

## **Ethnic and Gender Inequality in Employment during the New Economic Policy**

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**Abstract:** The paper analyses ethnic-based and gender-based segregation in employment as a fundamental reason for the economic inequality between the three major ethnic groups in Malaysia. Using the Duncan Dissimilarity Index (DDI) and the Adjusted Duncan Dissimilarity Index (ADDI), the study found a marked increase in the degree of segregation based on occupation between males and females by the end of the New Economic Policy (NEP), particularly among the ethnic Malays. The findings provide an explanation as to why ethnic inequalities persisted post NEP.

**Keywords:** Occupation segregation, Duncan Dissimilarity Index, New Economic Policy

**JEL Classification:** J15, J16, J31 and J48

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### **1. Introduction**

Pre-independence Malaya was characterised by ethnic economic inequality and high levels of poverty (Zainudin and Zulkifly, 1982). Following the 1969 race riots, the government initiated the New Economic Policy (NEP) in 1970 (Malaysia, 1971). The main thrust of the twenty-year social engineering plan (1971-1990) was to propel Malaysia from a society characterised by race-based employment inequalities and high poverty rates to a more equal society geared towards reducing, if not eliminating, inequality and poverty. The NEP was marked a volte-face from the colonial laissez-faire approach to state intervention in promoting economic redistribution. During the NEP, government participation in economic affairs increased significantly, particularly through the establishment of state development corporations and public enterprise. Osman-Rani (1982) believed that the interventionist philosophy and the reforms instituted by the NEP would reduce poverty and lead towards achieving an

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inter-ethnic economic parity and national unity, which was the ultimate goal of the NEP.

Osman-Rani contributed to the debate on the Malaysian development policy by focusing on government intervention in the economy, especially in developing and boosting of the manufacturing sector (Osman-Rani, 1980, 1982 and 1996).

At the end of the 1970s, and despite numerous successes, many problems that had been hoped to be resolved by the NEP persisted. In some cases, ethnic inequalities appeared to have increased. One of the principal problems that had remained unaddressed was racial identification with economic activities (Osman-Rani, 1982) which did not reflect the racial profile of the Malaysian population and, for certain sectors, ethnic divisions within occupational categories were even worse (Osman-Rani, 1982). The participation of ethnic Malays in industrial activities, also referred to as “the modern sector”, remained very low among the higher employment categories (Osman-Rani, 1982).

The paper analyses the root causes of ethnic divisions within occupational categories using new econometric analysis in an effort to understand the factors contributing to ethnic divisions. It is also an extension of Osman-Rani’s work. In particular, gender segregation based on ethnicity is explored using the adjusted Duncan Dissimilarity Index (ADDI) as a means to provide a fundamental explanation pertaining to the ethnic economic inequalities in Malaysia during the NEP.

The paper is divided into 5 sections. Section 2 is a brief history of the roots of ethnic economic identities, as well as some of the success stories of the NEP. Section 3 discusses the data and the methodology utilised in the study. Section 4 analyses the results and discusses the findings. The paper is summarised and concluded in Section 5 in addition to discussing the implications of the findings.

## **2. The Roots of Ethnic Economic Identities and Some Successful Story of NEP**

A shared experience among many developing countries (Getubig and Oshima, 1991) is the focus on economic growth while deliberating development planning. Malaysia embarked on this in the 1960s. The emphasis was on promoting the national products, namely through the promotion of industrial policies (Osman-Rani, 1982). The first phase (1958-1970) was the import substitution industrialisation (ISI) strategy. This strategy was largely *laissez-faire* in nature. State intervention was confined to infrastructure development in the form of industrial estates and other infrastructure facilities. During the 1960s, the manufacturing sector in Peninsular Malaysia managed to grow at a rate of 11.5% per year. The contribution of manufacturing industries to the gross domestic product (GDP) almost doubled, increasing from 8.5% in 1960

to 14.8% in 1970. In Peninsular Malaysia (representing about 85% and 84% of the Malaysia's total population and GDP respectively) between 1960 and 1970, the average annual rate of growth of the real GDP was 6.4% (Malaysia, 1971). According to Rao (1980) 70% of the total growth during the period is due to an increase in capital stock. About 17% resulted from an increase in labour input and the rest was attributable to other factors, namely increases in capacity utilisation, improvements in education, and technology.

