INCOME INEQUALITY IN MALAYSIA: A DECOMPOSITION ANALYSIS BY INCOME SOURCES

ROSLAN A. HAKIM

School of Economics

Universiti Utara Malaysia

ABSTRACT

This paper examines the contribution of inequality in income sources to total inequality in Malaysia using the Malaysian Family Life Survey (MFLS) data. Two measures of inequality are calculated - the Shorrock's and Gini indices of inequality. Both inequality indices are decomposed to its various income sources contribution to total inequality. The results show that a large portion of the total inequality in Malaysia was attributable to labour income, i.e. paid and self-employment. The contribution of capital and transfer incomes (i.e. rent, interest and dividends as well as pensions and EPF) to total inequality appeared to be relatively small. Nonetheless, its contribution has increased. The large contribution of paid and self-employment to total inequality was not because these sources were the most unequally distributed sources, but rather due to their importance in total household income. The results also show that income from rent, interest and dividends was found to have a consistently unequalising effect on inequality. The decomposition analysis highlighted the importance of reducing inequality in paid employment, self-employment, as well as rent, interest and dividends as the best strategy to reduce income inequality in Malaysia.

ABSTRAK

Kertas ini meneliti sumbangan ketaksamarataan dalam sumber-sumber pendapatan isi rumah terhadap ketaksamarataan di Malaysia. Data kajian diperoleh daripada Malaysian Family Life Survey (MFLS), manakala ukuran ketaksamarataan yang digunakan ialah indek ketaksamarataan Shorrock dan Gini. Kedua-dua indek ketaksamarataan ini masing-masing dipecahkan untuk melihat sumbangan ketaksamarataan agihan dalam sumber-sumber pendapatan terhadap jumlah ketaksamarataan pendapatan isi rumah. Hasil kajian menunjukkan bahawa sebahagian besar daripada jumlah ketaksamarataan di Malaysia berpunca daripada ketaksamarataan dalam pendapatan buruh, iaitu pendapatan daripada gaji dan pekerjaan sendiri. Sumbangan ketaksamarataan pendapatan daripada modal dan bayaran pindahan (sewa, bunga, dividen serta pencen dan KWSP) kepada jumlah ketaksamarataan adalah kecil. Bagaimanapun, peranan ketaksamarataan sumber-sumber pendapatan daripada modal

dan bayaran pindahan ini didapati semakin meningkat. Sumbangan yang besar dari ketaksamarataan dalam pendapatan daripada gaji dan pekerjaan sendiri ini pula bukanlah kerana sumber-sumber pendapatan ini merupakan sumber pendapatan yang paling tak sama rata agihannya, tetapi kerana bahagiannya yang besar dalam jumlah pendapatan isi rumah. Hasil kajian juga menunjukkan bahawa pendapatan daripada sewa, bunga dan dividen mempunyai kesan negatif terhadap ketaksamarataan pendapatan isi rumah. Kajian ini menunjukkan bahawa strategi terbaik untuk mengurangkan ketaksamarataan pendapatan isi rumah di Malaysia ialah dengan mengurangkan ketaksamarataan dalam pendapatan yang diperoleh daripada gaji dan pekerjaan sendiri, serta sewa, bunga dan dividen.

INTRODUCTION

The purpose of this paper is to examine the contribution of inequality in income sources to total inequality in Malaysia. Previous studies on income inequality in Malaysia, such as Anand (1983), Ikemoto (1985), and Shireen (1998) examined the personal income distribution in Malaysia, which included examination of the contribution of inequality within and between population sub-groups to the total inequality. Therefore, while these studies contributed to the understanding of income inequality in Malaysia, they did not however explain the whole story. The reason for this was that these studies treated income as if it was a single lump. In reality, however, income is usually derived from a range of sources such as income from labour, capital and transfers. The proportion of each source in total income is unlikely to be the same and also unlikely to be distributed evenly throughout the population. The questions then arise as to what extent the inequality of these sources contributes to total inequality and what impact they have on it. Thus, these questions merit investigation. Unfortunately, examination of this aspect of income inequality is still absent in Malaysia. Using the Malaysian Family Life Survey (MFLS) data, this study attempts to bridge the existing gap in the literature, and hopefully will improve and shed further light on the understanding of income inequality in Malaysia. This paper is organised as follows. First, we briefly describe the data, and then followed by a discussion on the method of inequality decomposition. Next, we examine the structure of household income. Subsequently, the results of the decomposition, i.e., the contribution of the various income components as well as their impact to total income inequality, is examined and discussed. Finally, we conclude the paper.

