditure declined in line with budget cuts, the rate of disbursements increased to 82.3 percent. (Bank of Thailand, 1998: 5).

Two years after the onset of the East Asian financial crisis, Thailand's economic prospects had improved significantly. Recovery was still in its early stages, but it has been helped by fiscal stimulus, growing exports, and a rebound in the manufacturing sector. Real GDP was projected to grow by 3 to 4 percent in 1999. Both investment and consumption indicators were strengthening, and export as well

as import volumes have been growing rapidly. Short-term debt came down to approximately \$18.3 billion by May 1999.

The government has undertaken a wide range of measures to promote economic recovery. Significant progress has been made in restructuring banks and corporations, resolving non-performing loans, and reforming the bankruptcy regime and foreign ownership laws. Improvements have also been made in economic governance and social protection. This effort has been underpinned by the new Constitution, which aims to create a conducive environment for strengthening governance by improving transparency, empowering communities, emphasizing decentralization, promoting social capital, and addressing corruption.

It is noteworthy that the social impact of the crisis has been significant but less severe than anticipated, particularly in the areas of health and education. Effective government intervention and a remarkable degree of resilience displayed by Thai families have cushioned the adverse impact. However, the unemployment rate was expected to rise further in 1999.

Despite progress made thus far, certain factors may impede quick and sustained growth in Thailand. Quick growth will depend on regional and domestic demand, further progress in corporate and bank restructuring, and the resolution of non-performing loans. Sustained growth will depend on maintaining the right macroeconomic framework; development of financial supervision capacity; and progress in the areas of competitiveness, governance, poverty, and the environment. (Bank of Thailand, 2000: 6)

3.1.2 Current Position: Thailand is committed to the idea of promoting free trade and competition, as illustrated through the Thai economy's exposure to international competition. It is believed that this idea would create an efficient and growing economy. The basic philosophy of the economic policy is to let market mechanisms function with minimal government intervention. This policy is not only enhancing competition and efficiency in the economy, but also keeping the cost of living to a minimum. To implement this policy, the government would adopt some necessary measures to regulate unfair business practices and to protect consumers.

Competition policy and consumer protection in Thailand is currently regulated under the Price Fixing and Anti-Monopoly Act 1979 (B.E.2522). Under the Act, there

is only one authorized agency to enforce the law. This law has been in force for 20 years, even though it is widely recognized that the economic environment has been rapidly changing over time. International trade between countries has been increasingly important to the global as well as the domestic economy. The world economy has become more interdependent. To adapt to this new economic era, the law for regulating competition policy was redrafted by having an Act specifically for promotion of competition. Thailand is also updating provisions and regulations to meet the current economic situation. This idea was initiated since 1991 and is now in the process of making a new law. Once the Parliament approves this new draft, it would be used to foster competition in the Thai business environment. (Bank of Thailand, 2000: 45)

3.2 Energy Policy

Thailand's energy policy aims to ensure the availability of energy, promote free market competition for energy enterprises, and promote private investment in the country's energy affairs. Furthermore, the government energy policy aims at reducing environmental impacts from the use of energy and implementing energy conservation programs (National Energy Policy Office 1999). In addition, through the NEPO, the government provides energy policy guidelines for each of the five-year National Economy and Social Development Plans (NESDP). These guidelines vary from one period to another in order to cope with the changing economic situation (National Economic and Social Development Board, Thailand, 1997). The energy policy guideline for the Eighth NESDP covering the period from 1997 to 2001 includes requirements to:

- Provide adequate amounts of energy to satisfy demand while ensuring quality and security of supply and reasonable prices;
- Promote efficient and economical use of energy;
- Promote competition in energy activities and increase the private sector's role; and

Prevent and solve environmental problems resulting from energy development and utilization, as well as improve the safety of energy-related activities and develop legislation related to energy and energy administration.

3.3 Current Policy on Privatization of Energy Enterprises

The government seeks to privatize government-owned enterprises and increase private participation in order to increase competition and efficiency in energy-related industries. Current financial conditions provide an even stronger rationale for increasing private sector participation, since it will help to reduce national debt burdens as well as attract investment. The government has therefore decided to accelerate the privatization of the energy-related industries (National Energy Policy Office, 29 March 1999)

3.3.1 State-owned Enterprises

- Electricity Generating Authority of Thailand (EGAT)
- Metropolitan Electricity Authority (MEA)
- Provincial Electricity Authority (PEA)
- Petroleum Authority of Thailand (PTT)
- PTT Exploration and Production Co., Ltd. (PTTEP)
- Bangchak Petroleum Public Co., Ltd. (Bangchak)

3.3.2 Current Government Participation

- Thai Oil Co.: PTT holds 49 percent.
- Electricity Generating Public Co., Ltd. (EGCO): EGAT holds 25.8 percent.
- Fuel Pipeline Transportation Co., Ltd. (FPT): PTT, Bangchak, Thai Airways International Public Co., Ltd. and Airports Authority of Thailand hold 44 percent all together.

- Thai Petroleum Pipeline Co., Ltd. (THAPPLINE): PTT holds 30.6 percent. Thai LNG Power Co., Ltd. (TLPC): PTT holds 40 percent.
- Esso (Thailand) Public Co., Ltd.: the Ministry of Finance holds 12.5 percent.
- Rayong Refinery Company (RRC): PTT holds 36 percent.
- Star Petroleum Refining Co., Ltd. (SPRC): PTT holds 36 percent.
- Bangkok Aviation Fuel Services Co., Ltd. (BAFS): PTT, Thai Airways and, Airports Authority of Thailand hold 49 percent.

This list excludes a number of petroleum companies in which PTT is also a shareholder, for example, National Petrochemical Public Co., Ltd. and Thai Olefins Co., Ltd. (TOC).

3.4 Privatization of the Electricity Industry

3.4.1 Privatization of the Electricity Generating Authority of Thailand:

The Electricity Generating Authority of Thailand (EGAT) was formed following the EGAT Act 1968 and 1 May 1969, which aimed at nationalizing and consolidating the functions and responsibilities of the three independent state enterprises: The Yanhee Electricity Authority (YEA), the Lignite Authority (LA), and the North-East Electricity Authority (NEEA) (EGAT, 1999)

Currently, EGAT is under the office of the Prime Minister and solely responsible for all electric power production and transmission in Thailand. Following the amendment of the Act in 1992, EGAT can also engage in businesses concerning electric energy. In addition, EGAT can continue its activities by establishing private limited companies or public companies limited; collaborating with other local or international entities in businesses concerning with activities of EGAT or holding shares in any company.

EGAT has been responsible for six main activities related to the growth and development of the country. These are power system operations: (generation, transmission system, fuel, mine operation, reservoir operation, operational efficiency

and maintenance); power development; sales and tariffs; power system planning; demand side management; and environmental concerns.

3.4.2 Privatization of the Electricity Generating Company Limited: The Electricity Generating Company Limited was established with a registered capital of 100 million Baht with the aim to acquire some of EGAT's operations. Later, the company was converted to the Electricity Generating Public Company Limited, EGCO. It is listed on the Stock Exchange of Thailand (SET) as "EGCOMP". The main business of EGCO is to produce electricity and supply it to EGAT under long-term power purchase agreements of 15 and 20 years.

During the circumstances of the recent economic situation, selling off government stakes to get funding was considered the most suitable measure. There is no better way that the security of the country's energy supply should benefit from diverse management and energy sources.

In July 1998, EGCO sold 78 million share or 14.9 percent of EGCO at US\$ 241 millions to China Light and Power (CLP) as the strategic foreign partner for developing electricity in Thailand. The share price of EGCO jumped by 16 per cent after the announcement that Hong Kong's China Light and Power Ltd. became the second largest shareholder. Pushing up the energy index by 10 per cent, EGCO shares rose from Bt10.5 to close at Bt64.5 on the stock exchange of Thailand one day after the announcement. On the foreign board, EGCO shares jumped from Bt14.5 to Bt80, compared with the price paid by CLP of about Bt126 a share.

At present, EGCO has a total installed capacity of 2,105 MW from Rayong Power Station, Khanom Power Station and Amata - EGCO Power Station, which account for 11.58 percent of national production capacity. EGCO is structured as a holding company with a number of subsidiaries, including Rayong Electricity Generating Co., Ltd., Khanom Electricity Generating Co., Ltd., EGCO Engineering & Service Co., Ltd., EGCO Joint Ventures & Development Co., Ltd., and EGCO Mining Co., Ltd. Each company was established for special purposes involving activities such as power generation, engineering, maintenance and utilities. Figure 2.1 shows the stakeholders of EGCO (EGCO 1998: 46).

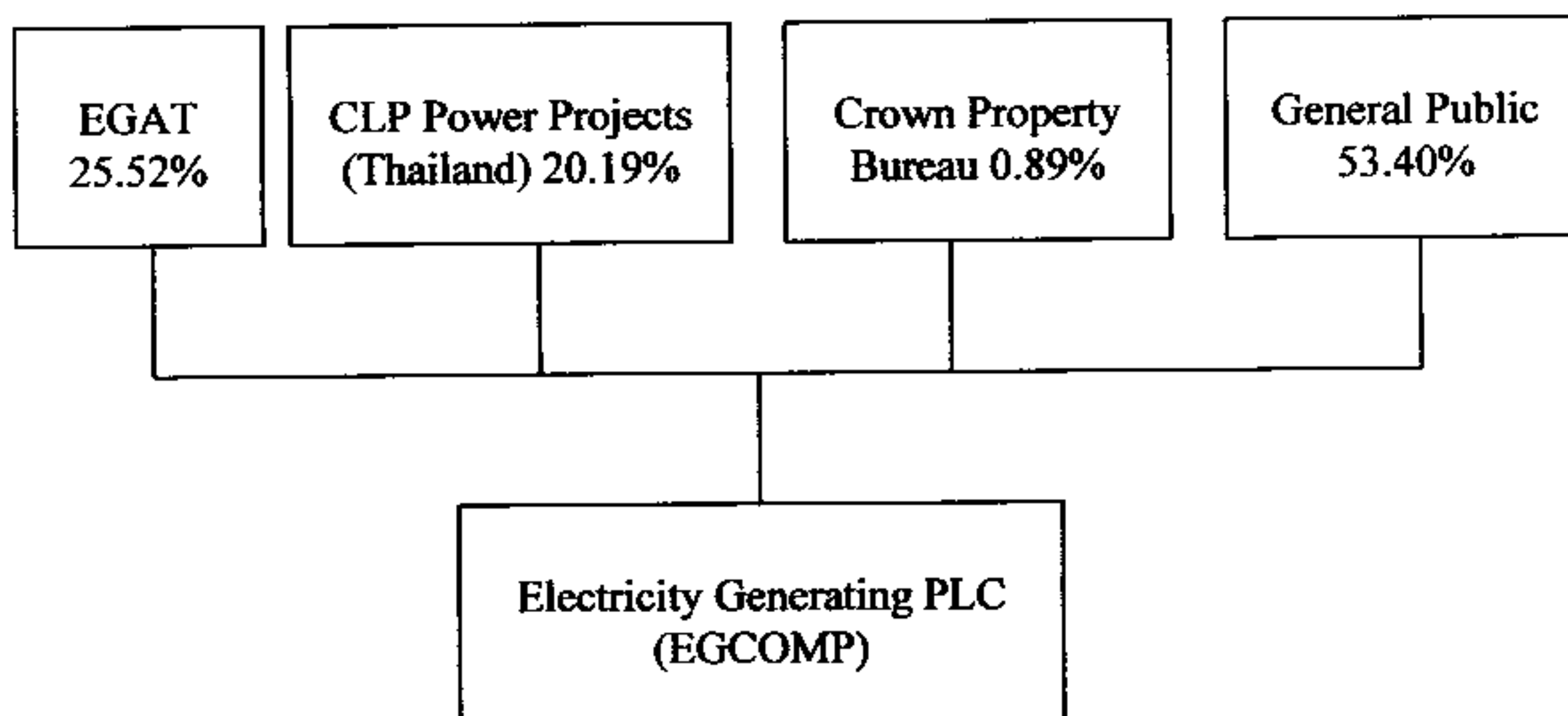


Figure 3.1 Stakeholders of EGCO

Source: Ministry of Commerce, National Energy Policy Office, 1999: 21.

3.4.2.1 Electricity Consumption: Thailand had 17,508 megawatts (MW) of electric generation capacity as of 1999, and generated approximately 89 billion kilowatt-hours (Bkwh) of electricity. The decline in the Thai economy as a result of the Asian financial crisis resulted in decreased domestic demand for electricity of about 3 Bkwh in 1998, before rebounding in 1999. Table 2.1 shows the electricity consumption per area from 1996 to 2000.

This situation compelled EGAT, the state-owned electricity company, to revise its electricity demand projections. The shrinking of electricity demand has a direct impact on the minimum reserve margin, which EGAT carefully planned as part of normal economic expansion. Table 2.2 shows electricity consumption for the whole country (Director of Central Intelligence [CIA] 1999)

Table 3.1 Electricity Consumption in Per Area. Unit: GWH

Year	Residential	Business	Industrial	Agriculture	Others	Total
1996	9,902.3	8,232.0	22,121.5	121.3	3,264.2	43,641.4
1997	10,655.0	9,077.1	24,392.6	167.0	3,599.3	47,891.0
1998	11,905.5	8,771.8	23,572.2	210.9	3,478.3	47,938.7
1999	11,763.4	9,198.5	24,719.0	164.2	3,647.5	49,492.5
2000	12,510.7	10,053.4	27,016.2	154.2	3,986.5	53,720.9

Sources: [on-line] Available: <www.nepo.or.th/>

Table 3.2 National Electricity Consumption. Unit: GWH

Year	Residential	Business	Industrial	Agriculture	Others	EGAT (DC*)	Total
1996	15,998.8	19,254.7	34,607.3	121.3	5,058.4	2,042.4	77,083.0
1997	17,322.5	20,190.7	36,981.2	167.0	5,408.3	1,928.4	81,998.0
1998	18,772.5	18,997.4	35,155.0	210.9	5,142.7	1,621.2	79,899.6
1999	18,171.1	19,316.4	36,179.8	164.2	5,294.4	1,666.3	80,792.3
2000	19,392.6	21,049.8	39,472.1	154.2	5,776.3	1,751.8	87,596.9

Source: Sources: [on-line] Available: <www.nepo.or.th/>

Note: DC = Direct Consumption

3.4.3 Independent Power Producers and Small Power Producers:

The Thai government deregulated the electricity supply industry to allow private sector investment in power generation projects, in the form of Independent Power Producers (IPPs) and Small Power Producers (SPPs), which sell electricity to EGAT. EGAT is expected to purchase power from seven IPP projects, with a total capacity of 5,944 MW, and from approximately 55 SPP projects, with estimated total sales of 2,500 MW. Power purchase from IPP's and SPP's will result in the reduction of

EGAT's required investment in power generation by approximately 300,000 million Baht (Somsak Chinanthananond, 1999: 1-2).

SPPs could be either co-generators or facilities using renewable energy as fuel that sell power to EGAT as long as it is not more than 90 MW for each project. Since each SPP can sell power directly to consumers located in its vicinity, its generating capacity is therefore often as large as 120-150 MW. A number of SPP's are really IPPs disguised as co-generators. Since 1991, 92 proposals have been received by EGAT, but some projects have been rejected, while some have been withdrawn, particularly after the Baht flotation in July 1997. In 1999, 51 power purchase agreements (PPA) with EGAT had been signed and another six PPAs were under negotiation. If all projects were completed, then the total purchases would amount to 2,445 MW (EGCO: 1999).

As of December 1998, thirty-one SPPs were already operating and selling 740 MW of power to EGAT, and a number of other projects were at various stages of development. After the Baht depreciation in July 1997, the government amended the terms and conditions for the SPPs, particularly by indexing part of the capacity payment to the exchange rate in order to cushion the impact of the economic crisis. Amending the PPA has helped a number of SPPs to obtain financial closing on their projects, thereby allowing them to proceed and complete the projects. However, many projects still face financing problems. It is possible that up to 11 projects will not be completed. Under this worse case scenario, EGAT would buy power from 44 SPPs with total purchases amounting to 1,730 MW.

A number of prominent Thai companies are involved in SPP projects. For example, Banpu, Advance Agro, Thai Oil, TPI, Bangkok Industrial Gas, EGCO, Hemaraj, Shapatanapubul and Bangpakong Industrial Park. Many international companies also play significant roles in the SPP business in Thailand. These include

- Sithe Pacific (USA)
- CMS
- Imatran Voima Oy (Finland)
- Air Product (USA)
- Tractebel (Belgium)
- Marubeni (Japan)

The economic crisis has also significantly affected Thai shareholders in SPP projects and forced them to seek new partners. A number of international companies have recently decided to participate in SPP projects, for instance, CMS (USA) and National Power (UK).

In addition, the first round of IPP solicitations was issued in December 1994, when EGAT was scheduled to buy up to 5,800 MW of capacity from IPPs for the period 1996-2003. Power Purchase Agreements (PPAs) have been signed with 7 IPPs for a total of 5,944 MW of electricity sold to EGAT.

Table 3.3 Thailand's IPP Awards

Company	Investor	Capacity (MW)	COD	Fuel-Used
Phase I (1996-2000)				
-Independent Power (Thailand) Co., Ltd. (IPT)	Thaioil 56% Unocal 24% Westinghouse 20%	700	Sep 1999	Natural gas
-Eastern Power & Electric Co., Ltd. (Bang Bo) (EPEC)	GMS Power Plc 67% Marubeni 33%	350	31 Jan 2002	Natural Gas
-Tri Energy Co., Ltd. (TECO)	Banpu 37.5% Texaco 37.5% Edison Mission Energy 25%	700	July 2000	Natural Gas
Phase II (2001-2003)				
-Union Power Development Co., Ltd.	Union Energy 10% Tomen 34% Imatran Voima Oy 28% Consolidated Electric Power Asia (CEPA) 28%	1,400	Unit 1 1 Oct 2002 Unit 2 1 Jan 2003	Coal
-Bowin Power Co., Ltd.	Hemaraj 50% Tractebel 50%	713	1 April 2002	Natural Gas
-BLCP Power Limited	Banpu 47.5% Loxley 5%	1,346.5	Unit 1 1 Oct. 2002 Unit 2	Coal
-Gulf Power Generation Co., Ltd.	PowerGen 47.5% Gulf Electric 60% Mission Energy 40%	734	1 Feb 2003 Unit 1 1 Oct 2002 Unit 2 1 April 2003	
Total		5,943.5		

Sources: [on-line] Available: <www.nepo.or.th/>

The Baht flotation in July 1997 was considered as a “change in law” and PPAs were therefore amended. This helped IPPs significantly and allowed them to proceed with their projects. At this stage, two IPP projects have been able to obtain financial support, while the other five IPPs are in the process of obtaining financing. The economic problems have resulted in re-negotiations about the commercial operation date. These negotiations were carried out between May and June 1998. The Cabinet approved the results on 16 February 1999, except for BLCP where the negotiation for a delay of two to four years has not yet been concluded.

Certain changes in the shareholding structure have taken place. For instance, Black & Veatch withdrew from TECO and were replaced by Mission Energy. Union Energy has reduced its share holding in Union Power in order to bring in CEPA. Rio Tinto withdrew from BPLC.

The main concern of the financial institutions when they provided financing relates to the ability of EGAT to uphold its commitment under the PPAs. Their concern was whether EGAT’s financial position could deteriorate if either of the following happened:

- The economic slow down would cause significant slow downs in power demand growth resulting in a very high level of reserve margin in the system; or
- The government, due to political reasons, would not allow EGAT to adjust the retail power tariff.

3.5 Petroleum and Natural Gas

The World Energy Council (WEC) expected that global oil consumption would rise from current levels of 65 million barrels a day to 90 million barrels a day in 2020. This would represent an increase equivalent to the total production of the Organization of the Petroleum Exporting Countries (OPEC) in 1997 (Organization for Economic Cooperation and Development, 1999).

Table 3.4 Annual Production of Petroleum Products (unit = Millions of Liters)

Products	1996	1997	1998	1999	2000
Gasoline	7,969.5	9,419.5	8,800.4	8,631.5	8,086.5
Regular	2,693.4	2,879.6	2,877.2	5,868.8	3,792.3
Premium	5,276.1	6,539.9	5,923.2	2,762.7	4,294.2
Kerosene	189.3	122.7	114.9	346.7	491.2
Diesel	3,929.9	17,272.5	16,437.3	15,948.2	16,105.7
HSD	13,754.5	17,128.3	16,326.4	15,817.1	59,191.3
LSD	207.2	144.3	111.0	131.1	114.4
JP	3,572.0	3,810.8	3,567.4	4,119.0	4,347.8
Fuel Oil	354.1	8,701.9	7,846.2	7,828.8	6,990.7
LPG	3,493.0	4,231.1	4,064.0	4,587.3	5,168.9
TOTAL	28,359.6	43,558.6	40,830.3	41,461.5	41,190.8

Sources: [on-line] Available: <www.nepo.or.th/>

In 1997, energy derived for oil consumption made up 62.4 percent of total energy production; 19.6 percent for natural gas and 14.9 percent for lignite and 3.1 percent for hydropower. The economic crisis caused a sharp decline in the demand for electricity and petroleum products.

In terms of oil reserves, Thailand holds 351 million barrels of confirmed oil reserves. In 1996, there was 7.0 trillion cubic feet (Tcf) of proven natural gas reserves, and Thailand produced 428 billion cubic feet (Bcf) of natural gas. Much of the country's natural gas is used for generating electricity. Thailand currently has electricity generation capacity of about 17,500 megawatts (MW). In 1996, Thailand generated approximately 82 billion kilowatt-hours of electricity (United States Government, Energy Information Administration, 2001).

3.5.1 Petroleum Industry-Industry Structure: In general, the petroleum industry can be divided into four business functions:

- Supply of crude oil and petroleum products

- Refining of crude oil in Thailand
- Petroleum logistics
- Marketing

Currently, two petroleum firms operate all four business functions. They are Bangchak Petroleum Co., Ltd., and Esso (Thailand) Co., Ltd. Shell (Thailand) Co., Ltd is not involved in all the four business functions. The Petroleum Authority of Thailand (PAT) entered into a joint venture with Caltex (Thailand) Co., Ltd to establish Rayon Refinery Co., Ltd. and Star Petroleum Refining Co., Ltd.

The five petroleum refinery firms and importing firms supply the petroleum in three market segments: large petroleum trading firms, middle-size petroleum trading firms, and small-size petroleum trading firms. There is a total of twenty-nine large and middle-size petroleum-trading firms that have their own tank farms.

The eight large petroleum-trading firms are: Bangchak, Caltex (Thailand), Petroleum Authority of Thailand (PAT), Rayong Refinery, Shell (Thailand), Star Petroleum Refinery, Thai Oil, Esso (Thailand) Co., Ltd.

The twenty-one middle-sized trading firms are: P.C. Petroleum, Cosmo Oil, Siam Gas Industry, Siam Makee, Southern Petroleum, Chalean Mankong, Siam Uni-Service, Mobil Oil (Thailand), SukuThai Petroleum, Tipco Asphalt, MP Petroleum, Petro Chemical Thai Industry, Kuwait Petroleum (Thailand), Thai Public Port, World Gas (Thailand), TPI Oil, BP Oil, Hard Oil Import and Export, ConAgro (Thailand), Aromatic (Thailand), Unigas and Petrochemical Co., Ltd.

The small sized petroleum trading firms are small petroleum jobbers and petroleum service stations. The market share of the individual firms is summarized in Table 2.6.

Table 3.5 Percentage Market Share of Petroleum Producers and Importers

Petroleum Producers & Importing firms	1996	1997	1998
Bangchak Petroleum (Public)	14	15	14
Esso Standard (Thailand)	18	16	16
Thai Oil	26	27	25
Other importing firms	42	42	45
Total	100	100	100

Sources: [on-line] Available: <www.nepo.or.th/>

3.5.2 Natural Gas: The gas industry in Thailand is effectively dominated by two main players, the PTT and EGAT. PTT, with few minor exceptions, acts as the sole purchaser, transporter and distributor of natural gas in Thailand. PTT purchases all indigenous gas from the producers, including PTTEP and transmits it through its pipeline system to the end-users.

Private participation in pipeline construction has been introduced with the establishment of PTTNGD, a joint venture pipeline, 49 percent of which is owned by PTT and the balance by private companies.

PTT's activities consist of gas exploration and development, gas pipelines, and gas trading. In the petroleum sector, activities consist of refining and retail distribution, international trading activities, and a number of international downstream joint venture operations (National Energy Policy Office, 1999).

The network of PTT pipelines currently covers 1,512 km, linking all commercial offshore gas fields to EGAT's power plants, its four-gas separation plant (GSPs) and industrial users. All of PTT's contracts, whether with suppliers or consumers, are on a long-term basis of 20 to 30 years, minimum take or pay basis.

EGAT is the largest consumer of natural gas in Thailand. In 1997, 75 percent of natural gas consumption went for power generation, 14 percent for the production of LPG and petrochemical feedstock from GSPs, and 11 percent was consumed as industrial fuel. There is not yet any retail gas industry in Thailand. However, the current GSI structure is shown in Figure 2.2

Production

In the production process, there is competition among several producers. However, only three are dominant players: UNOCAL, PTTPEP and Total. In addition, there are joint partnerships among the dominant players in certain projects.

Gas transmission

- Gas transmission is solely operated by the public organization, PTT;
- The pipeline tariff rate is regulated by NEPO/NEPC;
- Future demand for a gas transmission system persists

Gas Supply and distribution

- Gas supply and distribution is operated by PTT;
- NEPO NEPC regulates the rate of return from the gas supply and distribution.

Gas transportation in distribution system

- The distribution pipeline system is still limited;
- There is a joint venture involving PTT, Tractable, and British Gas to provide distribution system services under the Bangkok Ring Project.

Gas consumers

- There are numerous gas consumers, but the major one is the EGAT due to limitations of the pipeline system (80 percent of natural gas is used in power generation);
- Other types of fuel are being used to replace natural gas.

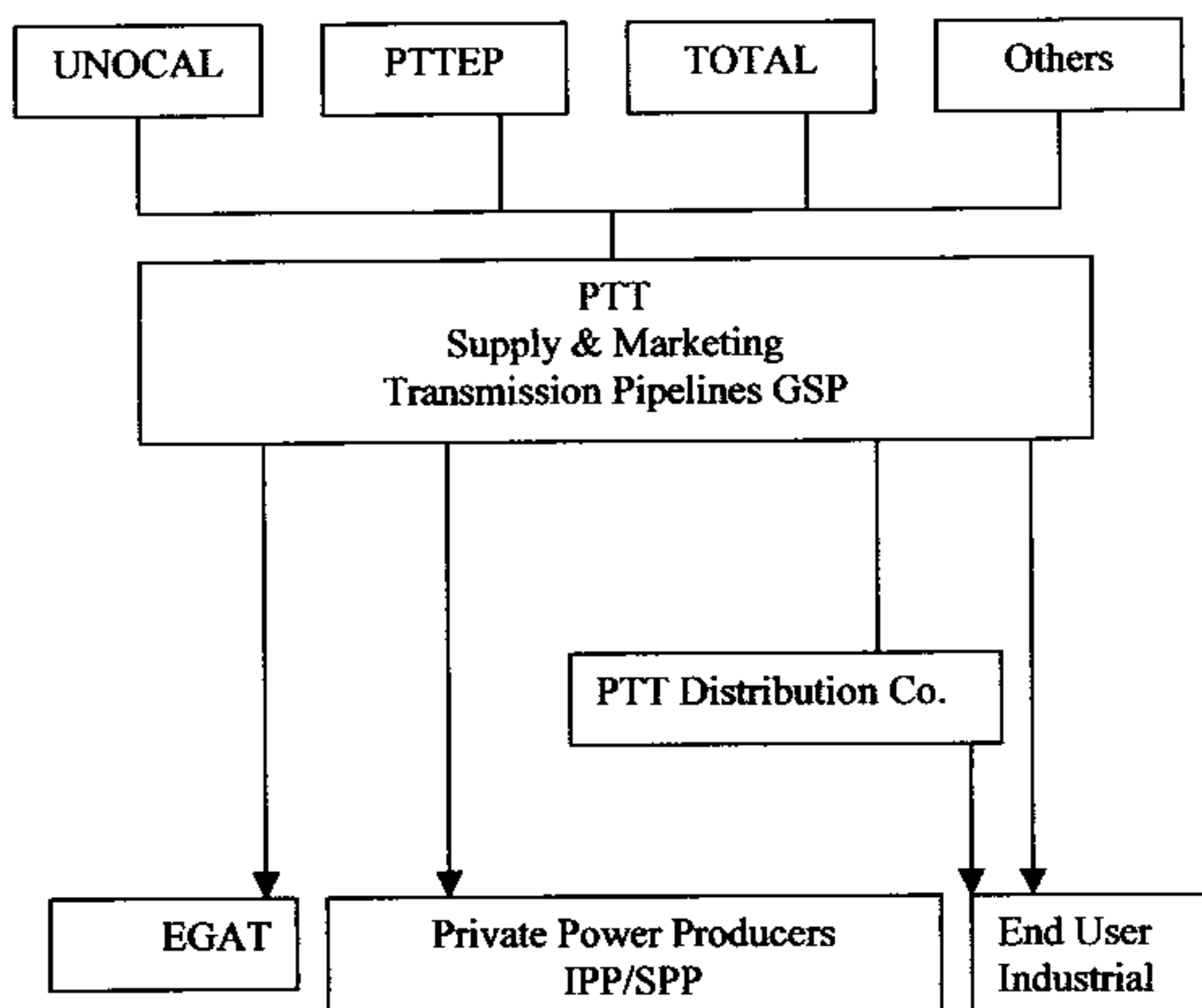


Figure 3.2 Current GSI structure

Source: [on-line] Available: <www.nepo.or.th/>

3.6 Conclusion

In conclusion, the Thai economy began slowing down in 1996, which was first indicated by the export sector. Then the operations of 58 finance companies were temporarily suspended in the middle of the year and subsequently closed later in December. In 1997 the weakness of the financial sector forced the government to float the Baht. The Thai Baht reached its lowest value when it was 56 to the dollar in January 1998. As a result, private consumption fell on account of reduced purchasing power and greater caution in spending, linked to higher unemployment and job-uncertainties. Two years after the onset of the East Asian financial crisis, Thailand's economic prospects have been improving significantly. GDP was projected to grow

by 3 to 4 percent in 1999. Both investment and consumption indicators had been strengthening, and export import volumes have been growing rapidly.

In its current position, Thailand is promoting free trade and competition as illustrated through the Thai economy exposure to international competition. It is believed that this idea would create growth in a more efficient economy and keep the cost of living under control as well.

The main goal of energy policy has been to ensure the availability of energy, to promote free market competition among energy enterprises, and to bring more private investment into the energy sector. The government energy policy also emphasizes reducing the environmental impact from the use of energy by having an energy conservation program. The policy on privatization of energy enterprises will require implementation with some state-owned enterprises such as EGAT, MEA, PEA, PTT, PTTEP and Bangchak. The government has also participated in some of these sectors.

CHAPTER IV

RESEARCH METHODOLOGY

This chapter presents the research methodology used in this study. Discussion of the methodology is divided into five major sections: 1) research design; 2) operational definitions and measurement; 3) sampling procedure; 4) data collection method; and 5) data analysis.

4.1 Research Design

This study makes use of a non-experimental research design and an empirical approach, because they are most suitable for the examination of various social phenomena involving people and organizations, particularly factors affecting the performance of energy enterprises as organizations (both before and after the 1997 economic crisis in Thailand). The Linear Structural Relationship of Equation Model (LISREL), in the form of a causal relationship among the constructs and path analysis were presented.

LISREL provides for measurement of estimated error, a goodness of fit index, and analysis within a theoretical framework designed to focus on empirical data. Furthermore, it is possible to examine both direct and indirect relationships among different factors of organizational performance after the 1997 economic crisis.

This study utilized primary data obtained from a questionnaire survey of top-level managers in energy enterprises of Thailand. The survey was carried out with a cross-sectional design. That is, the data were collected at one time through self-administered questionnaires and in-depth interviews. An investigation of the impact of different factors of organizational performance required additional types of information to be obtained from the top-level executives in the form secondary data on financial

statements. Textbooks, journals, documents of organizations and financial information also provided secondary data used for this study. The hypotheses testing mentioned in Chapter Three made use of the path analysis technique conducted by LISREL model.

4.2 Operational Definitions and Measurement of the Variables

The type of measurement techniques was very important for guiding the process of transforming more abstract concepts and the conceptual framework into observable variables that yielded both qualitative and quantitative data. Every variable required both an operational definition and a way to make measurements. The subsequent discussion elaborates on the variables employed in this study.

4.2.1 Dependent Variables: The performance of energy enterprises was measured in terms of the specific end results that were accomplished by the effective and efficient allocation of resources. Performance was measured as organizational capabilities in the future performance, in terms of financial conditions, customers' perspective, internal business processes, and learning and growth perspectives. The variable would be measured from 1997 to 1999, which was defined as the post-crisis period. (Kaplan and Norton, 1996: 20)

In this study, energy enterprises included the state-owned enterprises, privatized state-owned enterprises, private firms, and their subsidiaries, joint ventures engaged in generating electricity, petroleum, and the natural-gas industry. They are defined as energy enterprises. The electric industry included the state-owned enterprises, privatized state-owned enterprises, private firms generating electricity and the private firms related to the independent power producers (IPPs), and small power producers (SPPs) under the government's privatization policy. (See Chapter 2, Electricity Industry for details.)

The petroleum industry consisted of five petroleum refineries, the eight major petroleum distributors, and twenty-one middle-sized petroleum distributors which had a

combined market share of about 80 percent of petroleum products, including gasoline, fuel oil, LPG, diesel, LSD, and HSD. Small petroleum jobbers and retail outlets were excluded from this study. The eight major petroleum distributors were Shell, ESSO, Rayong Refinery, Star Petroleum, Thai Oil, PTT, Banchak, Caltex, Co., Ltd. and the Petroleum Authority of Thailand. The gas industry consisted of gas producers, such as Petroleum Exploration and Production (PTTEP), UNOCAL, and TOTAL. PPTNGD was a joint venture of PTT, British Gas, and Tractable that handled the gas transportation system. There was no retail gas industry at the time. (See Chapter 2, Petroleum Industry Structure for details.)

In this study, the term state-owned enterprise means enterprises that are owned by the government. Privatized state-owned enterprises are state-owned enterprises with a decreased ownership role by the government through divestment by means of selling shares to the public. They are categorized as energy enterprises in the research. The term top-level executive referred to those high-level executives of energy enterprises with the rank of assistant, deputy, department manager, and above, such as assistant, deputy managing directors, managing directors and directors.

4.2.1.1 Organizational Financial Performance: Variables related to organizational financial performance were intended to measure whether the enterprise's strategy, implementation, and execution contribute to improvement of the bottom-line. The variables typically relate to profitability, economic value added, sales growth, and cash flow. The variables were net profit after tax /sales (net profit margin), net income/total sales (return on total assets), current asset ratios, percentage change in net profit, earning per share, and percentage change in earnings per share. These are defined as follows:

Net profit after tax sales: refers to net income after tax multiplied by 100 divided by sales, which is known as net profit margin.

Net income after tax/total asset: refers to the return on total assets (ROA) referring to net profit after tax multiplied by 100, divided by total sales.

Current asset ratio: refers to current assets divided by current liabilities.

Earnings per share: refers to earnings available for common stockholders divided by the number of shares of common stock outstanding.

Percentage change in net profit: refers to the amount of change in net profits during the period from 1997 to 1999. The values were calculated from the annual net profit in percent of the present year minus the net profit of the previous year, divided by the net profit of the previous year and multiplied by 100.

Percentage of change in earnings per share: refers to the amount of change in earnings per share during the period from 1997 to 1999. The values are calculated from the earnings per share of the present year minus the earnings per share of the previous year, divided by the earnings per share of the previous year and multiplied by 100.

4.2.1.2 Customer aspects of organizational performance: refers to the evaluation of how the organization appears to customers and indicates customers' satisfaction, customer relations, new customers, and profitability from customers in terms of market share. The commonly used indicators are market share, customer survey, unit price index, customer satisfaction index, sales and returns, bad debt expenses, and uncollectable account receivable. For this study, customer aspects of organizational performance uses market share and percentage of change in sales per year as the measurement indicators. They were measured by comparing market share and percent change in sales per year with the internal factors of the organization implemented after the 1997 economic crisis (Kaplan and Norton, 1996: 30).

Market share of each firm: refers to the percentage of sales by each firm out of the total annual sales of all firms in the same industry during the period from 1997 to 1999.

Annual percent change in sales: refers to the amount of change in sales for the individual firm from 1997 to 1999. It is determined by calculating the difference in percentage between sales in the present year and sales in the previous year for each year after the 1997 economic crisis.

4.2.1.3 Internal business process—organizational performance: refers to the degree to which an organization can satisfy customers and shareholders by improving the business process and operations which can be measured in term of quality, cost, and time. The measurement indicators were time needed for order fulfillment, unit cost of production, reduction in loss severity, reduced claims, safety and accident rate, inventory turnover, shortage of inventory, research costs, new investment of new technology, and income from new products. In this research, the organizational performance refers to the annual percent change of total assets selected as the measurement indicators (Kaplan and Norton, 1996: 32). It was measured by comparing total asset turnover and annual percentage change in total assets with the internal factors of the firm implemented after the 1997 economic crisis.

Annual percent change in total assets: refers to the difference between the total assets in the present year and the total assets of the previous year in terms of percentage for each year from 1997 to 1999.

4.2.1.4 Learning and growth perspectives – organizational performance: refers to the organization maintaining the ability to change and improve its future performance. Three primary inputs to learning and growth were employees, the system process, and organization. The measurement indicators were the number of people trained, employee satisfaction, employee turnover, absenteeism, income of employees, index of continuous improvement, training programs, days in training program per year, and training budget. In this study, the indicators of learning and growth were employee turnover rates, absenteeism rates, and annual training expenses per employee (Kaplan and Norton, 1996: 34). They are measured with rating scores of 1 to 10 for internal factors within the organization after the economic crisis in 1997.

Employee turnover: refers to any permanent departure of employees from the organization. Annual turnover was determined by calculating the number of turnover incidents per period divided by the average workforce, then multiplied by 100 for the period from 1997 to 1999.

Rates of absenteeism: defined as the failure of employees to report to work when their schedules require it, whether or not such failure to report was excused. The rate of absenteeism was calculated by the number of working days lost due to job absence during the period divided by average number of employee multiplied by the number of working days multiplied by 100 for the period from 1997 to 1999.

4.2.2 Independent variables

4.2.2.1 Internal Factors Affecting Organization Performance: refers to tangible and intangible assets, capabilities, and limitations that are used to create the competence of the firm by providing value to customers. In this study, they were related to technologies, organizational structures, management styles, business systems, and functional strategies—value chain affecting the organizational performance. If these factors were considered to be relatively unimportant, the result would show low rating scores. These variables were measured according to the average rating score given by the top-level executives. The measurement of attitudes toward management was used to evaluate each factor based on a ten-point scale provided in the questionnaire. A score of 10 indicated the highest importance while a score of 1 indicated the lowest importance. The measurement scale for these variables was an interval scale.

4.2.2.1.1 Technology: refers to technology development. It covers a range of activities that can be broadly grouped into efforts to improve the product and the process. The scale for this variable was interval. The process of technology development involves: 1) implementing research and development of new technologies in the field of process, software, communication, production improvement, computer-aided manufacturing (CAM) process, database management system, 2) implementing technology for new products, and 3) implementing technology for quality control of products.

4.2.2.1.2 Organizational structure: refers to the complexity, centralization, and formalization of the organization. It was defined as the allocation of responsibilities,

activities, and authority to individuals and the coordination of these individuals vertically and horizontally.

Complexity: refers to the degree of differentiation existing within an organization, including horizontal, vertical, and spatial differentiation. In this study, complexity consists of management levels, coordination, clear responsibility, and the delegation of authority to support the decision-making process.

Formalization: relates to the extent to which rules, policies, procedures, formal training, norms, socialization, and traditions standardize behaviors in the organization.

Centralization: refers to the degree to which formal authority can make discretionary choices which are concentrated in an individual unit or level within an organization. The measurement scale for this variable was interval. It included the autonomy of making decisions on strategic planning, investment, procurement, operation plan, salary, work evaluation, the participation of employees in planning evaluation, and the operational plan (Robbins, 1990: 25-30).

4.2.2.1.3 Management style: refers to the pattern of value, beliefs, and assumptions that individual or groups of employees have developed to cope with internal and external problems. It consists of style of management, autonomy in decision-making, and teamwork. The style of management means changing the role of executive to consulting and coaching. The decision is decentralized in the business process. There will be a high level of cooperation among multi-functional specialists.

4.2.2.1.4 Business system: refers to the key element of an organization in building its competitive advantage and consists of total quality management and business process reengineering (Bound and others, 1994: 26).