These phenomena imply that economic growth (in particular the growth in manufacturing output) did not necessarily generate a high demand for labour. Employment creation lagged far behind economic growth (Edwards, 1975). The labour absorption capacity of the manufacturing sector was found to be comparatively low. During the 1960s, the absolute value of employment elasticity (0.35) was only marginally higher than that of agriculture (0.24), but lower than the national average by 0.14 (Rajah and Zukifly, 1998). Output in the manufacturing sector was almost three times more than employment growth.

In light of the perceived importance of the role of the manufacturing sector in reducing unemployment rates and poverty, results of the NEP in relation to job creation were unsatisfactory. The unemployment rate in Peninsular Malaysia increased from 6.0% in 1962 to 6.8% in 1967/68 (Malaya, 1962 and Malaysia, 1970). By 1970, the unemployment rate for Peninsular Malaysia increased to almost 8.0% (or 7.3% for Malaysia as a whole). In 1970, the overall incidence of poverty in Peninsular Malaysia was almost 50% (Malaysia, 1981) accompanied by widening income inequalities. For example, the Gini ratio for Peninsular Malaysia increased from 0.41 in 1957/58 to 0.51 in 1970, which was one of the highest among the Asian countries (Snodgrass, 1975; Ishak and Ragayah, 1978). In short, the economic growth during the period had not addressed poverty and inequality.

The pattern of employment in Malaysia after 12 years of independence was an extension of British colonial legacy. Race was identified with ethnic economic activities. The commercial and industrial sectors or modern sectors in urban areas continued to be monopolised by the ethnic Chinese. The majority of ethnic Malays were employed in the agricultural sector, with a small number holding positions in public service. Majority of ethnic Indians were still in the plantation sector, with only a small percentage in the public sector employment (Zainudin and Zulkifly, 1982). A significantly unequal distribution of income and wealth predominated.

In countries with multi-ethnic population, racial tensions and communal clashes can occur if problems relating to poverty, including exacerbated unemployment and racial imbalance, continue to exist for prolonged periods. Such situations may arise because of the inherent identification of economic activities with race and ethnic economic inequalities may inhibit

the strengthening of ties and relationships between ethnic communities. In the case of Malaysia, persistent inequalities and poverty resulted in increased ethnic tensions (Gomez and Jomo, 1999). The racial riots of 13 May 1969 was the product of communal divisions and association of economic activities on the basis of ethnicity. If a country is to achieve sustained and rapid economic development, racial tensions must be tackled effectively.

The NEP was introduced by the government in 1970 as a response to prevailing ethnic tensions in Malaysia at the time. The objective of the policy was to eradicate poverty and restructure Malaysian society (Malaysia, 1971) while strengthening national unity. The target of the NEP was to address problems of poverty and ethnic economic imbalances by 1990.

As far as poverty was concerned, the NEP projected a reduction in poverty rate from nearly 50% in 1970 to 16.7% in 1990. After 10 years of the implementation of NEP, the official figures show that the overall incidence of poverty in Peninsular Malaysia dropped to about 29% (Malaysia, 1981). By 1990, the incidence of poverty was reduced further to 15% for Peninsular Malaysia and 17% for the entire country (Malaysia, 1991).

Table 1 shows the initial distribution of employment in 1970 and the targeted employment distribution by 1990. In 1970, Table 1 clearly shows imbalance in terms of distribution of employment along ethnic lines. The majority of the Bumiputera (which include ethnic Malays and other indigenous people) were concentrated in the agricultural sector while ethnic Chinese dominated non-agricultural sectors, namely the modern sectors including mining, manufacturing, construction, and retail and wholesale.

