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Top Incomes in Indonesia, 1920-2004

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ABSTRACT

Using taxation and household survey data, this paper estimates top income shares for Indonesia during 1920-2004. Our results suggest that top income shares grew during the 1920s and 1930s, but fell in the post-war era. In more recent decades, we observe a sharp rise in top income shares during the late-1990s, coincident with the economic downturn, and some evidence that top income shares fell in the early-2000s. For pre-war Indonesia, we decompose top income shares by income source, and find that for groups below the top 0.5 percent, a majority of income was derived from wages. Throughout the twentieth century, top income shares in Indonesia have been higher than in India, broadly comparable to Japan, and somewhat lower than levels prevailing in the United States.

JEL codes: H24, N35, O15

Keywords: inequality, top incomes, personal income taxation, Indonesia

1. Introduction

According to the 2006 *Forbes* global rich list, Indonesia's richest man, Sukanto Tanoto, and his family were worth US\$2.8 billion (Doebele and Vorasarun 2006). Sukanto headed a group of Indonesia's 40 richest with a combined net worth of US\$22.3 billion, or about 19 million times Indonesia's average income of US\$1,150. Such numbers appear to confirm the numerous casual observations that income distribution in Indonesia is and has long been highly skewed in favour of the country's high-income earners. In contrast, academic literature on income distribution in Indonesia often indicated that income inequality has been relatively low as a consequence of 'pro-poor growth' policies fostered by its government (*e.g.* Ragayah 2005; Timmer 2004, 2005; World Bank 2005). Such contrasting views are in part caused by significant difficulties in interpreting the available income and expenditure survey data for Indonesia (Cameron 2002).

Hence, whether income inequality in Indonesia has long been highly skewed, whether it is more skewed than elsewhere, and if so why, remain issues of debate. We aim to contribute to this debate on the basis of a relatively new methodology that establishes and analyses trends in the share of top-income earners in a country's total income. Building on recent studies for other countries, employing under-explored historical data, and comparing our results with similar data for other countries, we establish and analyse such trends for the first time for one of Asia's most populous countries and biggest economies. We offer an assessment of changes in the share of top-income earners in Indonesia on the basis of income tax data for 1920-39 and 1990-2003, augmented by household income data from the country's national socio-economic survey for 1982-2004.

To preview our results, we find a significant increase in the income share of the richest households during the early 1920s, and again during the early 1930s. From the late-1930s until the early-1980s, top income shares fell (particular the top 1 percent share and above). Top income shares rose modestly in the 1980s, rose sharply in the late-1990s, and fell slightly in the early-2000s. Throughout the twentieth century, top income shares in Indonesia have been higher than in India and the United States, but comparable to

Japan. Since the 1980s, Indonesia's top income shares have been higher than in India and Japan, but lower than levels prevailing in the United States.

The remainder of this paper is organised as follows. Section 2 outlines how this study relates to other academic studies that fall in three categories: income inequality in Indonesia, the long-term relationship between income inequality and economic growth, and changes in top-incomes in other countries. Section 3 discusses the data and the methodology we used in this paper, particularly the intricacies of the income tax data. Section 4 presents the results that the analysis of top-incomes in Indonesia yields. Section 5 compares these results with existing evidence on inequality in Indonesia and on top-incomes in other countries. The final section concludes.

2. Context of the paper

There are very few assessments of income distribution in colonial Indonesia. Booth (1988: 323-32) surveyed the available evidence and offered an assessment on the basis of the data on income tax that were published for 1920-39 in the annual statistical yearbooks for colonial Indonesia. These data differentiate between three groups of tax payers – indigenous Indonesians, 'foreign Asians' (including ethnic Chinese, Indians and Arabs) and Europeans – and allow for the calculation of average income in each group. Booth (1988: 333) found that 'the distribution of income between Indonesians revealed less glaring disparities than between ethnic groups'. The author used the income tax data at face value, without taking account of the ways in which they were collected and therefore their shortcomings, such as the allowances for wife and children or consequences of the f120 threshold (see section 3.1 below).

For about 30 years since Indonesia's independence in 1949, a lack of data impeded any analysis of changes in income distribution. The income tax system deteriorated and data on income tax revenues were only published in aggregated forms. The first information took the form of the national household survey (*Survei Sosial-Ekonomi Nasional*, Susenas), which since 1964-65 included information on household expenditure and since 1978 also on household income. Particularly the Susenas household expenditure data have been used over and over again to analyse the degree of inequality and to a lesser extent trends in income inequality.

Cameron (2002) discussed the available data and noted that they generally indicated low degrees of inequality in household expenditure, with Gini ratios between 0.32 and 0.38. She also discussed the possible shortcomings of the Susenas data. For example, the surveys are often believed to be biased towards the urban poor. They also underestimate household expenditure on food (Surbakti 1995: 61). Non-food expenditure is underestimated, particularly spending on durables such as televisions and cars. Such factors create a progressively increasing degree of underestimation of expenditure and income among the high-income households in the surveys.¹

Cameron (2002: 12) noted that the Susenas household income data have hardly been used in the analysis of income distribution in Indonesia.² Cameron (2002: 15) concluded that very few studies offer a long-term perspective on changes in income distribution and offered her estimates of the Gini ratio of per capita household income of 0.42 in 1984 and 0.43 in 1990. On the basis of the same source, Alatas and Bourguignon (2000: 159) estimated the Gini ratio of per capita household income of 0.38 in 1980 and 0.40 in 1996. Using much smaller samples of Indonesia's Family Life Survey, Fields *et al.* (2003:73) estimated Gini ratios of household income distribution to be 0.56 in both 1993 and 1997.

Available studies of income and expenditure distribution in Indonesia tend to cover short-term changes and use different data configurations, indicators of inequality and methods of decomposition that impede the comparability of the results. For those reasons, Cameron (2002) could not be conclusive about the degree of income inequality and changes in income distribution in the longer term. Hence, the low degree of inequality may be real, or due to shortcomings in the survey in capturing

¹ The estimation of expenditure on consumer durables relies on the memory of the head of the households regarding spending during the year prior to the survey. For reasons that are unclear, low-income households tend to be less 'forgetful' than high-income households. On the whole, the degree of underestimation is illustrated by the fact that there has long been a substantial discrepancy between total household expenditure, estimated through Susenas, and total private consumption in the Indonesian national accounts, estimated as a residual after other main items of expenditure on GDP were accounted for (Hill 1996: 195). It is likely that the household income data from Susenas also suffer from underestimation, but there are no studies that have assessed the possible degree of underestimation, as the Indonesian national accounts do not use the income-based approach.

² An additional source of income data is contained in the National Labour Force Survey (*Survei Tenaga Kerja Nasional*, Sakernas), which collects information on wage incomes of employees since 1978. These have also hardly been used in assessments of wage income inequality in Indonesia, let alone changes in inequality over time.

high income households, or due to the fact that household expenditure tends to be more evenly distributed than income. Section 5 will directly compare the available inequality estimates with our estimates of top income shares.

Interest in long-term trends in income distribution increased since Kuznets (1955), who hypothesised that, from low levels of living, economic growth first increases inequality, before it generates a more even distribution of income. Extensive debate exists on the historical consequences of industrialisation during the 19th and 20th centuries for the equality of income and wealth in Western countries, particularly England, the UK and USA. This debate and the evidence it yielded indicates that inequality indeed increased since the early 19th century, but that in the 20th century until the 1970s pre-tax income inequality decreased, in part due to shifts in the progressivity of redistribution through government, in part due to factor-market forces and economic growth (Lindert 2000).

Lindert and Williamson (2003) recently interpreted trends in income distribution between and within nations during 1500-2000 in the context of changes in relative factor prices as the process of ‘globalisation’ mobilised production factors around the world. For Indonesia, they hypothesised an increase in inequality during 1900-30, as the country’s abundant land resources were mobilised for export production, raising land rents relative to wages. Implicitly, the mobilisation of labour for export production since the 1970s should reverse the effect, as in other Asian countries where the mobilisation of labour through labour-absorbing industrialisation raised wages relative to the costs of capital and land. However, the authors noted instead – without referring to a specific source – that income in Indonesia became more concentrated in the top decile.

Such generalisations of long-term trends in income inequality enhance the pertinence of a closer study of the case of Indonesia. However, the available data for Indonesia – income tax data – and national household surveys contain limitations that impede an assessment of trends in inequality on the basis of conventional measures, such as Gini indices of the size distribution of income.

An alternative approach is the estimation of the share of top incomes in total income, which may suits the available data for Indonesia in principle. As a measure of inequality, increasing attention has been devoted to understanding long-term changes in top income shares. Beginning with the work of Piketty (2001, 2003) on France, a number of scholars have used income taxation data to estimate the share of national income held by the rich in more than a dozen developed countries. Piketty and Saez (2006) and Leigh (2006) surveyed these papers, confirming the trends noted by Lindert (2000) for a greater range of countries, namely that top income shares in developed countries decreased during the first half of the 20th century, and remained fairly flat during the 1950s and 1960s. Since the 1970s, top income shares in English-speaking countries have increased sharply, but there has been little change in top income shares in continental Europe and Japan.

Less work has so far been done on estimating top income shares in developing countries, with three exceptions. Banerjee and Piketty (2005) used income taxation data to estimate top income shares for India during 1922-2000. They noted that the income share of top incomes decreased during the 1950s-1980s, before increasing again, and argued that this is consistent with economic policies in India. Using income tax data, Moriguchi and Saez (2005) found high top income shares in developing prewar Japan, and significantly lower shares after World War II. Piketty and Qian (2006) used household survey data to estimate top income shares in urban China during 1986-2001, and noted increasing top income shares. They also assessed the revenue raising potential of income taxation and its potential impact on mitigating after-tax income inequality.

