

NBER WORKING PAPER SERIES

ETHNIC INEQUALITY AND POVERTY IN MALAYSIA SINCE 1969

Martin Ravallion

Working Paper 25640

<http://www.nber.org/papers/w25640>

NATIONAL BUREAU OF ECONOMIC RESEARCH

1050 Massachusetts Avenue

Cambridge, MA 02138

March 2019

This paper was written while the author was visiting the Ungku Aziz Centre in the Faculty of Economics, University of Malaya in January 2019. The author is grateful to the University for its hospitality. Meetings with staff of the Government's Department of Statistics and Ministry of Economic Affairs helped with questions about the data. The author also thanks Muhamad Hilmi Abdul Rahman for help in finding some of the data needed and translating documents. Helpful comments were received from Niaz Asadullah, Garance Genicot, Shamsulbahriah Ku Ahmad, Dominique van de Walle and participants at a public lecture at the University of Malaya. The views expressed herein are those of the author and do not necessarily reflect the views of the National Bureau of Economic Research.

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2019 by Martin Ravallion. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Ethnic Inequality and Poverty in Malaysia Since 1969
Martin Ravallion
NBER Working Paper No. 25640
March 2019
JEL No. I32,O15,O53

ABSTRACT

Ethnic riots broke out in Malaysia in 1969, prompting a national effort at affirmative action favoring the poorer (majority) of “Bumiputera” (mainly Malays). Since then, Malaysia’s official poverty measures indicate one of the fastest long-term rates of poverty reduction in the world, due to both economic growth and falling inequality. Did ethnic inequality fall since 1969 and was that a key factor in the country’s success in reducing poverty and in managing inequality? New measures in this paper indicate a substantial decline in relative ethnic inequality. This brought down national relative inequality, though not enough to prevent rising absolute inequality, given the initial disparities. A new analytic decomposition of the rate of poverty reduction reveals that ethnic redistribution helped reduce poverty, although it was not as important as the overall rate of growth in household incomes. Despite past progress in reducing ethnic inequality, the responsiveness of the national poverty rate to ethnic redistribution remains high even today.

Martin Ravallion
Department of Economics
Georgetown University
ICC 580
Washington, DC 20057
and NBER
mr1185@georgetown.edu

1. Introduction

Many countries face troubling ethnic/racial disparities in living standards. In striving to reduce poverty and keep overall inequality in check, the question arises as to what role explicit efforts to reduce ethnic disparities can play in national poverty reduction, and in managing inequality. This paper studies the post-independence economic history of the developing country that is probably the most famous example of policy efforts at ethnic redistribution, Malaysia. Indeed, it is hard to think of any country where ethnic inequality has been a bigger issue, or the policies more contentious. Some observers have seen the country's efforts to reduce ethnic inequality as crucial to overall social welfare and (especially) progress against poverty, while to others, affirmative action (such as in education) has been seen as "a blatant form of racial discrimination" (Raman and Sua, 2010, p.130).

Malaysia's colonial legacy had left both high inequality—with a marked ethnic dimension—and high poverty—with an especially high incidence of poverty among the ethnic majority, the Malay people and other (non-Malay) "Bumiputera." The other main ethnic groups are those with "Chinese" and "Indian" origins (though almost all born in Malaysia). Ethnic conflict in the decade or so after Independence in 1957 culminated in the tragic Sino-Malay race riots of May 1969. A dramatic policy response was announced in 1970—the "New Economic Policy" (NEP).² The distinctive feature was the extra effort at affirmative action, such that the Bumiputera were to receive favorable treatment in access to education, housing, public-sector hiring, and corporate share ownership. The NEP started in 1971, but it became sharper in 1975 when its conditions on Bumiputera share ownership and employment quotas became mandatory for all but small companies (Drabble, 2000, Ch.10). The official policy lasted 20 years, but had continuing influence after that.

Poverty reduction was a core aim of the NEP. In 1970, the official poverty rate (discussed further below) was about 50%, and almost two-thirds of the Bumiputera lived in poverty at that time. Poverty was not the only motivation for the NEP. Such ethnically-grounded policies can be defended from multiple perspectives, including as means for promoting social solidarity and counteracting discrimination by ethnicity. These goals may be seen as relevant to poverty but

² The riots followed a general election that saw electoral gains to new opposition parties, dominated by Malaysian Chinese, relative to the governing political coalition (the multi-ethnic Alliance Party). The riots prompted a state of emergency and the suspension of Parliament, which lasted two years.

also as independent issues. Nonetheless, it is clear that in Malaysia around 1970, poverty was a major concern, and ethnic inequality was widely seen as an important cause.

Malaysia has made huge progress against poverty over the last 50 years. The official poverty rate has fallen to well under 1%—a compound rate of decline of 10% per annum since 1969! It is important to learn how Malaysia did this. Thankfully, we have data from 18 reasonably comparable, nationally representative, household surveys to draw on.³ A natural question to ask of these data is what role the ethnically-grounded policy regime had in the country’s success against poverty.

Given that the NEP’s intended beneficiaries were the poorest ethnic group, who were very poor at the time, it might be expected that the policy helped reduce poverty. That appears to have been the expectation of policy makers, and has been heard often since.⁴ However, the case for that view remains far from clear. One issue is just how much ethnic redistribution has really happened, and how much it helped reduce overall inequality. Casual observations are frequent, but the literature is largely silent on quantitative magnitudes. There is a widespread casual view that since 1969 “the gap in income between Malays ... and Chinese- and Indian-Malaysians has narrowed dramatically.” (Economist, 2017). Is that right? The Bumiputera may have seen higher growth rates in mean incomes than other ethnic groups, but that does not imply that “the gap ... has narrowed” (even if not “dramatically”). If the initial inequality is high enough, relative inequality can fall while absolute inequality rises. Indeed, the evidence across countries suggests that this is quite common (Ravallion, 2018).

A second issue is how much the attained ethnic redistribution contributed to the country’s (impressive) poverty reduction. One also hears claims that “The most remarkable achievement of the NEP was in the reduction in poverty” (Khalid, 2014).⁵ Is that right? It is easy to imagine a theoretical scenario in which the gains to the poorer ethnic group are largely captured by the non-poor within that group, while the poor in the donor group lose out. Then ethnic redistribution—interpreted as bringing group-mean incomes closer—will come with a higher national poverty rate. More generally, consider the effect on the national poverty rate (H) of a redistribution of income from group j (with mean μ_j , population share s_j and poverty rate H_j) to group i , holding

³ One would clearly like to have more observations, but that is all that we have since 1969 and with a poverty rate of nearly zero now there is not much gain from waiting for more.

⁴ Recent examples can be found in both Khalid (2014) and Thillainathan and Cheong (2016).

⁵ One finds many other statements of this sort in the literature; see, for example, Roslan (2001).

the overall mean constant, and assume (for analytic convenience) sufficiently smooth continuous distributions. Then $dH = s_i dH_i + s_j dH_j = \left(\frac{dH_i}{d\mu_i} - \frac{dH_j}{d\mu_j} \right) s_i d\mu_i > (<) 0$ as $\frac{dH_i}{d\mu_i} > (<) \frac{dH_j}{d\mu_j}$ (noting that $s_i d\mu_i + s_j d\mu_j = 0$). Only knowing that $\mu_j > \mu_i$ and $H_j < H_i$ does not tell us the sign of the inter-ethnic difference in the marginal impacts of a higher group-mean income on poverty, and (hence) the impact on the national poverty rate of lower ethnic inequality.

Critics of the NEP have pointed to the fact that a large share of inequality is within ethnic groups, rather than between them.⁶ By this view, ethnic inequality is a specific instance of the “between-group” component in a decomposition of overall inequality. It can be debated whether the salience of ethnic/racial inequality is well reflected in such a decomposition (Kanbur, 2006); a small difference between ethnic groups may matter a lot more than a similar difference within a given group. However, even accepting the “between-group inequality” interpretation, a static inequality decomposition cannot (of course) tell us how inequality evolves over time, and it cannot tell us that policies aimed at reducing ethnic inequalities will be ineffective against poverty, which depends on how levels of living respond. Ethnic redistribution can change inequalities within groups, with ambiguous implications for national poverty measures.

Yet even without changes in within-group distribution, there is nothing to guarantee that ethnic redistribution reduces national poverty. To give a simple numerical example, suppose that the poorer group has three people with incomes (1, 2, 3) (with mean 2), while the richer group has (1, 3, 8) (mean 4). The poverty line is 2.5, so the aggregate poverty rate is 50%. A 10% “tax” is now levied on the richer group and is used to raise the mean of the poorer group, keeping the relative distribution constant within each. Then the new distributions are (1.2, 2.4, 3.6) (with mean 2.4) and (0.9, 2.7, 7.2) (with mean 3.6). Ethnic inequality has been reduced but the poverty rate has stayed the same, at 50%. Generalizing this example to the prior case of continuous distributions, now hold the Lorenz curves constant within groups i and j . One can readily show that $dH = \left(\frac{f_j(z)}{\mu_j} - \frac{f_i(z)}{\mu_i} \right) z s_i d\mu_i$ where $f_j(z)$ is the density of incomes in j at the poverty line z .⁷

⁶ An influential volume by Anand (1983) found that only 13% of total inequality (measured using a Theil index) in 1970 is between ethnic groups. Also see the comments in Thillainathan and Cheong (2018) (reviewing Khalid, 2014) who use the evidence on inequality decompositions to question the effectiveness of the NEP.

⁷ This uses the fact that the poverty rate, H , is homogeneous of degree zero between the mean and the poverty line for a given Lorenz curve (Gastwirth, 1971). The poverty line is taken to be constant.

The necessary (and sufficient) condition for national poverty to fall with (mean-preserving) ethnic redistribution is that the ratio of the density at the poverty line to the mean is lower for the donor group than for the recipient.

The upshot of these observations is that it is far from obvious how much the ethnically-grounded policy regime since 1969 has mattered to the evolution of Malaysia's poverty measures. Further research is needed.

There is little hope of rigorously identifying the NEP's causal impact on aggregate poverty and inequality. We cannot observe Malaysia in the absence of the NEP. Nor do we have sufficient time series of distributions prior to the NEP to allow reflexive comparison. Rather than evaluating the NEP, this paper addresses some less ambitious but still important questions relevant to understanding the role of ethnic inequality in progress against poverty. Specifically:

- Have we seen falling ethnic inequality in Malaysia since 1969? Have the gaps narrowed, as widely believed? How much has this helped reduce national inequality?
- How much did lower ethnic inequality contribute to Malaysia's success against poverty nationally?
- Have any gains from ethnic redistribution as a means of reducing poverty been largely exhausted after 50 years? Or is there still some potential left?

The paper first looks at some aspects of Malaysia's economic history, drawing on the literature. Then Section 3 describes the country's progress in reducing inequality and poverty, drawing mainly on data from household surveys spanning 1970-2016. Section 4 uses decomposition tools to assess the contribution of lower ethnic inequality to poverty reduction, and the responsiveness of national poverty to ethnic redistribution. Section 5 concludes.

2. An historical perspective on ethnic inequality in Malaysia

The historical record suggests that the ethnic inequality found in Malaysia at the time of Independence was in no small measure a legacy of colonialism. The British rulers clearly favored non-Malays in the lucrative new cash-crop and non-farm sectors. This reflected a paternalistic attitude toward the Malay people, who appear to have been viewed as only being well suited to paddy farming, despite the fact that Malays themselves were diversifying in their crop choices (such as by growing the newly-profitable rubber trees) (Lim, 1977; Drabble,

2000).⁸ The British fostered Chinese immigrants, especially for the booming mining sector, while they brought in workers from the Indian subcontinent for the new cash-crop plantations (sugarcane, coffee and especially rubber).⁹ When tradeoffs emerged between the interests of the (mainly Malay) smallholders and the plantations, the latter tended to be favored.¹⁰

Some Malays needed to be educated for the Colonial civil service, especially to facilitate interactions with the local Sultans. However, the bulk of the Bumiputera lacked easy access to modern schooling, if only because schools were scarce in the rural areas where most Bumiputera lived.¹¹ While average schooling attainments were improving generally in the late colonial period, the education system of the time probably left the majority of the Bumiputera poorly equipped in the skills (including in the English language) needed for participation in the emerging non-farm economy.

Thus, Malaysia at the time of Independence was highly dualistic, comprising a large, low-productivity, traditional farming sector with foreign-controlled export-oriented mining and plantation sectors. There was a corresponding ethnic polarization in employment with the bulk of the Malays in the subsistence farming sector, non-Malays in the rest.

The only survey-based quantification of the extent of ethnic inequality at the time of Independence comes from the 1957/58 Household Budget Survey. The reliability and comparability (over time and space) of that survey are questionable (Anand, 1983). But this is all we have. Based on that survey, Urban Chinese mean income was 2.8 times the rural Malay mean in 1957 (Ikemoto, 1985). There was far higher poverty incidence among Malays; Ikemoto (1985) estimates a poverty rate of 71% for Malays in 1957 as compared to 27% for those with Chinese origin and 36% for those with Indian origin.¹²

Prior to Independence, the profits from Malaysia's primary exports, notably tin and rubber, were in large part remitted to Britain, and domestic consumption saw little growth.¹³ This

⁸ For example, the Colonial administrators imposed restrictions on the use and sale of Malay people's agricultural land to non-Malays (as described by Lim, 1977). This was rationalized as an effort to protect the Malays.

⁹ The social stratification of colonial Malaya is described in Hirschman (1975), Anand (1983), Ikemoto (1985), Drabble (2000), Shah (2017), among others.

¹⁰ Lim (1977) provides examples.

¹¹ Hirschman (1972) describes education attainments at the time of Independence, drawing on the 1957 Census.

¹² By 1957 the vast majority of the Chinese and Indian people in Malaya had been born there; see Hirschman (1972).

¹³ The British colony of Malaya (as present-day West, or "Peninsular," Malaysia was called then) had seen sizeable growth of GDP over 1900-1939, at about 3% per annum (Shah, 2017). However, only a modest share of this output growth was passed onto domestic real wages, consumption or domestic investment. The historical data suggest that domestic private consumption per capita grew at only 1% per annum over 1900-1939 (Shah, 2017).

changed with Independence, such that domestic consumption growth started to match GDP growth, and the economy became more diversified. It is likely that poverty incidence started to fall post-Independence, though no comparable national survey data exist to test this claim with tolerable rigor until 1970. However, it appears unlikely that inequality between Malays and Chinese had fallen in the decade or so after Independence. Ikemoto (1985) provides estimates (for Peninsular Malaysia) indicating that urban Chinese mean income was a remarkable 3.1 times the rural Malay mean in 1970, as compared to 2.8 times in 1957/58.¹⁴ Again, the comparability of results between the 1957/58 survey and that for 1970 is questionable, and the numbers should only be taken to be broadly indicative.

