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A Cautionary Tale from Australia

Richard V. Burkhauser, Markus H. Hahn and Roger Wilkins



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Richard V. Burkhauser[†], Markus H. Hahn[‡] and Roger Wilkins[‡]

**[†] Department of Policy Analysis and Management, Cornell University; and Melbourne
Institute of Applied Economic and Social Research, The University of Melbourne**

**[‡] Melbourne Institute of Applied Economic and Social Research,
The University of Melbourne**

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Melbourne Institute of Applied Economic and Social Research

The University of Melbourne

Victoria 3010 Australia

***Telephone* (03) 8344 2100**

***Fax* (03) 8344 2111**

***Email* melb-inst@unimelb.edu.au**

***WWW Address* <http://www.melbourneinstitute.com>**

Abstract

Atkinson, Piketty, and Saez (2011) survey an important new literature using income tax-based data to measure the share of income held by top income groups. But changes in tax legislation that expand the tax base to include income sources (e.g. capital gains, dividends, etc.) disproportionately held by these groups will conflate such an expansion with an increase in the share of income they hold. We provide a cautionary tale from Australia of how comprehensive tax reform legislation in 1985 substantially altered Australian top income series, especially those that do not separate taxable realized capital gains from other taxable income.

JEL classification: D3, H2

Keywords: Top incomes, income inequality, personal income, tax-based data

1. Introduction

A major new literature has developed using personal income tax data to measure the share of income captured by the top part of the income distribution. Atkinson, Piketty, and Saez (2011) survey the methodology, main findings, and perspectives emerging from the collective research projects that form the core of this new literature.¹ What makes this project especially valuable to researchers interested in trends in the level and distribution of income of a country or in making cross-national comparisons of such outcomes is that data from all 22 country studies are updated each year and put on a Paris School of Economics website: <http://g-mond.parisschoolofeconomics.eu/topincomes/>.

These studies are valuable in tracing the share of taxable income going to the top end of the income distribution beginning early in the 20th century. And they are likely to be a major component of studies of the Global Financial Crisis and its aftermath as data from these years become publically available. However, despite their great potential, especially in capturing long trends in top income growth beginning well before household survey unit record data existed, these data have limitations. Atkinson, Piketty, and Saez (2011, p. 5) warn for instance that “even within a country, there are breaks in comparability that arise because of changes in tax legislation... and perhaps most important, our series might be biased because of tax avoidance and tax evasion.”

That is, because these top income studies only capture income included in the personal income tax base (i.e. taxable income), changes in tax legislation that increase the personal income tax base may lead them to conflate an increase in the sources of income captured in the tax base with an increase in all income.² When these sources are disproportionately held by top income groups—e.g. dividends, capital gains, etc.—tax-based studies may overstate the rise in the actual share of all income held by top income groups. Here we provide a cautionary tale from Australia of how comprehensive tax reform legislation, first announced on September 19, 1985 (Keating 1985) and implemented over the next two years, has substantially altered Australian top income series since the 1985 tax year and their comparability with earlier years, especially in series like Atkinson and Leigh (2007) that do not separate taxable realized capital gains from other taxable income.³

¹ These core studies are available in Atkinson and Piketty (2007, 2010) and previously surveyed by Leigh (2009).

² One of the points of confusion for those unfamiliar with the top incomes literature is what exactly is operationally meant by income. It is what we are describing here as taxable income—the amount of total income that is captured in the tax base. This is further confused by the way that different countries’ tax offices describe income. This is especially a complication in Australia where the Australian Tax Office (ATO) uses the term “total assessable income” to describe what we are calling taxable income or the income tax base. The ATO uses the term “taxable income” to mean “total assessable income less any deductions allowed under the Income Tax Assessment Act 1936 (or 1997).” When we use their terms in the body of the text we reference them as: “ATO taxable income” and “ATO total assessable income.” In the Appendix we describe in much more detail, using ATO language, how we capture the tax base used in the numerator of our top income measures.

³ The Australian tax year begins in July and ends in June. In this paper we follow the Atkinson and Leigh (2007) convention and denote each tax year by the first of the two calendar years it spans.

Australia is one of the 22 countries in the top income data series Atkinson, Piketty, and Saez (2011) review. Atkinson and Leigh (2007) originally developed this data series based on ATO tax record tables and Australian Bureau of Statistics (ABS) National Accounts and population data for the tax years from 1921 to 2003.⁴ They use these data to trace levels and trends in the share of income held by top income groups. Leigh regularly updates this data series and provides those updates to the Paris website. This series now includes information through 2010.

According to Atkinson, Piketty, and Saez (2011) the main empirical findings from this literature are: most countries experienced a sharp drop in top income shares in the first half of the 20th century; in the second half of the 20th century, top percentile shares experienced a U-shape pattern, with further declines during the immediate post-war decades followed by increases in more recent decades. Most importantly for this paper, they report the increase was greatest in the English-speaking countries of Europe, North America, New Zealand, and Australia.

We first replicate the original work of Atkinson and Leigh (2007) and Leigh's updates of the data used in it. We then add to that work by disentangling taxable realized capital gains from all other taxable income.⁵ After doing so we show, like the case for the U.S., that the rise in the share of income held by top income groups in Australia using tax record data is greater when taxable realized capital gains are included than when they are excluded. However in the case of Australia we argue that much of the major short-term spike in top incomes in tax years 1987 and 1988 is the result of a fundamental change in the treatment of company profits and dividends for tax purposes that more fully captures profits as part of the personal income tax base. More importantly, we argue that much of the long-term growth in the share of income captured by top income groups in the Atkinson and Leigh series after 1989 is caused not by an increase in the yearly accrued value of capital gains, or even in realized capital gains each year, but by an increase in the share of realized capital gains that is captured in the tax base each year. That is, we show that the decision to, for the first time in Australia, tax longer term realized capital gains (capital gains on property held for more than one year)—but only on property purchased after September 19, 1985—set off a gradual increase in the share of the capital stock subject to capital gains taxed at sale.

Hence our series excluding taxable realized capital gains is a more consistent way of measuring levels and trends in top income groups in Australia over the entire period of our analysis, 1970 to 2010. Using our adjusted series excluding taxable realized capital gains and correcting for the way profits are treated in the

⁴ National Accounts are used beginning in 1959. For prior years Atkinson and Leigh splice together their “control totals” from various other sources.

⁵ Most of the 22 countries reviewed by Atkinson, Piketty, and Saez (2011) do not include taxable realized capital gains in their estimates of top income. Some country studies provide estimates both including and excluding taxable realized capital gains. Only the U.K., New Zealand, Germany, Norway, and Australia provide a single measure of top incomes that mixes taxable realized capital gains with other taxable income. The original top incomes studies of France by Piketty (2001 and 2003) do not included taxable realized capital gains and the Piketty and Saez (2003) study of the U.S. focused primarily on taxable income excluding taxable realized capital gains.

tax base, we find that not only does the share of income of the top 1 per cent not increase as fast or fluctuate as much over time, but the timing of the increase is substantially changed, with most of it occurring between 1985 and 2000.⁶ When we disaggregate our 1 per cent top income group into subgroups, only the top 0.1 per cent and the top 0.1 to 0.5 percentile groups have substantially increased their income share since 1970.

Finally, we draw on the Household, Income and Labour Dynamics in Australia (HILDA) Survey to make a more general point. Measures of the level and trend in income held by top income groups based on tax record data are affected by a country's personal income tax base. In general it has been argued that for horizontal equity reasons a tax base should capture income from all sources. But no income tax system does so. This is especially the case with respect to capital gains, since it would suggest that taxes should be placed on capital gains accrued from all assets each year. When capital gains are taxed, for practical reasons that tax is usually on realized capital gains, and not all sources of realized capital gains are taxed (e.g. owner-occupied homes).

Using HILDA data we first estimate the size and distribution (across income groups) of taxable realized capital gains assuming that all capital gains in Australia in 2006 were on assets purchased after September 19, 1985. We compare these results with those using accrued capital gains on these types of taxable assets as our capital gains measure and then do so, but using accrued capital gains on assets that are not taxable (in particular, owner-occupied homes and superannuation funds) as our measure. We find substantially different distributions across these three measures of capital gains. We also find this pattern of differences when we look at HILDA data for 2009. Most importantly, we also find substantial differences across our measures in how capital gains changed between 2006 and 2009 for top income groups. Given these results, it is far from clear that including taxable realized capital gains as the measure of capital gains in the top income tax-based literature—just because it is there—is appropriate.

