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Malaysia's Structural Impediments to High Income Status: Decomposition Analysis of Output Growth 1991-2005

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Objectives

- ❑ To explain sectoral output performance.
- ❑ To determine contribution of components of final demand to output growth.
- ❑ To suggest policy directions that could help enhance Malaysia's economic development going forward.

Methodology

- **Chenery (1960) first established the methodology for demand side decomposition of output growth followed by Akita (1991) and Zakariah & Ahmad (1999)**
- **The approach attributes output growth to:**
 - a) Domestic demand expansion**
 - b) Export demand expansion**
 - c) Intermediate demand expansion, or Technological change; and**
 - d) Import substitution**

Methodology

- Under equilibrium conditions, open input-output relation can be postulated as:

$$X = D + W + E - M,$$

where

X = vector of gross output

D = vector of domestic final demand

W = matrix of intermediate demand

E = vector of export demand

M = vector of imports

Methodology

- Let $\Delta X = X_i - X_0$
- Decomposed output can be expressed as:
$$\Delta X = R \mu_1 \Delta D + R \Delta E + R \mu_1 \Delta A X_0 + R \Delta \mu (A_0 X_0 + D_0)$$

In words, decomposed change in output =

Δ domestic demand

+ Δ export demand

+ Δ intermediate demand

+ Δ import substitution demand

Sources of Data

- **Malaysia's input-output tables, published by Department of**
- **Statistics**
 - **I-O Table, 1991**
 - **I-O Table, 2005**
- **deflate the 2005 table to make it consistent with the 1991 Table**

Results & Discussion

- Output as characterized in 1991 I-O Tables compared with that in 2005 I-O Tables

1) Total Output

a) 1991 – Top 20 Highest

Table 1: Output of Top 20 Sector (1991, RM'000)

Bil	TOTAL INPUT AND USE	X0 1991	Rank
1	Radio, TV and Com Equipment	28,775,002.00	1
2	Wholesale & retail trade	25,858,187.38	2
3	Buildings & constructions	25,088,324.68	3
4	Oils and fats	14,746,054.01	4
5	Crude petrol, natural gas & coal	13,769,369.77	5
6	Transport	13,676,287.10	6
7	Motor vehicles	8,052,713.61	7
8	Forestry & logging products	7,179,826.71	8
9	Hotels & restaurants	6,814,621.36	9
10	Elec Appl and Houseware	6,788,566.00	10
11	Meat and Meat Products	6,777,956.82	11
12	Industrial chemicals	6,142,140.65	12
13	Education	6,124,292.46	13
14	Public Order	6,034,626.00	14
15	Business services	5,727,522.14	15
16	Ownership of dwellings	5,669,673.00	16
17	Sawmill products	5,198,785.63	17
18	Petrol & coal products	4,947,215.73	18
19	Agriculture Products and Others	4,574,272.65	19
20	Iron & steel	4,527,655.26	20

Results

b) 2005 – Top 20 Highest

Table 2: Output of Top 20 Sector (2005, RM'000)

Bil	TOTAL INPUT AND USE	X1 - 2005	Rank
1	Radio, TV and Com Equipment	118,745,478.79	1
2	Wholesale & retail trade	113,576,332.69	2
3	Other electrical machinery	74,821,309.92	3
4	Crude petrol, natural gas & coal	49,802,938.64	4
5	Petrol & coal products	46,910,931.81	5
6	Business services	41,375,465.00	6
7	Transport	34,089,180.85	7
8	Insurance	30,153,011.15	8
9	Real estate	30,118,237.66	9
10	Banking services	28,056,813.88	10
11	Oils and fats	27,136,702.42	11
12	Motor vehicles	18,316,843.84	12
13	Others	18,024,873.56	13
14	Other chemical products	16,781,454.94	14
15	Communication	16,765,682.53	15
16	Electricity & gas	15,563,083.65	16
17	Other Metal Products	14,598,617.57	17
18	Industrial chemicals	14,451,882.19	18
19	Buildings & constructions	13,373,394.06	19
20	Paper & board	13,119,286.31	20

Comparing the two tables, we see that the first 2 sectors are still the same position
But Building & construction sector has fallen from 3rd to 19th position.