The post-Independence period saw a rapid expansion in school enrollments. In 1955, just before Independence, 42% of the relevant age groups were not enrolled in primary or secondary school, but this had fallen to only 9% by the early 1970s (Drabble, 2000, p.283). However, while this expansion in schooling would eventually help reduce income poverty, the implication for inequality is unclear; when the schooling gaps between the rich and poor are large (as they undoubtedly were at the time of Malaysia's Independence), a generalized expansion in schooling can be expected to increase earnings inequality (Ravallion, 2016, Section 7.5).

In short, while the colonial period generated ethnic inequality, policy makers in the immediate post-Independence period appear to have given too little attention to that inequality, and the consensus in the literature is that ethnic inequality rose in the decade or so after Independence.¹⁵ This neglect of ethnic inequality in the near term was to have a high cost. The Sino-Malay race riots that broke out in Kuala Lumpur in May 1969 are widely seen to have been motivated by the lack of attention to the prevailing ethnic inequalities in the country.¹⁶

The policy response was the New Economic Policy (NEP). The twin aims were (i) to help the Bumiputera catch up economically with other Malaysians, esp., the Chinese, and (ii) to reduce absolute poverty, with a goal of bringing the poverty rate down from 49% to 17% in 1990 (Jomo and Wee, 2014). Greatly expanded affirmative action policies favored the Bumiputera, such as by aiming to assure that they owned at least 30% of corporate wealth by 1990 (with

¹⁴ Also see Gallup's (1998, Figure 2.8) compilation of estimates of Malay income relative to Chinese, echoing earlier claims in Hirschman (1975), Snodgrass (1980) and Anand (1983). Also see Drabble (2000, Ch. 13), Chakravarty and Roslan (2005) and Jomo and Wee (2014).

¹⁵ See the discussions in Drabble (2000), Yusof and Bhattasali (2008) and Jomo and Wee (2014).

¹⁶ There had been a number of prior conflicts, including in Penang and Singapore.

ethnic restrictions on share ownership in public companies to help assure this). Preferences were given to the Bumiputera in access to public education through quotas and university scholarships. Some of the ostensibly “color-blind” policies would also have favored the Bumiputera such as the emphasis given to raising the productivity of smallholder agriculture.

The NEP officially ended in 1991. By the mid-1980s, the leadership was de-emphasizing inequality, in favor of greater emphasis on economic growth (Yusof and Bhattasali, 2008; Jomo and Wee, 2014). However, the ethnic-inequality focus of the NEP did not vanish in 1991, but has had a continuing influence on policy, and stimulated continuing debate, up to the present time.

There is evidence that ethnic inequality in schooling fell in the wake of the NEP. The school enrollment rates of the Malays had lagged other ethnic groups but soon caught up, or even overtook them (Pong, 1993).¹⁷ Given the initial inequality in education among the Malays, it can be expected that this process would also have been inequality-reducing within that ethnic group, which is also borne out by the findings of Pong (1993). However, test scores in math and science indicate persistent inequalities by ethnicity and (especially) socio-economic status within ethnic groups (Mohammadpour, 2012; Saw, 2015).

Soon after the 1969 riots, the Government of Malaysia started reporting regularly on income poverty and inequality. The official statistics on income inequality from the [Economic Planning Unit](#) (EPU) of the Ministry of Economic Affairs, based on household survey data collected by the Government’s Department of Statistics (DOSM), use the standard Gini index of household incomes. Their estimates indicate a trend decline in income inequality starting from the mid-1970s.

The discussion will return to study these data more closely, but one point is notable now: given the historical importance of ethnicity it is surprising that neither the official statistics nor the academic literature appear to include any summary statistics for the evolution of ethnic inequality over time. Indeed, one does not find any actual measures of ethnic inequality over time, which can be defined as the inequality between ethnic groups, taken account of their size, but ignoring the inequality within groups. The next section will provide such measures.

¹⁷ Using survey data for Peninsular Malaysia, Pong (1993) finds that secondary schooling attainments of older cohorts of Malays lagged other groups, but this had switched for the younger cohort. She interprets this as an effect of the NEP’s preferential schooling policies.

Other observers have expressed surprise at this finding of falling inequality, and pointed to contrary evidence (such as using wealth rather than income) (Lee and Khalid, 2018). But even focusing on household incomes, there are a number of reasons for caution. The literature has provided evidence of a continuing “pro-Chinese” bias in the labor market, as reflected in earnings regressions (including controls for education, experience and location) (Milanovic, 2006).¹⁸ A randomized experiment by Lee and Khalid (2016) also demonstrated such a bias in employer responses to job applications that differ only in ethnicity, as suggested by the applicant’s name. There may be substantial horizontal inequality hidden by standard measures.

Another reason for questioning the claimed progress in reducing household income inequality is the fact that the EPU/DOSM numbers relate (as is common) to relative inequality, while perceptions of “inequality” appear often to reflect absolute inequality.¹⁹ The next section will also look at what has been happening to absolute inequality in Malaysia.

Even though poverty was far more prevalent among the Bumiputera, it does not follow that success in reducing ethnic inequality helped much in reducing poverty nationally. A common view is that growth in the mean income of the Bumiputera favored the relatively well-off in that group, largely bypassing the poor. With reference to the NEP, the first Prime Minister of Malaysia, Tunku Abdul Rahman, was opposed to the 30% target for Bumiputera share ownership, writing that “Some (Malays) became rich overnight while others became despicable Ali Babas and the country suffered economic setbacks” (Abdul Rahman, 1986, p.98). Similarly, Jomo (1989, p.42) describes the new State interventionism of the 1970s, under the NEP, as being “..primarily in favour of the nascent Malay bourgeoisie;” he conspicuously does not say “in favor of poor Malays.” He goes on to argue that: “..poverty...could have been completely eradicated if more just and effective redistributive policies had been implemented, government waste minimised, and if government allocations ostensibly for poverty eradication had not been used to enrich politicians and contractors securing rural projects” (Jomo, 1989, p.46).

The claim here is that, while progress toward the NEP targets would undoubtedly increase mean income of the Bumiputera, it only benefited a select few with initial advantages, or luck. The dominant view in the literature is that, beyond creating a new class of Malay rentiers thriving on political and government patronage, the bulk of the Malays saw little gain. Motivated

¹⁸ Also see the earlier studies by Mazumdar (1991) and Gallup (1998).

¹⁹ For an overview of this distinction and the evidence see Ravallion (2018).

in large part by this view in the historical record, a number of observers have argued that the race-grounded redistributive policies need to be replaced with “needs-based affirmative action” (Thillainathan and Cheong, 2018, p.302; Economist, 2017). By this view, such policies are no longer needed, given past progress against both ethnic inequality and poverty.

There are strong feelings on both sides of this (ongoing) debate. The rest of the paper draws on the available data to try to see what more can be learnt about the extent of progress against ethnic inequality and how much that progress helped against poverty since 1969. The analysis will challenge some aspects of the prevailing historical narrative summarized above.

3. Inequality and poverty in Malaysia, 1970-2016

The bulk of the data used here originate from a series of 18 nationally-representative household surveys spanning 1970-2016.²⁰ A constraint on the analysis is the lack of public access to the micro data. Machine-readable micro data only exist since 1997 (based on interviews with DOSM staff), and even these recent micro data are not publically available.²¹ Political sensitivity to ethnic issues is a likely reason for the lack of public access to these (public) data. Thankfully, tabulations of summary statistics are available back to 1970, although these are rather limited in their detail and I cannot check the calculations in these tables. These data limitations naturally constrain the analysis of this paper in some respects, as described below.

Ethnicity: A large number of ethnic groups are identified in Malaysia, especially East Malaysia (with 40 “sub-ethnic groups” found in Sarawak alone). Here the focus is on the country’s three main ethnic groups, the Bumiputera, the Malaysian-Chinese and the Malaysian-Indians, together comprising 99% of the population (averaged over all survey years since 1969). The largest group of Bumiputera are the “Malay” people, defined in the Constitution as “a person who professed the Muslim religion, habitually speaks the Malay language, and conforms to the Malay custom.”²² “Chinese” are relatively well defined as those of Chinese descent (whatever

²⁰ There were two prior surveys but there are serious comparability problems with the 1970 survey (Anand, 1983).

²¹ Researchers can make application to DOSM for selected variables from sub-samples from the most recent surveys, to address specific research questions.

²² Other Bumiputera include the Orang Asli, the original inhabitants of Peninsular Malaysia, now representing 0.5% of the population.

their country of birth). “Indians” include people descending from immigrants from Bangladesh, Pakistan and Sri Lanka as well as those with actual Indian (mainly Tamil) descent.²³

Figure 1 shows the ethnic population shares over time. From the 2010 Census, the Bumiputera are 68% of the total (55% Malay and 13% other Bumiputera), the Chinese are 25% and Indians 7%. While this paper takes a national perspective, it should be noted that there are some marked geographic differences in ethnic composition.²⁴ In West Malaysia, the Bumiputera are mainly Malay people as distinct from East Malaysia (Sabah and Sarawak) where a larger share are non-Malay. The rising share of Bumiputera over time reflects ethnic differences in the fertility rate but also conversions to Islam.²⁵ The rising share of the poorest ethnic group will tend to be poverty increasing. We will see how much so in Section 4.

Distributional data: The analysis uses two main sources: (i) the published tabulations by EPU/DOSM available from 1970 onwards and (ii) the World Bank’s [PovcalNet](#) database from 1984. The underlying database for *PovcalNet* comprises both tabulations and (for recent years) micro data on household income, household size and the survey weights, drawn from the DOSM surveys. Following international practice, the DOSM definition of “income” includes both cash income and imputed values for goods received as income-in-kind (such as from household farms and enterprises). There are four main differences between (i) and (ii). First, the *PovcalNet* series misses two-thirds of the NEP period. Second, the EPU poverty measures allow for regional differences in the cost-of-living which *PovcalNet* does not. Third, *PovcalNet* uses the national CPI while the official measures use an implicit deflator anchored to consumption in a neighborhood of the poverty line. Finally, the EPU published tables use household total income while *PovcalNet* uses household income per capita (as is more common practice internationally).

A useful descriptive tool for representing the overall changes in income distribution is the Growth Incidence Curve (GIC) (Ravallion and Chen, 2003). This gives the growth rate over time by (anonymous) percentiles of the distribution, ranked from poorest to richest. The GIC is obtained by using dated quantile functions to calculate growth rates by percentile (as explained

²³ The 1970 and 1980 censuses provide these breakdowns for the total population, although later Censuses switched to total citizens.

²⁴ From the 2010 Census, the percentage Malay varies from 43% in Penang (Kuala Lumpur close behind with 45%) to 97% in Terengganu (95% in Kelantan). The percentage Chinese ranges from 3% in Kelantan and Terengganu to 46% in Penang (43% in Kuala Lumpur).

²⁵ In 1991, the Bumiputera fertility rate was 4.5, as compared to 2.5 for the Chinese and 2.8 for Indians (Saw, 2015). By 2011 all three fertility rates had fallen, but the proportionate differences remained similar; in 2011 the fertility rates were 2.7, 1.6 and 1.7 respectively.

in Ravallion and Chen, 2003). Unfortunately, the GIC cannot be calculated from the published tabulations by EPU/DOSM. Nevertheless, it can be calculated using *PovcalNet* by numerical methods (inverting the process by using a line search to find the “poverty line” corresponding to each possible “headcount index” as one moves from the poorest percentile to the richest). The base year for the GIC is 1984, the earliest year of the data for Malaysia in *PovcalNet*.

The resulting GIC in Figure 2 indicates that the incidence of growth has tended to favor poorer fractiles. The growth rate in mean household income per capita varied from the highest value of 3.4% at percentiles 5-6, to the lowest value at the very top. Given that all quantiles saw positive growth, the poverty rate has fallen for all possible poverty lines. Given that growth rates tend to be higher for poorer percentiles, it can be said that “inequality” has fallen. Unfortunately, the GIC cannot be broken down by ethnicity since this is not available in *PovcalNet*, and reliable GICs cannot be calculated from the limited published tabulations available historically.

The series of inequality measures from EPU/DOSM go back further, to 1970. Recall that EPU/DOSM use household income as the ranking variable (not per capita, as in *PovcalNet*). For the common years, the EPU/DOSM Gini index is lower than from *PovcalNet*; the mean difference in the Gini index is 1.5% (44.4% versus 45.9%). Figure 3a plots the EPU/DOSM Gini index over the whole period. The index rose for the first few years, but then a downward trend began. The index fell from 51.3% to 39.9% over 1970-2016. Using all years, the trend rate of decline (the regression coefficient on time) was -0.25% points per year (s.e.=0.03%).²⁶ Using instead the per-capita Gini indices from *PovcalNet* over 1984-2016, the trend rate of decline was -0.20% points per year (s.e.=0.06%). This can be compared with the Gini indices found in the data set for the longest available spells between household surveys for 144 countries described in Ravallion and Chen (2018). (The median year of the earliest survey is 1993, and that for the latest is 2012.) The mean rate of change in the Gini index in that data set is -0.06% points per year, and it is not significantly different from zero (s.e.=0.04). So Malaysia’s success in reducing inequality is far from typical.

EPU/DOSM reports the (standard) Gini indices in which absolute gaps are normalized by the current mean. This gives a relative inequality measure, as distinct from an absolute measure,

²⁶ All standard errors reported in this paper are robust to residual autocorrelation as well as heteroscedasticity, using the method Newey and West (1987) (the automatic lag specification with the degrees of freedom adjustment).

which reflects the absolute gaps between “rich” and “poor.”²⁷ The choice of measure depends on which of two rival axioms one prefers.²⁸ There is no “right” or “wrong” answer, so it can be deceptive to look at only one of the two. Figure 3b gives the absolute Gini index—half the mean real income gap between all pairs of households. We see a marked rise in absolute inequality, reflecting both the rise in average income and limited reduction in relative inequality.

