

## 5.0 Results and Analysis

### 5.1 Introduction

This chapter presents the findings of the study. The results of the statistical test that mentioned in earlier chapters are tabulated in this chapter. The data of this study is the 1990 updated input-output table that prepared by Yap (1998). The discussion will be presented in four parts.

The first part will concentrates on discussing the empirical result of intersectoral output linkage for 30 sectors in 1990 input-output table through the empirical estimates of backward linkages (BL), forward linkages (FL), total linkages (TL) and “key sectors” in terms of output linkage. The second will discusses the findings of employment generation in terms of backward ( $EU_j$ ), forward ( $EU_i$ ), total linkages (EU) and “key sectors” in terms of employment generation linkages as well. The third part describes the economic impact of investment in telecommunication and construction sectors over other sectors. Finally, last part will discuss some policy implication of the analysis.

In order to enhance the analysis, therefore it may be convenient to identify the sectors as belonging to one of the four industries namely, (1) primary products, (2) light industries, (3) heavy industries and (4) non-tradable industries. The classification is merely designed to help identify groups of various sectors. The sectors under each industry will be shown in table 8.

Table 8: List of Classification of Sectors

<b>Primary Products</b> Other Agriculture Rubber Planting Oil Palm Estates Forestry and logging Fishing Mining and Quarrying	<b>Heavy Industries</b> 14. Chemicals 15. Petroleum products 16. Non-metallic products 17. Metallic 18. Non-electrical machinery 19. Electrical machinery 20. Motor Vehicles and transport products
<b>Light Industries</b> Manufactured oils and fats Food processing Beverages and tobacco Textiles and wearing apparel Wood-based industry Rubber products Other manufacturing	<b>Non-tradable</b> 21. Electricity and gas products 22. Waterworks and supply 23. Constructions 24. Wholesale and retail trade 25. Transport and communication 26. Hotels and restaurants 27. Business services 28. Professional services 29. Personal services 30. Government services

### Intersectoral Linkages

Findings from the empirical results of  $U_i$  and  $U_j$  and the subsidiary criteria of  $V_i$  and  $V_j$  in table 9 are as follows. Basically, there are four types of relationship: (1) strong forward and backward linkages, (2) weak forward and strong backward linkages, (3) strong forward and weak backward linkages and (4) weak backward and forward linkages. The findings indicate that: Other Agriculture, manufactured oil and fats, and Wood base industry are sectors have strong forward and backward linkages (table 9). Sectors like Rubber product, Hotels and restaurant, construction, Petroleum products, Non metallic products, Metallic products, beverages and tobacco and the Non electrical machinery are sectors have weak forward and strong backward linkages. The strong forward and weak backward

Table 9: Values of Linkages and their Variation

	$U_i$	$V_i$	$U_j$	$V_j$
<b>Strong Forward &amp; Strong Backward Linkages</b>				
1. Oth Agr	1.3686	0.4398	1.1037	0.3907
2. Oil & Fats	1.2209	0.4124	1.5635	0.4760
3. Food	1.2167	0.4116	1.3159	0.4300
4. Wood	1.0531	0.3912	1.1192	0.3935
<b>Weak Forward &amp; Strong Backward Linkages</b>				
5. Rubprd	0.7849	0.3314	1.2230	0.4128
6. Hotel	0.8086	0.3358	1.2088	0.4102
7. Cons	0.8711	0.3475	1.2082	0.4101
8. Petror	0.8852	0.3501	1.0765	0.3856
9. None Met	0.8821	0.3495	1.0709	0.3846
10. Metal	0.9604	0.3640	1.0703	0.3844
11. Bev & Tob	0.7600	0.3282	1.0386	0.3786
12. None Elec	0.7976	0.3338	1.0035	0.3720
<b>Strong Forward &amp; Weak Backward Linkages</b>				
13. Mining	1.3785	0.4417	0.7606	0.3269
14. Business	1.3683	0.4398	0.8546	0.3444
15. Chem	1.3601	0.4383	0.9893	0.3694
16. Trade	1.3581	0.4379	0.9204	0.3566
17. Rr & Com	1.3127	0.4294	0.8948	0.3519
18. Oil Palm	1.1692	0.4028	0.8231	0.3385
19. Motveh	1.1583	0.4008	0.9459	0.3614
20. Rubber	1.1157	0.3927	0.7487	0.3247
21. Electy	1.1052	0.3909	0.8741	0.3480
<b>Weak Backward &amp; Forward Linkages</b>				
22. Tex & Wr	0.8962	0.3521	0.9748	0.3668
23. Forestry	0.8889	0.3508	0.7769	0.3299
24. Elec	0.8163	0.3373	0.8267	0.3392
25. Ota Monf	0.7840	0.3313	0.8978	0.3524
26. Prof	0.7588	0.3266	0.9477	0.3617
27. Water	0.7413	0.3234	0.9609	0.3641
28. Fishing	0.7292	0.3211	0.8723	0.3477
29. Pers	0.7254	0.3204	0.9638	0.3647
30. Govt.	0.7247	0.3203	0.9651	0.3649

Linkages are largely attributed to sectors like Mining, Business services, Chemical products, Whole sales and trade, Transportation and communication, Oil palm estates, Motor vehicles and transport products, Rubber plantation and Electricity and gas supply. Nonetheless, a number of sectors had poor linkages too. These are Textiles

and wearing apparel, Forestry, Electrical machinery, Other manufacturing products, Professional services, Waterworks and supply, Fishing, Personal services and Government services.

The results also indicate that there are relatively strong intersectoral dependence that emitted by various industrial sectors. This is based on the definition by Rasmussen (1938), if  $U > 1$ , this indicates that the sector is transmitting above average impulses to other via its intermediate input requirement. The above statement can be proved from the results in table 10, where most sectors indicates a high  $U$  value that is more than one in both forward and backward linkages. There are 13 sectors in forward linkage and 12 sectors in terms of backward linkage indicating value  $U$  are more than one (table 10).

On the other hand, values of  $U_j > 1$  are seldom shown by “primary and non tradable sectors”. In principle, this is most the same as highly developed country results. The distribution in table 10 also shows that, the most stimulating sectors are forthcoming from the secondary sectors the light and heavy industries. Among the light industries, Processed foods predominate. Stimulation forthcoming from Wood based industry, Chemical sector, Other agriculture, Food processing, Manufactured oils and fats are powerful owing to the strong forward and backward linkages as in table 8.

The empirical results in table 10 also indicates that Malaysia has relatively high linkages with domestic industries since most industries have indices  $U$

Table 10 :  
High Forward ( $U_i$ ) and Backward ( $U_j$ ) Output Linkages

Sectors	Forward	Linkages	
	$U_i$	$V_i$	Rank
<b>Primary Products</b>			
1 Mining	1.3785396	0.4416837	1
2 Oth Agr	1.3685986	0.4398377	2
3 Rubber	1.1156722	0.3928705	11
4 Oil Palm	1.1691561	0.4028022	9
<b>Light Industries</b>			
5 Oil & Fat	1.2209457	0.4124193	7
6 Food	1.2166916	0.4116293	8
7 Wood	1.0530507	0.3812419	13
<b>Heavy Industries</b>			
8 Chem	1.3601029	0.4382601	4
9 Motveh	1.1582533	0.4007776	10
<b>Non-Tradable</b>			
10 Business	1.3682507	0.4397731	3
11 Trade	1.3580624	0.4378812	5
12 Rr & Com	1.3126549	0.4294492	6
13 Electy	1.1052035	0.3909265	12

Sectors	Backward	Linkages	
	$U_j$	$V_j$	Rank
<b>Primary Products</b>			
1 Oth Agr	1.103725	0.390652	7
<b>Light Industries</b>			
2 Oil & Fat	1.563473	0.476025	1
3 Food	1.315889	0.43005	2
4 RubPrd	1.223046	0.412809	3
5 Wood	1.11917	0.39352	6
6 None Met	1.070982	0.384572	9
7 Bev & Tob	1.038569	0.378553	11
<b>Heavy Industries</b>			
8 Petror	1.07653	0.385602	8
9 Metal	1.070286	0.384443	10
10 None Elec	1.00347	0.372035	12
<b>Non-Tradable</b>			
11 Hotel	1.208807	0.410165	4
12 Cons	1.208241	0.41006	5

Low Forward ( $U_i$ ) and Backward ( $U_j$ ) Output Linkages

Sectors	Forward	Variation	Rank
	Linkage	( $V_i$ )	
	( $U_i$ )		
<b>Primary Products</b>			
1 Fishing	0.7291823	0.3211011	28
<b>Light Industries</b>			
2 RubPrd	0.7847843	0.3314261	23
3 Ota Monf	0.7840348	0.3312869	24
4 Bev & Tob	0.7600204	0.3268276	25
<b>Heavy Industries</b>			
5 None Elec	0.7976467	0.3338146	22
<b>Non-Tradable</b>			
6 Proif	0.7588219	0.3266050	26
7 Pers	0.7254811	0.3204138	29
8 Water	0.7413691	0.3233641	27
9 Govt	0.7247442	0.3202770	30

Sectors	Backward	Variation	Rank
	Linkages	( $V_j$ )	
	( $U_j$ )		
<b>Primary Products</b>			
1 Forestry	0.776954	0.329972	28
2 Mining	0.760646	0.326944	29
3 Rubber	0.748658	0.324718	30

more than one. Most light and heavy manufacturing industries as well as service industries show low indices of  $U_i$ , implying that they are least affected by the

expansion in the system of industries. These industries cater most of their output towards final demand. Several sectors also indicating rather low linkages with the rest of economy that is U value below than 1. There are nine sectors in terms of forward linkages and three sectors in terms of backward linkages (table 10)

The results also reveal that agro-based processing such as the Manufactured oil and fats sector tends to emerge as the strategic sectors. This is due to the capability of agro-based processing sectors in offering the wide scope of expansion for their corresponding raw materials.