Results

- To determine the growth rate of output over 1991-2005, in terms of compounded annual growth rate (CAGR)

a) Top 20 sectors Highest

Table 3: Output CAGR – Top 20 Sector (1991-2005)

No.	TOTAL INPUT AND USE	COMMODITY	CAGR %
1	Other chemical products	34	26.55
2	Other electrical machinery	50	20.84
3	Insurance	65	17.20
4	Petrol & coal products	35	16.18
5	Paper & board	28	15.17
6	Business services	68	14.09
7	Banking services	63	13.98
8	Real estate	66	13.68
9	Others	76	12.17
10	Oil Palm primary products	2	12.03
11	Other Metal Products	45	11.88
12	Public administration	73	11.32
13	Other textiles	22	11.32
14	Communication	62	11.13
15	Other transport equipment	54	11.01
16	Wholesale & retail trade	59	10.37
17	Radio, TV and Com Equipment	49	9.91
18	Ships & boats	51	9.56
19	Drugs & medicines	32	9.25

Overall Average = 7.17

Results

a) Top 20 sectors Highest

Table 4: Output CAGR – Bottom 20 Sector (1991-2005)

No.	TOTAL INPUT AND USE	COMMODITY	CAGR %
1	Other financial services	64	2.85
2	Public Order	74	2.69
3	Private non-profit services	71	1.90
4	Sawmill products	26	1.85
5	Processed rubber	36	1.76
6	Grain mill products	14	1.73
7	Rubber primary products	1	1.38
8	Other Wood Products	27	0.35
9	Elec Appl and Houseware	48	-0.38
10	Yarn and Cloth	21	-0.75
11	Preserved fruits & vegetables	11	-0.96
12	Agriculture Products and Others	3	-1.37
13	Meat and Meat Products	4	-1.39
14	Wearing apparel	23	-1.59
15	Forestry & logging products	5	-2.34
16	Industrial machinery	47	-2.73
17	Cycles & motorcycles	53	-2.77
18	Buildings & constructions	58	-4.11
19	Other public administration	75	-4.56
20	Metal ore	8	-5.39

Results

Sources of Output Growth

Table 5: Sources of Output Growth (1991-2005)

SOURCE OF DEMAND	FORMULA	%
Export demand	$R(E1-E0) \%$	50.87
Domestic demand	$R(\mu1(D1-D0)) \%$	13.33
Intermediate demand	$R((\mu1(A1 - A0) X0) \%$	7.31
Import substitution demand	$R((\mu1-\mu)(A0X0+D0)) \%$	28.48
Total		100.00

Export demand has shown the highest contribution to output growth, followed by Import substitution.

Results

i) Top 20 sectoral contributors to output growth due to Export Demand expansion

Table 6: Due to Export Demand Expansion - Top 20 sectors (1991-2005)

No.	TOTAL INPUT AND USE	COMMODITY	R(E1-E0) %
1	Rubber primary products	1	468.66
2	D - Yarn and Cloth	21	248.78
3	Elec Appl and Houseware	48	155.20
4	Tobacco	20	139.21
5	Soap & cleaning preparations	33	136.65
6	Ships & boats	51	106.98
7	Other transport equipment	54	106.74
8	Cement, lime & plaster	41	104.70
9	Other Wood Products	27	95.33
10	Forestry & logging products	5	89.94
11	Oils and fats	13	85.92
12	Insurance	65	78.19
13	Stone, clay & sand	9	77.96
14	Confectionary	16	77.40
15	Other textiles	22	75.79
16	Other electrical machinery	50	75.52
17	Private non-profit services	71	74.79
18	Crude petrol, natural gas & coa	7	70.62
19	Other chemical products	34	68.47
20	Iron & steel	43	67.53

Overall Average= 50.87

Results

ii) Bottom 20 sectoral contributors to output growth due to Export Demand expansion

Table 7: Due to Export Demand Expansion - Bottom 20 sectors (1991-2005)

No.	TOTAL INPUT AND USE	COMMODITY	R(E1-E0) %
1	Health	70	18.34
2	Other foods	17	17.46
3	Water	57	15.44
4	Leather products	24	12.25
5	Dairy products	10	9.38
6	Real estate	66	6.58
7	Motor vehicles	52	6.32
8	Hotels & restaurants	60	4.91
9	Public administration	73	3.21
10	Public Order	74	1.92
11	Education	69	0.95
12	Ownership of dwellings	67	0.90
13	Other public administration	75	0.00
14	Preserved fruits & vegetables	11	-4.65
15	Buildings & constructions	58	-9.20
16	Agriculture Products and Othe	3	-29.22
17	Cycles & motorcycles	53	-37.72
18	Meat and Meat Products	4	-69.11
19	Industrial machinery	47	-105.21
20	Processed rubber	36	-163.82