2. A Summary of the September 19, 1985 Proposals for Tax Reform⁷

As summarized by Reinhardt and Steel (2006), a growing concern about the equity of the Australian tax system led to the establishment of the Taxation Review Committee chaired by K. W. Asprey in the early 1970s. A major recommendation of the Asprey Report (Asprey et al. 1975), subsequently taken up in an Australia Government draft white paper (Australian Government 1985), was to broaden the tax base to improve equity and efficiency. This resulted in a government proposal to parliament for fundamental reform on September 19, 1985 by Labor M.P. and Government Treasurer Paul Keating (Keating 1985), who subsequently became Prime Minister of Australia (1991-1996). A sense of the magnitude of this reform is

⁶ While we will primarily focus on differences between our results and those found by Atkinson and Leigh (2007) for the top 1 per cent, we will later do so for other top income groups up to the top 0.1 per cent.

⁷ Our summary of the September 19, 1985 tax reform proposal and of the history of relevant Australian tax laws in this section is based on: Keating (1985), Australian Government (1985), and Reinhardt and Steel (2006).

captured in his opening statement: “Today we are addressing a crisis in our national taxation system that has been left by a succession of Governments to compound year upon year. There was a time when Australia had a reasonably sane and credible taxation system. But that time is long gone. The system has been broken and beaten by an avalanche of avoidance, evasion, and minimisation..... It is the deterioration and decay that occurred in the late 1970s and early 1980s that has now made substantial reform so essential.” (Keating, 1985, p. 2)

A number of changes to the taxation system followed Keating’s speech. We focus on the two aspects of the reforms that most increased the income base on which personal income taxes were collected—and hence the part of income captured by tax record data—after the law was enacted: changes to the taxation of dividends and changes to the taxation of capital gains.⁸

Dividends

Between 1940 and 1985 Australia maintained a classical company tax system with profits taxed at the company rate and then again at the personal income tax rate when distributed.⁹ Based on the Keating proposals announced on September 19, 1985, this proposal on the treatment of company profits and dividends was given Royal assent in June 1987. It resulted in the company marginal tax rate increasing from 46 to 49 per cent for income tax year 1987. This rate equalled the highest marginal tax rate on personal income. But under the new 100 per cent imputation tax system contained in the reform legislation, these company taxes effectively became withholding taxes. This was the case since their payment could be used to offset personal income tax on dividends as well as other taxes. It became a fully refundable tax credit in 2000.¹⁰ The result was a major reduction in the effective tax rate on dividends, with the greatest reduction in tax rates going to those with the lowest marginal personal income tax rate. One

⁸ Other significant changes made around this time included non-deductibility of entertainment expenses from 19 September 1985, and taxation of “fringe benefits” (in-kind employee remuneration) from 1 July 1986, both of which are likely to have decreased wage and salary income received as in-kind benefits in lieu of cash, and thus led to increased cash wage and salary incomes. The extension of company tax arrangements to public unit trusts which operate a trade or business from 1 July 1988 may also have acted to increase the personal income tax base. Effects of these changes are less easily estimated but, by their nature, they are likely to be less significant than the two changes on which we focus.

In addition, at the beginning of 1988, the ATO decided to grant a “tax amnesty” to encourage the lodgement of tax returns by those who had never lodged a return or had not done so for some time. The amnesty ran from 30 May to 31 October 1988, although tax agents were permitted to lodge returns on behalf of their clients until 15 April 1989, under the condition that the ATO was notified by 31 October 1988. The amnesty was taken up by 453,816 individuals, who filed 934,853 tax returns, approximately half of which were for the 1986-87 tax year. The amnesty may have acted to increase top incomes as measured by tax records at the time of the amnesty, and may also have increased measured top incomes in subsequent years if it was successful in shifting a number of high-income individuals out of the black economy.

⁹ Australia first taxed company profits in 1922. But at the same time a non-refundable rebate system was retained and applied to all dividends, making this effectively a withholding tax for individuals whose marginal tax rate was greater than the company rate. In 1940 this rebate was “temporarily” removed. (See Reinhardt and Steel 2006 for additional details.)

¹⁰ Handley and Maheswaran (2008) estimate that, between 1990 and 2000, resident individuals and funds were able to utilize 67 per cent of their tax credits to reduce their tax liabilities. The change in the tax law to make it a fully refundable tax credit increased this utilization rate to 81 per cent between 2001 and 2004.

reason for the passage of this legislation was to treat profits by companies in the same way profits by trusts were treated.¹¹

Holding aside whether this is good or bad tax policy, for purposes of measuring top incomes, this change in tax law had a major and “artificial” impact on top income trends by increasing the income base on which personal income was taxed. Hence this change in tax laws, unless accounted for in the data series, results in an overstatement in the growth of top income shares. This is the case because it mixes increases in measured income, because more of it is now taxable, with real increases in the dividends (market income) paid out of company profits. Because this previously uncounted income predominately went to higher income groups, it artificially increases their share of income relative to the way it was counted prior to 1987.

For example, assume a 49 per cent marginal company tax and a 49 per cent highest marginal personal income tax prior to the change in tax law. In this case, \$100 in profits results in \$51 in after-tax company profits, which we assume are fully distributed to a person in the 49 per cent top marginal tax bracket. This \$51 is counted as personal income in that person’s tax base. And that person pays a 49 per cent tax on that income resulting in net income of \$26 and an effective marginal tax rate of 74 per cent.

After the law, the company still pays the \$49 company tax, but now it effectively is in the form of a withholding tax on profits assigned to that taxpayer. The company still pays out the \$51 dividend, but now the tax system counts the full \$100 of profit associated with that dividend against that person’s taxable personal income—an increase of \$49. And the person must pay \$49 on that \$100, but the person has already paid it via the withholding tax that the company paid up front. Hence, the net result of this change in the way taxes are collected is a reduction in the highest effective marginal tax on dividends from 74 per cent to 49 per cent. However, since the economic idea behind the top income literature is pre-tax personal income, this after-tax income number is not relevant. It is the pre-tax number that is relevant, and that has increased from \$51 to \$100 as captured in the personal income tax base.¹²

Conveniently, this difference of \$49 is exactly the value of the personal income tax credit which is identifiable in the more detailed Australian tax tables we consistently use in this paper. Because we base our top income series on these more detailed tax tables we are able to subtract this credit from taxable income. By doing so, we are able to generate pre-tax income values that are consistent before and after

¹¹ Australian Government (1985) identified the shifting from companies and partnerships to public and private trusts as a major threat to the current tax system since it was increasingly becoming a relatively low cost legal vehicle for doing business in the 1970s and 1980s that successfully circumvented the classical taxation system. Based on tax record data, this white paper showed that the number of trusts grew from 117,616 (aggregate net income of \$0.312 Billion) in 1972 to 258,846 (aggregate net income of \$2.682 Billion) in 1982. It concluded that: “The phenomenal growth in recent years in private business and trading trusts has reflected a desire to avoid the two-tier taxation of company income which can feature under the private company structure.” (p. 55) Changes to tax rules reduced this behaviour beginning in 1981. Comprehensive tax reforms effectively ended the classical system of company taxation in Australia in 1986.

¹² The increase in the tax base is even larger to the degree that what would have been retained earnings prior to 1986 that were realized by stockholders via non-taxable long term capital gains are now realized as profits and paid out as dividends.

this change in tax rules. Atkinson and Leigh (2007) do not account for this aspect of the change in the tax reforms first announced in 1985 in their analysis. Rather, it is simply included as additional income in the more aggregated tax tables they do use. By explicitly considering this change in the tax rules on the taxable income base, we will be able to distinguish the change in the income tax base from the increase in dividends which is both the effect of changes in market forces and the effect of companies increasing the share of profits they pay out in dividends because of the fall in the effective marginal tax rate on dividends.

An important feature of this specific aspect of the tax reforms proposed in 1985 is the way it was implemented. While the government's decision to move from a classical to a 100 per cent imputation tax system was announced on September 19, 1985, this law was not officially adopted until June 1987 and its effective reduction in the marginal tax on dividends only began for dividends received on or after July 1, 1987, the start of the 1987 tax year. As we will see, this delay between its announcement and its start had a major short-run effect on top income measures in tax year 1987 and 1988 that is consistent with behavioural changes in the timing of dividend payments related to the roll-out of these tax reforms.

Capital Gains

Prior to 1985, Australia had no general tax on capital gains. Hence, almost no capital gains were captured in tax record data, since most capital gains were excluded from the personal income tax base. It was not until 1972 that realized capital gains on most assets were included in the tax base under Section 26AAA of the tax law, but only for short-term capital gains (those on assets held less than one year), and excluding owner-occupied housing. While a tax on realized capital gains on assets based on speculation existed as far back as the 1920s, it was not systematically enforced and it generated little revenue.¹³

Based on the Keating proposals announced on September 19, 1985, this proposal on the treatment of capital gains was given Royal assent in June 1986. It substantially expanded the income base on which taxes were collected by including most realized capital gains regardless of how long the asset was held. But to soften its effect, the reform applied only to assets purchased after September 19, 1985. Certain types of assets continued to be exempt, most importantly owner-occupied housing.¹⁴

This change in tax law with respect to capital gains has over time had a substantial effect on the income that is captured in the personal income tax base. As was the case with dividends discussed above, unless

¹³ "Section 25 taxes, inter alia, profits from the sale of property acquired for the purpose of profit-making by sale. This section raises the question of what was the dominant purpose of the taxpayer at the time of acquiring the property. Because of the subjective nature of this test, the section (and its predecessor section 26(a)) has been criticised as having uncertain application. This section also does not raise a large amount of revenue—approximately \$30 million was raised in 1982-1993 from individuals under section 26(a) or Section 26AAA" (Australian Government (1985, p. 77). For a fuller discussion see Chapter 7 of Australian Government (1985).