Total Quality Management: refers to a people-focused management system that aims at continuously increasing customer satisfaction through the use of an integrated system of tools, techniques, and training. It involves the continuous improvement of organizational processes, which leads to high quality products and services. It covered the 14 points of W. Edward Demming's philosophy of quality. It

consists of continuous improvement, preventive maintenance, and total quality programs, such as 5S, ISO 9000, ISO14000, just-in-time, QCC, Kaisen, statistic control techniques, and employee involvement (Besterfields and others, 1995: 20-10).

Business process reengineering: relates to business characteristics, job, structures, values, management and measurement systems, and information technology for new business processes. It means a fundamental rethinking and radical change of the business process to achieve dramatic improvement in critical measures of performance, such as cost, quality, service, and speed. It includes the large scope of the working process, more decision making in the business process, flat organization, less control and inspection, new information technology to change the business process, such as expert production, software MRP, and wireless communication. The measurement scale for this variable was an interval scale. (Hammer, 1993: 20-23).

4.2.2.1.5 The functional strategy-value chain: means the strategy directed at improving the effectiveness of functional operations within a company, and is comprised of primary activities and supporting activities. Primary activities are marketing and services, operations, and logistics. Supporting activities refer to firm infrastructure, human resource management, and research and development procurement to develop the competence of the firm. These activities can be related by examination as a chain of activities that transform inputs into outputs on which customers place values based according to the value chain developed by Michael E. Porter (1985). The measurement scale for these variables is a ratio scale.

Primary activities

Operation: refers to improvement and development of the production process, machines, automation of the production process, flexibility of the production system, production flow, production cost reductions, quality control of the production process.

Logistics: includes addition of new inventory control systems, including online computer, data storage, safety, warehouse transportation, multi-modal delivery systems (combining train, truck, ship, airplane), new inventory control systems such as MRP, ABC, MAGIC, development of many distribution centers.

Marketing and services: involves activities related to sales promotion, advertising, brand image, distribution channels, sales motivation, acceptance of new products, customer satisfaction, customer comments, quality guarantee policies, customer training, many service centers.

Supporting Activities

Firm infrastructure: refers to the composition of new products, services and environment scanning related to the planning system, effective strategic planning, efficient management system, long-term and short-term financial management, the application of MIS in various areas, and good relationships with interest groups.

Procurement: refers to good relationships with various suppliers, fair purchasing policies, good quality and timely delivery, lease and purchase policies, quality control and long-term contracts.

Human resource management: refers to new human resource policies such as recruiting, training, promotion, evaluation, and compensation. It also includes good working environment, organizational commitment, good relationships, challenging work, new work roles, and autonomy in decision making (Casio, 1992: 40).

Research and development: refer to the implementation of research work into organizational practices, good relationships with other departments, qualified research staff, and production research.

4.3 Sampling Procedures

4.3.1 Target Population and Unit of Analysis: The target population of this study consisted of all employees working in energy enterprises, including electricity producers, petroleum, and gas. The electricity producers were privatized state-owned enterprises, such as EGCO, independent power producers (IPPs), and small power producers (SPPs). The petroleum organizations included petroleum refineries, Shell, ESSO, and petroleum import and export firms. The retail service stations of petroleum firms and small

petroleum trading firms known as oil jobbers were excluded from this study. However, subsidiaries and joint ventures are included in the study.

In order to evaluate the organizational performance of energy enterprises, the unit of analysis chosen was the organization. On the other hand, in order to evaluate the internal factors affecting organizational performance, the executives of the energy enterprises were considered as the unit of analysis.

4.3.2 Sampling Techniques: The target population in this study consisted of employees and the amount of organization in the energy enterprises. Therefore, decisions had to be made about which employees and firms to study, whom to interview, the timing of research activities, importance of the organization in the Thai economy, how best to analyze the internal factors of the organizations, and organizational performance. Such decisions also influenced the use of a multi-stage sampling technique designed to provide an appropriate and representative sample, from which data and information could help to accurately assess the factors affecting organization performance. Thus, the multi-stage sampling technique used in this study consisted of the following three stages:

Stage 1. Purposive selection of the energy enterprises, which included electricity producers, petroleum refineries, petroleum import and export firms, and gas producers as listed in the report of National Energy Policy Office (NEPO) and Electricity Generating Authority of Thailand (EGAT) for 1999. The list is presented in Table 4.1.

Stage 2. Purposive selection of employees, which was done by focusing on people in executive positions of various departments in the organizations.

Stage 3. Executive sampling was based on selecting from a target population of 600 executives from 75 organizations identified as energy enterprises in Thailand. According to Yamane's table, with a sample size at a 95 per cent level of significance with a standard error equal to .05, if the size of the population is 20,000-50,000, then the appropriate sample size would only require 100 samples. Therefore, the sample selected for this study had an appropriate sample size, which consisted of 416 executives from 52 energy enterprises. The return rate for the questionnaire was 69.33 per cent of the target population both in terms of organization and the executives.

Furthermore, considering the research sample size with respect to the target population of petroleum refineries (including state-owned enterprises, privatized state-owned enterprises, and private firms), the sample size equaled 100 per cent of the target population.

Considering the research sample size with respect to the target population of gas, petroleum traders and petrochemical producers (including state-owned enterprises, privatized state-owned enterprises, and private firms), the sample size equaled 85.71 per cent of the target population.

When considering the research sample size with respect to the target population of enterprises in electricity power production (including state-owned enterprises, privatized state-owned enterprises, IPPs and SPPs), the sample size equaled 58.33 per cent of target population.

Table 4.1 Target population and return response to the questionnaire

Target population	Return questionnaire
Petroleum refinery (including state-owned enterprises, privatized state-owned enterprises, and private firms)	
1. Thai Oil	√
2. BCLP	√
3. ESSO	√
4. TPI	√
5. Rayong Refinery	√
6. Star Petroleum Refining	√

Table 4.1 Target population and return response to the questionnaire (continued)

Target population	Return questionnaire
Gas, petroleum traders and petrochemical producers (including state-owned enterprises, privatized state-owned enterprises, and private firms)	
7. PTT	√
8. PTTEP	√
9. Thai Shell	
10. Aromatics (Thailand)	
11. Bangkok synthetics	
12. MP Petroleum Co., Ltd.	√
13. Bangkok Industrial Gas	√
14. Siam Chemicals Public Co., Ltd.	√
15. Word Gas (Thailand) Co., Ltd.	√
16. Unic Gas and Petrochemicals Co., Ltd.	√
17. Southern Energy Public Co., Ltd.	√
18. Siam Gas Co., Ltd.	√
19. Sukhothai Petroleum Co., Ltd.	√
20. Cosmo Oil Co., Ltd.	√
21. Chareon Mun khong Co., Ltd.	√
22. TIPPO Asphalt Co., Ltd.	√
23. Tuntex (Thailand) Co., Ltd.	√
24. Thai Public Port Co., Ltd.	√

Table 4.1 Target population and return response to the questionnaire (continued)

Target population	Return questionnaire
25. BP Oil (Thailand) Co., Ltd.	√
26. PC Siam Petroleum Co., Ltd.	√
27. Siam Service Co, Ltd.	√
Electricity Power (including state-owned enterprises, privatized state-owned enterprises, IPPs and SPPs)	
28. Electricity Generating Authority of Thailand (EGAT)	
29. Metropolitan Electricity Authority (MEA)	
30. Electricity Generating Public Co., Ltd.	√
31. Provincial Electricity Authority (PEA)	
32. Independent Power (Thailand) Co., Ltd.	
33. Banpu Co., Ltd.	√
34. Tri Energy Co., Ltd.	√
35. Eastern Power and Electric Co., Ltd.	
36. Siam Power Generation Co., Ltd.	√
37. Union Power Development Co., Ltd.	
38. BLCP Power Limited.	
39. Bowin Power Co., Ltd.	√
40. Gulf Power Generation Co., Ltd.	
41. The Co-generation Public Co., Ltd.	√
42. Tuntex Petrochemical (Thailand) Public Co., Ltd.	√
43. National Petrochemical Public Co., Ltd.	√

Table 4.1 Target population and return response to the questionnaire (continued)

Target population	Return questionnaire
44. Industrial Power Co., Ltd.	√
45. Thai Oil Power Co., Ltd.	√
46. TLP Co-generation Co., Ltd.	√
47. Operation Power Service Co., Ltd.	√
48. Defense Energy	√
49. Gulf Co-generation Co., Ltd.	√
50. Leam –Cha-Bang Power Co., Ltd.	
51. Amata-EGCO Power Co., Ltd.	√
52. Bangkok Co-generation Co., Ltd.	√
53. National Power Supply Co., Ltd.	√
54. MTP Co-generation Co., Ltd.	√
55. Thai Power Supply Co., Ltd.	√
56. Rojana Power Co., Ltd.	√
57. Samutpragarn Co-generation Co., Ltd.	√
58. Thai Co-generation Co., Ltd.	√
59. United Agriculture Industry Co., Ltd.	√
60. Thai Petrochemical Public Co., Ltd.	
61. Mitr Phol Sugar Co., Ltd.	√
62. Ratchaburi Sugar Co., Ltd.	
63. Korat Industrial Co., Ltd.	
64. Thai Acrylic Fiber Co., Ltd.	

Table 4.1 Target population and return response to the questionnaire (continued)

Target population	Return questionnaire
65. Punchapol Pulp Industry Public Co., Ltd.	√
66. Advance Agro Public Co., Ltd.	
67. Banpong Sugar Co., Ltd.	
68. Mitr – Pu – Wiang Sugar Co., Ltd.	√
69. N.Y. Sugar Co., Ltd.	√
70. T.N. Sugar Industrial Co., Ltd.	√
71. Ratchasima Sugar Co., Ltd.	
72. Thai Power Supply Co., Ltd.	
73. T.R.T. Parawood Co., Ltd.	
74. Thai Identify Sugar Factory	
75. Kaset Thai Sugar	

4.3.3 Sampling collected and unit of analysis: The sampling collected for this study is comprised of energy enterprise executives, including electric producers, petroleum, and gas enterprises. Information was collected from 416 executives from 52 enterprises as shown in Tables 4.2 and 4.3.

Table 4.2 Frequency and Percentage of Respondents Classified by Enterprise

	Enterprise Name	Frequency	Percent
1	Amata EGCO Power	8	1.92
2	Bangkok Co-generation Co., Ltd.	8	1.92
3	Bangkok Industrial gas Co., Ltd.	8	1.92
4	Banpu Co., Ltd.	8	1.92
5	Bowin Power Co., Ltd.	8	1.92
6	ESSO Standards (Thailand) Co., Ltd.	8	1.92
7	Industrial Power Co., Ltd.	8	1.92
8	MTP Co-generation Co., Ltd.	8	1.92
9	National Power Supply Co., Ltd.	8	1.92
10	Operation Power service Co., Ltd.	8	1.92
11	Thai Co-generation Co., Ltd.	8	1.92
12	Thai Oil PCL.	8	1.92
13	Thai Oil Power Co., Ltd.	8	1.92
14	The Co-generation Co., Ltd.	8	1.92
15	Tri Energy Co., ltd.	8	1.92
16	World Gas (Thailand) Co., Ltd.	8	1.92
17	Defense Energy	8	1.92
18	PTT	8	1.92
19	TLP Co-generation Co., Ltd.	8	1.92
20	Tuntex Petrochemical Co., Ltd.	8	1.92
21	Mitr Pol Sugar Co., Ltd.	8	1.92
22	Mitr Pu Wiang Co., Ltd.	8	1.92
23	National Petrochemical PCL.	8	1.92
24	EGCO	8	1.92
25	Cosmo Oil Co., Ltd.	8	1.92

Table 4.2 Frequency and Percentage of Respondents Classified by Enterprise (continued)

	Enterprise Name	Frequency	Percent
26	Chareon Mun khong Co., Ltd.	8	1.92
27	TIPPO Asphalt Co., Ltd.	8	1.92
28	Tuntex (Thailand) Co., Ltd.	8	1.92
29	Thai Public Port Co., Ltd.	8	1.92
30	Thai Power Supply Co., Ltd.	8	1.92
31	Thai Petrochemicals Industry Co., Ltd.	8	1.92
32	The Bangchak Petroleum PCL.	8	1.92
33	BP Oil (Thailand) Co., Ltd.	8	1.92
34	Punchapol Pulp Industries Co., Ltd.	8	1.92
35	PC Siam Petroleum Co., Ltd.	8	1.92
36	Unic Gas and Petrochemicals Co., Ltd.	8	1.92
37	Siam Chemicals PCL.	8	1.92
38	Siam Power Generation Co., Ltd.	8	1.92
39	Siam Service Co., Ltd.	8	1.92
40	Sukhothai Petroleum Co., Ltd.	8	1.92
41	Aeromatics (Thailand) Co., Ltd.	8	1.92
42	T.N. Sugar Industries Co., Ltd.	8	1.92
43	Siam Gas Co., Ltd.	8	1.92
44	N.Y. Sugar Co., Ltd.	8	1.92
45	MP Petroleum Co., Ltd.	8	1.92
46	Southern Energy PCL.	8	1.92
47	United Agriculture Industry .Co., Ltd.	8	1.92
48	Rayong Refinery Co., Ltd.	8	1.92
49	Rojana Power Co., Ltd.	8	1.92
50	Star Petroleum Co., Ltd.	8	1.92

Table 4.2 Frequency and Percentage of Respondents Classified by Enterprise (continued)

	Enterprise Name	Frequency	Percent
51	Samutprakarn Co-generation Co., Ltd.	8	1.92
52	Leam Cha-bang Power Co., Ltd.	8	1.92
	<u>Total</u>	416	100.00

Table 4.3 Demographic Data on Respondents by Frequency and Percentage

Demographic Data		Frequency	Percentage
Sex	Male	285	68.51
	Female	131	31.49
	Total	416	100.00
Age (years)	31-35	117	28.13
	36-40	157	37.74
	More than 40	142	34.13
	Total	416	100.00
Highest Level of Education	Bachelor's degree	260	62.50
	Master's degree	156	37.50
	Total	416	100.00
Position	Managing Director	6	1.44
	Deputy/Assistant Managing Director	12	2.88
	Director	16	3.85
	Deputy/Assistant Director	18	4.33
	Department Manager	203	48.80
	Deputy/Assistant Department Manager	161	38.70
	Total	416	100.00

Table 4.3 Demographic Data on Respondents by Frequency and Percentage (continued)

Demographic Data		Frequency	Percentage
Year of work experience	Less than 2	1	0.24
	2-4	2	0.48
	4-6	64	15.38
	6-8	141	33.89
	8-10	156	37.50
	10-12	41	9.86
	12-15	7	1.68
	More than 15	4	0.96
	Total	416	100.00
Marital Status	Single	53	12.74
	Married	363	87.26
	Total	416	100.00
Income per month (Baht)	20,001 – 30,000	14	3.37
	30,001 – 40,000	102	24.52
	40,001 – 50,000	66	15.87
	More than 50,000	234	56.25
	Total	416	100.00

4.4 Data Collection Methods

Obtaining reliable and valid empirical data is one of the most important requirements in order to conduct good scientific research. In order that the resulting analysis is reliable and complete, this study used a combination of data obtained by two different collection methods. The two data collection methods employed were: document

research and secondary data collection (Method 1) and structured interviews and questionnaire interviews (Method 2).

4.4.1 Documentary Research and Secondary Data: Information on organizational performance of energy enterprises in terms of financial aspects, customer aspects and the internal business process was obtained from research documents, published documents, annual financial statements from the Stock Exchange of Thailand and financial statements from the Ministry of Commerce. (See APPENDIX C)

Table 4.4 Secondary Data Collected: Aspects, Sources, and Types of Data

Aspect	Source	Type of Data
Organizational Performance from financial aspect, customer aspect, internal business process	Stock Exchange of Thailand Ministry of Commerce	Financial ratios, market share of each enterprise
Information on the energy industry	Stock Exchange of Thailand Ministry of Commerce	Demand and supply in the energy industry, energy enterprises

4.4.2 Structured Interviews and Self-Administered Questionnaire: The purpose of this method was to obtain primary data. Information from the structured interviews helped to design the questionnaires as well as provide secondary data, comments, and opinions. The structured interviews were conducted with the executives from many departments and their sub-units in each enterprise, such as marketing, operations, logistics, administrations, procurement, technology, and human resources. Questionnaires were sent to all managers, deputy and assistant managers of the divisions,

departments, sections, and units of selected privatized state-owned enterprises and private firms. The executives were asked to complete the questionnaire and return their responses in the envelopes supplied. Responses were collected from 416 executives from 52 energy enterprises in Thailand. The rate of return of the questionnaire was 80 per cent, both in terms of the enterprises and the executives.

4.4.3 Field Survey: The interviews were conducted with executives from selected energy enterprises. The interview questionnaire contained various questions designed to elicit information regarding the following topics:

Technology: an opinion was rated on scale of 1 to 10, with 10 being the most important

Organizational Structure: opinions were rated on a scale of 1 to 10, with 10 being the most important and 1 being the least important. Ratings given were in terms of complexity, formalization, and centralization.

Management Style: opinions were rated on a scale of 1 to 10, with 10 being the most important. Ratings were given in terms of teamwork, empowerment, autonomy of decision-making and the management style.

Business System: opinion ratings were given in terms of Total Quality Management, business process re-engineering on a scale ranging from 1 to 10.

Functional Strategy: opinions were rated on a scale of 1 to 10 based on primary activities and support activities.

Organization Performance of Learning and Growth Perspective: measured in terms of employee turnover and absenteeism rate.

Organizational performance in terms of financial aspects, customer aspects, and the internal business process were obtained from financial statements of each energy enterprise.

Table 4.5 Measurement level for internal factors

Variable	Description	Operational Definition	Measurement level
TECH	Technology (rating given to technological factors. If TECH received a high rating score, it showed this factor was considered important	From questions 1-5 in the technology section. Consider the important factors in technology on various applications and give a rating score from 1 – 10 on technology factors	Interval: A ten-point scale was used: The score 10 showed the highest importance
OS	Organization structure (the average individual rating scores for complexity, formalization, centralization	From questions 1-5 in complexity section, questions 1-9 on centralization, questions 1-5 on formalization within organizational structure section. Rank the important factors in organizational structure from 1 – 10	Interval: A ten-point scale was used: The score 1 showed the lowest importance on a ten-point scale.
OC	Management style (the average individual rating scores given to culture of team work, style of management, autonomy, value	From questions 1-7 on management style. The important factors of management style on teamwork and autonomous decision-making.	Interval: A ten-point scale

Table 4.5 Measurement level for internal factors (continued)

Variable	Description	Operational Definition	Measurement level
BS	Business System (The average of individual rating scores for new ways of work, new business system of business process reengineering)	From questions 1-13 on total quality management of business system. From questions 1-10 on business process reengineering. Consider the important factors for business system and give a rating score of 1 – 10	Interval: A ten-point scale
FS	(The average of individual executive's rating scores from various departments of energy enterprises. The ten-point scale was used to evaluate primary and supporting activities in the value chain They were operations, logistics, marketing and services, procurement, firm infrastructure, human resources, supporting activities)	From questions 1-8 on operation questionnaire, questions 1-12 on logistics section, questions 1-10 on marketing and service section. Primary activities on the value chain: questions 1-6 on procurement, 1-14 on firm infrastructure, 1-23 on human resources, 1-6 on research and development. Supporting activities on value chain considered important factors for primary and supporting activities of the value chain and give a rating score from 1 -10	Interval: A ten-point scale

4.4.4 Pretest: The questionnaires were pre-tested with 30 executives from energy enterprises. The purpose of the pretest was to assess the validity and reliability of the questionnaire in terms of contents, comprehension, and structure. In fact, after the pretest, the questionnaire was revised. Some questions were modified, some instructions were made clearer, and the sequence of questions was improved. After the questionnaire was adjusted it was found that the Cronbach alpha coefficients in each part of the questionnaire were high, which indicated that the reliability and validity of the questionnaire were in the high criterion and appropriate for collecting data, as detailed in table 4.6.

Table 4.6 Reliability analysis

Terms	Cronbach Alpha Coefficients
Complexity	.7999
Formalization	.7209
Centralization	.8975
Business Process Re-engineering	.9507
Total Quality Management	.8370
Logistics	.9494
Research and Development	.9533
Firm Infrastructure	.9587
Procurement	.8923
Operations	.9102
Marketing and Services	.9343
Human Resource Development	.9716

Remark: The term Management Style is presented as centralization and formalization in the questionnaire, and the term Technology is presented as research and development in the questionnaire.

4.5 Data Analysis

The data analysis was accomplished with the SPSS program for Windows, Version 9.05 (Statistical Package for Social Sciences), which was used for analyzing the characteristics and opinions of the respondents. In addition, the AMOS program, Version 4.0 (Analysis of Moment Structure) was used for testing the research hypotheses and creating the linear structural relationship equation model (LISREL model), which was used to explain the cause-effect relationships of the factors effecting organizational performance of energy enterprises in Thailand.

The data analysis as described above, is presented in two parts as follows:

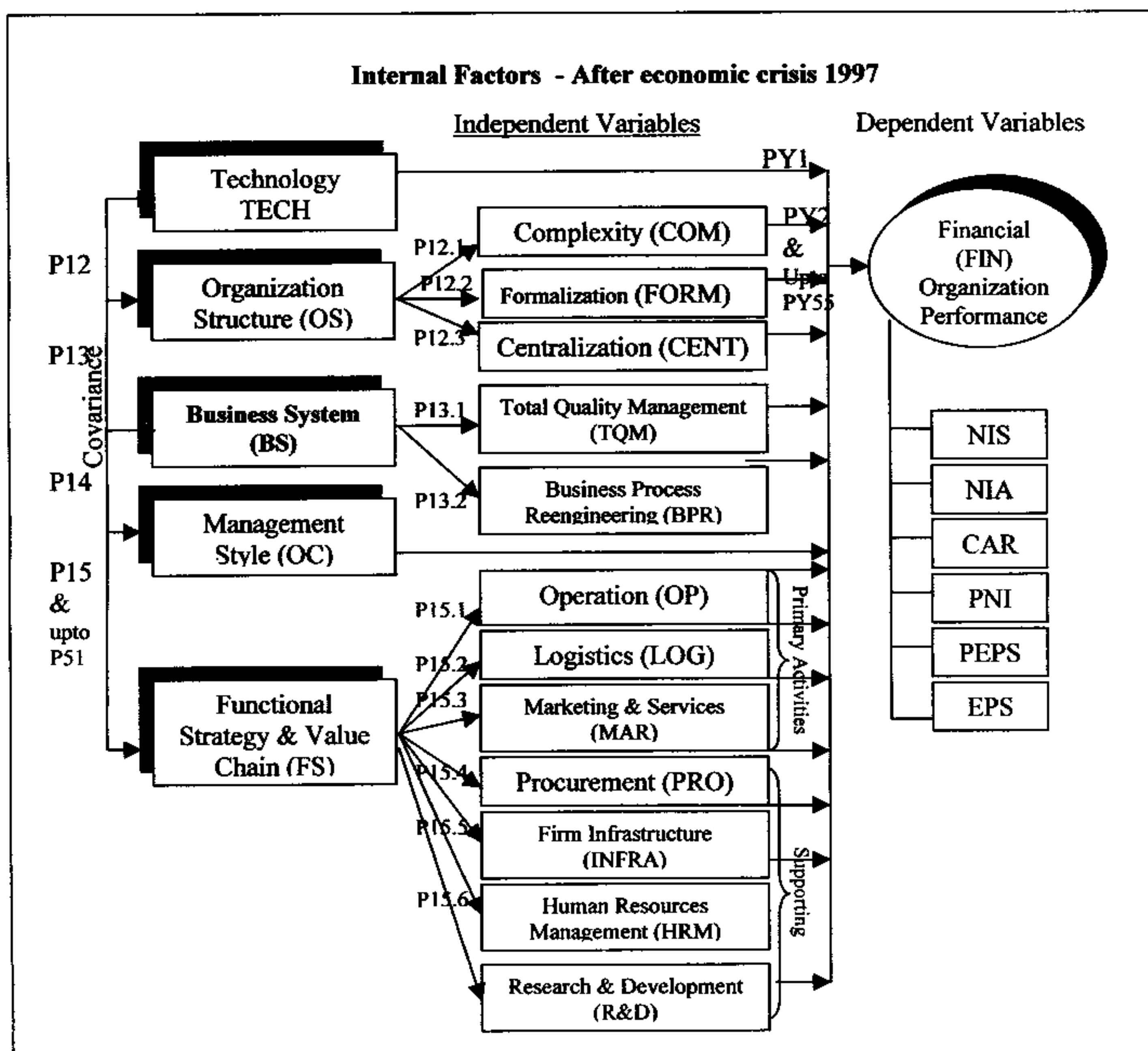
Part I: Opinions of the respondents from energy enterprises in Thailand about Organization Structure, Business System, Management Style, Technology, and the Functional Strategy-Value Chain, which included primary activities and support activities. The results are presented by the descriptive statistics techniques of mean and standard deviation.

Part II: Analysis of the research hypotheses and creation of the linear structural relationship equation model (LISREL model), which would explain the cause-effect relationships of the factors affecting organization performance of energy enterprises in Thailand.

The LISREL Models of the Internal Factors, Affecting Organization Performance

Hypothesis 1

Figure 4.1 Linear Structural Relationship Equation Modeling (LISREL 1)



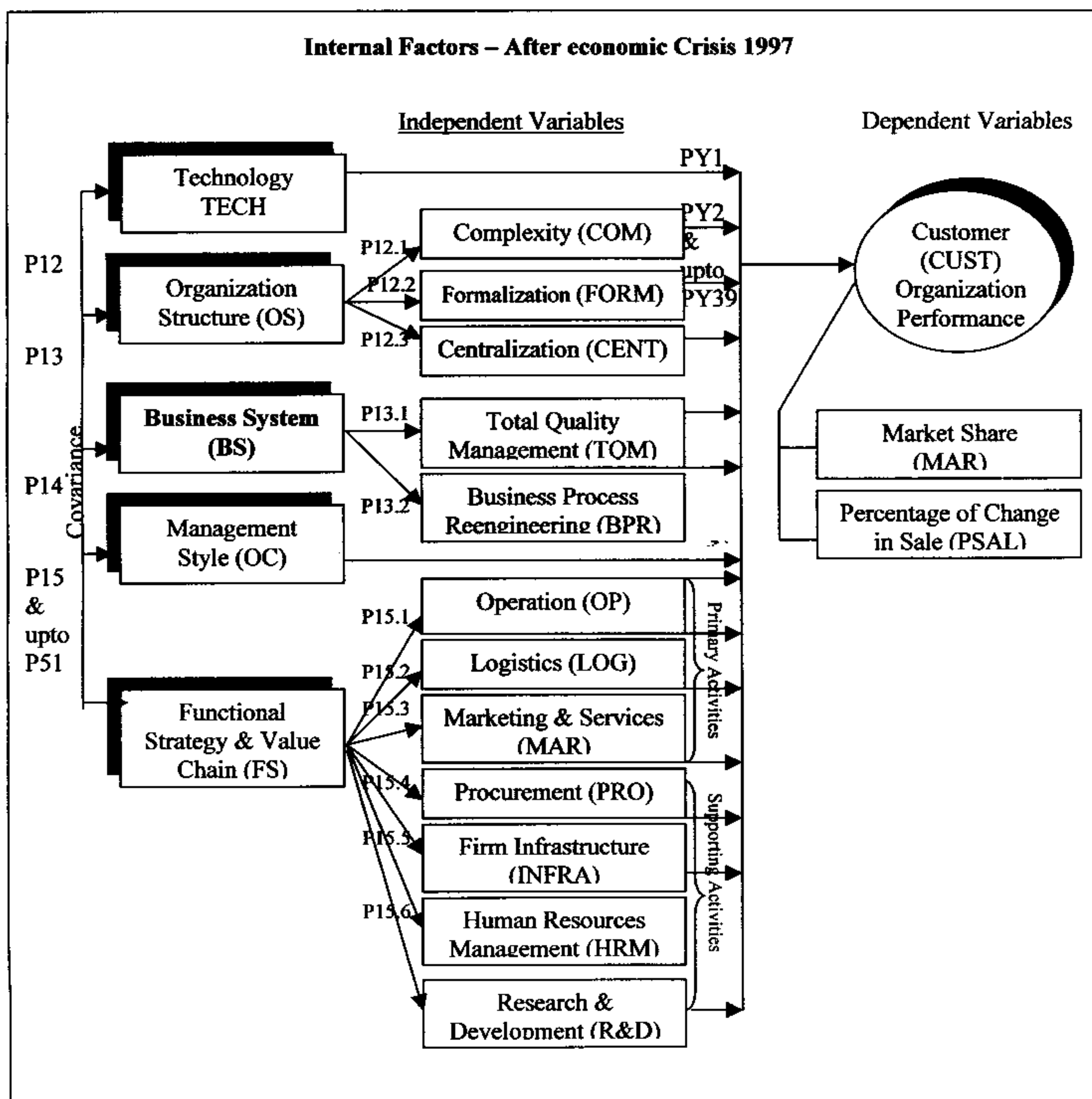
TECH	=	Technology
OS	=	Score on Organization Structure: Complexity (COM), Formalization (FORM), Centralization (CENT)
OC	=	Score on Management Style
BS	=	Score on Business System: Total Quality Management (TQM), Business Process Reengineering (BPR)
FS	=	Score on Functional Strategy – Value Chain: Primary Activities: Operation (OP), Logistics (LOG), Marketing & Services (MAR), Supporting Activities: Procurement (PRE), Firm Infrastructure (INFR), Research & Development (R&D), Human Resource Management (HRM)
FIN	=	Financial Organization Performance after economic crisis 1997
NIS	=	Net Income/Sale after economic crisis 1997
NIA	=	Net Income/Total Assets after economic crisis 1997
CAR	=	Current Assets Ratio after economic crisis 1997
PNI	=	Percentage of Change in Net Profit after economic crisis 1997
PEPS	=	Percentage of change in Earning Per Share after economic crisis 1997
EPS	=	Earning Per Share after economic crisis 1997

P12, P13, P14, P15 up to P15.6, = Covariance between independent variables

PY1, PY2 to PY55 = Path coefficient between independent variables and dependent variables (Organization Performance in terms of financial ratio)

Hypothesis 2

Figure 4.2 Linear Structural Relationship Equation Modeling (LISREL 2)



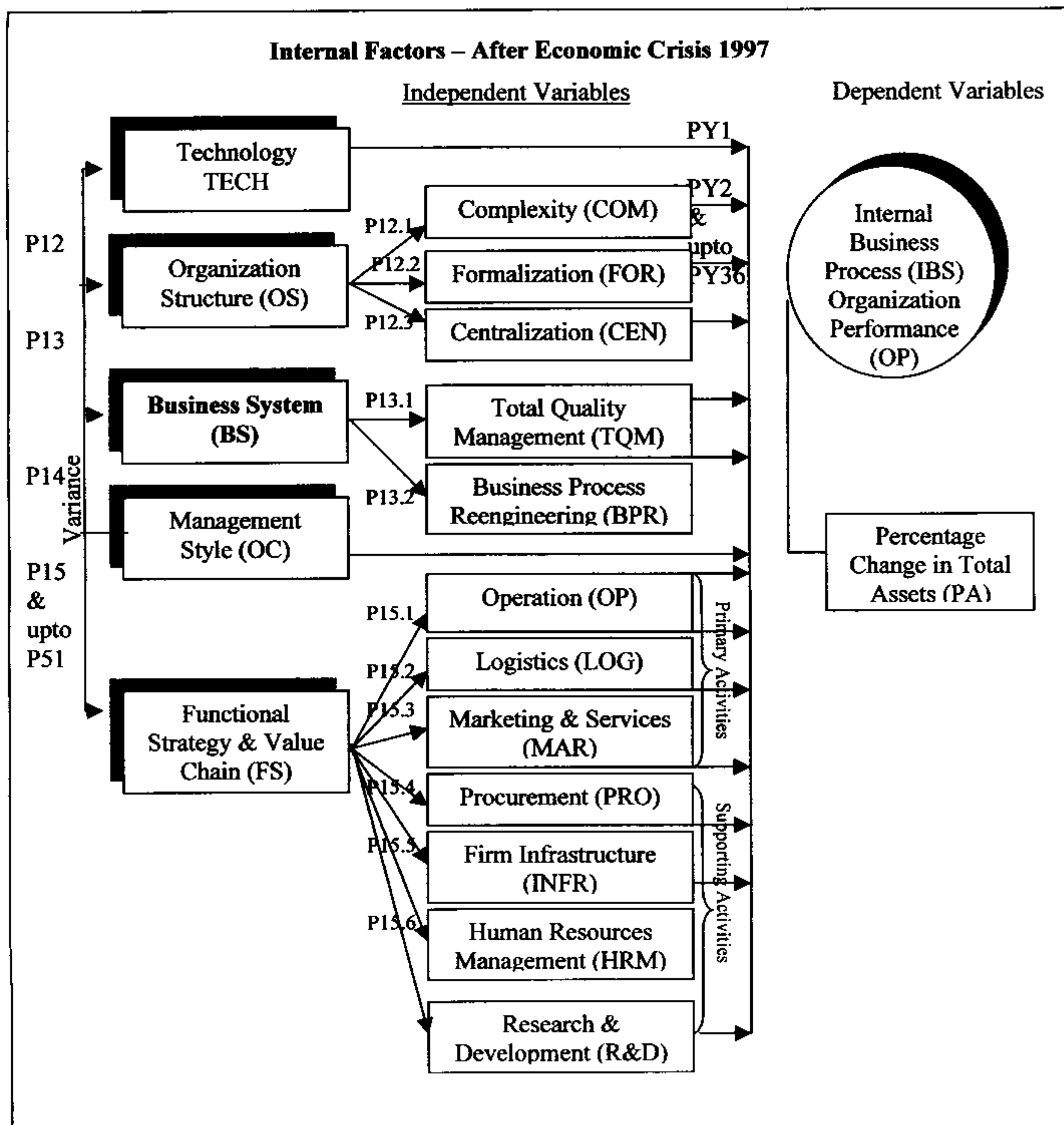
TECH	=	Technology
OS	=	Score on Organization Structure: Complexity (COM), Formalization (FORM), Centralization (CENT)
OC	=	Score on Management Style
BS	=	Score on Business System: Total Quality Management (TQM), Business Process Reengineering (BPR)
FS	=	Score on Functional Strategy – Value Chain: Primary Activities: Operation (OP), Logistics (LOG), Marketing & Services (MAR), Supporting Activities: Procurement (PRE), Firm Infrastructure (INFR), Research & Development (R&D), Human Resource Management (HRM)
CUST	=	Customer Organization Performance after economic crisis 1997
MAR	=	Market Share after economic crisis 1997
PSAL	=	Percentage of Change in Sales after economic crisis 1997

P12, P13, P14, P15 up to P15.6, = Covariance between independent variables

PY1, PY2 to PY55 = Path coefficient between independent variables and dependent variables (Organization Performance in terms of Market Share and Percentage of Change in Sales)

Hypothesis 3

Figure 4.3 Linear Structural Relationship Equation Modeling (LISREL 3)

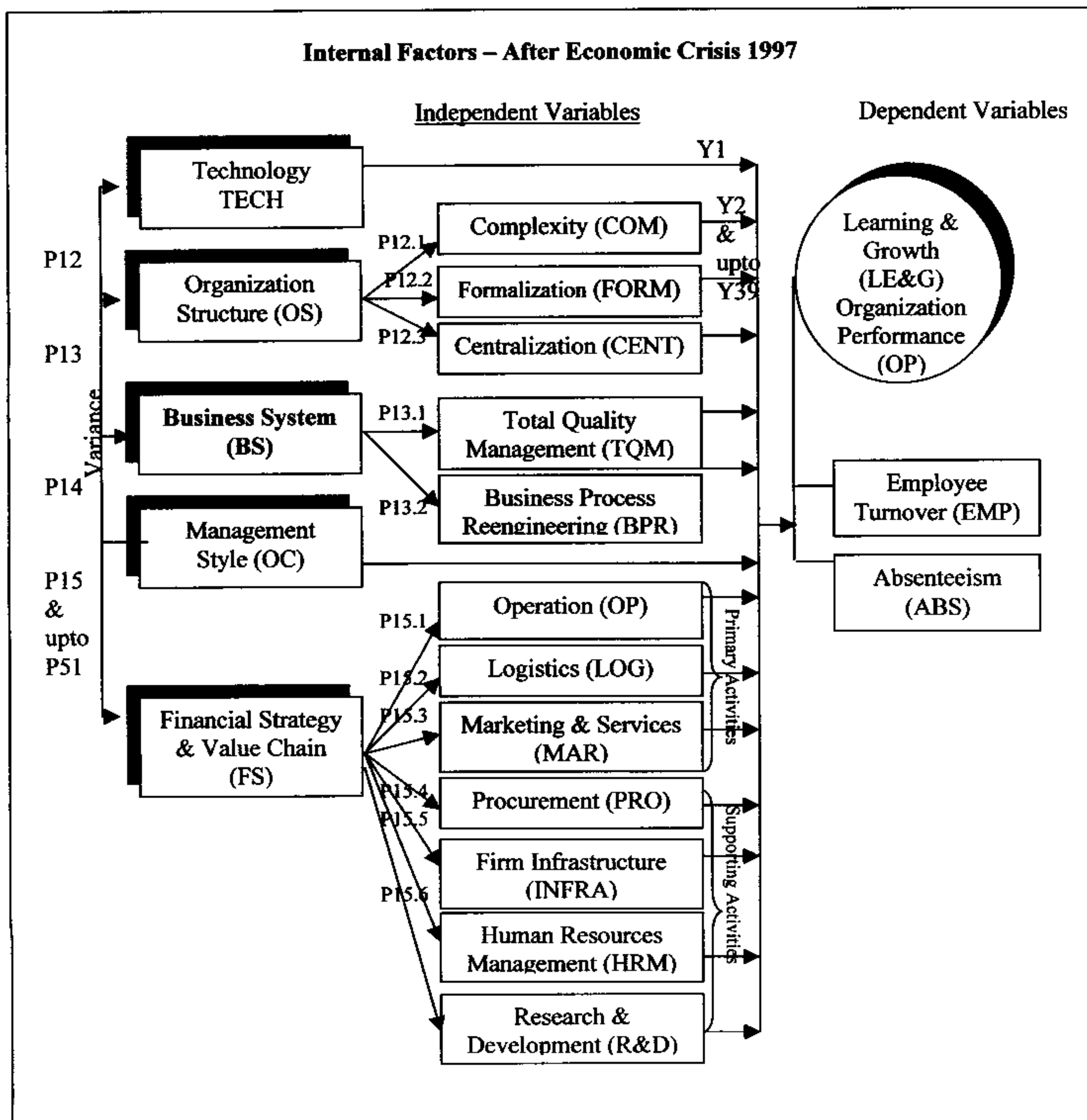


TECH	=	Technology
OS	=	Score on Organization Structure: Complexity (COM), Formalization (FORM), Centralization (CENT)
OC	=	Score on Management Style
BS	=	Score on Business System: Total Quality Management (TQM), Business Process Reengineering (BPR)
FS	=	Score on Functional Strategy – Value Chain: Primary Activities: Operation (OP), Logistics (LOG), Marketing & Services (MAR), Supporting Activities: Procurement (PRE), Firm Infrastructure (INFRA), Research & Development (R&D), Human Resource Management (HRM)
IBP	=	Internal Business Process Organization Performance after Economic crisis 1997
PA	=	Percentage Change in Total Assets after economic crisis 1997

P12, P13 up to P15.6 and PY1, PY2 to PY36 = Path coefficient between variables

Hypothesis 4

Figure 4.4 Linear Structural Relationship Equation Modeling (LISREL 4)



TECH	=	Technology
OS	=	Score on Organization Structure: Complexity (COM), Formalization (FORM), Centralization (CENT)
OC	=	Score on Management Style
BS	=	Score on Business System: Total Quality Management (TQM), Business Process Reengineering (BPR)
FS	=	Score on Functional Strategy – Value Chain: Primary Activities: Operation (OP), Logistics (LOG), Marketing & Services (MAR), Supporting Activities: Procurement (PRE), Firm Infrastructure (INFRA), Research & Development (R&D), Human Resource Management (HRM)
LE&G	=	Learning & Growth Organization Performance after Economic crisis 1997
EMP	=	Employee Turnover rate after economic crisis 1997
ABS	=	Absenteeism rate after economic crisis 1997

P12, P13 up to P15.6 and PY1, PY2 to PY39 = Path coefficient between variables

4.6 Conclusion

In summary, primary and secondary data were collected. Primary data were obtained from questionnaires and interviews with the top executives of energy enterprises, including petroleum, electricity, gas, other businesses related to energy manufacture, distributors, their subsidiaries, and joint ventures. Secondary data were acquired from other sources: the Stock Exchange of Thailand, financial statements, and the Ministry of Commerce. Multi-stage data was obtained from 69.33 per cent of a total 416 executives from 52 energy enterprises in Thailand. The sample of executives was selected from a target population of 600 executives from 75 energy enterprises in

Thailand. Considering the research sample size with respect to the target population of petroleum refinery enterprises (including state-owned enterprises, privatized state-owned enterprises, and private firms), it was found that the sample size covered 100 per cent of the target population. Considering the research sample size with respect to the target population of gas, petrochemical producers and medium-sized petroleum traders (including state-owned enterprises, privatized state-owned enterprises, and private firms), it was found that the sample size covered 85.71 per cent of the target population. The sample size covered 58.33 per cent of enterprises in electricity power (including state-owned enterprises, privatized state-owned enterprises, IPPs and SPPs).