In the last four columns of Table 1, it is clear that the initial pattern of distribution of employment by sector had changed towards the desired target (to match the composition of the population in 1970) which was 52.7% ethnic Malay; 35.8% ethnic Chinese; and 10.7% ethnic Indian. Although the imbalance relating to the employment had been reduced, major problems remained unresolved. For example, in the construction sector and the wholesale and retail trade, the participation of Bumiputera was still low. In the meantime, the trend of participation by Bumiputera in the agricultural sector had increased, opposite to the intended target of the NEP.

Table 2 shows that the pattern of inter-ethnic employment by occupation does not change significantly. The percentage of Bumiputera in agricultural employment continued to increase. Low productivity and low income characterise the agricultural sector with prevalent widespread disparity and rampant poverty. As a result, other ethnic groups had little interest to participate in this sector (Zainudin and Zulkifly, 1982; Osman-Rani, 1996).

Table 1: Sectoral Employment Division by Ethnicity, 1970-1990<sup>i</sup>: Peninsular Malaysia

Sector	Initial Position in 1970				Target by 1990 <sup>ii</sup>				Achievement in 1990 <sup>iii</sup>			
	B (%)	C (%)	I (%)	T ('000)	B (%)	C (%)	I (%)	T ('000)	B (%)	C (%)	I (%)	T ('000)
Agriculture	67.7	21.6	9.7	1359.1	60.0	29.1	10.2	1777.8	67.9	14.5	7.6	1738.0
Mining & Quarry	24.1	67.1	8.3	55.3	50.3	39.2	9.8	90.4	51.9	32.7	9.2	37.0
Manufacturing	29.0	65.3	5.3	251.9	50.0	40.0	9.6	933.4	46.4	37.9	11.0	1333.0
Construction	21.7	72.0	6.0	59.9	50.0	40.2	9.6	189.7	34.9	51.4	5.8	424.0
Electricity, Water & Gas	48.0	18.1	32.3	19.8	52.5	29.0	17.1	39.1	70.2	10.0	17.0	47.0
Transport & Communication	42.3	39.9	17.1	98.0	52.5	36.0	10.8	246.9	49.0	30.8	14.9	302.0
Retail & Wholesale	23.4	65.5	10.6	274.6	48.0	40.0	11.5	924.0	34.5	58.7	6.8	1218.0
Finance	-	-	-	-	-	-	-	-	41.1	46.8	9.9	258.0
Service	47.4	36.7	14.0	472.6	-	-	-	-	-	-	-	-
Other Services	51.0	39.3	9.8	145.2	46.5	39.4	12.8	1245.7	64.7	23.9	7.7	1329.0
<b>Total</b>	51.5	36.9	10.7	2783.0	52.5	36.0	10.8	5269.0	52.8	32.5	8.5	6686.0

Notes: <sup>i</sup>Total (T) percentage is less than 100% because other ethnic groups are excluded.

<sup>ii</sup> NEP target, based on the 1970 population: 52.7% ethnic Malay (B); 35.8% ethnic Chinese (C); and 10.7% ethnic Indian (I)

<sup>iii</sup> Data for Malaysia.

Sources: Malaysia (1973 and 1996)

Table 2: Occupational Distribution by Ethnicity<sup>i</sup>, 1970-1990: Peninsular Malaysia.