Average= 50.87

Results

iii) Top 20 sectoral contributors to output growth due to Domestic Demand Expansion

Table 8: Due to Domestic Demand Expansion - Top 20 sectors (1991-2005)

No.	TOTAL INPUT AND USE	COMMODITY	R ($\mu 1$ (D1-D0)) %
1	Meat and Meat Products	4	156.60
2	Agriculture Products and Othe	3	145.58
3	Cycles & motorcycles	53	123.57
4	Other financial services	64	112.11
5	Ownership of dwellings	67	97.60
6	Buildings & constructions	58	92.43
7	Other public administration	75	92.37
8	Education	69	91.65
9	Hotels & restaurants	60	84.49
10	Public administration	73	82.94
11	Water	57	75.99
12	Public Order	74	73.59
13	Real estate	66	66.20
14	Fish etc.	6	65.46
15	Grain mill products	14	65.44
16	Other Wood Products	27	59.22
17	Dairy products	10	57.83
18	Motor vehicles	52	55.98
19	Elec Appl and Houseware	48	55.40
20	Health	70	55.38

Results

iv) Bottom 20 sectoral contributors to output growth due to Domestic Demand Expansion

Table 9: Due to Domestic Demand Expansion - Bottom 20 Sectors (1991-2005)

No.	TOTAL INPUT AND USE	COMMODITY	R ($\mu 1$ (D1-D0)) %
1	Other transport equipment	54	1.66
2	Industrial chemicals	30	0.42
3	Other textiles	22	-0.92
4	Other electrical machinery	50	-1.23
5	Confectionary	16	-1.81
6	Ships & boats	51	-2.35
7	Radio, TV and Com Equipment	49	-3.01
8	Non-ferrous metal	44	-4.01
9	Other non-metal products	42	-4.17
10	Oils and fats	13	-4.36
11	Stone, clay & sand	9	-6.70
12	Iron & steel	43	-8.82
13	Recreation	72	-12.58
14	Rubber products	37	-17.82
15	Rubber primary products	1	-30.49
16	Footwear	25	-37.04
17	Tobacco	20	-37.74
18	Industrial machinery	47	-42.44
19	Processed rubber	36	-56.98
20	Private non-profit services	71	-156.63

Results

v) Top 20 sectoral contributors to output growth due to Intermediate Demand Expansion

Table 10: Due to Domestic Demand Expansion - Bottom 20 Sectors (1991-2005)

No.	TOTAL INPUT AND USE	COMMODITY	R ((μ 1 (A1 - A0) X0) %
1	Processed rubber	36	193.39
2	Private non-profit services	71	138.55
3	Recreation	72	81.55
4	Metal ore	8	75.77
5	Preserved fruits & vegetables	11	73.91
6	Banking services	63	48.74
7	Other financial services	64	48.52
8	Other non-metal products	42	43.93
9	Oil Palm primary products	2	35.66
10	Forestry & logging products	5	33.96
11	Rubber products	37	32.79
12	Transport	61	20.47
13	Petrol & coal products	35	16.61
14	Communication	62	14.56
15	Leather products	24	13.05
16	Stone, clay & sand	9	12.72
17	Wholesale & retail trade	59	11.08
18	Tobacco	20	9.15
19	Bakery products	15	9.14
20	Health	70	8.77

Results

vi) Bottom 20 sectoral contributors to output growth due to Intermediate Demand Expansion - Bottom 20 Sectors

Table 11: Due to Intermediate Demand Expansion – Bottom 20

Sectors			
No.	TOTAL INPUT AND USE	COMMODITY	R ((μ_1 (A1 - A0) X0) %
1	Motor vehicles	52	-1.83
2	Radio, TV and Com Equipment	49	-1.92
3	Insurance	65	-3.21
4	Clay products	40	-3.65
5	Other electrical machinery	50	-4.22
6	China, glass & pottery	39	-4.39
7	Fish etc.	6	-6.77
8	Agriculture Products and Othe	3	-8.49
9	Other transport equipment	54	-8.75
10	Elec Appl and Houseware	48	-8.82
11	Water	57	-11.64
12	Structural metal products	46	-14.79
13	Printed products	29	-15.00
14	Grain mill products	14	-44.94
15	Cement, lime & plaster	41	-46.49
16	Yarn and Cloth	21	-77.22
17	Meat and Meat Products	4	-122.82
18	Other Wood Products	27	-162.76
19	Rubber primary products	1	-190.86
20	Industrial machinery	47	-202.23