The SPSS and AMOS programs were used to test the research hypotheses and created the linear structural relationship equation model (LISREL) that was used to explain the cause-effect relationships of the factors affecting the organizational performance of energy enterprises in Thailand.

CHAPTER V

FINDINGS AND RESULTS

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The 52 organizations and 416 the respondents in the energy enterprises in Thailand including Oil, Gas and Electricity sector in Thailand were selected as population and sample of the study.

This chapter, discusses the analysis of the data with SPSS program on the characteristics and opinions of the respondents and the analysis with the AMOS program on which the research hypotheses tested. The linear structural relationship equation model (LISREL model) explains the cause-effects relationship of the internal structural adjustment factors affecting the Organizational Performance in the energy enterprises in Thailand. The data analysis mentioned above, presented in two parts as follows:

5.1. The evaluation of the internal factors affecting the Organizational Performance of the energy enterprises after the economic crisis of Thailand in 1997

5.2 The study of the cause-effects relationship of the internal factors and appropriate linear structural relationship equation model (LISREL model).

5.3 The results of qualitative analysis of six energy enterprises

5.1 The evaluation of the internal factors affecting the Organizational Performance of the energy enterprises after the economic crisis of Thailand in 1997

Table 5.1 Mean Score of Significance of Organizational Structure

Organizational Structure		Mean	S.D.
Complexity		3.97	1.00
1	Amounts of managers, deputy managers and assistant managers in department/division/section/ in the organizational were divided appropriately for job quantities, aspects and categorical.	3.67	1.04
2	The distribution of department/division/section/unit in the organizational has not the exceed stages, leaders and command lines.	3.92	1.03
3	The cooperation between department/division/section/unit in company were fast and convenience.	4.04	1.25
4	The missions of each department/division/section/unit in the company are clear, uncomplicated and easy to understand.	4.08	0.90
5	The structure of the jobs distribution in the company yielded more comfortable and rapidly in operating to resolve the problem	4.12	0.78
Formalization		7.07	1.00
1	The department/division/section/unit had a clarify handbook for staff in operating	6.90	1.14
2	The department/division/section/unit in the company had the clear work discipline and regulation, and easy to understand.	7.06	0.87

Table 5.1 Mean Score of Significance of Organizational Structure (continued)

	Organizational Structure	Mean	S.D.
3	The organization set up the regulation for customers service in case of external person and organization which was clear, and easy to understand and practice.	7.13	0.84
4	The department/division/section/unit set up the standard, objectives and target for operating in numeric aspects, which effect on the clarity of job distribution.	7.12	0.96
5	You were clarified the understanding in the boundary of responsibility and authority of yourself decision making.	7.13	1.17
	Centralization and Decision Making	7.38	1.24
1	The decision making which was important involved in the targets, strategic, planning, procurement, investment of business group depends on the top executive of the organizational.	6.77	1.20
2	Managers, deputy managers and assistant managers of business group/department/division/section/unit in the organization had an appropriate and adequate authority and responsibility to make decision.	7.21	1.18
3	Top executive of business group/department/division/section/unit had an independence authority in decision making to change the practical process, program, and strategies for competitive advantage in the Quality Management Policy.	7.52	1.18
4	Top executive of business group/department/division/section/unit had an independence authority in decision making to change the practical process, program, and strategies for competitive advantage in the Re-engineering	7.29	1.14

Table 5.1 Mean Score of Significance of Organizational Structure (continued)

	Organizational Structure	Mean	S.D.
5	Top executive of business group/department/division/section/unit had an independence authority in decision making to change the practical process, program, and strategies for competitive advantage in the Reduce Operation Cost strategies.	7.38	1.21
6	Top executive of business group/department/division/section/unit had an independence authority in decision making to change the practical process, program, and strategies for competitive advantage in the New Products Development leader strategies.	7.12	1.23
7	The executive committees took high potential roles in the decision making to identify the tendency in jobs practice, job evaluation, welfare and salary adjustment, evaluation and rewards consideration of business group/department/group/section/units.	7.58	1.23
8	The officers had no independence in working, planning and setting regulation under the present structure of organization.	7.81	1.17
9	The currently Organizational Structure promoted the participation of top executive in strategic planning, operate planning, evaluation, not emphasized the participation of middle and lower position.	7.73	1.61

Table 5.1 illustrates the opinions towards Organizational Structure with respects to the complexity, the respondents found that the mean value of all side = 3.97, in which the highest answered that “The structure of the jobs distribution in the company yielded more comfortable and rapidly in operating and to resolve the problem” (mean = 4.12), the minority answered “The missions of each department/division/section/unit in the company were clear, uncomplicated, and easy to understand” (mean = 4.08), and the sub-minority chose “The cooperation between department/division/section/unit in company were fast and convenience” (mean = 4.04).

Concerning the opinions towards Organizational Structure with respect to formalization, it is found that the mean value of all side = 7.07, which the highest responses were “You are clarified the understanding in the boundary of responsibility and authority of yourself decision making” and “The organization set up the regulation for customers service in case of external person and organization which was clear, easy to understand and practice.” (mean = 7.13). The minority answered that “The department/division/section/unit set up the standard, objectives and target for operating in numeric aspects which effect on clarify in jobs distribution.” (mean = 7.12), and the sub-minority chose “The department/division/section/unit in the company had the work discipline and regulation, which were clear and easy to understand” (mean = 7.06).

The opinions towards Organizational Structure with respect to formalization, it revealed that the mean value of all side = 7.38, which the highest in item The officers had no independence in working, planning and setting regulation under the present structure of organization.” (mean = 7.81). The minority item was “The currently Organizational Structure promoted the participation of top executive in strategic planning, operate planning, evaluation, not emphasized the participation of middle and lower position.” (mean = 7.73), and the sub-minority item was “The executive committee took high potential roles in the decision making to identify the tendency in jobs practice, job evaluation, welfare and salary adjustment, evaluation, rewards consideration of business group/department/group/section/units.” (mean = 7.58).

Table 5.2 Mean Score of Significance of Business System

	Business System	Mean	S.D.
	Business Process Re-engineering	7.32	1.08
1	The improvement and adjustment in business process were changed by small jobs and tasks to be a more important category and large which supported multiple functions and objective	7.73	0.93

Table 5.2 Mean Score of Significance of Business System (continued)

	Business System	Mean	S.D.
2	The changing in business process contributed to create independence authority in decision making for all level of employee.	7.62	0.97
3	Business process contributed to reduce inspection controlling and operate rapidly.	7.69	1.09
4	The aspects of new Organizational Structure contributed to flatter command lines than vertical, since the authority and decision making depended on the business team, not depended on the specialization.	7.60	0.87
5	The business changing contributed to new trend of human resource management such as provided the education to the employee, not only training program in the past. The consideration in benefits, rewards and promote to employee depended more on the capacity and ability than the seniority.	7.35	0.93
6	The organization used modern Technology to change the new operates process in operation system by specialist.	7.06	1.19
7	The organization used modern Technology to change the new operates process in MRP and DBMS.	7.19	1.07
8	The organization used modern Technology to change the new operate process in decision supported system.	6.73	1.30
9	The organization used modern Technology to change the new operate process in wireless communication	7.06	1.14
10	The organization used modern Technology to change the new operate process in software development	7.13	1.25

Table 5.2 Mean Score of Significance of Business System (continued)

	Business System	Mean	S.D.
	Total Quality Management	7.04	1.28
1	Total Quality Management was the important target with respect to strategic planning which emphasized on the research for development, producing new activity, continuing improvement and preventing management in quality management of organization.	6.92	1.06
2	The executive and officers learned the new philosophy of the quality management which changed and adjusted attitude towards the quality system, and emphasized on preventing the management in quality management of organization and continuing improvement.	6.48	1.21
3	The objective of inspection contributed to improve the internal business process and reduced the cost, which more used the statistical techniques than the inspection.	6.83	1.34
4	The organization allocated the resource to support the educational development and self development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in 5S	7.35	1.03
5	The organization allocated the resource to support the educational development and self development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in ISO9000	6.52	1.28
6	The organization allocated the resource to support the educational development and self development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in ISO14000	7.21	1.54

Table 5.2 Mean Score of Significance of Business System (continued)

	Business System	Mean	S.D.
7	The organization allocated the resource to support the educational development and self development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in Just in Time	7.02	1.48
8	The organization allocated the resource to support the educational development and self-development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in TQM.	7.27	1.17
9	The organization allocated the resource to support the educational development and self development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in Just in QCC	7.15	1.19
10	The organization allocated the resource to support the educational development and self development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in Just in KAISEN	6.98	1.63
11	The organization allocated the resource to support the educational development and self development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in Just in Employee involvement	6.90	1.33

Table 5.2 Mean Score of Significance of Business System (continued)

	Business System	Mean	S.D.
12	The organization allocated the resource to support the educational development and self development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in Just in Engineering value	7.15	1.19
13	The organization can not use the Management by objectives, can not set up the numeric targets and emphasized on the individual specialist.	7.71	1.16

Table 5.2 illustrates the opinions towards the business system with respect to business process re-engineering. It is found that the mean value of all side = 7.35, which the highest item was "The improvement and adjustment in business process were changed by small jobs and tasks to be a more important category and large which supported multiple functions and objective." (mean = 7.73), The minority item was "Business process contributed to reduce inspection controlling and operate rapidly." (mean = 7.69), and the sub-minority item was "The changing in business process contributed to create independence authority in decision making of all level of employee." (mean = 7.62).

The opinions towards business system with respect to Total Quality Management of the respondents found that the mean value of all side = 7.04, which the highest item was "The organization can not use the Management by objectives, can not set up the numeric targets and emphasized on the individual specialist." (mean = 7.71) and the minority item was "The organization allocated the resource to support the educational development and self development of employee in terms of quality system training program for executive, middle level administrator, division head and officers in 5S." (mean = 7.35), and the sub-minority item was "The organization allocated the resource to support the educational development and self development

of employee in terms of quality system training program for executive, middle level administrator, division head and officers in TQM.” (mean = 7.27).

Table 5.3 Mean Score of Significance of Management Style

	Management Style	Mean	S.D.
1	The changing in business process contributed to create more authority in decision making of all employees in organization, especially in performance.	7.48	1.02
2	The changing in the roles of executive toward employee contributed to reduce the controlling, regulation to consulting and leadership roles.	7.10	1.19
3	The department administrators emphasized on the management by teams, which were multi functional specialist, efficient and clear cooperation, training supported and the effective used of tools such as Workflow.	6.98	1.18
4	The department administrators emphasized on the management by teams, which were multi functional specialist, efficient and clear cooperation, training supported and the effective used of tools such as Demming Cycle.	6.67	1.25
5	The department administrators emphasized on the management by teams, which were multi functional specialist, efficient and clear cooperation, training supported and the effective used of tools such as Brain Storming.	7.13	1.22
6	The department administrators emphasized on the management by teams, which were multi functional specialist, efficient and clear cooperation, training supported and the effective used of tools such as QCC.	7.33	1.08
7	The department administrators emphasized on the management by teams, which were multi functional specialist, efficient and clear cooperation, training supported and the effective used of tools such as Facts Management.	7.17	1.15
	Total	7.12	1.16

Table 5.3 illustrates that the opinions towards Management Style of the respondents found that the mean value of all side = 7.12, the highest item scored "The changing in business process contributed to create more authority in decision making of all employee in organizational, especially in performance." (mean = 7.48), the minority in the item "The department administrator emphasized on the management by team, which were multi functional specialist, efficient and clear cooperation, training supported and the effects used of tools such as QCC." (mean = 7.33), and the sub-minority in the item of "The department administrator emphasized on the management by team, which were multi functional specialist, efficient and clear cooperation, training supported and the effects used of tools such as Facts Management." (mean = 7.27).

Table 5.4 Mean Score of Significance of Technology

	Technology	Mean	S.D.
1	The organization conducted the new Technology, which acquired by research and development in the organization to practice and receive more capacity than competitor in Operation Research.	5.38	1.51
2	The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in computer command.	7.27	1.47
3	The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in communication	7.13	2.03
4	The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in operation improvement.	6.85	2.22

Table 5.4 Mean Score of Significance of Technology (continued)

	Technology	Mean	S.D.
5	The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in engineering and designed by computer assistant.	7.04	2.18
6	The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in Operation Research.	6.50	2.36
7	The organizational conducted the new Technology, which acquired by research and development to use for producing the new products in the organization.	6.27	2.34
8	The organizational conducted the new Technology, which acquired by research and development to use for improving the operation and products quality, which reduced loss.	5.25	2.38
	Total	6.46	2.06

Table 5.4 illustrates that the opinions towards organizational technology of the respondents found that the mean value of all side = 6.46, which the highest item was “The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in computer command.” (mean = 7.27), the minority item was “The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in communication” (mean = 7.13), and the sub-minority item was “The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in engineering and designed by computer assistant.” (mean = 7.04).

Table 5.5 Mean Score of Significance of Firm Infrastructure

	Firm Infrastructure	Mean	S.D.
1	The ability and capacity of the organization produced and developed the new products and services, estimated the negative environmental impacts on the organization.	5.37	1.63
2	The strategic planning systems in the organization were efficient and high quality, conducted to attainable in goal and objectives.	6.31	2.02
3	The efficiency in management system created the supported system into the organizational, emphasized on cooperation, analysis and integrated the jobs in the department in the organizational such as operation, marketing, logistics, human resource, procurement, research and development.	7.27	1.47
4	The financial management provided the low costs funds of long-term investment and working capital in case of low interest from financial institute.	7.13	2.03
5	The financial management provided the low costs funds of long term investment and working capital in case of low interest funds from external and internal stock exchange.	6.85	2.22
6	The financial management provided the low costs funds of long term investment and working capital in case of foreign Joint – venture.	7.04	2.18
7	The financial management provided the low costs funds of long term investment and working capital in case of domestics Joint – venture.	6.50	2.36
8	The financial management provided the low costs funds of long term investment and working capital in case of domestics' common stocks.	6.81	2.68

Table 5.5 Mean Score of Significance of Firm Infrastructure (continued)

	Firm Infrastructure	Mean	S.D.
9	The financial management provided the low costs funds of long term investment and working capital in case of foreign common stocks.	5.00	2.44
10	The modern Technology and high efficiency of information management system supported the decision making for strategic planning.	5.25	2.61
11	The modern Technology and high efficiency of information management system supported the decision making for routine operation.	6.27	2.34
12	The modern Technology and high efficiency of information management system supported the decision making for general administration.	5.25	2.38
13	The modern Technology and high efficiency of information management system in organizational provided the customers information management for best services.	7.17	1.95
14	The organizational developed the relationship with the public sector, interest groups in the country and illustrates that good image to the public.	7.42	1.23
	Total	6.40	2.11

Table 5.5 illustrates that the opinions towards the firm infrastructure of the respondents found that the mean value of all side = 6.40, which the highest scored was "The organization developed the relationship with the public sector, interest groups in the country and illustrated the good image to the public." (mean = 7.42), the minority item was "The efficiency in management system created the supported system into the organization, emphasized on cooperation, analysis and integrated the jobs in the department in the organization such as operation, marketing, logistics, human resource, procurement, research and development." (mean = 7.27) and the sub-

minority item was “The modern Technology and high efficiency of information management system in organization provided the customers information management for best services.” (mean = 7.17).

Table 5.6 Mean Score of Significance of Human Resource Management

	Human Resource Management	Mean	S.D.
1	Human resource management policy was modernized, clarified, made it easy to understand and practice, and efficiency in recruitment.	7.27	1.47
2	Human resource management policy was modernized, clarified, made it easy to understand and practice, and efficiency in training.	7.13	2.03
3	Human resource management policy was modernized, clarified, made it easy to understand and practice, and efficiency in rank promoting.	6.85	2.22
4	Human resource management policy was modernized, clarified, made it easy to understand and practice, and efficiency in benefits and rewards consideration.	7.04	2.18
5	Human resource management policy was modernized, clarified, made it easy to understand and practice, and efficiency in salary, bonus and other allowance.	7.27	1.47
6	Human resource management policy was modernized, clarified, made it easy to understand and practice, and efficiency in life insurance.	7.13	2.03
7	Human resource management policy was modernized, clarified, made it easy to understand and practice, and efficiency in privilege to buy common stocks of the organizational.	6.85	2.22

Table 5.6 Mean Score of Significance of Human Resource Management (continued)

	Human Resource Management	Mean	S.D.
8	The organization developed working environment and atmosphere with respect to safety system.	7.04	2.18
9	The organization developed working environment and atmosphere with respect to facilities.	6.50	2.36
10	The organization developed working environment and atmosphere with respect to communication system.	6.81	2.68
11	The organization developed working environment and atmosphere with respect to computer system.	5.00	2.44
12	The organizational implemented to develop the good relationship with labor unions, club in terms of cooperating the programs projects.	5.25	2.61
13	The interpersonal relationship between top executive, department head and employee were good and created the several activities in the organization.	7.27	1.47
14	The organizational implemented the continuing modernized and efficiency improvement in terms of the relationship between employee and administrator.	7.13	2.03
15	The organization implemented the continuing modernized and efficient improvement in terms of the job specification.	6.85	2.22
16	The organization implemented the continuing modernized and efficient improvement in terms of the programs.	7.04	2.18
17	The organization implemented the continuing modernized and efficient improvement in terms of the interpersonal relationship between employee.	7.27	1.47

Table 5.6 Mean Score of Significance of Human Resource Management (continued)

	Human Resource Management	Mean	S.D.
18	The organizational implemented the continuing modernized and efficient improvement in terms of benefits and rewards consideration.	7.13	2.03
19	The organizational implemented the continuing modernized and efficient improvement in terms of love and belonging to the organization.	6.85	2.22
20	The job specification systems were changed to one new policy, which depended on the ability and capacity of employee.	7.04	2.18
21	The job specification systems were changed to one new policy, which created more independence in decision making of employee.	6.50	2.36
22	The job specification systems were changed to one new policy, which depended on the job specialization created of employee.	6.81	2.68
23	The job specification systems were changed to one new policy, which created the boundary of authority and responsibility to the employee.	5.00	2.44
	Total	6.74	2.14

Table 5.6 illustrates that the opinions towards the human resource management in the organizational of the respondents found that the mean value of all side = 6.74, which the highest score was “The organization implemented the continuing modernized and efficient improvement in terms of the interpersonal relationship between employee.”, followed by the “The interpersonal relationship between top executive, department head and employee were good and created the several activity in the organization.”, answered that “Human resource management policy was modernized, clarified, easy to understand and practice and efficiency in salary, bonus and other allowance.” and in the item chose “Human resource management policy was modernized, clarified, made it easy to understand and

practice and efficiency in recruitment.” (mean = 7.27). The minority item was “The organization implemented the continuing modernized and efficient improvement in terms of benefits and rewards consideration” answered that “The organization implemented the continuing modernized and efficient improvement in terms of the relationship between employee and administrator.” and in the item of “Human resource management policy was modernized, clarified , made it easy to understand and practice and efficiency in life insurance.” and in the item of “Human resource management policy was modernized, clarified, made it easy to understand and practice and efficiency in training. (mean = 7.13).

Table 5.7 Mean Score of Significance of Logistics

	Logistics	Mean	S.D.
1	Your organization has developed the inventory controlling system on finished good and modern raw material such as Information On Line system, the amount of goods inventory, and seller information.	7.63	0.97
2	Your organization has the effective inventory management system on finished good and modern raw material such as the delivery system inside warehouse.	7.46	1.00
3	Your organization has the effective inventory management system on finished good and modern raw material such as goods storing system.	7.63	0.97
4	Your organization has the effective Inventory management system on finished good and modern raw material such as security system and good maintaining system.	7.79	1.00
5	Your organization has the effective inventory management system on finished good and modern raw material such as the communication system inside warehouse.	7.62	0.89

Table 5.7 Mean Score of Significance of Logistics (continued)

	Logistics	Mean	S.D.
6	Your organization has the effective inventory management system on finished good and modern raw material such as computer system.	7.44	0.98
7	Your organization has the delivery and service system on time satisfied the customer need and saved the budget by improving transportation on train, car, water transportation and air transportation.	7.25	1.17
8	Your organization has the effective inventory management system on raw material to support the production system such as ABC system	7.50	1.06
9	Your organization has the effective inventory management system on raw material to support the production system such as Safety Stock system.	7.31	1.11
10	Your organization has the effective inventory management system on raw material to support the production system such as MRP system.	6.98	1.21
11	Your organization has the effective inventory management system on raw material to support the production system such as Magic system.	7.25	1.25
12	Your organization has the development in warehouse system, ordering system, and packaging system modern and has warehouse center in several zones.	4.69	1.44
	Total	7.21	1.09

Table 5.7 illustrates that the opinions towards the logistics of the respondents found that the mean value of all side = 7.21, which the highest answered that “Your organization has the effective inventory management system on finished good and modern raw material such as security system and good maintaining system” (mean = 7.79), the minority item was “Your organization has the effective inventory

management system on finished good and modern raw material such as goods storing system” and item was “Your organization has the effective inventory management system on finished good and modern raw material such as Information On Line system, the amount of goods inventory, and seller information” (mean = 7.63) and the sub-minority item was “Your organization has the effective inventory management system on finished good and modern raw material such as the communication system inside warehouse” (mean = 7.62).

Table 5.8 Mean Score of Significance of Marketing and Sales

	Marketing and Sales	Mean	S.D.
1	Developed the sale promotion and advertisement.	7.29	1.49
2	Assessed the alternatives and other distribution channel.	7.63	1.87
3	Created the persuasion on sale competition.	6.85	2.30
4	Developed organizational image and reputation.	7.98	1.45
5	Expanded the reputation of the product to be acceptance of the customer.	7.44	1.92
6	Created the customer satisfaction by improving the product.	7.33	1.96
7	Listened to the customer problem and taking for improvement.	6.46	2.53
8	Provided the product warrantee policy and free maintenance spare part in the appropriate time	5.87	2.63
9	Provided the training and education policy for customer in order to create the understanding in the product feature, product quality and be able to use the product correctly	5.90	2.41
10	Provided effective repairing service center and maintenance covering large area	5.27	2.24
	Total	6.80	2.08

Table 5.8 illustrates that the opinions towards the marketing and sales of the respondents found that the mean value of all side = 6.80, which the highest item was “Developed organizational image and reputation.” (mean = 7.79), the minority item

was “Assessed the alternatives and other distribution channel.” (mean = 7.63) and the sub-minority item was “Expanded the reputation of the product to be acceptance of the customer.” (mean = 7.44).

Table 5.9 Mean Score of Significance of Operation

Operation Department		Mean	S.D.
1	Developed engine, equipment, production facilities more effective than competitors.	6.12	1.50
2	Improved the production process more effective and decreased the production costs by using the automatic production system of the modern computer controlling system.	7.42	1.19
3	Used the production controlling system to increase the product quality and decrease the production costs such as the statistic production controlling system, Just in Time, etc.	6.88	1.45
4	Designed the factory plan for the appropriate productions process and supporting the job flow in the factory effetely.	8.10	1.09
5	Improved the production policy in consistency to the rapid change of the organizational strategy.	7.75	1.01
6	Provided the production policy emphasis on the increasing production quantity in order to reduce investment budget on engine and decreased the depreciation.	7.15	0.89
7	Provided the effective production quality policy emphasis on examining the product quality every stage of production process in order to use for improving the product quality and reduce the loss good.	5.92	1.28
8	Used the production standard system with the engine and equipment to produce more products or be able to produce the special order product quickly upon the increased market demand.	5.88	1.31
Total		6.90	1.22

Table 5.9 illustrates that the opinions towards the operation of the respondents found that the mean value of all side = 6.90, which the highest item was

“Designed the factory plan for the appropriate production process and supporting the job flow in the factory effectively.” (mean = 8.10), the minority item was “Improved the production policy in consistency to the rapid change of the organizational strategy” (mean = 7.75) and the sub-minority item was “Improved the production process more effective and decreased the production costs by using the automatic production system of the modern computer controlling system.” (mean = 7.42).

Table 5.10 Mean Score of Significance of Procurement

Procurement		Mean	S.D.
1	Considered the purchasing raw material, wasted material, hardware and other properties by multiple offering.	7.88	1.80
2	Developed the good relationship continuously with manufacturer and trader on raw material, wasted material, hardware, engine equipment and other properties.	7.33	1.97
3	Provided the clear and fair rule in purchasing raw material system, wasted material, hardware, engine equipment and other properties in form of committee.	7.77	1.21
4	Used the criteria in considering the good quality and low price as well as on time delivery in purchasing raw material system, wasted material, hardware, engine equipment and other properties.	7.46	1.67
5	Developed the criteria using for purchasing decision or used the property rental method inside organization, which benefited in long term.	8.08	1.10
6	Provided the purchasing policies by making long term contract and had the quality examining policy of offering .	7.44	1.63
Total		7.66	1.56

Table 5.10 illustrates that the opinions towards the procurement of the respondents found that the mean value of all side = 7.66, which the highest item was “Developed the criteria using for purchasing decision or used the property rental

method inside organization which benefited in long term.” (mean = 8.08), the minority item was “Considered the purchasing raw material, wasted material, hardware and other properties by multiple offering.” (mean = 7.88) and the sub-minority item was “Provided the clear and fair rule in purchasing raw material system, wasted material, hardware, engine equipment and other properties in form of committee.” (mean = 7.77).

Table 5.11 Mean Score of Significance of Research and Development

	Research and Development	Mean	S.D.
1	Provided the Research and Development program on the effective product and production process.	5.06	1.04
2	Viewed your organization that they had good relationship between the Research and Development and other department such as Marking, Production, and Purchasing.	7.33	1.00
3	The researcher has high ability and experience.	6.81	2.68
4	The working environment in research is appropriate for the researcher in creating thought and job development.	5.00	2.44
6	There were the good research and development on production process and good designing product component in order to reduce the production costs.	5.25	2.61
	Total	5.89	1.95

Table 5.11 illustrates that the opinions towards the research and development of the respondents found that the mean value of all side = 5.89, which the highest item was “Viewed your organization that they had good relationship between the Research and Development and other department such as Marking, Production, and Purchasing.” (mean = 7.33), the minority item was “The researcher have high ability and experience.” (mean = 6.81) and the sub-minority item was “There were the good research and development on production process and good designing product component in order to reduce the production costs.” (mean = 5.25).

5.2 The study of the cause-effects relationship of the internal factors and appropriate linear structural relationship equation model (LISREL model)

Hypotheses One: 1: After the 1997 economic crisis in Thailand, the organizational performance in terms of financial perspective (net income/ sale, net income/ total asset, current asset ratio, percentage of change in net profit, earning per share, percentage of change in earning per share) of energy enterprises would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering), and the functional strategy-value chain (primary activities, supporting activities) in terms of financial performance.

Table 5.12 Independent and the Dependent Variables of Hypotheses One

The Independent variables	The dependent variables
1. Organizational Structure (OS) - Complexity (COMP) - Formalization (FORM) - Centralization and Decision Making (CENT) 2. Management Style (OC) 3. Technology (TECH) 4. Business System - Business Process Re-engineering (BPR) - Total Quality Management (TQM) 5. Functional strategy - Value Chain 5.1 Primary activity - Logistic (LOG) - Operation (OP) - Marketing and Sales (MAK) 5.2 Support Activity - Human resource Management (HRM) - Firm Infrastructure (INFRA) - Procurement (PRO) - Research and Development (RD)	The Organizational Performance (Financial Ratio) 1. Net Income/Sales 1997-1999 (NIS) 2. Net Income/Total Assets 1997-1999 (NIA) 3. Current Assets Ratio 1997-1999 (CAR) 4. Percentage change in Net Profits 1997-1999 (PNI) 5. Percentage change in Earning Per Share 1997-1999 (PEPS) 6. Earning Per Share 1997-1999 (EPS)

The hypothesis testing whether Organizational Structure, Management Style, Technology, Business System, Functional strategy Value Chain were the factors

influencing the Organizational Performance (Financial Ratio) found the consistency between the empirical data and the linear structural relationship model one were not different from zero at the .05 significance level, because it is a saturated model (just identified model). It indicated that the goodness of fits statistics, chi-square value = 0.000, (df = 0) and the goodness of fits index = 1.000 (illustrated in Figure 5.1). Besides, the modification indices reported that there was no need to adjust the model because it was a saturated model and the fit was perfect. The concluded summarize of the research hypothesis 1 is as follows: -

The hypothesis testing found that the covariance between the independent variables (Organizational Structure, Management Style, Technology, Business System, Functional strategy-Value Chain) influenced the variance of the dependent variable (Net Income/Sales after the economics crisis: NIS) at 31.20% (R-square = 0.312). It also indicated that Infrastructure (INFRA), Research and Development (RD) and Management Style (OC) were the factors directly effected on at the .05 significance level as illustrated in Table 5.13 and Figure 5.1.

The hypothesis testing revealed that the covariance between the independent variables (Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain) influenced the variance in dependent variable (Net Income/Total Assets after the economics crisis : NIA) at 28.10% (R-square = 0.281). It also indicated that Procurement (PRO), Human Resource Management (HRM) and Technology (TECH) were the factors directly effected on at the .05 significance level as illustrated in Table 5.13 and Figure 5.1.

The hypothesis testing found that the covariance between the independent variables (Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain) influenced the variance of the dependent variables (Percentage change in Net Profits after the economics crisis: PNI) at 22.10% (R-square = 0.221). It also indicated that Management Style (OC) was the factors directly effected on at the .05 significance level as illustrated in Table 5.13 and Figure 5.1

The hypothesis test found that the covariance between the independent variables (Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain) influenced the variance of the dependent

variables (Current Assets Ratio after The economics crisis: CAR) at 26.20% (R-square = 0.262). It also indicated that Logistics (LOG), Infrastructure (INFRA) and Technology (TECH) were the factors directly effected on at the .05 significance level as illustrated in Table 5.13 and Figure 5.1

The hypothesis test found that the covariance between the independent variables (Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain) influenced the variance of the dependent variables (Percentage change in Earning per Share after the economics crisis: PEPS) at 24.90% (R-square = 0.249). It also indicated Management Style (OC) was the factors directly effected on at the .05 significance level as illustrated in Table 5.13 and Figure 5.1

The hypothesis test found that the covariance between the independent variables (Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain) influenced the variance of the dependent variables (Earning Per Share the after The economics crisis: EPS) at 19.90% (R-square = 0.199). It also indicated that Organizational Structure in terms of Complexity (COMP) was the factors directly effected on at the .05 significance level as illustrated in Table 5.13 and Figure 5.1

Table 5.13 The Standardized Coefficient, T-statistic and R-square

Dependent Variable	Independent Variables	Standardized Coefficient	t-statistic	R²
NIS	COMP	-0.008	-0.086	0.312
	FORM	-0.042	-1.224	
	CENT	0.076	0.617	
	TQM	0.195	1.587	
	BPR	-0.217	-1.453	
	OP	-0.018	-0.478	
	LOG	0.213	1.430	
	MAK	0.191	1.238	

Table 5.13 The Standardized Coefficient, T-statistic and R-square (continued)

Dependent Variable	Independent Variables	Standardized Coefficient	t-statistic	R²
NIA	INFRA	0.708	2.054*	
	PRO	-0.079	-0.259	
	HRM	0.120	0.266	
	RD	-0.710	-3.010*	
	OC	-0.260	-2.136*	
	TECH	-0.428	-1.463	
	COMP	0.011	0.075	0.281
	FORM	0.000	-0.608	
	CENT	-0.044	-0.324	
	TQM	-0.140	-0.953	
	BPR	-0.303	-1.870	
	OP	0.202	1.447	
	LOG	-0.168	-0.989	
	MAK	0.087	0.572	
	INFRA	-0.488	-1.473	
CAR	PRO	0.377	1.962*	
	HRM	-0.524	-1.982*	
	RD	0.325	1.417	
	OC	-0.151	-1.246	
	TECH	0.523	2.025*	
	COMP	-0.061	0.523	0.262
	FORM	-0.203	-0.220	
	CENT	-0.026	-0.125	
	TQM	0.167	1.100	
	BPR	0.024	0.198	
	OP	-0.076	-0.672	
	LOG	-0.342	-2.024*	

Table 5.13 The Standardized Coefficient, T-statistic and R-square (continued)

Dependent Variable	Independent Variables	Standardized Coefficient	t-statistic	R²
PNI	MAK	0.062	0.159	
	INFRA	-0.753	-2.134*	
	PRO	-0.241	-1.119	
	HRM	0.378	1.416	
	RD	0.056	0.335	
	OC	-0.126	-0.551	
	TECH	0.618	2.101*	0.221
	COMP	0.131	0.885	
	FORM	0.031	-0.249	
	CENT	-0.073	-0.527	
	TQM	-0.007	0.003	
	BPR	0.016	0.047	
	OP	-0.296	-1.897	
	LOG	0.035	0.217	
	MAK	0.139	0.906	
	INFRA	-0.067	-0.497	
	PRO	0.042	0.220	
	HRM	-0.050	-0.228	
	RD	0.046	0.187	
	OC	0.348	2.393*	
	TECH	0.045	0.221	
PEPS	COMP	0.105	0.715	0.249
	FORM	0.008	-0.244	
	CENT	-0.034	-0.247	
	TQM	-0.106	-0.725	
	BPR	0.023	0.099	
	OP	-0.252	-1.659	
	LOG	0.027	0.176	
	MAK	0.152	0.981	

Table 5.13 The Standardized Coefficient, T-statistic and R-square (continued)

Dependent Variable	Independent Variables	Standardized Coefficient	t-statistic	R²
	INFRA	-0.045	-0.147	
	PRO	-0.112	-0.525	
	HRM	0.055	0.148	
	RD	-0.107	-0.435	
	OC	0.415	2.976*	
	TECH	-0.042	-0.108	
EPS	COMP	-0.342	-2.195*	0.199
	FORM	0.103	1.014	
	CENT	-0.003	-0.622	
	TQM	-0.081	-0.069	
	BPR	-0.006	0.056	
	OP	-0.029	-0.209	
	LOG	0.021	0.035	
	MAK	-0.233	-1.333	
	INFRA	-0.265	-0.699	
	PRO	-0.023	-0.245	
	HRM	0.303	1.140	
	RD	0.143	0.484	
	OC	0.096	0.675	
	TECH	-0.155	0.608	

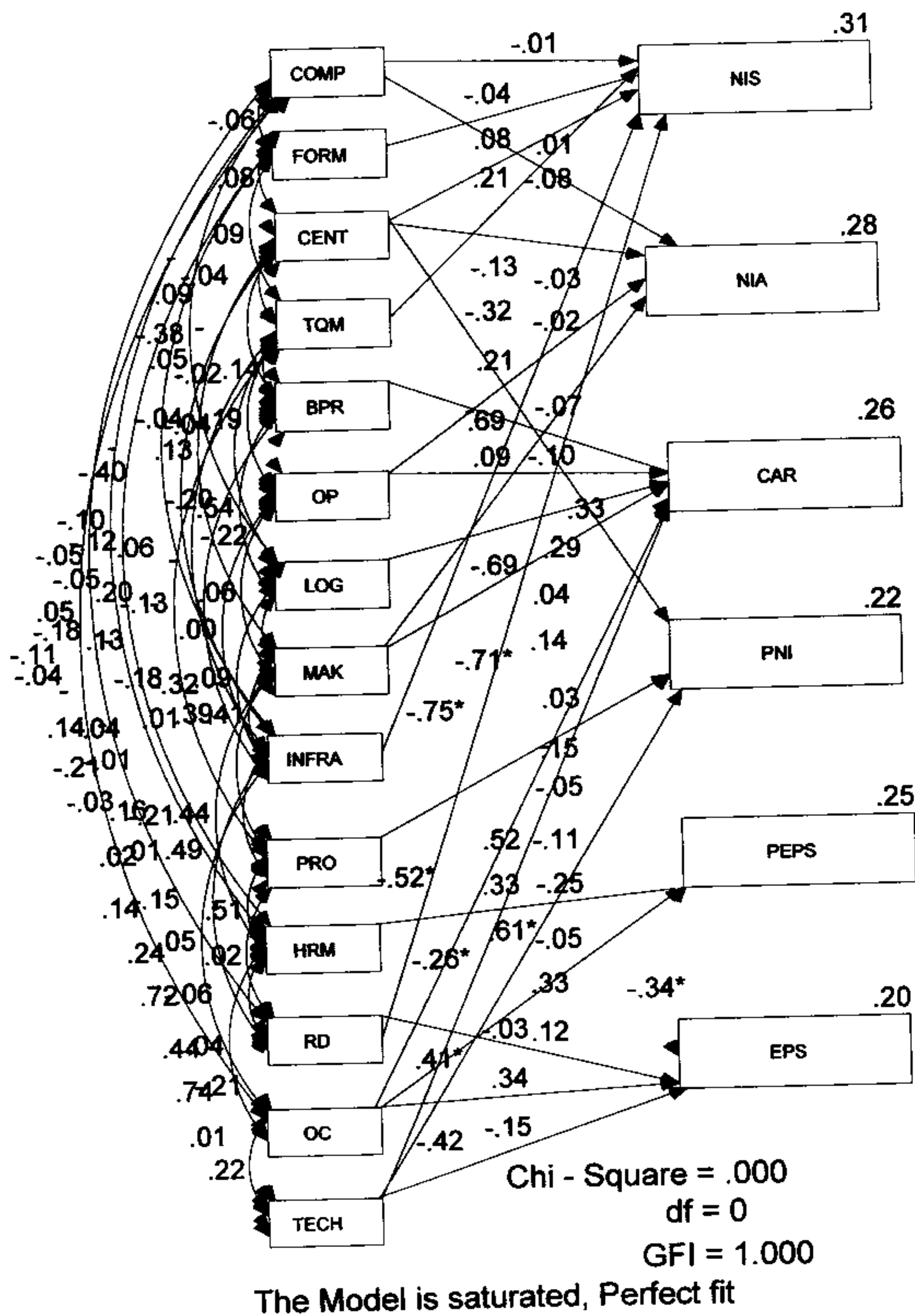


Figure 5.1 The Analysis of Linear Structural Relationship in Model 1

Hypothesis Two: After the 1997 economic crisis, the organizational performance in terms of customer (market share, percentage of change in sale) of energy enterprises related to customers would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering) and the functional strategy-value chain (primary activities, supporting activities).

Table 5.14 Independent and the Dependent Variables of Hypothesis Two

The Independent variables	The Dependent Variables
1. Organizational Structure - Complexity (COMP) - Formalization (FORM) - Centralization and Decision Making (CENT) 2. Management Style (OC) 3. Technology (TECH) 4. Business System - Business Process Re-engineering (BPR) - Total Quality Management (TQM) 5. Functional Strategy-Value Chain 5.1 Primary activity (PRI) - Logistic (LOG) - Operation (OP) - Marketing and Sales (MAK) 5.2 Support Activity(SUP) - Human resource Management (HRM) - Firm Infrastructure (INFRA) - Procurement (PRO) - Research and Development (RD)	The Organizational Performance (Customers Perspective) 1. Market Share the (MAR) 2. Percentage change in Sales (PSAL)

The hypothesis testing whether Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain were the factors

influenced the Organizational Performance (Customers Perspective) found the consistency between the empirical data and the linear structural relationship model 2 of researcher was not different from zero at the .05 significance level, because it is a saturated model (just identified model). It indicated that the goodness of fits statistics, chi-square value = 0.000 (df = 0) and the goodness of fits index = 1.000 (illustrated in Figure 5.2). Besides, the modification indices reported that there was no need to adjust the model because it was a saturated model and the fit was perfect. The concluded summarize of the research hypothesis 2 is as follows: -

The hypothesis testing found that the covariance between the independent variables (Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain) influenced the variance of the dependent variables (Market Share: MAR) at 29.10% (R-square = 0.291). It also indicated that Research and Development (RD) and Technology (TECH) were the factors directly effected on at the .05 significance level as illustrated in Table 5.15 and Figure 5.2.

The hypothesis testing found that the covariance between the independent variables (Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain) influenced the variance of the dependent variables (Percentage change in Sales: PSAL) at 30.0% (R-square = 0.300). It also indicated that Organizational Structure in terms of Centralization (CENT) was the factor directly effected on at the .05 significance level as illustrated in Table 5.15 and Figure 5.2.