Occupation	Initial Position in 1970				Target by 1990 <sup>ii</sup>				Achievement in 1990 <sup>iii</sup>			
	B (%)	C (%)	I (%)	T ('000)	B (%)	C (%)	I (%)	T ('000)	B (%)	C (%)	I (%)	T ('000)
Professional & Technical	47.2	37.7	12.7	129.6	50.7	37.2	11.5	387.0	60.5	29.1	7.7	586.4
Teacher & Nurse	-	-	-	-	-	-	-	-	68.5	24.6	6.4	221.8
Admin & Management	22.4	65.7	7.5	22.8	49.3	39.4	9.8	73.9	28.7	62.2	4.0	163.8
Clerical	33.4	51.0	14.3	140.0	47.9	38.7	12.5	372.2	52.4	38.6	8.6	652.6
Sales	23.9	64.7	11.0	316.0	36.9	51.8	11.0	445.8	29.9	58.4	6.8	768.9
Service	42.9	42.5	13.4	462.4	52.3	35.4	11.4	1397.3	57.8	26.8	9.5	777.6
Agriculture	68.7	20.8	9.6	1364.5	62.3	27.8	9.2	1700.9	69.1	13.8	7.3	1890.7
Production	31.3	59.9	8.6	358.4	52.0	38.0	9.6	1072.1	43.6	39.6	10.8	1846.0
Total	51.4	37.0	10.7	2793.7	53.6	35.3	10.4	5449.1	52.8	32.5	8.5	6686.0

Notes:<sup>i</sup>Total (T) percentage is less than 100% because other ethnic groups are excluded.

<sup>ii</sup>NEP target, based on the 1970 population: 52.7% ethnic Malay (B); 35.8% ethnic Chinese (C); and 10.6% ethnic Indian (I).

<sup>iii</sup>Data for Malaysia

Sources: Malaysia (1976 and 1996)

Although the number of Bumiputera employed in professional and technical jobs had increased, most were concentrated in lower level occupations as teachers and nurses. In other words, the participation of Bumiputera in high-level positions continued to lag when compared with other ethnic groups, particularly the ethnic Chinese. Similar patterns are observed in the administration and management occupations, where performance was still far behind the initial targets of the NEP. The findings indicate that the largest increase in the participation of Bumiputera was in low level occupations. This fact was readily apparent in the case of the manufacturing sector (Ishak and Zulkify, 1988).

Employment creation in the modern sector had been emphasised under the NEP (Malaysia, 1971). This is because the economic gap between the Bumiputera (particularly ethnic Malays) and the non-Bumiputera could only be narrowed through a marked increase in the participation of Bumiputera in modern activities (Zainudin and Zulkify, 1982).

The 1970s witnessed significant changes in the structure of the Malaysian economy. The economy became diversified, shifting from a predominantly primary commodity exporting country (principally rubber and tin) towards the export of manufactured goods, such as electronic and textiles. However, the economy continued to be heavily dependent on exports and highly exposed to global price fluctuations and growth issues. The most prominent feature of the

transformation of the economy was the emergence of the manufacturing sector as a leading sector in generating employment. This resulted in structural changes in employment by sector that corresponded with the changes in economic structure of Malaysia, which required a transition from an agricultural economy to a manufacturing one. During the first ten years of the NEP, the Malaysian government initiated the second phase of the industrialisation strategy, namely the export-oriented industrialisation (EOI) strategy (1970-80) led by foreign direct investment (FDI). The EOI emphasised labour-intensive textiles, apparel and electronics industries (Hoffmann and Tan, 1980; Rasiah, 1995). Since cheap labour is important to maintain competitiveness in labour-intensive industries, labour regulations were tightened to favour transnational operations (Rajah and Zulkifly, 1998). The process of making labour more flexible gained strength and involved a shift away from employment security and weakening trade unions movement in Malaysia.

Policies initiated to keep costs low included various measures, such as exemption from labour law and strict controls on unions in “pioneer” firms (mostly the manufactured export sector). For example, pioneering export oriented firms enjoyed certain privileges conferred by Section 15 of the Industrial Relation Act, 1967. Collective agreements reached between employers and a trade union in a “pioneer enterprise” do not contain provisions regarding terms and conditions of service that exceeded the minimum standards prescribed in Employment Act, 1955, unless approved by the Minister (Section 15, Industrial Relation Act, 1967; Part XII of The Employment Act, 1955). The effect of such policies was the reduction of influence of trade unions on worker’s wages and welfare. The overwhelming emphasis on foreign investment stimulation during the period of EOI undermined the social balance as workers’ rights were sacrificed (Ishak and Zulkifly, 1995; Rajah and Zulkifly, 1998). The phenomenon significantly weakened the trade union movement in Malaysia during the aforementioned period (Dunkley, 1982; Arudsothy, 1990; Jomo and Todd, 1994).