¹⁴ Between 1985 and 1999, an indexation system was applied so that taxes were only paid on inflation-adjusted capital gains. In 1999, the indexation system was replaced with a discount of 50 per cent on capital gains realized on assets acquired after September 19, 1999. Holders of assets acquired before 1999 were given (and still have) the option of using either the indexation method, but only for adjustments for inflation up to 1999, or the 50 per cent discount method. Throughout the operation of the capital gains tax, net capital losses have been able to be carried forward to offset capital gains in subsequent years.

accounted for, the pre-tax taxable income measure used in the top income literature will once again conflate an increase in the share of income that is taxable with an actual increase in income—in this case, via an increase in the share of the asset base on which realized capital gains are taxed.

As we will see, unlike the effect of the change in the tax law on dividends, this artificial increase in income is not primarily a short-run phenomenon. Rather it grows over time with the stock of assets purchased after September 19, 1985 and the share of realized capital gains that enter the tax base. Atkinson and Leigh (2007) do not mention this consequence of the 1985 change in the tax law and do not control for this artificial increase in their income base. We will do this by disentangling taxable realized capital gains income from all other taxable income and provide a more consistently measured top income series from tax records that does not include this conflated capital gains income measure.

3. Data and Methods

Empirical researchers are limited in their measure of income to the types of income collected in their database. Estimates of income and its distribution based on unit record survey data like the Household, Income and Labour Dynamics in Australia (HILDA) Survey and the Australian Bureau of Statistics (ABS) Survey of Income and Housing that do not contain income from capital gains, focus on household size-adjusted, post-tax, post-government transfer, in-cash income of individuals. They do not attempt to estimate capital gains from another source. In doing so they are consistent with most OECD studies based on country-level, household-unit-record-level data surveys. See Brandolini and Smeeding (2009) for a review of this literature.

CBO (2011, 2012) and Armour, Burkhauser, and Larrimore (2013) are recent exceptions in the United States literature based on unit-record survey data that use household income as the sharing unit. They impute the value of capital gains from Internal Revenue Service (IRS) tax records along with other income sources not found in the U. S. Current Population Survey to more fully measure household income. CBO (2011, 2012) use taxable realized capital gains as their measure of capital gains. Armour, Burkhauser, and Larrimore (2013) use both a taxable realized capital gains measure and one more consistent with Haig-Simon principles—the yearly accrued value of capital gains. Using their measure of taxable realized capital gains, Armour, Burkhauser, and Larrimore (2013) are able to replicate the very large increases in income over the 1989 to 2007 period among top income groups found by CBO (2012). But using their yearly accrued value measure of capital gains they find that these top income groups had smaller gains than did lower income groups. Hence they conclude that the choice of measure of capital gains used in income studies can substantially alter the trends in income observed.

A newer inequality literature estimates the income controlled by top income groups based on personal income tax records. It focuses on the pre-tax income of tax units. See Atkinson, Piketty and Saez (2011) for a review of this literature. Atkinson and Leigh (2007) were the first to estimate the share of income going to

top income groups in Australia using tax record data. This seminal study measures levels and trends in top incomes from 1921 to 2003 based on ATO data in the Australian Taxation Statistics component of the Annual Reports of the Commissioner of Taxation combined with ABS National Accounts data (as well as a splice of data from other sources prior to 1959 as their control of total income) and ABS population data. Their unit of analysis is the tax unit, which in Australia is the individual. They assume that all persons aged 15 and over are potential tax units, and indeed estimates of top income shares relate only to persons aged 15 years and over. For example, the interpretation of the estimated income share of the top 1 per cent is “the proportion of total income going to the top 1 per cent of individuals aged 15 years and over.”¹⁵

The key elements of Atkinson and Leigh’s method (described in more detail in the Appendix) are as follows. The number of individuals in the top x per cent is derived from ABS estimates of the total population aged 15 years and over. The total income of the top x per cent is then obtained from tax tables in the Australian Taxation Statistics. This total pre-tax taxable income value is then divided by aggregate household income, obtained from National Accounts data. For example, on June 30, 2011, the ABS determined that 18.111 million Australians were aged 15 and over, implying 181,110 were in the top 1 per cent income group. The total income of the top 181,110 people in the tax data in 2010-11 is then calculated (\$80.2 billion). This value is then divided by total household income in 2010-11 obtained from the National Accounts data (\$881.8 billion) to produce the income share of the top 1 per cent (9.1 per cent).¹⁶

Here, using Atkinson and Leigh’s methods we replicate their findings for the period from 1970 to 2003 using ATO tax (Australian Taxation Statistics) data and the ABS 2004 National Accounts (Household Income Account) and population data. Leigh has updated the Atkinson and Leigh top income series each year since then, using the next year of these data. We are also able to replicate these yearly values from 2003 to 2010. But we argue that because the National Accounts and population data Leigh uses are preliminary data for the year they are announced, their continued use in subsequent years, without updating them based on subsequent ABS corrections, will introduce unnecessary noise. Furthermore, National Accounts and population data are subject to periodic revisions of concepts, definitions, and methods. Such revisions, when they occur, are typically applied retrospectively, so that using the most recent release for all previous years produces a more consistent total income series. Therefore we use the most updated ABS series in our analyses. Atkinson and Leigh (2007, p. 250, fn. 3) recognize that it would be valuable to produce top income series with and without capital gains, but state that “Because of the manner in which Australians’ income tax statistics are tabulated, we have not attempted to estimate top income shares excluding capital gains.”

¹⁵ In principle, a taxpayer can be younger than age 15 (even a newborn baby can be required to file a tax return), but in practice the number of taxpayers under 15 years of age is negligible.

¹⁶ This implicitly assumes that every individual over the age of 15 is a self-contained sharing unit whose income is not shared with other members of his or her household. Those under 15 are implicitly assumed to be dependents of these tax units but not considered to have any effect on economic well-being. As Burkhauser, Larrimore and Simon (2012) point out, these assumptions will result in trends in the income of tax units differing from trends in the size-adjusted household income of persons. This will overstate the growth in the share held by the top 1 per cent when tax units per household increase or when the number of persons in a household declines.

Their reticence to attempt to exclude capital gains is understandable, particularly given their focus on producing a long-run series.¹⁷ But by not separating taxable realized capital gains from all other taxable income, the Atkinson and Leigh income tax series conflates an increase in the share of realized capital gains after 1985 that are taxable, and hence in their taxable income base, with an increase in realized capital gains. By doing so, their series systematically overstates the increase in income going to top income groups.¹⁸

Conveniently, the ATO in their more detailed Australian Taxation Statistics tax tables, which we use in this paper, include tabulations of realized capital gains by ranges of ATO taxable (i.e. total assessable income less deductions) income, with ATO total assessable income also available for the same ATO taxable income ranges. We are therefore able to separate taxable realized capital gains from other taxable income over the entire period.¹⁹ Doing so, we provide a measure of pre-tax income that is both of value in its own right and a more consistent measure of income derived from tax data.

We also use the more detailed tax record data series in the Australian Taxation Statistics since 1979 to adjust our series for the 1987 change in tax laws related to dividends. We do so by subtracting the primary imputation credit going directly to individuals based on the profits associated with their dividends as well as the subsidiary imputation credit provided on the dividends going to trusts and then passed on to individuals.

4. Results

Alternative estimates of the top 1 per cent

Figure 1, based on Appendix Tables A1 through A4, provides alternative estimates of the share of income held by the top 1 per cent of Australians for tax years 1970 to 2010.²⁰ In discussing our results we will show how important it is to take into consideration the two tax reforms announced in September of 1985 in understanding how much top income shares have increased over this 40-year period. To emphasize this point we divide the years in Figure 1 into three parts. The first is 1970 to 1985, years before these tax

¹⁷ Creating such a series is not without its problems. Australian Taxation Statistics did not provide information on taxable realized capital gains until 1969. Hence it is not possible to extract taxable realized capital gains from other taxable income before then. However, during this earlier period, realized capital gains were only collected on property that the tax office could demonstrate was purchased primarily for “the purpose of profit-making by sale.” In addition, Australian Government (1985) suggests they were not a large source of revenue in 1982-1983. Hence while realized capital gains may have been an important part of the income of top income groups, it is likely that taxable realized capital gains did not play an important role in their income prior to 1970. Hence our taxable income without taxable capital gains series beginning in 1970 can plausibly be linked to top income values that contained some unknown amount of taxable realized capital gains in earlier years.