Table 5.15 The Standardized Coefficient, T-statistic and R-square (continued)

Dependent Variable	Independent Variables	Standardized Coefficient	t-statistic	R²
MAR	COMP	-0.055	-0.388	0.291
	FORM	0.021	0.169	
	CENT	0.198	1.494	
	TQM	0.002	0.018	
	BPR	-0.191	-1.137	
	OP	0.199	1.371	
	LOG	-0.145	-0.897	
	MAK	-0.083	-0.547	
	INFRA	-0.547	-1.616	
	PRO	0.311	1.573	
	HRM	-0.539	-1.951	
	RD	0.462	1.984*	
	OC	0.185	1.391	
	TECH	0.689	2.553*	
PSAL	COMP	0.023	0.162	0.300
	FORM	0.176	1.422	
	CENT	-0.363	-2.755*	
	TQM	-0.018	-0.134	
	BPR	0.155	0.927	
	OP	0.232	1.609	
	LOG	0.043	0.268	
	MAK	-0.063	-0.412	
	INFRA	0.169	0.503	
	PRO	0.228	1.163	
	HRM	0.203	0.739	
	RD	-0.006	-0.027	
	OC	-0.051	-0.383	
	TECH	-0.271	-1.011	

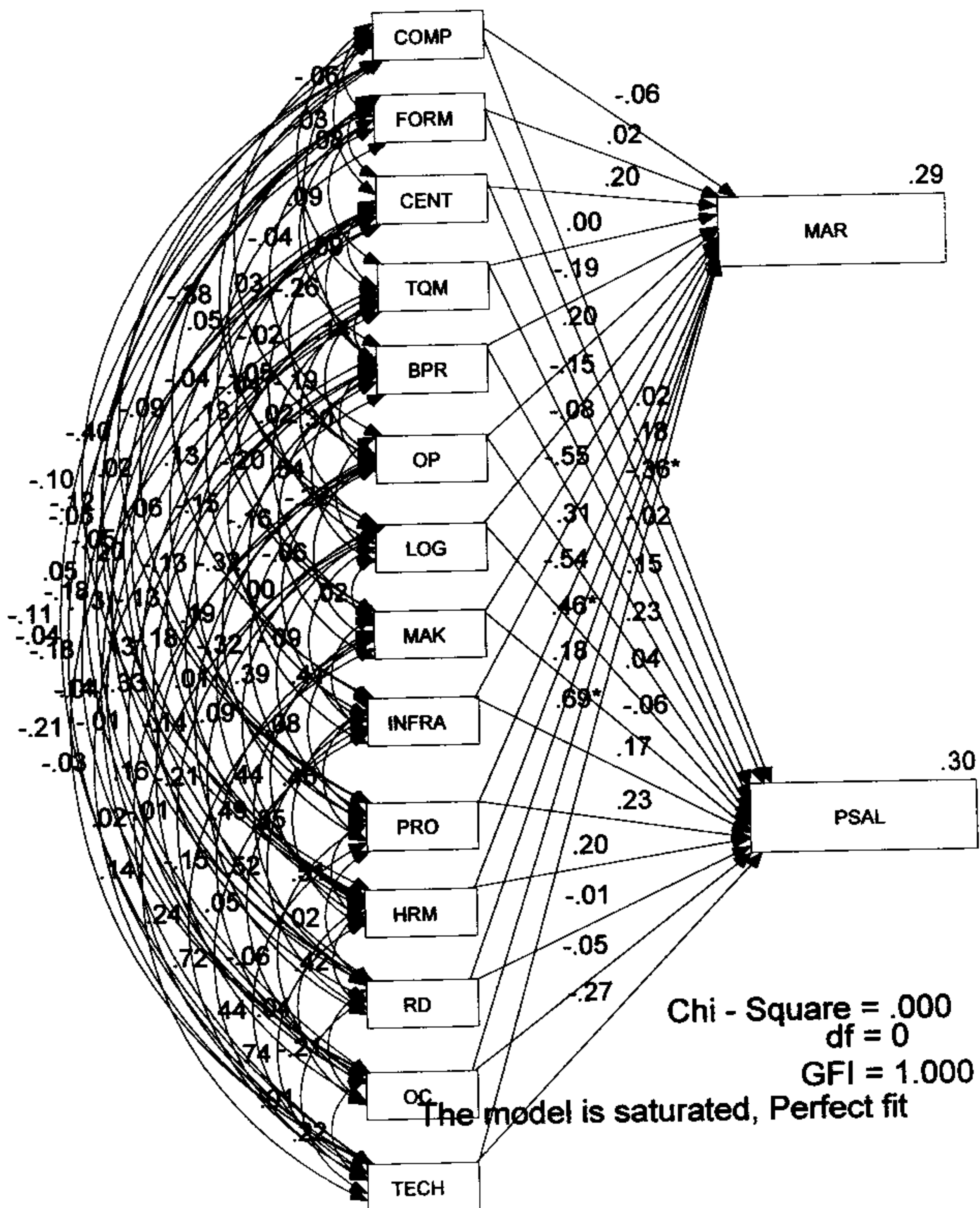


Figure 5.2 The Analysis of Linear Structural Relationship in Model 2

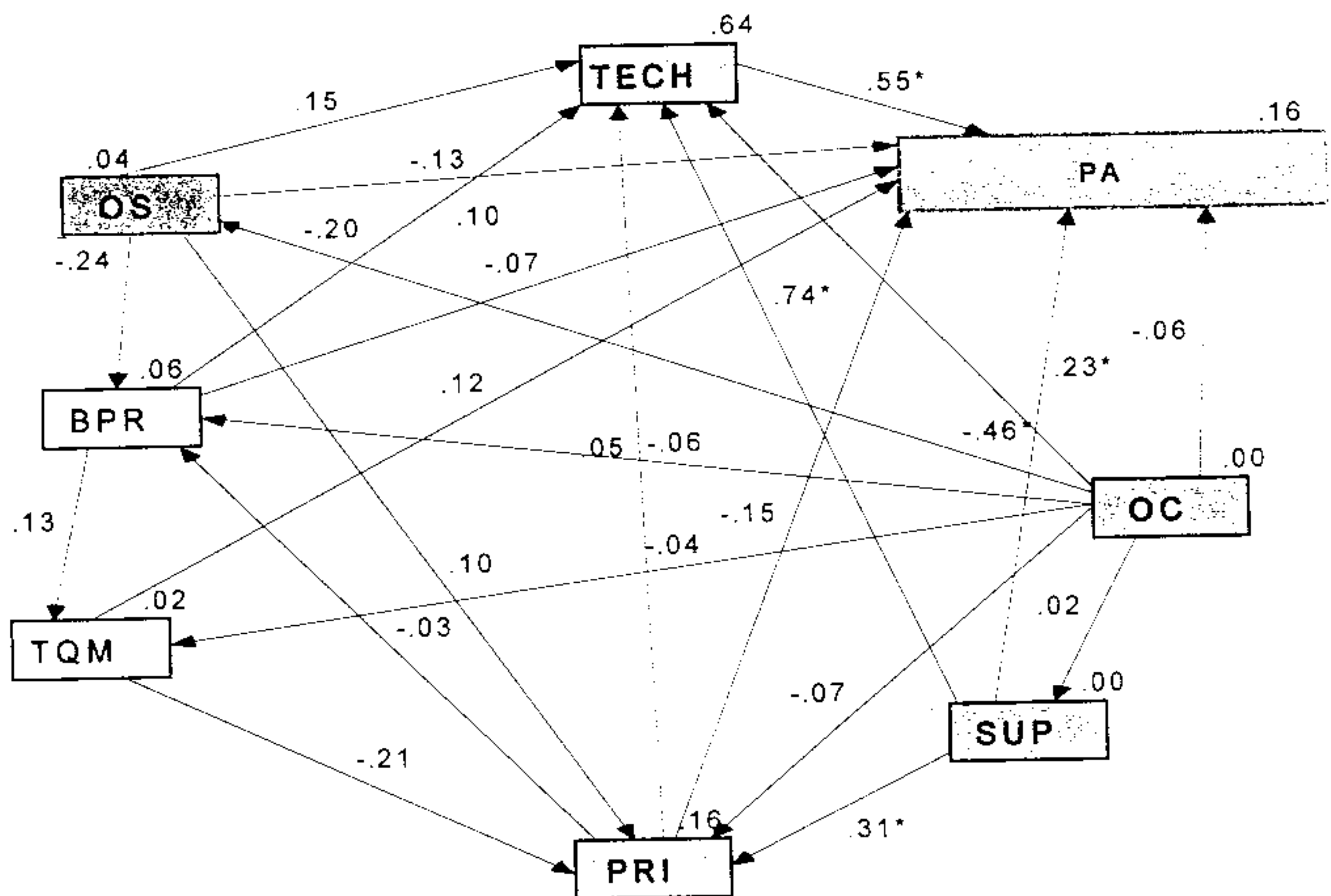
Hypothesis Three: After the 1997 economic crisis, the organizational performance of energy enterprises in terms of the internal business process (percentage of change in total asset) would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering), and the functional strategy-value chain (primary activities, supporting activities).

Table 5.16 Independent and the Dependent Variables of Hypothesis Three

The Independent Variables	The Dependent Variable
1. Organizational Structure (OS) - Complexity (COMP) - Formalization (FORM) - Centralization and Decision Making (CENT) 2. Management Style (OC) 3. Technology (TECH) 4. Business System - Business Process Re-engineering (BPR) - Total Quality Management (TQM) 5. Functional Strategy-Value Chain 5.1 Primary activity (PRI) - Logistic (LOG) - Operation (OP) - Marketing and Sales (MAK) 5.2 Support Activity (SUP) - Human resource Management (HRM) - Firm Infrastructure (INFRA) - Procurement (PRO) - Research and Development (RD)	The Organizational Performance (Internal Business Process) 1. Percentage change in Total Assets (PA)

The hypothesis testing whether Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain were the factors influenced the Organizational Performance (Internal Business Process in terms of Percentage change in Total Assets: PA) found the consistency between the empirical data and the linear structural relationship model 3 of researcher were different from zero at the .05 significance level, because it is a non recursive model. It indicated that

the goodness of fits statistics, chi-square value = 5.265, (df = 5) and the goodness of fits index = 0.974 (illustrated in Figure 5.3). Besides, the modification indices reported that there was no need to adjust the model because it is a fit model and consistent with the empirical data.



Chi-square = 5.25

df = 5

GFI = .974

Figure 5.3 Linear Structural Relationship (LISREL) Model 3 (Standardized Regression Weights Estimation)

The summary of the research hypothesis testing, is presented in the Table 5.17 below.

Table 5.17 The Standardized Coefficient and T-statistic

Dependent Variable	Independent Variable	Standardized Coefficient	t-statistic
SUP	OC	0.276	0.112
OS	OC	0.195	-1.422
BPR	OC	0.143	-0.456
TQM	OC	0.129	-0.269
PRI	OS	0.070	0.733
PRI	SUP	0.049	2.419
PRI	OC	0.099	-0.508
BPR	OS	0.101	-1.713
TECH	OC	0.187	2.703
TECH	OS	0.136	1.648
TECH	SUP	0.097	8.340
TECH	PRI	0.259	0.510
TECH	BPR	0.183	1.202
PA	TECH	14.053	2.568
PA	OC	20.087	-0.442
PA	PRI	26.655	-1.048
PA	SUP	15.049	-2.225
PA	OS	13.991	-0.918
PA	BPR	18.759	-0.492
PA	TQM	20.424	0.895
BPR	PRI	0.193	-0.186
TQM	BPR	0.128	0.921
PRI	TQM	0.105	-1.583

Table 5.17 illustrated the hypothesis testing, When considering the dependent variable as SUP (Support Activity) found no independent variable can predict the variance at the .05 significance level. Considering the dependent variable as OS (Organizational Structure), found that there was no the independent variable can predict the variance at the .05 significance level. The considered the dependent variable as BPR (Business Process Re-engineering), found that was no independent variables can predict the variance at the .05 significance level.

When considering the dependent variable, TQM (Total Quality Management), found that there was no the independent variables which can predict the variance at the .05 significance level. Considering the dependent variable as PRI (Primary Activity), found Support Activity (SUP) was factor influencing at the .05 significance level ($p = 0.016$), which the standardized regression weights = 0.49

When the dependent variable was TECH (Technology), found that Management Style (OC) and Supporting Activity (SUP) were the factors influencing at .05 and .01 significant level ($p = 0.007$ and 0.000), which the standardized regression weights = 0.187 and 0.097. And When considering the dependent variable as PA (Percentage change in Total Assets), found that there were TECH (Technology) and SUP (Support Activity) variable can predict the variance at the .05 significance level ($p = 0.010$ and 0.026), which the standardized regression weights = 14.053 and 15.049.

When considering the dependent variable as TECH (Technology), it indicated that all of the independent variables can predict the variance at 63.80% (R square = 0.638). And When considering the dependent variable were PA (Net Income/Sales), it indicated that all of the independent variables can predict the variance at 16.0% (R square = 0.160)

Tables 5.18 Standardized Direct Effect, Indirect Effect and Total Effects Estimation

Standardized Total Effect – Estimation							
	OC	SUP	OS	TQM	BPR	PRI	TECH
TECH	0.211*	0.753*	0.126	-0.009	0.103	0.043	0.000
PA	0.078	-0.096*	-0.061	0.144	0.009	-0.122	0.548*
Standardized Direct Effect – Estimation							
	OC	SUP	OS	TQM	BPR	PRI	TECH
TECH	0.233	0.74	0.146	0.000	0.104	0.046	0.000
PA	-0.062	-0.463	-0.127	0.119	-0.067	-0.147	0.548
Standardized Indirect Effect - Estimation							
	OC	SUP	OS	TQM	BPR	PRI	TECH
TECH	-0.022	0.013	-0.020	-0.009	-0.001	-0.003	0.000
PA	0.140	0.367	0.066	0.025	0.076	0.025	0.000

Table 5.18 illustrates the Standardized direct effect, indirect effect and total effect estimation of the Linear Structural Relationship Equation Model in the terms of statistical significance (.05) as follows: -

$$\begin{aligned}
 \text{TECH} &= 0.211\text{OC}^* + 0.753\text{SUP}^* & \text{R-square} &= 0.638 \\
 \text{PA} &= -0.096\text{SUP}^* + 0.548\text{TECH}^* & \text{R-square} &= 0.160
 \end{aligned}$$

Remark: * = Statistical significant at .05 level

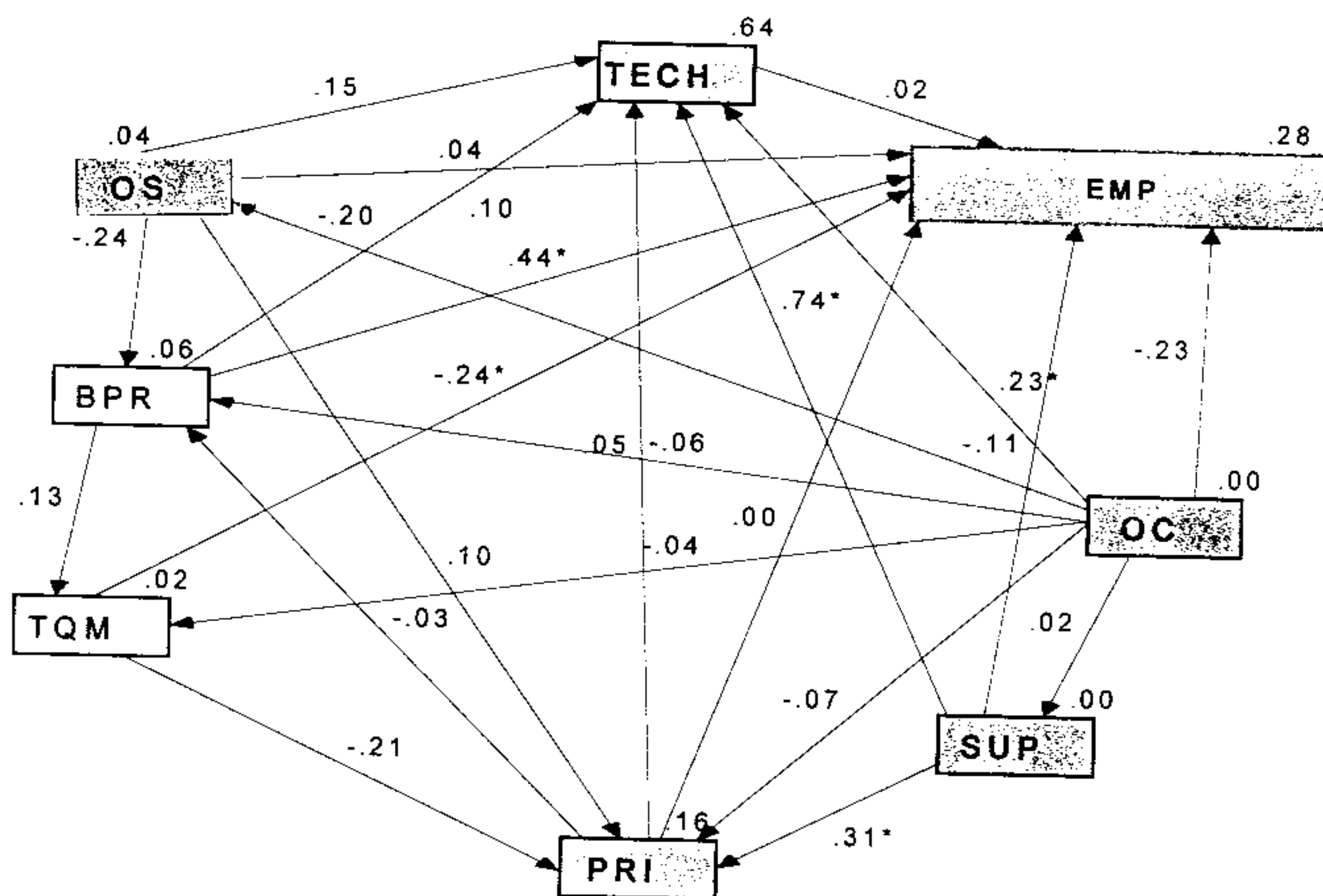
Hypothesis Four: After the 1997 economic crisis, organizational performance in terms of learning and growth (employee turnover, absenteeism) would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering), and the functional strategy- value chain (primary activities, supporting activities).

Table 5.19 Independent and the Dependent Variables of Hypothesis Four

The Independent Variables	The Dependent Variables
1. Organizational Structure (OS) - Complexity (COMP) - Formalization (FORM) - Centralization and Decision Making (CENT) 2. Management Style (OC) 3. Technology (TECH) 4. Business System - Business Process Re-engineering (BPR) - Total Quality Management (TQM) 5. Functional Strategy-Value Chain 5.1 Primary activity (PRI) - Logistic (LOG) - Operation (OP) - Marketing and Sales (MAK) 5.2 Support Activity (SUP) - Human resource Management (HRM) - Firm Infrastructure (INFRA) - Procurement (PRO) - Research and Development (RD)	The Organizational Performance (Human Resource Development) 1. Employee Turnover Rate (EMP) 2. Absenteeism Rate (ABS)

The hypothesis testing identified that the Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain were the factors influenced the Organizational Performance (Employee Turnover Rate: EMP). It found the consistency between the empirical data and the linear structural relationship model of researcher which were different from zero at the .05 significance level, because it is a non recursive model. It indicated that the goodness

of fits statistics, chi-square value = 5.265 (df = 5) and the goodness of fits index = 0.974 (illustrated in Figure 5.4). Besides, the modification indices reported that there was no need to adjust the model because it is a fit model and consistent with the empirical data.



Chi-square = 5.25

df = 5

GFI = .974

Figure 5.4 Linear Structural Relationship (LISREL) Model 4 (Standardized Regression Weights Estimation)

The summary of the research hypothesis testing is presented in table 5.20 as follows: -

Table 5.20 The Standardized Coefficient and T-statistic

Dependent Variable	Independent Variable	Standardized Coefficient	t-statistic
SUP	OC	0.276	0.112
OS	OC	0.195	-1.422
BPR	OC	0.143	-0.456
TQM	OC	0.129	-0.269
PRI	OS	0.070	0.733
PRI	SUP	0.049	2.419
PRI	OC	0.099	-0.508
BPR	OS	0.101	-1.713
TECH	OC	0.187	2.703
TECH	OS	0.136	1.648
TECH	SUP	0.097	8.340
TECH	PRI	0.259	0.510
TECH	BPR	0.183	1.202
EMP	TECH	1.035	0.121
EMP	OC	1.480	-1.742
EMP	PRI	1.964	0.033
EMP	SUP	1.109	-0.563
EMP	OS	1.031	0.303
EMP	BPR	1.382	3.551
EMP	TQM	1.505	-1.919
BPR	PRI	0.193	-0.186
TQM	BPR	0.128	0.921
PRI	TQM	0.105	-1.583

Table 5.20 illustrates that the hypothesis testing, considering the dependent variable as SUP (Support Activity), found that there was no the independent variables that can predict the variance at the .05 significance level. Considering the dependent variable as OS (Organizational Structure), found that there was no the independent variables that can predict the variance at the .05 significance level. Considering the dependent variable as BPR (Business Process Re-engineering), found that there was no the independent variables can predict the variance at the .05 significance level.

When considering the dependent variable as TQM (Total Quality Management), found that there was no the independent variables can predict the variance at the .05 significance level. Considering the dependent variable as PRI (Primary Activity), found Support Activities (SUP) were factor influencing at the .05 significance level ($p = 0.016$), which the standardized regression weights = .049

Considering the dependent variable as TECH (Technology), found Management Style (OC) and Supporting Activity (SUP) were the factors influencing at .05 and .01 significant level ($p = 0.007$ and 0.000), which the sequence standardized regression weights = 0.187 and 0.097 respectively. And when considering the dependent variable as EMP (Employee Turnover Rate), found that there was BPR (Business Process Re-engineering) variable can predict the variance at the .05 significance level ($p = .000$), which the standardized regression weights = 1.382

And When considering the dependent variable were EMP (Employee Turnover rate), it indicated that all of the independent variables can predict the variance at 28.10% ($R \text{ square} = 0.281$).

Tables 5.21 Standardized Direct effect, Indirect Effect and Total Effects Estimation

Standardized Total Effect - Estimation							
	OC	SUP	OS	TQM	BPR	PRI	TECH
EMP	-0.229	-0.092	-0.057	-0.235	0.416*	-0.006	0.024
Standardized Direct Effect - Estimation							
	OC	SUP	OS	TQM	BPR	PRI	TECH
EMP	-0.227	-0.108	0.039	-0.236	0.444	0.004	0.024
Standardized Indirect Effect - Estimation							
	OC	SUP	OS	TQM	BPR	PRI	TECH
EMP	-0.002	0.016	-0.096	0.001	-0.028	-0.010	0.000

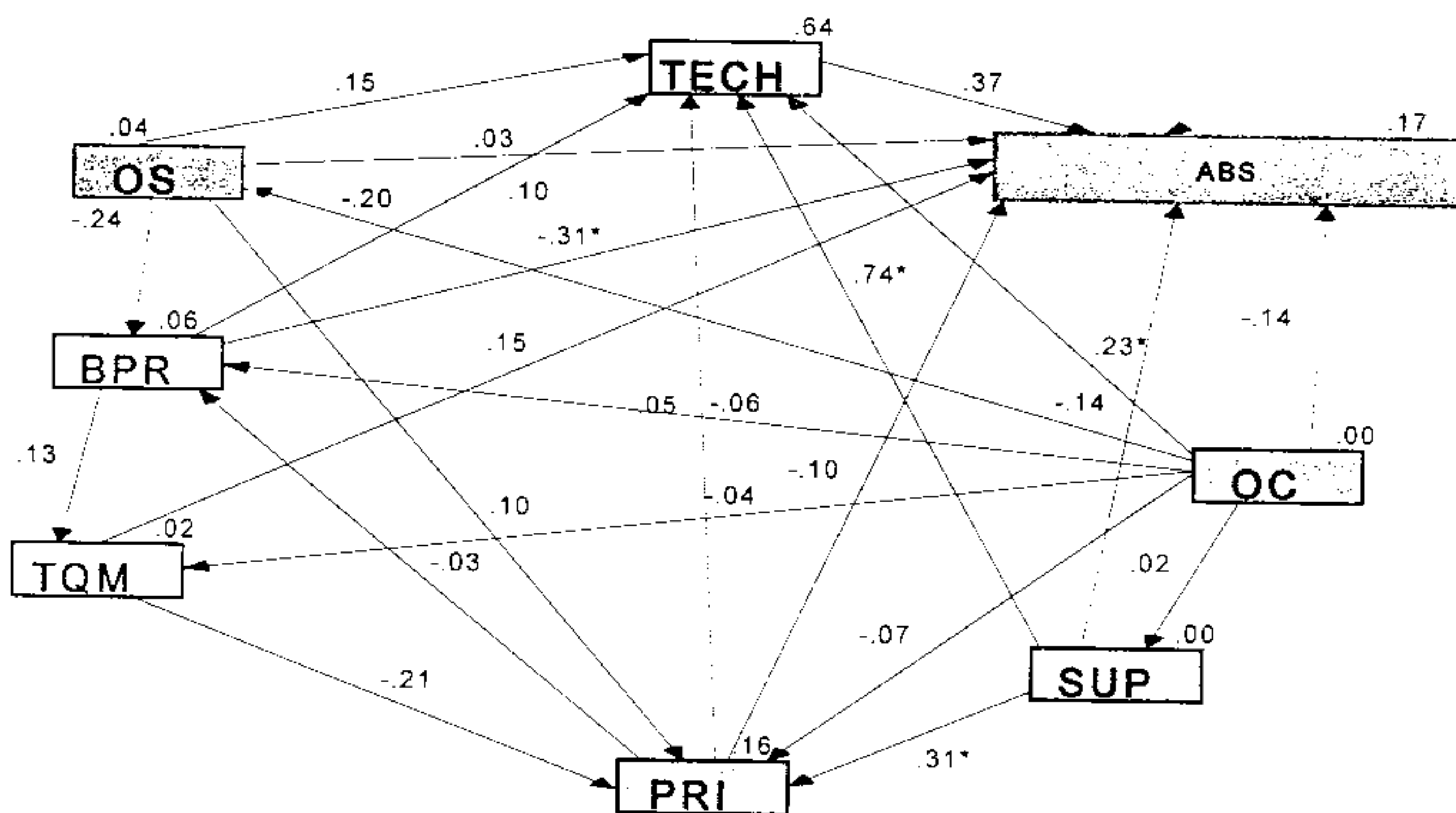
Table 5.21 illustrates that Standardized direct effect, indirect effect and total effect estimation of the Linear Structural Relationship Equation Model in the terms of statistical significance (.05) as follows: -

$$\text{EMP} = 0.416 \times \text{BPR}$$

$$\text{R-square} = 0.281$$

Remark: * = Statistical significant at .05 level

The hypothesis testing identified that Organizational Structure, Management Style, Technology, Business System, Functional Strategy-Value Chain were the factors influenced the Organizational Performance (Absenteeism Rate : ABS) found the consistency between the empirical data and the linear structural relationship model of researcher were different from zero at the .05 significance level, because it is a non recursive model. It indicated that the goodness of fits statistics, chi-square value = 5.265. (df = 5) and the goodness of fits index = 0.974 (illustrated in Figure 5.5). Besides, the modification indices reported that there was no need to adjust the model because it is a fit model and consistent with the empirical data.



Chi-square = 5.25

df = 5

GFI = .974

Figure 5.5 Linear Structural Relationship (LISREL) Model 5 (Standardized Regression Weights Estimation)

The summary of the research hypothesis testing is presented in the table 5.22 below:

Table 5.22 The Standardized Coefficient and T-statistic

Dependent Variable	Independent Variable	Standardized Coefficient	t-statistic
SUP	OC	0.276	0.112
OS	OC	0.195	-1.422
BPR	OC	0.143	-0.456
TQM	OC	0.129	-0.269
PRI	OS	0.070	0.733
PRI	SUP	0.049	2.419
PRI	OC	0.099	-0.508
BPR	OS	0.101	-1.713
TECH	OC	0.187	2.703
TECH	OS	0.136	1.648
TECH	SUP	0.097	8.340
TECH	PRI	0.259	0.510
TECH	BPR	0.183	1.202
ABS	TECH	0.315	1.725
ABS	OC	0.451	-1.019
ABS	PRI	0.598	-0.743
ABS	SUP	0.338	-0.684
ABS	OS	0.314	0.188
ABS	BPR	0.421	-2.275
ABS	TQM	0.459	1.110
BPR	PRI	0.193	-0.186
TQM	BPR	0.128	0.921
PRI	TQM	0.105	-1.583

Table 5.22 illustrates the hypothesis testing, considering the dependent variable as SUP (Support Activity). It is found that there was no the independent variables can predict the variance at the .05 significance level. Considering the dependent variable as OS (Organizational Structure), found that there was no the independent variables can predict the variance at the .05 significance level. Considering the dependent variable as BPR (Business Process Re-engineering), found that there was no the independent variables can predict the variance at the .05 significance level.

When considering the dependent variable as TQM (Total Quality Management). It is found that there was no the independent variables can predict the variance at the .05 significance level. Considering the dependent variable as PRI (Primary Activity), found the Support Activity (SUP) was the factor influencing at the .05 significance level ($p = 0.016$), which the standardized regression weights = 0.049

Considering the dependent variable as TECH (Technology), found Management Style (OC) and Supporting Activity (SUP) were the factors influencing at .05 and .01 significant level ($p = 0.007$ and 0.000), which the sequence standardized regression weights is 0.187 and 0.097. And When considering the dependent variable as ABS (Absenteeism Rate), found BPR (Business Process Re-engineering) can predict the variance at the .05 significance level. ($p = 0.023$), which the standardized regression weights is 0.421.

And When considering the dependent variable were ABS (Absenteeism Rate), it indicated that all of the independent variables can predict the variance at 16.90% ($R \text{ square} = 0.169$).

Tables 5.23 Standardized Direct Effect, Indirect Effect and Total Effect Estimation

Standardized Total Effect – Estimation							
	OC	SUP	OS	TQM	BPR	PRI	TECH
ABS	-0.066	0.104	0.131	0.163	-0.246*	-0.080	0.366
Standardized Direct Effect – Estimation							
	OC	SUP	OS	TQM	BPR	PRI	TECH
ABS	-0.143	-0.142	0.026	0.147	-0.306	-0.104	0.366
Standardized Indirect Effect – Estimation							
	OC	SUP	OS	TQM	BPR	PRI	TECH
ABS	0.076	0.246	0.105	0.017	0.059	0.023	0.000

Table 5.23 illustrates that Standardized direct effect, indirect effect and total effect estimation of the Linear Structural Relationship Equation Model in the terms of statistical significance (.05) as follows: -

$$\text{ABS} = -0.246\text{BPR}^* \quad \text{R-square} = 0.169$$

Remark: * = Statistical significant at .05 level

5.2.1 Hypothesis 1 – Analysis of Results

5.2.1.1 Due to the complexity (covariance with other the independent variables) in Organizational Structure strongly direct negative effect on earning per share the of the firms after the economic crisis in 1997 as well as the complexity of Organizational Structure declined which affects the increase in earning per share of the organization after the economic crisis in 1997. In deed, during the interview field work it was found that the most of the top executives recommended the implementation of organizational restructuring strategic plan after the economic crisis in 1997 to reduce the different levels of differentiation and integration by eliminating divisions, departments, branches, or the level of hierarchical, Organizational Structure. Organizations reduced the number of employees, early retirement, and layoff because the organizational grew too hierarchical with high bureaucratic system. Therefore, the flat Organizational Structure is required. Additionally, the organization did not need the effective communication, coordination, and control devices, thus, the operating cost decreased.

5.2.1.2 For the Management Style (covariance with other independent variables) which has a positive direct effect on percentage change of earning per share and in chapter 3, the various frameworks of organizational analysis indicated that the Management Style had direct and indirect effect on the Organizational Performance. It recommended the developing of the Management Style to cope with the internal and external problems of survival and prosperity, particularly, during the economic crisis. The organizational required the employees to change their ways of thinking and cope with the economic crisis. For example, the employees work more efficiently and effectively to accomplish the organization's objectives, during the economic turmoil. Teamwork is able to provide the better solution to the problem. A new style of management in terms of coaching is able to lead creative ideas. The autonomy of decision-making makes employees have the sense of accomplishment that creates job satisfaction. Therefore, they certainly enhance the productivity of the firms. They are also important culture to support business reengineering and Total Quality Management.

The Management Style in terms of teamwork, autonomy in decision making, the new style of management were the major determinants of affecting

financial the Organizational Performance in terms of earning per share the of the firms in the long run.

5.2.1.3 The direct positive effect on Management Style towards the percentage change in net profit after tax after the economic crisis in 1997, the reasons cited in this study were mentioned in the sub-heading 5.2.1.2

5.2.1.4 Concerning positives significant effect on Technology towards the degree of change in net profit after tax in terms of percentage after the economic crisis in 1997, the secondary research data, particularly from the annual financial reports of the firms in energy enterprises from 1997 to 2000, the Technology was one of the key success factors due to the following reasons:

- a) The energy enterprises generally requires the high capital-intensive investment, particularly in petroleum refinery, electricity, and natural gas.
- b) Generally, the energy enterprises requires the advanced and highly sophisticated Technology together with electricity, petroleum and natural gas. The Technology is imported from the developed countries such as USA, and European countries.
- c) The energy enterprises needs the experienced personnel to maintain the high productive efficiency.

Furthermore in chapter 2, indicated that technological system directly related to the environment supra system and to the goals and value of the organizational. It also has an important impact on the structure, social relationship, and managerial system. For example, the adaptive-organic form of Organizational Structure is most effects for the complex and advanced Technology firms

5.2.1.5 The result of analysis shows that the Functional Strategy-Value Chain(covariance with the dependent variables), particularly primary activities on logistics and supporting activities on infrastructure has the negative direct effect on the current ratio, current asset/current liability of the firms after the economic crisis in 1997, which means the firm has ability to meet its short-term obligations.

According to the analysis on the secondary-data from annual report of financial statements of the firms from 1997 to 1999, the liquidity of the firms decreased after the economic crisis in 1997. The fixed assets of the firms in the energy

enterprises increased due to high long term and the average high market interest rates during 1997 and 1998.

Additionally, the interviews of the top executives further confirmed that the organization emphasized on developing the logistics system in order to save the logistics cost, for example, the developing an inventory system by on-line computer, new warehousing, new communication, increasing safety stock. However, these investments of logistic system were mostly long-term investment, while the firms unable to borrow from commercial bank on long term, because the commercial bank did not want to provide loan for investors during the economic crisis. Meanwhile, the source of fund investing of the above logistics system of these firms was short-term. Therefore, the current ratios of the firms were not low to indicate the low liquidity. Furthermore, the firms were charged the high Lending Interest Rates during the economic crisis. As a result, the logistics and infrastructure variables had negative direct effect on the current ratio of the firms after the economic crisis.

5.2.1.6 Considering the internal factors, which were examined to determine the extent of their influence on the financial performance, the Organizational Performance of net profit after tax per total asset after the economic crisis in 1997, the Functional Strategy-Value Chain of primary activities on procurement (covariance with other the independent variables) was a significant factor affecting the financial Organizational Performance.

Whereas the supporting activities on human resource management were the factors negative significant directly affecting financial of the Organizational Performance. Furthermore, the Technology, covariance with other the independent variables, had a direct positive effect on net profit after tax/total asset after the economic crisis. This financial indicator is used to measure the firm's return on investment (ROI), which presents the overall effects of management in generating profits with its available assets. Furthermore, the asset employed is equal to net worth plus total debt.

Therefore, the main reasons cited for the above analysis derived from the executive interviews on other opinions were as follows:

Procurement

The procurement of energy enterprises is the important function of the firms because the firms have costs of direct raw material about 50-65 percent of total cost of production. Petroleum firms import the oil from overseas countries. Electricity producers use the coal, natural gas, petroleum as the raw material for production the electricity. Furthermore, they have also faced the foreign exchange risk due to currency fluctuation, particularly importing raw material from overseas countries.

If the top management is able to manage the procurement functions effectively, the cost of production reduce significantly.

Human Resource Management

- Human Resource Management Policy (HRM) did not concentrate on increasing the function of knowledge and intellectual capital rather than traditional capital and labor. Thus, the HRM policy did not encourage learning processes and create learning Management Style. Particularly, with Information Technology, Innovative business system, knowledge-intensive skill, in order to invest in human resource and build new capabilities to be competitive, particularly the knowledge base industry.

- The HRM policy was not improved to accept the new concept of Business Process Reengineering.

- HRM departments did not change new roles, such as concentrate on learning new skill (IT).

- Human resources department did not concentrate training and education about on the Management Style of teamwork, autonomy in decision making, new style of management (Hoon and others, 2000:199-238).

The main reasons of technology in this study are related to the positive effect on financial Organizational Performance, which are already mentioned in the result of the analysis in the sub-heading 5.2.1.4

5.2.1.7 The results found that the functional strategy-value chain, particularly supporting activities on research and development covariance with other the independent variable, had the negative direct impacts, while the firm infrastructure had the positive effect on net profit after tax/sale after the economic crisis in 1997.

Interestingly, it further indicated that the Management Style had negative impact on financial the Organizational Performance. Furthermore, research and development was unable to be applied for actual practice.

Indeed during the interview, particularly on other opinions from the top-level executives undertaken for this study, the most top executive mentioned that research and development was also one of the significant factors to gain competitive advantage. However, it was the investment for future performance of the organizational, which was not necessary after the economic crisis in 1997 to the present. Especially, the demands for products were decreased due to slow purchasing power of the customers.

In addition, as mentioned in chapter 2, the firm infrastructure had the positive direct effect on net profit / sale due to the following reasons:

Firm Infrastructure

- The infrastructure supported efficiency of other departments in terms of coordination, synthesis, and analysis.
- The organization established and maintained good relationships between the public sector and various interest groups, and earned good public image to support the company strategic planning.

Management Style

However, the main reasons of negative effect on the Management Style are:

- The employees in different departments still distrusted one another, thus they perceived things differently and proposed the conflict solutions.
- The employees did not fully understand theory and philosophy underlying the new tools and techniques.
- The management must change many elements of the culture to have the strategic change to cope with the economic crisis and to realize that the change in Management Style takes time to develop. (Bound and others, 1998: 310-320)

In conclusion, the analysis results above mentioned in the sub-heading 5.2.1.1 – 5.2.1.7 confirmed that the independent variables of Technology, Management Style, and Functional Strategy-Value Chain focusing on supporting

activities, firm infrastructure and procurement (covariance with other the independent variables) were the factors influencing the significant positive- direct effect on financial in the Organizational Performance in the energy enterprises after the economic crisis in 1997.

5.2.2 Hypothesis 2 - Analysis of the Results

5.2.2.1 The results of hypothesis testing two revealed that the Technology covariance of other the independent variables) was positive significant factor directly affecting customer the Organizational Performance after the economic crisis in 1997. The main reasons for this factor were already mentioned in the sub-heading 5.2.1.3 The research and development (covariance with other independent variables) was positive significant factor directly affecting Organizational Performance in terms of customer (market share). It indicated that the research and development was able to build the competitive advantage of Technology in various points, such as the decreasing of production cost , the innovative product and service, the productivity improvement.

Interestingly, whenever the percentage of change in sale were dependent variable, Organizational Structure on centralization was negatively affecting. According to the executive interviews and the literature review in Chapter 2, the advantage of decentralization were as follow:

1) Organizations need to respond rapidly to changing conditions at a point that the environment change is taking place. After the economic crisis in 1997, the organization faced dynamic changing environments such as changing in exchange rate and government policy, therefore the top management delegate more responsibility and authority to lower level management.

2) Decentralization decision-making can provide motivation to employees by allowing them to participate in the decision-making process, thus the lower level management have job satisfaction.

5.2.3 Hypothesis 3 - Analysis of the Results

The path analysis of hypothesis testing three clearly indicated that the Technology and Functional Strategy-Value Chain on supporting activities including research, human resource management, firm infra-structure, procurement influenced the percentage change in total asset of any Organizational Performance in terms of internal business process. The Technology was the significant factor positively

influencing the variance of dependent variable—percentage change in total asset at .54 unit both direct and indirect effects. Moreover, the supporting activities had the direct effect on percentage change on asset at path coefficient $-.0463$, while they had the indirect effect on percentage change on asset at path coefficient $=.367$. In addition, the supporting activities negatively influenced the variance of dependent variable—percentage change on total asset of $-.096$. However, the value of path coefficient below one on functional strategy-supporting activities was not considered for analyzing because it is not significant in terms of actual practice (Piamsomboon, 1990:88)

The reasons of Technology affecting the Organizational Performance already mentioned at the result of analysis on sub-heading 5.2.1.4

5.2.4 Hypothesis 4 - Analysis of the Results

The results of hypothesis testing four pointed that the Business Process Reengineering was a significant positive direct factor influencing the variance of the dependent variable of employee turnover ratio at .416, path coefficient of direct effects and indirect effects after the economic crisis in 1997.

According to the executive interviews and the review literature in chapter 2, the reasons were as follows: -

- 1) After the economic crisis in 1997, the firms implemented the concept of Business Process Reengineering which involved eliminating low-value services and activities and outsource services and activities that could provide the cheaper, or higher quality, or both, by outside vendors. In addition, the business process reengineering including the new type of work, new value, new process, information technology and compensation based on activity was implemented. Thus, the employees were not able to do the job, they would resign from the firms.

- 2) The firms established the alternative work arrangement including part-time programs, contingent or contract employment, early retirement schemes. Therefore, these affected the high employee turnover rate.

In conclusion, the business reengineering was the significant factor positively influencing the employee turnover rate, which in turn, negatively effects the learning and growth of the Organizational Performance after the economic crisis in 1997.