Figure 4a gives the relative Gini indices by ethnic group. Relative inequality has been falling within each group, and nationally since the mid-1970s—precisely when the NEP took a more aggressive stance against inequality. The evidence does not support the view that economic growth has been (relative) inequality increasing within any ethnic group. Indeed, for each group, one finds a negative correlation between levels of the Gini index and the means; the correlation coefficients between the (log) Gini index and (log) mean real income are -0.83, -0.72, and -0.60 for the Bumiputera, Chinese and Indians respectively. However, the correlations drop substantially when one switches to the difference-in-logs, suggesting that the correlation in the levels is generated by common time trends. The correlation coefficient between changes in the (log) Bumiputera Gini index and the log Bumiputera mean is 0.25, but this is not significantly different from zero ($t=0.99$). For the Chinese, the correlation is 0.03 while it is 0.15 for Indians; neither is significantly different from zero.

The absolute Gini indices by ethnicity are in Figure 4b. Absolute inequality has been rising for all three groups, but more steeply so among the Malaysian-Chinese.

Growth rates by ethnicity: Over time, all three main ethnic groups have seen rising mean incomes, with the Bumiputera having the highest growth rate (Figure 5a). The annual growth rates (based on a regression of log mean on time) over 1970-2016 were 4.15% (s.e.=0.19%), 3.09 (0.18), and 3.31 (0.13) for the Bumiputera, Chinese and Indians respectively. Thus, there was progress toward relative convergence, with the Bumiputera mean rising as a proportion of both the Chinese mean and the Indian mean (Figure 5b). The 1990s was an exception.

On the other hand, absolute incomes have diverged over time (Figure 5c). Each series of absolute gaps relative to the Chinese in Figure 5c has shown a significant positive trend (at better

²⁷ On this conceptual distinction see Ravallion (2018). The distinction has salience in Malaysia; see, for example, the media report in the [Star](#) entitled “Malaysia’s widening income gap between rich and poor.” This makes the distinction between absolute and relative inequality, drawing on a report by KRI (2018).

²⁸ The relative measure stems from the scale-invariance axiom (multiplying all incomes by a constant leaves the measure unchanged), while the absolute measure stems from translation invariance (adding a constant leaves it unchanged). For an overview of these axioms and the measures implied see Cowell (2000).

than the 1% level), although this is not true of the Indian-Bumiputera gap (which has a positive trend, but only significant at the 6% level).

Clearly, Figure 5c does not support the claim that “The gap in income between Malays ... and Chinese- and Indian-Malaysians has narrowed dramatically” (Economist, 2017). Indeed, one might be more inclined to say that the (absolute) gap has risen dramatically. The rising absolute ethnic disparities reflect the extent of the initial ethnic inequality, as well as the pattern of growth by ethnicity. (More precisely, if the mean for group i grows at a constant rate r_i , such that $y_{it} = (1 + r_i)y_{it-1}$, then it is readily verified that (on comparing groups i and j), $y_{it} - y_{jt} < (>)y_{it-1} - y_{jt-1}$ as $\frac{r_j}{r_i} > (<) \frac{y_{it-1}}{y_{jt-1}}$.) To begin to close the (large) gap in mean household incomes around 1970, mean income of the Bumiputera would have had to grow at 2.3 times the Chinese rate, while in actuality the subsequent ratio of growth rates was 1.3.

It is of interest to see if the path of growth rates by ethnicity was any different during the NEP period. While the NEP continued to have influence after 1991, if the NEP was an important factor in reducing ethnic inequality then we would expect to see signs of this in the data. Here it is notable that, while overall inequality has been on a trend decline in Malaysia, this did not start until the mid-1970s. An obvious test is to see whether the evolution of the group-specific mean relative to the overall mean changed in the NEP period. On pooling the three ethnic groups, the test regression can be written as:

$$\mu_{jt}/\mu_t = \sum_{i=1}^3 [\alpha_i + (\beta_{0i} + \beta_{1i}NEP_t)(t - 1)]D_{ij} + \varepsilon_{jt} \quad (1)$$

where μ_{jt} denotes the mean income of group j ($=1,2,3$) in year t ($=1,T$) with national mean, μ_t , $NEP_t = 1$ if t is within the NEP period and 0 otherwise, and $D_{ij} = 1$ if $i=j$ and 0 otherwise. In other words, each group has its own initial (1970) ratio of mean income to the overall mean, and the ratio evolves with a trend rate specific to each group, but with a different NEP trend. Using the pooled data set of survey years and three ethnic groups ($n=54$), I find that $\hat{\beta}_{11} = 0.003$ (robust s.e.=0.0005) (for the Bumiputera), $\hat{\beta}_{12} = -0.003$ (0.001) (for the Chinese) and $\hat{\beta}_{13} = -0.004$ (0.001) (for the Indians). The ratio of the Bumiputera mean to the national mean would have been 0.06 lower without the NEP, representing a drop from 0.81 to 0.75 by 1991.

So the NEP period saw a significantly higher trend increase in the relative mean of the Bumiputera, with significantly lower trends for those with Chinese and Indian origin. While

warning against causal attribution, these findings are at least consistent with the view that the NEP encouraged convergence in relative income by ethnicity.

There is no sign that the NEP period came at a cost to the overall rate of growth. The mean growth rate of household income was 3.9% in the NEP period versus 3.8% in the rest (with standard errors of 1.9% and 1.4%). However, while such comparisons are suggestive, they cannot be conclusive as to whether the NEP came at a cost to growth (or stimulated it).

Measures of ethnic inequality: The official statistics and academic literature are (oddly) devoid of defensible ethnic-inequality measures over time. One sees many instances in the literature of the types of comparisons of group means in the last sub-section. Yet most people would surely agree that individuals should be weighted equally when measuring inequality. Looking solely at group means does not, of course, do that.

To measure ethnic inequality one can follow the literature on inequality decomposition and set all incomes within a given group to that group's mean, and then measure inequality for this synthetic distribution. More formally, let y_{hj} denote the income for household $h=1,\dots,n_j$ in group $j=1,2,3$ (in this case) with mean μ_j . The actual distribution is

$$\mathbf{y} \equiv (y_{11}, y_{21}, \dots, y_{n_1 1}; y_{12}, y_{22}, \dots, y_{n_2 2}; y_{13}, y_{23}, \dots, y_{n_3 3})$$

and the overall inequality index is $I(\mathbf{y})$ for a suitable function I . The measure of ethnic inequality is then $I(\mathbf{y}^*)$, based on the synthetic distribution:

$$\mathbf{y}^* \equiv (\mu_1, \mu_1, \dots, \mu_1; \mu_2, \mu_2, \dots, \mu_2; \mu_3, \mu_3, \dots, \mu_3).$$

The key property of $I(\mathbf{y}^*)$ is that the inequality is only between groups of individuals. Naturally, this measure takes account of the differing sizes of the groups.²⁹ Two standard functional forms for $I(\mathbf{y}^*)$ are considered here, namely:

$$I_G(\mathbf{y}^*) = \frac{1}{2\mu} \sum_{i=1}^3 \sum_{j=1}^3 s_i s_j |\mu_i - \mu_j| \quad (2.1)$$

$$I_M(\mathbf{y}^*) = \ln(\mu) - \sum_{i=1}^3 s_i \ln(\mu_i) \quad (2.2)$$

where s_i is the population share of group i and the overall mean is $\mu (= \sum_{i=1}^3 s_i \mu_i)$. $I_G(\mathbf{y}^*)$ can be recognized as the between-group Gini index while $I_M(\mathbf{y}^*)$ is that for the Mean-Log Deviation (MLD). Both satisfy the usual transfer axiom, which says that a mean-preserving redistribution from group j and group i with $\mu_j > \mu_i$ must reduce ethnic inequality. $I_M(\mathbf{y}^*)$ (but not $I_G(\mathbf{y}^*)$)

²⁹ Some measures use income shares as weights (see, for example, Bourguignon, 1979). Here I take the view that individuals should be weighted equally when thinking about inequality, whatever the individual incomes.

also satisfies the Monotonicity in Distance axiom of Cowell and Flachaire (2017), i.e., when comparing two distributions that differ in one person’s income, the greater the distance from equality, the higher the inequality. Also, MLD is exactly decomposable into between and within group components (Bourguignon, 1979). However, while we can always calculate a Gini index for the synthetic distribution \mathbf{y}^* , as in (2.1), the difference between that index and the corresponding $I(\mathbf{y})$ does not only reflect inequality within groups. As is well known, there is also a component that stems from the overlaps in ethnic distributions, reflecting the interaction of the between- and within-group components.³⁰ This only goes to zero when ethnic distributions do not overlap.

Figure 6a gives the summary statistics of relative ethnic inequality over time for both measures.³¹ We see a marked downward trend in relative ethnic inequality, though uneven; ethnic inequality rose over the period 1994-2002. The inter-ethnic Gini index has fallen substantially, from 20.0% to 6.9%. Both measures indicate that ethnic inequality rose immediately after the NEP’s official end date, 1991. Figure 6b gives the absolute Gini index of ethnic inequality. (There is no absolute version of MLD.) This shows a trend increase over time, from 20.0 in 1970 to 36.6 in 2016 and the regression-based trend of 0.003 per year is significant at the 1% level (s.e.=0.001). The absolute Gini for ethnic inequality fluctuated over time, but showed little increase in the NEP period.

The complete decomposition of the (relative) Gini index over time is found in Figure 7. While total inequality and its ethnic between-group component ($I_G(\mathbf{y}^*)$) have fallen, the within-group and overlap components have remained fairly stable; indeed, neither shows a statistically significant trend at the 5% level, although the positive trend in the overlap component passes at the 7% level. Even though the Gini index has declined within each of the three groups (Figure 4a), the contributions to total within-group inequality are weighted by the products of population and income shares, which do not sum to unity.³² Furthermore, the total weight has a strong positive trend, rising from 0.39 to 0.50 over 1970-2016. Given that the within-group Gini indices are similar (Figure 4a), this renders the overall within-group component close to stationary.

³⁰ Lambert and Aronson (1993) provide a good explanation of this overlap component.

³¹ Recall that EPU/DOSM uses household incomes, not per capita. There is not option but to weight households equally, ignoring differences in household size.

³² The total within-group component of the Gini index is $\sum_i s_i s_i^y G_i$ where s_i^y is the income share of group i and G_i is the Gini index. Note that $I_G(\mathbf{y}^*)$ now includes all other ethnic groups, though this makes negligible difference.

Thus, it can be said that the falling overall Gini index is attributable to the country's success in reducing ethnic inequality.

Poverty measures: The official measures apply the Government's poverty lines to DOSM's surveys on household incomes. The nominal line is re-calculated for each survey, but only updated for price-level changes. So these are absolute measures.

Based on the official figures, Malaysia is close to eliminating poverty, and this is so for each of the three main ethnic groups. Figure 8a gives the national poverty measures. At the beginning of the period, the overall poverty rate was 49%, falling to 0.4% by 2016. The compound growth rate in the poverty index is an impressive -9.9% per annum.³³ The NEP's target of bringing the official poverty rate down to 17% by 1990 was achieved.

How does this progress against poverty compare to other countries? For that purpose, we can use Purchasing Power Parity (PPP) exchange rates from the International Comparison Program (ICP). The national average official line in 2009 was MYR 800 per household per month (EPU, 2010), or MYR 840 in 2011 prices, which is the year of the last ICP. Average household size was 4.3 persons in 2010. Thus, the average official line is equivalent to MYR 6.4 per person per day at average household size. When converted using the PPP for consumption from the 2011 ICP, the official line comes out to almost exactly \$4 per day.³⁴ From *PovcalNet* one can calculate annualized rates of change in the poverty rate for a \$4 a day line over 1981-2015. Using a regression of $\log H$ on year, for Malaysia the rate is -8.5% per annum (s.e.=1.8%). This is well above (in absolute value) the rate for the world as a whole, which is -1.8% (s.e.=0.4%). It is also more than double the rate for East Asia as a whole, which is -4.1% (0.7%). Malaysia is clearly one of the world's star performers in terms of the annual rate of poverty reduction over this period, as judged by Malaysia's official poverty line.³⁵

Turning to the ethnic poverty profile, one finds that the Bumiputera poverty rate fell from 65% to 0.5% (Figure 8a). For the Chinese and Indians, the poverty rate was 26% and 39% at the beginning of the period, falling to 0.1% by 2016. All three groups have seen large declines in the incidence of poverty, but the share accountable to the Bumiputera has risen (Figure 8b).

³³ This is calculated using only the end points of the series. If instead one regresses the log of the headcount index on time using the whole series then the implied growth rate is -9.44% (s.e.=0.81%; n=17).

³⁴ The PPP rate for private consumption from the 2011 ICP is 1.59 per \$1. This is well below the exchange rate, since, PPP rates are based on the actual prices paid by Malaysians, including for goods not trade internationally.

³⁵ Neighboring Thailand did slightly better, with a rate of -9.9% per annum (s.e.=1.4%). China and Vietnam both had a rate of -5.0% per annum (s.e.=1.0% and 1.1% respectively). Indonesia had a rate of -2.0% (0.3%).

Averaged over the 2000s, the Bumiputera accounted for two-thirds (67%) of the population but 94% of those designated as poor. While this paper takes a national perspective, it is notable that the location of the country's poor has also shifted over time between West and East Malaysia. In 1976, 29% of the poor lived in Sabah and Sarawak, but by 2012 this had risen to 64%.³⁶

Some observers have questioned whether Malaysia's longstanding official poverty line (going back to 1970) is still socially relevant today.³⁷ There are survey-based methods of addressing that question, so as to derive the Social Subjective Poverty Line (Ravallion, 2016)—defined as the income level above which people tend to say they are not poor, but below which they say they are poor. Absent such survey data for Malaysia, one clue is to see how the official line compares to other countries. \$4 a day is well above the World Bank's international poverty line of \$1.90 a day. But it should be well above that line. The \$1.90 line is deliberately low, being anchored to poverty lines found in the poorest countries. If one looks instead at countries with a roughly similar average income as Malaysia, one would expect the poverty line to be about \$12 a day—three times the current line in Malaysia.³⁸ Figure 9 shows how Malaysia's poverty line compares to the poverty lines found in other countries. Malaysia's current official line is clearly well below what one would expect for a country with its current average standard of living. \$4 a day may well have been a sensible line for Malaysia in 1970. That is no longer clear; real income per household in Malaysia has increased more than fivefold over 1970-2016!