The current paper not only adds to this body of studies, it also offers an assessment of long-term changes in income distribution for Indonesia on the basis of data for 1920-39 and 1982-2004, and a comparison of trends in Indonesia with trends in other countries. The questions it seeks to answer are: do trends in top incomes substantiate the widely perceived long-term increase in income inequality in Indonesia, and is Indonesia different from other countries, if so why?

Since the rate of income tax avoidance is generally thought to be higher in developing countries, we use both income taxation data and the Susenas household survey data to analyse top income shares over the last two decades. As well as providing a check on our

results, this also provides insights into the extent to which income tax data in developing countries can be relied upon for estimating top income shares.

3. Methodology for Estimating Top Income Shares

Our estimates of top income shares in Indonesia are based on three sources: income taxation data compiled at the Ministry of Finance of colonial Indonesia for 1920-1939, income taxation data from the Directorate-General of Taxation of the Ministry of Finance of Indonesia for 1990-2003, and the Susenas household survey data for benchmark years between 1982 and 2004. This section deals first with the issues surrounding the use of taxation data, before turning to the Susenas data.

3.1 Using taxation data to estimate top income shares

The general methodological issues surrounding the use of taxation data to estimate top income shares have been well canvassed by Atkinson (2007). In essence, our approach involves using external control totals for both the adult population and total personal income, and interpolating top income shares using tabulated income taxation data. In Indonesia, as in other countries, those with incomes below a certain threshold were not liable for income tax. Our control totals are the total population that would have paid income tax if such thresholds did not apply, and the total personal income that would have been declared if such thresholds did not apply. We discuss tax evasion below.

3.1.1 Income Taxation Data 1920-39

Our first set of taxation data covers 1920-39. Until the enactment of the Income Tax Ordinance of 1920, the taxation system of colonial Indonesia was, as Mansury (1992: 13) described it, ‘a mix of widely diverging statutes and provisions’. A tax on incomes in the trades and professions or business tax (*bedrijfsbelasting*), was levied since 1839. The tax rate varied by income, but was paid by very few individual income earners and yielded only a very minor share of public revenue. In 1908 a general income tax was introduced, but only the net incomes of ‘European’ income earners were liable, while non-Europeans continued to be liable for the 1907 business

tax on incomes in the trades and professions. The number of individuals assessed for income tax remained low – in 1919 still only 50,544 people were taxed.

The 1920 Income Tax Ordinance introduced a universal income tax for which in principle both all individual income earners, regardless of ethnicity, and also companies in colonial Indonesia were liable. This raised the number of individuals liable for income tax to 2.6 million in 1920. Provisional assessments for income tax started in 1920, but final assessments could take up to two years to be settled. Net incomes of less than *f*120 were exempted from income tax.³ A revision of the income tax in 1935 increased the tax threshold to *f*900 and also saw the introduction of a withholding wage tax, which employers deducted from the wages and salaries of their employees at a uniform rate of 4%. Incomes higher than *f*900 were also liable for income tax, but received an allowance for the withholding tax already paid.

The income taxation statistics were published annually in the statistical yearbooks of colonial Indonesia (see Appendix 1). These tabulated net income into income bands, with the number of bands ranging between 23 and 91. Income tax was to be paid on all income, and subject to a progressive scale, rising from 1 percent on the minimum taxable income of *f* 120 to 25 percent on incomes over *f* 180,000.

Although it is tempting to take these available data at face value, they harbour several problems. The following is a brief discussion of the main issues:

1. Persons living in the same household in Indonesia during this period were taxed jointly, as was the case under the tax system in The Netherlands at the time (see Atkinson and Salverda 2005). At the same time, heads of households could deduct set allowances for wife and children from gross income. Hence, the income data represent net, pre-tax, taxable income.
2. Huender and Meijer Ranneft (1926: 78-79) noted that non and under-compliance was significant in the lower income bands. Reys (1925: 72-91) argued that taxable incomes in the lowest bands were significantly underestimated, simply because

³ The currency unit in colonial Indonesia was the guilder (*f*), which was renamed rupiah (Rp) after Indonesia gained its independence in 1949.

taxation authorities had no other data available to estimate income and base tax assessment on than the assessment of the previous year. Reys concluded that the cost of tax assessment and enforcing tax compliance was high in relation to the share of the income tax revenue from annual incomes between f120 and f1,800. Both studies proposed to raise the threshold to f300, respectively f600. Hence, there is a significant element of arbitrariness and underestimation in the numbers of income earners and their incomes in the lower income bands. In those bands, assessment of income tax liability was often a mere guess by village authorities, as non-European income earners with assessed incomes of less than f1,200 were not required to file income tax returns.

3. Farmers in Java liable for land tax (*landrente*) were exempted from income tax. This was also the case in other parts of the country, where the land tax was introduced during the 1920s-30s, particularly Bali, Lombok, Sumbawa, Southeast Kalimantan and Southeast Sulawesi. Consequently, most ethnic Indonesians were exempted from income tax, because they had income from land, not necessarily because they earned less than the threshold of f120 per year.
4. The threshold was not adjusted for changes in the general level of prices until the revision in 1935. During the early 1920s, Indonesia experienced deflation after high price levels during World War I, while during the early 1930s prices fell due to the impact of the international economic slump. Given that the income threshold and the income bands were not adjusted for price changes, deflation caused a reverse 'fiscal drag'. A large portion of income earners, who would otherwise have been taxed, fell below the threshold and were no longer liable for income tax. This effect was masked during the 1920s, when the number of income tax payers increased from 2.6 million in 1920 to almost 4.1 million in 1930. The effect was obvious during the 1930s, when the number of income tax payers decreased to a low of 2.3 million in 1938.
5. As noted in section 2, the data appear to distinguish between groups of income tax payers according to ethnicity. However, Fasseur (1994) explained that the distinction only served the purpose of determining which sets of private and family laws applied to individual cases involving people of different ethnic

backgrounds. He also noted that from 1899 the distinction ‘lost its purely racial connotation’ (p.40), as people would not necessarily be classified according to ethnic background. For example, all Japanese were classified as ‘Europeans’, Indo-Europeans could be classified as ‘indigenous’ or ‘European’, and ethnic Chinese could be classified as ‘foreign Asians’ or ‘European’. Hence, by the 1920s, if not before, the distinction had no socio-economic basis. Under the 1920 Income Tax Ordinance, all income earners were subject to the same legislation for the purpose of income tax liabilities. The differences in average income between ethnic groups and the changes in income distribution may have been due to general factors which determine the distribution of income in all economies; particularly the distribution of human capital and advances in educational attainment.⁴ In addition, the 1930 population census indicated that 66 percent of the ‘foreign Asians’ and 71 percent of the ‘Europeans’ had actually been born in Indonesia. It would therefore be more appropriate to regard all non-ethnic Indonesians as residents of colonial Indonesia, rather than ‘foreigners’. Many became Indonesian nationals after 1949, when the country gained its full independence. For the purpose of comparing pre- and post-Independence data, we refrain from using the distinction of income tax payers according to ‘ethnicity’.

More details on the taxation data for 1920-39 are provided in Appendix 1. It should be noted that by developing country standards, the coverage of the income tax system in colonial Indonesia during this period, with a maximum of 4.1 million taxed income earners in 1930, was extraordinarily high. For example, Banerjee and Piketty (2004: Table A0) note that the number of income tax returns in India – a much more populous nation – only passed 1 million in 1960-61. This may indicate that the income tax threshold in Indonesia was relatively low.

3.1.2 Income Taxation Data, 1990-2003

After Indonesia’s independence in 1949, the land tax was abolished and all income earners became in principle liable for withholding wage tax and/or personal income tax. The total number of income tax assessments was still considerable, but decreasing

⁴ Scholte (1929: 4-5) noted that the average incomes of ‘Europeans’ were higher than in The Netherlands, due to the lower share of low-income groups.

– from 3.0 million in 1952 to 2.3 million in 1955 (Dris 1958: 433). This was most likely below the taxable capacity, as growing staff shortages, shortages of trained and experienced staff at the Ministry of Finance, and greater complexity of the accumulating new income tax regulations caused increasing delays in income tax assessments and payments, and new opportunities to evade tax obligations.

The number of self-employed people registered for personal income tax liability remained around 0.2 to 0.3 million during 1955-71, although by 1971 the number of effective tax payers was about half (Dris 1958: 433; Lent and Missorten 1967: 43; Obernsdorfer *et al.* 1976: 149). The total number of income tax payers, including withholding tax, decreased to just 0.6 million in 1971 or just 0.5% of the population (Lerche 1978: 300). By 1980 still only 1.2 million income earners paid income tax – or 0.8% of the population – of which only 0.2 million were self-employed (Asher 1997: 134). Hence, by the early 1980s, it was obvious that Indonesia's income tax system was 'plagued by uneven enforcement and compliance' (Asher 1997: 127) and underperforming in terms of maximising tax revenues.

As part of a comprehensive package of tax reforms, a new Income Tax Law of 1984 was introduced. It integrated the personal income tax and corporate income tax into a single income tax law and simplified the income tax regulations considerably (Mansury 1992: 22-27; Asher 1997: 140-44; Uppal 2003: 1-29). The 1984 law introduced a new withholding tax, payable monthly by employers on wages and salaries of their employees, and also on gross dividends, interest payments, royalties etc., and on estimated net incomes of a wide range of purchased services, including rentals and insurance premiums. Individual income earners engaged in business or self-employed, or with incomes higher than a specified non-taxable allowance (Rp 0.96 million from 1984, increasing gradually over time, plus allowances for dependants) were required to register for income tax and file tax returns.

The Income Tax Law was updated and revised in 1994 and 2000 (Siswanto 2003: 22-26). For example, in 1994, the principle of self-assessment of personal income tax liability was abandoned in favour of assessment by the tax authorities only. In 2000, five income bands were introduced, self-assessment was re-introduced, and the non-

taxable allowance was drastically increased to Rp 12 million from 2001, plus allowances for dependants. Withholding tax rates also changed marginally, but most principles remained the same.