Considering Business Process Reengineering which was the significant factor negatively affecting variance of the dependent variable of absenteeism rate at path coefficient of -.246 units of direct and indirect effects, it means that the Business Process Reengineering positively influencing the learning and growth of the Organizational Performance in terms of absenteeism rate after the economic crisis in 1997.

According to the executive interviews and the literature review in chapter 2, the main reasons of decreasing absenteeism rate was the Business Process Reengineering supported the employee satisfaction with work because it had more decision making, new information Technology supporting their works, compensation depending on their abilities, and new Organizational Structure.

5.3 The results of the qualitative analysis of six energy enterprises were summarized as follows:

5.3.1 Electricity Generating Public Company Limited (EGCO)

Technology: EGCO took various steps to solve the Y2K problems and with its subsidiaries. The steps are taken in four major's steps such as awareness, assessment, renovation and validation and implementation of the technology. The cooperation, commitment and support from the management, employees, consultants and manufacturers, EGCO absolutely passed the most serious critical date from December 31, 1999 to January 1, 2000. All systems, both internal and external, did not impact their business. The internal systems, which were expected to be affected by the crisis, have been roll over the year 2000 without any problems and were checked for proper functionality carefully. The conceivable external impacts of supply chain were also obviously comprehended that they did not influence any parts of their operations. .

Management Style: The quality of EGCO's production can be judged by the quality of life of the company's staff and the environment surrounding EGCO. The staff's smile and the green leaves around the power plant reflect that the quality of EGCO production meets the standards and goals they have in mind. The organization emphasized on teamwork , the participate decision-making.

Business System:

Total Quality Management (TQM): As a Thai public enterprise, EGCO had prime consideration on the responsibility and ultimate benefits to Thai society in any business transaction. In operation, EGCO and its subsidiaries took serious concern to the health and safety of employees in compliance with environmental standards. Khanom Electricity Generating Company Limited (KEGCO), a subsidiary of EGCO, was awarded Environmental Impact Assessment Awards (EIA Award 2000) from the Ministry of Science, Technology and Environment and received Certification Audit of Environmental Management System (ISO 14001) from RWTUV (Thailand) Ltd. In aspect of social contribution, the company had continuous support on the natural resources and environmental conservation.

EGCO sets a clear policy for the past, present and future emphasizing the responsibility to society and environment. EGCO Tower received Thailand's energy efficient building award not only from its advanced technology, but also from the technique of building design in harmony with nature, which was the crucial factor of energy conservation

Organizational Strategy: EGCO is Thailand's first and largest Independent Power Producer (IPP), which generates and supplies electric power and engages in other related businesses. In 2000 the company set a clear corporate strategy and business direction to invest in its core business under its core competency value e.g. electricity generation, power plant operation and maintenance including others related to the core business such as the investment in natural gas, oil, transmission line and energy services. The objective was to maintain the leading position in electricity generation aiming at favorable return on investment and maximizing the stakeholders' value (EGCO Annual Report, 1998-1999)

5.3.1 National Petrochemical Public Company Limited (NPC):

Technology: National Petrochemical Public Company limited (NPC) recognized the importance of taking early preventive measures to avoid any possible loss or damage resulting from the Y2K computer problem. NPC kept abreast of the latest developments aimed at solving the Y2K problem and carried out a company – wide review of all its computer system. An in-house Y2K inspection committee tested all the computers to make sure they were Y2K complaint. By the time the turn of the

new millennium rolled around, NPC was confident that all operation would be continue to function normally.

All the essential opening systems were verified to be Y2K complaint before the New Year. Major equipment was similarly certified by the manufacturer.

Organizational Structure: Since its founding, National Petrochemical Public Company limited (NPC) has made a number of modifications to its overall structure in order to make the company more efficient, make responsive, and better able to compete in an increasingly volatile business climate. NPC organizational structure is divided into four separate components, which are Business Development, Joint Venture Development, Productions and Service Business, including the component directly supervised by the President. This structure has given NPC greater management flexibility, clarified duties and responsibilities, and enhances the efficiency. In NPC, each components has its own Senior Executive Vice President and each responsible for its own specific function.

Management Style: NPC improved the workers' skills and expertise, building better morale, and most importantly, instilling staff at all levels with an appreciation for the words "Quality", "Customers", "Standard", and "Teamwork". At NPC, quality comes first, and it is this emphasis on quality that underpins the company's success.

Business System:

Total Quality Management (TQM): NPC started implementing the TQM in 1991. NPC has made a number of significant improvements. Under the supervision of the President, is chiefly responsible for overseeing the company's total management system. NPC has other special groups involve in the quality improvement-meeting unit, the corrective action team, the suggestions committee and other committees assigned in the TQM structure.

In addition, NPC keeps the environmental impact of its production process to an absolute minimum. As a result, company has consistently won praise from Thai and international organizations for its excellent commitment to environmental management. Furthermore, NPC stresses strict compliance with ISO 9002 and ISO 14001 and recognizes the importance of customer services, safe, occupational health and environmental management.

Business Process Reengineering: In 1997, NPC carried out organizational transformation at the policy level, identifying four key business lines, Business Development, Joint Venture Development, Productions, and Service Business.

This reorganization gives NPC greater flexibility and efficiency and helps define responsibilities within the organization to serve customers' demand with its products, sales and services. NPC is also profiting from the experience and expertise of its staff by offering a wide range of services while continuing to give priority to product quality and service in compliance with international standard.

Furthermore, NPC has upgraded the efficiency of its information and communications technology systems in order to improve the links between its computer network and significant database. NPC has adopted into value adding to work with information technology, emphasized on executive support, customer service, marketing and staff development, which includes Executive Information System, Intranet and Remote Access Services.

Corporate Strategy: Since the market for petrochemical, chemical and related plant support services have grown steadily in recent years. This growth has presented new opportunities to NPC that foresight to take advantage of them. In addition, it has recognizes the importance of forming joint venture partnerships and other business alliance in such fields as marketing, sales and technology.

Functional Strategy-Value Chain

Primary Activities:

Marketing: NPC has given special emphasis to marketing, sales and related services. It held on to its customer base and adopted the new pricing policy in line with current conditions to help keep NPC and its downstream petrochemical companies operating successfully. Furthermore, the using regional pricing structures that raise the percentage of ethylene production sold under contract to 67%. NPC has other long term plants to invest in certain downstream operations as a means of further reducing risk and using the surplus quantity of ethylene.

Operation: The factory operates in strict accordance with ISO 14001 standards of environmental safety and the company's own environmental management policies. NPC's environmental management plan for 1999 considered are: Preventing leaks or

accidental discharges of potential hazardous materials, reducing wastes in the factory, reducing the use of natural resources, and compliance with law.

Procurement: The NPC give top priority to quality and the company's olefins, utilities and service unit performed admirably. Under the Olefins, Ethylene and Propylene production were 401,000 tons/year and 127,000 – 173,800 tons/year during 1996 and 1997. Furthermore, the olefins sales for the year totaled 348,810 tons, which is roughly equivalent to 37% of total domestic demand. The utilities production remained in operation throughout 1997 continually, supplying the company's olefins plant and other customers with water, steam and electricity.

Table 5.24 Increased Production Capacity of Utilities Production Units

Increased Production Capacity of Utilities Production Units				
Utilities Unit	Units/Hour	1996	1997	% Increase
Demineralized Water	Metric ton	160	280	75
Electricity	Megawatt	66	100	52
Steam	Metric ton	200	340	70

Source : National Petrochemical Public Co., Ltd. 1997. Annual report 1997.

NPC boosted its income from the sale of utilities to approximately 1, 299 million baht in 1997, an increase of 47%. The major share of this increase was due to higher sales of other petrochemical producers and to the EGAT under its SPP program

Firm Infrastructure: Most of the revenue earned by the NPC's subsidiaries is in Thai Baht, however, so as to reduce the risk from foreign exchange rates on long-term foreign loans, a cross currency interest rate swap is used. NPC has combination of fixed-rate and floating-rate loans in order to offset the risk of unforeseen changes in prevailing interest rates. The average rate of interest currently paid is approximately 8.5% per annum.

Human Resources: NPC has given special emphasis to provide training to their staff in various fields such as marketing division, production division. It also

encourage initiative and creativity to prepare staff for further expansion through offering training courses in small business management and strategic planning for related group of staff.

5.3.3 Petroleum Authority of Thailand (PTT)

Technology: Information technology has acquired a significant role in business and office administration. PTT has thus continuously developed its information technology, including Internet, and intranet, for swift service and enhancement of the capabilities of PTT's personnel. PTT has studied an E-Business Master Plan to increase business opportunities and the competitive edge of the organization. Work procedures have been improved for higher efficiency, and are intended to satisfy customers, business partners, suppliers, and product and service providers. Implementation of the E-Business Master Plan is expected to commence by end of 2001.

Organizational Structure: PTT transformed its organizational structure from a functional type with a centralization of authority to a business – oriented type with a decentralization of authority to suit today's world of business.

In June 2000, PTT set up a committee to improve the organizational structure and undertook a comparative study of other companies both at home and abroad. The reorganized structure was completed at the end of 2000 and approved by PTT's Board of Directors in early 2001. In the new structure, PTT Oil and PTT International will be merged, resulting in 3 business units, i.e. gas, oil, and investment management. The Head Office will be in charge of formulating strategies and policies as well as monitoring the performance of business units. Each business unit will focus on operations that can ensure customer satisfaction. PTT has always aimed at resource optimization, economy of scale, cost reduction, flexibility, and streamlining, e.g. centralizing similar service units to achieve maximum benefits. Simultaneously, management will focus on its responsibilities, through good corporate governance and transparency. Various committees will be appointed to screen work and provide co-ordination for greater efficiency.

Management Style: PTT commits itself to conduct its business with quality standards that go hand-in-hand with the environment. PTT has specified working ethics for the Board of Directors, management, and staff members:

Ethics of Board of Directors and management – Work with integrity and sincerity for overall corporate benefit. Exercise authority with prudence, carefulness, and responsibility to shareholders. Take into consideration all groups of stakeholders, avoiding abuse of inside information and the advantages of one's position.

Ethics of staff members – Work with responsibility and integrity. Be determined, educated, and obedient to corporate regulations, by regarding corporate benefit as one's prime concern. Safeguard the secrets of customers, partners, and corporate associates. Promote unity and solidarity. Help to examine and report fraud in corporate operations. Help preserve a good working environment. Develop corporate excellence. Do not seek benefits from partners and associates in business.

Value of Good Corporate Governance – Good corporate governance, the objective of PTT, is a response to liberalization of the entire business. It must focus on capability, morality, and transparency for maximum benefits to all parties concerned. Good corporate governance enhances the prosperity of the country's society and economy.

- Teamwork, new management styles, decentralization and autonomous decision-making are established.

Business System:

Total Quality Management (TQM): PTT has continuously emphasized quality, safety, health and environment or QSHE. In 2000, therefore, QSHE policy was formulated with explicit targets, such as considerable reductions in operating costs and increased flexibility. Aiming for working procedure standardization in 2000, PTT firstly targeted 26 areas to achieve ISO 9000, ISO 14001, and ISO/IEC Guide 25 and TISI 18000 certification and later achieved quite well. Namely, 36 areas were certified: 23 ISO 9001, ISO 9002 certifications; one ISO 14001 certification and 2 ISO/IEC Guide 25 certifications. It is obvious that most of PTT's operational areas, such as petroleum terminals and gas separation plants already achieved such industrial standards. Furthermore, Total Quality Management (TQM) was adopted as a development tool to improve efficiency. Staff members were given directions to

continuously improve and add value to their work, thus providing benefits for the whole organization. TQM work principles put into practice include commitments to customer satisfaction, leadership, participation, prioritization, standardized work methods, problem management through prevention, continuous work improvement, management by facts, and social responsibility.

Business Process Reengineering: PTT Business Process redesign and improvement in management systems in priority areas, notably Sales, Account Receivable, Assets, Service Station Network Development and Information Technology Management. The reengineering the business process is executed under at least two principles. One side is the “technique” involved the establishment of important procedures over the organization and is a valuable reinforcement the organization, indeed. Another side is the “behavior” involved in the change of “individual working style essential parts over the organization “technique” operation will be successful. The information and business systems development project started in 1995, and later its process design completed in 1996. The chronological work can be arranged in nine phase as follows:

- Phase 1 Began in mid 1995. PTT reengineered a quick fix.
- Phase 2 April 1995, study problems, analyze causes and arrange in order of the significance of business process redesign.
- Phase 3 Specify technological demand and framework or the form of technology required.
- Phase 4 Business process redesign
- Phase 5 Educate a number of employees concerned about the new work process
- Phase 6 Communicate and inform employees in the organization especially employees directly concerned
- Phase 7 Improve work process comprising work system modification, technology utilization and appropriate personnel management
- Phase 8 Commence partial implementation, particularly sections unnecessary to be equipped with technology; such as, planning.
- Phase 9 Equip relevant technology, especially information technology or computer. The whole design was completed in October 1996.

Functional Strategy – Value Chain:

Primary Activities:

Marketing: PTT has its own marketing policy, which are: Retaining leadership, by being no. 1 in the market; Securing existing market share, Developing the potential of sales representatives, Increasing the number of Company-owned service stations; Expanding the market for products giving a high return, i.e. lubricant; Maintaining quality products and services, Standardized quality and services, Expanding business in high-potential areas, e.g. tourist route, border points, Improvements in the non-oil business at service stations.

Logistics: PTT operational policies are: Improving efficiency of oil procurement and distribution; developing a nationwide-terminal automation system

Supporting Activities:

The support functions are: Controlling expenses; Prudent investments; Developing e-commerce systems for retail business.

Table 5.25 Procurement

Procurement	2000	1999	% Change
Crude oil (thousand barrels day)			
Indigenous sources	68	69	(1.5)
Import	205	168	22.0
Finished Product (thousand barrels/day)			
- Import	22	20	5.8
Export & Trading			
LPG (tons)	417,916	563,882	(25.9)
Petroleum products / Condensate / natural gasoline / Petrochemicals (thousand barrels/day)	92	86	5.8

Source : Petroleum Authority of Thailand (PTT). Annual report 2000.

Research & Development: PTT founded a Research and Technology Institute, intended to serve as petroleum and petrochemical research body, in Wang Noi District of Ayutthaya Province, with an investment of over 1.463 billion baht. PTT conducted research and developed quality fuels of international standards that are friendly to the environment. Consequently, PTT has become a perennial leader in the sale of such

products as MTBE-blended gasoline, unleaded premium gasoline, low-sulfur diesel fuels, and low-smoke two-stroke engine fuels. PTT pioneered research for the benefit of the public and private sectors and conducted quality tests of fuels and other standard petroleum products. As a result, PTT is widely recognized for its standards.

Human Resources: PTT took steps to align its human resource development with international standards, from manpower planning, recruitment, training, remuneration, to performance appraisal. The transformed practice, now comparable with those of international oil companies, was intended to add quality to the workforce and provide an incentive for efficient performance. At its inception, PTT had about 2,000 personnel, rising to 3,600 in 1985, and 3,500 at the present time. These people work for PTT and its affiliated organizations, and coordinate as well as ensuring that the various business units work in a unified and synergistic way (Petroleum Authority of Thailand Annual Report, 2000).

5.3.4 Cogeneration Public Company Limited (COCO):

Technology: The supplier of main equipment and control system of the company's and subsidiaries' facilities are the reputable world class companies such as General Electric (GE). The company employs highly efficient and reliable cogeneration technology to produce power, steam and industrial water. Power is supplied to customer via high-security Gas Insulation Switch Gear (GIS), distribution system and underground cable network, while steam and water are delivered through high-security pipelines. As a result, COCO has been successfully awarded ISO 14001 certificate. In the meantime, much aspect on safety issues have been pursued at all facilities to ensure full compliance with OHSAS 18000 requirement.

Business System:

Total Quality Management (TQM): COCO received 14001 certification from the industry-standard accreditation firm, AJA EQS (Thailand) Ltd. ISO 14001 (the international standard for Environment Management System) is another evidence of their commitment to the environment. In the meantime COCO continue to work hard to ensure the safety of their employees and as such are working towards obtaining the OHAS 18000 Occupational Health and Safety Management certifications.

Procurement: Fuel costs make up the bulk of the company's and subsidiaries' costs. In 2001, 72% of the operational expense is estimated as fuel expense, which

consists of 63% and 9% of coal and natural gas respectively. Thus, change in fuel price will have substantial impact on operational expenses of the company and subsidiaries. The price of natural gas from the Gulf of Thailand does move with global cure price but to a lesser extent than oil; while the coal price is historically more stable, fluctuating little over the years. However, electricity and steam price are indexed to the fuel cost, the impact on operational expenses of the company and subsidiaries will not be critical.

Research & Development: In compliance with the company's mission to deliver high quality and reliable products to their customers, continuous development and improvement on the company's line of products, production process, transmission and distribution system, and industrial water quality control and chemical components analysis have been undertaken by their own professional staffs with support from expatriate specialists.

Firm Infrastructure: The company and its subsidiary have incurred debts in two currencies. Thai Baht and United States Dollars. Even though the company's operating revenue are dominated in Thai Baht the mechanisms in each of the Power Purchase Agreement with EGAT and Power Sales Agreement with Industrial customers effectively compensate the company for the fluctuations in currencies (the foreign exchange index formula). The Company, therefore, have arranged and adjusted its debts structure to have USD loan portion in appropriate level. For short-term management, the Company has policy to enter into forward foreign exchange transaction on a monthly basis to cover a potential foreign exchange risk, which may arise in each and every debt servicing date. In addition, the Company has entered into a interest rate swap agreement to fully cover itself against interest rate risk of the its USD loans. The remaining loan outstanding are denominated in Thai Baht 80% of which has been fixed for 3 years (COCO Annual Report, 2000).

5.3.5 Banpu Public Company Limited (BANPU):

Technology: As the global business current take places alarming importance to the new economy in regard to information technology and borderless communication- as if the world were a village, the company itself has a long term plan concerning information technology in order to increase efficiency in its operation, management and decision making process. It has an Intranet system in operation and a web site as

tool to disseminate information to shareholders, investors, and the general public. The company has allocated budget for further development of information technology to seriously study the benefits of the new and existing business so as to be constantly in step with events and making the extension in order to derive the maximum benefits for the company in the longer term.

The quality Promotion Center and the Environmental and Safety Promotion Center play an important role in monitoring quality and safety as well as protecting the environment. The Company's operation in this respect is accepted by international institutions, which they received ISO9002 certification. As regards to the environment, the company's goal is to adopt national standards by following a master plan designed for all mines and operations, as well as utilizing technology that effectively monitors environmental standards.

Human Resources: The Company develops its human resources to support its future business plan. Banpu allocate 5% of its annual salary budget to various short and long-term personnel development to upgrade competency and efficiency to the international level. The program include the sponsorship of staff education, educational trips both inside and outside the country, organizing in-house training in the areas of business management, English proficiency and computer skills, as well as encouraging employees to participate in external seminars and training on courses related to, e.g. laws and taxation. At the same time, the human resource department was assigned to develop system that enables staff to achieve maximum working efficiency. Modern performance Management was introduced including yardsticks for measuring each staff member's contribution to the overall corporate goal.

Operation: In 1999, Banpu and affiliates sold 3.39 million tons of coal to the domestic market, an increase of 19.79% of the year 1998. Oversea coal mine, Banpu owned 95% of PT. Jorong Barutama Greston mine, which has began production and sold 0.35 million tons of coal to power and cement production in Thailand. In addition, company began trial shipments of 0.10 million tons of Jorong coal to buyers in India and Spain (Banpu Annual Report, 2000).

5.3.6 PTT Exploration Public Company Limited (PTTEP)

Management Style: The vision of PTTE is leading Petroleum Exploration and Production Company with Operational Excellence, International Best Practices, and

World-class competitive strength. The mission is to conduct their core business by operating and investing petroleum exploration, development, production, and strategic related business in Thailand and overseas.

The adjustment of the company's income structure from gas to oil as major income via the swap of assets, and the reorganization of the company's structure in line with its business direction and global business environment; Teamwork, new management styles are established.

Business System:

Total Quality Management: In the Health, Safety and Environment aspects, PTTEP has executed its petroleum exploration and production under ISO 14001 standard since 1997, when the Company was granted the certificate. Furthermore, in 2000, PTTEP received another ISO 14001 certificate in building management and maintenance services from AJA EQS (Thailand) Co., Ltd. The certificate was a result of PTTEP's commitment to reduce pollution and preserve the environment to our best ability.

Functional Strategy – Value Chain: PTTEP had adjusted its strategies, firstly by accelerating the conversion of petroleum reserves into production, prioritizing projects requiring marginal investment and enabling to execute operations as planned, and secondly, by the expansion of their petroleum asset base through international investment.

Human Resources: PTTEP has encouraged job rotation at both management and working levels, aiming to reinforce basic knowledge and expand vision, in the mean time the implementation of the Learning Organization concept is to be introduced continuously. The Company expects all staff members within the organization to systemize their thinking process as well as exchange information among one another for maximum value and effectiveness of the Company in the future.

PTTEP also provides courses on Health, Safety, and Environment for its personnel in order to create understanding and awareness of hazard and accident prevention and safe working practices, including emergency procedures for safety and environmental impact mitigation. In year 2000, more than 300 PTTEP personnel and contractors have attended 39 Health, Safety, and Environment related training courses

Table 5.26 Financial Statement of National Petrochemical Public Company Limited

Performance	1995	1996	1997	1998	1999
Profit (Loss) Before Extraordinary Item (Million Baht)	420	584	1,545	3,270	927
Net Profit (Loss) After Extraordinary Item (Million Baht)	420	584	(3,591)	3,270	927
Earning Per Share before Extraordinary Item (Million Baht)	1.35	1.88	4.98	10.55	2.99
Earning Per Share After Extraordinary Item (Million Baht)	1.35	1.88	(11.58)	10.55	2.99
Return on Sales Before Extraordinary Item (Million Baht)	6.92	8.09	15.73	29.21	9.60
Return on Sales After Extraordinary Item (Million Baht)	6.92	8.09	(36.33)	29.21	9.60
Return on Total Assets Before Extraordinary Item (Million Baht)	2.95	3.69	9.49	17.23	4.30
Return on Total Assets After Extraordinary Item (Million Baht)	2.69	3.69	(22.05)	17.13	4.30
Financial Position					
Current Ratio (Times)	1.94	1.64	1.18	1.39	1.42

Source: National Petrochemical Public Company Limited, Annual Report 1999

Table 5.27 Financial Position Cogeneration Public Company Limited

Financial Position	July-Dec. 2000 (6month)	1999/2000 12 Month	Changed from Previous Year	1998/1999	Changed from Previous Year
Total Revenue	2,744,115	4,860,074	(43.54)	6,311,285	(22.99)
Operation Revenue	2,731,940	4,818,011	(43.30)	4,682,182	2.90
Gross Profit (Loss)	733,940	1,353,103	(45.78)	1,448,071	(6.56)
Net Profit (Loss)	(1,561,961)	(729,841)	(114.01)	2,074,964	(135.17)
Earning (loss) Per Share (Baht)	(1.30)	(0.81)	(61.09)	(2.58)	(131.15)

Source: The Cogeneration Public Company Limited., Annual Report 2000.

Table 5.28 Financial Ratio of Banpu Public Company Limited

Financial Ratio	%	2000	1999	1998
Gross Profit Margin	%	17.49	28.54	24.16
Net Profit Margin	%	(18.34)	49.36	(85.44)
Return on Assets	%	(5.79)	12.64	(21.65)
Return on Equity	%	(12.27)	27.91	(45.89)
Interest Coverage Ratio	%	3.08	3.29	2.36
Net Debt to Equity Ratio	%	0.99	1.09	1.82

Source: Banpu Public Company Limited., Annual Report 2000.

Table 5.29 Financial Ratio of PTT Exploration and Production Public Limited Company

Major Items	Q1/2001	2000	1999
Total Assets	72,245	64,373	53,361
Total Liabilities	48,712	43,505	35,970
Total Shareholders' Equity	23,533	20,868	17,391
Sales Revenue	6,724	21,519	13,050
Total Revenues	7,397	22,616	14,887
Net Income (loss)	2,665	5,433	2,1

Source: PTTEP Homepage on line Available < www.ptt-ep.com/images/name.gif>

Table 5.30 Financial Ratio of Electricity Generating Public Company Limited

Ratio Analysis	2000	1999	1998
Liquidity Ratio (Time)	2.85	6.97	4.08
Cashflows Liquidity Ratio (Time)	0.97	1.29	0.68
Gross Profit Ratio (%)	65.12	67.50	58.22
Net Profit Ratio (%)	11.62	27.99	59.97
Return on Equity Ratio (%)	7.21	16.83	53.28
Return on Assets Ratio (%)	2.32	5.57	13.75
Debt to Equity Ratio (Time)	2.16	1.97	2.06

Source: Electricity Generating Public Company Limited., Annual Report 2000

Table 5.31 Financial Ratio of Petroleum Authority of Thailand (PTT)

Financial Ratio	1999	1998	1997	1996	1995
Net Operating Income	8,957	13,357	10,122	7,867	7,820
Net Profit	6,310	12,246	2,871	8,301	7,527
Total Assets	176,971	146,290	141,338	116,157	97,012
Profit Margin on Sale (%)	2.78	5.76	1.22	5.08	6.24
Current Ratio (times)	1.97	1.59	1.72	1.69	1.77
Return on Equity (%)	11.26	24.81	7.01	18.32	21.04

Sources: Petroleum Authority of Thailand, Annual Report 1999.

5.4 Conclusion

The strategies for internal factors of the organization, the management can formulate various strategies on internal factors: Technology, Management Style, Business Process Reengineering, and functional strategy-value chain. Nevertheless, to maintain firm's existing competitive advantage, the management should adapt new

Technology in the field of information Technology and production system into the functional strategy-value chain. Also the Management Style should be maintained through the training support on teamwork, strengthen the autonomy in decision making, new management style, develop and establish the Management Style as a more learning and capacity building to up grade employee skills.

Moreover, for the concept of Business Process Reengineering, the management should implement, maintain, and develop the software and hardware system. The compensation should be given according to the individual capacity and teamwork. In addition, there should be the improvement in the primary and supporting activities of the Organizational Performances such as operation, logistics, marketing, procurement, human resources, research and development and firm infrastructure.

Since this research focus on various internal factors of the organizational affecting Organizational Performances in the energy enterprises, therefore, further research is recommended in depth analysis of the firm and focus on more specific internal factors, such as Technology, organization culture, Business Process Reengineering, functional strategy–value chain.

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The 52 organizations and 416 the respondents in the energy enterprises in Thailand including Oil, Gas and Electricity sector in Thailand were selected as population and sample of the study.

In the two parts of this concluding chapter, the main findings emerging from the research and recommendations are presented.

6.1 Conclusion

The conclusion can be divided into two parts in order to present the main findings, Part I consists of the evaluation of internal structural adjustment factors affecting organizational performance Part II gives conclusions from the study of the cause-effect of internal structural adjustment factors and appropriate linear structural relationship equation model.

Part I: The evaluation of internal structural adjustment factors affecting organizational performance

The results of study found that respondents' opinions concerning organizational structure with respect to complexity had the highest mean value related to the answer, "The structure of the jobs distribution in the company yielded more comfortable and rapidly in operating and to resolve the problem." A minority of respondents answered, "The missions of each department/division/section/unit in the company were clear, uncomplicated, and easy to understand". The opinion from respondents with the highest mean value about organizational structure with respect to formalization was the answer, "You are clarified the understanding in the boundary of responsibility and authority of yourself decision making." A minority of respondents answered, "The organization set up the regulation for customers service in case of external person and organization which was clear, easy to understand and practice."

The opinion about organizational structure with respect to formalization that had the highest mean value was expressed by respondents as, "The officers had no independence in created working, planning and regulation under the present structure of the organization." A minority of respondents answered was "The currently Organizational Structure promoted the participation of top executive in strategic planning, operate planning, evaluation, not emphasized the participation of middle and lower position."

The opinion about the business system with respect to business processes re-engineering with the highest mean value was the answer, "The improvement and adjustment in business process were changed by small jobs and tasks to be a more important category and large which supported multiple functions and objective." A minority of respondents said, "Business process contributed to reduce inspection controlling and operate rapidly." Among the opinions about the business system with respect to total quality management, the one with the highest mean value was, was "The organization can not use the Management by objectives, can not set up the numeric targets and emphasized on the individual specialist." The minority of respondents answered, "The organization allocated the resource to support the educational development and self development of employee in terms of quality

system training program for executive, middle level administrator, division head and officers in 5S.”

Respondents’ opinion about management style that had the highest mean value stated, “The changing in business process contributed to create more authority in decision making of all employee in organizational, especially in performance.” The minority of respondents chose the answer, “The department administrator emphasized on the management by team, which were multi functional specialist, efficient and clear cooperation, training supported and the effects used of tools such as QCC.”

The opinion of respondents about organizational technology with the highest mean value was, “The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in computer command.” A minority of respondents answered, “The organization conducted the new Technology, which acquired by research and development in the organization to practice and received more capacity than competitor in communication”

The opinion of respondents about infrastructure with the highest mean value was, “The organization developed the relationship with the public sector, interest groups in the country and illustrated the good image to the public.” The minority of respondents answered, “The efficiency in management system created the supported system into the organization, emphasized on cooperation, analysis and integrated the jobs in the department in the organization such as operation, marketing, logistics, human resource, procurement, research and development.”

Respondents’ opinion about human resource management in the organization with the highest mean value was “The organization implemented the continuing modernized and efficient improvement in terms of the interpersonal relationship between employee.” “The interpersonal relationship between top executive, department head and employee were good and created the several activity in the organization.” Respondents also answered, “Human resource management policy was modernized, clarified, easy to understand and practice and efficiency in salary, bonus and other allowance” and “Human resource management policy was modernized, clarified, made it easy to understand and practice and efficiency in recruitment.”

For the opinion with the highest mean value concerning logistics, respondents answered “Your organization has the effective inventory management system on finished good and modern raw material such as security system and good maintaining system” A minority of respondents answered “Your organization has the effective inventory management system on finished good and modern raw material such as goods storing system” A few others said, “Your organization has the effective inventory management system on finished good and modern raw material such as Information On Line system, the amount of goods inventory, and seller information”

The opinion with the highest mean value towards marketing and sales was, “Develop organizational image and reputation.” The minority of respondents answered, “Assessed the alternatives and other distribution channel.”

Among opinions about procurement, the response with the highest mean value was, “Developed the criteria using for purchasing decision or used the property rental method inside organization which benefited in long term.” The minority of respondents answered, “Considered the purchasing raw material, wasted material, hardware and other properties by multiple offering.”

The opinion about research and development with the highest mean value was, “Viewed your organization that they had good relationship between the Research and Development and other department such as Marking, Production, and Purchasing.” A minority of respondents answered, was “The researcher have high ability and experience.”

Part II: The study of the cause-effect of internal structural adjustment factors and appropriate linear structural relationship equation model.

Hypothesis One: After the 1997 economic crisis in Thailand, the organizational performance in terms of financial perspective (net income/ sale, net income/ total asset, current asset ratio, percentage of change in net profit, earning per share, percentage of change in earning per share) of energy enterprises would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering),and

the functional strategy-value chain (primary activities, supporting activities) in terms of financial performance.

The main findings for the first hypothesis were that the complexity (covariance with other independent variables) in organizational structure had negative direct effects on firms' earnings per share after the economic crisis. The management style (covariance with other independent variables) had positive direct effects on the percentage change of earnings per share and percentage change of net income/sales after the economic crisis, on the other hand, management style (covariance with other independent variables) had a negative direct effect on net income/sales after the economic crisis. Technology (covariance with other independent variables) had positive direct effects on current asset ratio and net income/ total asset after the economic crisis. The primary activities in the functional strategy—value chain had direct negative effects on the current asset ratio after the economic crisis.

The supporting activities of the functional strategy—value chain had positive direct effects on net income/ total assets and net income/ sales after the economic crisis. On the other hand, the supporting activities in terms of human resource and research had negative direct effects on net income/ total assets and net income/ sales after the economic crisis. These results yielded partial acceptance of the first hypothesis.

Table 6.1 The Summary of Hypothesis One

Independent Variables	Dependent Variables: Financial Ratio					
	NIS	PNI	EPS	PEPS	CAR	NIA
Technology					+√	+√
Management Style	-√	+√		+√		
Functional Strategy – Value Chain:						
- Primary Activities: Marketing						
Operation						
Logistics					-√	
- Supporting Activities: Procurement						+√
Research & Development	-√					
Firm Infrastructure	+√				-√	
Human Resources						-√
Business System: Total Quality Management						
Business Process Reengineering						
Organizational Structure: Centralization						
Formalization						
Complexity			-√			

NIS	=	Net Profit/ Sale
PNI	=	Percentage Change in Net Income
EPS	=	Earning per Share
PEPS	=	Percentage Change in Earning per Share
CAR	=	Current Asset Ratio
NIA	=	Net Income/ Asset

Table 6.2 The Summary of Hypothesis Two

Independent Variables	Dependent Variables: (Customer) – Organizational Performance	
	(MAR) Market Share	(PSAL) % Change in Sale
Technology	+ $\sqrt$	
Management Style		
<u>Functional Strategy – Value Chain:</u> - <u>Primary Activities:</u> Marketing Operation Logistics - <u>Supporting Activities:</u> Procurement Research & Development Firm Infrastructure Human Resources		
	+ $\sqrt$	
<u>Business System:</u> Total Quality Management Business Process Reengineering		
<u>Organizational Structure:</u> Centralization Formalization Complexity		- $\sqrt$

Hypothesis Two: After the 1997 economic crisis, the organizational performance in terms of customer (market share, percentage of change in sale) of energy enterprises related to customers would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering) and the functional strategy-value chain (primary activities, supporting activities).

The main findings based on testing the second hypothesis found that technology (covariance with other independent variables) was a positive factor

directly affecting market share, while the centralization of organizational structure (covariance with other independent variables) was a negative factor directly affecting percentage change of sales after the economic crisis. This result indicated partial acceptance of the second hypothesis

Hypothesis Three: After the 1997 economic crisis, the organizational performance of energy enterprises in terms of the internal business process (percentage of change in total asset) would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering), and the functional strategy-value chain (primary activities, supporting activities).

The results of testing hypothesis three indicated that technology positively influenced the variance in the dependent variable – percentage change in total assets with both direct and indirect effects. Therefore, this result leads to partial acceptance of the third hypothesis.

Table 6.3 The Summary of Hypothesis Three

Independent Variables	Dependent Variables: (Internal Business Process) – Organizational Performance
	Percentage change in assets
Technology	+ $\sqrt{\quad}$
Organizational Structure	
Management Style	
Business System: Total Quality Management	
Business Process Reengineering	
Functional Strategy – Value Chain: - <u>Primary Activities</u> : Marketing, Operation, Logistics - <u>Supporting Activities</u> : Procurement, Firm Infrastructure Human Resources Research & Development	} – $\sqrt{\quad}$

Hypothesis Four: After the 1997 economic crisis, organizational performance in terms of learning and growth (employee turnover, absenteeism) would be positively influenced by organizational structure, management style, technology, the business system (Total Quality Management, Business Process Reengineering), and the functional strategy- value chain (primary activities, supporting activities).

Testing the fourth hypothesis revealed that after the economic crisis, business process reengineering positively influenced the variance in employee turnover, with both direct and indirect effects. On the other hand, business process reengineering negatively influenced variance in absenteeism as the dependent variable, both directly and indirectly. This means that business process reengineering positively influenced organizational performance in terms of the learning and growth aspect. This result indicates partial acceptance of the fourth hypothesis.

Table 6.4 The Summary of Hypothesis Four

Independent Variables	Dependent Variable: Organizational Performance- Learning & Growth	
	Employee Turnover	Absenteeism
Technology		
Organizational Structure		
Culture		
<u>Business System:</u> Total Quality Management		
Business Process Reengineering	+ √	- √
<u>Functional Strategy – Value Chain:</u>		
- <u>Primary Activities:</u> Marketing Operation Logistics		
- <u>Supporting Activities:</u> Procurement Firm-Infrastructure Human Resources Research & Development		

Internal Factors.

The top management should maintain and develop the competitive advantage based on technology, business process reengineering, management style, with a

functional strategy covering both primary activities and supporting activities concentrating on human resources, firm infrastructure, and procurement.

6.2 Recommendations

The recommendations related to energy enterprises in Thailand are as follows:

6.2.1 Policy Implications

Results of the study clearly confirmed that technology in energy enterprises positively influenced the organizational performance in terms related to financial aspects, customer relations and the internal business process. Therefore, the government could make the following policies to support energy enterprises:

a) Maintain stability in the exchange rate and the interest rate. The greatest costs in energy enterprises is the fuel cost, which is more than 70 per cent of total costs for operational expenses. The fuel cost consists of coal, natural gas, crude oil, and refined crude oil, all of which are largely imported. Exchange rates and access to foreign currency will have an important role in the profits and losses for these enterprises. During the period when a floating currency policy is used, the government should encourage use of forward contracts or other kinds of hedging of foreign currency. Moreover, the government should implement monetary policy to control the interest rate as well as support domestic financial instruments, such as currency, interest rate swap, and forward foreign currency market.

b) Develop human resources in energy enterprises: As a result of high-investment and the use of complex technology in energy enterprises, high-skilled and well-trained human resource are required. The government should implement policies that support the development of experienced and knowledgeable human resources. The policy could provide budgets for institutions or universities to provide training courses or seminars, including free training programs for IT technology and energy related technology in energy enterprises. This would help to upgrade the technical skills of human resources and enable them to deal with new high technology for energy enterprises.

c) Allocation of research and development funds to develop the country's technology in the energy sector: Technology outside the agricultural sector in

Thailand has not been developed as extensively as in developed countries. The government could hire foreign instructors and experts in order to adopt and transfer technology as well as buy technologies in order to train domestic workers for the first time. In the long run, the government should allocate research and development funds to universities and institutions to further develop the technology. Finally, the government could establish a technology center for the energy sector aimed at creating competitiveness.

d) Remove structural impediments that block improvements to industry competitiveness. In many cases, government regulations are obstacles in doing international business, such as requiring many documents from companies for foreign transactions. Within the government, too much time is taken to provide services for customers. An energy enterprise will be unable to compete with other competitors in a global market that is rapidly changing. Thus, the burden of regulations should be eliminated from the working process to expedite the flow of work. As the energy sector is a major importer and exporter of raw materials, reducing the regulations can help reduce operating costs. Another policy could provide incentives for the use of local components in production processes. Energy enterprises must use core parts from their mother companies, but some component can be sourced domestically to help cut costs of operation.

e) The government should establish the energy research center to support the energy industry. This center would provide related energy technology and knowledge to public.

6.2.2 Management option - Internal Factor Affecting Organizational Performance

Firms' policies on internal structural adjustment affecting organizational performance should be outlined to enhance organizational performance after the economic crisis as follows:

6.2.2.1 Technology: Due to the effects of technology on financial aspects, customer services and relations, and the internal business process as part of organizational performance, energy enterprises should improve their technology along the following dimensions:

- a) Firms should acquire new technology and use it to create more capacity than competitors. Technology should utilize new products, improve operations, raise product quality, and reduce production losses.
- b) Firms should maintain their existing competitive advantage in the areas of communications, software, computer applications in production, such as computer-aided manufacturing and design.
- c) Firms should maintain high quality, reliable products for customers, make continuous improvements, develop lines of product, production processes, transmission and distribution systems, quality control of industrial water, and analysis of chemical components.
- d) Management should develop and integrate new technology, particularly information technology, into the functional strategy-value chain for primary activities, including operations, marketing, logistics; and for supporting activities, including procurement, research, firm infrastructure, and human resource management. For instance, firms could develop E-commerce trading within the supply chain.

6.2.2.2 Management Style: Management style was a factor affecting percentage change in earnings per share and percentage change in net income related to financial aspects. The management should maintain and develop the management style with the following policies:

- a) Maintain the existing management style for teamwork among multi-functional specialists based on total quality management tools, such as the Demming cycle, QCC, brain storming, and workflow.
- b) Maintain training that supports multi-function teamwork.
- c) Strengthen autonomy in decision making for lower-level management.
- d) Expand the management style on consulting and coaching to various management levels.
- e) Develop new management styles that are not slow, consistent and regulated, but are fast, constantly changing, entrepreneurial and innovative.
- f) Establish a management style based more on learning and developing capacities to upgrade to new skills, such as IT, lifelong learning, creative thinking and problem solving skills.

- g) Develop the management style based on business process reengineering.

Suriyamongkol (1988) pointed out the importance of culture as an influence on management styles in the Thai political process. His concepts could also be applied to explain the management styles in private organizations. He indicated that the criticism of problems as culturally determined should not prevent the use of other interpretations of institutional dynamics or the necessity to understand the process of cultural change. He further explained the process of culture change from clientelism and entrepreneurship (pariah) to a consultative committee approach. Therefore, these concepts could be applied to understand changes need in management styles in Thai energy enterprises.