Results

vii) Top 20 sectoral contributors to output growth due to Import Substitution Demand Expansion

Table12: Due to Import Substitution Demand Expansion – Top 20 Sectors

No.	TOTAL INPUT AND USE	COMMODITY	$R((\mu_1 - \mu)(A_0X_0 + D_0))$ %
1	Industrial machinery	47	449.88
2	Meat and Meat Products	4	135.34
3	Processed rubber	36	127.41
4	Other Wood Products	27	108.21
5	Footwear	25	83.60
6	Instruments & clocks	55	66.70
7	Radio, TV and Com Equipment	49	49.45
8	Leather products	24	45.94
9	Wearing apparel	23	45.80
10	Grain mill products	14	44.83
11	Other Metal Products	45	44.10
12	Private non-profit services	71	43.30
13	Structural metal products	46	41.78
14	Paints & lacquers	31	40.63
15	Sawmill products	26	39.97
16	Plastic products	38	39.92
17	Non-ferrous metal	44	39.79
18	Iron & steel	43	39.60
19	Motor vehicles	52	39.52
20	Wholesale & retail trade	59	37.70

Results

viii) Bottom 20 sectoral contributors to output growth due to Import Substitution Demand Decrease

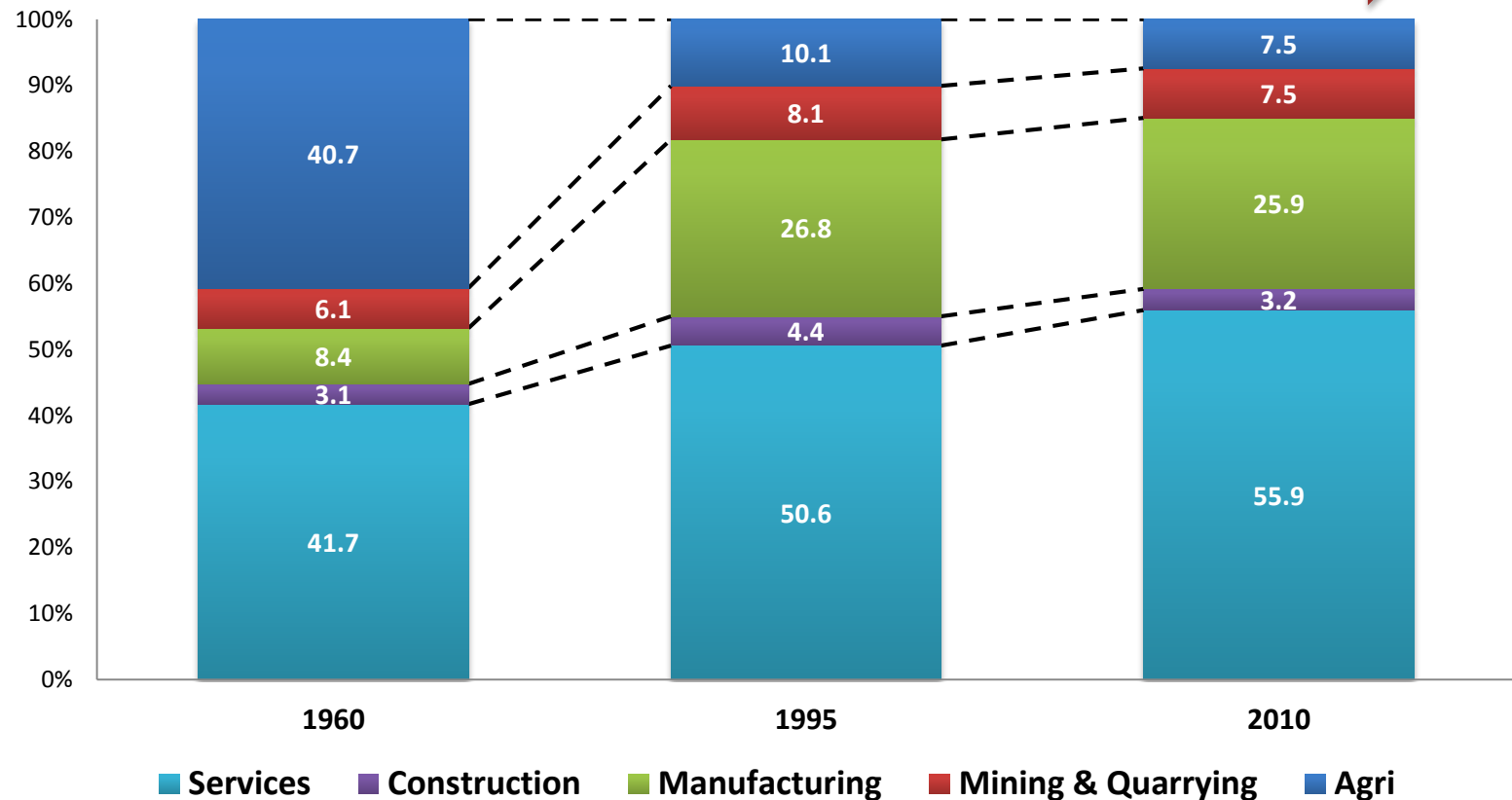
Table12: Due to Import Substitution Demand Expansion – Bottom 20