¹⁸ In addition, because the total income value they use in the denominator is derived from National Accounts data that do not include capital gains, including any amount of capital gains to the numerator that is not also added to the denominator is inconsistent.

¹⁹ Full details on how we separate realized capital gains from other taxable income are provided in the Appendix.

²⁰ Appendix Tables A1 through A4 also contain values for other top income groups from the top 10 per cent to the top 0.01 per cent.

reforms were implemented. The second is 1986 to 1988, years in which these reforms increase the income base and top incomes in the short run. The third is 1989 to 2010, years in which these reforms increase the income base and top incomes in the longer term.

Share line (1) uses yearly diamond-markers to denote top 1 per cent income shares whose exact values can be found in Appendix Table A1. It replicates the level and trend found in Atkinson and Leigh (2007) through 2003 as well as the updated values reported each year by Leigh using preliminary ABS National Accounts and population data thereafter. Share line (1) includes taxable realized capital gains in its income base. We replicated these values based on Leigh's programs.

Share line (2) uses yearly square-markers to denote top 1 per cent income shares whose exact values can be found in Appendix Table A2. It is based on ABS data that are consistently updated to 2010. Atkinson and Leigh (2007) top income values reported in share line (1) are based on ABS data for the years 1970 to 2003 that include ABS revisions for all prior years up to 2003. Thereafter, Leigh reports each additional year of data updated by ABS for that year. But he does not adjust previous years to account for these new updates. Share line (2) uses the latest ABS standards as of 2013 for all years.

The first two share lines are somewhat different over much of the 1970 to 2003 period. Notice, however, that these differences are ones of level, not direction. These differences primarily reflect a major revision to National Account concepts and definitions made by the ABS in 2004 that the ABS—and we, using their revisions—have retrospectively applied to the data for all preceding years. In contrast, Leigh, in adding years, has included this major revision for 2004. But he has not done so for earlier years. As a result, share line (1) shows a decline of 0.29 percentage points in the share of income of the top 1 per cent from 2003 to 2004 instead of the increase of 0.41 percentage points we find using our single consistent ABS series in share line (2). Thereafter, the minor differences in these two series are primarily due to our using the 2012 corrections consistently for all years while Leigh continues to simply add the current year's base ABS numbers.²¹

Note that share line (2) makes a better case for the view that the share of income controlled by the top 1 per cent consistently increased from 2001 to 2006. It also suggests that the share of income held by the top 1 per cent in Australia is sensitive to international business cycles—2001 was a recession year in the United States and most other major western industrial countries and was followed by five years of economic growth until the start of the Global Financial Crisis in 2007.²² In all subsequent analyses we will contrast

²¹ As discussed in more detail in the Appendix there are also slight differences between these two lines because we consistently use the more detailed tables in the ATO tax series (Commissioner of Taxation, 1973-2013) that allow us to disentangle the various sources of income that are taxed. In contrast, Atkinson and Leigh always use the tax table that has the most income brackets. In many years these are the same tables. As Appendix Table A1.2 shows, our use of the more detailed tax tables only accounts for a very small part of the difference between these two lines.

²² Updating top income series each time the government updates its National Accounts data has the advantage that the new series uses the best available data and does so in a consistent manner. But it has the drawback of requiring all years of the data to be re-valued. This can be especially troublesome for very long time series that contain splices in the data related to the introduction of

share line (2) with our other series—that also use the updated ABS data—since we consider series (2) to be the preferable way to update the original Atkinson and Leigh (2007) series, especially for those who are primarily interested in comparing years since 2003 with previous years. To do otherwise is to miss the consequences of changes in National Accounts methods on the inter-temporal comparability of estimates.

Share line (3) uses yearly triangle-markers to denote top 1 per cent income shares whose exact values can be found in Appendix Table A3. It reports the share of income held by the top 1 per cent adjusting for the changes with respect to dividends contained in the 1985 tax proposals. As discussed above, while the change in dividends was announced on September 19, 1985, the movement to a 100 per cent imputed tax system and its subsequent effect on marginal tax rates was only for dividends received after July 1, 1987, the start of the 1987 tax year. As can be seen, there is a major spike in the top 1 per cent share of income in both share lines (1) and (2) in 1987 and again in 1988 that we will show is largely related to increases in dividends and in the primary and subsidiary imputation credits associated with the profits linked to them. Share line (3) subtracts these credits from taxable income so that our income measure consistently excludes this component of profits up to 1985 and thereafter. Doing so substantially reduces the size of the spike. The share of income controlled by the top 1 per cent falls in 1989 in all three series but still remains considerably above 1985 levels in each. In subsequent years, share line (3) continues to show a substantial increase in the share of pre-tax income held by the top 1 per cent, but the level is lower.

Share line (4) uses yearly x-markers to denote top 1 per cent income shares whose exact values can be found in Appendix Table A4. It removes all taxable realized capital gains from the income included in share line (3). In our view, these two lines best represent the share of income with and without realized capital gains controlled by the top 1 per cent from 1970 to 2010 based on tax record data.²³

There is almost no difference between share lines (3) and (4) prior to 1986, since realized capital gains only started to be systematically taxed in 1972, and then only on property held less than one year. The vast majority of capital gains did not enter the tax base. This began to change after the implementation of the 1985 tax reforms in 1986. But over the first few years there is little or no difference between these two

the National Accounts data into the denominator. For secondary users of the data any changes in earlier yearly values will make it more difficult to replicate past research using previous versions of the data series. Hence committing to consistent updating of the data rather than merely adding yearly iterations would at a minimum require data repositories like the one at the Paris School of Economics to maintain all past versions of the data and assign version numbers to successive series. If the yearly changes are small, one could argue that this added complexity in documentation is not worth the effort. However in cases where the change in National Accounts is large, failing to do so will not only change the level but also the direction of the yearly change, as was the case between 2003 and 2004 for share lines (1) and (2) in Figure 1.

²³ In creating our series without capital gains and imputation credits, we subtract these components from the income measures in each income bracket before calculating the top income shares. This implicitly assumes that capital gains and imputation credits within an income bracket are the same proportion of total income for all individuals within the bracket. That is, we assume no re-ranking of individuals after removal of capital gains and imputation credits. We test the sensitivity of this assumption using ATO unit record data from their “1 per cent individual sample file” which is available for the tax years from 2003 to 2009. Doing so, we show that effects of re-ranking are relatively small and thus our findings are robust. See Appendix Table A10 and the discussion around it in the Appendix. The unit record data is useful for testing the robustness of such assumptions, but it has the disadvantage that, for confidentiality reasons, the top 1 per cent of each source of income is top coded. As a consequence, it is less valuable than the tax tables for measuring top incomes.

series, since most realized capital gains were on assets purchased prior to September 19, 1985, and were therefore not taxable. But over time, the share of assets purchased after September 19, 1985 grew and with it the income base on which realized capital gains are taxed. Therefore, it is not obvious how much of the difference between these two series is due to increases in realized capital gains and how much is due to increases in the share of realized capital gains that are now taxable and included in the income base.

What is clear is that the level and trend in the share of income not including realized capital gains held by the top 1 per cent (share line 4) are different from those based on the values found in Atkinson and Leigh (2007) and Leigh's updates, even when we adjusted them for changes in ABS National Accounts methods in share line 2. (See: Appendix Table A5 for exact yearly differences between share lines 2 and 4.) There are virtually no differences in these three share lines prior to the 1985 tax reform's implementation in 1986. But the differences are larger between 1986 and 1989 and, we will argue below, are almost entirely accounted for by the change from a classical to an imputed tax on profits (share line 3). After 1990, the differences are increasingly larger and, we will argue below, are primarily accounted for by the growing importance of taxable realized capital gains income—some due to increases in the growth of realized capital gains and some because of the share of this income captured in the tax base, in the portfolio of the top 1 per cent.²⁴

Changes in the portfolio of income of the top 1 per cent

In Figure 2 we provide evidence that the differences in Figure 1 between share line (2) and share lines (3) and (4) are the result of the 1985 tax reforms whose implementation resulted in capital gains and the profits related to dividends increasingly being included in the tax base and hence “artificially” increasing income based on tax record data in share line (2). Figure 2 uses information in the more detailed tables in the Australian Taxation Statistics series (Commissioner of Taxation, 1973-2013) that allow us to disentangle the various sources of income that are taxed. We do so for share line (2) to show how the types of income held by those in the top 1 per cent group change over the period from 1979 to 2010.²⁵

As discussed above, an effective reduction in the tax on dividends was announced on September 19, 1985, but only for dividends received after July 1, 1987, the first day of the 1987 tax year. Note that the share of dividends in the income portfolio of the top 1 per cent over the seven years from 1979 through 1986 rises

²⁴ In the Appendix (Appendix Figures A2.1 to A2.4) we repeat our analysis as shown in Figure 1 for subcomponents of the top 1 per cent income group. We find the same differences between each of our share lines as discussed here. These values can be derived from values reported in Tables A1-A4.