The number of registrations for personal income tax increased from 0.3 million in 1984 to almost 0.7 million in 1988, where it stayed until 1991, when only half of them actually paid personal income tax during the year (Asher 1997: 152-53; Mansury 1992: 209). Hence, non and incomplete compliance were still significant. Including individuals assessed for withholding tax, the total number of actual income tax payers rose to 0.7 million in 1985, but was in 1989 still only 1.4 million.

During the 1990s, the taxation authorities improved their tax registration capabilities and increased their efforts to enforce compliance. At the same time, the number of companies required to pay withholding tax on behalf of their employees increased. A sluggish adjustment of the non-taxable allowance caused 'fiscal drag' and also increased the number of income earners liable for income tax. The data we obtained from the Directorate General for Taxation indicate that the total number of individual income tax payers increased to 8.8 million in 1991 and 20.7 million in 1997, after which it stagnated until the recent increase to 23.7 million in 2002, of which 23.0 million paid withholding tax and 0.7 million were personal income tax payers.

Although the withholding taxes were actually paid by a smaller number of companies, their number increased from about 51,900 in 1989 to 350,000 in 2003, requiring a greatly enhanced capacity and also greater capabilities of the taxation authorities. Employment at the Directorate-General of Taxation and at the regional tax offices has indeed increased significantly during the 1990s. Despite this, non- and incomplete compliance remained a concern. Uppal (2003: 53-54) noted that in 1997 56% of individual tax payers did not file income tax return forms. Although this percentage may have decreased in recent years, as the tax office sought to increase compliance, a significant degree of non-compliance is likely to have remained.

Our second set of personal income taxation data for the period 1990-2003 was especially extracted for us in 2005 at the Directorate General of Taxation of the

Ministry of Finance in Jakarta. So far as we are aware, we are the first to use these particular data. Although 1989 was the first year for which the data were available in electronic format, the data for that year were not tabulated in a usable manner, so we begin with 1990. 2003 was the last year for which complete income tax data were available. The withholding tax data were not available in disaggregated form by individual wage earners, but only by companies paying the withholding tax obligations.

During 1990-2003, personal income taxation applied to wage, salary and capital income, with earnings over the taxable threshold subject to progressive tax rates in initially three bands taxed at 10%, 15% and 30%, five bands rising from 5% up to 35% since 2001. An advantage of 1990-2003 taxation data is that they are highly disaggregated. The number of bands into which earnings are divided ranges between 182 and 662. However, a disadvantage of these data is that we are only able to identify the very top taxpayers: our coverage is around 0.5% of the total population. In addition, since taxpayers with only salary income are not required to file a return, our results assume that all those with incomes in the top 0.5% of the distribution file a return; either because they wish to seek deductions, or because they have other sources of income.

Details of the 1990-2003 taxation data are provided in Appendix 2.

Figure 1: Share of Households Assessed for Income Tax as % of all Households in Indonesia, 1920-2003

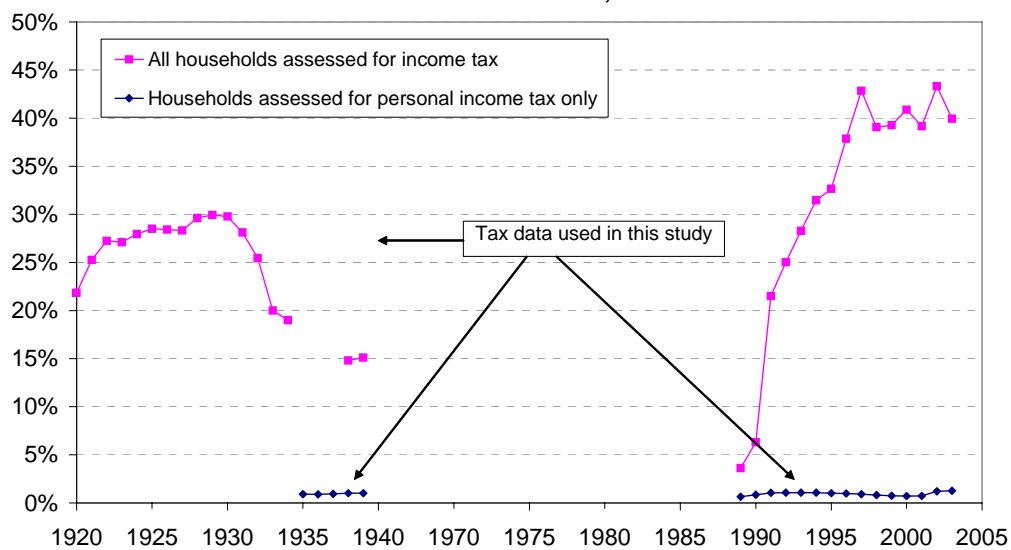


Figure 1 shows the coverage of our two taxation series. For the pre-war years, the data cover the incomes of 15 to 30% of the households, except for 1935-37 for which only the personal income tax data are available for about 2.5% of households, not the withholding tax data. This share is lower than for the later period, but it should be reiterated that a large number of farming households was not liable for income tax, as noted above. The decrease after 1930 was caused by the fact that deflation following the 1929 crisis caused nominal incomes to fall below the *f*120 threshold.

For the period 1990-2003, Figure 1 shows the significant increase in the share of households paying income tax, mostly withholding tax. For this period, only data on households paying personal income tax data can be used, representing on average only 0.9% of households (see Appendix 2).

3.1.3 Population Control Totals

For control purposes, we need to establish the total number of potential tax units. In both periods, married couples and their income-earning dependents were taxed jointly, which effectively defines the tax unit as a household.

As noted above, farmers in parts of colonial Indonesia were excluded from income taxation. As there are hardly any data that allow us to identify income distribution among the farm households liable for land tax in order to add the top income-earning farmers to the income tax data, we opted to assume that the incomes of all farm households would have fallen below the cut-off incomes used to identify the top income earners. This is plausible, as by the 1920s the size distribution of farm land was not heavily skewed in favour of large landholders (Van der Eng 1996: 142-52). For example, the only available quantitative information indicates that in 1925 the number of large holders of farmland in Java, owning 18 hectares or more, was 3,387, or just 0.06% of the total number of landholders (Huender and Meijer Ranneft 1926: 203). Assuming that the net income of their land was the same as the Java average, 18 hectares would have generated an income of around f3,000.⁵ Hence, they would have been in the top 0.5 percent of income earners, but they would have added less than 5 percent to the total number of top 0.5 percent income earners.

For the post-war years, we estimated the total number of households in Indonesia. For both periods we assumed that all households were earning an income. Details on the derivation of our population control totals are provided in Appendix 3.

3.1.4 Income Control Totals

In using taxation data to estimate top income shares, our personal income control total aims to answer the question: if there had been no minimum threshold in the income taxation system and full tax compliance, how much income would have been declared?

Estimates of total pretax household income do not exist for Indonesia for both 1920-39 and 1990-2003. For that reason we had to construct the best possible estimates of household earnings from wages, salaries and capital on the basis of available national accounts data. Details on the derivation of our income control totals are provided in Appendix 4.

⁵ Total value added in agriculture in Java was f1,232 million (Polak 1979: 32-9), divided by 7.5 million hectares of farmland in Java (Van der Eng 1996: 285), times 18 hectares.

In short, for 1920-39, the estimates were based on estimates of total personal income in current prices from Polak (1943/1979). It is very likely that Polak's estimates of total output were too low (Van der Eng 1992). The main reason for underestimation was that Polak had few data to make proper estimates of output or income in particularly small-scale industry and a range of services. The degree of underestimation of total output could be around 30%, when compared with 'reflated' estimated of Gross Domestic Product (GDP) in constant prices (Van der Eng 2002a: 171-72). For that reason, the pre-war estimates of household income we used in this paper have to be regarded as minimum estimates. This suggests that the income shares of top income earners may be somewhat lower than presented. At the same time, our implicit assumption that all land-tax liable farm households had incomes below the cut-off incomes of the top-income groups implies that the shares may be somewhat higher than presented. Both effects may cancel each other out.

The main problem for 1990-2003 was that Indonesia's national accounts data do not employ the income approach to estimating GDP, only the output and expenditure approaches. Another problem is that the national accounts data before the latest revision in 2000 are underestimated (Van der Eng 2005), which makes it difficult to use private consumption expenditure as a proxy of household income. For the purpose of this paper, we estimated total pretax personal income on the basis of the latest quinquennial data on disposable household income from Indonesia's Socio-Economic Accounts (BPS 2003). These data are extensions of the improved official national accounts data. They were interpolated on the basis of the official national accounts data.