Sectors			
No.	TOTAL INPUT AND USE	COMMODITY	$R((\mu_1 - \mu) / (A_0 X_0 + D_0)) \%$
1	Cycles & motorcycles	53	9.59
2	Hotels & restaurants	60	8.79
3	Education	69	7.13
4	Recreation	72	6.25
5	Other public administration	75	5.73
6	Insurance	65	4.13
7	Ownership of dwellings	67	0.40
8	Other transport equipment	54	0.35
9	Preserved fruits & vegetables	11	-0.94
10	Ships & boats	51	-3.68
11	Banking services	63	-4.17
12	Agriculture Products and Othe	3	-7.87
13	Metal ore	8	-10.56
14	Tobacco	20	-10.62
15	Forestry & logging products	5	-27.56
16	Soap & cleaning preparations	33	-44.79
17	21. D - Yarn and Cloth	21	-74.33
18	48. G - Elec Appl and Housewa	48	-101.79
19	Other financial services	64	-119.54
20	Rubber primary products	1	-147.31

Conclusion and Policy Implication

- **During 1991-2005 Malaysia real GDP grew at 7.1 %**
- **Total output in 2005 = 2.83 times that of 1991 (RM558 billion as against RM1,578.8 billion)**
- **118 sectors experienced output growth**
- **12 sectors experienced output shrinkage**
- **16 sectors experienced double-digit rate in output growth**
- **2 sectors grew more than 20% (chemical product and electrical machinery)**
- **14 sectors grew 10-20%**

Structural Changes in Malaysian Economy



Economic Structural Change: 1978, 1991 and 2005

YEAR	1978					1991					2005				
SECTOR	TOTAL INTERME- DIATE INPUT	IMPORTS	VALUE ADDED	OTHERS	TOTAL	TOTAL INTERME- DIATE INPUT	IMPORTS	VALUE ADDED	OTHERS	TOTAL	TOTAL INTERME- DIATE INPUT	IMPORTS	VALUE ADDED	OTHERS	TOTAL
Oil, Gas and Energy	0.407	0.365	0.222	0.006	1.000	0.350	0.064	0.575	0.011	1.000	0.437	0.134	0.423	0.006	1.000
Education	0.171	0.024	0.802	0.003	1.000	0.207	0.045	0.745	0.003	1.000	0.287	0.066	0.647	0.000	1.000
Tourism	0.519	0.100	0.331	0.050	1.000	0.493	0.113	0.375	0.018	1.000	0.625	0.078	0.288	0.008	1.000
Wholesale & retail trade	0.386	0.037	0.571	0.005	1.000	0.358	0.048	0.590	0.004	1.000	0.392	0.212	0.389	0.008	1.000
Electrics and Electronics	0.392	0.374	0.203	0.031	1.000	0.393	0.436	0.155	0.015	1.000	0.398	0.453	0.148	0.001	1.000
Healthcare	0.325	0.079	0.586	0.011	1.000	0.326	0.126	0.544	0.004	1.000	0.508	0.150	0.341	0.000	1.000
palm Oil	0.669	0.029	0.297	0.006	1.000	0.750	0.034	0.215	0.001	1.000	0.657	0.065	0.275	0.003	1.000
Communication	0.146	0.072	0.780	0.002	1.000	0.317	0.030	0.651	0.002	1.000	0.447	0.054	0.499	0.000	1.000
Agriculture	0.227	0.055	0.711	0.007	1.000	0.333	0.042	0.621	0.005	1.000	0.363	0.073	0.561	0.002	1.000
Business services	0.336	0.071	0.585	0.008	1.000	0.419	0.094	0.479	0.008	1.000	0.330	0.087	0.579	0.005	1.000
Financial Services	0.311	0.015	0.673	0.001	1.000	0.295	0.027	0.675	0.003	1.000	0.524	0.017	0.457	0.002	1.000
Others	0.540	0.127	0.309	0.024	1.000	0.482	0.193	0.309	0.016	1.000	0.472	0.210	0.305	0.014	1.000
Average	0.467	0.117	0.398	0.018	1.000	0.447	0.168	0.372	0.012	1.000	0.455	0.220	0.318	0.008	1.000