²⁵ Figure A1.1 in the Appendix presents an alternative view of the composition of the incomes of the top 1 per cent, showing the share of ATO total assessable income of each of seven components: primary imputation credits, subsidiary imputation credits, capital gains, dividends, net partnership and trust income, salary and wages, and all other income. For both Figures 2 and A1.1 we are limited to the period from 1979 to 2010 because specific information on income components other than salary and wages are only available beginning in 1979. Income on dividends did not begin until tax year 1982. In the prior three years we use the broader dividends and interest category and approximate the importance of dividends in those three years. (See the Appendix for a fuller discussion.) We also provide these values for the subcomponents of the top 1 per cent in Figures A3.1-A3.4 and A4.1-A4.4.

slightly from 2.2 to 3.1 per cent. This increases to 6.0 per cent in 1987 and 11.8 per cent in 1988, the first two tax years in which the decline in the marginal tax rates on dividends is in place.

But in addition to this increase in dividends, the income of the top 1 per cent now includes the primary imputation credits associated with the profits on which these dividends are based. This income share, which was zero prior to 1987, now makes up 4.5 per cent of their portfolio in 1987 and 10.8 per cent in 1988. The dividends paid to partnerships and trusts but distributed as income to individuals also now come with a subsidiary imputation credit attached to them. The income the top 1 per cent receives from these credits makes up a total of 1.7 per cent of their portfolio in 1987 and 4.2 per cent in 1988.²⁶ This new addition of income from profits that was never counted as personal income prior to 1987 explains the difference between share lines (2) and (3) reported in Figure 1, in the size of the short-run spike in top incomes in 1987 and 1988.

This pent-up short-run spike in the pay-out of profits to individuals in the form of dividends in Figure 2 is consistent with firms deferring profits and dividends that would have been paid in tax years 1985 and 1986 after the announcement of the government's tax reform plan but before its effective date. As can also be seen in Figure 2, in 1989 dividends fall but to a level higher than over the 1979 to 1986 period, reflecting the lower marginal tax rate on dividends. The share of income associated with primary and subsidiary imputation credits also falls from its 1988 height, both because dividends fall and because subsequent tax reforms lowered the tax rate on company profits and hence the difference between dividends and the profits associated with them. For purposes of measuring top income shares from tax record data, if the tax on profits were zero and all profits were paid out in dividends, then there would be no difference in Figure 1 share lines (2) and (3).

Table 1 shows the exact shares of dividends and the tax credits associated with them in the portfolio of the top 1 per cent for 1985 to 1989 based on income series (2)—the years just before and just after the short-run spike years. It also shows those values for the subcomponents of this top 1 per cent income group. The share of dividends in the portfolio of the top 0.1 percentile (5.4 per cent) is higher than in the 0.1 to 0.5 percentile (2.8 per cent) and in the 0.5 to 1 percentile (2.0 per cent) in 1985, the year the tax reforms were announced. The growth in the share of dividends over the spike years from 1986 to 1988 for the 0.1 percentile is also greater, as is the difference between 1985 and 1989. But so is the share of tax credits in their portfolio, which artificially increases the pre-tax measure of income used in the top income literature. In spike year 1988, 48.2 per cent of the income of the top 0.1 percentile group was in dividends and the tax

²⁶ Also included in Figure 2 is the share of net partnership and trust income in the income portfolio of the top 1 per cent. Note that, after declining as a share of income between 1979 and 1982 and then increasing somewhat up to 1986, there is also a spike in this income in 1987 and 1988. This spike reflects the increase in dividends held by partnerships and trusts that are paid out as partnership and trust income to the top 1 per cent, which is the basis for the subsidiary imputation credits these individuals receive.

credits associated with them—more than 10 times the share of dividends in their portfolio in 1986.²⁷ But only 20.2 percentage points of this spike were in dividends; the other 27.9 percentage points were in tax credits.

Figure 2 also traces the share of taxable realized capital gains in the portfolio of the top 1 per cent. As can be seen, taxable realized capital gains (the measure of capital gains in the tax-based top income literature) made up a trivial share of the taxable income of this group between 1983 and 1985 (between 0.2 and 0.4 per cent) since only capital gains on assets held less than one year entered the taxable income base. This changed in 1986, since assets purchased after September 19, 1985 were taxed in 1986 even if held for more than one year—past September 19, 1986. So unlike dividends that did not increase as a share of the income of the top 1 per cent until 1987, and in the case of the top 0.1 per cent actually fell in 1986, the share of capital gains in the portfolio of the top 1 per cent as measured in the tax base did increase in 1986. But since these potentially taxable assets—those held more than one year—only made up a small part of the stock of assets and the share of realized capital gains taxed in 1986, the increase was only to 1.8 per cent. While some of this increase is the result of market forces, it is also because a larger share of their total capital gains were now subject to tax and hence now artificially included in the share series (2) and (3) in Figure 1.

As can also be seen in Figure 2, the increase in the share of realized capital gains in the portfolio of the top 1 per cent only increased gradually over the next few years. Hence, unlike dividends, it played no role in the spike in the share of income controlled by the top 1 per cent in 1987 or 1988 shown in Figure 1. The reason there is no difference between share lines (3) and (4) for those years is that the share of capital gains included in the tax base did not grow much at first. Unlike the effect of tax reform on dividends, which had its biggest distortion effect (difference between share lines (2) and (3)) with respect to a change in the share of the income that entered the tax base in these spike years, the distortion in the share of realized capital gains that are taxed has grown over time as the share of capital gains on assets purchased after September 19, 1985 has grown.

As Figure 2 shows, taxable realized capital gains grew from less than 1 per cent of the portfolio of the top 1 per cent before 1986 to a high of 15 per cent in 2006, just before the Global Financial Crisis. The difference between share lines (3) and (4) in Figure 1 is explained by the growth in the share of capital gains in the portfolio of the top 1 per cent found in Figure 2. What is unknown is the degree to which this difference is simply the result of the broadening of income counted in the tax base due to the tax reforms of 1985.

²⁷ Part of the reason for this huge spike is that dividends fell from 5.4 to 4.5 per cent of their portfolio between 1985 and 1986, the year after the announcement of the decline in marginal tax rates and the year before they were implemented.

Effects of adjustments on alternative top income groups

Figure 3 summarizes the effects of excluding dividend imputation credits and taxable realized capital gains on alternative top income groups. (See: Appendix Table A4.1 for the exact values in this figure.) It shows the percentage difference in the income share of each top income group using an income series that includes dividend imputation credits and capital gains (e.g. share series 2 in Figure 1 for the top 1 per cent) and one that does not (e.g. share series 4 in Figure 1 for the top 1 per cent). We focus only on the years 1985 to 2010 since, as discussed above, there was virtually no difference in these series before the 1985 tax reforms. The difference between our adjusted Atkinson and Leigh top income series that includes taxable realized capital gains and imputation credits and our preferred series without them is greatest for the highest top income group (those in the top 0.1 per cent). In spike year 1988 it is 40.9 per cent—all of this is caused by the inclusion of dividend imputation credits. It then falls to 14.2 per cent in 1989 but then builds again as a greater share of capital gains becomes taxable. The peak difference in the two series—54.5 per cent—occurs in 2006, the last tax year before the start of the Global Financial Crises.

It is not surprising that the difference in these two series is greatest for this top income group since they received the most disproportionate amount of imputation credits and realized capital gains that entered the tax base after the implementation of the 1985 tax reforms. While the spike in 1988 is still observable for those in the 0.1 to 0.5 and the 0.5 to 1.0 percentile top income groups, it is smaller, as is the spike for the sum of these groups that is captured in our top 1 per cent top income group. Figure 3 provides a simple measure of the differences in growth in income shares of these various top income groups using the two series between 1985 and any other year. Between 1985 and 2010, the difference is 31.5 per cent for those in the top 0.1 per cent and 15.9 per cent for those in the top 1 per cent.

Changes in top income shares using our preferred series

In Figure 4 we use our preferred series 4 measure of income that excludes taxable realized capital gains and dividend imputed credits to show how levels and trends in the share of various top income groups have changed between 1970 and 2010, once again separating these years into: those before tax reform (1970 to 1985), immediately after tax reform (1986 to 1988), and 1989 to 2010. (All values for this figure are from Appendix Table A4.2 which is derived from Appendix Table A4.)

Focusing first on the second vingtile (those in the top 5 to 10 percentiles), we see a slight decline (2.7 per cent) in their share of income between 1970 and 2010. There is a slight increase between 1970 and 1985, a small spike in 1986 to 1988, but one that is much less pronounced than for the top 1 per cent and a slight overall decline since then, but with some growth since 2008.