The success of the EOI had been contingent on the states’ ability to attract foreign investors seeking to lower production costs (especially labour costs) in order to be more competitive in the international market. Additionally, the strategy was associated with low value added activities that depended heavily on the processing and assembly of imported inputs (Rasiah, 1995). This could be one of many reasons why female workers were increasingly employed in the manufacturing sector during this period. Female workers were mostly concentrated in industries that involved tedious activities, such as assembling components in the electrical industry and sewing in textile industries. During the peak period of this activity (1980), females accounted for about 85.0% of the

total workforce in electronic industries in Malaysia. The total share of female employment in the manufacturing sector was around 50.0%.

World recession in the mid-1980s changed the employment pattern in Malaysia. There was widespread retrenchment of labour across the various sectors of the economy. The retrenchments reduced the total share of female employment in the manufacturing sector to 46.1% (1985). Between 1983 and mid-1987, close to 100,000 workers were reportedly retrenched. In 1985 alone, a total of 556 establishments across the country retrenched 43,844 workers. The majority were female workers and ethnic Malays (Malaysia, 1986b). Manufacturing was the most severely affected sector and accounted for 63% of these retrenched workers. Additionally, commodity prices fell and workers in rubber and oil palm estates were made redundant. Real GDP growth also plunged to -1.1% in 1985 due to a decline in commodity prices (Malaysia, 1986a). The rate of unemployment rose from 5.7% in 1980 to 7.6% in 1985 (Malaysia, 1986 b).

Interestingly, a survey of manufacturing industries in 1988 indicates that the majority of female workers were in low-paying, semi-skilled jobs in production operations, with female employment amounting to only 17.7% in technical and supervisor occupations and 10.9% in managerial and professional positions. As a result of this segregation and since female workers received lower wages than their male counterparts, their participation in the labour market resulted in an overall decrease in average wages in the manufacturing sector, which had particularly affected the income of ethnic Malays. Additionally, Ishak and Zulkifly (1988) depict a rather unpleasant picture of conditions for workers in the manufacturing sector. Firstly, the share of wages in the value added declined for all manufacturing establishments, despite a rising ratio of value added to fixed assets per worker. Secondly, there was a decline in the real wage levels of workers in the manufacturing sector, particularly in export-oriented industries. Thirdly, the distribution of wages among workers within the manufacturing sector continued to worsen, which may imply that a substantial portion of the increased earnings were absorbed by a few highly salaried managerial and technical workers. Consequently, the goal to distribute employment opportunities equally was adversely affected and interethnic income inequalities persisted.

### **3. Model Framework: Gender Occupation Segregation Before and After NEP**

The data utilised in the present study is obtained from the Malaysian Population Census. The survey is conducted by the Malaysian Department of Statistics every ten years. Its 2% sample data file consists of 175,997 person-records in 1970; 182,601 person-records in 1980; and 347,892 person-records in 1991.



A household is defined as a group of persons who live together in single living quarters and make common provisions for food and other essentials of living. There are primary family units and secondary family units in the households. The primary family unit is defined as the family whose head is also the household head. The secondary one consists of any married couple, with or without children or another married person with an absent spouse, but with an unmarried child present in the same household.

Information regarding all the variables examined in the study are obtained from the aforementioned sources. The variables examined in the present study include occupation; industry; and demographic variables, such as gender, race, age, and place of living. The study includes all working labourers, aged 18 and above, from all ethnicities and excludes any immigrant labour from neighbouring countries and non-citizen workers. The occupation variables only focus on three major categories (business and commerce, agriculture and professional job) which reflect the identification of race occupation.