Table 11  
Statistical coherence Between Backward and Forward Linkages

**Symmetric Measures**

		Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	-.032	.176	-.170	.866 <sup>a</sup>
Ordinal by Ordinal	Spearman Correlation	-.109	.178	-.581	.566 <sup>a</sup>
N of Valid Cases		30			

a. Based on normal approximation.

Looking at both  $U_j$  and  $U_i$  values for each sector in table 10, it is noted that generally sectors with high forward linkage effects are somewhat low on backward linkage. This is especially true for sectors such as Mining and quarrying and the Rubber planting sectors. As a matter of fact the Pearson and Spearman rank correlation applied to both distribution showed a negative relationship of  $-0.032$  and  $-0.019$  (table 11), significant at the 0.005 level degree of freedom. There are sectors, however, which showed both high backward and forward linkage effects. Those

sectors except for Other agriculture sector, all are manufacturing sectors namely, Manufactured oil and fat, Food processing and Wood base industry.

Table 12: Statistical Coherence Between  $U_i$  and  $V_i$  and  $U_j$  and  $V_j$

**Symmetric Measures**

		Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	1.000	.000	8723638	.000 <sup>a</sup>
Ordinal by Ordinal	Spearman Correlation	1.000	.000 <sup>a</sup>		
N of Valid Cases		30			

a. Based on normal approximation.

The Pearson and Spearman correlation coefficient for  $U_j, V_j$  and  $U_i, V_i$  is positive 1.00 (table 12). The result implies that the larger the linkage inducement of a particular sector, the larger the internal variability of the structure of the inducements over the other sectors. In other words, the high backward effects are not well spread out over the rest of the sectors that receive the inducement. Similarly, sectors with a high value of  $U_i$  have a relatively high value of  $V_i$ . In other words, the larger the forward linkage effects of a sector, the more unlikely the input distributions because the effects are spread out not evenly over the rest of the using sectors.

### 5.3 Backward Linkage (Power of Dispersion)

Table 13 below shows the distribution of industries with respect to their respective indices of backward linkage effect. Looking at the distribution of sectors based upon backward linkage, there are 12 sectors registering  $U_j$  values greater

Table 13 List of Sectoral Backward Linkages

		Backward Linkages		Rank
		U <sub>j</sub>	V <sub>j</sub>	
	<b>Primary Products</b>			
1	Oth Agr	1.103724986	0.390651923	7
2	Rubber	0.748657987	0.324717636	30
3	Oil Palm	0.823124783	0.338545773	27
4	Forestry	0.77695421	0.329972113	28
5	Fishing	0.872302772	0.347677897	24
6	Mining	0.760646163	0.326943785	29
	<b>Light Industries</b>			
7	Oil & Fat	1.56347261	0.476024914	1
8	Food	1.315889229	0.430049834	2
9	Bev & Tob	1.038569344	0.378552824	11
10	Tex & Wr	0.974774291	0.36670638	14
11	Wood	1.119169946	0.39351998	6
12	Rubprd	1.223045883	0.412809257	3
13	Non Met	1.070982009	0.384571705	9
	<b>Heavy Industries</b>			
14	Chem	0.989259991	0.369396307	13
15	Petror	1.076530425	0.38560202	8
16	Metal	1.070286381	0.38444253	10
17	None Elec	1.003470264	0.372035088	12
18	Elec	0.826695601	0.339208857	26
19	Motveh	0.945997359	0.361362638	19
20	Ota Monf	0.897830557	0.352418287	21
	<b>Non-Tradable</b>			
21	Electry	0.874091728	0.348010097	23
22	Water	0.96099938	0.364148443	17
23	Cons	1.208241025	0.410060064	5
24	Trade	0.920441519	0.356617038	20
25	Rr & Comm	0.894819036	0.351859062	22
26	Hotel	1.208806587	0.410165086	4
27	Business	0.854560941	0.344383321	25
28	Proff	0.9477087	0.361680426	18
29	Pers	0.963872781	0.36468202	16
30	Govt.	0.965073485	0.364904985	15

unity indicating high total backward linkage as highlight in table 13. These sectors are from various industries which includes (1) one primary product : Other agriculture (sector 1), (2) six light industries namely., Manufactured oil and fats (sector7), Food



processing (sector 8), Beverage and tobacco (sector 9), Textiles and wearing and apparel (sector 10), Wood based industry (sector 11), Rubber products (sector 12) and Non metallic products (sector 13), (3) three heavy industries, Petroleum products (sector 15), Metallic (sector 16), Non electrical machinery (sector 17) and (4) two Non tradable industries namely Construction (sector 23) and Hotels and restaurant (sector 26). Among these sectors most of them are from manufacturing sectors. Indicating that a wide range of manufacture sectors both light and heavy possessing high backward linkages. These sectors have larger input dependence to other sectors and mostly involve as the transmitting production stimulate to other sectors and cater largely in final demand to the consumption demand.

It is crucial to note that those sectors that have high backward linkage also have relatively high values for  $V_j$  ranking from 0.37 to 0.47 variability (table 13) compared to those sectors that have low backward linkages effects. This means that these sectors depend relatively less on other sectors generally depend only on a few of other sectors.

On the other hand, the remaining 18 sectors registering rather low backward linkage includes the non-manufacturing industries or basic industries such as Fishing, Forestry, Mining and Rubber planting.

The noteworthy features in terms of ranking by backward linkages is the high linkages of both Food processing (sector 8) and certain services sector activities such as Hotels and restaurant (sector 26). The reason is because both sectors encounter mostly to the consumption demand.

The high backward linkage of the Rubber products sector (sector 12) arise due to the fact that most of the rubber products are charter largely to the final demand. The output of rubber products sectors like tyres, tubes, rubber footwear, plastic products and other rubber products are ready for final consumption.

Light industries like Manufactured oil and fats, Food processing, Wood based industry, Beverages and tobacco also attained rather high backward linkage. The reason is that these industries mostly serve the final consumption sector. The output of these sectors reach final consumption without further process, and especially the Food processing, Beverages and tobacco sector's output go towards satisfying the final demand.

Industries producing Metallic, Non metallic, Petroleum and Non electrical machinery also have high backward linkage. This is attributed to the characteristic of these industries products which is serving final consumption. The products like hand tools, aluminum product, agricultural equipment, computing and accounting machinery and others all serving the final demands sector.

#### **5.4 Forward Linkage**

Table 14 below shows the distribution of sectors according to their relative indices of  $U_i$  and the corresponding coefficients of variation  $V_i$  for each linkage measure. There are 13 sectors registering  $U_i$  values greater than unity indicating high forward linkage. These sectors are from various industries that

Table 14 : List of Sectoral Forward Linkages

Forward Linkages				
	Primary Products	U <sub>i</sub>	V <sub>i</sub>	Rank
1	Oth Agr	1.3685986	0.4398377	2
2	Rubber	1.1156722	0.3928705	11
3	Oil Palm	1.1691561	0.4028022	9
4	Forestry	0.8889484	0.3507689	16
5	Fishing	0.7291823	0.3211011	28
6	Mining	1.3785396	0.4416837	1
	<b>Light Industries</b>			
7	Oil & Fat	1.2209457	0.4124193	7
8	Food	1.2166916	0.4116293	8
9	Bev & Tob	0.7600204	0.3268276	25
10	Tex & Wr	0.8961721	0.3521103	15
11	Wood	1.0530507	0.3812419	13
12	Rubprd	0.7847843	0.3314261	23
13	Ota Monf	0.7840348	0.3312869	24
	<b>Heavy Industries</b>			
14	Chem	1.3601029	0.4382601	4
15	Petror	0.8851924	0.3500714	17
16	None Met	0.8820932	0.3494959	18
17	Metal	0.9603922	0.3640357	14
18	None Elec	0.7976467	0.3338146	22
19	Elec	0.8162574	0.3372705	20
20	Motveh	1.1582533	0.4007776	10
	<b>Non-Tradable</b>			
21	Electry	1.1052035	0.3909265	12
22	Water	0.7413691	0.3233641	27
23	Cons	0.8710952	0.3474537	19
24	Trade	1.3580624	0.4378812	5
25	Rr & Comm	1.3126549	0.4294492	6
26	Hotel	0.8085822	0.3358453	21
27	Business	1.3682507	0.4397731	3
28	Prof	0.7588219	0.3266050	26
29	Pers	0.7254811	0.3204138	29
30	Govt.	0.7247442	0.3202770	30

includes (1) four primary products: Other agriculture (sector 1), Rubber planting (sector 2), Oil palm estates (sector 3), Mining and quarrying (sector 6), (2) three from light industries, namely Manufactured oil and fats (sector 7), Food processing

(sector 8), Wood-based industry (sector 11), (3) two heavy industry, Chemicals (sector 14) and Motor vehicles and transport products (sector 19) and (4) four non tradable industries namely Electricity and gas products (sector 21), Wholesale and retail trade (sector 24) ), Transport and communication (sector 20), Business services (sector 27).

The result shows that industrial activities such as Mining (sector 6) and Chemicals (sector 12) play critical roles as input suppliers in the Malaysian manufacturing sectors. The Mining sector indicate a high forward linkage, which is fulfil the assertion of Hirschman (1957), who has drawn a special attention in the iron and steel industry because it has the highest combined linkage score. Therefore, under this reason, he defended the attempts of some underdeveloped countries in attributing prime importance to the iron and steel industry in their development programs. The above sectors have attained a high forward linkages are because most of the sectors produce relatively little directly to final demand but rather to intermediate demand of other sectors.

Most of the non industrial sectors such as Other agriculture (sector 1), Business services (sector 27), Wholesales and retail trade (sector 24) and Rubber planting (sector 11) also have high forward linkages. Therefore, the results suggests that high forward linkages is not the only exclusive domain for modern manufacture activities.