When we look at those in the bottom part of the top vingtile (those in the top 1 to 5 percentiles), there is a slight increase (5.2 per cent) in their share of income between 1970 and 2010. There is a slight decline

before 1986, a small spike in 1986 to 1988, a return to slightly below their 1970 level in 1989, and modest growth since then. They also display some growth since 2008.

We reproduce the share of income held by the top 1 per cent we first reported in Figure 1. Their share of income increased substantially between 1970 and 2010 (39.7 per cent). There was a clear decrease in their income between 1970 and 1985, followed by a substantial spike in 1986 to 1988. Their income share in 1989 was noticeably higher than in 1985, returning to approximately the share of income they controlled in the early 1970s. It continued to grow until 2000. The recession in most Western industrialized countries in 2001 may explain the drop in their income share in 2001 and its increase over the next 6 years until the start of the Global Financial Crisis. After falling back to its 2000 level in 2008, it has grown over the last two years. (In Appendix Figure A1.2 we provide a magnified picture focusing solely on the trends in the top 1 per cent and its subcomponents discussed below.)

But when we subdivide the top 1 per cent, we find that the lower half of this population (those in the 0.5 to 1.0 percentile) look more like those in the lower 9.5 percentiles of the top decile in terms of their trend. Their share of income increased by 15.0 per cent between 1970 and 2010. They exhibited a small decline in income share between 1970 and 1985, a spike in income for 1986 to 1988, a return to just slightly below their 1970 level in 1989 and modest growth since then. They also exhibit some growth since 2008.

Only the top 0.1 to 0.5 percentile group and top 0.1 per cent substantially increased their share of income between 1970 and 2010—31.4 and 98.3 per cent respectively. Both groups experienced declines in income shares between 1970 and 1985, a substantial but temporary spike in income share for 1986 to 1988, and a fall in 1989, but to share levels slightly below those in 1970 for the 0.1 to 0.5 percentile group and appreciably higher for the top 0.1 per cent. Both groups experienced substantial increases in their share through 2000, a drop-off in share in 2001, followed by increases to just over their 2000 levels by the start of the Global Financial Crisis. They have also increased their share since 2008.

Hence, even in our preferred series without realized capital gains there has been some increase in top incomes between 1970 and 2010. But we find that only the shares of those in the top 0.1 to 0.5 percentile and especially the top 0.1 per cent income groups increased substantially since 1970, and most of that increase occurred between 1985 and 2000.

5. Evidence from Household Survey Data on Capital Gains

We have argued that major changes in Australian tax laws first announced in 1985 make our top income series excluding taxable realized capital gains the most consistent way to measure levels and trends in top incomes. Here we make a broader point. Haig-Simons principles suggest that for horizontal equity reasons a tax base should capture income from all sources. If tax systems followed this ideal, they would be the perfect data source for measuring the share of income going to top income groups. But no income tax system includes income from all sources in its tax base. This is especially the case with respect to capital

gains, since Haig-Simons principles would suggest that taxes should be placed on capital gains accrued from all assets each year. When capital gains are taxed, that tax is usually on realized capital gains. And it is not even on all sources of realized capital gains. So even after all assets purchased before September 19, 1985 have been realized and hence this eccentricity in Australian tax history has run its course, it is not clear that just because it is there, that taxable realized capital gains is a useful measure of accrued capital gains.

Below we use data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey to compare the size and distribution (across income groups) of taxable realized capital gains with the size and distribution of accrued capital gains on this type of taxable assets. We then compare them to the size and distribution of accrued capital gains on assets that are non-taxable (i.e. owner-occupied homes and superannuation funds). In keeping with the conventions of the top income literature, our sharing unit is the tax unit.²⁸

HILDA does not specifically ask about capital gains. To estimate these values we impute both taxable realized capital gains and yearly accrued capital gains on all assets. Taxable realized capital gains are imputed by first ranking all tax units in the ATO “1 per cent individual sample file” (produced for each tax year since 2003) into percentiles of ATO taxable (i.e. total assessable income less deductions) income and assigning the mean value of ATO total assessable income of each percentile to tax units ranked in a similar manner in the HILDA data. While we could do this for all years since 2003, we focus only on tax years 2006 and 2009. We focus on these two years because, in addition to information on owner-occupied housing, which is reported each year, HILDA collected a detailed wealth supplement in 2006 and 2010. With these data we are able to estimate accrued capital gains, both on assets that are taxable and those that are not. Conveniently, these are two particularly interesting years—2006 is the tax year prior to the start of the Global Financial Crisis when capital gains were at a global business cycle peak, and the 2009 tax year is a much worse period for capital gains.

Our estimates of accrued capital gains on owner-occupied housing are based on estimates of home values provided by respondents. For a household that sells the home between one wave and the next, the capital gain in that year is approximated by the change in the ABS house price index over the last year for the capital city of the state of residence (ABS 2013b).

Our estimates of accrued capital gains on non-owner-occupied housing, unincorporated businesses, equities and superannuation funds are based on asset holdings in 2006 and 2010, when detailed household wealth data was collected in the HILDA Survey. Our estimates of accrued capital gains on non-owner-occupied housing are approximated by changes in the ABS house price index, while unincorporated

²⁸ HILDA is a nationally representative household panel study that began in 2001 with 13,969 respondents aged 15 years and over in 7,682 households. Face-to-face interviews are conducted annually with all household members aged 15 years and over. Detailed income information is collected from each respondent, which is aggregated by the data managers to produce annual aggregate income at both the person level and household level. See Wooden and Watson (2007) and Watson and Wooden (2010) for more HILDA details. To be consistent with the approach taken for tax record data, we restrict to persons aged 15 years and over and restrict non-capital gains income to components that are required to be reported to the tax office.

businesses and equity and superannuation fund holdings are assumed to track the Australian Stock Exchange ASX200 share price index. (See the Appendix for a more detailed discussion of these imputations.)²⁹

In Table 2 we report the share of capital gains held by top income groups in Australia across our four alternative measures of capital gains. In 2006 the top 1 per cent of tax units in the HILDA data received 20.9 per cent of the \$26.2 Billion in Taxable Realized Capital Gains declared. The top 10 per cent received 42.2 per cent thus showing the degree that this source of income is skewed to the top part of the income distribution. The top 1 per cent held an even larger share of Accrued Capital Gain on Taxable Assets—30.8 per cent. But more importantly this is a larger share of a much larger amount \$362.5 Billion. In contrast, the top 1 per cent held only 14.6 per cent of the \$565.0 Billion of Accrued Capital Gains on Non-Taxable Assets. Overall they held 17.1 per cent of the \$927.6 Billion of Total Accrued Capital Gains. It should not be surprising that accrued capital gains were so much larger than realized capital gains in 2006, since realized capital gains are only a subset of accrued capital gains in 2006 plus the realization of accrued capital gains from previous years. In the peak year of the global business cycle, the accrued value of financial assets and owner-occupied housing were enormous relative to taxable realized capital gains. In contrast, in 2009 all four measures of capital gains were much diminished. The share of realized and accrued taxable assets held by the top 1 per cent fell substantially, while their share of accrued non-taxable assets rose somewhat.

Table 3 shows how these varying patterns of capital gains translate into our alternative measures of top incomes. Column 1 is our estimate of the share of income excluding capital gains in 2006 and in 2009 based on the HILDA data. We find little change in the share of this measure of income (10.6 in 2006 and 10.5 in 2009) between these two years. When we include taxable realized capital gains in our income measure in column 2, the top 1 per cent income rises to 11.0 in 2006; but falls to 10.5 per cent in 2009. This reflects the drop in total taxable realized capital gains in these two years that disproportionally occurred at the top end of the distribution reported in Table 2. But this drop is even more pronounced in column 3 of Table 3 when we use accrued capital gains on taxable assets rather than taxable realized capital gains in our income measure—a fall from 15.7 to 10.7 per cent. As can be seen in Table 2, this is so much larger both because the total dollar drop in accrued gains was so much larger than in realized gains and because it was more concentrated at the top end of the distribution. When we use accrued capital gains on assets that are not taxable (column 4 of Table 3), there is little change in the top 1 per cent share. This drops from 10.8 to 10.7 per cent despite the very large fall in the dollar value of these assets, because their distribution is much more evenly spread across the income distribution. Note that these levels in both years are very close to those in column 1 which measures income without capital gains. Column 5, which includes all accrued capital gains, shows a fall from 13.0 to 10.8 per cent reflecting a blend of the previous two columns.

²⁹ For all three income variables, we have artificially restricted personal income inclusive of capital gains to be non-negative. In Appendix Tables A6 and A7 we include negatives and find that the pattern of results evident in Tables 2 and 3 does not change.