6.2.2.3 Business Process Reengineering: Given the effects of business process reengineering on the absenteeism rate, employee turnover in the terms of learning and growth on organizational performance can be enhanced if business process reengineering consisted of the following elements:

- a) improve modern technology in terms of new business processes, MRP (Material Resources Planning), DBMS (Decision Management Business System), wireless communication and software development.
- b) Maintain important elements of business process reengineering, such as autonomy of decision making for lower level management, flat organizational structure, compensation based on capacity, combining multiple tasks into one task, and reduction of controls and inspections.
- c) Implement command and control by self-managing teams, move from functional processes to a team process.
- d) Develop software and hardware systems that will enable enterprises to effectively implement business process reengineering.
- e) Change employee compensation based on individual capacity and teamwork.

6.2.2.4 Functional Strategy – Value Chain: Since functional strategy-value chain related to supporting activities was a factor affecting the internal business process and financial performance aspects of organizational performance, management should improve the following dimensions:

- a) Procurement factors, such as good relationships with suppliers, good quality and competitive pricing, and long-term purchase contracts.
- b) Infrastructure factors, such as development of the strategic planning system, financial policy, and information technology to support other functions.
- c) Human resource management factors, such as good relationships with labor unions, transparent job specification, enriching the organizational commitment, developing education and training policies, and reengineering the human resource system.
- d) Existing research and development dimensions, such as research on production and production processes, research related to the reduction of production costs, and recruiting new specialists.

Functional strategy-value chain on supporting activities for human resource management affects net profits/total assets under the financial aspects of organizational performance. Related human resources policy should:

- a) maintain the existing strengths of human resource policy, such as clear human resource management, good interpersonal relationship among executive and employee, and good compensation.
- b) establish the reengineering of the human resource management department to a strategic level, provide leadership in training about new ways of work, create intellectual human capital, provide new training on IT, encourage expertise and creativity.

6.2.3 The Directions of the Future Research: It is recommended that the future research could move in the following directions:

1) This research focused on various internal structural factors affecting the organizational performance of energy enterprises after the economic crisis. Future research studies should expand to consider the internal factors affecting organizational performance before the 1997 economic crisis in order to analyze patterns of change.

2) In order to make in-depth studies, particularly with a focus on the most significant factors affecting organizations, future research should focus only on management style, business process reengineering, and technology.

3) In order to make studies more complete, the target population should be expanded to include middle-level and low-level management.

4) Interviews with executives should explore the internal factors in greater depth.

5) The causal relationships among variables of organizational performance in terms of learning and growth, internal business process, customer relations, and financial aspects should be tested in greater depth.

6) More external factors affecting organizations, including the general environment and the industry environment should be studied. (See detail contained in model A.)

7) Additional internal factors affecting organizations, particularly corporate restructuring, restructuring of marketing strategy, and restructuring within the organization should be included in future research. (See detail contained in model A)

8) Further investigation of efficiency and the effects of privatization on state-owned enterprise in terms of public acceptance, social impact, and environmental impact on the local community should be included in future study. Chandarasorn and Pathranarakul (1998:37) developed a conceptual framework to evaluate projects based on an underlying open system with eight standard principles and indicators: a) progress, b) efficiency, c) effectiveness, d) impacts, e) relevance, f) sustainability, g) equity and j) externalities. Their framework could be adapted to the evaluation of organizational performance for organizations in both private and public sectors and used as a foundation for future research on organizational performance.

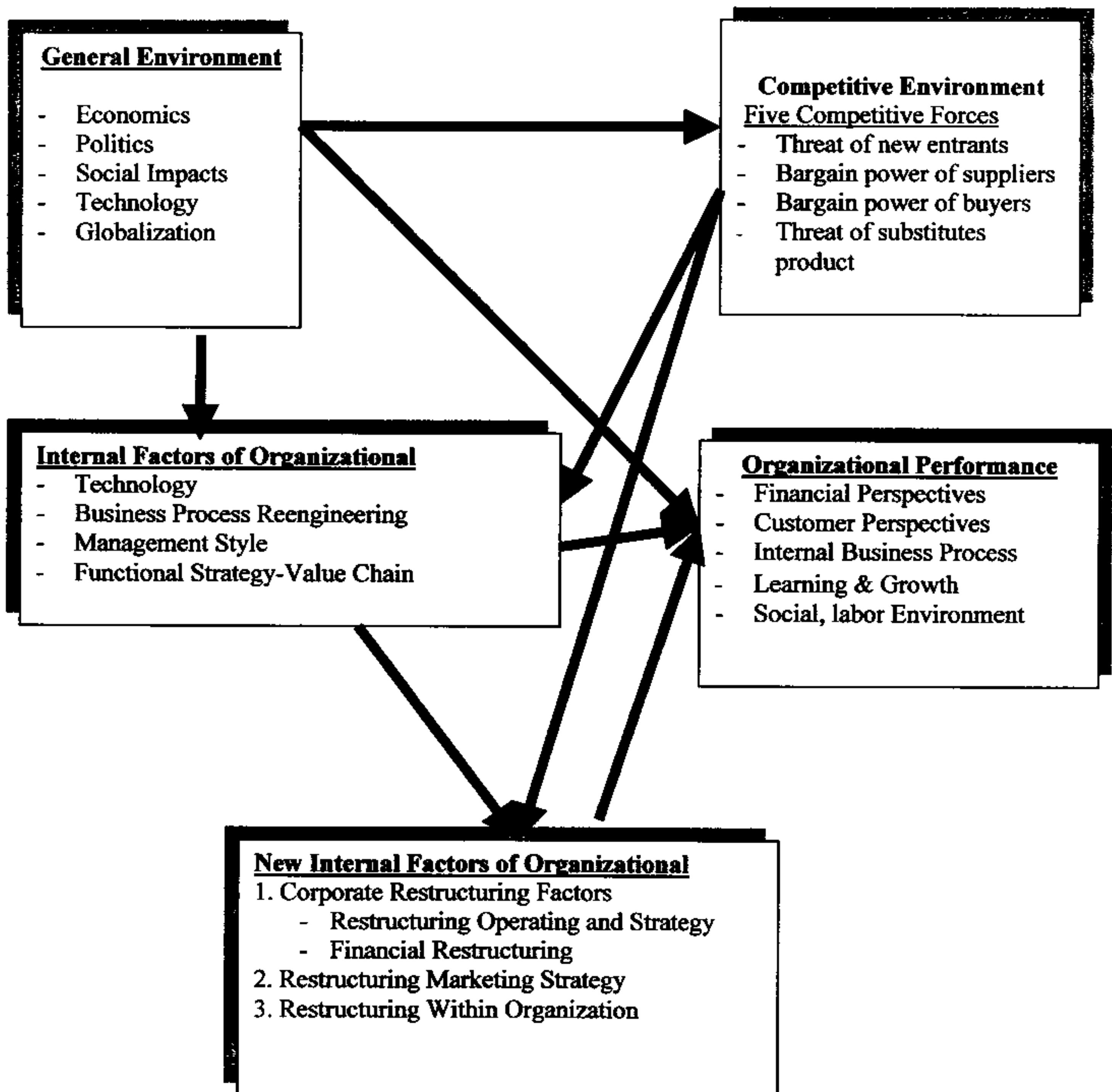


Figure 6.1 Show the Alternative Synthesis of Organizational Analysis Model for Further Research

APPENDIX B:

The Reliability Analysis

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	COMPLEX1	3.6000	1.0372	30.0
2.	COMPLEX2	3.7333	1.0807	30.0
3.	COMPLEX3	4.0333	1.4016	30.0
4.	COMPLEX4	4.0333	.8503	30.0
5.	COMPLEX5	4.1000	.7589	30.0

Statistics for	Mean	Variance	Std Dev	Variables
SCALE	19.5000	15.2931	3.9106	5

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
COMPLEX1	15.9000	9.3345	.7704	.7004
COMPLEX2	15.7667	9.2195	.7475	.7058
COMPLEX3	15.4667	8.2575	.6296	.7613
COMPLEX4	15.4667	12.5333	.3383	.8244
COMPLEX5	15.4000	12.0414	.5081	.7873

Reliability Coefficients

N of Cases = 30.0 N of Items = 5

Alpha = .7999

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	FORMAL1	7.5667	1.1043	30.0
2.	FORMAL2	7.7667	.6789	30.0
3.	FORMAL3	7.7333	.6397	30.0
4.	FORMAL4	7.5333	1.0080	30.0
5.	FORMAL5	7.9000	.7120	30.0

Statistics for	Mean	Variance	Std Dev	Variables
SCALE	38.5000	8.5345	2.9214	5

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
FORMAL1	30.9333	4.4092	.6265	.6097
FORMAL2	30.7333	5.9264	.6496	.6243
FORMAL3	30.7667	6.1851	.6098	.6428
FORMAL4	30.9667	5.0678	.5400	.6502
FORMAL5	30.6000	7.6276	.1017	.7904

Reliability Coefficients

N of Cases = 30.0 N of Items = 5

Alpha = .7209

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	CENTRAL1	7.5667	1.1043	30.0
2.	CENTRAL2	7.7667	.6789	30.0
3.	CENTR3.1	7.7333	.6397	30.0
4.	CENTR3.2	7.5333	1.0080	30.0
5.	CENTR3.3	7.5667	1.1043	30.0
6.	CENTR3.4	7.7667	.6789	30.0
7.	CENTRAL4	7.7333	.6397	30.0
8.	CENTRAL5	7.5333	1.0080	30.0
9.	CENTRAL6	7.1000	.3051	30.0

Statistics for	Mean	Variance	Std Dev	Variables
SCALE	68.3000	31.1828	5.5842	9

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
CENTRAL1	60.7333	21.7885	.7929	.8761
CENTRAL2	60.5333	25.3609	.7840	.8795
CENTR3.1	60.5667	25.7023	.7819	.8807
CENTR3.2	60.7667	24.1851	.6033	.8930
CENTR3.3	60.7333	21.7885	.7929	.8761
CENTR3.4	60.5333	25.3609	.7840	.8795
CENTRAL4	60.5667	25.7023	.7819	.8807
CENTRAL5	60.7667	24.1851	.6033	.8930
CENTRAL6	61.2000	30.5103	.1719	.9102

Reliability Coefficients

N of Cases = 30.0

N of Items = 9

Alpha = .8975

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	BPRE1	7.5667	1.1043	30.0
2.	BPRE2	7.7667	.6789	30.0
3.	BPRE3	7.7333	.6397	30.0
4.	BPRE4	7.5333	1.0080	30.0
5.	BPRE5	7.5667	1.1043	30.0
6.	BPRE6	7.7667	.6789	30.0
7.	BPRE7	7.5667	1.1043	30.0
8.	BPRE8.1	7.7667	.6789	30.0
9.	BPRE8.2	7.7333	.6397	30.0
10.	BPRE8.3	7.5333	1.0080	30.0
11.	BPRE8.4	7.5667	1.1043	30.0
12.	BPRE8.5	7.7667	.6789	30.0

Statistics for Mean Variance Std Dev Variables

SCALE 91.8667 74.4644 8.6293 12

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
BPRE1	84.3000	58.4241	.8779	.9427
BPRE2	84.1000	64.9207	.8302	.9456
BPRE3	84.1333	65.7057	.8051	.9466
BPRE4	84.3333	64.7126	.5386	.9546
BPRE5	84.3000	58.4241	.8779	.9427
BPRE6	84.1000	64.9207	.8302	.9456
BPRE7	84.3000	58.4241	.8779	.9427
BPRE8.1	84.1000	64.9207	.8302	.9456
BPRE8.2	84.1333	65.7057	.8051	.9466
BPRE8.3	84.3333	64.7126	.5386	.9546
BPRE8.4	84.3000	58.4241	.8779	.9427
BPRE8.5	84.1000	64.9207	.8302	.9456

Reliability Coefficients

N of Cases = 30.0

N of Items = 12

Alpha = .9507

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	TQM1	6.9333	1.0148	30.0
2.	TQM2	7.7667	.6789	30.0
3.	TQM3	7.7333	.6397	30.0
4.	TQM4.1	7.5333	1.0080	30.0
5.	TQM4.2	7.5667	1.1043	30.0
6.	TQM4.3	7.7667	.6789	30.0
7.	TQM4.4	7.5667	1.1043	30.0
8.	TQM4.5	7.2667	1.1121	30.0
9.	TQM4.6	7.7667	.6789	30.0

10.	TQM4.7	7.7333	.6397	30.0
11.	TQM4.8	7.5333	1.0080	30.0
12.	TQM4.9	7.5667	1.1043	30.0
13.	TQM5.1	7.7667	.6789	30.0
14.	TQM5.2	7.5667	1.1043	30.0
15.	TQM5.3	7.1333	1.1666	30.0
16.	TQM5.4	7.4667	.9371	30.0
17.	TQM5.5	7.3667	1.0334	30.0
18.	TQM6	8.1000	.8449	30.0

Statistics for Mean Variance Std Dev Variables

SCALE 136.1333 75.7057 8.7009 18

RELIABILITY ANALYSIS - SCALE (ALPHA)

Item-total Statistics

Scale	Scale	Corrected	
Mean	Variance	Item-	Alpha
if Item	if Item	Total	if Item

	Deleted	Deleted	Correlation	Deleted
TQM1	129.2000	78.9241	-.2356	.8629
TQM2	128.3667	66.1023	.8282	.8150
TQM3	128.4000	67.4897	.7428	.8193
TQM4.1	128.6000	67.5586	.4303	.8291
TQM4.2	128.5667	60.1161	.8391	.8037
TQM4.3	128.3667	66.1023	.8282	.8150
TQM4.4	128.5667	60.1161	.8391	.8037
TQM4.5	128.8667	71.3609	.1654	.8448
TQM4.6	128.3667	66.1023	.8282	.8150
TQM4.7	128.4000	67.4897	.7428	.8193
TQM4.8	128.6000	67.5586	.4303	.8291
TQM4.9	128.5667	60.1161	.8391	.8037
TQM5.1	128.3667	66.1023	.8282	.8150
TQM5.2	128.5667	60.1161	.8391	.8037
TQM5.3	129.0000	71.9310	.1220	.8483
TQM5.4	128.6667	77.6092	-.1685	.8574
TQM5.5	128.7667	77.2195	-.1422	.8590

TQM6 128.0333 75.1368 -.0099 .8483

Reliability Coefficients

N of Cases = 30.0 N of Items = 18

Alpha = .8370

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

	Mean	Std Dev	Cases
1. จัดส่ง1	7.7667	.6789	30.0
2. ส่ง2.1	7.7333	.6397	30.0
3. ส่ง2.2	7.5333	1.0080	30.0
4. ส่ง2.3	7.7667	.6789	30.0
5. ส่ง2.4	7.7333	.6397	30.0
6. ส่ง2.5	7.5333	1.0080	30.0
7. ส่ง3	7.5667	1.1043	30.0

8.	ส่ง4.1	7.7667	.6789	30.0
9.	ส่ง4.2	7.5667	1.1043	30.0
10.	ส่ง4.3	7.7667	.6789	30.0
11.	ส่ง4.4	7.5667	1.1043	30.0
12.	ส่ง5	7.7667	.6789	30.0

Statistics for Mean Variance Std Dev Variables

SCALE 92.0667 67.9264 8.2417 12

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
จัดส่ง1	84.3000	58.4241	.8712	.9427
ส่ง2.1	84.3333	59.5402	.8081	.9447
ส่ง2.2	84.5333	58.3954	.5527	.9531
ส่ง2.3	84.3000	58.4241	.8712	.9427
ส่ง2.4	84.3333	59.5402	.8081	.9447

สิ่ง2.5	84.5333	58.3954	.5527	.9531
สิ่ง3	84.5000	53.3621	.8271	.9435
สิ่ง4.1	84.3000	58.4241	.8712	.9427
สิ่ง4.2	84.5000	53.3621	.8271	.9435
สิ่ง4.3	84.3000	58.4241	.8712	.9427
สิ่ง4.4	84.5000	53.3621	.8271	.9435
สิ่ง5	84.3000	58.4241	.8712	.9427

Reliability Coefficients

N of Cases = 30.0 N of Items = 12

Alpha = .9494

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	RD1	7.7333	.6397	30.0
2.	RD2	7.7667	.6789	30.0

3.	RD3.1	7.7333	.6397	30.0
4.	RD3.2	7.5333	1.0080	30.0
5.	RD3.3	7.5667	1.1043	30.0
6.	RD3.4	7.7667	.6789	30.0
7.	RD3.5	7.5667	1.1043	30.0
8.	RD3.6	7.7667	.6789	30.0
9.	RD4	7.7333	.6397	30.0
10.	RD5	7.7667	.6789	30.0
11.	RD6	7.7333	.6397	30.0
12.	RD7	7.5333	1.0080	30.0
13.	RD8	7.5667	1.1043	30.0

Statistics for	Mean	Variance	Std Dev	Variables
SCALE	99.7667	76.3920	8.7402	13

Item-total Statistics

Scale	Scale	Corrected	
Mean	Variance	Item-	Alpha
if Item	if Item	Total	if Item

	Deleted	Deleted	Correlation	Deleted
RD1	92.0333	66.9989	.8579	.9482
RD2	92.0000	66.5517	.8467	.9481
RD3.1	92.0333	66.9989	.8579	.9482
RD3.2	92.2333	66.4609	.5424	.9570
RD3.3	92.2000	60.7862	.8354	.9482
RD3.4	92.0000	66.5517	.8467	.9481
RD3.5	92.2000	60.7862	.8354	.9482
RD3.6	92.0000	66.5517	.8467	.9481
RD4	92.0333	66.9989	.8579	.9482
RD5	92.0000	66.5517	.8467	.9481
RD6	92.0333	66.9989	.8579	.9482
RD7	92.2333	66.4609	.5424	.9570
RD8	92.2000	60.7862	.8354	.9482

Reliability Coefficients

N of Cases = 30.0

N of Items = 13

Alpha = .9533

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	ACC1	7.7667	.6789	30.0
2.	ACC2	7.5667	1.1043	30.0
3.	ACC3	7.7667	.6789	30.0
4.	ACC4.1	7.7333	.6397	30.0
5.	ACC4.2	7.7667	.6789	30.0
6.	ACC4.3	7.7333	.6397	30.0
7.	ACC4.4	7.5333	1.0080	30.0
8.	ACC4.5	7.5667	1.1043	30.0
9.	ACC4.6	7.7667	.6789	30.0
10.	ACC5.1	7.5667	1.1043	30.0
11.	ACC5.2	7.7667	.6789	30.0
12.	ACC5.3	7.7333	.6397	30.0
13.	ACC5.4	7.5333	1.0080	30.0
14.	ACC6	7.5667	1.1043	30.0

Statistics for	Mean	Variance	Std Dev	Variables
SCALE	107.3667	95.1368	9.7538	14

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
ACC1	99.6000	84.0414	.8543	.9547
ACC2	99.8000	77.1310	.8654	.9538
ACC3	99.6000	84.0414	.8543	.9547
ACC4.1	99.6333	84.9299	.8310	.9554
ACC4.2	99.6000	84.0414	.8543	.9547
ACC4.3	99.6333	84.9299	.8310	.9554
ACC4.4	99.8333	84.2816	.5316	.9622
ACC4.5	99.8000	77.1310	.8654	.9538
ACC4.6	99.6000	84.0414	.8543	.9547
ACC5.1	99.8000	77.1310	.8654	.9538
ACC5.2	99.6000	84.0414	.8543	.9547
ACC5.3	99.6333	84.9299	.8310	.9554
ACC5.4	99.8333	84.2816	.5316	.9622
ACC6	99.8000	77.1310	.8654	.9538

Reliability Coefficients

N of Cases = 30.0

N of Items = 14

Alpha = .9587

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	ข้อ 1	7.7667	.6789	30.0
2.	ข้อ 2	7.7667	.6789	30.0
3.	ข้อ 3	7.7333	.6397	30.0
4.	ข้อ 4	7.5333	1.0080	30.0
5.	ข้อ 5	7.5667	1.1043	30.0
6.	ข้อ 6	7.7667	.6789	30.0

Statistics for	Mean	Variance	Std Dev	Variables
SCALE	46.1333	15.7057	3.9630	6

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
ข้อ 1	38.3667	11.2057	.8886	.8521
ข้อ 2	38.3667	11.2057	.8886	.8521
ข้อ 3	38.4000	11.9034	.7687	.8700
ข้อ 4	38.6000	11.5586	.4568	.9243
ข้อ 5	38.5667	9.7713	.6829	.8908
ข้อ 6	38.3667	11.2057	.8886	.8521

Reliability Coefficients

N of Cases = 30.0

N of Items = 6

Alpha = .8923

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	ผลิต1	7.5667	1.1043	30.0
2.	ผลิต2	7.7667	.6789	30.0
3.	ผลิต3	7.7333	.6397	30.0
4.	ผลิต4	7.5333	1.0080	30.0
5.	ผลิต5	7.7667	.6789	30.0
6.	ผลิต6	7.7333	.6397	30.0
7.	ผลิต7	7.5333	1.0080	30.0
8.	ผลิต8	7.5667	1.1043	30.0

Statistics for Mean Variance Std Dev Variables

SCALE 61.2000 30.5103 5.5236 8

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
ผลิต1	53.6333	21.2747	.7869	.8929
ผลิต2	53.4333	24.7368	.7867	.8955
ผลิต3	53.4667	25.0161	.7947	.8961
ผลิต4	53.6667	23.6092	.6008	.9099
ผลิต5	53.4333	24.7368	.7867	.8955
ผลิต6	53.4667	25.0161	.7947	.8961
ผลิต7	53.6667	23.6092	.6008	.9099
ผลิต8	53.6333	21.2747	.7869	.8929

Reliability Coefficients

N of Cases = 30.0

N of Items = 8

Alpha = .9102

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	ตลาด1	7.7667	.6789	30.0
2.	ตลาด2	7.5667	1.1043	30.0
3.	ตลาด3	7.7667	.6789	30.0
4.	ตลาด4	7.7333	.6397	30.0
5.	ตลาด5	7.5333	1.0080	30.0
6.	ตลาด6	7.7667	.6789	30.0
7.	ตลาด7	7.7333	.6397	30.0
8.	ตลาด8	7.5333	1.0080	30.0

9.	ตลาด9	7.5667	1.1043	30.0
10.	ตลาด10	7.7667	.6789	30.0

Statistics for	Mean	Variance	Std Dev	Variables
SCALE	76.7333	44.8230	6.6950	10

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
ตลาด1	68.9667	37.2057	.8641	.9232
ตลาด2	69.1667	33.6609	.7759	.9274
ตลาด3	68.9667	37.2057	.8641	.9232
ตลาด4	69.0000	38.0690	.8038	.9263
ตลาด5	69.2000	36.7172	.5804	.9376
ตลาด6	68.9667	37.2057	.8641	.9232
ตลาด7	69.0000	38.0690	.8038	.9263

ตลาด8	69.2000	36.7172	.5804	.9376
ตลาด9	69.1667	33.6609	.7759	.9274
ตลาด10	68.9667	37.2057	.8641	.9232

Reliability Coefficients

N of Cases = 30.0

N of Items = 10

Alpha = .9343

Reliability

***** Method 1 (space saver) will be used for this analysis *****

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	HR1.1	7.7667	.6789	30.0
2.	HR1.2	7.7333	.6397	30.0
3.	HR1.3	7.5333	1.0080	30.0
4.	HR1.4	7.7667	.6789	30.0

5.	HR2.1	7.7333	.6397	30.0
6.	HR2.2	7.5333	1.0080	30.0
7.	HR2.3	7.5667	1.1043	30.0
8.	HR3.1	7.7667	.6789	30.0
9.	HR3.2	7.7667	.6789	30.0
10.	HR3.3	7.7333	.6397	30.0
11.	HR3.4	7.5333	1.0080	30.0
12.	HR4	7.7667	.6789	30.0
13.	HR5	7.7333	.6397	30.0
14.	HR6.1	7.5333	1.0080	30.0
15.	HR6.2	7.5667	1.1043	30.0
16.	HR6.3	7.7667	.6789	30.0
17.	HR6.4	7.7667	.6789	30.0
18.	HR6.5	7.7333	.6397	30.0
19.	HR6.6	7.5333	1.0080	30.0
20.	HR7.1	7.7667	.6789	30.0
21.	HR7.2	7.7333	.6397	30.0
22.	HR7.3	7.5333	1.0080	30.0

23. HR7.4 7.5667 1.1043 30.0

Statistics for Mean Variance Std Dev Variables

SCALE 176.4333 224.9437 14.9981 23

Item-total Statistics

	Scale	Scale	Corrected	
	Mean	Variance	Item-	Alpha
	if Item	if Item	Total	if Item
	Deleted	Deleted	Correlation	Deleted
HR1.1	168.6667	207.7471	.8551	.9698
HR1.2	168.7000	209.3897	.8181	.9701
HR1.3	168.9000	203.4724	.7113	.9710
HR1.4	168.6667	207.7471	.8551	.9698
HR2.1	168.7000	209.3897	.8181	.9701
HR2.2	168.9000	203.4724	.7113	.9710
HR2.3	168.8667	200.1885	.7531	.9708

HR3.1	168.6667	207.7471	.8551	.9698
HR3.2	168.6667	207.7471	.8551	.9698
HR3.3	168.7000	209.3897	.8181	.9701
HR3.4	168.9000	203.4724	.7113	.9710
HR4	168.6667	207.7471	.8551	.9698
HR5	168.7000	209.3897	.8181	.9701
HR6.1	168.9000	203.4724	.7113	.9710
HR6.2	168.8667	200.1885	.7531	.9708
HR6.3	168.6667	207.7471	.8551	.9698
HR6.4	168.6667	207.7471	.8551	.9698
HR6.5	168.7000	209.3897	.8181	.9701
HR6.6	168.9000	203.4724	.7113	.9710
HR7.1	168.6667	207.7471	.8551	.9698
HR7.2	168.7000	209.3897	.8181	.9701
HR7.3	168.9000	203.4724	.7113	.9710
HR7.4	168.8667	200.1885	.7531	.9708

Reliability Coefficients

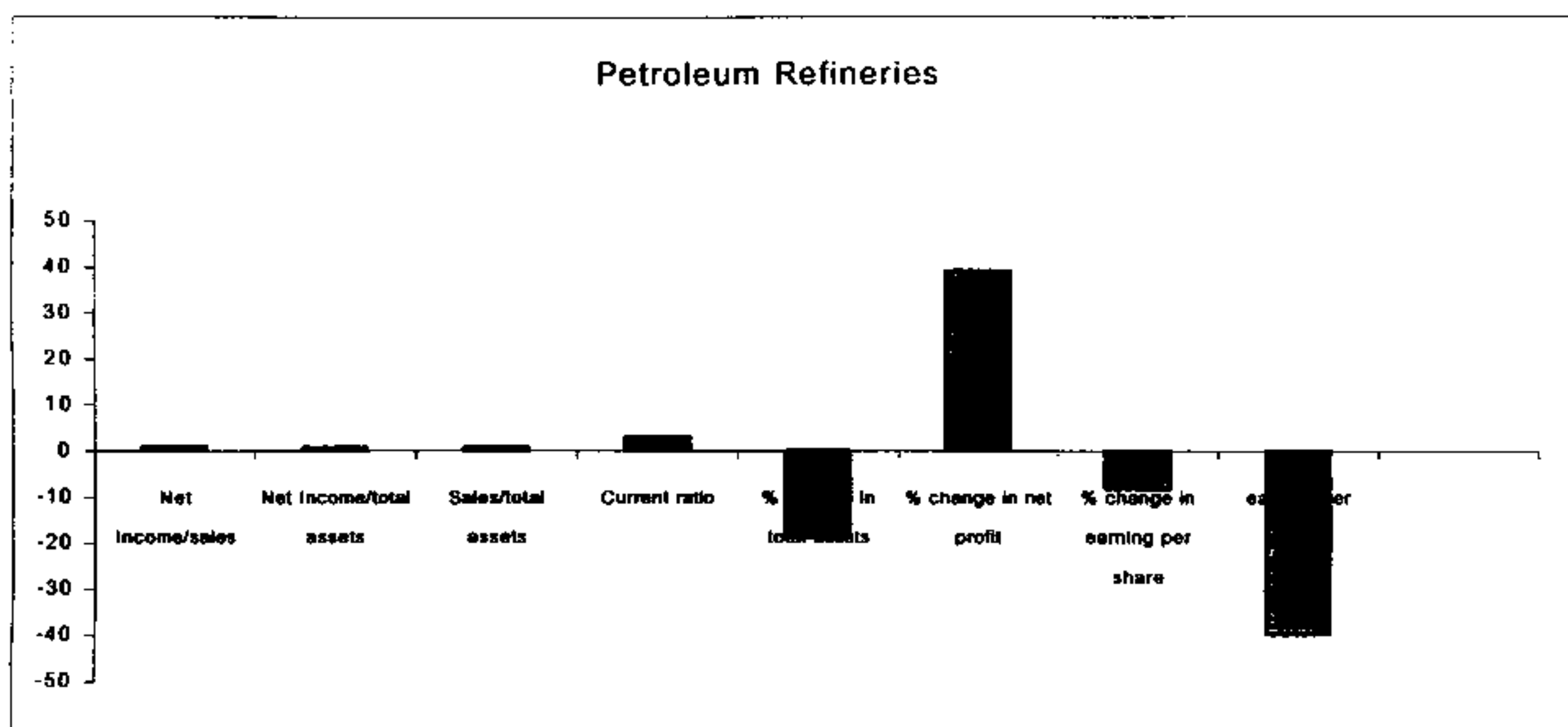
N of Cases = 30.0

N of Items = 23

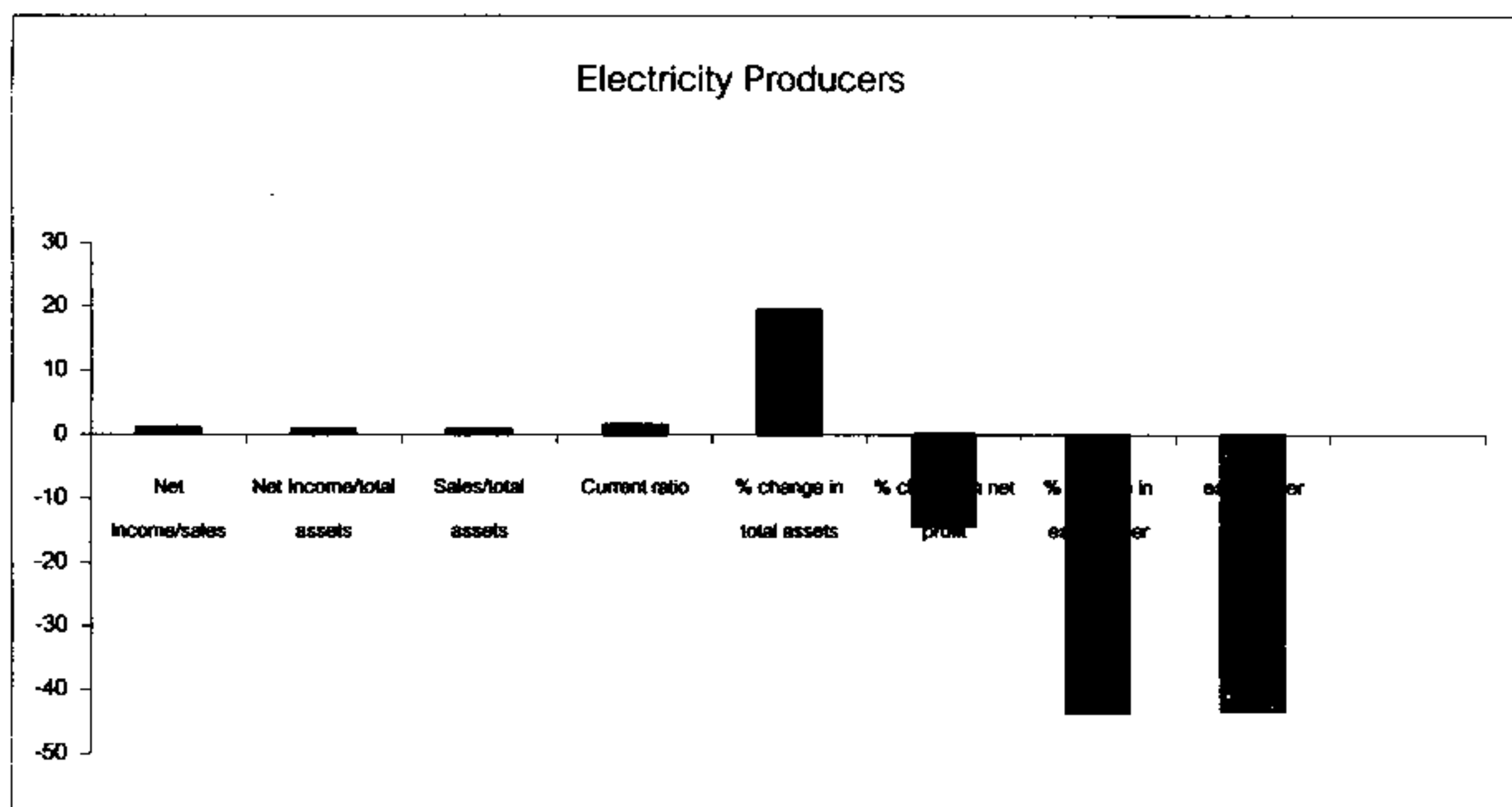
Alpha = .9716

APPENDIX C :

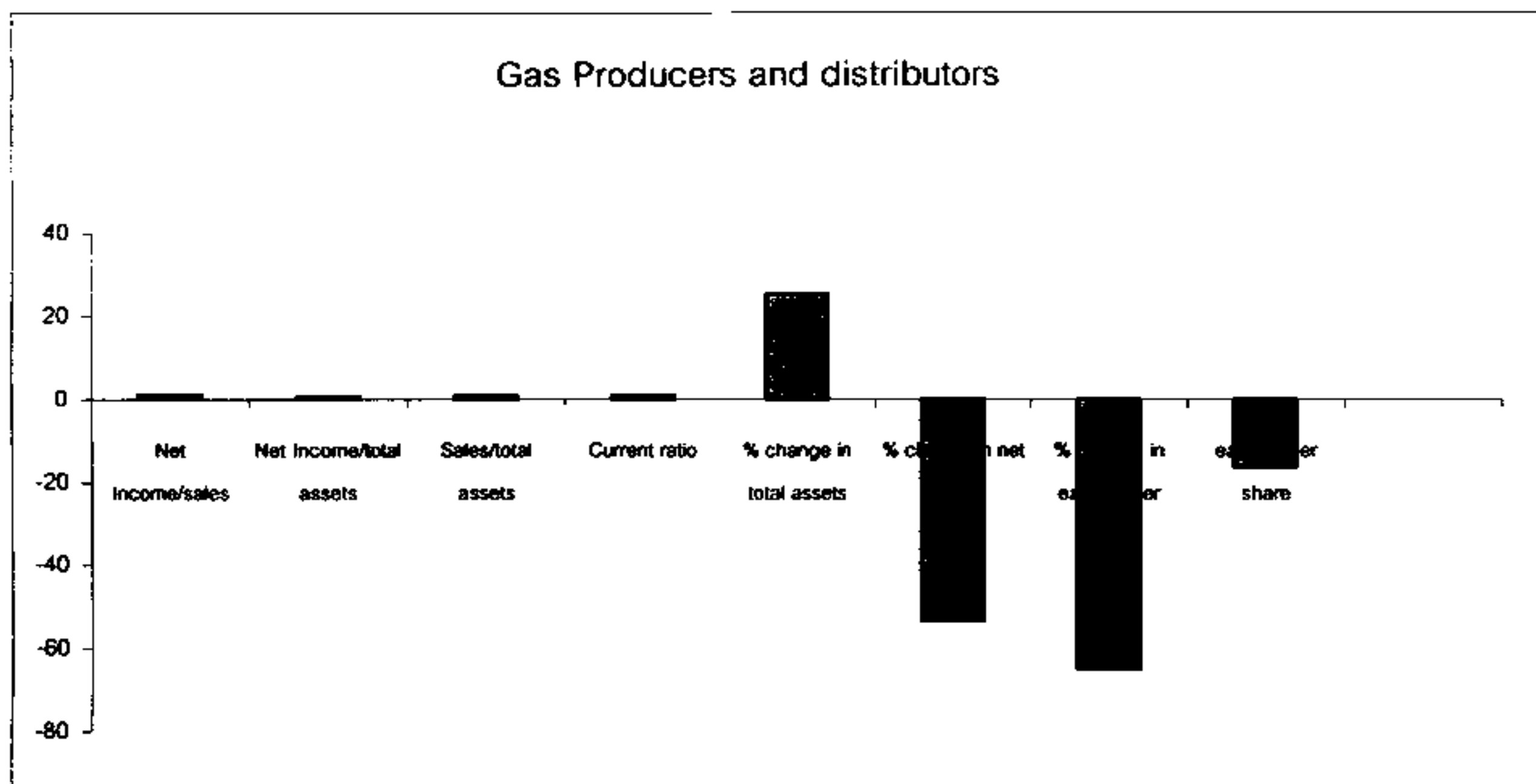
The Sample of the Secondary Data
(Financial Ratio, Employee Turnovers,
Absenteeism Rate - Empirical Data)



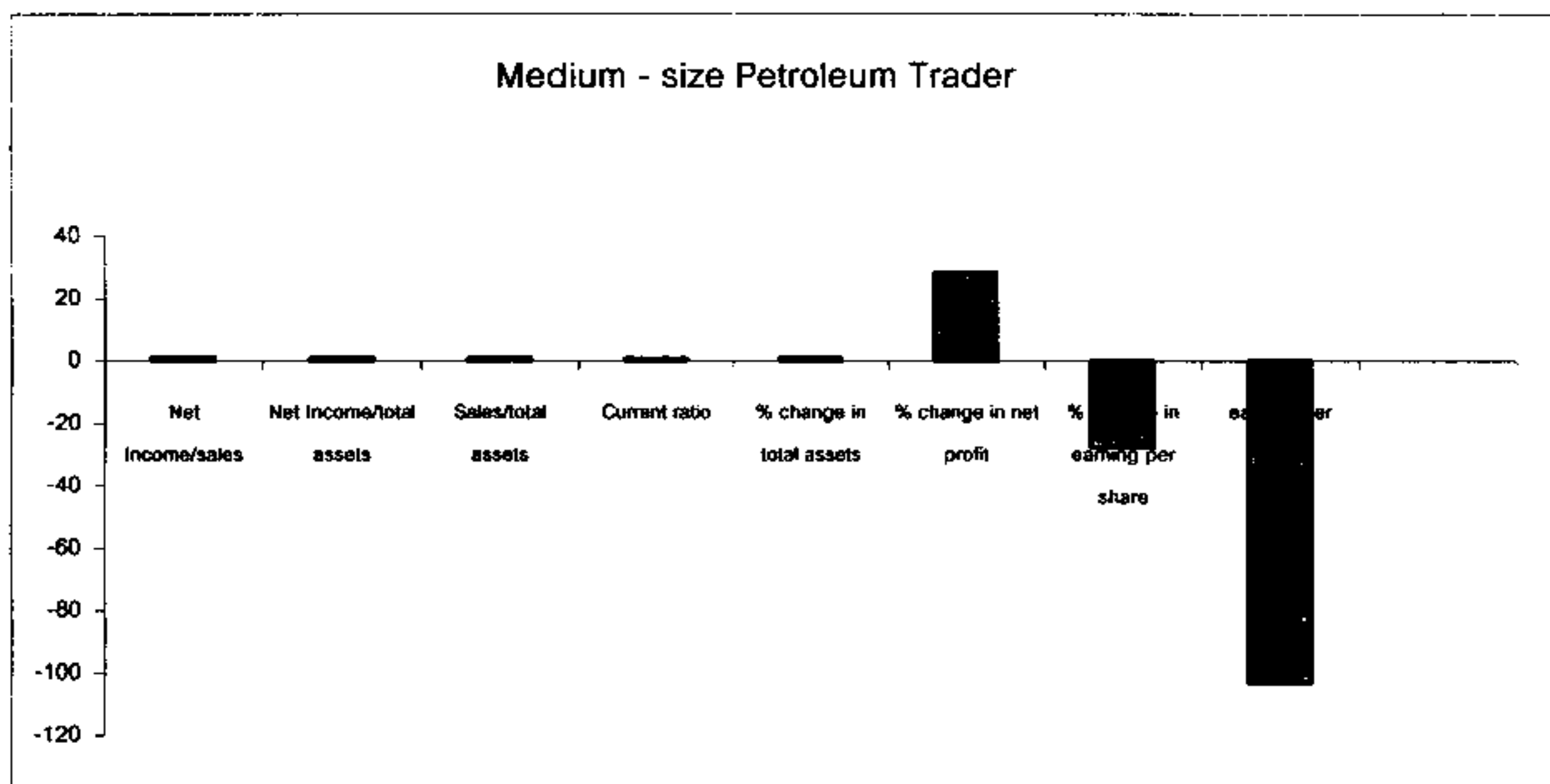
Financial Ratio –aggregate level 1997-1999