THE DATA

The present study employs household income data from the Malaysian Family Life Survey (MFLS), which was conducted in Peninsular Malaysia by the RAND Corporation, USA. There are two surveys – the MFLS1 and the MFLS2.[1] The MFLS1 was fielded in 1976-1977, while the MFLS2 was fielded in 1988-89 as a

follow-up survey to the MFLS1. The MFLS gathered information generally on all income received by the household – cash and non-cash income, which included the value of self-activities such as housework products and services for own consumption. Income data was collected on agricultural production, ownership of animals, businesses owned, services performed, gifts from non-household members, inheritance or dowries received, income from insurance, pensions, retirement programs and interest; income received from renting rooms, houses or land; ownership of land; and possession of durable goods. Thus, the concept of income used in the MFLS was fairly broad and the income data could also be classified according to its sources. Here household income, which refers to total annual income received by each household, is broadly grouped into the following sources: (i) paid employment – refers to income before tax received from work, which is mainly wages and salaries, including bonuses as well as payments in-kind; (ii) self-employment – refers to gross income from self-employment including income from agriculture and business activities; (iii) rent (from property such as housing, and land), interest and dividends; (iv) pensions and employment provident funds (EPF); (v) remittances; (vi) welfare payment and zakat; (vii) inheritance, gifts and dowries; (viii) home produce and consumption, and (ix) others.

METHOD OF INEQUALITY DECOMPOSITION

As mentioned above, household income gathered in the MFLS could be classified according to its various sources. Thus, the MFLS data sets allow inequality decomposition analysis to be carried out to examine the contribution of different source of income to total inequality. Here, two decomposable measures of inequality are calculated - the Shorrock's index and the Gini coefficient (Pyatt, Chen and Fei 1980; Shorrocks 1982; Adams 1994; Yao 1997). Reddy and Chakravarty (1998) for instance, have employed both these indices in their study on the role of income from forestry in income inequality and poverty in India. The decomposition of the Shorrocks and Gini inequality indices are explained below.

Decomposition of Shorrocks Inequality Index

Shorrocks (1982) investigates the impact of different sources of income on aggregate income inequality. The contribution of inequality in each source on aggregate income inequality could be viewed from two dimensions. First, if the source of inequality only arises from one source of income, while the rest were equally distributed, what would be the level of aggregate inequality index? Second, if all other sources of income were left unaffected, but one remaining source is made equally distributed, what would be the decline in the aggregate income inequality? Lets call the former C_r^A and the latter C_r^B. Shorrocks (1982) demontrates that for a certain class of indices, such as the square of coefficient

of variation, the aggregate inequality index could be decomposed into a sum of contributions from the income sources. For this class of indices, the share of source r in aggregate inequality, say S_r, is the arithmetic mean of C_r^A and C_r^B. Now, suppose a population that consists of n number of households, i=1, 2, …,n. Their income is derived from k sources, say sources r = 1, 2, …k. Let y_i^r be the income derived from source r by the ith household. The aggregate income for that i^{th} household, y_i, is the sum of y_i^r, summed over r=1, 2, …, k. Let also the symbols μ and μ_r represent the arithmetic mean of y_i and y_i^r respectively. If I is the index of inequality of y_i, then Shorrocks (1982) demonstrates that,

[1] $C_r^A = I\{z_1, …, z_n\}$, where, $z_i = y_i^r + (\mu - \mu_r)$, for i=1,…,n, and

[2] $C_r^B = I\{y_1,…,y_n\} - I(w_1,…,w_n)$, where $w_i = (y_i - y_i^r - \mu_r)$, for i=1,…,n.

C_r^A could be interpreted as the value of inequality index if income in all other sources other than source r were equally distributed. In other words, C_r^A is the inequality index if the only source of income differences arose from source r. C_r^B on the other hand, could be interpreted as the decline in inequality index when income from source r is equally distributed, while all other income source remain unaffected. Shorrocks (1982) also demonstrates that the two components, C_r^A and C_r^B, can be unambiguously separated if the inequality measure selected comes from a limited class of measures, such as the square of coefficient of variation. Therefore, the inequality index I can be decomposed into the contribution of each income source. The aggregate inequality then is the sum of these components over the entire range of the income sources, r=1, 2,…k, i.e.

[3] $I\{y_1, y_2, …,y_n\} = \Sigma S_r(y_1,…,y_n;y_1^r,…,y_n^r)$, where Shorrock (1982) has demonstrated

that;

[4] $S_r(y_1,…,y_n;y_1^r,…,y_n^r) = (1/2)(C_r^A + C_r^B)$.

The fractional contribution of source r to the total inequality is S_r/I, and the percentage contribution could be obtained by multiplying this amount by 100. The inequality index, I, considered here is the C-Square, i.e. the square of coefficient of variation.