6. Discussion

Australia provides a cautionary tale of how comprehensive tax reform legislation, first announced on September 19, 1985 and implemented over the next two years, has substantially altered the Australian top income series since 1985 and its comparability with earlier years, especially the Atkinson and Leigh (2007) series that does not separate taxable realized capital gains from other taxable income.

The huge short-run spike in top income shares reported by Atkinson and Leigh (2007) for 1987 and 1988 is a direct result of comprehensive tax reform that, as a side effect, distorted their “pre-tax income” top income series by the introduction of tax credits. But even in our corrected series we find a substantial rise in dividend income in those years, especially for the top 0.1 per cent. Here we suggest that tax avoidance rather than real changes in the economy may be at work. The government’s decision to move from a classical to a 100 per cent imputation tax system was announced on September 19, 1985, but the law was not officially adopted until June 1987 and its effective reduction in the marginal tax on dividends only began for dividends received on or after July 1, 1987, the start of the 1987 tax year. This delay between the announcement and the implementation of this drop in the marginal tax rate for dividends explains the drop in the share of dividends in the portfolio of the top 0.1 per cent seen in 1986 and the dramatic rise in their share in 1987 and 1988, before falling in 1989 to a level above their share prior to 1985.

More important, what appears to be an increase in the share of income controlled by the top 1 per cent following the tax reforms—because of the rise in their dividend income, both in the short-run and even in the long-run—may to some degree simply be a fuller capturing of the earnings of companies in the Australian tax base. Prior to the 1985 tax reforms, companies were able to pay their shareholders in the form of capital gains that, if held for one year, were not taxed and hence not in the tax base. The 1985 tax reforms dramatically increased the share of earnings from companies captured in the personal income tax base by taxing these long-term capital gains, but did so only gradually on assets purchased after September 19, 1985. For this reason, we argue that the Atkinson and Leigh top income series including realized capital gains overstates the growth in share of income of the top 1 per cent after 1985 and create a top income series excluding taxable realized capital gains.

However, some of the rise in dividends in our top income series that excludes taxable realized capital gains comes from a behavioural change in the way that companies reward their stockholders. Not only was the marginal tax on dividends reduced but the marginal tax on capital gains was increased by the 1985 tax reforms, thus levelling the marginal tax rates on these two alternative methods of distributing profits to shareholders. To the degree that profits that were “paid” to stockholders in the form of untaxed long-term capital gains prior to the 1985 tax reforms were shifted to payments in the form of dividends thereafter, this is another way that changes in tax rules and their effects on behaviour may be distorting the Australian top income series. The irony in this case is that major tax reforms in 1985 that fixed a tax system “broken and beaten by an avalanche of avoidance, evasion, and minimisation” by broadening its income base and

levelling the marginal rate across sources of income has had the side effect of substantially increasing the share of income Atkinson and Leigh capture in their top income measures, thereby resulting in their conflating this broadening of the tax base with a rise in the share of income held by top income groups.

More broadly, the decline in the share of top incomes reported by Atkinson and Leigh in the 1970s and early 1980s may in part be explained by these top income groups' growing use of trusts over this period to avoid the classical two-tier company tax system that the comprehensive tax reforms of 1985 ended. It was this tax avoidance, together with the very rapid inflation that lowered the real income levels at which the top marginal tax rate on personal income kicked in, that motivated these reforms in the first place (Australian Government 1985, Keating 1985). To the degree that top income groups were better able to shift their income into trusts and non-taxable capital gains over this period leading up to the 1985 tax reforms to avoid having their income counted in the tax base, the more tax-based studies like those of Atkinson and Leigh will also conflate increases in relative tax avoidance by top income groups with a decline in their income shares.

What lessons can be drawn from this Australian case study? The changes in the personal income tax base that we have documented in Australia occurred to some degree in all countries over the periods spanned by the existing top income series reviewed by Atkinson, Piketty, and Saez (2011). The Australian experience is therefore unlikely to be unique. Hence, we advocate similar careful examination of tax system changes in all countries for which tax-records-based top income series are produced. While studies typically acknowledge at least some of the major changes in tax laws in the period being examined, they rarely attempt to correct for the inter-temporal inconsistencies that result from these changes. This is a potentially important limitation. At a minimum, for country data series that contain a spike like the one we identified for Australia between 1985 and 1989, it should be documented whether it is the result of a change in the economy or a change in tax rules that—either temporarily or over the long run, or both—expands the personal income tax base.³⁰

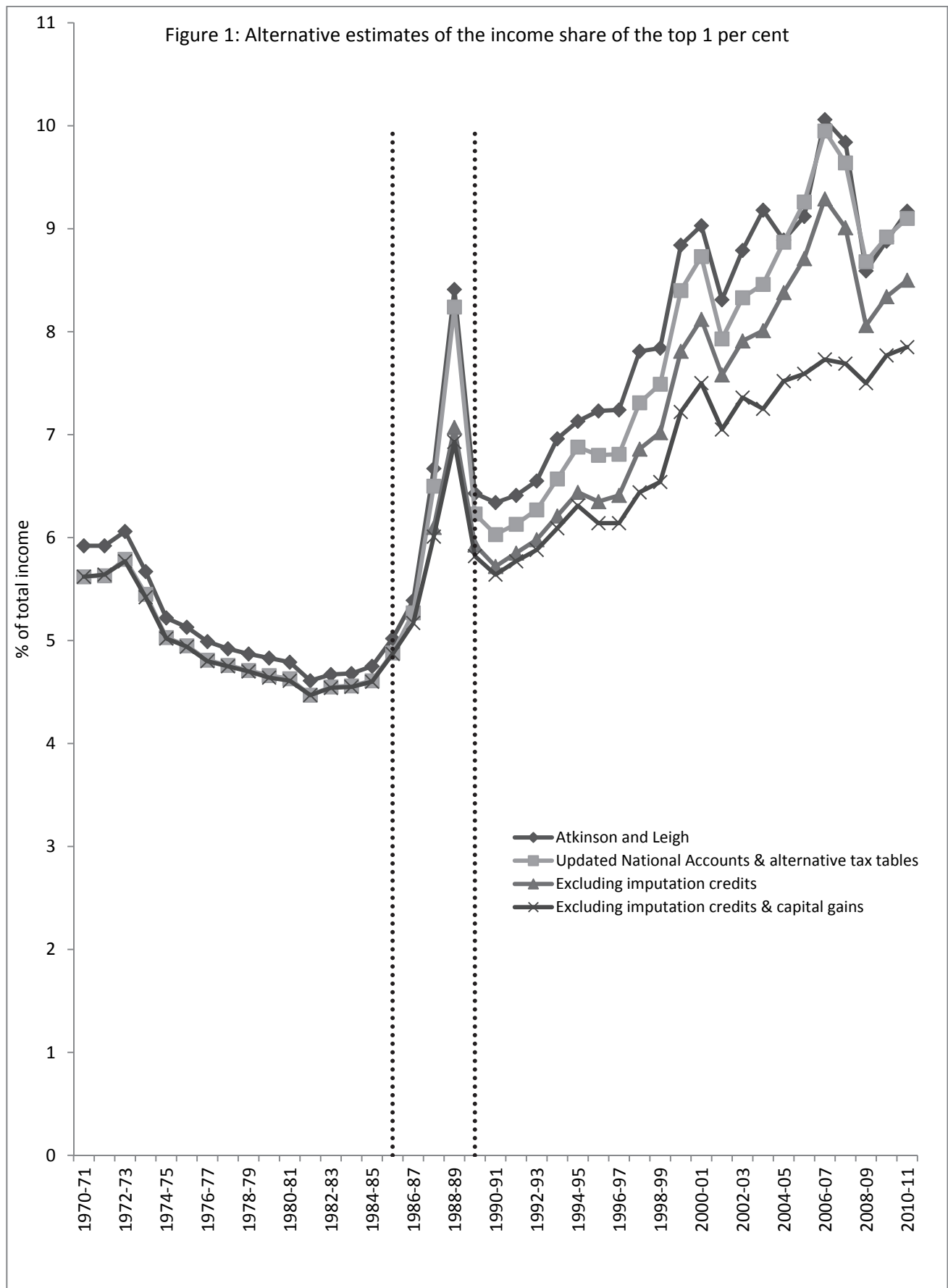
The need for better documentation of differences in tax laws is even greater for those who use these data for cross-national comparisons. The world top incomes database maintained on the Paris School of Economics website makes the start-up costs for cross-national comparisons lower. Yet there are a number of reasons to be concerned about the validity of such comparisons, in terms of both levels and trends. The tax treatment of capital gains is just one point of difference between countries. Countries that tax realized capital gains will capture a greater share of the income of high income groups. This is especially the case in Australia and the United States where realized capital gains on owner-occupied housing are not taxed and thus not included in the tax base. Another difference is in the taxation of the rental value of owner-

³⁰ Another example of a rarely controlled-for cliff caused by a tax law change can be found in the top income series excluding capital gains created for the United States by Piketty and Saez (2003). See Feenberg and Poterba (1993) and Slemrod (1996) for empirical analyses of the importance of the Reagan Era Tax Reform Act of 1986, which reduced the highest marginal tax rate on personal income below the corporate tax rate and hence distorted subsequent changes in measured top income shares.

occupied housing. Broadening the tax base in this way is likely to have the opposite effect, i.e., lowering the top income shares in these countries. Work to date attempting to harmonize series across countries or otherwise account for the income base in country tax systems and other differences has been limited.