The Duncan Dissimilarity Index (DDI) (Duncan and Duncan, 1955) is employed to measure the degree to which male and females are segregated in all job categories. The job categories examined consist of self-employed professional employees; professional employees; self-employed business and commercial employees; business and commercial employees; self-employed agricultural employees; agricultural employees; clerical administration workers; factory and industry workers; other self-employed employees; and other employees.

The DDI calculates what percentage of males or females would have to change occupations in order for employment to be identified with gender. The DDI is calculated as follows:

$$DDI = \frac{1}{2} \sum_{i=1}^N |O_{im} - O_{if}| \quad (1)$$

$$m \neq f$$

$N$  = Number of occupation choices

$O_{im}$  = Percentage of male in occupation  $I$  over total male in employment

$O_{if}$  = Percentage of female in occupation  $I$  over total female in employment

An Adjusted Duncan Dissimilarity Index (ADDI) is employed to measure the degree to which dissimilarity is affected by counterfactual changes in the parameters of an occupational choice model. Thus, the first counterfactual analysis consists of calculating the difference in the predicted probability from a multinomial logit model of occupational choice between males and females before the NEP by substituting the pre-policy characteristics ( $X$ ) with

the post-policy characteristics. The ADDI is utilised to calculate the difference in the predicted probability before the policy by examining male and female employment characteristics at the end of the NEP.

The analysis is conducted in the following manner. First, a separate multinomial logit regression of occupational choices for male and female is performed. Second, the predicted probability of each occupational choice category is calculated separately for males and females. Then, the ADDI is constructed as follows:

$$ADDI = \frac{1}{2} \sum_{i=1}^N |\bar{P}_{0mi}^1 - \bar{P}_{0fi}^1| \quad (2)$$

Where

$$\bar{P}_{0mi}^1 = \frac{\text{Exp}(X_m^1 \beta_i^0)}{\sum_i^N \text{Exp}(X_m^1 \beta_i^0)} \quad \text{and} \quad \bar{P}_{0fi}^1 = \frac{\text{Exp}(X_f^1 \beta_i^0)}{\sum_i^N \text{Exp}(X_f^1 \beta_i^0)}$$

where,

$\bar{P}_{0mi}^1$  = Predicted probability (from multinomial logit) of male employment in an occupation ( $i$ ) before the NEP ( $t=0$ ) by substituting with characteristics ( $X$ ) after the NEP ( $t=1$ ).

$\bar{P}_{0fi}^1$  = Predicted probability (from multinomial logit) of female employment in an occupation ( $i$ ) before the NEP ( $t=0$ ) by substituting with characteristics ( $X$ ) after the NEP ( $t=1$ ).

The next counterfactual analysis is performed by calculating the difference in the predicted probability of an occupation choice between males and females after the NEP by substituting the post-policy characteristics ( $X$ ) with the pre-policy characteristics. The Adjusted Duncan Dissimilarity Index II (ADDI II) calculates the difference in the predicted probability of an occupation choice post NEP by comparing the results against gender characteristics before the NEP period. The ADDI II is formulated as follows:

$$ADDI II = \frac{1}{2} \sum_{i=1}^N |\bar{P}_{1mi}^0 - \bar{P}_{1fi}^0| \quad (3)$$

Where

$$\bar{P}_{1mi}^0 = \frac{\text{Exp}(X_m^0 \beta_i^1)}{\sum_i^N \text{Exp}(X_m^0 \beta_i^1)} \quad \text{and} \quad \bar{P}_{1fi}^0 = \frac{\text{Exp}(X_f^0 \beta_i^1)}{\sum_i^N \text{Exp}(X_f^0 \beta_i^1)}$$

Where

$\bar{P}_{1mi}^0$  = Predicted probability (from multinomial logit) of male employment in an occupation ( $i$ ) after the NEP ( $t=1$ ) by substituting with characteristics ( $X$ ) before the NEP ( $t=0$ ).