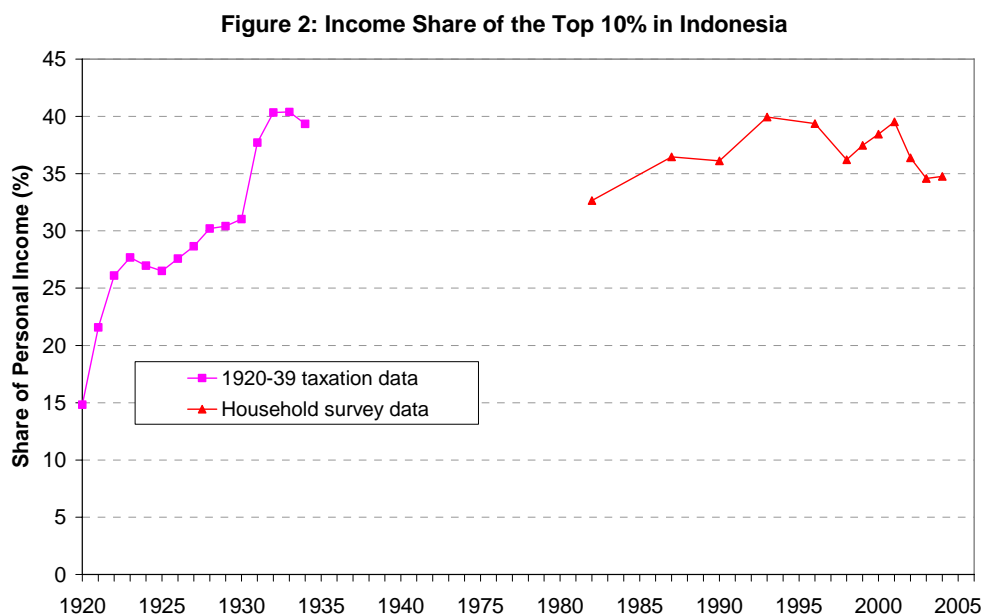
3.2 Using household survey data to estimate top income shares

Given the noted limitations of the income tax data for 1990-2003, we also opted to use Susenas household survey data for in our estimation of top income shares, as far as they were available to us. We were able to obtain a relatively consistent income definition for 12 years between 1982 and 2004. The sample size was around 30,000 households for 1982-96, and around 80,000 households thereafter (sample sizes are listed in Appendix 5). We are mindful of the possible shortcomings of the Susenas data, as noted in section 2.

When using survey data, we simply calculated the total income of all households, and then estimated the fractions of this income that are held by the richest 10%, 5%, 1%, 0.5%, 0.1% or 0.01% of households. We assumed that the household samples were representative of the population, so that it was not necessary to use external control totals. We estimated the distribution of incomes across households. For comparability with top incomes studies in other countries, we did not adjust household incomes for household size.

4. Top Income Shares in Indonesia

Figure 2 shows our estimate of the income share of the richest 10 percent of households, combining taxation estimates for 1920-39 with survey estimates for 1982-2004.



In 1920, the first year of our study, the richest 10 percent held 15 percent of total household income. We observe sharp increases in the share of the richest decile during 1920-23 and 1930-32. In both cases the increases may have been caused by significant falls in the incomes of farm households relative to those of non-farm households as the terms of trade of farm-produced commodities decreased sharply in both the early 1920s and early 1930s. In the early 1920s, the price fall was in part a correction from a situation of very high commodity prices during and immediately

after World War I. The price fall in the early 1930s was a consequence of oversupply in and reduced access to commodity export markets, combined with increased competition from imported commodities, particularly rice. In 1932-34, the richest 10 percent held about 40 percent of total income, four times their proportionate share.

We then have a five-decade break in our series. When we resume with the 1982 survey data, we find the income share of the richest decile to be lower – around 33 percent. Over the next two decades, the top 10 percent share figure fluctuated between 35 and 40 percent, appearing to have fallen at the time of the 1997-98 economic downturn from 39 percent in 1996 to 36 percent in 1998.

Figure 3 depicts the share of the richest 1 percent. During 1920-39, this series follows a similar trajectory to the top decile series in Figure 2. However, there is a large drop in the top 1 percent share from 1939 to 1982. Over this interval, the income share of the top percentile group fell from 20 percent to 7 percent. We observe a steady rise in the share of the top percentile group, peaking at 16 percent in 2001, and falling sharply in the following three years.

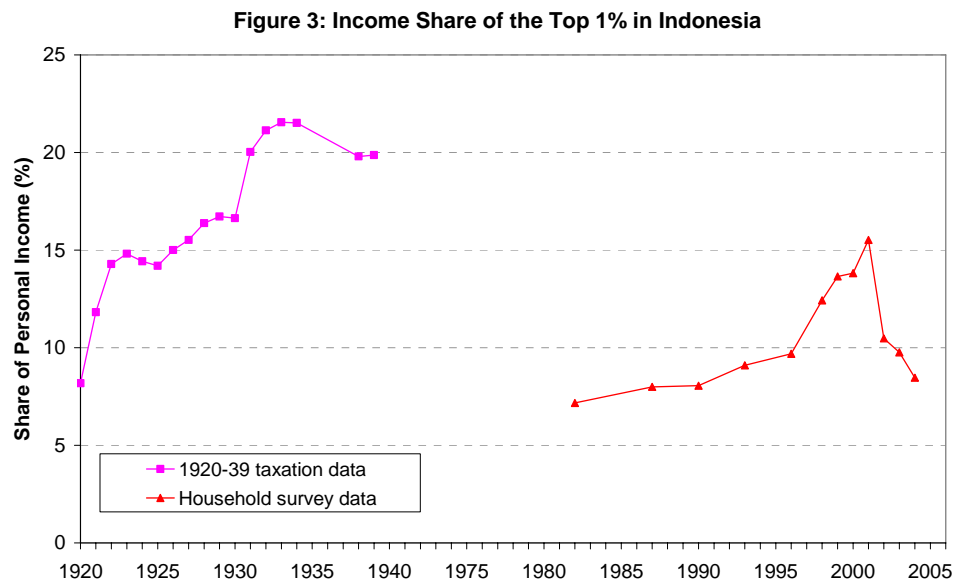
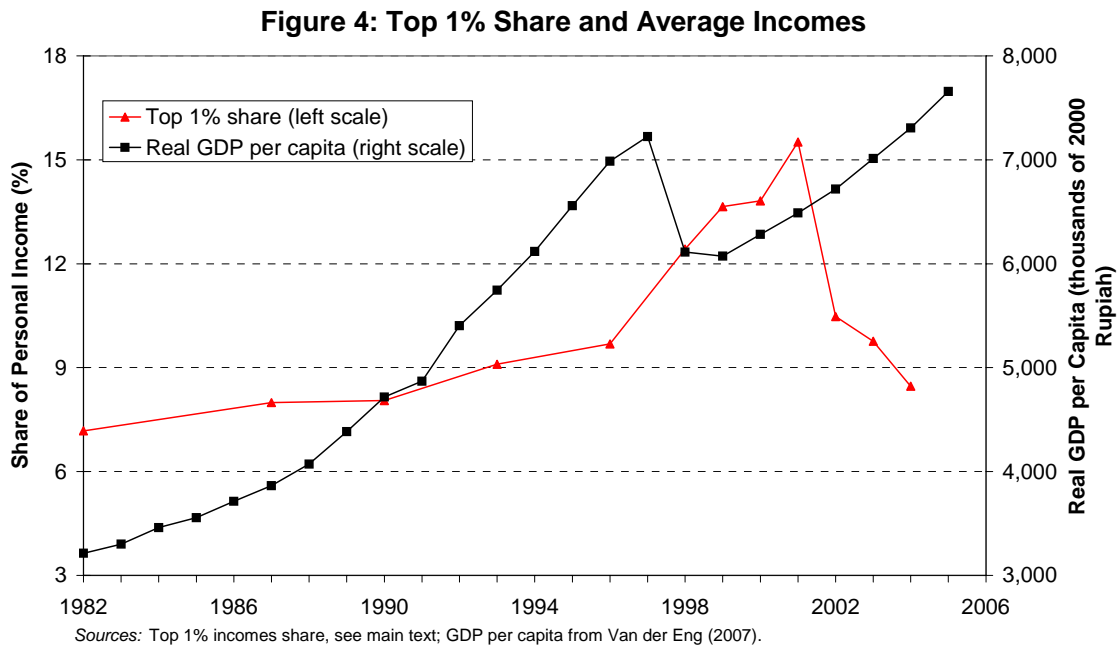


Figure 4 focuses on the period from 1982-2004, charting the top 1 percent share against real GDP per capita. The rise in the top 1 percent share in the late-1990s

coincided with a fall in average per-capita GDP, suggesting that part of the explanation may have been that the top 1 percent were better able to withstand the 1997-98 economic downturn than the bottom 99 percent.



Figures 5 and 6 show the income share of the richest 0.1 percent and 0.05 percent of the population, respectively. In these charts, we use both taxation and survey data for the post-war period, with the taxation data containing a much larger sample of the rich, but the survey data less likely to suffer from underreporting of incomes.