Besides examining the contribution of each source, it is also interesting to calculate the likely impact of each source on total income inequality. Thus, it would be worthwhile to estimate the proportion of inequality that would remain if the only source of income differences is from source r, while inequality in the rest of the sources were eliminated; and also to estimate the proportion of inequality that would remain if the income from source r were equally distributed while the distribution of the rest of the sources remains unchanged. Let the former be denoted α^r, while the latter β^r. Following Jenskins (1995) and Papatheodorou (1998), α^r and β^r are calculated as follows:

[5] $\alpha_r = C_r^A/I$ and

[6] $\beta_r = (I - C_r^B)/I$

Decomposition of Gini Inequality Index

Another most commonly used measure of income inequality is the Gini coefficient. When the total income is divided into a number of sources, the Gini coefficient measuring the total income inequality can be decomposed into its various sources. Yao (1997) develops a new decomposition approach, which is simple to follow, and applicable regardless of how the population is grouped. Following Yao (1997), consider a population that is divided into n groups. Let m_i denote the mean income of group i (i=1,2,…,n), m the mean income of the total population, p_i the population share of group i, and w_i, where $w_i = p_i m_i/m$, is the income share of group i in total income. Yao (1997) expresses the Gini index measuring total income inequality as follows:

$$[7]\ G = 1 - \sum_{i=1}^{n} p_i(2Q_i - w_i),\ i=1, 2, …, n.$$

where $\sum_{i=1}^{n} p_i = 1$, $\sum_{i=1}^{n} w_i = 1$, $w_i = p_i m_i/m$, and

$Q_i = \sum_{k=1}^{i} w_k$, for k = 1, 2, …, n, is the cumulative income share from group 1 to group i,

and p_i and w_i follow an ascending order of m_i ($m_1 \le m_2 \le … \le m_n$). Now, suppose that the total income is derived from F sources. Let $w_{fi} = p_i m_{fi}/m_f$ denote the income share of group i in the total income arising from factor f (f=1,2,…,F), where p_i is defined as above, m_f is the population mean income of factor f, and m_{fi} is the mean factor income of group i. If p_i's and w_{fi}'s are arranged so that they strictly follow a monotonically ascending order of group mean factor income m_{fi}'s (or $m_{f1} \le m_{f2} \le … \le m_{fn}$), the Gini coefficient for income source f is defined as follows:

$$[8]\ G_f = 1 - \sum_{i=1}^{n} p_i(2Q_{fi} - w_{fi}),\ \text{where}$$

$\sum_{i=1}^{n} pi = 1$, $Q_{fi} = \sum_{k=1}^{i} w_{fk}$ is the cumulative income share from group 1 to i with p_i's and

w_i's following $m_{f1} \le m_{f2} \le \ldots \le m_{fn}$. If p_i's and w_{fi}'s follow an ascending order of group mean total income, m_i's, instead of group mean factor income, m_{fi}'s, the same equation can be used to calculate the factor concentration ratio, C_f, as below:

$$[9] \quad C_f = 1 - \sum_{i=1}^{n} p_i(2Q_{fi} - w_{fi})$$

with p_i's and w_{fi}'s following $m_1 \le m_2 \le \ldots \le m_n$. Substituting equation [3] into equation [7], the Gini index can then be decomposed as:

$$G = \sum_{f=1}^{F} w_f C_f, \text{ where}$$

$$\sum_{f=1}^{F} w_f = \sum_{f=1}^{F} m_f / m = 1$$

In other words, the Gini index of total income is the weighted average of concentration ratios. Thus, the decomposition of the Gini index only involves the factor concentration ratio, C_f's, and the factor income shares in total income, w_f. It does not involve the calculation of factor Gini index, G_f's. Dividing the factor concentration ratio, C_f, with the total Gini index, G, gives the relative concentration coefficient, g_f, which is defined as follows:

$$[10] \quad g_f = C_f / G, \text{ and } \sum_{f=1}^{F} w_f g_f = 1$$

The relative concentration ratio, g_f, shows the effects of income source f on total inequality. If the g_f value for an income factor is greater than unity, that income factor is said to be an inequality-increasing factor, which means that, *ceteris paribus*, an enlarged share of that income factor will lead to an increase in total income inequality. On the contrary, if the g_f value of an income factor is less than unity, that income factor is said to be an inequality-decreasing factor. The percentage contribution of an income source can then be obtained by multiplying the $w_f g_f$ value of the income source by 100.