As an alternative, I have constructed relative lines that rise with average income in a seemingly sensible way. The slope is 1:3. The intercept is set at \$2.50, the official "hard-core" poverty line (given by the food component of the official line). These parameter choices yield a poverty line of about \$12 per day in 2016. This is a schedule of "weakly relative lines" as defined by Ravallion and Chen (2011). The word "weakly" refers to the fact that the poverty line is not directly proportional to the mean (so that it has an elasticity less than unity). Making the

³⁶ I have used the population counts from the 1970 and 2010 Censuses. Official poverty rates for Sabah and Sarawak are not available before 1976.

³⁷ For example, in one comment in 2018 in the Malaysian newspaper, the [Star](#), the Deputy Minister of International Trade and Investment, Dr Ong Kian Ming, wrote that "As wages climbed and we became a middle-income nation, we didn't increase the standard for what is considered decent living above the poverty line."

³⁸ Taking the arithmetic mean of the last three years, mean income is \$24.84 in 2015. Using a linear regression of national poverty lines on the means for non-OECD countries, the predicted poverty line is \$11.94 (s.e.=\$0.34).

line directly proportional to the mean (“strongly relative”) has the odd property that if all incomes (including that of the poor) rise by the same percentage then poverty does not change.³⁹

Figure 10 compares my new series of poverty measures for Malaysia with those for \$4 a day. Here the only option is to use *PovcalNet*, so the series starts in 1984. The pattern is similar over time, and we still see a marked longer-term decline in poverty incidence. However, the new series suggests that Malaysia still has a long way go to eliminating poverty.

4. A decomposition analysis of Malaysia’s progress against poverty

The poverty rate depends on both mean income and the relative distribution of income, loosely interpretable as “inequality.” Using *PovcalNet* one can calculate counterfactual measures, which combine the mean for one date with the distribution (Lorenz curve) for another date. Table 1 gives these measures using both the initial (1984) and end point (2016) for the series in *PovcalNet*. Applying the Datt and Ravallion (1992) decomposition one finds that 75% of the reduction in absolute poverty in Malaysia since 1984 is attributable to growth in mean household income, with 25% due to falling inequality.⁴⁰ (Recall that the NEP started in 1971; the share attributable to inequality may well be higher if the *PovcalNet* series had also started in 1970.) This changes noticeably if one switches to the (weakly) relative measures described in the previous section. Then the same decomposition method, but now using the relative lines, indicates that 43% of the fall in poverty over the same period was attributable to falling inequality (a pro-poor shift in distribution at a given mean), with 57% due to growth in the mean, holding the Lorenz curve constant (Table 1).

Given the aforementioned data constraints, it is not possible to do such decompositions back to 1970 or by ethnicity. However, from the published historical tabulations it is possible to identify the effect of changes in ethnic inequality on the evolution over time of the official (absolute) poverty measures. That is the focus of the rest of this section.

³⁹ Strongly relative lines also have the property that the poverty rate can fall in a recession. For example, if one uses strongly relative lines for Malaysia I find that the poverty rate fell during the Global Financial Crisis of 2008-10. That is clearly questionable. Weakly relative lines are more sensible.

⁴⁰ The 1984 Lorenz curve is held constant, while the mean grows at the observed rate. This is equivalent to re-estimating the 1984 poverty measure using the original poverty line times the ratio of the end-point mean to the 1984 mean. I have taken an average of the decompositions using the initial and final years as the references. As noted by Datt and Ravallion (1992) the decomposition becomes exact when one does this averaging.

First, this section provides an analytic decomposition of the rate of national poverty reduction that identifies ethnic redistribution as an explicit component. On implementing the decomposition empirically, it is then shown that ethnic redistribution has helped reduce poverty nationally though it has been a less important factor than within-group redistribution and (especially) overall economic growth. The last subsection asks whether this is because ethnic redistribution is a blunt instrument.

Measuring the contribution of ethnic redistribution: One way of measuring the impact of lower ethnic inequality on poverty is to calculate counterfactual poverty measures by ethnicity, as obtained by replacing each group-specific mean by the overall mean (similarly to my measure of ethnic inequality). Thus, the ethnic dimension of inequality is artificially removed, while preserving within-group distributions. The difference between the population-weighted aggregate of these counterfactual poverty measures and the actual national measure is then taken to indicate the contribution of ethnic inequality to national poverty. As a consequence of the aforementioned data limitations (notably the absence of suitable tabulations from the 1970 survey data), it is not possible to perform these counterfactual calculations. But nor is it obvious that this is the best way to proceed. As noted, reducing ethnic inequality (the dispersion in means by ethnicity) could well alter inequality within ethnic groups.

Instead, this section proposes a feasible analytic decomposition, exploiting the variation over time, while allowing changes in the group-specific means to alter distribution within groups. The new decomposition gives the proportionate rate of progress against poverty as the sum of: (i) a pure growth component; (ii) an ethnic inequality component allowing within-group inequality to change; (iii) a component reflecting intra-ethnic distributional shifts not accountable to growth in the group-specific means, and (iv) a population composition component reflecting ethnic differences in population growth rates. The next subsection provides a more formal exposition.

As with other such decompositions, the components are treated as independent. In this respect, probably the main caveat is that the NEP may have reduced Malaysia's rate of economic growth (Thillainathan and Cheong, 2016), which one would expect to be poverty reducing, based on evidence from other countries.⁴¹ Possibly the loss of growth dominated the gains from ethnic redistribution. However, the evidence for the claim that the policy reduced the growth rate is not

⁴¹ For an overview of that evidence see Ravallion (2016, Chapter 8).

strong; as we have seen, the mean growth rate was no lower in the NEP period, though we do not know the counterfactual. The claim that the NEP came at a cost to growth must be considered something of a conjecture. If it is true that the NEP diminished the growth rate then the decomposition used in this paper will overstate the contribution of lower ethnic inequality to poverty reduction.

The decomposition in theory: Some well-known properties of the Lorenz curve (following Gastwirth, 1971) are used here to develop the required decomposition. A brief review of those properties will be useful. Let $L_i(p)$ denote the (differentiable) Lorenz curve for group i ($=1, \dots, 4$), giving the share of the group's total income held by the poorest p proportion of the population ranked by income, y . As is well known, $L_i'(p) = y_i/\mu_i$, where μ_i is the group's mean income. Equivalently (on inverting), $p = F_i(y_i)$ where F_i is the group-specific cumulative distribution function (subsuming the mean) with corresponding density function $f_i(= F_i'(\cdot))$. Letting H_i denote the headcount index ("poverty rate") we have $\mu_i L_i'(H_i) = z$, the poverty line (taken to be fixed across groups), i.e., $H_i = F_i(z)$.

Without loss of generality, we can assume that a parameter vector π_i fully characterizes the inter-group differences, so we can re-write the Lorenz curve as $L(p, \pi_i)$. Motivated by the discussion in earlier sections, the Lorenz parameters can be altered by the growth process, reflecting the potentially unequal ways in which efforts to reduce inter-group inequality may alter within-group inequality. We can write this as $\pi_i = \phi_i(\mu_i) + I_i$ where I_i is a vector of group-specific parameters that are unaffected by changes in the mean.

Combining these features, the poverty rate H_i for group i satisfies:

$$\mu_i L_p(H_i, \phi_i(\mu_i) + I_i) = z \quad (3)$$

(subscript p denoting the partial derivative). On taking the differential of (3) and solving:

$$\frac{dH_i}{H_i} = \eta_i \frac{d\mu_i}{\mu_i} + \gamma_i dI_i \quad (4)$$

where:

$$\eta_i = - \left(z + \mu_i^2 L_{\pi\pi}(\cdot) \phi_i'(\cdot) \right) f_i(z) / H_i$$

$$\gamma_i = -\mu_i L_{\pi\pi}(\cdot) f_i(z) / H_i$$

Here η_i is the elasticity of the poverty rate for group i to the mean for group i , allowing “inequality” (as reflected in the π_i parameters) to change with growth in the mean.⁴² The second term on the RHS of (5) stems from shifts in intra-group inequality not attributable to growth in the mean. In the special case in which the Lorenz curve parameters are fixed ($d\pi_i = 0$) we have $dI_i=0$ and $\eta_i = -zf_i(z)/H_i$, the elasticity of the headcount index evaluated at the poverty line (as expected, given that H is homogeneous of degree zero in μ and z).

On noting that $H = \sum_{i=1}^4 s_i H_i$ (where $s_i \equiv n_i/n$) it is readily verified that:

$$\frac{dH}{H} = \sum_{i=1}^4 s_i^H \left(\eta_i \frac{d\mu_i}{\mu_i} + \gamma_i dI_i + \frac{ds_i}{s_i} \right) \quad (5)$$

Here $s_i^H \equiv s_i H_i / H$, the share of poverty in group i . Notice that a term in the changes in population shares now appears, in addition to the effects of growth and distributional changes. With some further algebraic manipulation, we then have the following decomposition of the proportionate rate of poverty reduction:

$$\begin{aligned} \frac{dH}{H} = & \left(\sum_{i=1}^4 s_i^H \eta_i \right) \frac{d\mu}{\mu} \quad (\text{aggregate growth effect}) \\ & + \sum_{i=1}^4 s_i^H \eta_i \left(\frac{d\mu_i}{\mu_i} - \frac{d\mu}{\mu} \right) \quad (\text{ethnic-redistribution effect}) \\ & + \sum_{i=1}^4 s_i^H \gamma_i dI_i \quad (\text{intra-group distributional shifts not attributed to growth}) \\ & + \sum_{i=1}^4 s_i^H \frac{ds_i}{s_i} \quad (\text{population composition effect}) \end{aligned} \quad (6)$$

If all ethnic groups see the same rate of growth in mean income then the ethnic redistribution component goes to zero. If, in addition, there are no changes in inequality within group (specifically in the Lorenz parameters), and all groups have the same rate of population growth, then only the overall rate of growth matters to the rate of poverty reduction.

Empirical implementation: Table 2 provides the relevant summary statistics for implementing the decomposition in equation (6). We also need the unconditional growth elasticities of poverty reduction—the η_i 's in (6). Table 3 gives regression estimates of those elasticities, both nationally (panel a) and by ethnic group (panel b)—the latter being the estimates of the η_i 's. Results are provided for both the (log) levels and the first difference in logs, given that the variables have strong time trends in the levels. Thus, this second specification is likely to be more robust to time-dependent omitted variables.

⁴² These elasticities should not be confused with Kakwani's (1993) elasticities of poverty measures w.r.t the mean, which hold inequality constant. On the conceptual distinction between Kakwani's partial elasticities and the total elasticities used here see Ravallion (2007).

The (log) poverty rate moves with the (log) mean nationally using all three poverty measures (Table 3a). The official series (1970-2016) has slightly lower elasticity than the *PovcalNet* series (1984-2016). As expected, the relative poverty measures respond less elastically to the mean, though it is still a significant response. The official measures responded to the mean for each of the three main ethnic groups. The “other” group is the exception. The following analysis will take the difference-in-logs specification to be preferable for the $\hat{\eta}_i$'s.

There is a possible bias in these regressions due to time-varying measurement errors in the log-differences, though the sign of that bias is unknown. There is the usual attenuation bias from measurement errors in the regressor, but also a potentially offsetting bias due to the likely negative correlation with the measurement errors in the dependent variable. (If one under/over estimates the mean from a given survey then one will tend to over/under estimate the poverty rate.) An independent proxy for the survey mean can provide a valid instrumental variable (IV) under the assumption that measurement errors in that proxy are uncorrelated with those in the survey. National accounts consumption is a candidate IV, given that it is often determined residually in developing countries, including Malaysia (rather than being calibrated directly to survey data). Estimates using this IV have suggested little bias in OLS estimates of the growth elasticity of poverty reduction (Ravallion, 2001). In the present context, one is limited by the absence of an ethnic breakdown of the national accounts. The first-stage regression was satisfactory on using both current and lagged growth rates in real private consumption per capita from the national accounts as the IVs for the growth rate in the survey mean ($F=3.40$; $\text{prob.}=0.062$). The IV estimate of the elasticity of the official poverty measures to the survey mean is -2.67 ($\text{s.e.}=0.67$), fairly close to the OLS estimate of -2.36 (Table 3, panel a). The first stage was also satisfactory for the Bumiputera ($F=3.37$; $\text{prob.}=0.064$), and this gave an IV estimate of -2.28 ($\text{s.e.}=0.67$), again close to Table 3(b). However, the first stages did not have satisfactory power for the Chinese, Indians or others, so the IV estimates could not be trusted for these groups. Sensitivity tests will be performed to see how robust the decomposition might be to biases in these parameters.

Motivated by the results in Table 3, the following analysis will assume benchmark values of η_i of -2 for the Bumiputera, and -3 for each of the Chinese and Indians, and 0 for “others,” giving a share-weighted overall elasticity of -2.23 using initial shares of poverty (-1.94 using final shares). This is fairly close to the regression-based elasticity in Table 3 (panel a) for the

official poverty measures using the difference specification. The first two components of (6) can then be calculated. The last term, due to changes in population composition by ethnicity, is non-parametric and so can be calculated directly from the data. The intra-group distributional term not attributable to growth can then be determined residually.

Table 4 gives results for the decomposition in (6) using both initial and final year shares of poverty as the weights. As noted, the overall rate of poverty reduction is almost 10% per annum. The pure growth effect is 7.7% per annum (averaging the results for base-year and final-year weights), representing 78% of the total. The contribution of inter-ethnic redistribution is a decline in poverty of almost exactly 1% per annum. The implied contribution of intra-group distributional shifts not accountable to growth in the within-group means is a 1.5% per annum decline in the poverty rate. The population effect is poverty increasing, as expected, though the effect is small, representing only 0.3% per annum.

Recall that the IVs from national accounts data were too weak for addressing measurement error concerns related to the regressions for the Chinese and Indians in Table 3(b). Recognizing this uncertainty, Table 4 also provides two sensitivity tests, “High-case” and “Low-case” options, using -3.5 and -2.5 as the growth elasticities respectively, for both the Chinese and Indians (keeping -2 for the Bumiputera and 0 for others). The ethnic redistribution component is quite robust to this change, staying at around 10% of the overall rate of poverty reduction. The growth component rises (falls) slightly using the higher (lower) elasticities, while the intra-group distributional component does the opposite.