Figure 5: Income Share of the Top 0.1% in Indonesia

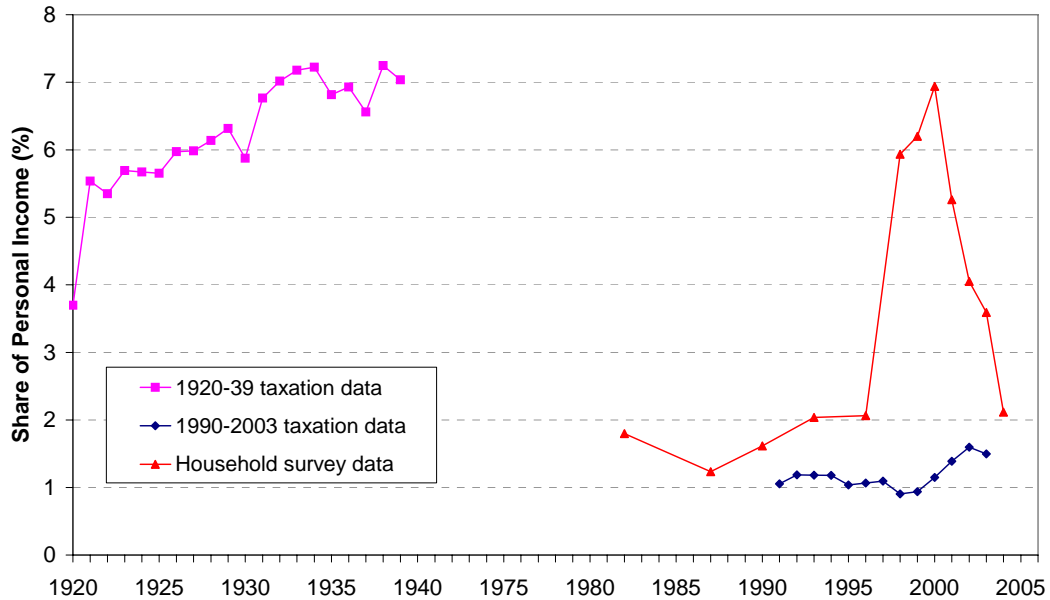
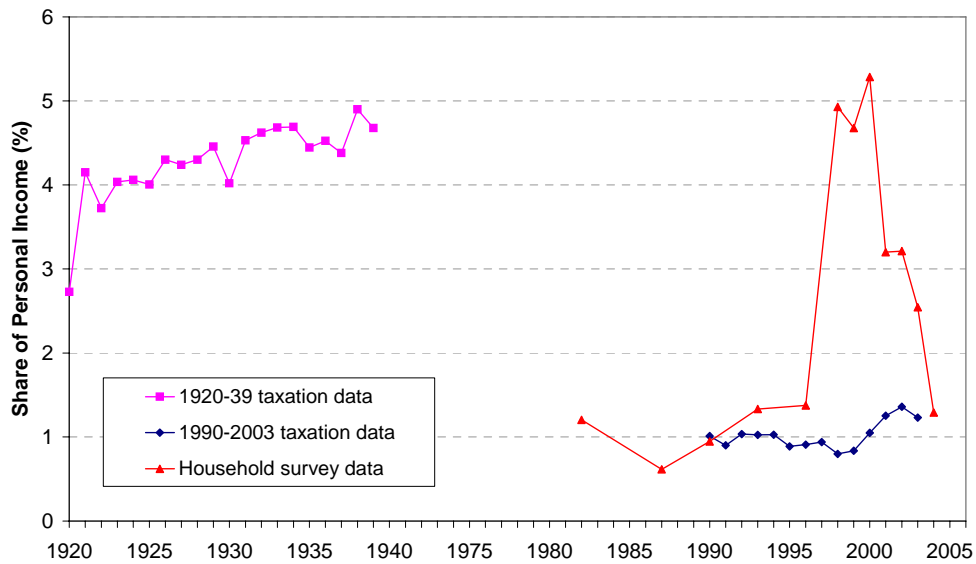


Figure 6: Income Share of the Top 0.05% in Indonesia

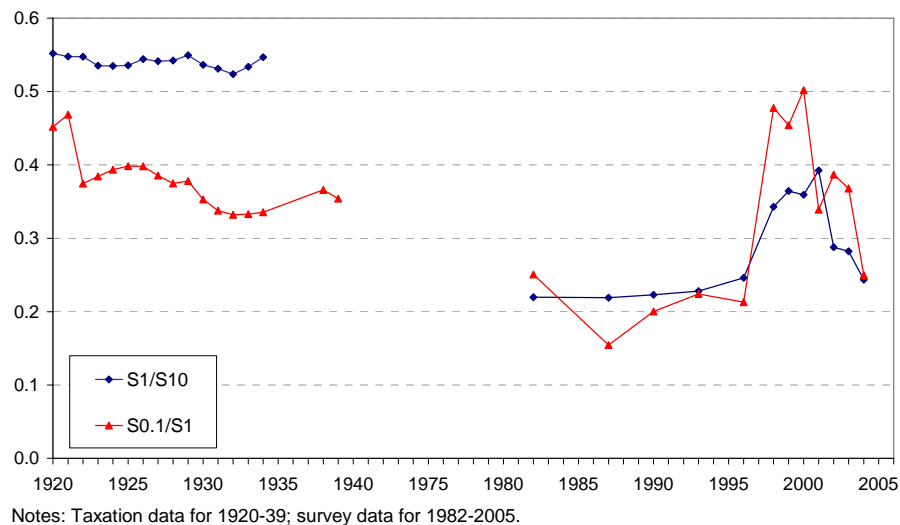


For the period 1920-39, we find that the income shares of the top 0.1 percent increased during the 1920s and 1930s, but less sharply than the top 10 percent and top 1 percent. A similar pattern holds for the superrich 0.05 percent.

A levelling at the very top appears to have occurred between 1939 and 1982; both the survey-derived and taxation-derived estimates indicate that the shares of the top 0.1

percent and 0.05 percent were lower in the early-1990s than the late-1930s. During the 1990s, the taxation and survey data both indicate a rise, but the magnitude of the increase is considerably larger in the survey data than in the taxation data. Figures 5 and 6 also show a sharp increase in top income shares from 1996 to 1998, followed by a fall in the early-2000s. The significant fluctuations in the survey data are caused by the very low number of observations in the groups of top income earners in the Susenas sample (ranging from 13 to 87 in the top 0.1 percent and half as many in the top 0.05 percent) in addition to the possible problem of underestimation of incomes. It should be noted as well that the income tax data, although they cover a much larger number of observations, only apply to those assessed for personal income tax, not all income tax paying households. This issue is discussed in detail in Appendix 2.

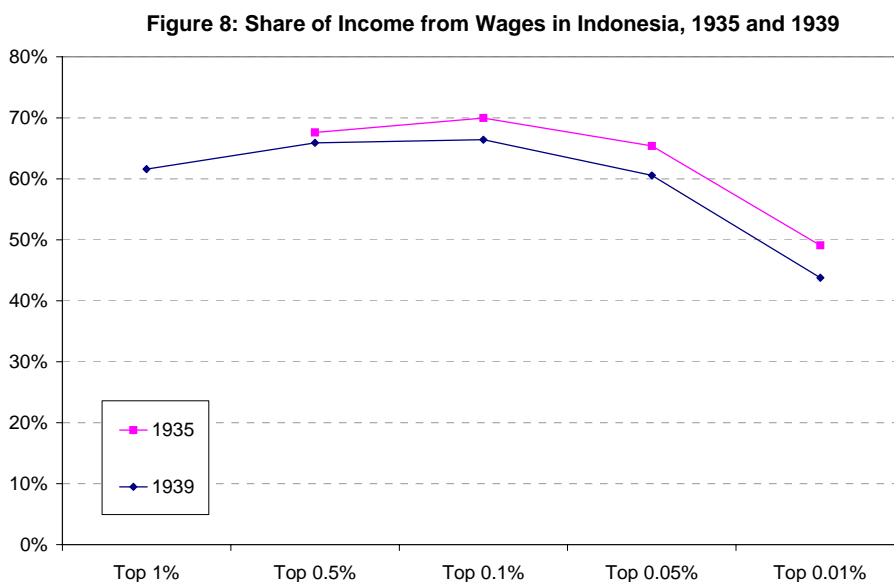
Figure 7: Shares Within Shares



Another approach is to estimate shares within shares, comparing the super-rich with the very rich. This has the benefit that it is not affected by our control totals. Figure 7 shows the share of the richest 1 percent within the top 10 percent, and the share of the richest 0.1 percent within the top 1 percent. We observe a slight decline in concentration within the top 1 percent during the 1920s and 1930s, which is consistent with the earlier observation that the top 1 percent share rose faster than that of the top 0.1 percent. Both these concentration indices show a fall between 1939 and 1982. For example, in 1939 the richest 1/1000th of households had about 35 percent of the income held by the top 1/100th, compared with 25 percent in 1982. During the late-

1990s, both shares-within-shares measures rose sharply, before declining slightly in the early-2000s.

An advantage of the pre-war taxation data is that we are able to separate salary and non-salary income for the years 1935-39. Figure 8 shows the share of income from wages in 1935 and 1939. In general, the wage shares are high, though it should be recalled that most farmers are excluded from these statistics. For the richest 1 percentile group, about 70 percent of income comes from wages, compared with about 40 percent for the richest 0.01 percent. The share of top incomes derived from wage-earnings fell slightly from 1935 to 1939. But even in 1939, all but the richest 0.05 percent derived a majority of their income from wages.

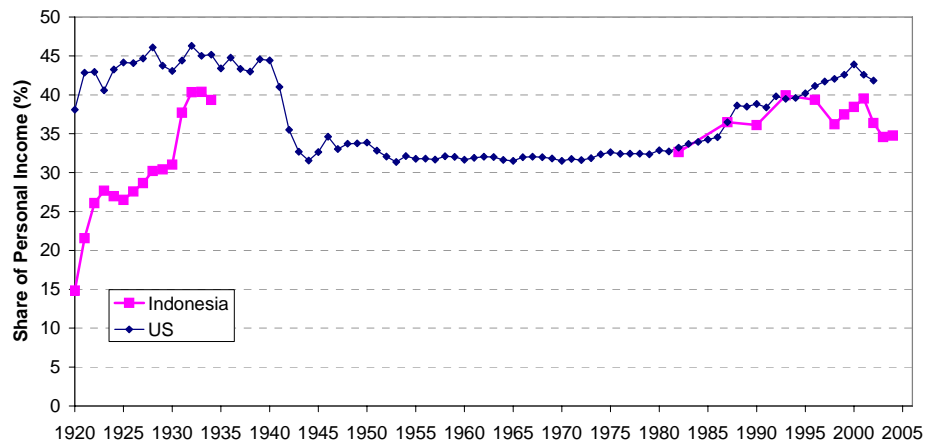


5. Comparison with Other Estimates

How do our estimates compare with those for other countries? To test this, we chart our estimates against the corresponding estimates for India, the world's largest developing nation, and against top income share estimates for the United States and Japan. In the case of the United States, the estimates are based on households, while the estimates for India and Japan are based on individuals. The estimates for India, Japan and the United States are derived from taxation data.

Figure 9 compares the top 10 percent share in Indonesia with that in the United States (the top 10 percent share is unavailable for India and Japan). During the 1920s and 1930s, the top 10 percent share in Indonesia was lower than in the United States, although less so during the 1930s. In the early-1990s, the top decile share is similar in both Indonesia and the United States, but the share then increased more rapidly in the United States.