THE STRUCTURE OF HOUSEHOLD INCOME

Table 1 presents the structure of household income for 1976/77 and 1988/89. It is clear that paid employment constituted the major portion of total household income, followed by self-employment. About three fifths of total household

income was derived from paid employment. Self-employment made up about one third to one fourth of the total household income. Therefore, taking both the paid income and self-employment together, labour income formed the main source of household income. The share of income from capital (rents, interests and dividends, pensions and EPF) and transfers (welfare payments, remittances, inheritance, dowries, and gifts) appeared to be relatively small compared to income from labour.

Table 1
The Structure of Household Income (%), 1976/77 and 1988/89.

Income Source	1976/77	1988/89
Paid Employment	58.71	59.84
Self-Employment	35.69	24.40
Rent, Interest and Dividends	1.25	3.23
Pension and EPF	0.13	3.33
Welfare Payment and Zakat	0.01	0.02
Remittances	0.87	5.02
Inheritance, Dowries and Gifts	0.15	0.66
Home Produce and Consumption	2.83	2.42
Others	0.35	1.08
TOTAL	100.00	100.00

Between 1976/77 and 1988/89, it was found that the share of self-employment in the total household income declined. The share of paid employment remained almost about the same. On the other hand, the share of income from capital and transfers - particularly rents, interests, dividends, pensions, EPF and remittances - increased. Nonetheless, it still remained relatively small. A simple correlation was performed between total household income and its various sources. The correlation coefficient for both 1976/77 and 1988/89 is shown in Table 2.

There was a high correlation between total income and income from paid employment as well as self-employment for both 1976/77 and 1988/89. In 1976/77 the correlation coefficient between total income and self-employment appeared to be relatively higher than that between total income and paid employment. In 1988/89, however, the reverse was true. The correlation coefficient was relatively higher between total income and paid-employment than between total income and self-employment. The correlation coefficient between total income and income from capital (rent, interest, dividends, pensions and EPF) was higher in 1988/89 than in 1976/77. Thus, generally speaking, paid and self-employment were positively and relatively highly correlated with total income compared to the rest of income sources. Capital income (particularly rent, interest and dividends) was also found to be positively and quite highly correlated with total income in 1988/89.

Table 2

Correlation Coefficient Between Income Sources and Total Household
Income, 1976/77 and 1988/89.

Income Source	1976/77	1988/89
Paid Employment	0.524**	0.680**
Self-Employment	0.798**	0.553**
Rent, Interest and Dividends	0.168**	0.417**
Pension and EPF	0.028	0.297**
Welfare Payment and Zakat	-0.015	0.019
Remittances	0.033	0.214**
Inheritance, Dowries and Gifts	0.036	0.040
Home Produce and Consumption	0.177**	0.157**
Others	0.078**	0.087**
TOTAL	1.000	1.000

Note:
* Correlation is significant at the 0.05 level (2-tailed).

THE CONTRIBUTION AND EFFECT OF INCOME SOURCES ON INEQUALITY

Table 3 and Table 4 respectively present the decomposition of Shorrock's and the Gini inequality indices to their various income source components. The magnitude of contribution of income source to aggregate inequality from Shorrock's decomposition was not exactly similar to the Gini decomposition. However, both decomposition methods showed that a significantly large portion of total income inequality was contributed by labour income – paid and self-employment. This finding is quite similar to Fields (1979) in his study on urban income inequality in Colombia. The rest of the sources of income made only a relatively small contribution. However, there was a growing role of rent, interest and dividends as well as pensions and EPF as determinants of aggregate inequality. This could be seen from the increased contribution of these sources to aggregate inequality between 1976/77 and 1988/89. The question that needed further investigation was why was it that labour income – paid and self-employment - contributed a large portion of the aggregate income inequality, while the rest of the sources were smaller? What was the explanation for this observation? One possible explanation was that if paid and self-employment accounted for a significantly large portion of aggregate income inequality, then it was likely that paid and self-employment were highly unequally distributed. By the same token, if the rest of the sources accounted for only a relatively small portion of aggregate inequality, then it was likely that these sources were relatively equally distributed.

Table 3
MFLS Data: Shorrock's Decomposition of Inequality by Income Sources, 1976/77 and 1988/89.