So these calculations indicate that the reduction in ethnic inequality accounted for about one tenth of the overall rate of poverty reduction. Recall that these results are for the official poverty measures and that the (weakly) relative measures provided in Section 3 are more responsive to inequality. While the calculations are not feasible for relative poverty (given the aforementioned constraints on data access), it is very likely that lower ethnic inequality contributed more to the reduction in relative poverty than for absolute poverty. Recall that the distributional component switched from 25% of total absolute poverty reduction to 43% using the relative measure. It should not matter much to the impact on poverty whether the redistribution is between or within groups so this can be taken as an indication of the likely upward adjustment to the inter-ethnic share, which would then account for around 17% of the reduction in the national relative poverty rate.

Inter-ethnic redistribution and aggregate poverty: While lower ethnic inequality has been poverty reducing in Malaysia, we have seen in the results above that the effect has been rather modest compared to the impact of growth in the mean. The question is begging: after 50 years of effort to reduce ethnic inequality, have the potential gains to Malaysia’s poor been exhausted?

To address this question, consider again the theoretical scenario sketched in Section 1, entailing a redistribution of income from group j to group i , holding the overall mean constant:

$$s_i^y \frac{d\mu_i}{\mu_i} + s_j^y \frac{d\mu_j}{\mu_j} = 0 \quad (7)$$

Here $s_i^y \equiv s_i \mu_i / \mu$. Recall that the aggregate poverty rate is $H = \sum_{i=1}^4 s_i H_i$. Then we have:

$$\frac{dH}{H} = s_i^H \frac{dH_i}{H_i} + s_j^H \frac{dH_j}{H_j} = s_i^H \eta_i \frac{d\mu_i}{\mu_i} + s_j^H \eta_j \frac{d\mu_j}{\mu_j} \quad (8)$$

Solving (7) and (8) we have:

$$\frac{dH}{H} = \left(s_i^H \eta_i - s_j^H \eta_j \frac{s_i^y}{s_j^y} \right) \frac{d\mu_i}{\mu_i} \quad (9)$$

The term in parentheses is the elasticity of the national poverty rate to an increase in the mean of group i at the expense of group j , holding the overall mean constant. I shall call this the “ethnic redistribution elasticity.” We would expect this elasticity to be low for redistribution from Chinese to Indians, since the two groups have fairly similar shares of poverty and income (Table 2), and similar growth elasticities (Table 3). It is less clear what elasticity to expect from Chinese to Bumiputera redistribution—while the Bumiputera have a large share of poverty, they have a lower growth elasticity—and how this would vary over time.

Figure 11 gives the redistributive elasticities over time. We see that the elasticities are higher (most negative) for redistribution between the Chinese and the Bumiputera, and close to zero for redistribution from the Chinese to Indians. Also, note that the elasticities for redistribution from Chinese to Bumiputera have not fallen over time; indeed there is a trend increase (more negative elasticities). Despite the signs of (relative) economic convergence by ethnicity, the poverty-reducing efficacy of ethnic redistribution from the Chinese to the Bumiputera has remained high.

It might be conjectured that the high recent elasticities are an artifact of the assumption of constant elasticities of poverty to growth over time for each ethnic group. This is not the case. Panel (c) of Table 3 includes interaction effects with time in the log-difference specification. The

elasticity has decreased (becoming more negative) over time for the Bumiputera and Chinese, reaching about -5 by 2016. Using an elasticity of -5 in 2016 for both groups one obtains an ethnic redistribution elasticity of -3.7 instead of -1.3.

5. Conclusions

In the wake of the 1969 race riots, the twin aims of Malaysia's New Economic Policy were ethnic redistribution and poverty reduction. To varying degrees, successive governments have intervened against ethnic inequality. Over the same period, the country has seen enormous progress against poverty. Indeed the official poverty rate has gone from about 50% to virtually zero, although the old official poverty line is probably too low by prevailing standards. The alternative (weakly-relative) measure of poverty proposed here shows a similar pattern over time, and indicates a near halving of the poverty rate over 1984-2016, though it also suggests that Malaysia still has some way to go before it can claim to have eliminated poverty.

Malaysia can also claim more success than many countries in managing inequality. The Gini index of household incomes fell from 0.51 in 1970 to 0.40 in 2016. This was due to progress in reducing ethnic inequality. The paper finds that the reduction in overall inequality played a non-negligible role in the country's success at reducing poverty, in combination with economic growth. There have also been clear signs of relative convergence in mean household incomes between the main ethnic groups. The mean income of the lagging Bumiputera has grown at a faster rate since 1970 than that for either the Chinese or Indians.

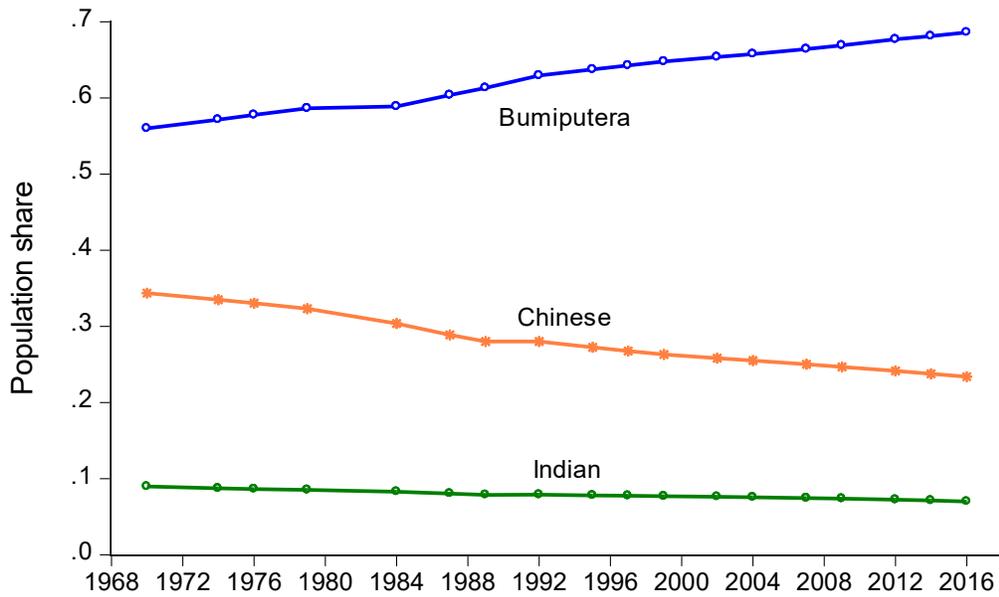
The paper's measures of ethnic inequality show a large reduction over these 50 years. Nonetheless, the ethnic differential in growth rates has not been enough to attenuate the large absolute gaps in mean incomes by ethnicity. Importantly, there is no sign of a robust effect of the growth process on inequality within ethnic groups. It is not the case, for example, that the higher growth rate for the Bumiputera in the wake of the NEP was shared unevenly among the Bumiputera when one defines "uneven" in terms of proportionate changes. However, that growth did come with rising absolute inequality.

The paper's results suggest that progress in reducing ethnic inequality has played a non-negligible role in reducing national poverty over these 50 years. Using the official poverty measures, about 10% of the overall rate of poverty reduction is accountable to reduced inequality

in average incomes between the main ethnic groups. (Using the proposed relative poverty measure it would probably rise to about 17%.) Inequality reduction within ethnic groups has played a somewhat more important role than ethnic redistribution. However, overall economic growth has been the more important driver quantitatively. Changes in the ethnic composition of the population tended to be poverty increasing, though this effect turns out to be small.

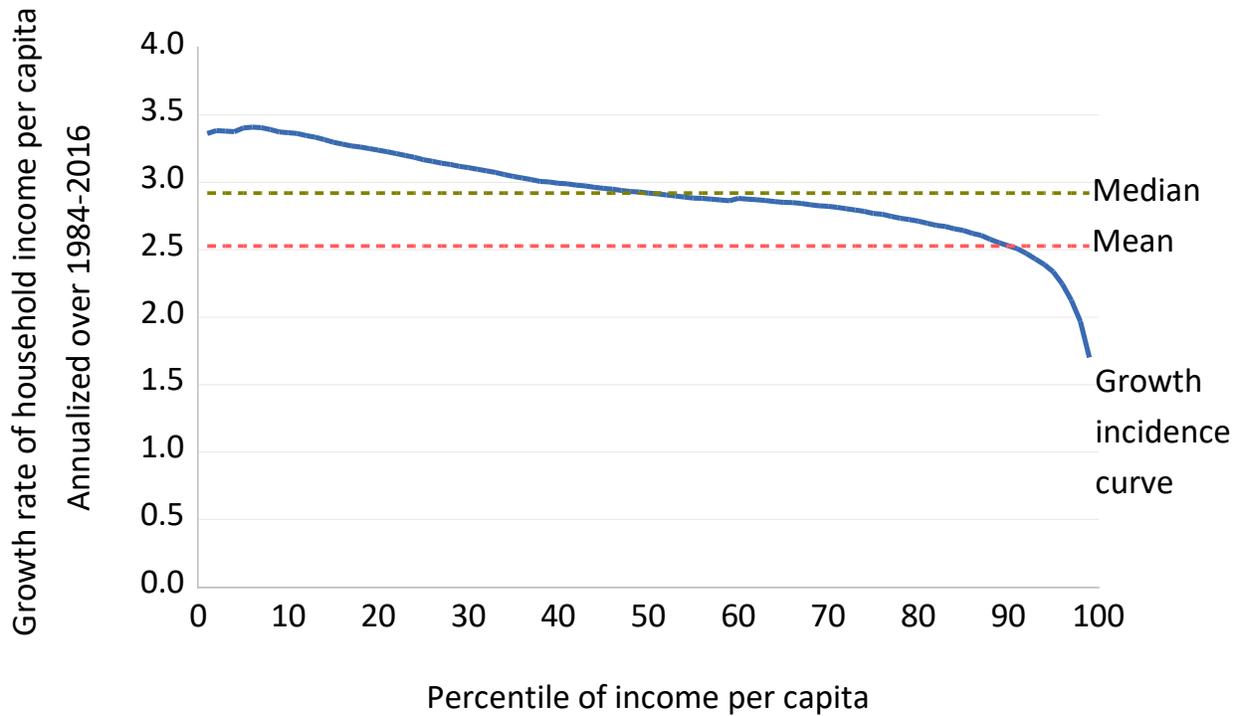
While the reduction in ethnic inequality has not been as quantitatively important to poverty reduction as overall growth that does not imply that ethnic redistribution is a blunt tool against poverty in this setting. Nor do the facts that both ethnic inequality and poverty have been reduced substantially imply that ethnic inequality no longer matters to poverty. Indeed, the paper finds quite sizable elasticities of national poverty to inequality-reducing ethnic redistribution. And the elasticities have stayed high—indeed, they have increased—through this period of ethnic redistribution and poverty reduction spanning 50 years. The potential gains to poor Malaysians from progress toward ethnic equality do not appear to have been exhausted. Even small reductions, or increases, in ethnic inequality can still matter.

Figure 1: Malaysia's ethnic population shares over time



Source: Public data from DOSM.

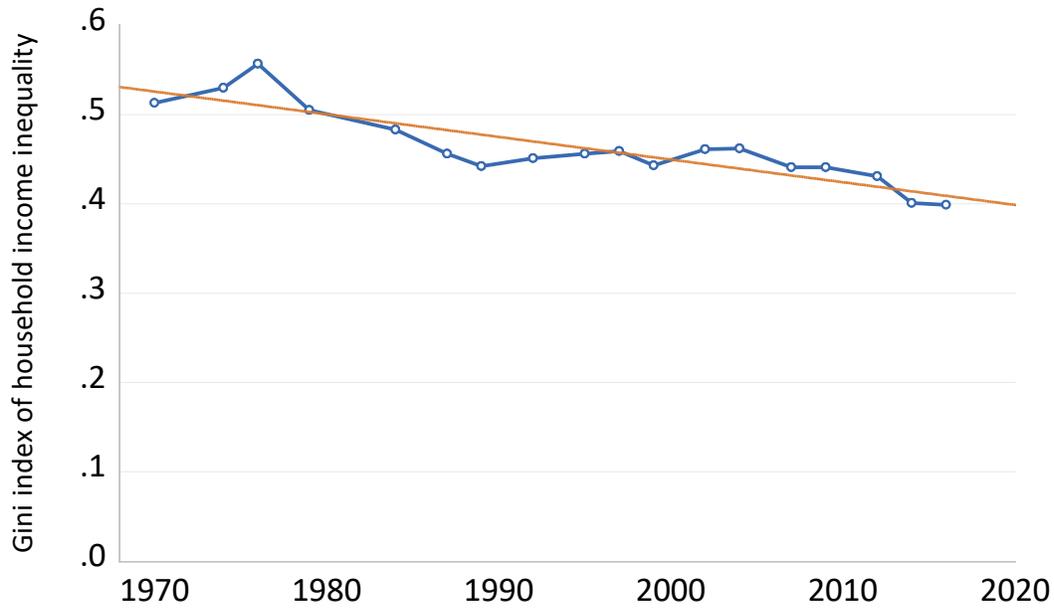
Figure 2: Growth incidence curve for Malaysia, 1984-2016



Source: Author's calculations using *PovcalNet*.

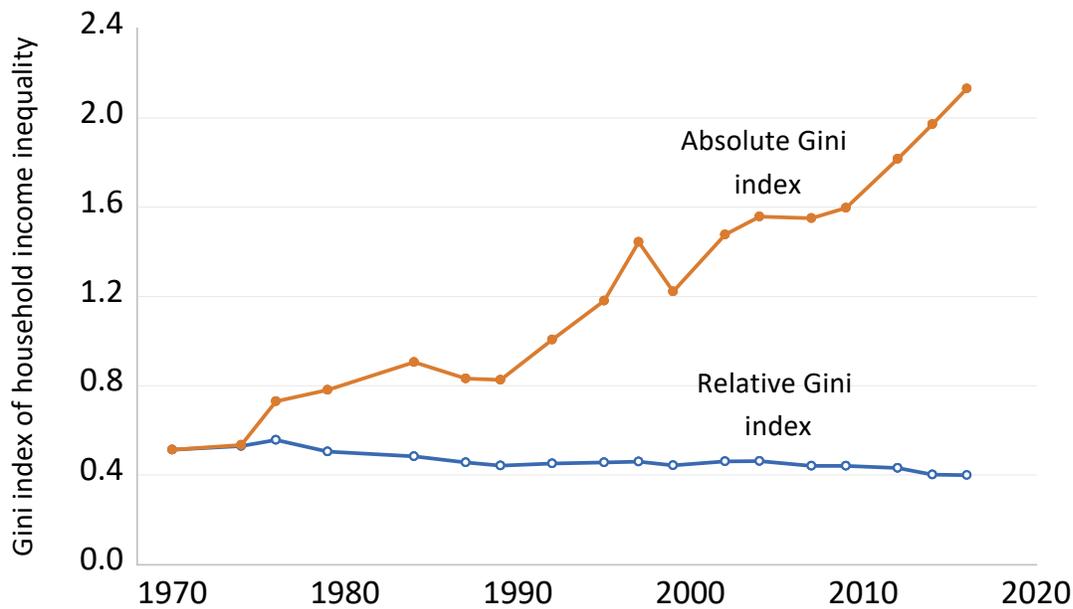
Figure 3: National Gini indices for household incomes

(a) EPU/DOSM's Gini index



Source: Public data from EPU/DOSM.