$\bar{P}_{1fi}^0$  = Predicted probability (from multinomial logit) of female employment in an occupation ( $i$ ) after the NEP ( $t=1$ ) by substituting with characteristics ( $X$ ) before the NEP ( $t=0$ ).

During the analysis, the overall DDI, ADDI and ADDI II were calculated for both males and females. Next, the DDI, ADDI and ADDI II were calculated separately for males and females according to their respective status: ethnic Malay, ethnic Chinese or ethnic Indian.

#### 4. Empirical Results and Discussion

Table 3 shows the results of the male-female DDI before and after the NEP, both overall and within each ethnic group. The overall DDI before the NEP was 0.16. However, the DDI increased to 0.22 by the end of NEP. The result implies that the segregation between males and females in occupation worsened by the end of the NEP. Table 4 shows the results of the ADDI before the NEP, both overall and within each ethnic group. When the characteristics of male and female employment before the NEP are replaced with the characteristics of male and female employment after the NEP, the overall segregation between males and females increases from 0.16 to 0.24. The improvement in the observable characteristics of male and female employment under the NEP demonstrates that segregation widened during the NEP. Table 5 shows the results of the ADDI II after the NEP, both overall and within each ethnic group. When the characteristics of male and female employment after the NEP are replaced by the characteristics of male and female employment before the NEP, the overall segregation based upon gender decreases from 0.22 to 0.13. The results indicate that segregation between males and females worsened during the NEP period.

Table 3: Duncan Dissimilarity Index for Overall and within ethnic group before and after NEP

	Overall	Malay	Chinese	India
Standard DDI				
Before Policy	0.16	0.12	0.19	0.37
After Policy	0.22	0.33	0.24	0.23

Table 4: Duncan Dissimilarity Index &amp; Adjusted Duncan Dissimilarity Index (ADDI) for overall and within ethnic group before NEP

	Overall	Malay	Chinese	India
DDI Before	0.16	0.12	0.19	0.38
ADDI	0.24	0.30	0.29	0.34

Table 5: Duncan Dissimilarity Index &amp; Adjusted Duncan Dissimilarity Index II (ADDI II) for overall and within ethnic group after NEP

	Overall	Malay	Chinese	India
DDI After	0.22	0.33	0.24	0.24
ADDI II	0.13	0.14	0.16	0.35

The next analysis estimates the gender occupation segregation index within the three main ethnicities: ethnic Malay, ethnic Chinese and ethnic Indians based on gender. The male-female ethnic segregation index is important because it represents the overall gender segregation index. For example, the culture and religious beliefs among ethnic Malays could explain the concentration of male and female ethnic Malays in certain types of occupations. The concentration of ethnic Chinese communities in the city and impoverished ethnic Indians in the plantations leads to a different male-female occupation concentration. Furthermore, the gender occupation distribution within ethnicities may imply the existence of an inter-ethnic economic gap in the labour market.

For ethnic Malays, the DDI before the NEP was 0.12. However, the DDI increases to 0.33 by the end of the NEP. The finding implies that occupation segregation between ethnic Malay males and females worsened by the end of the NEP. In addition, the male-female segregation index post-NEP for ethnic Malays was higher than the overall male-female segregation index. According to the results of the ADDI pre-NEP for ethnic Malays, if the characteristics of male and female employment pre-NEP are replaced by the characteristics of male and female employment post-NEP, occupation segregation among ethnic Malays increases from 0.12 to 0.30 under the NEP. The improvement of the observable characteristics for male and female employment under the NEP widened occupational segregation. In addition, the difference between the DDI before the NEP and the ADDI for ethnic Malays is larger than the difference between the overall DDI before the NEP and the ADDI. Furthermore, the ADDI II post-NEP for ethnic Malays showed that when the characteristics of male and female employment post-NEP are replaced by the characteristics of male and female employment pre-NEP, occupational segregation decreases from 0.33 to 0.14. The results of the observable characteristics of male and female employment indicate that occupation segregation worsened during the NEP.