The results indicate that most of the agriculture sector score high forward linkage. This is mainly due to most farming products like agriculture, rubber, oil palm that are important as the intermediate inputs for food, textile, clothing and leather, paper and wooden products industries. The primary sector output is important

as the key suppliers of input mostly for the agro-based industries. Hence, any changes in this sector tend to create extensive repercussion on the agro-based industries.

Chemical industries also important as the intermediate input that contributed to utilities production of chemical-base industry like manufactured of drugs and medicines, soap, cosmetic, cleaning preparations. It is also as the main supplier to industrial like fertilizers and pesticides, synthetic resins, plastic materials or man made fibres.

Business services (sector 27) is important in providing interindustrial support through the institutions and services like financial institutions, insurance, legal services, accounting, auditing and book-keeping services, engineering, architecture and technical services and other business services to support production activities

Transport and communication attained higher forward linkages because of its important role in providing delivery services from sector to sector. The delivery services is conducted through various ways of transportation like railway, land transport, water transport, air transport or through the services allied to transport such as travel and tourist agencies, storage and warehousing services etc. In spite of using the transportation, nowadays due to the advancement of technologies most of the transaction also can be done by using telecommunication too.

Electricity and gas product are the vital supplier of electricity, gas and steam towards satisfying interindustrial demand in order to implement the smoothly production process. Without these supplement all industries activities will come to the immediate halt. Hence, these sectors are playing the crucial role as energy supplier to the rest of industrial sectors.

Sector such as Non electrical machinery, Rubber products, Beverage and tobacco and Fishing indicate a rather low and weak forward linkages. These sectors have relatively large input dependence but not large input suppliers to other input using industries. Nonetheless, most of the products produced by these sectors reaches directly to final demand. As an example fishing output cater largely to the consumption demand

As the conclusion, primary products attained quite high forward linkages compare to other industrial. The ranking of forward linkages in table 9 reveal that primary products are relatively importance as the intermediate demand for others sector.

### 5.5 Overall Linkages

A surprising result based on the ranking of sectors by overall linkages in table 15 is the high total linkage of non-manufacturing and “traditional” sector, such as Other agriculture (sector 1) and Transportation and communication (sector 25). Taking an overall measure of linkage effect, the Manufactured oils and fats sector (sector 7) posses the most extensive linkages with the rest of economy. Other sectors, which perform well in combined forward and backward linkages such as Food processing (sector 8), Other agriculture (sector 1), Chemicals (sector 4) and Wholesale and retail trade (sector 24), Business services (sector 27), Transportation and communication (sector 25), Wood base industry (sector 11), Mining and quarrying (sector 6) and Motor vehicles and transport products (sector 19). These sectors lie within the top ten in terms of overall linkage. These sectors depend

Table 15 List of Sectoral Overall Linkages

		Total Linkages		
		U	V	Rank
	<b>Primary Products</b>			
1	OTH AGR	2.4723235	0.830490	3
2	Rubber	1.8643302	0.717588	20
3	Oil Palm	1.9922809	0.741348	15
4	Forestry	1.6659026	0.680741	28
5	Fishing	1.6014851	0.668779	30
6	Mining	2.1391857	0.768627	9
	<b>Light Industries</b>			
7	Oil & Fat	2.7844183	0.888444	1
8	Food	2.5325808	0.841679	2
9	Bev & Tob	1.7985897	0.705380	22
10	Tex & Wr	1.8709464	0.718817	19
11	Wood	2.1722206	0.774762	8
12	RUBPRD	2.0078302	0.744235	14
13	NONMET	1.9530752	0.734068	18
	<b>Heavy Industries</b>			
14	Chem	2.3493629	0.807656	4
15	PETROR	1.9617228	0.735673	17
16	METAL	2.0306785	0.748478	12
17	NONELEC	1.8011170	0.705850	21
18	ELEC	1.6429530	0.676479	29
19	MOTVEH	2.1042507	0.762140	10
20	OTA MONF	1.6818653	0.683705	27
	<b>Non-Tradable</b>			
21	ELECTY	1.9792952	0.738937	16
22	WATER	1.7023685	0.687513	24
23	CONS	2.0793362	0.757514	11
24	TRADE	2.2785039	0.794498	5
25	RR & COMM	2.2074740	0.781308	7
26	HOTEL	2.0173888	0.746010	13
27	BUSINESS	2.2228116	0.784156	6
28	PROTF	1.7065306	0.688285	23
29	PERS	1.6893539	0.685096	26
30	GOVT	1.6898177	0.685182	25

heavily on other domestic sectors for their input. However, any changes in the level of activity within these sectors would generate extensive repercussion on the

economy. The result in table 15 revealed that light industries are the important sectors through the overall linkages.

### 5.6 Empirical Identification of Key Sector

Most literature on economic development lay emphasis on the importance of “key sectors” in initiating the process of economic development. Thereby, in this section the empirical identification of “key sector” is carried out. We define “key sector” broadly from the output expansion viewpoint. In terms of output expansion, a “key sector” is one which possesses high backward and high forward linkage effects relative to other sectors of the economy. Therefore, by using Rasmussen’s indices as the measure of linkage the “key sector” operationally defines the sector as one in which (1) both  $U_i$  and  $U_j$  values are greater than unity and (2) both  $V_i$  and  $V_j$  coefficients are relatively low.

Given this operational definition the result shows in Malaysia economy that there are 13 sectors can be considered as “key sectors “ in terms of forward linkage. These sectors included Mining and quarrying, Other agriculture, Business services, Chemical, Wholesale and trade, Transportation and communication, Manufactured oil and fat, Processing food, Oil palm estates, Motor vehicle, Rubber planting, Electric and gas products and the Wood based industry. These sectors are shown in table 16.

In view of the importance of backward linkage effects as a development mechanism (Hirschman, 1958), the interested is not only on the forward



Table 16 : List of Sectoral Key Sectors

		Backward Linkages		Forward Linkages			
		U <sub>j</sub>	V <sub>j</sub>	U <sub>i</sub>	V <sub>i</sub>		
1	Oil & Fat	1.5634726	0.4760249	1	Mining	1.3785396	0.4416837
2	Food	1.3158892	0.4300498	2	Oth Agr	1.3685986	0.4398377
3	RubPrd	1.2230459	0.4128093	3	Business	1.3682507	0.4397731
4	Hotel	1.2088066	0.4101651	4	Chem	1.3601029	0.4382601
5	Cons	1.2082410	0.4100601	5	Trade	1.3580624	0.4378812
6	Wood	1.1191699	0.3935200	6	Rr & Comm	1.3126549	0.4294492
7	Oth Agr	1.1037250	0.3906519	7	Oil & Fat	1.2209457	0.4124193
8	Petror	1.0765304	0.3856020	8	Food	1.2166916	0.4116293
9	None Met	1.0709820	0.3845717	9	Oil Palm	1.1691561	0.4028022
10	Metal	1.0702864	0.3844425	10	Motveh	1.1582533	0.4007776
11	Bev & Tob	1.0385693	0.3785528	11	Rubber	1.1156722	0.3928705
12	None Elec	1.0034703	0.3720351	12	Electry	1.1052035	0.3909265
				13	Wood	1.0530507	0.3812419

linkages, but rather focused on output expansion which is based primarily upon backward linkage effects. Hence, the define of a “key sector” operationally as one in which U<sub>j</sub> value is greater than unity and its corresponding V<sub>j</sub> measure is relatively low. Based on this definition there are 12 “key sectors” in Malaysia economy in terms of backward linkage. Most of them are form the manufacturing sectors except Hotels and restaurant and Construction sectors. These sectors included Manufactured oil and fact, Processing food , Rubber products, Hotels and restaurant, Construction, Wood base industry, Other agriculture, Petroleum products, Non metallic products, Metallic products, Beverage and tobacco and Non electricity products. The sectors are shown in tables 16.

These “key sectors” are the common leading sectors in the economy owing to the high weight of these sectors whether as an intermediate input for final demand in the forward linkages or as the users of raw materials and serving the final demand as in backward linkages. However, the result reveals that the common leading sector in Malaysia economy are those such as Food processing, Wood based

industry and Other agriculture sector as highlight in table 16. These sectors score high value in the ranking of both backward and forward linkages.

Therefore, in order to achieve an impressive economic growth and to accelerate it, the development strategic should focus on the key sectors, as indicate in the above section. Thus, investment made on the same industries will yield substantially lager returns.

### **5.7 Employment Generation**

There are two general conditions which must prevail before studying the interindustry employment generation. Firstly, there must already exist some degree of interdependence among various sectors of the economy. Each sector in input-output table produces a final product from primary input and also from intermediate inputs which are purchased from other sectors. Therefore, indirectly it also mean that each sector not only sells its output for direct use of final demand sectors but also for the indirect intermediate uses of the other productive sectors. Secondly, there must exist some relationship between an industry's output and its employment. Thus, when an industry's output expands, its employment requirements also expanding upon its particular employment output function.

There are two viewpoints in the process of interindustry employment expansion either from forward linkages or backward linkage standpoints. The "forward linkages" indicate a changes in the final demand in all sectors induces each industry to expand its output either directly and indirectly. Directly, means each sector will expand output to satisfy its own final demand. Indirectly means, each sector will expand its output indirectly to satisfy the intermediate demand for its

product by the other sectors of the economy. As a conclusion, the industry's total output consists of the amount delivered output to its own final demand (direct output). This kind of relationship can then be converted into direct and indirect employment changes. All of this indicates the process of employment expansion within an industry based on forward linkages.