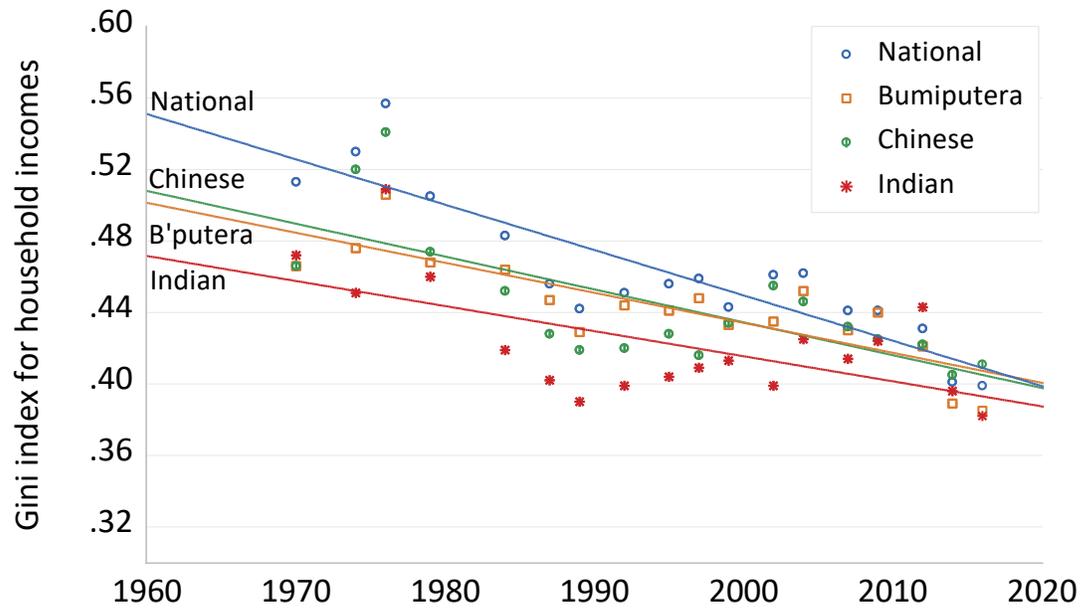
(b) Absolute and relative Gini indices



Note: The absolute index is scaled to equal the relative index in 1970. Source: Author's calculations from EPU/DOSM data.

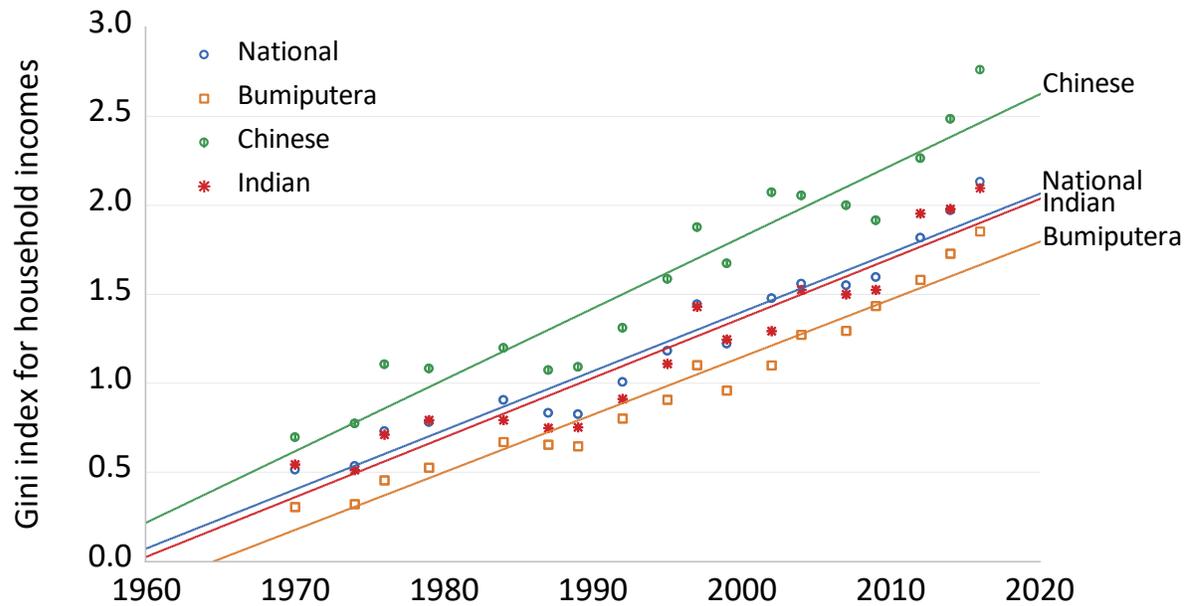
Figure 4: Gini indices by ethnic group

(a) Relative Gini indices



Source: Public data from EPU/DOSM.

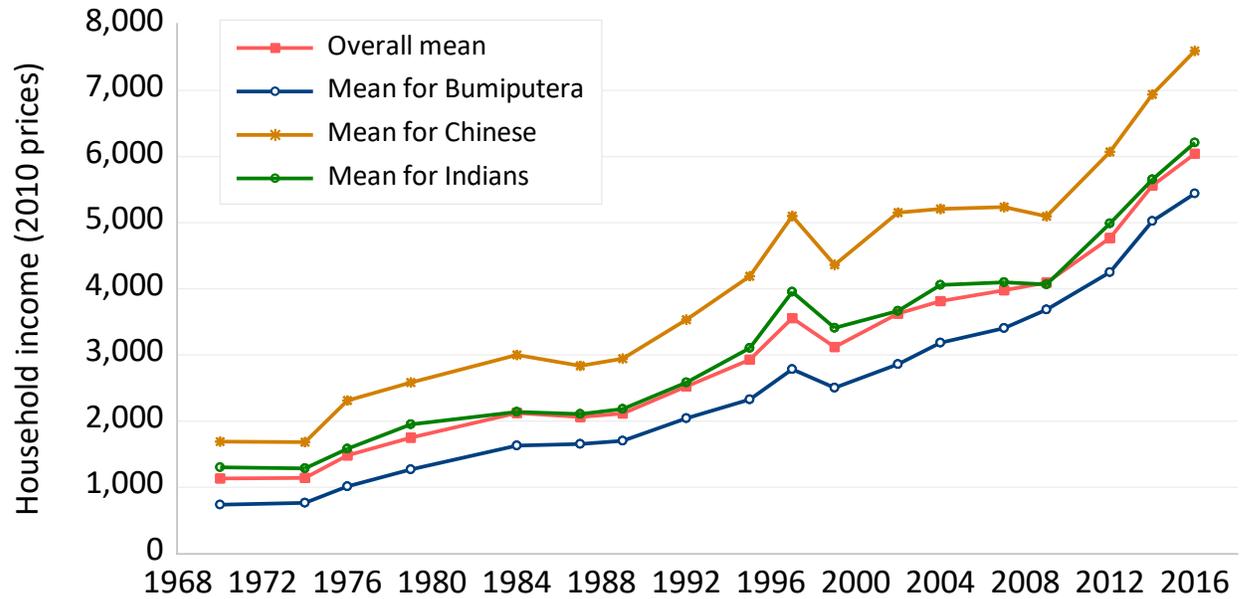
(b) Absolute Gini indices



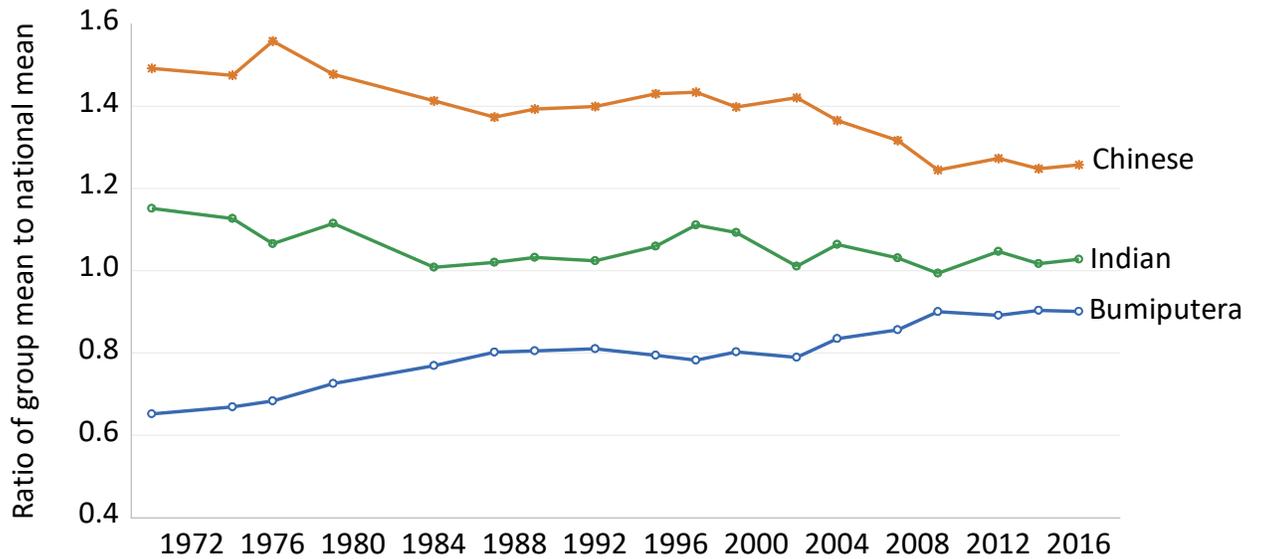
Source: Author's calculations using public data from EPU/DOSM. Note: Normalized by national mean in 1970.

Figure 5: Mean real household income by ethnic group

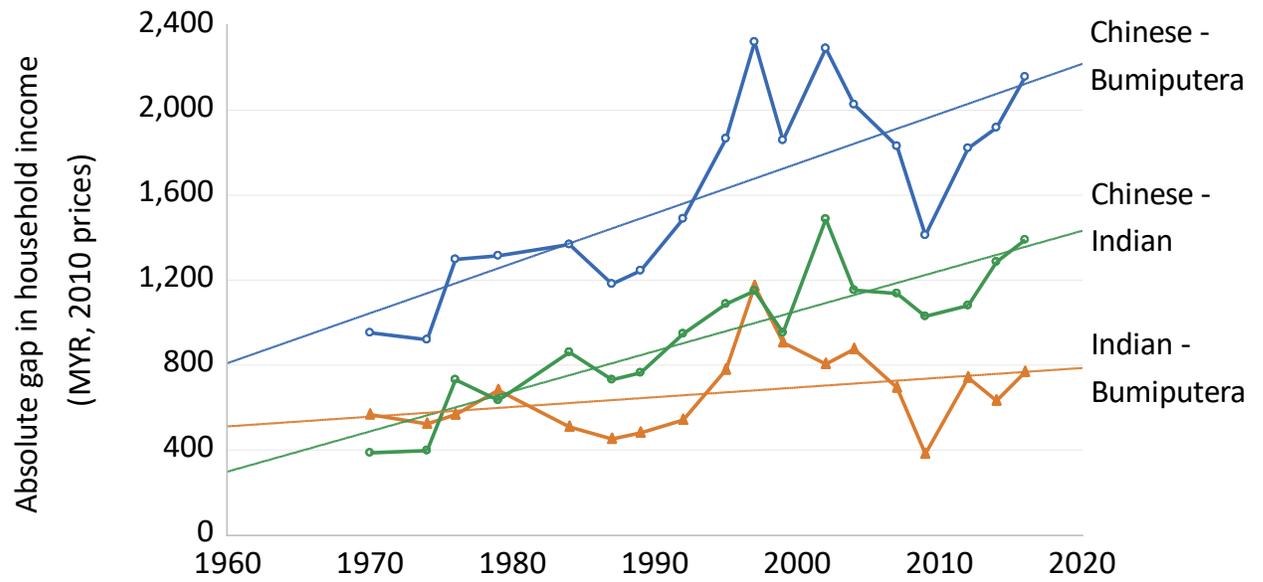
(a) Overall means and means by ethnicity



(b) Relative convergence: Means by ethnicity normalized by overall mean



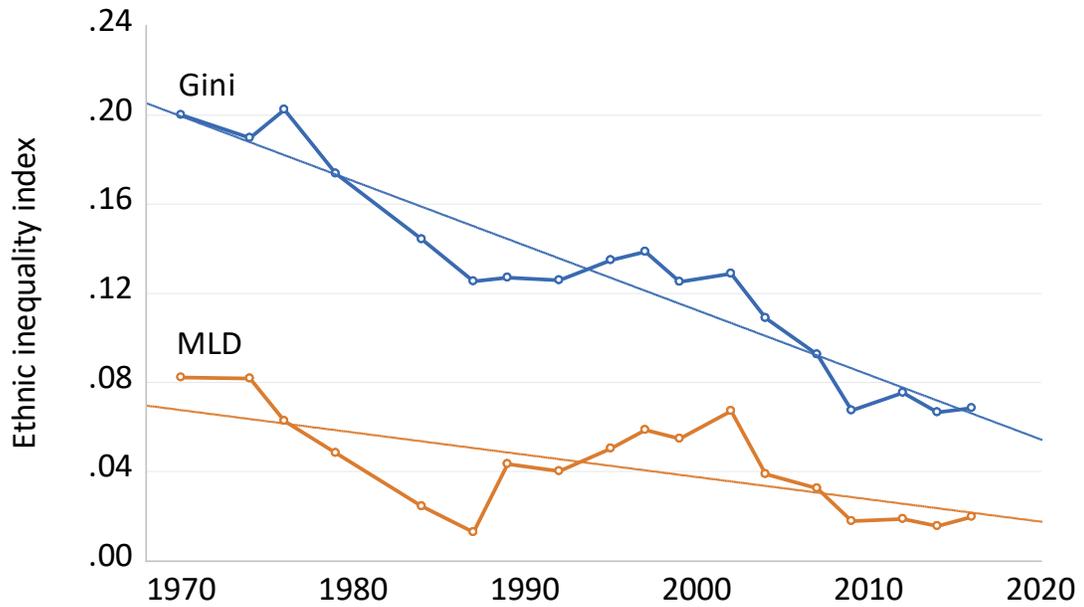
(c) Absolute divergence: Gaps in (real) household incomes