	Paid Employment	Self-Employment	Rent, Interest & Dividends	Pensions & EPF	Welfare Payments & Zakat	Remittances	Inheritance, Dowries & Gifts	Home Produce & Consumption	Others	TOTAL
1976/77										
$(\mu_r/\mu)*100$	58.71	35.69	1.25	0.13	0.01	0.87	0.15	2.83	0.35	100.00
P_r	0.5242	0.7977	0.1680	0.0279	-0.0151	0.0331	0.0361	0.1773	0.0778	1.0000
C-Squared	2.5376	13.4197	81.2798	174.3125	686.2289	31.7857	231.6106	14.4663	79.7783	2.4852
C^A	0.8748	1.7091	0.0128	0.0003	0.0000	0.0024	0.0005	0.0116	0.0010	2.4852
C^B	0.6709	1.5790	0.0471	0.0012	-0.0002	0.0027	0.0021	0.0486	0.0067	2.4852
S_r	0.7729	1.6440	0.0299	0.0008	-0.0001	0.0026	0.0013	0.0301	0.0038	2.4852
$S_r/I*100$	31.10	66.15	1.20	0.03	0.00	0.10	0.05	1.21	0.15	100.00
α_r*100	35.20	68.77	0.51	0.01	0.00	0.10	0.02	0.47	0.04	100.00
β_r*100	73.00	36.47	98.11	99.95	100.01	99.87	99.89	98.05	99.73	0.00
1988/89										
$(\mu_r/\mu)*100$	59.84	24.40	3.23	3.33	0.02	5.02	5.02	2.42	1.08	100.00
P_r	0.6799	0.5534	0.4169	0.2969	0.0187	0.2145	0.2145	0.1568	0.0867	1.0000
C-Squared	1.8898	6.4090	36.3006	99.6411	393.4313	15.6358	15.6358	19.5291	111.2174	1.3271
C^A	0.6766	0.3816	0.0380	0.1107	0.0000	0.0394	0.0394	0.0115	0.0129	1.3271
C^B	0.6119	0.4061	0.1492	0.1169	0.0002	0.0587	0.0587	0.0272	0.0098	1.3271
S_r	0.6443	0.3938	0.0936	0.1138	0.0001	0.0490	0.0490	0.0193	0.0114	1.3271
$S_r/I*100$	48.55	29.67	7.05	8.58	0.01	3.69	3.69	1.46	0.86	100.00
α_r*100	50.98	28.75	2.86	8.34	0.00	2.97	2.97	0.86	0.98	100.00
β_r*100	53.89	69.40	88.76	91.19	99.99	95.58	95.58	97.95	99.26	0.00

Note:
$(\mu_r/\mu)*100$ = the share of income from source r in total household income; p_r = the correlation coefficient between income from source r and total household income; C-Squared = the squared coefficient of variation; C^A = inequality index if the only source of income differences arose from source r; C^B = the decline in inequality index when income from source r is equally distributed, while all other income source remain unaffected; S_r = the absolute contribution of source r to total inequality; $S_r/I*100$ = the percentage contribution of source r to total inequality; α_r*100 = the percentage of total inequality that would remain if the only source of income differences is from source r, while the income for the rest of the sources become equally distributed; β_r*100 = the percentage of total inequality that would remain if the income from source r were equally distributed while the distribution of the rest of the sources remains unchanged.

Table 4

MFLS Data: Gini Decomposition of Inequality by Income Sources, 1976/77 and 1988/89.

	mf	wf	Gf	Cf	wfCf	gf=Cf/G	wfgf	% contribution
1976/77								
Paid Employment	3659	0.5871	0.6293	0.4821	0.2831	0.8898	0.5224	52.24
Self-Employment	2224	0.3569	0.8399	0.6422	0.2292	1.1853	0.4230	42.30
Rent, Interest & Dividends	78	0.0125	0.9745	0.7333	0.0092	1.3534	0.0170	1.70
Pensions & EPF	8	0.0013	0.9945	0.4032	0.0005	0.7442	0.0010	0.10
Welfare Payments & Zakat	1	0.0001	0.9983	-0.4011	-0.0001	-0.7403	-0.0001	-0.01
Remittances	54	0.0087	0.9263	0.2010	0.0018	0.3710	0.0032	0.32
Inheritance, Dowries & Gifts	10	0.0015	0.9947	0.5719	0.0009	1.0554	0.0016	0.16
Home Produce & Consumption	176	0.0283	0.8212	0.5423	0.0153	1.0009	0.0283	2.83
Others	22	0.0035	0.9804	0.5591	0.0020	1.0318	0.0036	0.36
TOTAL	6232	1.0000	0.5418	0.5418	0.5418	1.0000	1.0000	100.00
1988/89								
Paid Employment	7881	0.5987	0.5850	0.4620	0.2765	0.9902	0.5925	59.25
Self-Employment	3214	0.2440	0.7969	0.4660	0.1137	0.9987	0.2437	24.37
Rent, Interest & Dividends	426	0.0323	0.9589	0.7635	0.0247	1.6361	0.0529	5.29
Pensions & EPF	439	0.0333	0.9685	0.5888	0.0196	1.2618	0.0421	4.21
Welfare Payments & Zakat	3	0.0002	0.9965	0.0781	0.0000	0.1673	0.0000	0.00
Remittances	661	0.0502	0.8830	0.3327	0.0167	0.7131	0.0358	3.58
Inheritance, Dowries & Gifts	86	0.0066	0.9724	0.3678	0.0024	0.7881	0.0052	0.52
Home Produce & Consumption	319	0.0242	0.9015	0.3359	0.0081	0.7198	0.0174	1.74
Others	142	0.0108	0.9856	0.4512	0.0049	0.9669	0.0104	1.04
TOTAL	13172	1.0000	0.4666	0.4666	0.4666	1.0000	1.0000	100.00

Note:
mf = average income for source f; wf = income share of source f in total income; Gf = Gini coefficient for source f; Cf = factor concentration ratio; wfCf = relative factor concentration ratio; wfgf = factor inequality weight.