The process of interindustry employment expansion may be viewed from the backward linkages standpoint as well. To produce a given amount of output for delivery to final demand, an industry requires a given amount of output from other sectors as inputs. In order to satisfy the required output for other sectors, which in turn respond by expanding their outputs and consequently their employment. The original industry, therefore by creating effective demand for the output of other industries induces these industries to expand their output employment. This is the process of employment generation.

In this study, the discussion of employment generation from the backward linkages and forward linkages viewpoint is discussed. The computing of employment linkage by using the method suggested by Rasmussen through the extending Rasmussens's methodology used in constructing output linkage indices.

### **5.7.1 Backward and Forward Employment Linkage**

Table 17 below shows the distributions of sectors in terms of their employment generation capacities based upon backward linkage  $E_j$  (power of dispersion) effects and forward linkages  $E_i$  (sensitivity of dispersion) and the corresponding measures of relative variability  $V_j$  and  $V_i$ . Based on the table there are

Table 17 : Backward and Forward Employment Linkage

		Euj	Evj			Eui	Evi
1	Oth Agr	3.0802690	0.7576869	1	Oth Agr	5.0554145	1.1244622
2	RubPrd	2.6793383	0.6832360	2	None Met	2.7818969	0.7022806
3	None Met	2.5946995	0.6675189	3	Trade	2.6869118	0.6846423
4	Hotel	2.1501190	0.5849624	4	RubPrd	2.5091918	0.6516406
5	Pers	2.0101819	0.5589767	5	Pers	1.9033873	0.5391455
6	Trade	1.5571106	0.4748435	6	Hotel	1.7906658	0.5182136
7	Petror	1.3273084	0.4321703	7	Petror	1.5334819	0.4704558
8	Food	1.3262019	0.4319649	8	Metal	1.4031225	0.4462486
9	Metal	1.3225740	0.4312912	9	Chem	1.2582719	0.4193506
10	Govt	1.2068585	0.4098033	10	Govt	1.0034142	0.3720247
11	Bev & Tob	1.1666525	0.4023373	11	Rr & Comm	0.8302081	0.3398611
12	Cons	0.9781996	0.3673424	12	Proff	0.8205787	0.3380730
13	Proff	0.9502848	0.3621588	13	Rubber	0.8052512	0.3352267
14	Chem	0.8183659	0.3376621	14	Wood	0.7184934	0.3191162
15	Rr & Comm	0.6145449	0.2998135	15	Oil Palm	0.6724987	0.3105752
16	Forestry	0.5929657	0.2958063	16	Bev & Tob	0.6621120	0.3086465
17	Wood	0.5797095	0.2933447	17	Forestry	0.6555807	0.3074336
18	Rubber	0.5648811	0.2905911	18	Business	0.6033786	0.2977399
19	Oil Palm	0.5639138	0.2904115	19	Cons	0.4628232	0.2716395
20	Water	0.5121381	0.2807970	20	Fishing	0.4383283	0.2670909
21	Fishing	0.5063100	0.2797147	21	Water	0.3585984	0.2522854
22	Tex & Wr	0.4489784	0.2690685	22	Food	0.2022488	0.2232520
23	Oil & Fat	0.4385700	0.2671357	23	Electy	0.1864853	0.2203248
24	Busniness	0.4239424	0.2644195	24	Elec	0.1670230	0.2167107
25	None Elec	0.3839063	0.2569850	25	None Elec	0.1255964	0.2090180
26	Elec	0.2807425	0.2378279	26	Motveh	0.1111792	0.2063408
27	Motveh	0.2803752	0.2377597	27	Mining	0.0858386	0.2016352
28	Electy	0.2778002	0.2372815	28	Ota Monf	0.0833463	0.2011724
29	Ota Monf	0.2688363	0.2356170	29	Oil & Fat	0.0677970	0.1982849
30	Mining	0.0942245	0.2031924	30	Tex & Wr	0.0168782	0.1888295

Table 18 : Statistical Coherence between Employment Backward and Forward Linkage

## Symmetric Measures

		Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	.960	.007	18.081	.000 <sup>a</sup>
Ordinal by Ordinal	Spearman Correlation	1.000	.000 <sup>a</sup>		
N of Valid Cases		30			

a. Based on normal approximation.

two-signification indications. First most sectors attribute to high backward employment linkages rather than forward employment linkages. There are 11 sectors in backward linkage whose value is more than unity, while, there are only 10 sectors that can be found in terms of forward employment linkage. More specifically, most manufacturing industries have more backward employment linkages than forward employment linkages.

Second, the Pearson correlation coefficient between employment forward and backward linkage is 0.96, while Spearman correlation is estimated to be 1.00 (table 18). Therefore, the result indicated that sectors having the highest backward employment linkage are same as those having the highest forward employment. For instance the Others agriculture (sector 1) score the highest value for both backward and forward employment linkages (table 17).

The employment linkages are also high in sectors like Others agriculture, Non metallic products, Wholesale and trade, Hotels and restaurants, Rubber products, Metallic and Chemical. The high employment forward linkage in Others agriculture sector in Malaysia is expected. This may highly due to the additional employment generated in the storage, processing transportation and distribution of agriculture output.

The manufacturing sectors such as Non metallic products, Rubber products, Metallic industry, Chemical products and Petroleum products can be considered as the leading sector in generation employment opportunities among other manufacturing sectors. These sectors have high score in both forward and backward linkage employment generation linkages. This is partly owing to the government's policy of economic liberalization and deregulation aimed at attracting more

investment to increase both domestic and foreign investment, particularly in the manufacturing sectors. The high employment linkages both forward and backward in Wholesale and trade and Hotels and restaurant is due to the strong pick-up in domestic demand for consumer goods and the influx of tourists and high rate of hotel room occupation during the visit Malaysia Year 1990.

Apart from the above sector, most other sectors have relative low employment forward and backward linkages. Sectors such as Electrical machinery, Motor vehicles and transport products, Electricity and gas products, Other manufacturing, Mining and quarrying are sectors indicated relative low backward linkages. This may be explained by industry strategy adopted by these sectors. Some of these industries are in the small scale in the sense of production like Mining and quarrying, Fishing thereby generated relative low employment. Some of them are emphasis the capital and technology intensive rather than labour intensive especially in the heavy industry sectors such as motor vehicles.

### **5.7.2 Key Sector for Employment**

In terms of employment generation as in the output expansion viewpoint, the definitions of “key sectors” of employment generation are as below. First, from the point of view of both backward and forward linkages, the definition of a “key sector” operationally will have  $EU_j$  and  $EU_i$  values which are greater than unity while the corresponding  $EV_j$  and  $EV_i$  values are relatively low. Secondly, if the interested in employment generation is based solely upon backward linkage effects then a “key sector” may be defined as one when the  $EU_j$  value is greater than unity and  $EV_j$  value is relatively low.

Table 19: Key Sector of Overall Employment Linkage

		EU	EV
1	Oth Agr	8.1356835	1.8821492
2	None Met	5.3765964	1.3697996
3	RubPrd	5.1885301	1.3348765
4	Trade	4.2440224	1.1594858
5	Hotel	3.9407848	1.1031760
6	Pers	3.9135692	1.0981222
7	Petror	2.8607902	0.9026261
8	Metal	2.7256965	0.8775398
9	Govt	2.2102727	0.7818280
10	Chem	2.0766377	0.7570126
11	Bev & Tob	1.8287645	0.7109837
12	Prof	1.7708635	0.7002318
13	Food	1.5284508	0.6552169
14	Rr & Comm	1.4447529	0.6396746
15	Cons	1.4410229	0.6389819
16	Rubber	1.3701323	0.6258179
17	Wood	1.2982028	0.6124609
18	Forestry	1.2485464	0.6032399
19	Oil Palm	1.2364125	0.6009867
20	Business	1.0273211	0.5621594

Finally, if the interest is solely in forward linkages, the “key sector” may be defined as one whose  $EU_i$  value is greater than unity and  $EV_i$  value is relative low. By using the first definition there are 20 sectors that can be considered as “key sectors” in terms of over all employment generation (based on both backward and forward employment linkages). These industries included Other agriculture, Non metallic products, Rubber product, Wholesale and trade, Hotels and restaurant, Professional services, Petroleum product, Metallic sectors, Government, chemical, Personal services, Transportation and communication, Construction, Rubber planting, Wood industries, Forestry, Oil palm estates and Business services.( table 19).

Table 20 : Key Sectors for Backward Employment Linkages

		Euj	Evj
1	Oth Agr	3.0802690	0.7576869
2	RubPrd	2.6793383	0.6832360
3	None Met	2.5946995	0.6675189
4	Hotel	2.1501190	0.5849624
5	Pers	2.0101819	0.5589767
6	Trade	1.5571106	0.4748435
7	Petror	1.3273084	0.4321703
8	Food	1.3262019	0.4319649
9	Metal	1.3225740	0.4312912
10	Govt	1.2068585	0.4098033
11	Bev & Tob	1.1666525	0.4023373

On the other hand, using the second definition there are only 11 sectors can be considered as “key sectors” in terms of backward employment linkages. (table 20) These are Others agriculture, Rubber product, Non metallic product, Hotel and restaurant, Personal services, Wholesale and trade, Petroleum product, Food processing, Metallic, Government and Manufactured of beverages and tobacco.

Table 21 : Key Sectors for Forward Employment Linkages

		Eui	Evi
1	Oth Agr	5.0554145	1.1244622
2	None Met	2.7818969	0.7022806
3	Trade	2.6869118	0.6846423
4	RubPrd	2.5091918	0.6516406
5	Pers	1.9033873	0.5391455
6	Hotel	1.7906658	0.5182136
7	Petror	1.5334819	0.4704558
8	Metal	1.4031225	0.4462486
9	Chem	1.2582719	0.4193506
10	GOVT	1.0034142	0.3720247

Finally, from the point of view of forward employment linkage, 10 sectors are qualified as “key sectors”. These are Others agriculture, Non metallic,



Wholesales and trade, Rubber product, Personal services, Hotel and restaurant, Petroleum products, Metallic, Chemical and Government. (table 21).