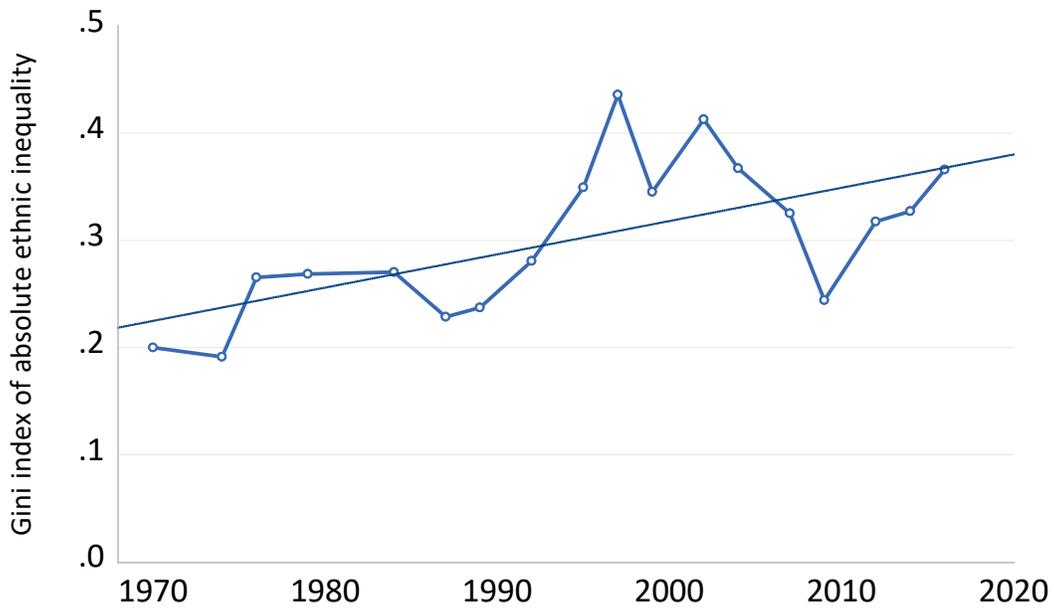
Source: Author's calculations using data from EPU/DOSM.

Figure 6: Ethnic inequality indices

(a) Relative



(b) Absolute



Source: Author's calculations using data from EPU/DOSM. Note: Inequality between Bumiputera, Chinese and Indian; MLD=Mean Log Deviation.

Figure 7: Components of the national Gini index

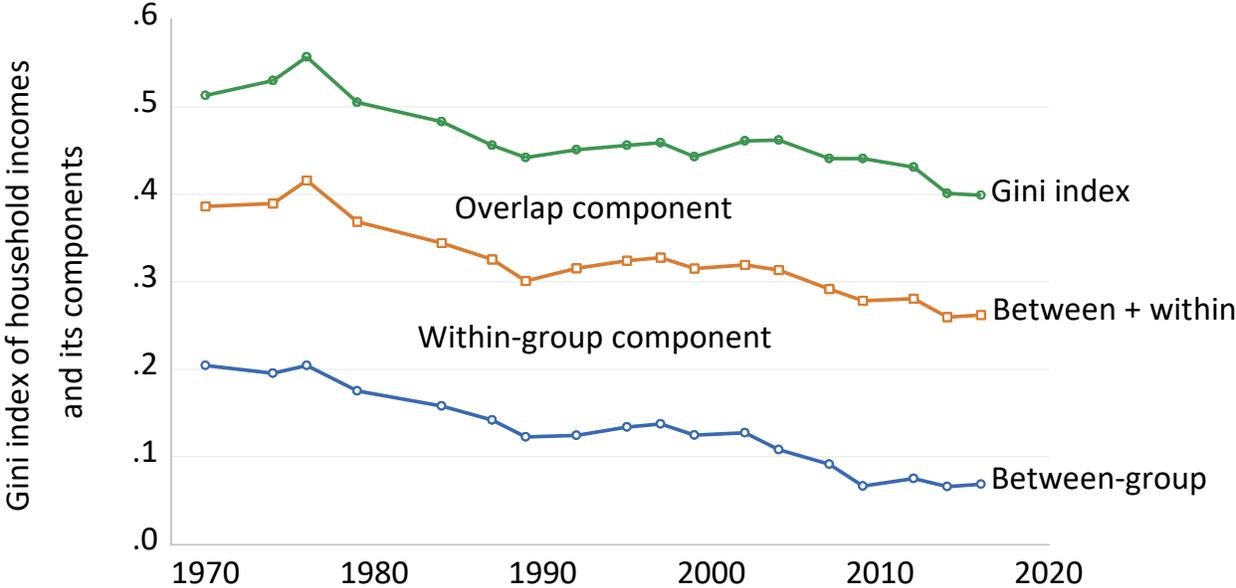
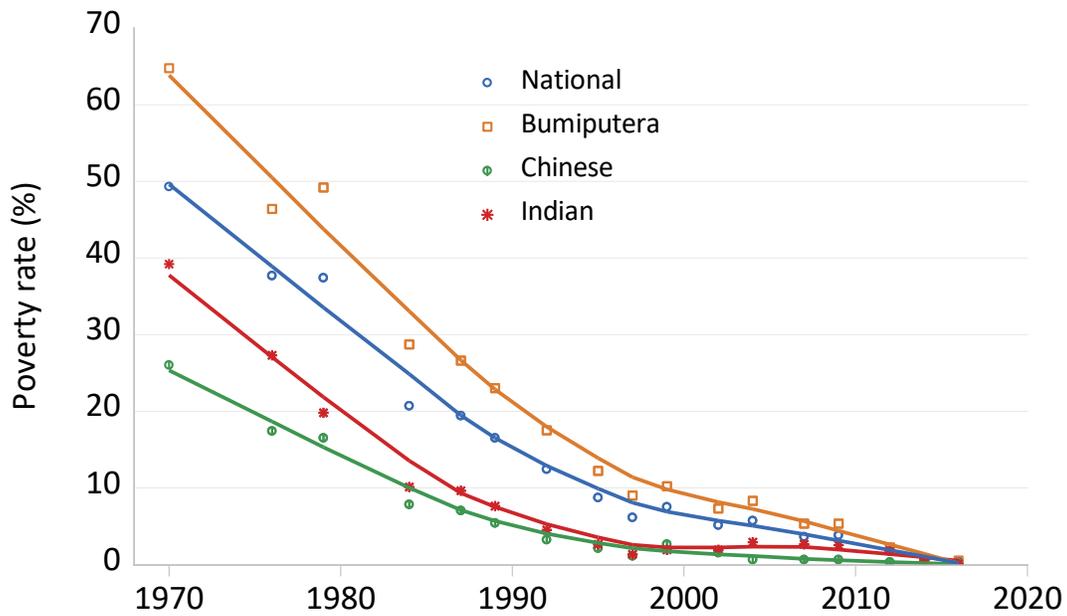


Figure 8: Ethnic poverty profiles over time

(a) Poverty rates (% of relevant population)



Source: Public data from DOSM. Note: Fitted lines are nonparametric regressions using a nearest neighbor smoother.

(b) Ethnic shares of poverty (% of those deemed to be poor)

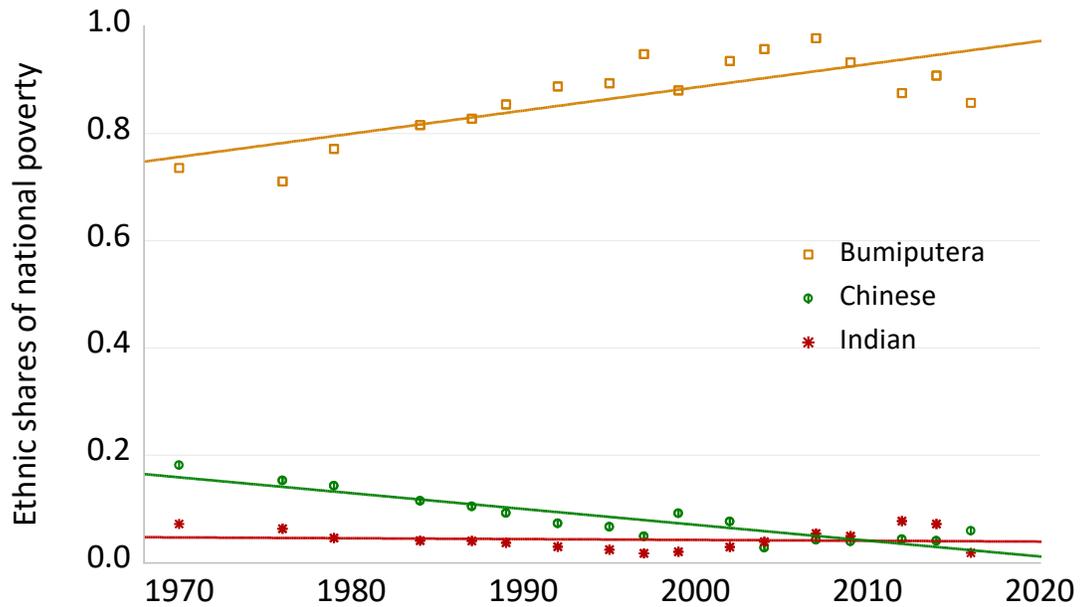
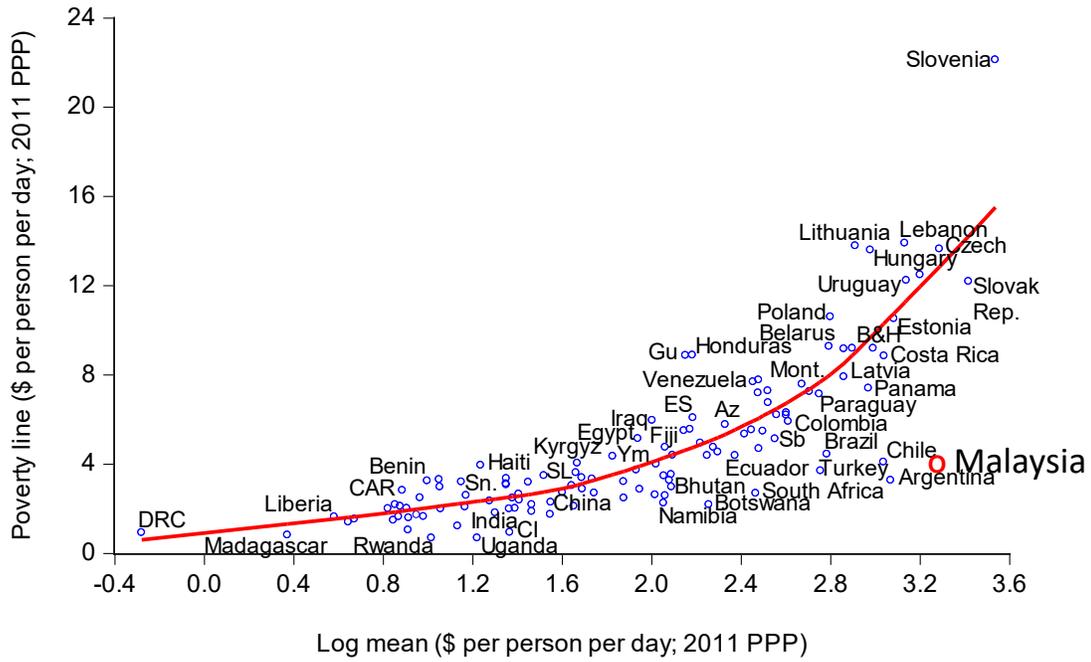
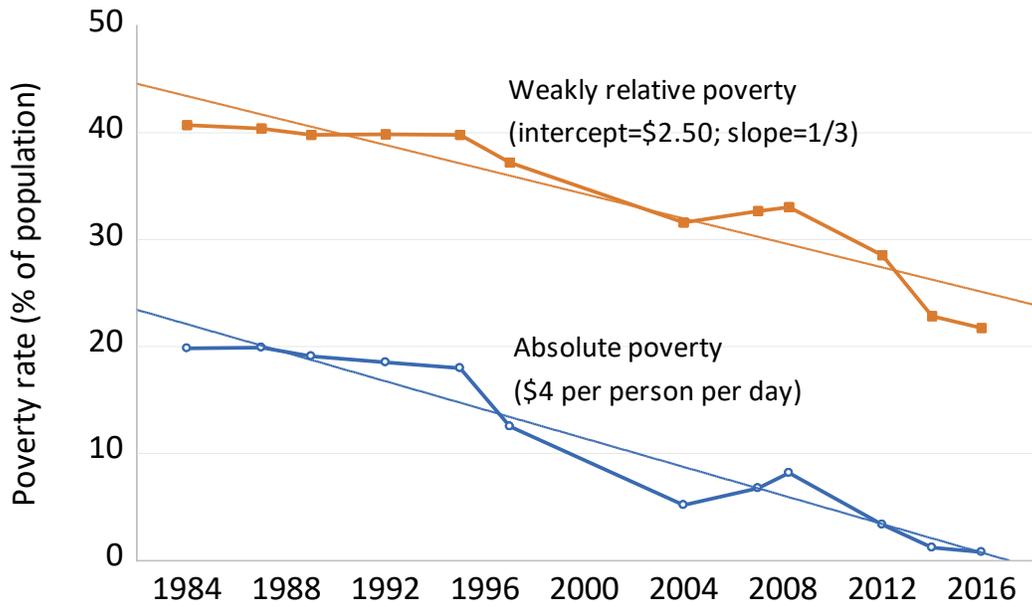


Figure 9: Malaysia's official poverty line compared to national poverty lines across countries



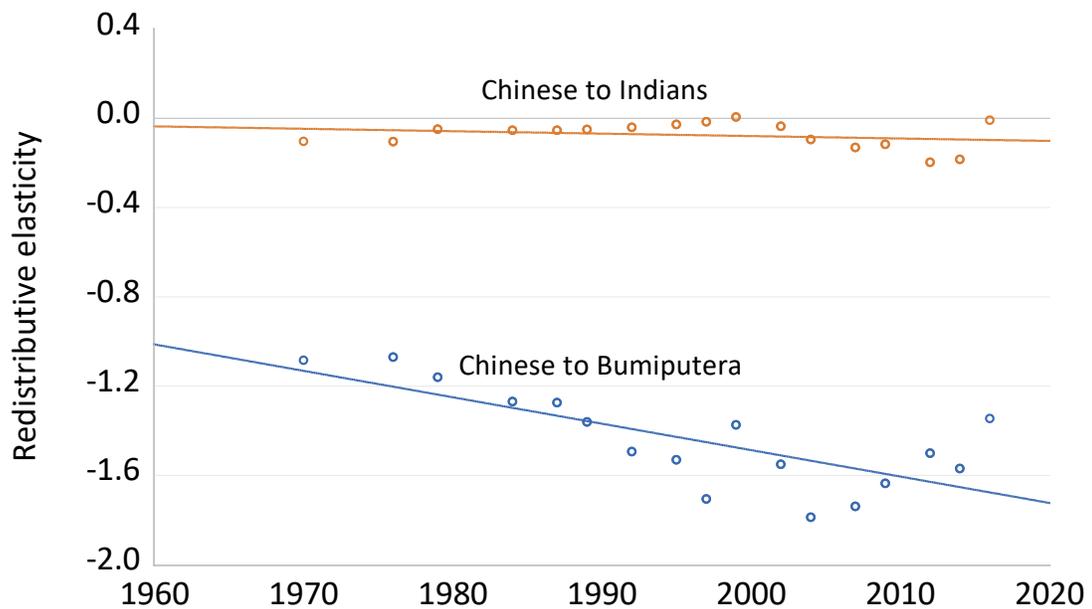
Source: National poverty lines from Ravallion and Chen (2017). Note: Fitted line is a nonparametric regressions using a nearest neighbor smoother.