However, this was not the case. Table 3 and Table 4 show that the inequality indices (both Shorrock's and Gini) for both paid employment and self-employment appeared to be relatively the most equally distributed sources of income compared to the rest of the sources. Income from capital (rents, interests, dividends, pensions and EPF) and transfers (welfare payments, remittances, inheritance, dowries and gifts) on the other hand, appeared to be relatively highly unequally distributed.

Another sensible explanation could be the relative importance of each income source to total household income. The contribution of income source to total inequality not only depends on the degree of inequality of each source, but also on the relative importance of that income source in the total household income. In other words, the magnitude of the contribution of income sources to total income inequality also depends on their relative importance in the total household income. As examined earlier, it is clear that the structure of household income in 1976/77 and 1988/89 showed that the bulk of total household income came from paid and self-employment. Besides, the importance of both income sources in the household total income was also revealed by fact that both sources were positively and relatively highly correlated with total household income. Therefore, even though paid and self-employment appeared to be more equally distributed than other sources of income, both sources formed an important part of the total household income. The bulk of household income comes from paid and self-employment. Their weight ensures that they make a major contribution to total inequality, even though they are more evenly distributed than other sources of household income. By extension, although capital and transfer income are unequally distributed, their lack of weight ensures that their contribution to household income inequality is limited.

The above observation was still unsatisfactory. It only showed how much each source contributed to total income inequality. It did not tell the attribute of the sources, i.e. the likely impact of each source on inequality. One of the ways to examine this attribute was by comparing the percentage share of the income source to total household income with the percentage contribution of the source to aggregate inequality (Adger 1999). If the percentage share of the source in total household income was larger than its percentage contribution to aggregate inequality, then the source had an equalising (positive) effect on aggregate inequality. On the other hand, if the percentage share of the source in total household income was smaller than its percentage contribution to aggregate inequality, then the source had an unequalising (negative) effect on aggregate inequality. Adger (1999) employed this method to identify the effect of income source on income inequality in his study of income inequality in Vietnam. However, Yao (1997, p. 28) pointed out that there was a more direct way of identifying which income source served to increase or decrease inequality. This attribute of income source could be identified by looking at the relative concentration coefficient (g_f) derived from the Gini inequality decomposition as being mentioned earlier. According to Yao (1997, p. 28), a relative

concentration coefficient (g_f) of more than the value of unity (one) implied that an income source had an unequalising (negative) effect on total inequality, while a value less than unity (one) implied that the income source had an equalising (positive) effect on inequality.

From Table 4 it could be observed that in 1976/77 the percentage contribution of paid employment to aggregate inequality was smaller than its percentage share in total household income. Meanwhile, the percentage contribution of self-employment to aggregate inequality was higher than its percentage share in total household income. Furthermore, the relative concentration ratio (gf) for paid employment was less than one, while the relative concentration ratio (gf) for self-employment was more than one. Thus, it is clear that in 1976/77 paid employment had an equalising (positive) effect on aggregate inequality. On the other hand, self-employment had an unequalising (negative) effect on aggregate inequality.[2] In 1988/89 however, both sources had an equalising (positive) effect on aggregate inequality. Another observation that is worth mentioning here is that rent, interest and dividends consistently had an unequalising effect on aggregate inequality, both in 1976/77 and 1988/89. Besides, pensions and EPF had a positive impact on inequality in 1976/77. In 1988/89 however, they became unequalising sources. Comparing the percentage share of income source in total income with the percentage contribution of that income source to aggregate inequality, or looking at the relative concentration ratio of that income source, revealed only the attribute of the income source. It did not give the real magnitude of the impact of the income source on aggregate inequality. The magnitude of the impact of each source of income on aggregate inequality can be gauged from the respective figures of α and β derived in Shorrock's decomposition (see Table 3). The figures of α and β for paid employment and self-employment confirmed the importance of these sources in determining aggregate inequality. The α for paid employment indicated that if all other sources of income had been equalised except income from paid employment, total household income inequality would have remained at about 35.0 percent of its actual figure in 1976/77. Thus, if paid employment had been the only source of differences in income, total household income inequality would have been reduced by 65.0 percent. Looking at it differently, if income from paid employment had been equalised while the rest of the sources of income remained the same, the β for paid employment would have indicated that total household income inequality would be at 73.0 percent of its current level. In other words, if inequality in paid employment had been eliminated, the total household income inequality would have declined about 27.0 percent. On the other hand, if self-employment had been the only source of income differences (α), total household income inequality would have remained at about 69.0 percent of its current level. If the differences in paid employment had been eliminated and the rest of the sources remained unchanged (β), total household income inequality in 1976/77 would have been reduced to about 36.0 percent of its current level of inequality – a reduction of 64.0 percent of the aggregate income inequality. For sources other than paid