The above employment key sectors are the sectors with high level of labour absorption. Therefore, to reduce the unemployment rate policy should be designed to expand these sectors output.

Table 22 : Key Sector of Output and Employment Backward Linkages

Output		Backward Linkages		Employment		Backward Linkages	
		$U_j$	$V_j$			$Eu_j$	$Ev_j$
1	Oil & Fat	1.5634726	0.4760249	1	Oth Agr	3.0802690	0.7576869
2	Food	1.3158892	0.4300498	2	RubPrd	2.6793383	0.6832360
3	RubPrd	1.2230459	0.4128093	3	None Met	2.5946995	0.6675189
4	Hotel	1.2088066	0.4101651	4	Hotel	2.1501190	0.5849624
5	Cons	1.2082410	0.4100601	5	Pers	2.0101819	0.5589767
6	Wood	1.1191699	0.3935200	6	Trade	1.5571106	0.4748435
7	Oth Agr	1.1037250	0.3906519	7	Petror	1.3273084	0.4321703
8	Petror	1.0765304	0.3856020	8	Food	1.3262019	0.4319649
9	None Met	1.0709820	0.3845717	9	Metal	1.3225740	0.4312912
10	Metal	1.0702864	0.3844425	10	Govt	1.2068585	0.4098033
11	Bev & Tob	1.0385693	0.3785528	11	Bev & Tob	1.1666525	0.4023373
12	None Elec	1.0034703	0.3720351				

Table 22 is the combination of table 13 and table 20. The distribution shows a close correspondence between those sector that possess relatively large output backward linkages (these with  $U_j$ 's greater than unity) and those sectors that possess relatively large employment backward generation linkages ( these with  $EU_j$ 's greater than unity). In fact, with the exception of Other agriculture and Hotels and restaurant, all are manufacturing sectors namely Rubber product, Non metallic products, Processing food, Metallic product and Manufactured of beverage and tobacco are qualified as "key sectors" of output backward linkage

These sectors are also showing a high employment backward generation. This finding tends to support the contention that sectors which generate

relatively large effective demand for the products of other industries to satisfy their own input requirement, however, at the same time also tend to generate large employment absorption in other sectors too.

Table 23 : The Key Sector of Output and Employment Forward Linkages

	Output	Forward	Linkages		Employment	Forward	Linkages
		Ui	Vi			Eui	Evi
1	Mining	1.3785396	0.4416837	1	Oth Agr	5.0554145	1.1244622
2	Oth Agr	1.3685986	0.4398377	2	None Met	2.7818969	0.7022806
3	Business	1.3682507	0.4397731	3	Trade	2.6869118	0.6846423
4	Chem	1.3601029	0.4382601	4	RubPrd	2.5091918	0.6516406
5	Trade	1.3580624	0.4378812	5	Pers	1.9033873	0.5391455
6	Rr & Comm	1.3126549	0.4294492	6	Hotel	1.7906658	0.5182136
7	Oil & Fat	1.2209457	0.4124193	7	Petror	1.5334819	0.4704558
8	Food	1.2166916	0.4116293	8	Metal	1.4031225	0.4462486
9	Oil Palm	1.1691561	0.4028022	9	Chem	1.2582719	0.4193506
10	Motveh	1.1582533	0.4007776	10	Govt	1.0034142	0.3720247
11	Rubber	1.1156722	0.3928705				
12	Electy	1.1052035	0.3909265				
13	Wood	1.0530507	0.3812419				

Sectors such as Other agriculture, Wholesale and trade and Chemical products are key sectors in terms of forward linkages for both output and employment generation (table 23). Therefore, these sectors not only stimulate great output to other sectors but also create higher labour absorption from the labour forces.

In order to accelerate economic growth and reduce the unemployment, the above sectors should be the “top priority” for policy makers to concentrate on. This because the above sector not only capable of inducing great output but also capable of stimulate many employment opportunities as well, along with absorbing the retrenched workers who are the victims of the financial crisis.

### 5.8 Estimation of Final Direct Demand

Final demand for each sector can be obtained by using the final demand coefficient prepared by Yap (1998) and data from Malaysia Statistic Department for the year of 2000. Table 24 show the final demand coefficient for each sector for the year of 1990.

Table 24: Estimation Coefficient Final Demand For Each Industry at Year 2000

	Sectors	Coefficient For Each Industry At Year 1990				
		PRIV C COEF	GOVT G COEF	CHCNESC COEFF	INV COEFF	EXPORT COEFF
1	Oth Agr	0.049890736	0	0.324427541	0.008452	0.003915217
2	Rubber	6.11834E-07	0	0.113038946	0.008430217	0.006686631
3	Oil Palm	0.001161739	0	-0.05566763	0.020084656	0.012935599
4	Forestry	0.001209117	0	0.01212488	0	0.049615227
5	Fishing	0.029080726	0	0.006288634	1.31254E-05	0.006791259
6	Mining	0.000298096	0	0.891754626	0.000102434	0.122399975
7	Oil & Fat	0.004702288	0	-0.036167531	0.000856058	0.049555189
8	Food	0.09483163	0	-0.252213255	0.000853991	0.026863658
9	Bev & Tob	0.042137206	0	-0.020168985	0.000160577	0.000935935
10	Tex & Wr	0.017356075	0	0.007235314	0.001857166	0.05497935
11	Wood	0.016688511	0	-0.021561341	0.002455239	0.047100623
12	Chem	0.011439217	0	-0.028318549	0.001049421	0.011579262
13	Petror	0.045990588	0	-0.015966042	0.001707312	0.014559384
14	RubPrd	0.011926875	0	0.435524187	0.000427833	0.038493271
15	None Met	0.001829809	0	-0.030590537	0.00151987	0.008498384
16	Metal	0.002278655	0	-0.14274518	0.011390199	0.030250299
17	None Elec	0.002545042	0	0.037419495	0.014311028	0.0127216
18	Elec	0.010706346	0	-0.48466377	0.023013695	0.278986968
19	Motveh	0.024154958	0	-0.013591022	0.036622261	0.021836665
20	Ota Monf	0.003900547	0	-0.027771042	0.001768974	0.040036804
21	Electy	0.024198266	0	0.004311801	3.12776E-06	0.000310707
22	Water	0.004732162	1.4096E-06	-0.00112093	0.000177556	0.000158648
23	Cons	0.000176235	0	0.004011187	0.509013515	0.000192588
24	Trade	0.083855598	0	0.009799643	0.069005396	0.025532413
25	Rr & Comm	0.004025679	0	0.017673935	0.004907294	0.042691788
26	Hotel	0.055199059	0	-0.01007982	0.000514741	0.000232065
27	Business	0.093470725	0	-0.000183227	5.01001E-05	0.005572651
28	Prof	0.039024408	0	-0.01280593	0.000323612	0.000329556
29	Pers	0.013906849	0	-0.003698715	8.36677E-05	5.32368E-05
30	Govt	0.0022985	0.99999859	-0.004389368	8.71864E-05	8.79263E-05
	TOT ID	0.703749718	1	0.701907317	0.719242251	0.913902878

Table 25 : Gross National Products By Demand Aggregate 2000 ( Rm Million Malaysia )

Final Consumption Expenditure		Gross Fixed Capital Formation		Change In Stocks	Exports
Public	Private	Public	Private	I	X
33,481	143,492	36,880	37,924	1,785	376,462

Table 26 : Estimation of Output for Final Demand from Each Industry at Year 2000

		PRIV C	GOVT G	Stock Change	Investment I	EXPORT X	Total Final Demand
1	Oth Agr	7158921	0	579103	632243	1458270	9828538
2	Rubber	88	0	201775	630614	2490516	3322992
3	Oil Palm	166700	0	-99367	1502413	4818019	6387765
4	Forestry	173499	0	21643	0	18479787	18674928
5	Fishing	4172852	0	11225	982	2529486	6714544
6	Mining	42774	0	1591782	7662	45589340	47231559
7	Oil & Fat	674741	0	-64559	64037	18457425	19131643
8	Food	13607580	0	-450201	63882	10005692	23226953
9	Bev & Tob	6046352	0	-36002	12012	348600	6370962
10	Tex & Wr	2490458	0	12915	138923	20477719	23120015
11	Wood	2394668	0	-38487	183662	17543192	20083035
12	Chem	1641436	0	-50549	78501	4312835	5982224
13	Petror	6599281	0	-28499	127714	5422817	12121313
14	RubPrd	1711411	0	777411	32004	14337281	16858106
15	None Metal	262563	0	-54604	113692	3165325	3486976
16	Metal	326969	0	-254800	852032	11267087	12191288
17	None Elec	365193	0	66794	1070522	4738313	6240822
18	Elec	1536275	0	-865125	1721516	103912044	106304711
19	Motveh	3466043	0	-24260	2739492	8133328	14314603
20	Ota Monf	559697	0	-49571	132326	14912188	15554640
21	Electy	3472258	0	7697	234	115726	3595914
22	Water	679027	47	-2001	13282	59090	749446
23	Cons	25288	0	7160	38076247	71732	38180427
24	Trade	12032607	0	17492	5161880	9509854	26721833
25	Rr & Comm	577653	0	31548	367085	15901069	16877355
26	Hotel	7920623	0	-17992	38505	86435	8027571
27	Business	13412301	0	-327	3748	2075601	15491323
28	Proff	5599690	0	-22859	24207	122747	5723786
29	Pers	1995522	0	-6602	6259	19829	2015007
30	Govt	329816	33480953	-7835	6522	32749	33842205

Output = Coefficient Industry X Sum of Aggregate Demand.