Economic Structural Change:1978, 1991 and 2005

- Total Intermediate Input Requirement, Import and Value Added for 1978, 1991 and 2005 have changed.
- Total Intermediate input coefficient fell from 0.467 in 1978 to 0.447 in 1991 and then rose marginally to 0.455 in 2005
- Value-added coefficient fell from 0.398 in 1978 to 0.372 in 1991 and further fell to 0.318 in 2005

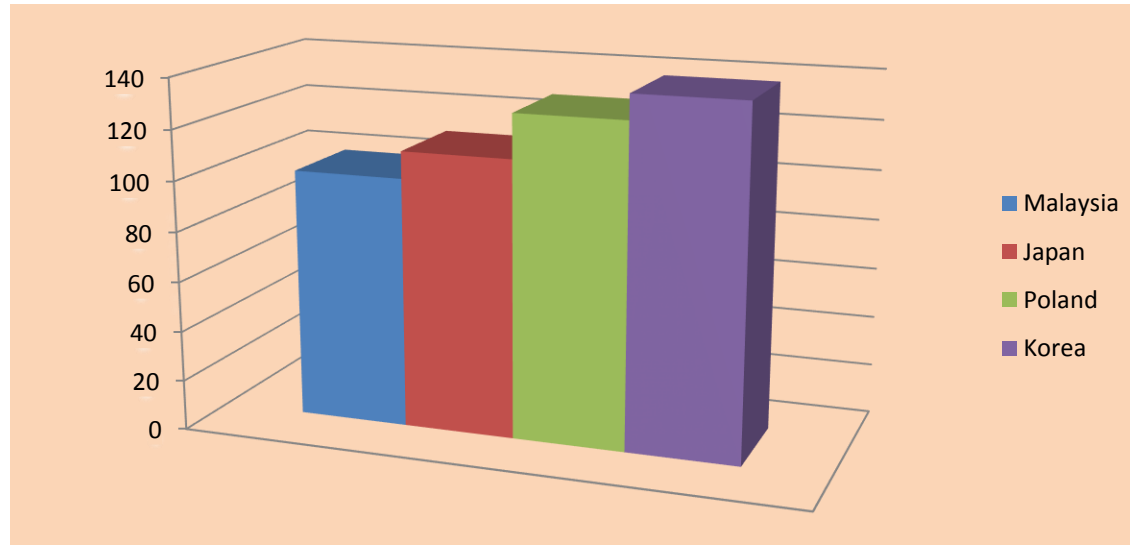
Input Structure: Malaysia Compared to Poland, Japan and Korea