and self-employment, it appeared that if inequality in these sources had been eliminated, there would have been no significant reduction in total income inequality. Thus, it appeared that the most effective way to reduce total income inequality in 1976/77 was by reducing inequality in self-employment, followed by reducing inequality in paid employment.

In 1988/89, the β for paid employment showed that if paid employment had been equalised while the rest of the sources remained the same, total income inequality would have been at about 54.0 percent of its actual figure – a reduction of about 46.0 percent. On the other hand if inequality in self-employment had been eliminated, then total inequality would have been reduced by only about 29.0 percent. Therefore, while eliminating inequality in self-employment had been the best strategy to reduce total inequality in 1976/77, it appeared that this changed for 1988/89. In 1988/89, the most effective way to reduce total income inequality was by reducing inequality in paid employment. Furthermore, the β for rent, interest and dividends as well as for pensions and EPF showed that, if these sources had been equalised, aggregate inequality would have remained at 89.0 and 91.0 percent respectively. In other words, aggregate inequality would have been respectively reduced by 11.0 and 9.0 percents. While this was only a small reduction in aggregate inequality, nonetheless it was significant compared to the figures in 1976/77. For example, the β for rent, interest and dividends in 1976/77 showed that if inequality in this source had been eliminated, aggregate inequality in 1976/77 would only have been reduced by about 2.0 percent. This is relatively smaller than the 1988/89 figures where if inequality in rent, interest and dividends had been eliminated, aggregate inequality would have been reduced by about 11.0 percent. This result therefore confirms that there was a growing role of inequality of rent, interest and dividends (as well as pensions and EPF) as determinants of aggregate income inequality between 1976/77 and 1988/89.

CONCLUSION

Decomposition of income inequality by income source in Malaysia shows that a large portion of the total inequality was attributable to labour income, i.e. paid and self-employment. The large contribution of paid and self-employment to total inequality was not because these sources were the most unequally distributed sources, but rather due to their importance (large share) in total household income. The contribution of capital and transfer incomes (i.e. rent, interest and dividends as well as pensions and EPF) to total inequality appeared to be relatively small. Nonetheless, its contribution increased between the two periods under study. These findings are quite similar to those of Fields (1979).

With regard to effects of income source on income inequality, the results show that income from rent, interest and dividends was found to have a consistently unequalising effect. This implies that, *ceteris paribus*, an enlarged share of rent,

interest and dividends in total household income would be likely to worsen income inequality. The decomposition analysis highlighted the importance of reducing inequality in paid employment, self-employment, as well as rent, interest and dividends. The importance of reducing inequality in paid employment for instance, can be comprehended from the fact that by eliminating inequality in paid employment in 1988/89, while leaving the distribution of the rest of the sources unchanged, the overall inequality was expected to decline roughly about 46.0 percent from its 1988/89 level. The figures for eliminating inequality in self-employment as well as in rent, interest and dividends (while leaving inequality of the rest of the sources unchanged) were 31.0 and 11.0 percent respectively. Thus, in terms of strategy to improve inequality, the decomposition analysis indicated that the best strategy to reduce income inequality is by reducing inequality in paid employment, followed by reducing inequality in self-employment as well as inequality in rent, interest and dividends.

ENDNOTES

1. The first Malaysian Family Life Survey (MFLS1) was funded by the U.S. Agency for International Development. The MFLS1 was conducted by the RAND Corporation in collabouration, initially, with the Department of Statistics of the Government of Malaysia, and subsequently, with Survey Research Malaysia Sdn. Bhd. For more information about the survey, see Butz and Da Vanzo (1978). The second Malaysian Family Life Survey (MFLS2) was a colloborative project between RAND and the National Population and Family Development Board of Malaysia, with the support from the National Institute of Child Health and Human Development (USA) and the National Institute on Ageing (USA). For more information about the MFLS2, see Peterson (1993).