E.g. : 0.049890736 X Rm143,492, 000 thousan = Rm 7158921 thousand

Table 25 show the gross national products by demand aggregates 2000 from the Ministry of Finance. The estimate total private consumption for year 2000 is Rm 33,481 million and by public is Rm143,492 million. The estimate gross fixed capital formation for public and private is Rm36,880 million and Rm 37,924 million. The change in stocks for year 2000 is only Rm 1,785 million and the estimate export is Rm376,462 million.

The total final direct demand (table 26) can be derived by multiplying the final demand coefficient from each sector with the gross national product in table 20.

### 5.9 Final Direct and Indirect Demand for Each Sector

Total final direct and indirect demand (table 28) for each final demand sector (C,G,S,I and X) is computed by multiplying final direct demand with Leontief inverse matrix. The direct and indirect output (Y) is obtained by adding across all final demand from private consumption (C), government consumption (G), changes in stock (S), investment (I) and export (X). The formula is as below :

$$(I-A)^{-1}(X) = Y$$

where  $(I-A)^{-1}$  = Leontief inverse matrix

(X) = Final Demand

Y = Direct and indirect output

### 5.10 Impact Of Investment in Telecommunication

Adequate investment in telecommunications is important for both the developed nations and the developing nations. The advances made in telecommunications will affect the growth of the national economy. Its also will carry Malaysia into the information age and the realisation of Vision 2020. The mergers of communications and computer technologies have sparked innovations that are transforming the overall global and local activities. Subsequently, no economic, political or social entity can be exempted from the influence of telecommunications. The world is getting smaller through these links. This section is to analyze the impact of investment in telecommunication industry. For year 2000, around RM 11.1 billion will be invested in the telecommunication industry, They are from the five dominant players namely, Telekom Malaysia, Celcom, Maxis Communications, Time Telekom and Digi Telecom. Telekom Malaysia is investing around Rm 3.5 billion, Maxis Rm 2 billion, Digi Telecom will invest Rm 600 million , Time Telekom will invest Rm4.5 billion and Celcom is going to invest Rm 500 million.. Therefore, the amount of investment in transportation and communication will increase from Rm 367,085.2124 to Rm1,46,085.212 thousand. (table 26 & 27)

The impact of increased investment in telecommunication in direct and indirect final demands are shown in table 27 and 28. The new column (table 28) is the total amount after the increase of investment. Direct final demand can be derived by multiplying the industry's coefficient with the sum of aggregate demand. Table 27 shows the direct final demand using the above equation.

Table 27 : Estimation of Output for Direct and Indirect Final Demand for Each Industry at Year 2000

		PRIV C	GOVT G	Stock Change	Investment I	EXPORT X	Total Final Demand
1	Oth Agt	7158921	0	579103	632243	1458270	9828538
2	Rubber	88	0	201775	630614	2490516	3322992
3	Oil Palm	166700	0	-99367	1502413	4818019	6387765
4	Forestry	173499	0	21643	0	18479787	18674928
5	Fishing	4172852	0	11225	982	2529486	6714544
6	Mining	42774	0	1591782	7662	45589340	47231559
7	Oil & Fat	674741	0	-64559	64037	18457425	19131643
8	Food	13607580	0	-450201	63882	10005692	23226953
9	Bev & Tob	6046352	0	-36002	12012	348600	6370962
10	Tex & Wr	2490458	0	12915	138923	20477719	23120015
11	Wood	2394668	0	-38487	183662	17543192	20083035
12	Chem	1641436	0	-50549	78501	4312835	5982224
13	Petror	6599281	0	-28499	127714	5422817	12121313
14	RubPrd	1711411	0	777411	32004	14337281	16858106
15	None Met	262563	0	-54604	113692	3165325	3486976
16	Metal	326969	0	-254800	852032	11267087	12191288
17	None Elec	365193	0	66794	1070522	4738313	6240822
18	Elec	1536275	0	-865125	1721516	103912044	106304711
19	Motveh	3466043	0	-24260	2739492	8133328	14314603
20	Ota Mpnf	559697	0	-49571	132326	14912188	15554640
21	Electy	3472258	0	7697	234	115726	3595914
22	Water	679027	47	-2001	13282	59090	749446
23	Cons	25288	0	7160	38076247	71732	38180427
24	Trade	12032607	0	17492	5161880	9509854	26721833
25	Rr & Comm	577653	0	31548	1467085	15901069	1119918830
26	Hotel	7920623	0	-17992	38505	86435	8027571
27	Business	13412301	0	-327	3748	2075601	15491323
28	Prof	5599690	0	-22859	24207	122747	5723786
29	Pers	1995522	0	-6602	6259	19829	2015007
30	Govt	329816	33480953	-7835	6522	32749	33842205

Estimated About Rm 1110 million will be invested in Telecommunication for the year of 2000 Therefore the total investment in Telecommunication is Rm367,085.2124 thousand + Rm1,100,000 thousand = Rm 1,467,085.212 thousand

The differentiate between the new amount and base amount can be derive by using the formula below :

$$\text{Differentiate} = [ (\text{New Amount} - \text{Base Amount}) / \text{Base Amount} ] \times 100 \%$$

As shown in table 28, the investment of Rm11.1 billion in telecommunication sector stimulate every sector production. All sectors indicate improvement in output especially transportation and communication sectors indicate the highest increase in output. This sector indicate the increase of Rm 1,467,085.212 thousand owing to the investment in telecommunication by the five dominant players which provides the network services. The total increase in output in this sector is about 3513% (table 28). The high increase in transportation and communication is owed to the large usage of telecommunication systems to extract information, news and data such as telephones, telegrams telexes and mobile phone etc which in turn will assist the activities of large scale business either domestically or foreign which also includes the government departments.

Motor vehicles and transport products sector indicate the second highest increase in output (171%) (table 28). Followed by Personal services (166%), hotel and restaurant (153%), Business services (144%) and Petroleum products (139%). These sectors have higher production level owing to the strong influence of telecommunication in these sectors. Undoubtedly, an increase investment in telecommunication will definitely increase the value of access to the network, indirectly increases the number of people that can be reached on the network to enhance interconnection of two separate networks from overall the world.

Motor vehicle and petroleum products gain high level of output owing to the increase of coordination of numerous activities such as the acquisition of suppliers, recruitment and coordination of labour, control of stocks, processing of material delivery of goods to buyers and general market search activities, all these activities requires motor vehicles to implement especially the delivery task. In the



absence of accessible and reliable motor vehicle service the above activities suffer a variety of inefficiencies including the creation of markets.

Personal services indicate the third highest output. This is because the usage of personal computer (PC) expands the activities carried out by personal services sectors. Personal computer will enable the sending and receiving faxes and voice data. Addition to that, mobile phone can be used for exchanging e-mail and keeping appointments, maintaining contact list and keeping notes. Therefore, the investment in telecommunication has given the tools and techniques for most of the personal services sector in increasing the output substantially.

The increase output in Restaurant and hotel and Business services are owing to the high inflow of numerous entrepreneurs from other regions attracted to the capability of the telecommunication industry in providing the appropriate market intelligence for profit-making. Besides that, business services indicate a high percentage of output due to the extensions of existing business or the establishment of a completely new business. The web site facilities allow businesses services to establish its own presence in the cyber world, to complement or to establish its chain of outlets in Malaysia or overseas. Undoubtedly, this will increase the output.

Sector such as Other agriculture, Oil palm estate, Forestry and logging, Fishing, Mining and quarrying, Manufactured oil and fats, Processing food, Beverage and tobacco, Textiles and wearing apparel, Non metallic product, Electrical machinery, Other manufactured and Construction indicate a rather low percentage change, between 3% to 20%. This is because these sectors are not really influenced by the increase of investment in telecommunication.

### 5.11 Impact of Investment in Lebu Raya SPRINT

Development of the economy will increase the traffic volume. The situation will intensify in the future, when about eight new developments are expected in the areas of Damansara, Penchala, Bukit Lanjan and Sungai Buloh. Therefore, this will cause the existing road network to be badly congested and it will not be able to cope with the increase in traffic. The bigger ring road Middle Ring Road I (MRR I ) formed by Jalan Parlimen, Jalan Istana and lebu raya Mahameru become severely congested due to the rapid expansion. While, the Middle Ring Road II which allows motorists to bypass the city central, however is too far out and is unable to efficiently ease the traffic congestion in the city.

Therefore, Lebu Raya SPRINT (System Penyuraian Trafik Kuala Lumpur Barat Sdn Bhd) provide an intermediate ring road between MRR I and MRR II to solve this problem. The solutions lies within its three critical links, Kerinchi link, Damansara link and Penchala link serving as a dispersal road system aimed to ease traffic congestion and to provide the increased road capacity in the west of Kuala Lumpur. It also serves as the crucial link road network in supporting infrastructure, catalyzing growth and development in the west of Kuala Lumpur.