Sectors	Malaysia				Poland			Japan			Korea		
	TOTAL INTERMEDIATE	IMPORTS	VALUE ADDED	OTHERS	TOTAL INTERMEDIATE	VALUE ADDED	OTHERS	TOTAL INTERMEDIATE	VALUE ADDED	OTHERS	TOTAL INTERMEDIATE	VALUE ADDED	OTHERS
Oil, Gas and Energy	0.437	0.004	0.423	0.136	0.626	0.365	0.009	0.607	0.393	0.00	0.648	0.352	0.000
Education	0.287	0.000	0.467	0.066	0.162	0.811	0.027	0.138	0.862	0.00	0.195	0.805	0.000
Tourism	0.625	0.001	0.288	0.086	0.559	0.388	0.053	0.456	0.544	0.00	0.583	0.417	0.000
Wholesale & Retail Trade	0.392	0.002	0.389	0.218	0.429	0.562	0.009	0.301	0.699	0.00	0.404	0.596	0.000
Electrics and Electronics	0.398	0.001	0.148	0.454	0.720	0.276	0.003	0.680	0.320	0.00	0.744	0.256	0.000
Healthcare	0.508	0.000	0.341	0.150	0.313	0.650	0.037	0.376	0.624	0.00	0.441	0.559	0.000
Palm Oil	0.657	0.000	0.275	0.068	-	-	-	-	-	-	-	-	0.000
Communication	0.447	0.000	0.499	0.054	0.479	0.515	0.006	0.398	0.602	0.00	0.503	0.497	0.000
Agriculture	0.363	0.000	0.561	0.075	0.529	0.446	0.025	0.465	0.535	0.00	0.420	0.580	0.000
Business Services	0.330	0.000	0.579	0.091	0.497	0.500	0.003	0.372	0.628	0.00	0.000	0.000	0.000
Financial Services	0.524	0.002	0.457	0.017	0.381	0.580	0.039	0.313	0.687	0.00	0.373	0.627	0.000
Others	0.472	0.003	0.305	0.220	0.599	0.387	0.014	0.507	0.493	0.00	0.000	0.383	0.000
Intermediate Input (average)	0.455	0.002	0.318	0.225	0.481	0.498	0.020	0.419	0.581	0.00	0.392	0.461	0.000

Economic Input Structure Malaysia Compared to Poland, Japan and Korea 2005

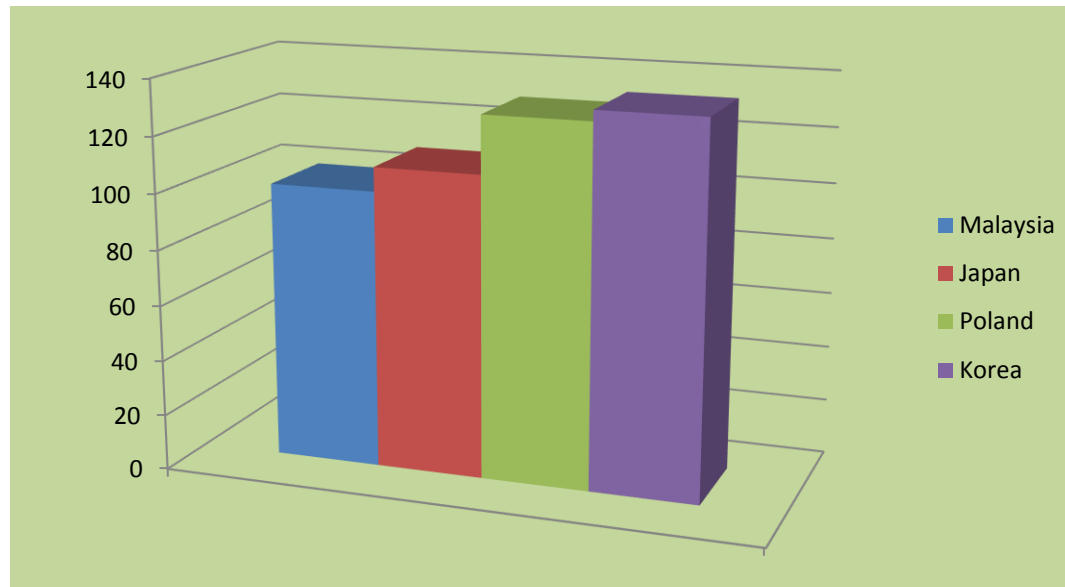
- Poland's total intermediate inputs coefficient almost equal to that of its value added.
- Malaysia's value-added coefficient lower than those of Poland, Japan and Korea.