2. As being mentioned earlier, the contribution of each income source to aggregate inequality is not similar between the two methods of decomposition. Thus comparing the percentage share of income source in total income with the percentage contribution of income source in aggregate inequality derived from the two methods might produce inconsistent results. Here the effect of income source on inequality is identified by looking at the relative concentration ratio (gf) as well as comparing the percentage share of income source in total income with the percentage contribution of income source in aggregate inequality derived from the Gini decomposition only. The relative concentration ratio (gf) derived from Gini decomposition appears to give a more consistent results.

REFERENCES

Adams, R.H. (1994). Non-farm income and inequality in rural Pakistan: a decomposition analysis. *The Journal of Development Studies*, 31(1), 110-33.

Adger, W.L. (1999). Exploring income inequality in rural, coastal viet nam. *The Journal of Development Studies*, 35(5), 96-119.

Anand, S. (1983). *Inequality and Poverty in Malaysia: Measurement and Decomposition*. Oxford University Press.

Butz, W.P. & DaVanzo, J. (1978). *The Malaysian Family Life Survey: Summary Report*. Santa Monica: RAND.

Butz, W.P. et al. (1978). *The Malaysian Family Life Survey: Appendix A, Questionnaires and Interview Instructions*. Santa Monica: RAND.

DaVanso, J. et al. (1993). *The Second Malaysian Family Life Survey: Survey Instruments*. Santa Monica: RAND.

Fahmi, O. (1978). *The Malaysian Family Life Survey: Appendix D, Descriptions of Sample Communities*. Santa Monica: RAND.

Fain, T. (1996). *The First Malaysian Family Life Survey: Codebook for the Individual-Level Dataset*. Santa Monica: RAND.

Fain, T. & Tan P.K. (1982). *The Malaysian Family Life Survey: Appendix E, Master Codebook*. Santa Monica: RAND.

Fields, G.S. (1979). Income inequality in urban Colombia: a decomposition analysis. *Review of Income and Wealth*, 25, 327-41.

Fields, G.S. (1994). Data for measuring poverty and inequality changes in the developing countries. *Journal of Development Economics*, 44, 87-102.

Haaga, J.G. et al. (1993), *The Second Malaysian Family Life Survey: Overview and Technical Report*. Santa Monica: RAND.

Ikemoto, Y. (1985). Income distribution in Malaysia: 1957-80. *The Developing Economies*, 23(4), 347-67.

Jenkins, S.P. (1995). Accounting for inequality trends: decomposition analysis for the UK, 1971-86. *Economica*, 62, 29-63.

Paptheodorou, C. (1998). Inequality in Greece: an analysis by income sources, discussion paper DARP No. 39 (July). *Distributional Analysis and Research Programme*. London School of Economics.

Perumal, M. (1989), Economic growth and income inequality in Malaysia, 1957-1984. *Singapore Economic Review*, 34(2), 33-46.

Peterson, C.E. (1993). *The Second Malaysian Family Life Survey: User's Guide*. Santa Monica: RAND.

Peterson, C.E. & Campbell, N. (1993). *The First Malaysian Family Life Survey: Documentation for Subfiles*. Santa Monica: RAND.

Peterson, C.E., Sine, J., & Wesley, D. (1993). *The Second Malaysian Family Life Survey: Codebook*. Santa Monica: RAND.

Pyatt, G., Chen, C.C.N., & Fei, J. (1980). The distribution of income by factor components. *The Quarterly Journal of Economics*, 94, 451-73.

Reddy, S.R.C., & Chakravarty, S.P. (1999). Forest dependence and income distribution in a subsistence economy: evidence from India. *World Development*, 27(7), 1141-9.

Sen, A. (1997b). On Economic Inequality (Expanded Edition With a Substantial Annexe by James E. Foster & Amartya Sen). Clarendon Press, Oxford.

Shari, I. & Zin, R.H.M. (1990). The patterns and trends of income distribution in Malaysia, 1970-1987. *Singapore Economic Review*, 35(1), 102-23.

Shireen M.H. (1998). *Income Inequality and Poverty in Malaysia*. Rowman & Littlefield Publishers, Inc.

Shorrocks, A.F. (1980). The class of additively decomposable inequality measures. *Econometrica*, 48(3), 613-25.

Shorrocks, A.F. (1982). Inequality decomposition by factor components. *Econometrica*, 50(1) 193-211.

Shorrocks, A.F. (1983). The impact of income components on the distribution of family incomes. *The Quarterly Journal of Economics*, 98, 311-26.

Snodgrass, D.R. (1980). *Inequality and Economic Development in Malaysia*. Kuala Lumpur: Oxford University Press.

Yao, S. (1997). Decomposition of gini coefficients by income factors: a new approach and application. *Applied Economic Letters*, 4, 27-31.