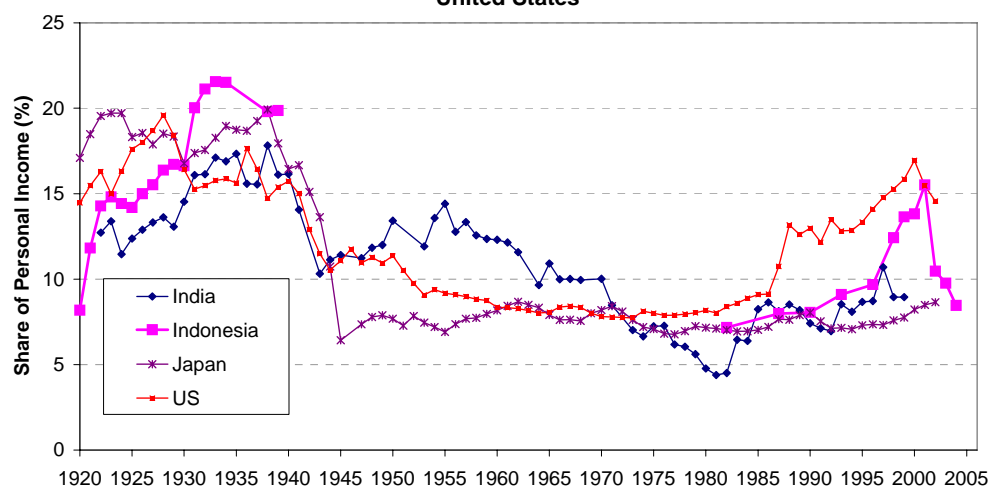
Figure 9: Income Share of the Top 10% in Indonesia and the United States



Sources: Indonesia, authors' calculations; United States, Piketty and Saez (2003, 2004).

Figure 10 charts the top 1 percent share. In Indonesia, India and the United States, the series follows a similar trajectory, peaking in the 1920s or 1930s, falling in the middle decades of the twentieth century, and rising in the 1980s and 1990s (though not to the heights of the early decades). In the 1980s and 1990s, the share of the top percentile group was slightly higher in Indonesia than in India and Japan. However, the share of the richest 1 percent in Indonesia was lower than that of the United States during most of the twentieth century, although the level of inequality in Indonesia exceeded the level in United States during the 1930s. This is possibly caused by the fact that agricultural producers suffered more from the downturn in the agricultural terms of trade *vis-à-vis* non-agricultural producers in Indonesia in the absence of a significant degree of trade protection, than was the case in the United States, where economic regulation and protection may have prevented a similar sharp increase in the inequality of agricultural and non-agricultural incomes.

Figure 10: Income Share of the Top 1% in India, Indonesia, Japan and the United States



Sources: India, Banerjee and Piketty (2003); Indonesia, authors' calculations; Japan, Moriguchi and Saez (2005); United States, Piketty and Saez (2003, 2004).

6. Conclusion

Notwithstanding some major data problems, and continued shortcomings of the available data, we were able to offer several new insights into the long-term trends in income distribution in Indonesia during the twentieth century that allow us to address the questions that this paper set out to answer.

The available evidence on trends in top incomes does not suggest that there has been a sustained long-term increase in income inequality in Indonesia. There was an increase in the top 10% income share during the early 1920s and early 1930s, possibly caused by adverse changes in markets for agricultural commodities affecting farm incomes. But even during the rest of the 1920s, there was an increase, possibly associated with the fact that the 1920s was a period of significant economic expansion, largely based on the growth of commodity export production (Van der Eng 2002a). This increase may substantiate the inferences of Lindert and Williamson (2003). On the other hand, the share of the top 1% decreased during the late-1930s, even though at that time the economic growth resumed vigorously, this time on the basis of the growth of import-substituting production.

For the period 1982-2004, which also was a period of high economic growth, we found that the income share of the top 10% was comparable to that during the 1930s. If income inequality in Indonesia during these two recent decades has been moderate relative to other countries, as current studies such as Cameron (2002) and Timmer (2005) maintained, income inequality during 1920-39 may have been equally moderate as during 1982-2004. This would certainly be the case if we consider that total income for the pre-war years was most likely underestimated.

While the top 10% in total income increased only slightly over the period 1982-2004, a more marked increase can be observed in the top 1% share. Notably, the sharp economic contraction during 1997-98 was associated with a rise in the share of the very richest groups (top 1% and above), but little change in the top 10% share. Generally speaking, these findings accord with the interpretations of income inequality in Indonesia offered by *e.g.* Cameron (2002) and Timmer (2005). However, we should note that our findings and those of other studies are based on the same source; the household survey data.

Lastly, throughout the twentieth century, top income shares in Indonesia have been higher than in India, broadly comparable to Japan, and somewhat lower than in the United States.

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Appendix 1: Income Taxation Data, 1920-39

Our data are based on personal income taxation records for 1920-39 published by income bands in the annual reports and statistical yearbooks of colonial Indonesia: *Koloniaal Verslag*, 1922/23-1923/24, *Statistisch Jaaroverzicht voor Nederlandsch-Indië*, 1922-30, *Indisch Verslag*, 1931-40. The taxation data were revised in subsequent years, pending final assessments of tax obligations. Income earners with incomes over *f*1,200 were compelled to submit a tax return form that required time to be assessed (Reys 1925: 68). For that reason we use the latest data available. Table A1 shows the numbers of households assessed for income tax.

Table A1: Total income earners assessed for income tax, 1920-39

	Withholding tax	Personal income tax	Total income tax
1920			2,648,640
1921			3,098,431
1922			3,377,760
1923			3,398,159
1924			3,544,376
1925			3,653,080
1926			3,683,578
1927			3,716,561
1928			3,934,933
1929			4,026,979
1930			4,057,698
1931			3,887,520
1932			3,574,353
1933			2,848,903
1934			2,748,721
1935		132,626	
1936		131,960	
1937		141,256	
1938	2,118,679	154,205	2,272,884
1939	2,198,770	157,415	2,356,185

In 1920-24 and 1926-29, the published tables show only the number of taxpayers within each income band. In these cases, we assumed that the average earnings within each band are at the midpoint of the band, extrapolating for those in the top band. *E.g.* in 1920, the top two bands are *f* 150,000 and *f* 200,000, so we assume that the average income of those in the second-top band is *f* 175,000, and the average income of those in the top band is *f* 225,000. In 1925 and 1930-39, such a correction is not necessary, since the tables show both the number of taxpayers within each band, and the total income earned within each band. In 1935 and 1938-39, the tables separately identify wage and non-wage income.

As discussed in section 3.1.1, incomes of married couples and their income-earning dependents were taxed jointly. The exceptions to this rule were widows, divorced women and women who held assets that were managed independently from those of their husbands. According to Reys (1925: 84) the share of women in the total of income tax payers was negligible. In instances where couples were separated, we

assumed that they would have been living apart, and therefore will appear in separate households in the control totals.

As noted in section 3.1.1, there was significant degree of non and under-compliance in the lower income bands. Table A2 shows the income cut-offs used in this study. Underestimation of incomes in the income bands up to f1,200 (below which income earners were not obliged to submit tax returns) may affect our estimates of the top-10% and top-1%. Unfortunately, there is no way to accommodate this issue in the data set.

Table A2: Income cut-offs for given percentiles, 1920-39 (guilders)

	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%
1920	212	329	865	1,958	7,862	11,529	27,091
1921	254	379	926	2,035	8,724	12,818	29,397
1922	263	395	1,220	2,915	9,519	13,012	26,969
1923	270	399	1,170	2,713	8,950	12,271	25,878
1924	282	429	1,281	2,822	9,252	13,103	28,482
1925	281	434	1,311	2,858	9,893	14,116	31,052
1926	285	455	1,480	3,166	10,364	14,589	35,425
1927	290	459	1,486	3,239	10,372	14,543	33,008
1928	301	465	1,523	3,397	10,664	14,686	32,765
1929	311	465	1,574	3,547	10,965	15,185	34,063
1930	311	468	1,594	3,556	10,528	14,583	30,761
1931	288	430	1,468	3,207	9,522	13,100	25,457
1932	241	372	1,201	2,636	7,978	10,728	20,160
1933	197	286	957	2,150	6,724	9,072	16,385
1934	182	245	867	1,976	6,355	8,521	15,321
1935				1,833	6,007	8,087	14,714
1936				1,777	5,900	7,937	14,520
1937				1,910	6,246	8,480	16,608
1938		224	904	2,109	7,021	9,653	19,697
1939		219	910	2,140	7,036	9,507	18,387

Appendix 2: Income Taxation Data, 1990-2003

With the exception of 1966 and 1971 (Lent and Missorten 1967: 43; Lerche 1978: 298), we have been unable to locate any published tabulations of income taxpayers by income bands for Indonesia since the 1950s. However, we were fortunate in 2005 to be supplied with a unique tabulation of income taxpayers by grade of income. These data were extracted for us from the electronic tax data base of the Directorate General of Taxation, and are the only data available at the Directorate General.

The files supplied to us provided the number of taxpayers in each band, and the total income of taxpayers in that band. The data are the result of online data submissions by the regional tax offices. Apart from non or under compliance, the low numbers of returns may indicate that data for 1990 were underestimated, because not all offices were then online. We were unable to check this. The 1989 data could not be used, since more than 99.9% of the taxpayers were classified in the same income band (nonetheless, we show below the summary statistics for 1989). Table A3 shows the numbers of households assessed for income tax.