Expected Malaysian Total Output Simulated if Poland, Japan and Korea Economic Structure is adopted



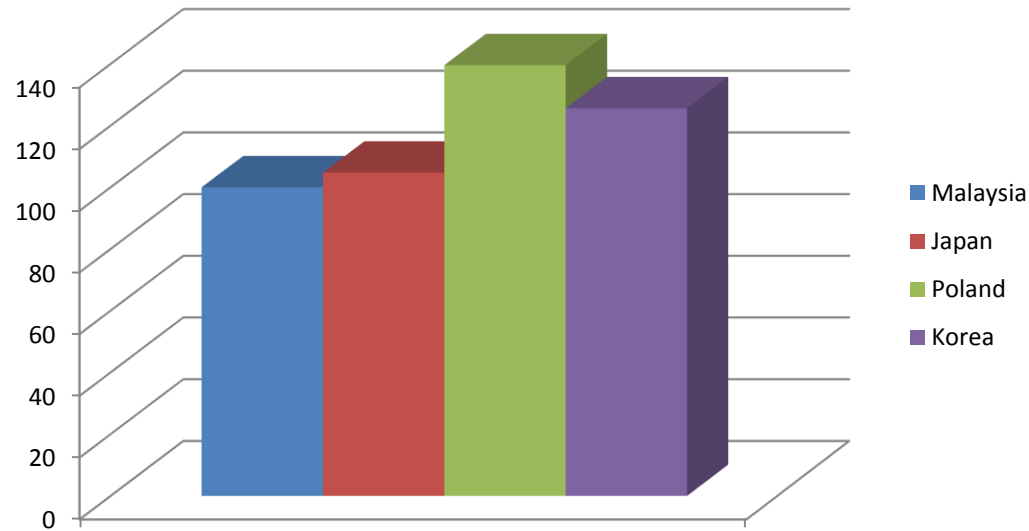
	Malaysia	Japan	Poland	Korea
Expected Total Output (RM '000)	1,603,906,680	1,777,007,265	2,058,696,475	2,217,640,689
%	100	110.79	128.36	138.26

Expected Malaysian Household Income Simulated if Poland, Japan and Korea Economic Structure is adopted



	Malaysia	Japan	Poland	Korea
Expected Total Output (RM '000)	138,365,009	150,346,758	178,909,817	184,210,567
%	100	108.66	129.30	133.13

Expected Malaysian Employment Creation Simulated if Poland, Japan and Korea Economic Structure is adopted



	Malaysia	Japan	Poland	Korea
Expected Total Output (RM '000)	9,784,000	10,250,733	13,658,230	12,293,942
%	100	104.76	139.59	125.64

Summary – Economic Impact

	Malaysia	Japan	Poland	Korea
Expected Total Output (Total - RM billion)	1.603	1.777	2.058	2.217
Expected Total Output (%)	100.00	110.79	128.36	138.26
Total Household Income (Total – RM million)	138.365	150.346	178.909	184.210
Total Household Income (%)	100.00	108.66	129.30	133.13
Expected Employment Creation (No. of jobs - million)	9.784	10.25	13.658	12.293
Expected Employment Creation (%)	100.00	104.76	139.59	125.64

Conclusion and Policy Implication

- **Contribution to Output Growth due to expansion in**

Export Demand = 50.87%

Import Substitution Demand = 28.48%

Domestic Demand = 13.33%

Intermediate Demand = 7.31%

Conclusion and Policy Implication

- The economy was significantly relying on external sector for its output growth.
- A more conducive export environment is needed for the country to be transformed into a high-income economy.
- Technological change potential yet to be explored. Need in house new technology to tap the global market potential.
- The new technology will embodied high skill labor that challenge the current human resource situation.
- The new technology will enhance productivity and thus GDP growth.

Conclusion

- The present paper examines the country's economic input structure then compare it with those of selected high-income countries
- The period 1978 – 2005 saw marginal improvement in value-added generating capacity

The present paper also estimates additional output, household income and number of workers that can be generated from the 2011-2020 ETP

Conclusion

- Based on the the country's 2005 economic structure, total output will be generated by 1.38 times and its associated multipliers for household income and employment
- Clear structural gap does exist between Malaysia and other selected countries in 2005
- This implies that if Malaysia is equipped with those countries structural outfits, it can generate bigger output, household income and employment, thus the probability of achieving high-income economy is brighter

Conclusion

- Structural gap between Malaysia and other selected countries in 2005. Malaysia was:
 - 38% behind Korea
 - 28% behind Poland
 - 10% behind Japan

THANK YOU