Furthermore, the difference between the DDI after the NEP and the ADDI II for ethnic Malays was larger than the difference between the overall DDI after the NEP and the ADDI II. The results indicate that male-female occupation segregation among ethnic Malays was worse than the overall male-female occupation segregation index.

The DDI index for ethnic Chinese pre-NEP was 0.19. However, the index increases to 0.24 towards the end of the NEP. The result implies that occupation segregation between ethnic Chinese males and females worsened by the end of the NEP. However, the male-female segregation index post-NEP for the ethnic Chinese was slightly lower than the overall male-female segregation index. Next, the results of the ADDI pre-NEP for the ethnic Chinese demonstrate that when the characteristics of male and female employment before the NEP are replaced with their characteristics of male and female employment after the NEP, occupation segregation increases from 0.19 to 0.29 by the end of the NEP. The improvement of the observable characteristics for male and female employment indicates that occupation segregation among the ethnic Chinese increased during the NEP. Additionally, the difference between the DDI before the NEP and the ADDI for ethnic Chinese is slightly larger than the difference between the overall DDI before the NEP and the ADDI. Furthermore, the result of the ADDI II post-NEP for ethnic Chinese shows that if the characteristics of male and female employment after the NEP are replaced by the characteristics of male and female employment before the NEP, occupation segregation decreases from 0.24 to 0.16. The change in observable characteristics of male and female employment indicates that occupation segregation worsened among the ethnic Chinese during the NEP. Furthermore, the difference between the DDI after the NEP and the ADDI II for the ethnic Chinese was slightly smaller than the difference between the overall DDI after the NEP and the ADDI II. The results imply that male-female occupation segregation among ethnic Chinese was less conspicuous than the overall male-female occupation segregation index. In contrast, gender occupation segregation among the ethnic Chinese was lower than gender occupation segregation among ethnic Malays.

For the ethnic Indians, the DDI prior to NEP was 0.37. However, the DDI decreased to 0.23 by the end of the NEP. The finding implies that occupation segregation between ethnic Indian males and females was less marked by the end of the NEP. Efforts undertaken in accordance with the NEP policy were able to provide many low-income Indian families with employment in various sectors of the economy. Thus, the NEP promoted rural-urban migration and female participation among ethnic Indians in modern sectors. According to the results of the ADDI pre-NEP for ethnic Indians, when the characteristics of male and female employment before the NEP are replaced with the characteristics of male and female employment after the NEP, segregation decreases from

0.37 to 0.33. The improvement of observable characteristics for male and female employment indicates that segregation was slightly reduced under the NEP. The result of the ADDI II post-NEP for ethnic Indians shows that when the characteristics of male and female employment after the NEP are replaced with the characteristics of male and female employment before the NEP. Segregation among ethnic Indians increases from 0.23 to 0.35. The change in observable characteristics of male and female employment indicate that segregation between ethnic Indian males and females reduced under the NEP. Segregation based on employment between ethnic Indian males and females was high at the beginning of the NEP. However, the NEP was successful in lifting the standard of living of ethnic Indians. As a result, the segregation gap between ethnic Indian males and females was reduced by the end of the NEP.

## 5. Concluding remarks

The paper explored ethnic gender occupation segregation that underpinned the economic inequalities between the major ethnic groups in Malaysia. Using the DDI and the ADDI, the study finds that the overall occupation segregation between males and females increased by the end of the NEP, particularly among ethnic Malays. As a result, economic inequalities between ethnic groups persisted at the end of NEP. The findings imply that issue relating to gender segregation among ethnic groups should be taken into consideration in order to ensure that employment patterns reflect the racial composition of Malaysian society. This is consistent with the low level Malay (female) occupation participation in modern sector, namely the manufacturing sector, as observed by Osman-Rani (1982).

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