Table A3: Total income earners assessed for income tax, 1989-2003

	Withholding tax	Personal income tax	Total income tax
1989	1,156,891	244,091	1,400,982
1990	2,161,586	339,316	2,500,902
1991	8,360,557	424,572	8,785,129
1992	10,087,064	450,147	10,537,211
1993	11,800,000	460,223	12,260,223
1994	13,578,446	471,855	14,050,301
1995	14,565,973	467,303	15,033,276
1996	17,400,000	456,279	17,856,279
1997	20,262,393	434,849	20,697,242
1998	18,927,125	404,673	19,331,798
1999	19,541,043	380,796	19,921,839
2000	20,890,946	371,698	21,262,644
2001	20,488,669	391,210	20,879,879
2002	23,077,662	655,448	23,733,110
2003	21,771,865	709,787	22,481,652

Our top income shares are estimated using midpoint interpolation, rather than Pareto extrapolation. We experimented with Pareto extrapolation, but found that the irregular size of the income ranges used in the taxation data meant that the Pareto index was imprecisely estimated. Thus extrapolating outside the range of the available data was unlikely to provide accurate estimates of top income shares.

We were also supplied with data on withholding tax. However, this is not tabulated according to the wages of individuals, but according to the total income of the employees for which firms paid the withholding taxes. Since these data do not allow us to determine the distribution of earnings within the firm, we opted not to use them.

For the most part, Indonesian taxation laws require couples to file tax returns jointly (article 8 of the tax law). The two main exceptions are where the wife's employer has already paid withholding tax, and where wife and husband are separated. Since we do not have any data on frequency with which the wife's employer pays withholding tax, we do not make any adjustment for it. In instances where couples are separated, we assume that they will be living apart, and therefore will appear in separate households in the control totals.

Table A4 shows the income cut-offs used in this study.

Table A4: Income cut-offs for given percentiles, 1990-2003 (million rupiah)

	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%
1990			18.3	66.9
1991		10.6	19.9	79.5
1992		11.4	22.0	97.0
1993		12.9	25.5	117.0
1994		14.5	30.9	140.0
1995		18.5	38.8	158.0
1996		20.6	43.2	173.0
1997		21.5	45.9	190.0
1998		20.5	43.9	213.0
1999		22.5	47.3	254.0
2000		26.2	55.7	392.0
2001		44.0	89.2	750.0
2002	19.5	86.9	162.0	819.0
2003	22.8	106.0	190.0	777.0

Appendix 3: Population Control Totals, 1920-2005

1920-39

The population control totals had to be estimated, due to severe limitations in the available demographic data for colonial Indonesia, for which only the 1930 population census offers reliable data. The 1920 and 1930 population censuses do not offer estimates of households, so that their total number had to be estimated.

Firstly, population numbers were estimated for Java and separately for the other islands for 1920-30. The 1930-39 population data are interpolations of 1930 and 1940 from Van der Eng (2002b).

For 1920-30 Java, non-Indonesian population is taken from the 1920 population census and the administrative counts for 1925-27 and the 1930 population census and interpolated with exponential growth rates. For Java, the Indonesian population 1920-30 is estimated, using 1920-27 growth rates for 19 residencies (assuming that the 1920 data were the ‘anchor’ for the collection of the 1927 data). 1920-30 growth rates were used for 4 other residencies (Semarang, Kudus, Wonosobo and Kedu where the 1920-27 growth rate was negative and the 1927-30 growth rate was abnormally high.

For 1920-30 other islands, non-Indonesian population is taken from the 1920 population census and the administrative counts for 1925 and 1927 and the 1930 population census and interpolated with exponential growth rates. The Indonesian population is estimated, using 1920-27 growth rates for 18 regions on the basis of the same reasoning as for Java above. For West Papua, 600,000 people were assumed in 1930, which was extrapolated assuming 1% annual growth.

To estimate the number of households, we needed an indication of average household size. The 1920 and 1930 population censuses only identify the numbers of dwellings, which yields estimates of 4.6 people per dwelling in Java and 6.6 in the Outer Islands in 1920, and 4.6 people per dwelling in Java in 1930. These data may be used as proxies for average household size. The Java estimates appear acceptable, but the 1920 estimates for the Outer Islands seem too high. The only other sources are local surveys for consumption and expenditure surveys, summarised in Table A5. Taken together, these surveys suggest a weighted average of 4.41 per household in both rural and urban Java. The 1961 population census also suggested an Indonesia-wide total of 4.41 people per household: 4.24 in Java and 4.82 in the Outer Islands (BPS 1961: 13-14).

We assumed all households in pre-war Indonesia to have comprised an average of 4.5 people. The estimated population totals were divided by 4.5 to yield the total number of income-earning households shown in Table A6.

Table A5: Overview of household average household size in food consumption and expenditure surveys in Java, 1924-1961

Source	Sample size	Region	Year(s)	Av. hh.size
Boeke (1927)	29 rural hh	Java (various parts)	1924-25	4.3
CKS (1928)	314 urban hh	Indonesia	1925	4.3
Ochse and Terra (1934: 59, 77)	30 farm hh	Kutawinangun (Kebumen, C. Java)	1932-3	6.7
CKS (1939)	95 labourers' hh	Jakarta	1937	4.6
Volksoeding (1940: 42)	12 rural hh	Pacet (Cianjur, W.Java)	1938	4.0
Volksoeding (1941)	100 rural hh	Gunungkidul (Yogyakarta, C.Java)	1938-9	5.5**
Postmus and Van Veen (1949: 264)	400 hh	Rengasdengklok (W.Java)	1939	4.2
Huizenga (1958: 112-148)	1,945 rural hh	Java	1939-40	4.7
Sato (1994: 90)	443 rural hh	Tasikmadu (Malang, E.Java)	1942	4.0
Sato (1994: 97)	345 rural hh	Tumut (Bantul, C.Java)	1942	5.0
Sato (1994: 103)	938 rural hh	Cimahi (Sukabumi, W.Java)	1942	5.0
Ibrahim and Weinreb (1957: 766-8)	50 urban hh	Jakarta	1953-4	5.9*
Bachtiar Rifai (1958: 39, 90)	806 rural hh	Pati (C.Java)	1956-7	4.2
ILO (1967: 27) = Ministry of Labour	2,639 urban hh	Jakarta	1957	4.3
ILO (1967: 27) = Ministry of Labour	2,180 urban hh	Surabaya	1958	4.3
ILO (1967: 27) = Ministry of Labour	123 rural hh	Wuryantoro (Solo, C.Java)	1958-9	4.9
Adyanthaya (1963: 11-12)	10,700 hh	Java (rural, throughout)	1958	4.3
Adyanthaya (1963: 11-12)	1,300 hh	Java (urban, throughout)	1958	4.8
Sukamto (1962), Wirjosudarmo (1964)	503 hh	Yogyakarta	1958	4.4
Lauw et al. (1962: 119)	46 rural hh	Pacet/Rengasdengklok (W.Java)	1961	4.4

* Children and other dependants included.

** Unusually high, according to the report.

Sources: Adyanthaya, N.K. (1963) 'Report on the Labour Force Sample Survey in Java and Madura', *Ekonomi dan Keuangan Indonesia*, 14: 1-96; Bachtiar Rifai, T. (1958) *Bentuk Milik Tanah dan Tingkat Kemakmuran: Penelitian Pedesaan Didaerah Pati, Djawa-Tengah*. PhD Thesis, Fakultas Pertanian, Universitas Indonesia; Boeke, J.H. (1926) 'Inlandsche Budgetten', *Koloniale Studiën*, 10, pp.229-334; CKS (1928) 'Onderzoek naar Gezinsuitgaven in Nederlandsch-Indië Gedurende Augustus 1925 en het Jaar 1926.' *Mededeelingen van het Centraal Kantoor voor de Statistiek No.60*. Weltevreden: Albrecht; CKS (1939) 'Een Onderzoek naar de Levenswijze der Gemeentekoelies te Batavia in 1937.' *Mededeelingen van het Centraal Kantoor voor de Statistiek No.177*. Batavia: Cyclostyle Centrale; Huizinga, L.H. (1958) *Het Koeliebudgetonderzoek op Java in 1939-40*. Wageningen: Vada; Ibrahim, A.M. and W.F. Weinreb (1957) 'Penyelidikan Biaja Hidup di Djakarta', *Ekonomi dan Keunangan Indonesia*, 10, pp.738-795; ILO (1967) *Household Income and Expenditure Statistics No. 1, 1950-1964*. Geneva: International Labour Office; Lauw Tjin Giok et al (1962) 'A Study of the Nutritional Status of Two Economic Levels in Tjiwalen and Amansari Villages of West Java' in *Laporan Kongres Ilmu Pengetahuan Nasional Kedua, Djilid Kedua Seksi A-1*. (Djakarta: MIPI) pp.113-144; Postmus, S. and A.G. van Veen (1949) 'Dietary Surveys in Java and East-Indonesia', *Chronica Naturae*, 105:229-236, 261-268, 316-323; Ochse, J.J. and G.J.A. Terra (1934) *Geld- en Producten-Huishouding, Volksoeding en -Gezondheid in Koetowingagoen*. Buitenzorg: Archipel; Sato, S. (1994) *War, Nationalism and Peasants: Java under the Japanese Occupation*. Sydney: Allen and Unwin; Sukamto (1962) 'Laporan Penyelidikan Biaja Hidup untuk Daerah Istimewa Jogjakarta 1954-1960' in *Laporan Kongres Ilmu Pengetahuan Nasional Kedua, Djilid Kesembilan Seksi E-3*. (Djakarta: MIPI) pp.331-378; Volksoeding (1940) 'Patjet-Rapport: Onderzoek naar de Voeding en Voedingstoestand van de Bevolking te Patjet (Regentschap Tjiandjoer) in 1937-1939.' *Mededeeling van het Instituut voor Volksoeding No.2*. Batavia: Instituut voor Volksoeding; Volksoeding (1941) 'Goenoeng Kidoel-Rapport: Onderzoek naar de Voeding en Voedingstoestand der Bevolking in het Regentschap Goenoeng Kidoel (Djokdjakarta) in 1938-1941.' *Mededeeling van het Instituut voor Volksoeding No.5*. Batavia: Instituut voor Volksoeding; Wirjosudarmo, S. (1964) *Beberapa Penemuan pokok Penelitian Anggaran Belanja Keluarga di Daerah Istimewa Jogjakarta, Agustus 1958-Agustus 1959*. Yogyakarta: Gadjah Mada University.