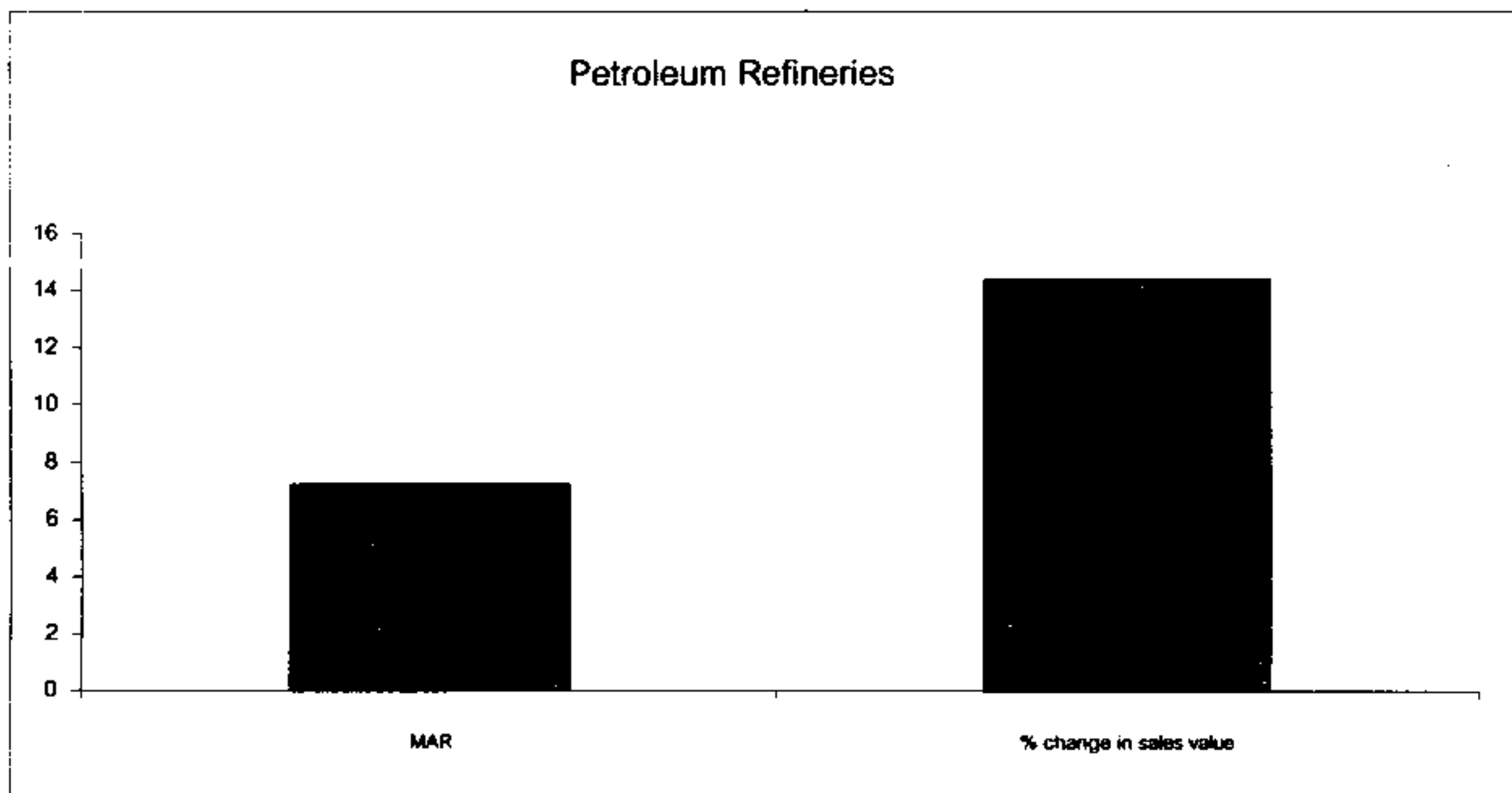
Financial Ratio –aggregate level 1997-1999



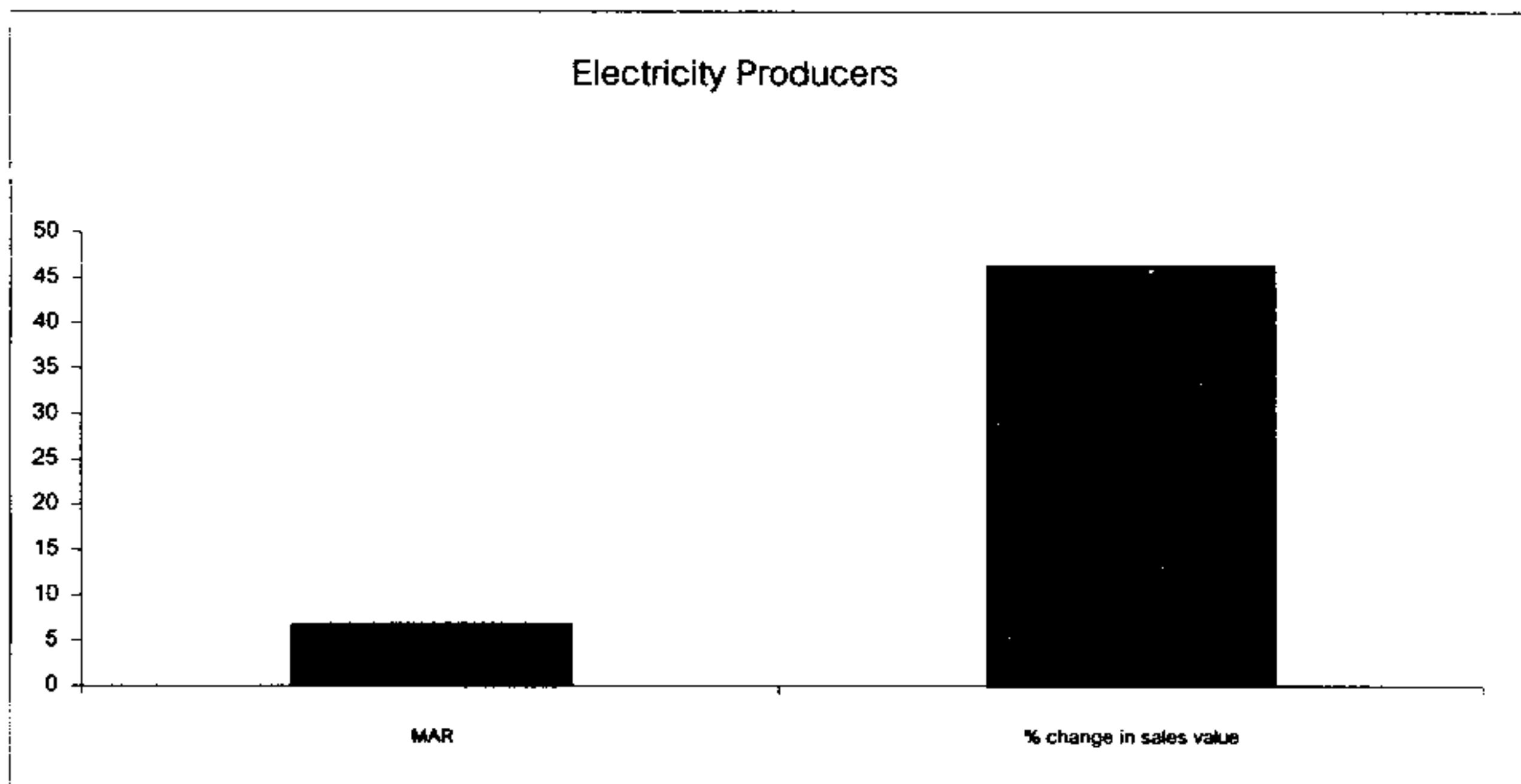
Financial Ratio –aggregate level 1997-1999



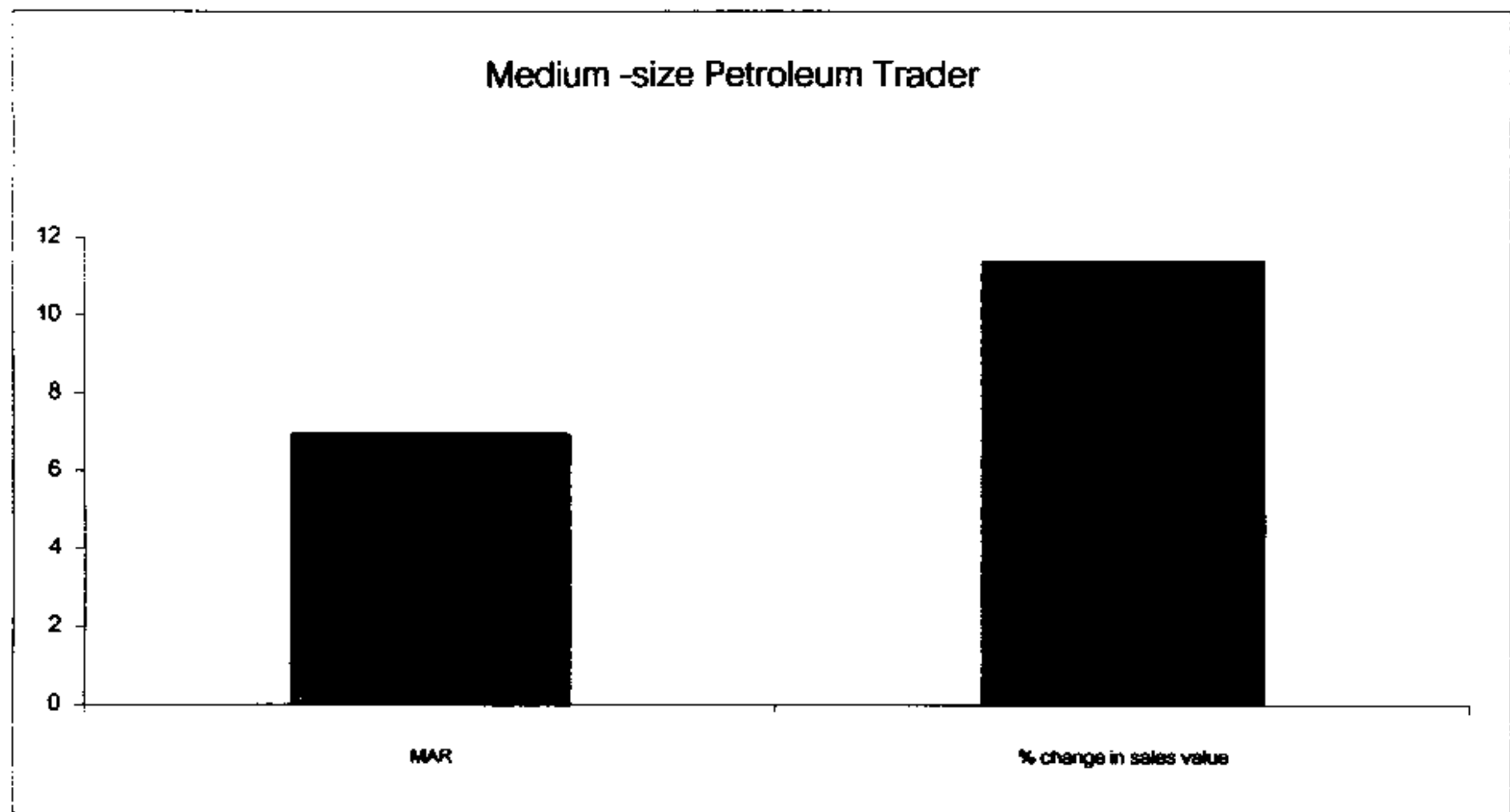
Financial Ratio –aggregate level 1997-1999



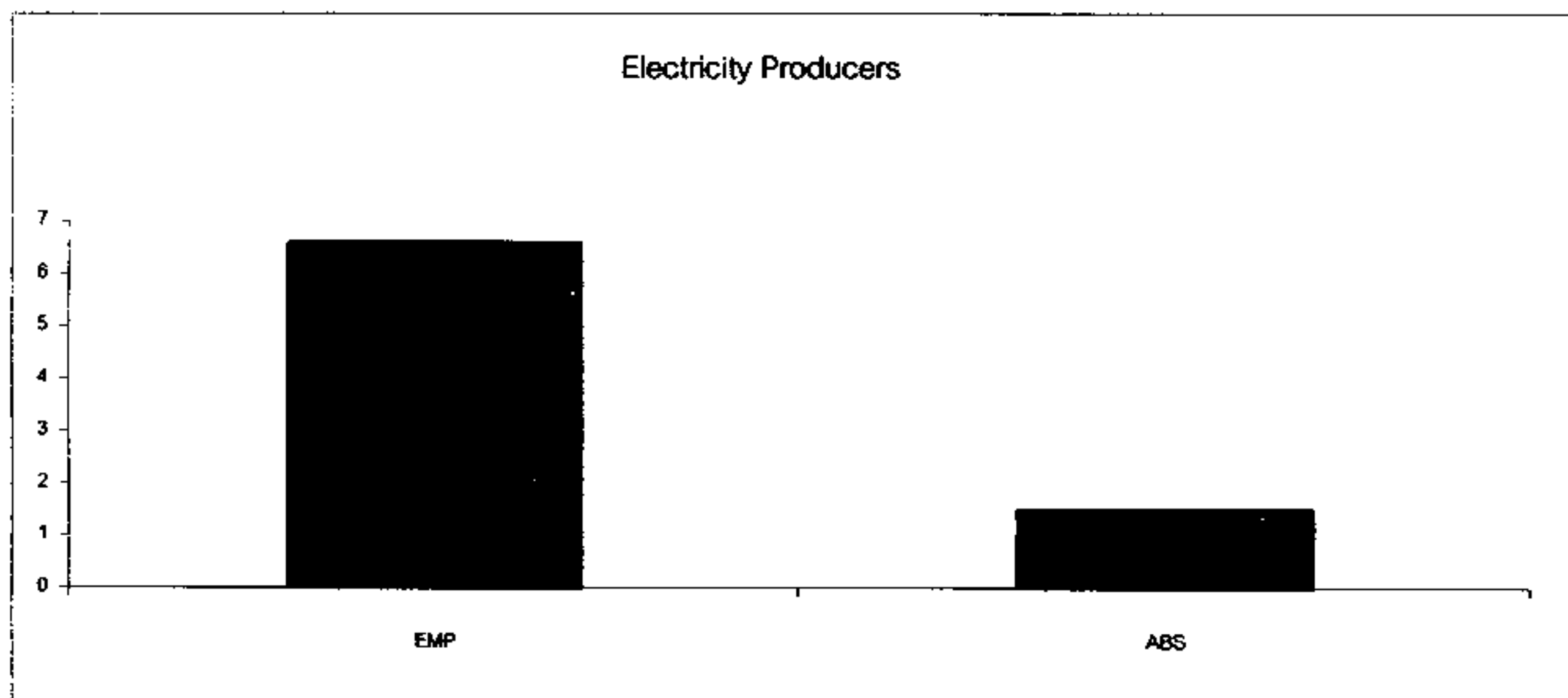
Market share and percentage change in sale value 1997-1999 at aggregate value



Market share and percentage change in sale value 1997-1999 at aggregate value

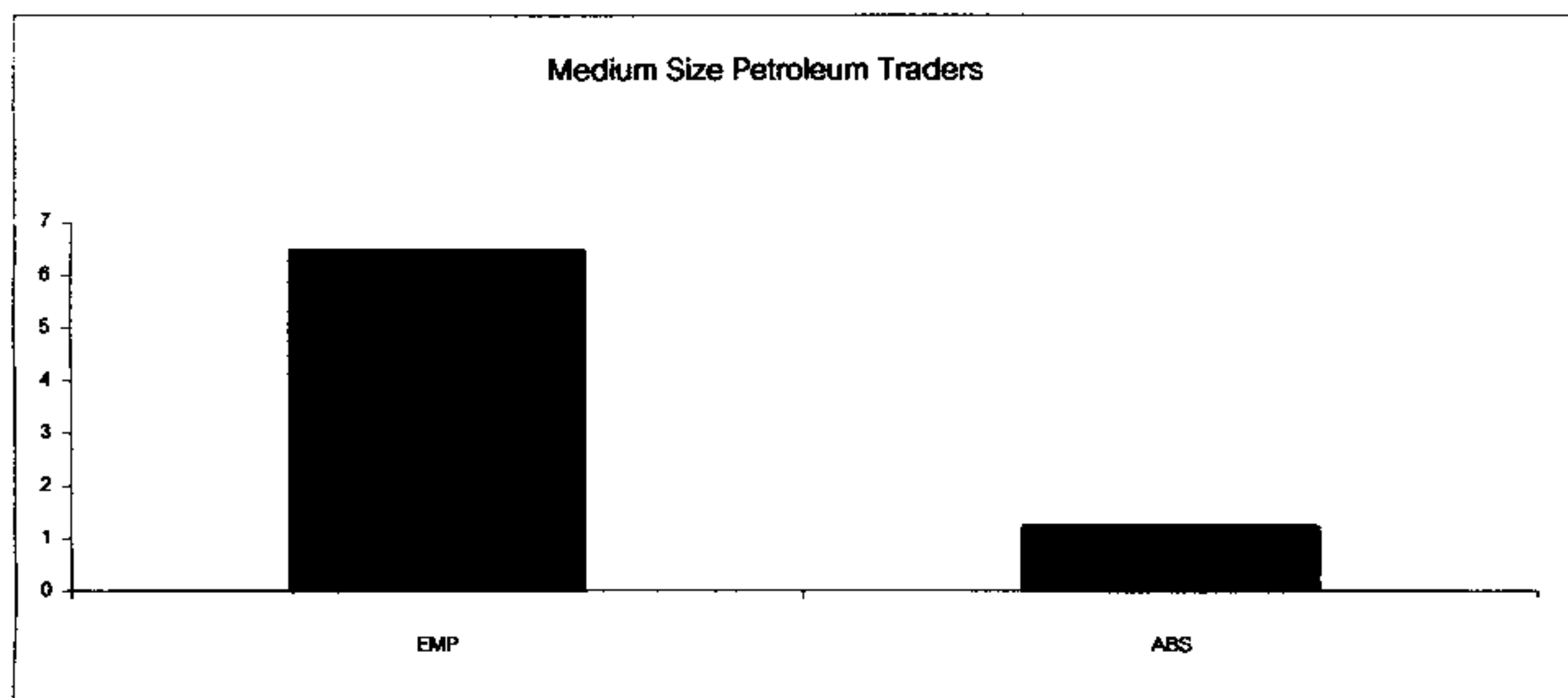


Market share and percentage change in sale 1997-1999



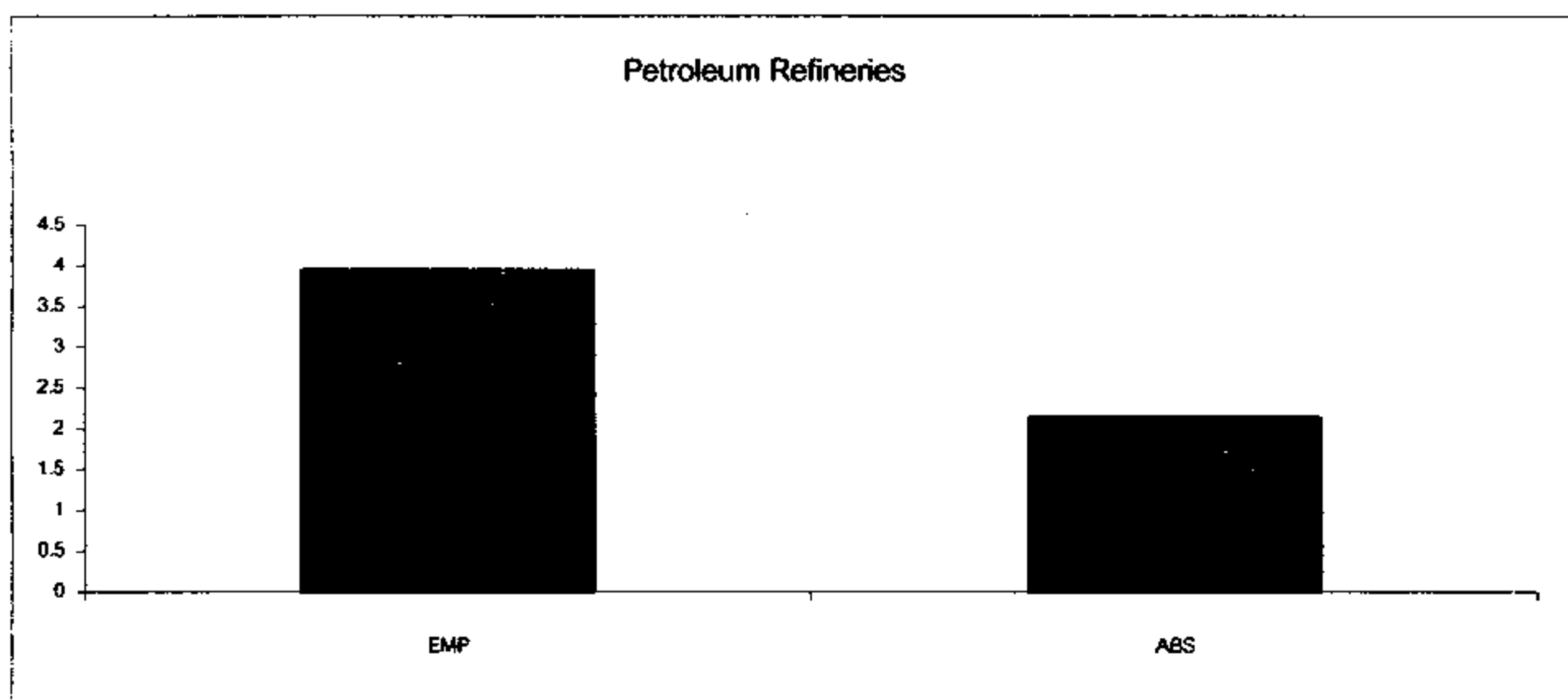
Employee Turnover
1997-1999

Absenteeism rate
1997-1999



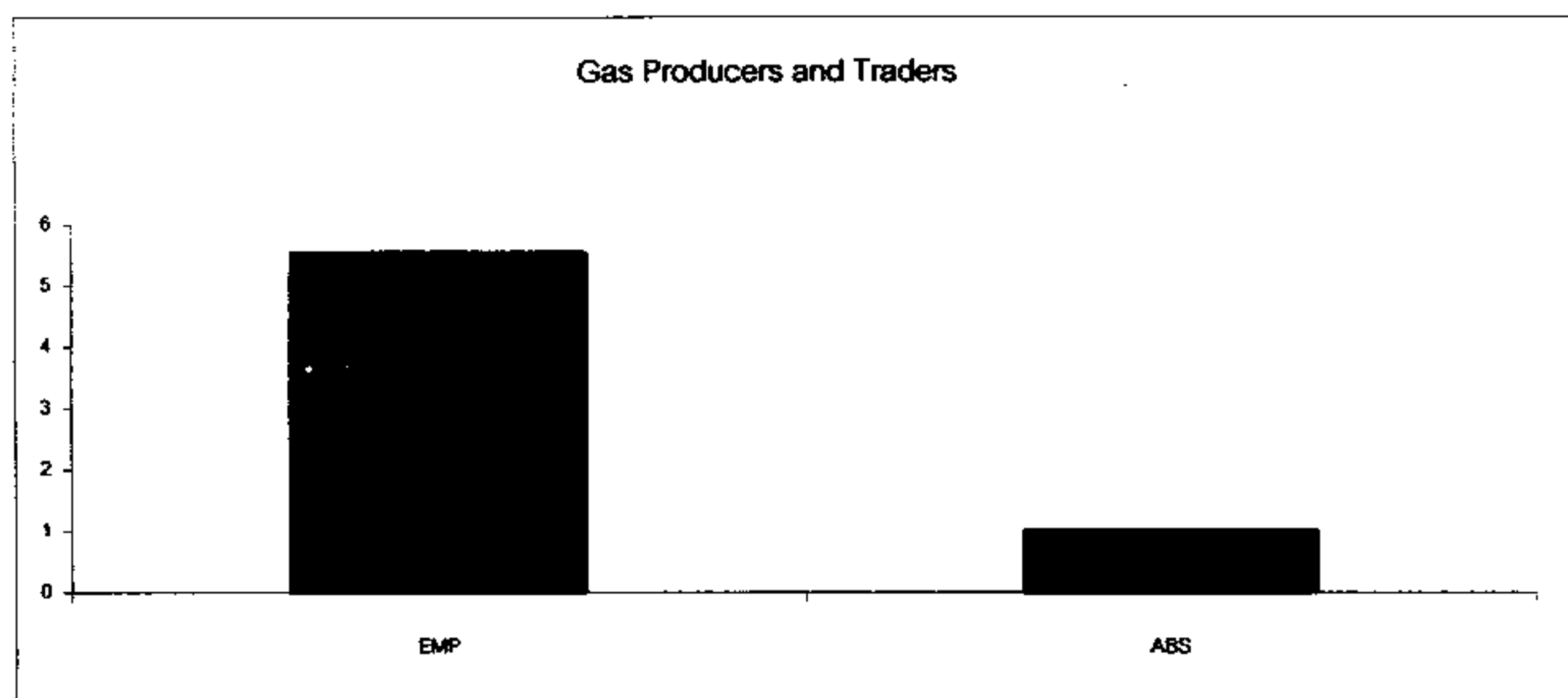
**Employee Turnover
1997-1999**

**Absenteeism rate
1997-1999**



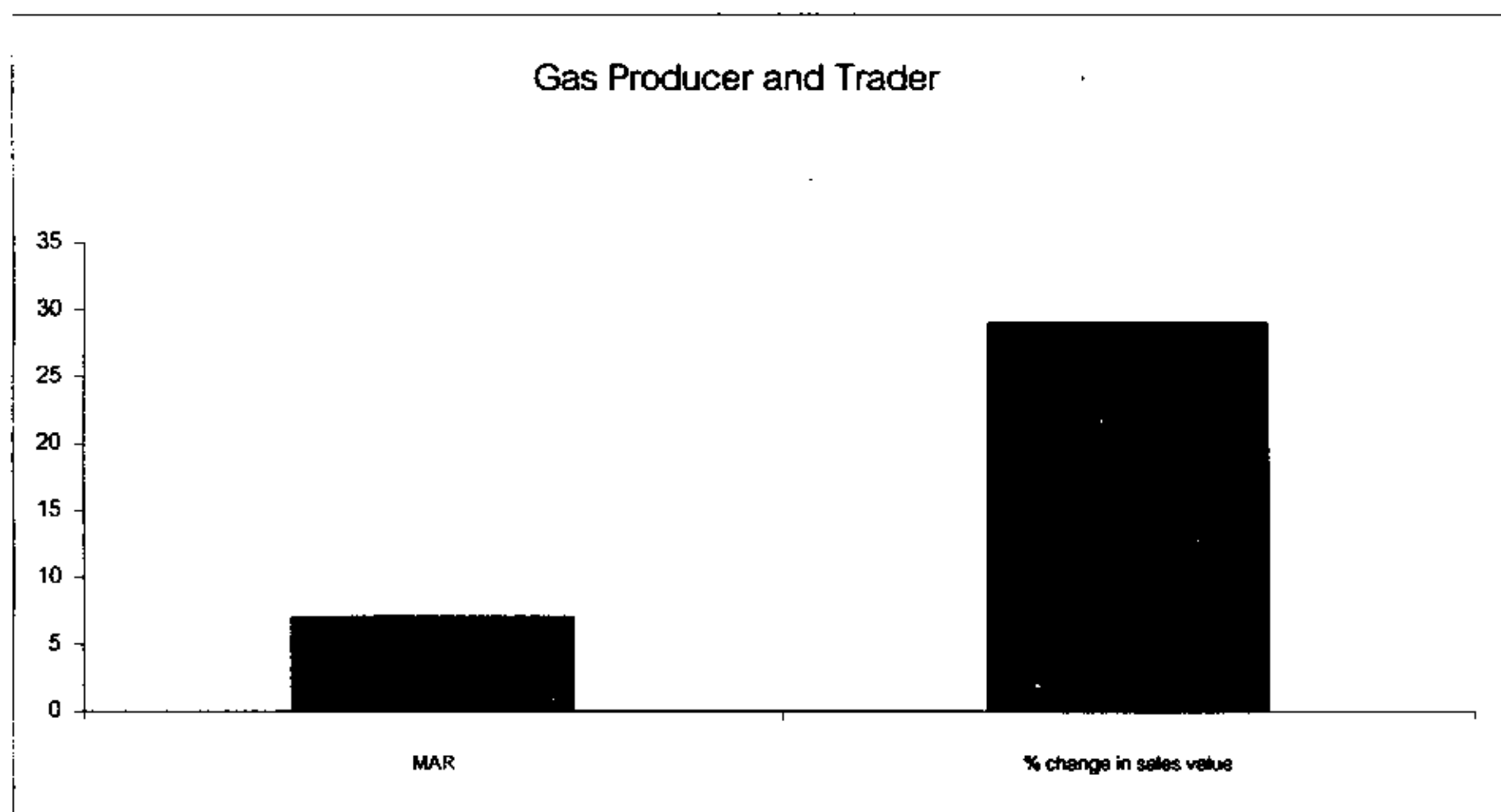
**Employee Turnover
1997-1999**

**Absenteeism rate
1997-1999**



**Employee Turnover
1997-1999**

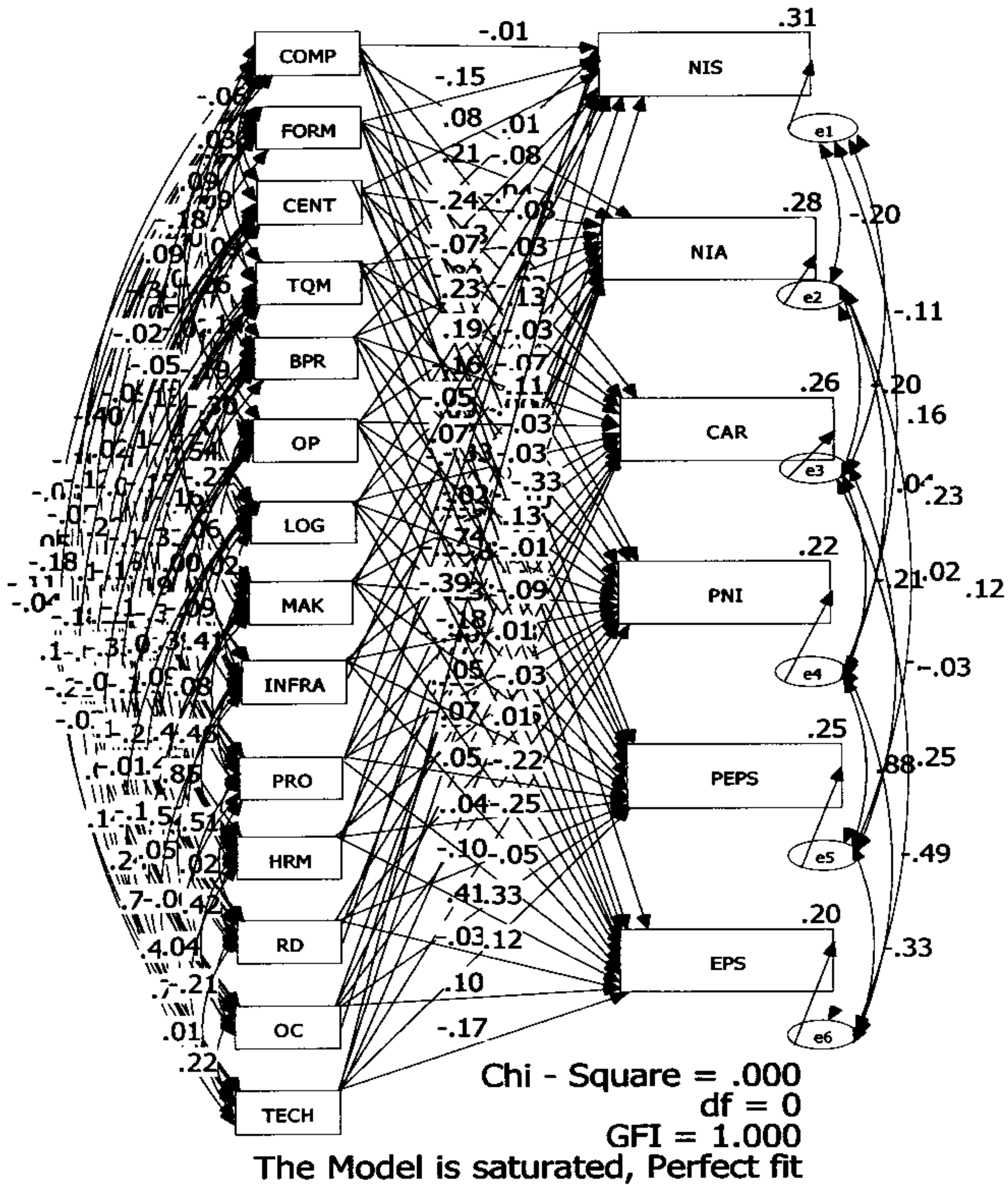
**Absenteeism rate
1997-1999**

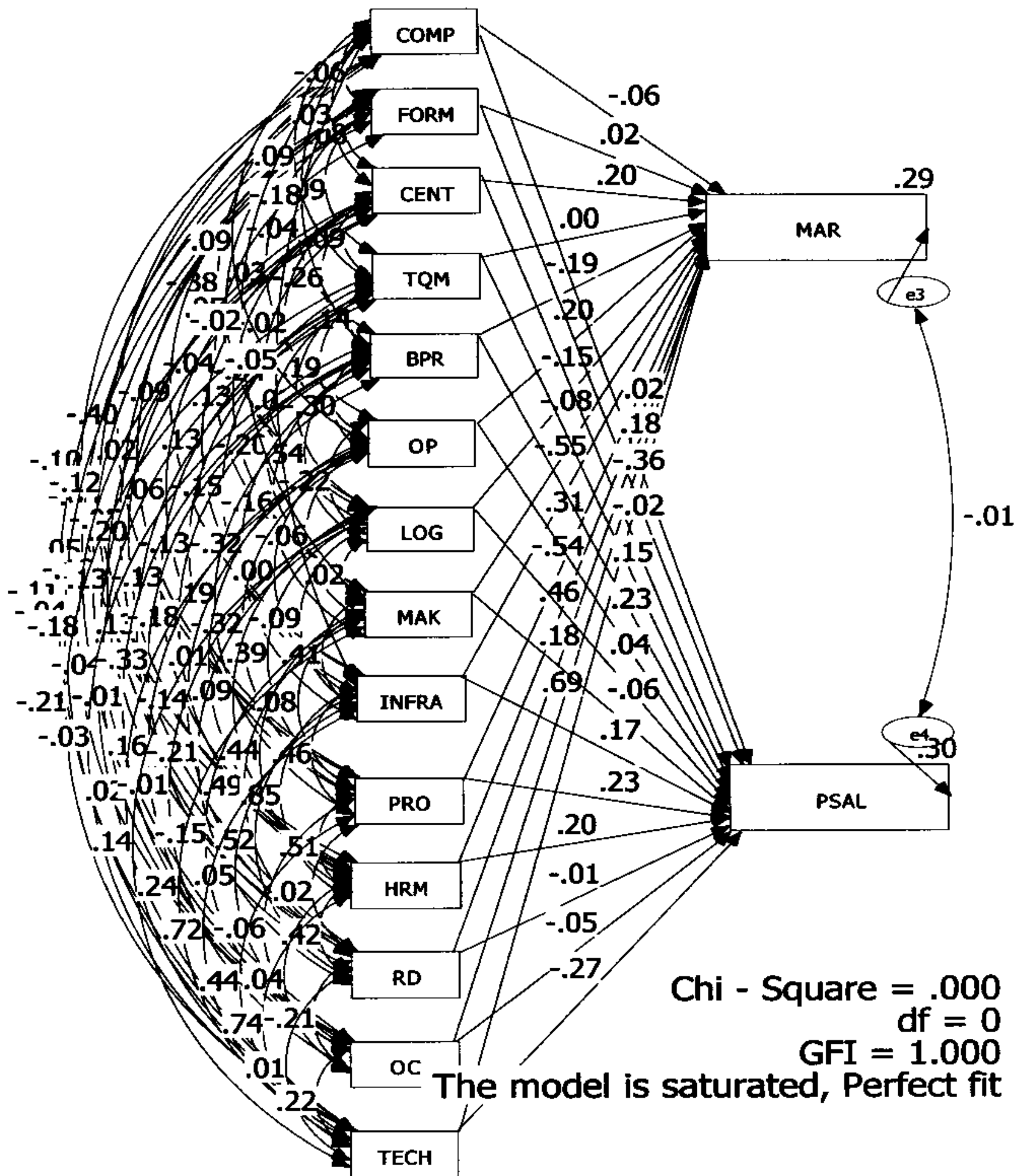


Market share and percentage change in sale 1997-1999

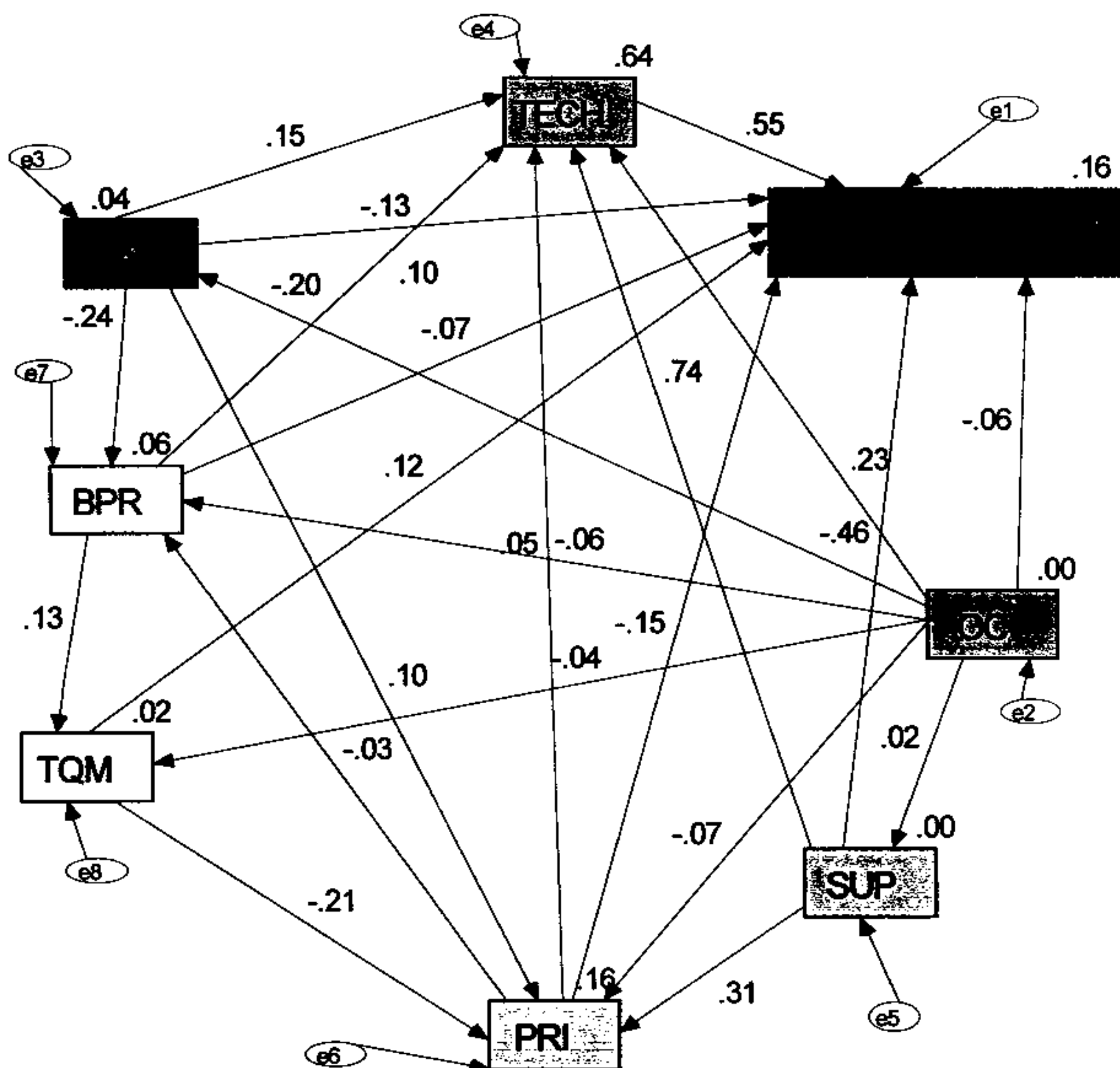
APPENDIX D:

The Sample of LISREL Analysis by AMOS Program and Full Presentation Model



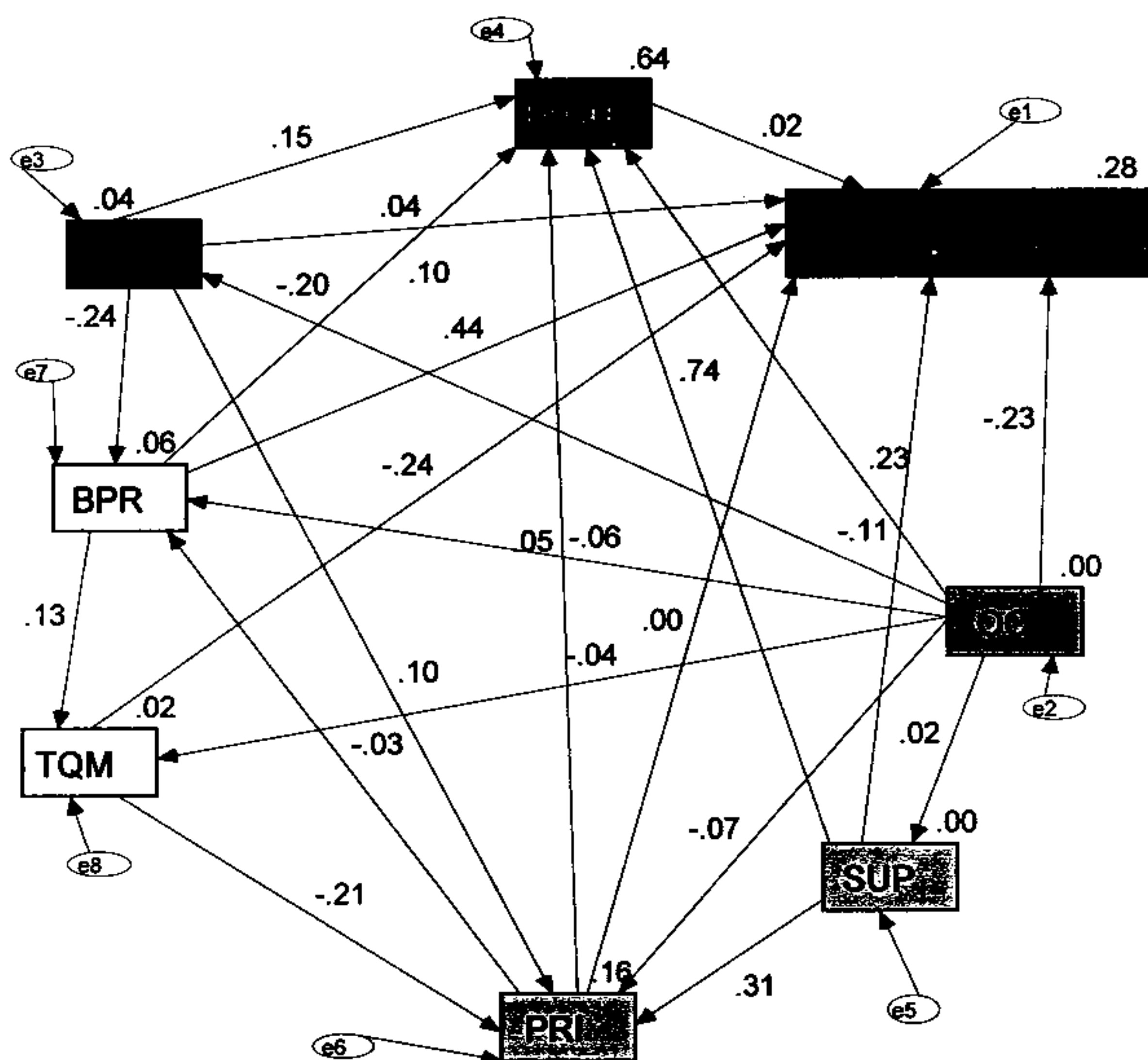


LISREL MODEL 2 (FULL MODEL)



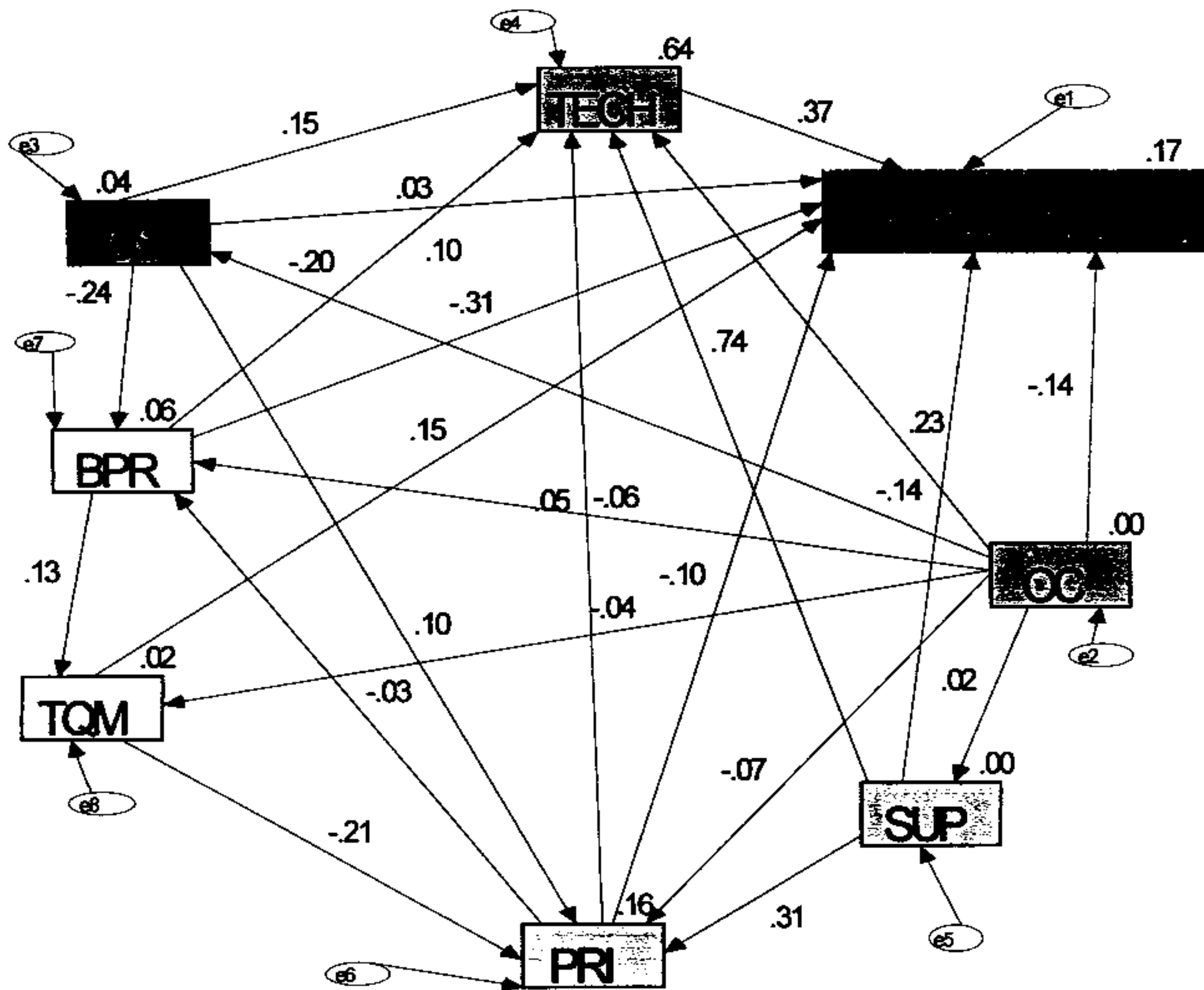
By Vichak Phongpetra
 Chi - Square = 5.265
 df = 5
 GFI = .974

LISREL MODEL 3 (FULL MODEL)



By Vichak Phongpetra
 Chi - Square = 5.265
 df = 5
 GFI = .974

LISREL MODEL 4 (FULL MODEL)



By Vichak Phongpetra
 Chi - Square = 5.265
 df = 5
 GFI = .974

LISREL MODEL 5 (FULL MODEL)

Tue Aug 14 12:26:23 2001

Amos
Version 3.61b (w32)
by James L. Arbuckle

Copyright 1994-1997 SmallWaters Corporation
1507 E. 53rd Street - #452
Chicago, IL 60615 USA
773-667-8635
Fax: 773-955-6252
<http://www.smallwaters.com>

```
*****  
* Hypo1: 14 August 2001 12:26 PM *  
*-----*  
* *  
*****
```

Serial number 55501773

Hypol: 14 August 2001 12:26 PM

user-selected options

Output:

Maximum Likelihood

Output format options:

Compressed output

Minimization options:

Technical output
Standardized estimates
Squared multiple correlations
Total effects
Machine-readable output file

Sample size: 52

Your model contains the following variables

NIS	observed	endogenous
NIA	observed	endogenous
PNI	observed	endogenous
CAR	observed	endogenous
PEPS	observed	endogenous
EPS	observed	endogenous
COMP	observed	exogenous
FORM	observed	exogenous
CENT	observed	exogenous
OC	observed	exogenous
TECH	observed	exogenous
RD	observed	exogenous
MAK	observed	exogenous
PRO	observed	exogenous
LOG	observed	exogenous
OP	observed	exogenous
HRM	observed	exogenous
INFRA	observed	exogenous
BPR	observed	exogenous
TQM	observed	exogenous
e1	unobserved	exogenous
e2	unobserved	exogenous
e3	unobserved	exogenous
e4	unobserved	exogenous
e5	unobserved	exogenous
e6	unobserved	exogenous

Number of variables in your model:	26
Number of observed variables:	20
Number of unobserved variables:	6
Number of exogenous variables:	20
Number of endogenous variables:	6

	Weights	Covariances	Variances	Means	Intercepts	Total
	-----	-----	-----	-----	-----	-----
Fixed:	6	0	0	0	0	6
Labeled:	0	0	0	0	0	0
Unlabeled:	84	106	20	0	0	210
	-----	-----	-----	-----	-----	-----
Total:	90	106	20	0	0	216

The model is recursive.

Model: Your_model

Computation of Degrees of Freedom

Number of distinct sample moments: 210
 Number of distinct parameters to be estimated: 210

 Degrees of freedom: 0

Minimization History

0e 31	0.0e+00	-7.6935e-01	1.00e+04	5.86629633976e+02	0	1.00e+04
1e*11	0.0e+00	-4.4634e+00	1.41e+00	2.11533259716e+02	18	1.12e+00
2e 7	0.0e+00	-1.6502e+00	1.32e-01	1.75990158700e+02	7	7.87e-01
3e 3	0.0e+00	-1.4296e+00	1.22e-01	1.52455102805e+02	5	6.27e-01
4e* 0	2.0e+04	0.0000e+00	2.68e-01	1.15612190034e+02	6	6.36e-01
5e 0	1.6e+04	0.0000e+00	5.37e-01	8.65292363964e+01	5	0.00e+00
6e 0	9.3e+03	0.0000e+00	1.40e+00	3.09743620323e+01	2	0.00e+00
7e 0	5.6e+03	0.0000e+00	7.64e-01	5.60343180891e+00	1	1.20e+00
8e 0	4.5e+03	0.0000e+00	4.78e-01	5.81322179373e-01	1	1.17e+00
9e 0	4.2e+03	0.0000e+00	2.50e-01	1.71172797248e-02	1	1.10e+00
10e 0	4.1e+03	0.0000e+00	5.99e-02	3.27136271956e-05	1	1.03e+00
11e 0	4.2e+03	0.0000e+00	2.91e-03	1.64195768093e-10	1	1.00e+00
12e 0	4.1e+03	0.0000e+00	6.53e-06	-1.22923893286e-12	1	1.02e+00

Minimum was achieved

Chi-square = 0.000

Degrees of freedom = 0

Probability level cannot be computed

Maximum Likelihood Estimates

Regression Weights:

	Estimate	S.E.	C.R.	Label
	-----	-----	-----	-----
NIS <----- COMP	-0.001	0.026	-0.056	
NIS <----- FORM	-0.005	0.016	-0.334	
NIS <----- CENT	0.019	0.033	0.577	
NIS <----- OC	-0.099	0.051	-1.930	
NIS <----- TECH	-0.077	0.048	-1.595	
NIS <----- RD	-0.097	0.032	-3.051	
NIS <----- MAK	0.037	0.029	1.242	
NIS <----- PRO	-0.014	0.034	-0.402	

NIS <----- LOG	0.092	0.069	1.323
NIS <----- OP	-0.032	0.058	-0.558
NIS <----- HRM	0.018	0.042	0.438
NIS <----- INFRA	0.121	0.058	2.098
NIS <----- BPR	-0.080	0.061	-1.304
NIS <----- TQM	0.080	0.055	1.454
NIA <----- COMP	0.008	0.100	0.078
NIA <----- FORM	0.000	0.060	-0.003
NIA <----- CENT	-0.042	0.128	-0.332
NIA <----- OC	-0.216	0.196	-1.105
NIA <----- TECH	0.356	0.184	1.937
NIA <----- RD	0.167	0.121	1.380
NIA <----- MAK	0.063	0.113	0.556
NIA <----- PRO	0.250	0.131	1.898
NIA <----- LOG	-0.273	0.266	-1.029
NIA <----- OP	0.304	0.221	1.377
NIA <----- HRM	-0.303	0.160	-1.898
NIA <----- INFRA	-0.315	0.220	-1.429
NIA <----- BPR	-0.423	0.235	-1.797
NIA <----- TQM	-0.216	0.210	-1.027
PNI <----- COMP	24.807	28.532	0.869
PNI <----- FORM	3.969	17.021	0.233
PNI <----- CENT	-18.881	36.238	-0.521
PNI <----- OC	136.902	55.640	2.460
PNI <----- TECH	8.271	52.237	0.158
PNI <----- RD	6.439	34.450	0.187
PNI <----- MAK	27.393	31.985	0.856
PNI <----- PRO	7.534	37.342	0.202
PNI <----- LOG	15.502	75.454	0.205
PNI <----- OP	-122.018	62.657	-1.947
PNI <----- HRM	-7.838	45.388	-0.173
PNI <----- INFRA	-29.512	62.594	-0.471
PNI <----- BPR	6.268	66.854	0.094
PNI <----- TQM	-2.848	59.702	-0.048
CAR <----- COMP	-0.177	0.411	-0.430
CAR <----- FORM	-0.393	0.245	-1.603
CAR <----- CENT	-0.102	0.522	-0.195
CAR <----- OC	-0.752	0.802	-0.937
CAR <----- TECH	1.738	0.753	2.309
CAR <----- RD	0.121	0.496	0.243
CAR <----- MAK	0.185	0.461	0.401
CAR <----- PRO	-0.664	0.538	-1.234
CAR <----- LOG	-2.313	1.087	-2.128
CAR <----- OP	-0.473	0.903	-0.524
CAR <----- HRM	0.907	0.654	1.386
CAR <----- INFRA	-2.017	0.902	-2.237
CAR <----- BPR	0.137	0.963	0.142
CAR <----- TQM	1.070	0.860	1.244
PEPS <----- COMP	18.682	26.278	0.711
PEPS <----- FORM	0.986	15.676	0.063
PEPS <----- CENT	-8.260	33.375	-0.247
PEPS <----- OC	153.043	51.245	2.987
PEPS <----- TECH	-7.323	48.111	-0.152
PEPS <----- RD	-14.087	31.729	-0.444
PEPS <----- MAK	28.162	29.458	0.956
PEPS <----- PRO	-19.013	34.392	-0.553
PEPS <----- LOG	11.180	69.493	0.161
PEPS <----- OP	-97.447	57.707	-1.689
PEPS <----- HRM	8.096	41.803	0.194
PEPS <----- INFRA	-7.383	57.650	-0.128
PEPS <----- BPR	8.320	61.573	0.135
PEPS <----- TQM	-41.911	54.986	-0.762
EPS <----- COMP	-45.879	20.531	-2.235
EPS <----- FORM	9.242	12.248	0.755
EPS <----- CENT	-0.614	26.076	-0.024

EPS <----- OC	26.775	40.037	0.669	345
EPS <----- TECH	-20.334	37.589	-0.541	
EPS <----- RD	14.286	24.789	0.576	
EPS <----- MAK	-32.525	23.016	-1.413	
EPS <----- PRO	-2.883	26.871	-0.107	
EPS <----- LOG	6.556	54.294	0.121	
EPS <----- OP	-8.570	45.086	-0.190	
EPS <----- HRM	33.882	32.660	1.037	
EPS <----- INFRA	-33.124	45.041	-0.735	
EPS <----- BPR	-1.617	48.106	-0.034	
EPS <----- TQM	-24.250	42.960	-0.564	

Standardized Regression Weights:

Estimate

NIS <----- COMP	-0.008
NIS <----- FORM	-0.042
NIS <----- CENT	0.076
NIS <----- OC	-0.260
NIS <----- TECH	-0.428
NIS <----- RD	-0.710
NIS <----- MAK	0.191
NIS <----- PRO	-0.079
NIS <----- LOG	0.213
NIS <----- OP	-0.081
NIS <----- HRM	0.120
NIS <----- INFRA	0.708
NIS <----- BPR	-0.217
NIS <----- TQM	0.195
NIA <----- COMP	0.011
NIA <----- FORM	0.000
NIA <----- CENT	-0.044
NIA <----- OC	-0.151
NIA <----- TECH	0.526
NIA <----- RD	0.325
NIA <----- MAK	0.087
NIA <----- PRO	0.377
NIA <----- LOG	-0.168
NIA <----- OP	0.202
NIA <----- HRM	-0.524
NIA <----- INFRA	-0.488
NIA <----- BPR	-0.303
NIA <----- TQM	-0.140
PNI <----- COMP	0.131
PNI <----- FORM	0.031
PNI <----- CENT	-0.073
PNI <----- OC	0.348
PNI <----- TECH	0.045
PNI <----- RD	0.046
PNI <----- MAK	0.139
PNI <----- PRO	0.042
PNI <----- LOG	0.035
PNI <----- OP	-0.296
PNI <----- HRM	-0.050
PNI <----- INFRA	-0.167
PNI <----- BPR	0.016
PNI <----- TQM	-0.007
CAR <----- COMP	-0.061
CAR <----- FORM	-0.203
CAR <----- CENT	-0.026
CAR <----- OC	-0.126
CAR <----- TECH	0.618
CAR <----- RD	0.056
CAR <----- MAK	0.062

CAR <----- PRO	-0.241
CAR <----- LOG	-0.342
CAR <----- OP	-0.076
CAR <----- HRM	0.378
CAR <----- INFRA	-0.753
CAR <----- BPR	0.024
CAR <----- TQM	0.167
PEPS <----- COMP	0.105
PEPS <----- FORM	0.008
PEPS <----- CENT	-0.034
PEPS <----- OC	0.415
PEPS <----- TECH	-0.042
PEPS <----- RD	-0.107
PEPS <----- MAK	0.152
PEPS <----- PRO	-0.112
PEPS <----- LOG	0.027
PEPS <----- OP	-0.252
PEPS <----- HRM	0.055
PEPS <----- INFRA	-0.045
PEPS <----- BPR	0.023
PEPS <----- TQM	-0.106
EPS <----- COMP	-0.342
EPS <----- FORM	0.103
EPS <----- CENT	-0.003
EPS <----- OC	0.096
EPS <----- TECH	-0.155
EPS <----- RD	0.143
EPS <----- MAK	-0.233
EPS <----- PRO	-0.023
EPS <----- LOG	0.021
EPS <----- OP	-0.029
EPS <----- HRM	0.303
EPS <----- INFRA	-0.265
EPS <----- BPR	-0.006
EPS <----- TQM	-0.081

ovariances:

	Estimate	S.E.	C.R.	Label
COMP <-----> FORM	0.102	0.121	0.841	
COMP <-----> CENT	0.013	0.059	0.226	
COMP <-----> OC	0.014	0.039	0.365	
COMP <-----> TECH	-0.063	0.083	-0.759	
COMP <-----> RD	-0.037	0.109	-0.340	
COMP <-----> MAK	-0.009	0.077	-0.118	
COMP <-----> PRO	-0.241	0.091	-2.652	
COMP <-----> LOG	-0.093	0.037	-2.540	
COMP <-----> OP	0.023	0.037	0.606	
COMP <-----> HRM	-0.066	0.097	-0.682	
COMP <-----> INFRA	-0.031	0.087	-0.357	
COMP <-----> BPR	-0.051	0.041	-1.255	
COMP <-----> TQM	0.023	0.036	0.636	
FORM <-----> CENT	0.020	0.088	0.230	
FORM <-----> OC	-0.090	0.059	-1.513	
FORM <-----> TECH	-0.022	0.123	-0.181	
FORM <-----> RD	-0.065	0.162	-0.405	
FORM <-----> MAK	0.082	0.116	0.711	
FORM <-----> PRO	-0.141	0.127	-1.111	
FORM <-----> LOG	-0.031	0.051	-0.600	
FORM <-----> OP	0.052	0.056	0.927	
FORM <-----> HRM	-0.087	0.144	-0.605	
FORM <-----> INFRA	-0.072	0.129	-0.560	
FORM <-----> BPR	-0.029	0.060	-0.478	
FORM <-----> TQM	0.006	0.054	0.104	

CENT <-----> OC	-0.036	0.029	-1.248
CENT <-----> TECH	0.060	0.061	0.992
CENT <-----> RD	0.076	0.080	0.947
CENT <-----> MAK	0.051	0.057	0.900
CENT <-----> PRO	0.028	0.062	0.456
CENT <-----> LOG	-0.006	0.025	-0.253
CENT <-----> OP	-0.004	0.027	-0.155
CENT <-----> HRM	0.100	0.072	1.392
CENT <-----> INFRA	0.057	0.064	0.895
CENT <-----> BPR	-0.054	0.030	-1.793
CENT <-----> TQM	0.016	0.026	0.609
OC <-----> TECH	0.062	0.041	1.510
OC <-----> RD	-0.077	0.053	-1.442
OC <-----> MAK	-0.041	0.038	-1.080
OC <-----> PRO	-0.018	0.041	-0.438
OC <-----> LOG	-0.002	0.017	-0.099
OC <-----> OP	0.021	0.018	1.131
OC <-----> INFRA	0.016	0.042	0.391
OC <-----> HRM	0.014	0.047	0.298
OC <-----> BPR	-0.002	0.019	-0.105
OC <-----> TQM	-0.005	0.017	-0.280
TECH <-----> RD	0.005	0.111	0.045
TECH <-----> MAK	0.138	0.082	1.693
TECH <-----> PRO	0.271	0.094	2.870
TECH <-----> LOG	0.036	0.035	1.003
TECH <-----> OP	0.006	0.038	0.167
TECH <-----> HRM	0.523	0.123	4.250
TECH <-----> INFRA	0.457	0.109	4.184
TECH <-----> BPR	-0.009	0.041	-0.226
TECH <-----> TQM	-0.055	0.038	-1.468
RD <-----> MAK	0.365	0.116	3.147
RD <-----> PRO	0.016	0.114	0.141
RD <-----> LOG	-0.069	0.047	-1.473
RD <-----> OP	-0.051	0.051	-1.012
RD <-----> HRM	0.394	0.141	2.786
RD <-----> INFRA	0.433	0.131	3.297
RD <-----> BPR	-0.128	0.057	-2.246
RD <-----> TQM	0.044	0.049	0.890
MAK <-----> PRO	0.046	0.081	0.569
MAK <-----> LOG	0.005	0.033	0.157
MAK <-----> OP	-0.016	0.036	-0.438
MAK <-----> HRM	0.289	0.101	2.856
MAK <-----> INFRA	0.241	0.090	2.681
MAK <-----> BPR	-0.044	0.039	-1.127
MAK <-----> TQM	-0.050	0.035	-1.400
PRO <-----> LOG	0.099	0.039	2.580
PRO <-----> OP	-0.088	0.041	-2.165
PRO <-----> HRM	0.367	0.114	3.230
PRO <-----> INFRA	0.297	0.100	2.975
PRO <-----> BPR	0.056	0.043	1.312
PRO <-----> TQM	-0.035	0.038	-0.918
LOG <-----> OP	-0.025	0.016	-1.562
LOG <-----> HRM	0.027	0.041	0.645
LOG <-----> INFRA	-0.025	0.037	-0.673
LOG <-----> BPR	0.065	0.019	3.369
LOG <-----> TQM	0.003	0.015	0.165
OP <-----> HRM	0.002	0.045	0.041
OP <-----> INFRA	0.000	0.040	0.012
OP <-----> BPR	-0.040	0.019	-2.053
OP <-----> TQM	-0.022	0.017	-1.319
HRM <-----> INFRA	0.630	0.136	4.623
HRM <-----> BPR	-0.063	0.049	-1.298
HRM <-----> TQM	-0.041	0.044	-0.930
INFRA <-----> BPR	-0.099	0.045	-2.181
INFRA <-----> TQM	-0.042	0.039	-1.081

BPR <-----> TQM	0.017	0.018	0.963	348
e1 <-----> e2	-0.009	0.007	-1.251	
e2 <-----> e3	2.521	7.976	0.316	
e3 <-----> e4	-48.545	33.316	-1.457	
e4 <-----> e5	-49.138	30.817	-1.595	
e5 <-----> e6	-3565.158	1580.996	-2.255	
e1 <-----> e3	2.414	2.109	1.145	
e3 <-----> e5	13089.752	2775.917	4.715	
e2 <-----> e4	-0.169	0.117	-1.439	
e4 <-----> e6	45.797	24.330	1.882	
e1 <-----> e4	-0.025	0.030	-0.830	
e2 <-----> e5	0.981	7.340	0.134	
e3 <-----> e6	-5802.107	1820.166	-3.188	
e1 <-----> e6	1.055	1.505	0.701	
e1 <-----> e5	3.127	1.966	1.590	
e2 <-----> e6	-1.568	5.738	-0.273	

Correlations:

	Estimate
COMP <-----> FORM	0.119
COMP <-----> CENT	0.032
COMP <-----> OC	0.051
COMP <-----> TECH	-0.107
COMP <-----> RD	-0.048
COMP <-----> MAK	-0.017
COMP <-----> PRO	-0.400
COMP <-----> LOG	-0.380
COMP <-----> OP	0.085
COMP <-----> HRM	-0.096
COMP <-----> INFRA	-0.050
COMP <-----> BPR	-0.178
COMP <-----> TQM	0.089
FORM <-----> CENT	0.032
FORM <-----> OC	-0.217
FORM <-----> TECH	-0.025
FORM <-----> RD	-0.057
FORM <-----> MAK	0.100
FORM <-----> PRO	-0.157
FORM <-----> LOG	-0.084
FORM <-----> OP	0.131
FORM <-----> HRM	-0.085
FORM <-----> INFRA	-0.079
FORM <-----> BPR	-0.067
FORM <-----> TQM	0.015
CENT <-----> OC	-0.178
CENT <-----> TECH	0.140
CENT <-----> RD	0.134
CENT <-----> MAK	0.127
CENT <-----> PRO	0.064
CENT <-----> LOG	-0.035
CENT <-----> OP	-0.022
CENT <-----> HRM	0.199
CENT <-----> INFRA	0.126
CENT <-----> BPR	-0.259
CENT <-----> TQM	0.086
OC <-----> TECH	0.216
OC <-----> RD	-0.206
OC <-----> MAK	-0.153
OC <-----> PRO	-0.061
OC <-----> LOG	-0.014
OC <-----> OP	0.160
OC <-----> INFRA	0.055
OC <-----> HRM	0.042

OC <----->	BPR	-0.015
OC <----->	TQM	-0.039
TECH <----->	RD	0.006
TECH <----->	MAK	0.244
TECH <----->	PRO	0.439
TECH <----->	LOG	0.142
TECH <----->	OP	0.023
TECH <----->	HRM	0.741
TECH <----->	INFRA	0.723
TECH <----->	BPR	-0.032
TECH <----->	TQM	-0.210
RD <----->	MAK	0.491
RD <----->	PRO	0.020
RD <----->	LOG	-0.211
RD <----->	OP	-0.143
RD <----->	HRM	0.424
RD <----->	INFRA	0.521
RD <----->	BPR	-0.331
RD <----->	TQM	0.126
MAK <----->	PRO	0.080
MAK <----->	LOG	0.022
MAK <----->	OP	-0.061
MAK <----->	HRM	0.436
MAK <----->	INFRA	0.405
MAK <----->	BPR	-0.160
MAK <----->	TQM	-0.200
PRO <----->	LOG	0.387
PRO <----->	OP	-0.318
PRO <----->	HRM	0.507
PRO <----->	INFRA	0.458
PRO <----->	BPR	0.187
PRO <----->	TQM	-0.130
LOG <----->	OP	-0.224
LOG <----->	HRM	0.091
LOG <----->	INFRA	-0.095
LOG <----->	BPR	0.535
LOG <----->	TQM	0.023
OP <----->	HRM	0.006
OP <----->	INFRA	0.002
OP <----->	BPR	-0.300
OP <----->	TQM	-0.188
HRM <----->	INFRA	0.849
HRM <----->	BPR	-0.185
HRM <----->	TQM	-0.131
INFRA <----->	BPR	-0.321
INFRA <----->	TQM	-0.153
BPR <----->	TQM	0.136
e1 <----->	e2	-0.178
e2 <----->	e3	0.044
e3 <----->	e4	-0.208
e4 <----->	e5	-0.229
e5 <----->	e6	-0.333
e1 <----->	e3	0.162
e3 <----->	e5	0.879
e2 <----->	e4	-0.206
e4 <----->	e6	0.273
e1 <----->	e4	-0.117
e2 <----->	e5	0.019
e3 <----->	e6	-0.499
e1 <----->	e6	0.099
e1 <----->	e5	0.228
e2 <----->	e6	-0.038

variances:

Estimate

S.E.

C.R.

Label

APPENDIX A :

The Research Questionnaire

This Questionnaire submitted to director level only (Included Managing Director, Deputy and Assistant Managing Director, Department Director, Deputy and Assistant Department Director)

The explanation

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The results of the analysis, which involve to this questionnaire, will be confidential and will not report the name and personal data of respondent. Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

This Questionnaire composed two parts as follow:

- 1) Part one includes the demographics data of respondents and
- 2) Part two includes the opinions of respondents towards your present organization.

Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

Part One: The demographic data of respondent

Please correct the sign $\surd$ in the blank of each item, in which consistent with your characteristics.

1. Gender ☐ Male ☐ Female

2. Marriage Status ☐ Single ☐ Married ☐ Other

3. Age

☐ Lower than 25 years old	☐ 25 - 30 years old
☐ 31 - 35 years old	☐ More than 40 years old

4. Highest Education Level

☐ Lower than Bachelor Degree	☐ Bachelor Degree
☐ Master Degree	☐ Doctoral Degree

5. Position

☐ Managing Director	☐ Deputy/Asst. Managing Director
☐ Director	☐ Deputy/Asst. Director

6. Working Experience

☐ Lower than 2 years	☐ 2 – 4 years
☐ 4 – 6 years	☐ 6 – 8 years
☐ 8 – 10 years	☐ 10 – 12 years
☐ 12 – 15 years	☐ More than 15 years

7. Income per Month

☐ 20,001 – 30,000 Baht	☐ 30,001 – 40,000 Baht
☐ 40,001 – 50,000 Baht	☐ More Than 50,000 Baht

Business System

[illegible]

For Administration Manager Level Only (Included Deputy and Assistant Manager)

The explanation

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The results of the analysis, which involve to this questionnaire, will be confidential and will not report the name and personal data of respondent. Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

This Questionnaire composed two parts as follow:

- 3) Part one includes the demographics data of respondents and
- 4) Part two includes the opinions of respondents towards your present organization.

Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

Part One: The demographic data of respondent

Please correct the sign $\sqrt{\quad}$ in the blank of each item, in which consistent with your characteristics.

8. Gender ☐ Male ☐ Female
9. Marriage Status ☐ Single ☐ Married ☐ Other
10. Age
- ☐ Lower than 25 years old ☐ 25 - 30 years old
- ☐ 31 - 35 years old ☐ More than 40 years old
11. Highest Education Level
- ☐ Lower than Bachelor Degree ☐ Bachelor Degree
- ☐ Master Degree ☐ Doctoral Degree
12. Position
- ☐ Managing Director ☐ Deputy/Asst. Managing Director
- ☐ Director ☐ Deputy/Asst. Director
13. Working Experience
- ☐ Lower than 2 years ☐ 2 – 4 years
- ☐ 4 – 6 years ☐ 6 – 8 years
- ☐ 8 – 10 years ☐ 10 – 12 years
- ☐ 12 – 15 years ☐ More than 15 years
14. Income per Month
- ☐ 20,001 – 30,000 Baht ☐ 30,001 – 40,000 Baht
- ☐ 40,001 – 50,000 Baht ☐ More Than 50,000 Baht

For Human Resource Manager Level Only (Included Deputy and Assistant Manager)

The explanation

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The results of the analysis, which involve to this questionnaire, will be confidential and will not report the name and personal data of respondent. Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

This Questionnaire composed two parts as follow:

- 5) Part one includes the demographics data of respondents and
- 6) Part two includes the opinions of respondents towards your present organization.

Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

Part One: The demographic data of respondent

Please correct the sign $\sqrt{\quad}$ in the blank of each item, in which consistent with your characteristics.

15. Gender ☐ Male ☐ Female

16. Marriage Status ☐ Single ☐ Married ☐ Other

17. Age

☐ Lower than 25 years old ☐ 25 - 30 years old
☐ 31 - 35 years old ☐ More than 40 years old

18. Highest Education Level

☐ Lower than Bachelor Degree ☐ Bachelor Degree
☐ Master Degree ☐ Doctoral Degree

19. Position

☐ Managing Director ☐ Deputy/Asst. Managing Director
☐ Director ☐ Deputy/Asst. Director

20. Working Experience

☐ Lower than 2 years ☐ 2 – 4 years
☐ 4 – 6 years ☐ 6 – 8 years
☐ 8 – 10 years ☐ 10 – 12 years
☐ 12 – 15 years ☐ More than 15 years

21. Income per Month

☐ 20,001 – 30,000 Baht ☐ 30,001 – 40,000 Baht
☐ 40,001 – 50,000 Baht ☐ More Than 50,000 Baht

For Logistics Manager Level Only (Included Deputy and Assistant Manager)

The explanation

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The results of the analysis, which involve to this questionnaire, will be confidential and will not report the name and personal data of respondent. Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

This Questionnaire composed two parts as follow:

- 7) Part one includes the demographics data of respondents and
- 8) Part two includes the opinions of respondents towards your present organization.

Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

Part One: The demographic data of respondent

Please correct the sign $\sqrt{\quad}$ in the blank of each item, in which consistent with your characteristics.

22. Gender ☐ Male ☐ Female

23. Marriage Status ☐ Single ☐ Married ☐ Other

24. Age

☐ Lower than 25 years old ☐ 25 - 30 years old
☐ 31 - 35 years old ☐ More than 40 years old

25. Highest Education Level

☐ Lower than Bachelor Degree ☐ Bachelor Degree
☐ Master Degree ☐ Doctoral Degree

26. Position

☐ Managing Director ☐ Deputy/Asst. Managing Director
☐ Director ☐ Deputy/Asst. Director

27. Working Experience

☐ Lower than 2 years ☐ 2 – 4 years
☐ 4 – 6 years ☐ 6 – 8 years
☐ 8 – 10 years ☐ 10 – 12 years
☐ 12 – 15 years ☐ More than 15 years

28. Income per Month

☐ 20,001 – 30,000 Baht ☐ 30,001 – 40,000 Baht
☐ 40,001 – 50,000 Baht ☐ More Than 50,000 Baht

For Marketing and Sales Manager Level Only (Included Deputy and Assistant Manager)

The explanation

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The results of the analysis, which involve to this questionnaire, will be confidential and will not report the name and personal data of respondent. Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

This Questionnaire composed two parts as follow:

- 9) Part one includes the demographics data of respondents and
- 10) Part two includes the opinions of respondents towards your present organization.

Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

Part One: The demographic data of respondent

Please correct the sign $\surd$ in the blank of each item, in which consistent with your characteristics.

29. Gender ☐ Male ☐ Female
30. Marriage Status ☐ Single ☐ Married ☐ Other
31. Age
- ☐ Lower than 25 years old ☐ 25 - 30 years old
- ☐ 31 - 35 years old ☐ More than 40 years old
32. Highest Education Level
- ☐ Lower than Bachelor Degree ☐ Bachelor Degree
- ☐ Master Degree ☐ Doctoral Degree
33. Position
- ☐ Managing Director ☐ Deputy/Asst. Managing Director
- ☐ Director ☐ Deputy/Asst. Director
34. Working Experience
- ☐ Lower than 2 years ☐ 2 – 4 years
- ☐ 4 – 6 years ☐ 6 – 8 years
- ☐ 8 – 10 years ☐ 10 – 12 years
- ☐ 12 – 15 years ☐ More than 15 years
35. Income per Month
- ☐ 20,001 – 30,000 Baht ☐ 30,001 – 40,000 Baht
- ☐ 40,001 – 50,000 Baht ☐ More Than 50,000 Baht

For Operation Manager Level Only (Included Deputy and Assistant Manager)

The explanation

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The results of the analysis, which involve to this questionnaire, will be confidential and will not report the name and personal data of respondent. Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

This Questionnaire composed two parts as follow:

- 11) Part one includes the demographics data of respondents and
- 12) Part two includes the opinions of respondents towards your present organization.

Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

Part One: The demographic data of respondent

Please correct the sign $\surd$ in the blank of each item, in which consistent with your characteristics.

36. Gender ☐ Male ☐ Female

37. Marriage Status ☐ Single ☐ Married ☐ Other

38. Age

☐ Lower than 25 years old ☐ 25 - 30 years old
☐ 31 - 35 years old ☐ More than 40 years old

39. Highest Education Level

☐ Lower than Bachelor Degree ☐ Bachelor Degree
☐ Master Degree ☐ Doctoral Degree

40. Position

☐ Managing Director ☐ Deputy/Asst. Managing Director
☐ Director ☐ Deputy/Asst. Director

41. Working Experience

☐ Lower than 2 years ☐ 2 – 4 years
☐ 4 – 6 years ☐ 6 – 8 years
☐ 8 – 10 years ☐ 10 – 12 years
☐ 12 – 15 years ☐ More than 15 years

42. Income per Month

☐ 20,001 – 30,000 Baht ☐ 30,001 – 40,000 Baht
☐ 40,001 – 50,000 Baht ☐ More Than 50,000 Baht

For Procurement Manager Level Only (Included Deputy and Assistant Manager)

The explanation

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The results of the analysis, which involve to this questionnaire, will be confidential and will not report the name and personal data of respondent. Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

This Questionnaire composed two parts as follow:

- 13) Part one includes the demographics data of respondents and
- 14) Part two includes the opinions of respondents towards your present organization.

Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

Part One: The demographic data of respondent

Please correct the sign $\surd$ in the blank of each item, in which consistent with your characteristics.

43. Gender ☐ Male ☐ Female

44. Marriage Status ☐ Single ☐ Married ☐ Other

45. Age

☐ Lower than 25 years old ☐ 25 - 30 years old
☐ 31 - 35 years old ☐ More than 40 years old

46. Highest Education Level

☐ Lower than Bachelor Degree ☐ Bachelor Degree
☐ Master Degree ☐ Doctoral Degree

47. Position

☐ Managing Director ☐ Deputy/Asst. Managing Director
☐ Director ☐ Deputy/Asst. Director

48. Working Experience

☐ Lower than 2 years ☐ 2 – 4 years
☐ 4 – 6 years ☐ 6 – 8 years
☐ 8 – 10 years ☐ 10 – 12 years
☐ 12 – 15 years ☐ More than 15 years

49. Income per Month

☐ 20,001 – 30,000 Baht ☐ 30,001 – 40,000 Baht
☐ 40,001 – 50,000 Baht ☐ More Than 50,000 Baht

For Research and Development Manager Level Only (Included Deputy and Assistant Manager)

The explanation

The objectives of the research on “An Assessment of the Internal Structural Adjustment Factors Affecting Organizational Performance: A Case Study of the Energy Enterprises in Thailand after the Economic Crisis 1997” are to: 1) identify and evaluate critical internal factors affecting the organizational performance of energy enterprises in Thailand after the economic crisis 1997; 2) study cause-effect relationships among internal factors affecting the organizational performance of those energy enterprises; 3) create an appropriate linear structural relationship equation of the internal factors affecting organizational performance in order to explain the cause-effect relationships affecting the organizational performance in those energy enterprises in Thailand.

The results of the analysis, which involve to this questionnaire, will be confidential and will not report the name and personal data of respondent. Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

This Questionnaire composed two parts as follow:

- 15) Part one includes the demographics data of respondents and
- 16) Part two includes the opinions of respondents towards your present organization.

Please correct by the facts of your opinions towards your organization and all of items in the questionnaire.

Part One: The demographic data of respondent

Please correct the sign $\checkmark$ in the blank of each item, in which consistent with your characteristics.

50. Gender ☐ Male ☐ Female

51. Marriage Status ☐ Single ☐ Married ☐ Other

52. Age

☐ Lower than 25 years old ☐ 25 - 30 years old
☐ 31 - 35 years old ☐ More than 40 years old

53. Highest Education Level

☐ Lower than Bachelor Degree ☐ Bachelor Degree
☐ Master Degree ☐ Doctoral Degree

54. Position

☐ Managing Director ☐ Deputy/Asst. Managing Director
☐ Director ☐ Deputy/Asst. Director

55. Working Experience

☐ Lower than 2 years ☐ 2 – 4 years
☐ 4 – 6 years ☐ 6 – 8 years
☐ 8 – 10 years ☐ 10 – 12 years
☐ 12 – 15 years ☐ More than 15 years

56. Income per Month

☐ 20,001 – 30,000 Baht ☐ 30,001 – 40,000 Baht
☐ 40,001 – 50,000 Baht ☐ More Than 50,000 Baht

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