Figure 10: Comparison of absolute and (weakly) relative poverty measures for Malaysia



Source: Author's calculations using stipulated poverty line and *PovcalNet*

Figure 11: Redistributive elasticities of national poverty reduction



Source: Author's calculations as described in text.

Table 1: Actual and counterfactual poverty rates

Absolute poverty (\$4 per person per day); % population		Distribution	
		1984	2016
Mean	1984	19.82	11.82
	2016	2.26	0.75
Weakly relative poverty (intercept=\$2.50; slope =1/3); % population		Distribution	
		1984	2016
Mean	1984	40.73	32.85
	2016	30.36	21.73

Source: Author's calculations using *PovcalNet*.

Table 2: Summary statistics for beginning and end of the series

	1970	2016	Compound growth rate (% p.a.)
Headcount index (official)	0.493	0.004	-9.937
Mean income	1131.13	6042.69	3.710
Mean for Bumiputera	736.95	5442.59	4.443
Mean for Chinese	1688.12	7598.95	3.320
Mean for Indians	1302.51	6209.43	3.453
Population share for Bumiputera	0.560	0.686	0.442
Population share for Chinese	0.343	0.234	-0.831
Population share for Indians	0.090	0.070	-0.642
Bumiputera share of poverty (%)	73.609	85.752	0.332
Chinese share of poverty (%)	18.112	5.849	-2.457
Indian share of poverty (%)	7.146	1.753	-3.055

Source: Author's calculations using publicly available tabulations from EPU/DOSM. Growth rates calculated as (in obvious notation) $r = (y_{2016}/y_{1970})^{1/46} - 1$.

Table 3: Regressions for the log headcount index on the log mean

(a) Nationally

	Absolute, using the official poverty measures		Absolute, using <i>PovcalNet</i>		Weakly relative, using <i>PovcalNet</i>	
	Log headcount index	Difference in logs	Log headcount index	Difference in logs	Log headcount index	Difference in logs
Constant	24.215*** (2.990)	n.a.	12.156*** (1.384)	n.a.	5.477*** (0.213)	n.a.
Log real mean	-2.788*** (0.381)	-2.357*** (0.698)	-3.588*** (0.507)	-3.486*** (0.763)	-0.696*** (0.099)	-0.601*** (0.134)
R ²	0.914	0.231	0.905	0.664	0.897	0.500
N	17	16	12	11	12	11

(b) By ethnic group, using the official poverty measures

	Bumiputera		Chinese		Indian		Others	
	Log headcount index	Difference in logs	Log headcount index	Difference in logs	Log headcount index	Difference in logs	Log headcount index	Difference in logs
Constant	20.323*** (2.853)	n.a.	33.569*** (3.314)	n.a.	25.574*** (2.794)	n.a.	10.815 (6.596)	n.a.
Log real mean	-2.325*** (0.374)	-1.958*** (0.683)	-3.969*** (0.403)	-3.003*** (0.645)	-3.030*** (0.362)	-3.008*** (0.741)	-1.042 (0.864)	-0.428 (0.268)
R ²	0.889	0.043	0.935	0.366	0.876	0.142	0.136	-0.079
N	17	16	17	16	17	16	17	16

(c) By ethnic group, using log differences in the official measures, with year interactions

	Bumiputera	Chinese	Indian	Others
Difference in log real mean	-4.705*** (1.065)	-5.193*** (0.514)	-4.852** (2.149)	-1.041 (0.674)
(year-2016)*Difference in log means	-0.105*** (0.031)	-0.091*** (0.018)	-0.087 (0.073)	-0.027 (0.025)
R ²	0.525	0.517	0.226	-0.045
N	16	16	16	16

Note (both panels): HAC standard errors in parentheses (Bartlett kernel, Newey-West fixed bandwidth of 3). The mean is that for the relevant ethnic group. The poverty rate is not available for 1974. The differences for 1976 are calculated relative to 1970 (including for the log means). Source: Author's calculations as described in the text.

Table 4: Decomposition of the rate of poverty reduction

% per annum (% of total)	Benchmark parameters		Mean	Mean for “high-case” option	Mean for “low-case” option
	Base year share weights	Final year share weights			
Aggregate growth	-8.273 (83.25)	-7.209 (72.54)	-7.741 (77.90)	-8.045 (80.96)	-7.436 (74.83)
Ethnic redistribution	-0.814 (8.20)	-1.176 (11.83)	-0.995 (10.01)	-0.966 (9.72)	-1.024 (10.30)
Intra-group distributional shifts not due to growth	-0.988 (9.95)	-1.929 (19.41)	-1.459 (14.68)	-1.183 (11.90)	-1.734 (17.45)
Population composition	0.139 (-1.40)	0.376 (-3.79)	0.257 (-2.59)	0.257 (-2.59)	0.257 (-2.59)
Total	-9.937 (100.00)	-9.937 (100.00)	-9.937 (100.00)	-9.937 (100.0)	-9.937 (100.0)

Source: Author’s calculation of the decomposition in equation (5) (as explained in text).

References

- Abdul Rahman Putra, Tunku , 1986. *Political Awakening*, Kuala Lumpur: Pelanduk Publications.
- Anand, Sudhir, 1983, *Inequality and Poverty in Malaysia: Measurement and Decomposition*, New York: Oxford University Press.
- Bourguignon, François, 1979, “Decomposable Income Inequality Measures,” *Econometrica*, 47: 901-920.
- Chakravarty, Shanti, and Abdul-Hakim Roslan, A.H., 2005, “Ethnic Nationalism and Income Distribution in Malaysia,” *European Journal of Development Research* 17(2): 270–288.
- Cowell, Frank, 2000, “Measurement of Inequality,” in A.B. Atkinson and F. Bourguignon (eds), *Handbook of Income Distribution*, Amsterdam: North-Holland.
- Cowell, Frank, and Emmanuel Flachaire, 2017, “Inequality Measures and the Median: Why Inequality Increased more than we Thought,” mimeo, London School of Economics.
- Datt, Gaurav, and Martin Ravallion, 1992, “Growth and Redistribution Components of Changes in Poverty Measures: A Decomposition with Applications to Brazil and India in the 1980s,” *Journal of Development Economics* 38: 275-295.
- Drabble, John, 2000, *An Economic History of Malaysia, c.1800-1990: The Transition to Modern Economic Growth*. London: Macmillan Press.
- Economic Planning Unit (EPU), 2010, *Tenth Malaysia Plan 2011-2015*. Economic Planning Unit, Prime Minister’s Department, Putrajaya, Malaysia.
- Economist, The, 2017, “Deformative Action: Malaysia’s System of Racial Preferences should be Scrapped,” May 18.
- Gallup, John Luke, 1998, “Ethnicity and Earnings in Malaysia,” Harvard Institute for International Development, Harvard University.
- Gastwirth, J.L., 1971, “A General Definition of the Lorenz Curve,” *Econometrica* 39: 1037-39.
- Hirschman, Charles, 1972, “Educational Patterns in Colonial Malaya,” *Comparative Education Review* 16(3): 486-502.
- _____, 1975, *Ethnic and Social Stratification in Malaysia*, Arnold and Catherine Rose Monograph Series, Washington DC: American Sociological Association.
- Ikemoto, Y., 1985, “Income Distribution in Malaysia: 1957-80,” *The Developing Economies* 23(4): 347-367.

- Jomo, Kwame Sundaram, 1989, "Malaysia's New Economic Policy and National Unity," *Third World Quarterly* 11(4): 36-53.
- Jomo, Kwame Sundaram and Wee Chong Hui, 2014, *Malaysia@50: Economic Development, Distribution, Disparities*. Petaling Jaya: Strategic Information and Research Development Centre.
- Kakwani, Nanak, 1993, "Poverty and Economic Growth with Application to Côte D'Ivoire," *Review of Income and Wealth*, 39, 121-139.
- Kanbur, Ravi, 2006, "The Policy Significance of Inequality Decompositions," *Journal of Economic Inequality* 4: 367-374.
- Khalid, Muhammed Abdul, 2014, *The Colour of Inequality. Ethnicity, Class, Income and Wealth in Malaysia*, Kuala Lumpur: MPH Publishing.
- Khazanah Research Institute (KRI), 2018, *The State of Households 2018. Different Realities*. Kuala Lumpur: Khazanah Research Institute.
- Lambert, Peter, and J. Richard Aronson, 1993, "Inequality Decomposition Analysis and the Gini Coefficient Revisited," *Economic Journal* 103: 1221-1227.
- Lee, Hwok-Aun and Muhammed Abdul Khalid, 2016, "Discrimination of High Degrees: Race and Graduate Hiring in Malaysia," *Journal of the Asia Pacific Economy* 21(1): 53-76.
- _____ and _____, 2018, "Is Inequality Really Declining in Malaysia?," *Journal of Contemporary Asia*, [Online](#).
- Lee Yong Leng and Martina Ting 1986 "Economic Divisions and Ethnic Differences in Malaysia," *Southeast Asian Journal of Social Science* 14(2): 85-96.
- Lim, Teck Ghee, 1977, *Peasants and their Agricultural Economy in Colonial Malaya 1874-1941*, Kuala Lumpur: Oxford University Press.
- Mazumdar, Dipak, 1991, "Malaysian Labor Market under Structural Adjustment," World Bank Working Paper 573, World Bank, Washington DC.
- Milanovic, Branko, 2006, "Inequality and Determinants of Earnings in Malaysia, 1984-1997," *Asian Economic Review* 20(2): 191-216.
- Mohammadpour, E., 2012, "A Multilevel Study on Trends in Malaysian Secondary School Students' Science Achievement and Associated School and Student Predictors," *Science Education* 96(6): 1013-1046.

- Newey, Whitney and Kenneth West, 1987, “A Simple, Positive Semidefinite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix,” *Econometrica* 55: 703–708.
- Pong, Suet-ling, 1993, “Preferential Policies and Secondary School Attainment in Peninsular Malaysia,” *Sociology of Education* 66(4): 245-61.
- Ramana, Santhiram R., and Tan Yao Sua, 2010, “Ethnic Segregation in Malaysia’s Education System: Enrolment Choices, Preferential Policies and Desegregation,” *Paedagogica Historica* 46(1–2): 117–131.
- Ravallion, Martin, 2001, “Growth, Inequality and Poverty: Looking Beyond Averages.” *World Development* 29(11): 1803-1815.
- _____, 2007, “Inequality is Bad for the Poor,” in *Inequality and Poverty Re-Examined*, edited by John Micklewright and Steven Jenkins, Oxford: Oxford University Press.
- _____, 2016, *The Economics of Poverty: History, Measurement and Policy*, New York: Oxford University Press.
- _____, 2018, “What Might Explain Today’s Conflicting Narratives on Global Inequality?” WIDER Working Paper 2018/141.
- Ravallion, Martin, and Shaohua Chen, 2003, ““Measuring Pro-Poor Growth,” *Economics Letters* 78(1): 93-99.
- Ravallion, Martin, and Shaohua Chen, 2011, “Weakly Relative Poverty,” *Review of Economics and Statistics* 93(4): 1251-1261.
- _____, and _____, 2018, “Welfare-Consistent Global Poverty Measures,” NBER Working Paper 23739.
- Roslan, Abdul-Hakim, 2001, “Income Inequality, Poverty and Development Policy in Malaysia.” Universiti Utara Malaysia.
- Saw, Guan Kung, 2016, “Patterns and Trends in Achievement Gaps in Malaysian Secondary Schools (1999–2011): Gender, Ethnicity, and Socioeconomic status,” *Educational Research for Policy and Practice* 15(1): 41-54.
- Saw, Swee-Hock, 2015, *The Population of Malaysia (Second Edition)*, ISEAS Publishing, Singapore.
- Shah, Sultan Nazrin, 2017, *Charting the Economy*. New York: Oxford University Press.

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

Thillainathan, R., and Kee-Cheok Cheong, 2018, "Book Review" (of Khalid, 2014), *Malaysian Journal of Economic Studies* 55(2): 301-307.

_____ and _____, 2016, "Malaysia's New Economic Policy, Growth and Distribution: Revisiting the Debate," *Malaysian Journal of Economic Studies* 53(1): 51-68.

Yusof, Zainal Aznam, and Deepak Bhattasali, 2008, "Economic Growth and Development in Malaysia: Policy Making and Leadership," Working Paper 27, Growth Commission, World Bank.