Table A6: Total number of households, 1920-39

1920	12,132,164	1930	13,629,447
1921	12,265,765	1931	13,834,123
1922	12,401,499	1932	14,041,886
1923	12,539,414	1933	14,252,784
1924	12,679,562	1934	14,466,863
1925	12,821,994	1935	14,684,172
1926	12,969,625	1936	14,904,761
1927	13,122,109	1937	15,128,678
1928	13,287,109	1938	15,355,974
1929	13,456,353	1939	15,586,701

1990-2005

The estimates of the total number of households were based on the population census data for 1961, 1971, 1980, 1990 and 2000, and the inter-sensus survey of 1995. We used the 1961 and 1971 data for consistency checks.

We interpolated the population totals from the census data and added population data for 2001-2005. We then took the numbers of households for each census year, calculated the average number of people per household, interpolated these average numbers of people per household and divided the total numbers of people for 1961-2005 with the average number of people per households to obtain annual estimates of the total number of households.

Table A7: Total number of households, 1971-2005

1971	24,322,589	1990	39,695,375
72	24,917,894	91	40,873,419
73	25,528,406	92	42,093,655
74	26,154,531	93	43,357,921
1975	26,796,684	94	44,668,155
76	27,455,293	1995	46,026,395
77	28,130,798	96	47,149,233
78	28,823,652	97	48,307,348
79	29,534,317	98	49,502,195
1980	30,263,273	99	50,735,310
81	31,140,668	2000	52,008,308
82	32,045,818	01	53,321,622
83	32,979,691	02	54,779,165
84	33,943,294	03	56,281,713
1985	34,937,672	04	57,830,189
86	35,835,940	2005	59,422,109
87	36,759,990		
88	37,710,661		
89	38,688,822		

Appendix 4: Income Control Totals, 1920-2003

1920-39

As noted in section 3.1.4, the 1920-39 income control totals were based on estimates of personal income provided by Polak (1943, 1979: 70) for ‘Indonesians’, ‘Europeans’ and ‘other Asians’. Polak’s personal income data for the group of ‘Indonesians’ are based on a variety of estimates of incomes in different economic sectors, but are likely to have been underestimated, particularly for small-scale industry and a range of services. In essence, Polak used the income tax data to estimate these incomes for the groups of ‘Europeans’ and ‘other Asians’, albeit with various corrections, e.g. for non-compliance, to include some income not subject to income tax, and to exclude pensions. Polak added value added in farm agriculture and several other sources of income to approximate total income of the ‘Indonesians’.

Table A8 shows the estimates of total household income. 1920 is a rough estimate obtained by linking Polak’s estimates of total income in 1921 to an estimate of ‘reflated’ Gross Domestic Product (GDP) in constant prices (Van der Eng 2002a: 171). The estimates in Table A8 are imperfect. In part because Polak’s estimates are likely to be too low, in part because they only approximate disposable household income, and in part because Polak based them on population estimates that are not in line with our estimates used in Appendix 3.

Table A8: Total household income, 1920-39 (million guilders)

1920	5,870	1930	4,503
1921	4,587	1931	3,417
1922	4,187	1932	2,686
1923	3,927	1933	2,217
1924	4,272	1934	2,077
1925	4,452	1935	2,130
1926	4,721	1936	2,090
1927	4,585	1937	2,503
1928	4,490	1938	2,674
1929	4,623	1939	2,685

1990-2003

As noted in section 3.1.4, Indonesia’s national accounts do not a disaggregation of national income by sources of income, only disaggregation by expenditure and output. Moreover, the national accounts data are underestimated, as the successive rounds of revisions, the latest being in 2000, have shown (Van der Eng 2005). These revisions were based on the Input-Output (I-O) Tables, which were given much greater attention and where published with a significant delay, compared to the national accounts data. For that reason the I-O Tables have been used as ‘anchors’ for national accounts revisions.

The I-O Tables were also used as ‘anchors’ for Indonesia’s System of Economic and Social Accounting Matrices and Extension (SESAME) for Indonesia (Keuning and Saleh 2000), which have been published as Social Accounting Matrices since the early 1980s. These accounts offer a fine disaggregation of total income by a variety of

key socio-economic income groups, but not a disaggregation by of income by size. The latest publication of these accounts offers quinquennial data on pretax and after-tax disposable household income for 1985-2000 (BPS 2003: 59 and 73). These were interpolated with the help of national accounts data in current prices, as follows.

Firstly, BPS (2003: 33) also offers revised quinquennial estimates of total GDP, which are higher than in the national accounts. The degree of underestimation of GDP was interpolated for each benchmark year (1985, 1990, 1995, 2000), and the 1985-2000 series of the degree of underestimation was used to multiply the existing GDP series from the national accounts with, to yield a new series of GDP in current prices.

Secondly, the shares of total pretax disposable household income in GDP were calculated for each benchmark year and these shares were interpolated. The 1985-2000 series representing the share of disposable household income in GDP was multiplied with the new GDP series in current prices, to yield the annual series of total disposable household income for 1985-2000. The 2000 share was used to estimate total disposable household income for 2001-2003. These estimates are somewhat arbitrary, but they are firmly anchored to the official quinquennial data of disposable household income.

Table A9: Total pretax disposable household income, 1990-2003 (billion rupiah)

1990	158,545	1997	479,773
1991	187,653	1998	671,984
1992	211,024	1999	787,491
1993	244,548	2000	988,484
1994	310,223	2001	1,197,957
1995	402,104	2002	1,349,824
1996	438,599	2003	1,459,424

Appendix 5: Using Household Survey Data, 1982-2004

So far as we are aware, no other researchers have used the income variables from all available Susenas surveys. Most have argued that this is because the quality of data on income is inferior to the quality of data on expenditure. Whether or not this is true, it is almost certainly the case that for the very rich, ignoring savings will lead to large measurement errors when estimating inequality.

Generally speaking, there are two ways of measuring income in the Susenas.

- (a) Approximately every three years, the Susenas contains an income module, which contains data on earnings from employment over the past month, from agricultural businesses over the past year, from non-agricultural businesses over the past quarter, and from other sources over the past month. In these years, the Susenas data files contain a variable with the English name *income*. However, because this variable follows a national accounting concept of income (*e.g.* it includes imputed rent for owner-occupiers), and not a Haig-Simons definition of income (*i.e.* the money value of the net increase over a period of time in a person's potential to consume), it is not suitable for our purposes. In some years (*e.g.* 1993, 1996), it is possible to create an income variable that includes earnings from employment, agriculture businesses, non-agricultural businesses, and other sources, but not imputed rent. However, this is not feasible for all years in which the Susenas includes an income module. Using this broader definition of income would substantially reduce the number of years for which we were able to estimate top income shares.
- (b) In virtually all years, the Susenas contains questions on earnings. The question asks about cash earnings (*upah/gaji berupa uang*) and in-kind earnings (*upah/gaji berupa barang*). For comparability, we opt to use this simpler definition of income in our analysis. Note that in most cases, respondents were asked for their earnings over the past month, which implies that seasonal variations in income and the moment during the year when the survey is conducted may distort the estimated distributions, compared to a situation where households are asked about their annual income.

For 1999 and 2002, we used the core to calculate top income shares, on the basis that this was more comparable with earlier and later years than using the income module. In calculating top income shares, we sum earnings to the household level. Households whose income is zero or negative are ignored in the calculations (except for the purpose of estimating average earned household income).

Table A10: Susenas Summary Statistics, 1982-2004 (households)

Year	Sample Size	Core or Income Module	Estimated Gini for Earned Household Income	Average Earned Household Income (Susenas)	Average Household Income (National Accounts)
1982	44,960	Core	0.45	754,979	
1987	13,315	Module	0.43	1,203,789	2,598,967
1990	23,310	Module	0.51	1,430,713	4,129,136
1993	32,013	Module	0.50	2,211,095	6,675,187
1996	32,691	Module	0.52	2,886,196	10,125,696
1998	83,292	Core	0.46	4,581,106	15,374,394
1999	81,531	Core	0.47	5,881,665	16,380,537
2000	75,931	Core	0.47	6,880,478	19,006,261
2001	76,852	Core	0.47	9,563,413	22,466,619
2002	79,927	Core	0.46	11,255,366	24,641,189
2003	76,486	Core	0.45	12,364,493	25,930,692
2004	86,821	Core	0.44	13,422,218	28,990,184

Our data suggest that, for most years, average earned household income constituted between one-half and one-third of average household income from the national accounts.

For comparison purposes, we also calculated Gini coefficients for household earned income. These ranged from 0.43 to 0.52 over the period 1982-2004, and show no strong trends, either upwards or downwards.

Full Stata do-files are available from the authors upon request.

Microdata from Susenas were obtained from the Australian Social Science Data Archive at the Australian National University (www.assda.anu.edu.au), and the Demography program at ANU. Two Susenas surveys were omitted from our analysis:

- Earned income data from the 1980 Susenas is so highly skewed (an apparent Gini of 0.85) that we formed the view that some incomes are probably monthly, and others are annual. We therefore decided not to use the survey.
- Earned income in the 2005 Susenas (core) appears to have been top-coded. The highest wage levels in the 2005 survey are about 100 times smaller than in the 2003 and 2004 surveys. We therefore opted not to use this survey.

We contacted Statistics Indonesia, and were told that it was not possible to obtain the microdata for any Susenas surveys conducted prior to 1980. To the best of our knowledge, this paper therefore incorporates all available Susenas income surveys.

Most Susenas codebooks (with English translations) are available at http://www.rand.org/labor/bps.data/webdocs/susenas/susenas_main.htm