The Kerinchi link enable motorists heading for a destination outside Kuala Lumpur to avoid the heavily congested roads like Jalan Kuching and Jalan Istana in the city central. While, the Damansara link is developed in order to eliminate severe congestion at Jalan Maarat and Jalan Semantan. It also aims at easing the increase in traffic from future developments along Jalan Damansara. The Penchala link serves as the crucial spine road for the future development in

Table 28 : Direct and Indirect Final Demand In Telecommunication Sector

	Sectors	Consumption C	Government G	STOCK CHANCE	INVESTMENT I	EXPORT X	New Total Final Demand	Base Total Final Demand	Differentiate (value)
1	Oth Agr	15940245.375	626552.248	472283.635	4004646.060	6845243.006	27888970.324	24821670.844	3067299.480
2	Rubber	1097024.953	28545.887	632756.689	5526583.236	10932767.994	18217678.758	13459002.581	4758676.177
3	Oil Palm	1643598.695	143273.039	-139116.499	2423769.143	15374278.976	19445803.354	18665795.427	780007.927
4	Forestry	880106.575	112664.211	12618.088	2354134.140	22545951.379	25905474.393	24460595.822	1444878.571
5	Fishing	4504472.398	48069.106	8381.846	464923.863	2705866.945	7831714.158	7387998.666	443715.492
6	Mining	3529188.811	243020.372	1538723.747	12963638.396	52269722.011	70544293.337	59974042.486	10570250.850
7	Oil & Fat	2801930.870	231749.122	-106209.652	1757837.610	29122941.024	33808248.974	32338154.493	1470094.482
8	Food	19515713.150	845989.641	-411995.156	4776887.874	12952029.743	37678625.252	33350666.120	4327959.132
9	Bev & Tob	6640846.554	54299.082	-38640.058	796220.565	451656.858	7904383.001	7142405.028	761977.973
10	Tex & Wr	3254241.870	217766.594	15398.602	1649043.015	25774393.804	30910843.884	29533204.955	1377638.930
11	Wood	3925317.304	612580.140	-47365.590	12978680.120	22356280.646	39825492.620	31743794.152	8081698.468
12	Chem	4596785.688	692310.188	-25149.409	7653688.926	11640060.272	24557695.665	18773769.143	5783926.522
13	Petror	7496488.995	218652.446	-30402.603	25191173.571	8573829.898	41449742.306	17320049.982	24129692.324
14	RubPrd	2030244.697	50486.354	804283.355	9084567.704	15671580.551	27641162.661	18795187.269	8845975.392
15	None Met	586636.710	192691.363	-61513.351	5268886.942	4153480.359	10140182.024	9067403.962	1072778.062
16	Metal	880737.566	186280.991	-281708.933	5918035.054	14316410.690	21019755.369	19374485.277	1645270.092
17	None Elec	601914.092	86033.393	75063.693	3193102.728	5852782.421	9808896.326	8114458.044	1694438.283
18	Elec	1844965.263	148241.216	-876504.553	7176137.352	107083682.594	115376521.872	111037550.836	4338971.036
19	Motveh	5499283.998	238745.334	-20437.665	4122550.837	12349641.460	59292783.965	21841352.684	37451431.281
20	Ota Monf	837292.968	254787.338	-52641.457	1842232.122	16279726.450	19161397.421	17542288.013	1619109.408
21	Electy	5094542.568	849334.830	182.819	13977010.814	4260123.665	24181194.697	11166772.669	13014422.028
22	Water	881337.332	178197.531	-2817.558	1252571.499	405452.317	2714741.120	1565641.734	1149099.385
23	Cons	1115630.107	1603592.066	10449.682	45333791.959	1142844.997	49206308.810	42325515.458	6880793.352
24	Trade	14583068.240	595437.154	-21407.040	26352226.885	21703986.652	63213311.891	45341037.143	17872274.748
25	Rr & Comm	3996367.659	1450182.419	46058.562	1193146108.525	24965001.063	1223603718.227	33863186.065	1189740532.162
26	Hotel	8539134.281	757165.783	-18294.310	17713921.029	1370528.739	28362455.522	11220627.866	17141827.656
27	Business	17346379.665	1899690.144	5769.619	47872676.193	10103465.435	77227981.056	31651062.367	45576918.688
28	Proff	6029612.428	108304.958	-23625.600	1741202.936	462485.162	8317979.884	6708679.109	1609300.775
29	Pers	2120078.753	241021.132	-3561.413	5061939.072	380290.544	7799768.087	2928259.715	4871508.372
30	Govt	502866.821	33661420.742	-7433.965	1485349.702	333711.779	35975915.079	34709187.614	1266727.465

Table 29 : List of Direct Final Demand Before Investment In Construction Sector

	Sectors	PRIV C	GOVT G	Stock Change	Investment I	EXPORT X	Total Final Demand
1	Oth Agr	7158921	0	579103.16	632243.394	1458269.6	9828537.6
2	Rubber	87.79325	0	201774.52	630613.966	2490515.9	3322992.2
3	Oil Palm	166700.3	0	-99366.72	1502412.62	4818019.1	6387765.3
4	Forestry	173498.6	0	21642.912	0	18479787	18674928
5	Fishing	4172852	0	11225.212	981.835228	2529485.8	6714544.4
6	Mining	42774.4	0	1591782	7662.4928	45589340	47231559
7	Oil & Fat	674740.8	0	-64559.044	64036.547	18457425	19131643
8	Food	13607580	0	-450200.66	63881.9601	10005692	23226953
9	Bev & Tob	6046352	0	-36001.638	12011.814	348600.07	6370962.1
10	Tex & Wr	2490458	0	12915.035	138923.418	20477719	23120015
11	Wood	2394668	0	-38486.993	183661.68	17543192	20083035
12	Chem	1641436	0	-50548.61	78500.86	4312835.2	5982223.6
13	Petror	6599281	0	-28499.385	127713.784	5422817.2	12121313
14	RubPrd	1711411	0	777410.67	32003.6504	14337281	16858106
15	None Met	262562.9	0	-54604.109	113692.341	3165324.9	3486976.1
16	Metal	326968.8	0	-254800.15	852032.433	11267087	12191288
17	None Elec	365193.2	0	66793.799	1070522.11	4738312.6	6240821.7
18	Elec	1536275	0	-865124.83	1721516.46	103912044	106304711
19	Motveh	3466043	0	-24259.974	2739491.58	8133327.9	14314603
20	Ota Monf	559697.3	0	-49571.31	132326.321	14912188	15554640
21	Electy	3472258	0	7696.564	233.969246	115726.42	3595914.5
22	Water	679027.4	47.19484	-2000.8595	13281.9327	59090.265	749445.91
23	Cons	25288.27	0	7159.9697	38076247	71731.632	38180427
24	Trade	12032607	0	17492.362	5161879.64	9509853.6	26721833
25	Rr & Comm	577652.8	0	31547.974	367085.212	15901069	16877355
26	Hotel	7920623	0	-17992.479	38504.653	86435.45	8027571
27	Business	13412301	0	-327.05952	3747.68595	2075600.8	15491323
28	Proff	5599690	0	-22858.584	24207.4609	122747.09	5723786.3
29	Pers	1995522	0	-6602.2057	6258.67732	19828.696	2015006.7
30	Govt	329816.4	33480953	-7835.0219	6521.89272	32749.223	33842205

Damansara, Penchala, Bukit Lanjan and Sungai Buloh. Currently, around 68 per cent of Damansara and Kerinchi link already completed. The construction is progressing smoothly ahead of schedule. Both links are expected to be completed in mid 2001. Hence, this will allow motorists faster and smoother travel via the multi-tier interchanges. A sum of Rm1.3 billion ringgit will be allocated to implement the SPRINT highway programs in 2000 by the developers.

Table 30 : List of Direct Final Demand After Investment In Construction Sector

	Sectors	PRIV C	GOVT G	Stock Change	Investment I	EXPORT X	Total Final Demand
1	Oth Agr	7158921	0	579103.2	632243.394	1458269.58	9828537.59
2	Rubber	87.79325	0	201774.5	630613.966	2490515.93	3322992.21
3	Oil Palm	166700.3	0	-99366.7	1502412.62	4818019.07	6387765.27
4	Forestry	173498.6	0	21642.91	0	18479786.7	18674928.2
5	Fishing	4172852	0	11225.21	981.835228	2529485.84	6714544.4
6	Mining	42774.4	0	1591782	7662.4928	45589339.6	47231558.5
7	Oil & Fat	674740.8	0	-64559	64036.547	18457424.8	19131643
8	Food	13607580	0	-450201	63881.9601	10005691.9	23226953.4
9	Bev & Tob	6046352	0	-36001.6	12011.814	348600.066	6370962.15
10	Tex & Wr	2490458	0	12915.04	138923.418	20477718.5	23120014.9
11	Wood	2394668	0	-38487	183661.68	17543192.3	20083034.8
12	Chem	1641436	0	-50548.6	78500.86	4312835.22	5982223.57
13	Petror	6599281	0	-28499.4	127713.784	5422817.23	12121313.1
14	RubPrd	1711411	0	777410.7	32003.6504	14337280.8	16858106.3
15	None Met	262562.9	0	-54604.1	113692.341	3165324.93	3486976.07
16	Metal	326968.8	0	-254800	852032.433	11267087	12191288
17	None Elec	365193.2	0	66793.8	1070522.11	4738312.63	6240821.75
18	Elec	1536275	0	-865125	1721516.46	103912044	106304711
19	Motveh	3466043	0	-24260	2739491.58	8133327.94	14314602.8
20	Ota Monf	559697.3	0	-49571.3	132326.321	14912188	15554640.3
21	Electy	3472258	0	7696.564	233.969246	115726.422	3595914.49
22	Water	679027.4	47.19484	-2000.86	13281.9327	59090.2653	749445.91
23	Cons	25288.27	0	7159.97	39376247	71731.6321	39480426.9
24	Trade	12032607	0	17492.36	5161879.64	9509853.63	26721833
25	Rr & Comm	577652.8	0	31547.97	367085.212	15901068.7	16877354.7
26	Hotel	7920623	0	-17992.5	38504.653	86435.4501	8027570.98
27	Business	13412301	0	-327.06	3747.68595	2075600.77	15491322.7
28	Prof	5599690	0	-22858.6	24207.4609	122747.089	5723786.33
29	Pers	1995522	0	-6602.21	6258.67732	19828.6964	2015006.73
30	Govt	329816.4	33480953	-7835.02	6521.89272	32749.2233	33842205.2

Estimated Rm1.3 billion will be invested in Construction Lebu Raya Sprint for the year of 2000 Therefore the total investment in Construction is going to be Rm38,076,247 thousand + Rm1,300,000 thousand = Rm 39,376,247 thousand

The amount of investment in construction will increase from Rm38,076,247 thousand to Rm 39,376,247 thousand. (Tables 29 & 30)

Contribution by Lebu Raya SPRINT on direct and indirect final demand is shown in tables 29, 30 and 31. The new column in table 31 is the total amount after the contribution of Rm1.3 billion by developers

Table 31 : Direct and Indirect Final demand In Construction Sector

	Sectors	PRIV C	GOVT G	CHCNESC	INVESTMENT	EXPORT	New Total		Base Total		Differentiate (%)
							Final Demand	Final Demand	Final Demand	Final Demand	
1	Oth Agr	15940245.4	626552.2484	472283.6346	940651.6212	6845243.01	24824975.88	24821670.84	0.013315142		
2	Rubber	1097024.95	28545.88721	632756.6888	769912.5138	10932768	13461008.04	13459002.58	0.014900476		
3	Oil Palm	1643598.7	143273.0394	-139116.4991	1645995.9	15374279	18668030.11	18665795.43	0.011972079		
4	Forestry	880106.575	112664.2106	12618.08802	937515.2161	22545951.4	24488855.47	24460595.82	0.115531309		
5	Fishing	4604472.4	48069.10568	8381.846031	21604.43018	2705866.95	7388394.725	7387998.666	0.005360841		
6	Mining	3529188.81	243020.3723	1538723.747	2463900.392	52269722	60044555.33	59974042.49	0.117572277		
7	Oil & Fat	2801930.87	231749.1217	-106209.652	291881.0315	29122941	32342292.4	32338154.49	0.012795729		
8	Food	19515713.1	845989.6413	-411995.1563	454306.7855	12952029.7	33356044.16	33350666.12	0.016125745		
9	Bev & Tob	6640846.55	54299.08243	-38640.05822	34768.36732	451656.858	7142930.804	7142405.028	0.007361319		
10	Tex & Wr	3254241.87	217766.5939	15398.60179	273978.1841	25774393.8	29535779.05	29533204.95	0.008715949		
11	Wood	3925317.3	612580.1401	-47365.58978	5049176.758	22356280.6	31895989.26	31743794.15	0.479448378		
12	Chem	4596785.69	692310.1879	-25149.40883	1922246.254	11640060.3	18826252.99	18773769.14	0.279559473		
13	Petror	7496488.99	218652.4459	-30402.60324	1088144.48	8573829.9	17346713.22	17320049.98	0.15394432		
14	RubPrd	2030244.7	50486.3539	804283.3555	241640.2933	15671580.6	18798235.25	18795187.27	0.016216816		
15	None Met	586636.71	192691.3633	-61513.3511	4333604.233	4153480.36	9204899.315	9067403.962	1.516369555		
16	Metal	880737.566	186280.9914	-281708.9327	4382134.198	14316410.7	19483854.51	19374485.28	0.564501376		
17	None Met	601914.092	86033.39259	75063.69297	1509603.936	5852782.42	8125397.534	8114458.044	0.134814802		
18	Elec	1844965.26	148241.2155	-876504.5527	287112.573	107083683	111071497.1	111037550.8	0.030571871		
19	Motveh	5499284	238745.3343	-20437.66451	3792109.638	12349641.5	21893342.77	21841352.68	0.082367071		
20	Ota Monf	837292.968	254787.3382	-52641.45733	224939.05	16279726.5	17544104.35	17542288.01	0.010354044		
21	Electy	5094542.57	849334.8299	182.8194091	987657.9481	4260123.67	11191841.83	11166772.67	0.22449782		
22	Water	881337.332	178197.5306	-2817.558429	105786.6339	405452.317	1567956.254	1565641.734	0.147832029		
23	Cons	1115630.11	1603592.066	10449.68165	39761285.08	1142845	43633801.93	42325515.46	3.091011324		
24	Trade	14583068.2	595437.1542	-21407.04038	8574411.04	21703986.7	45435496.05	45341037.14	0.208329825		
25	Rr & Comm	3996367.66	1450182.419	46058.56169	3486123.937	24965001.1	33943733.64	33863186.07	0.237861771		
26	Hotel	8539134.28	757165.7835	-18294.31006	586567.259	1370528.74	11235101.75	11220627.87	0.128993546		
27	Business	17346379.7	1899690.144	5769.618946	2354620.947	10103465.4	31709925.81	31651062.37	0.185976197		
28	Proff	6029612.43	108304.9581	-23625.59953	134771.2967	462485.162	6711548.245	6708679.109	0.042767521		
29	Pers	2120078.75	241021.1316	-3561.413287	196170.8145	380290.544	2933999.83	2928259.715	0.196024796		
30	Govt	502866.821	33661420.74	-7433.9649	224899.843	333711.779	34715465.22	34709187.61	0.018086294		

As shown in table 31 the contribution of Rm 1.3 billion in construction SPRINT highway by developers will stimulate each sector's production in a similar manner to the case in telecommunications. All sectors indicate an improvement in output level especially Construction (sector 2) which shows higher output increase. Follow by Non metallic products (sector 15), Metallic products (sector 16), Wood based industry products (sector 11) and Chemical products (sector 12). All these sectors indicate an increase in output from 0.3% to 3%.

Construction sector shows the increase of 3.09% in total output (table 31). The high increase in construction sector is owing to the increase in demand for construction and building materials in order to fulfill the increased road network by SPRINT.

Non metallic products indicate the second higher output increase 1.51% compare with construction sector. This sector attributed to higher output is due to the high demand for cement, lime, paster, cut-stone products, slate products etc. All of these are the major construction related materials.

The increase output of metallic products by 0.56% in the construction of highway is attributed to the increase in demand of fabricated metal products such as iron and steel, structural metal products. The output for these sectors is an important material for the structures used in the construction of highways.

Wood based industry and Chemicals products also attained higher output in the construction of highway 0.48% and 0.28%. The increase output of these sectors was in response to the buoyant demand of increasing construction highway activities. Wood products like plywood, veneer and block boards are the essential materials in construction the highway structure.

However, sectors like Fishing (sector 5), Beverages and tobacco (sector 9), Textiles and wearing apparel (sector 10) indicates rather low increase in output, the rank is around 0.005 % to 0.008% not even reaching 0.1%. This is because these sectors are not really influence by the construction of highway. Hence, all the above mentioned sectors showed only slight increase in their output.

### **5.12 Policy Implication**

The results of the linkage analysis reveals that there are many sectors with extensive links with the rest of economy, whether in terms of backward or forward linkages. However, only a few number of sectors emerge as key sectors in the Malaysia economy. The overall sectoral linkage indices have revealed an increasing trend. All of these indicate that the economy is becoming more interrelated.

The manufacturing sectors, comprising both light and heavy industries posses high linkages with the rest of economy in terms of both backward or forward linkages, as compared with primary and non tradable sectors. The majority of these sectors are involved in processing for domestic as well as export markets, Manufactured of oil and fats, Food processing, Chemical products, Rubber products, Metal based industries and Motor vehicles and transportation products. Therefore, any changes in their level of productive activity would generate extensive repercussions on the economy. Hence, these sectors should be giving high priority in national development plans.

A noteworthy trend in the analysis of intersectoral linkages is the emergence of agro-based manufacture sectors as the key sectors, namely Manufacture



of oil and fats, Food processing, Wood and paper products and Manufacturing of beverage and tobacco. These sectors should be promoted as they have the capability of inducing the growth and expansion of other sectors in their economy. Therefore, appropriate incentive programs should be launched to stimulate investment in these sectors. In terms of research and development and technology activities, the increase in input cost and competitiveness in export markets serve as.

The conclusion drawn from output backward linkage studies suggest that an expansion in final demand markets would stimulate output from the supplying sectors which feed these industries. The results from output forward linkages suggest that emphasis on the expansion of intermediate market would stimulate output from the buying industries.

The empirical results also reflect the important policy implication that are related to the employment changes. The empirical results indicate those sectors with high and low employment generation as well. Manufacturing and Other agriculture sectors indicate the high employment generation.. Conversely, Mining and quarrying, Fishing, Electricity and gas, Motor vehicles indicating relative low employment generation.

The empirical results imply that if the unemployment rate is high policy should emphasis the sectors with high backward employment linkages. Emphasis on forward employment linkages is appropriate if the economy is facing a supply side shortage.

The study of the impact from investment in telecommunication indicate that telecommunication industry plays the proactive role in leading and transforming the Malaysian economy into an information based economy of the 21st

century. The result also indicate that telecommunication sector capable to accelerate the growth of most none tradable sectors, especially, services sectors. Therefore, investment in these activities is important in reallocation of current capital stock in order to achieve the extensive economic growth.

Empirical result from the contribution from the construction of the SPRINT highway, show that the investment in highway also enhances all sectoral output especially in sectors like : Construction, Non metallic products, and Metallic products, Wood based industry products and Chemical products. However, investment in construction and telecommunication does bring negative impact in term of increasing import technologies or materials from overseas. In the long term this will result in lower economic growth owing to the outflow of currency. Nonetheless, the contribution of both telecommunication and construction on economic growth still remains crucial but must be implemented in a manner which maximises local content wherever possible.

### **5.13 Conclusion**

Based on the empirical evidence gathered so far, it would conclude that by concentrating investment on “key sectors” (these sectors with high backward and forward linkages) the industrialisation process can be speeded up. If investment, entrepreneurial skills and energy are allocated to key sectors on a priority basis, certainly output and employment will grow more rapidly than if these sectors are not given special attention. Therefore, these key sectors will stimulate greater economic activity in other sectors. Subsequently, they will have a large multiplier effect on economic growth.

The investment impact analysis in telecommunication and construction implies that both sectors have positive influences on other sectors' output level. Both sectors are potential stimulants to most other sectors. Therefore, substantial investment in these sectors not only will enhance growth but also expand employment generation.