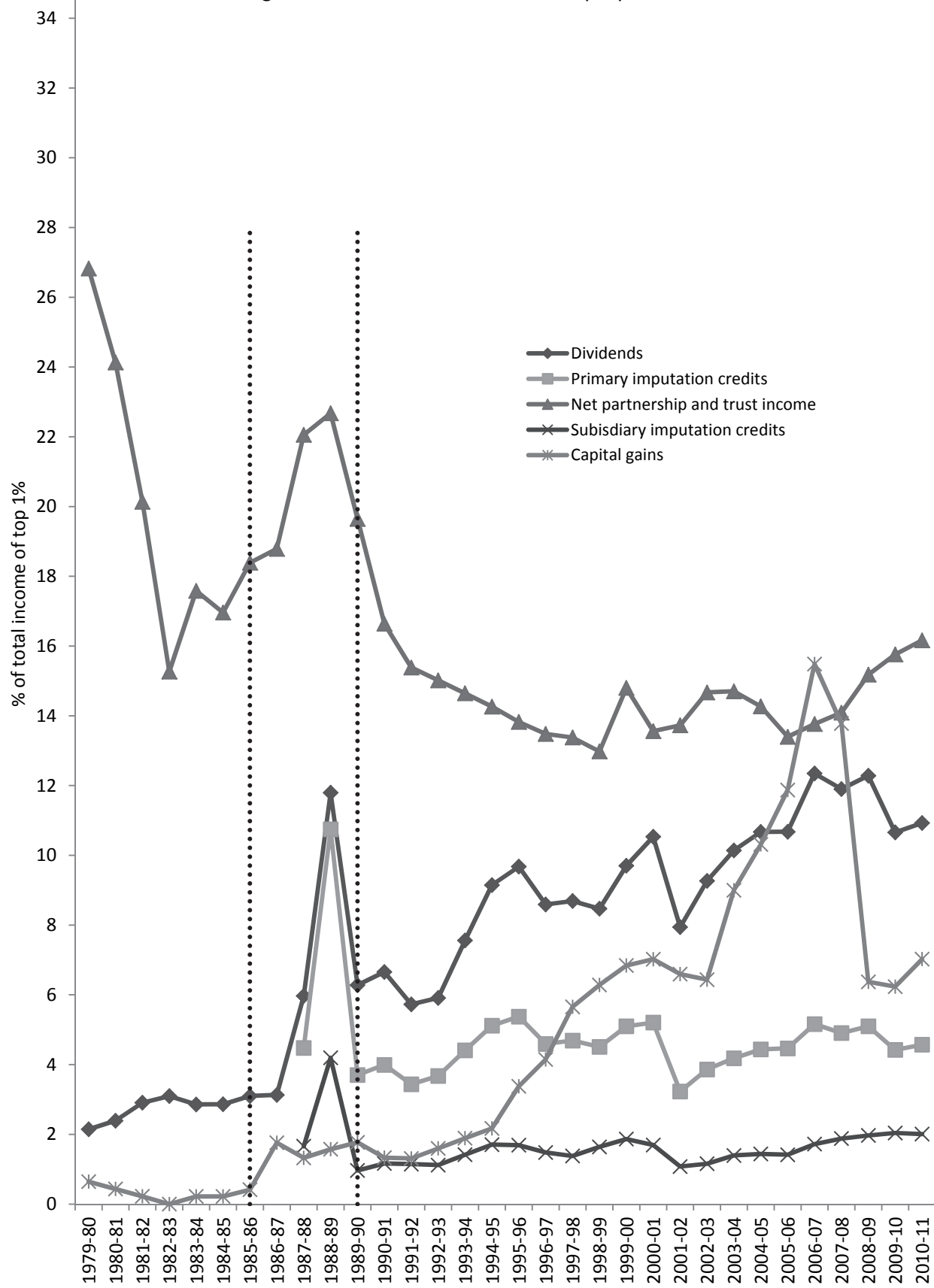
Finally, our findings using HILDA household survey data make a more general point with respect to capital gains and its effect on levels and trends of top income series. Armour, Burkhauser and Larrimore (2013) show that U.S. top income series are sensitive to the choice of measure chosen to capture capital gains. We find the same is the case in Australia. Given the sensitivity in our results across alternative measures of capital gains, it is not clear that including taxable realized capital gains as the measure of capital gains in the top income tax-based literature—just because it is there—is appropriate.

7. Figures and tables

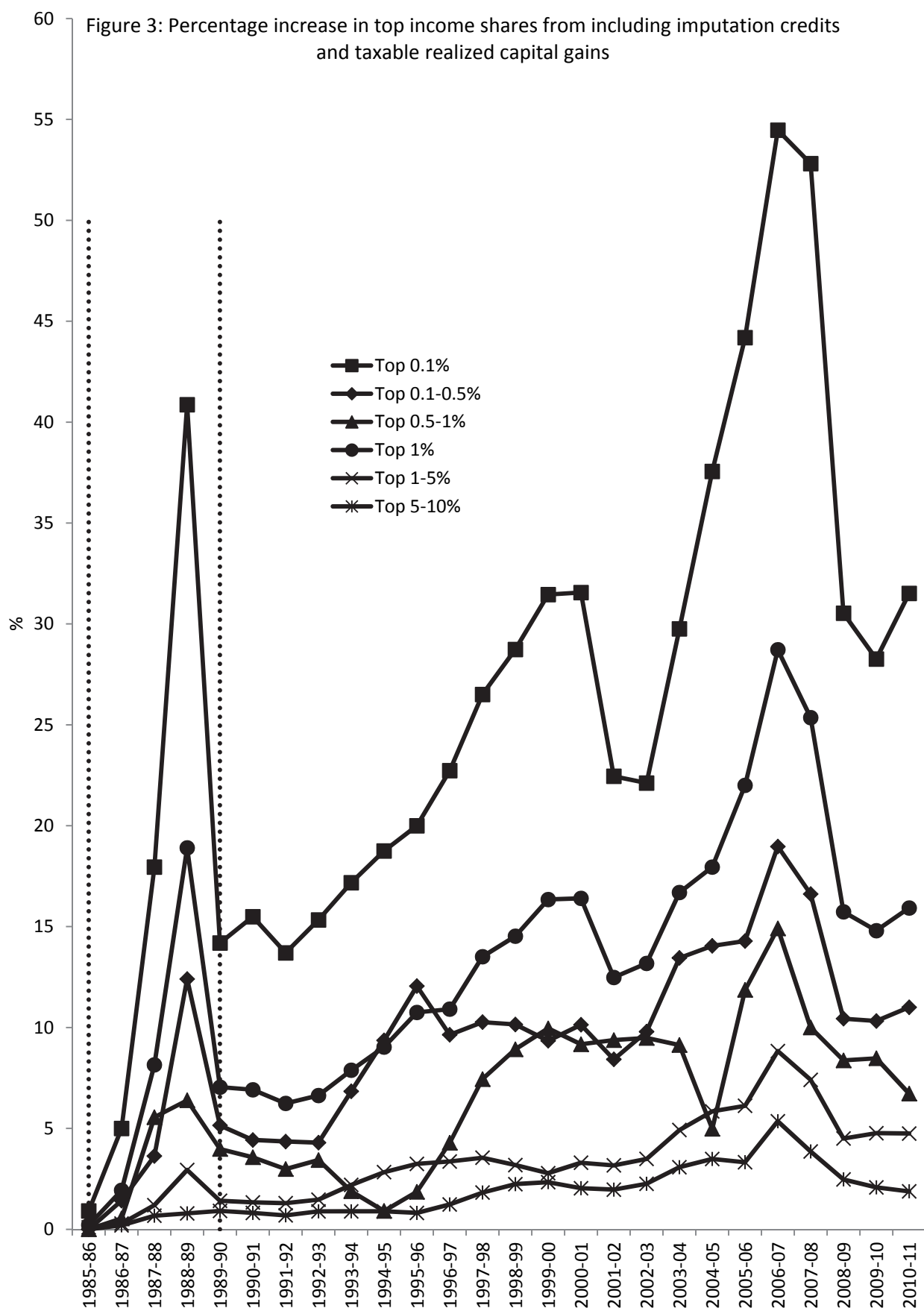


Source: Authors' calculations.

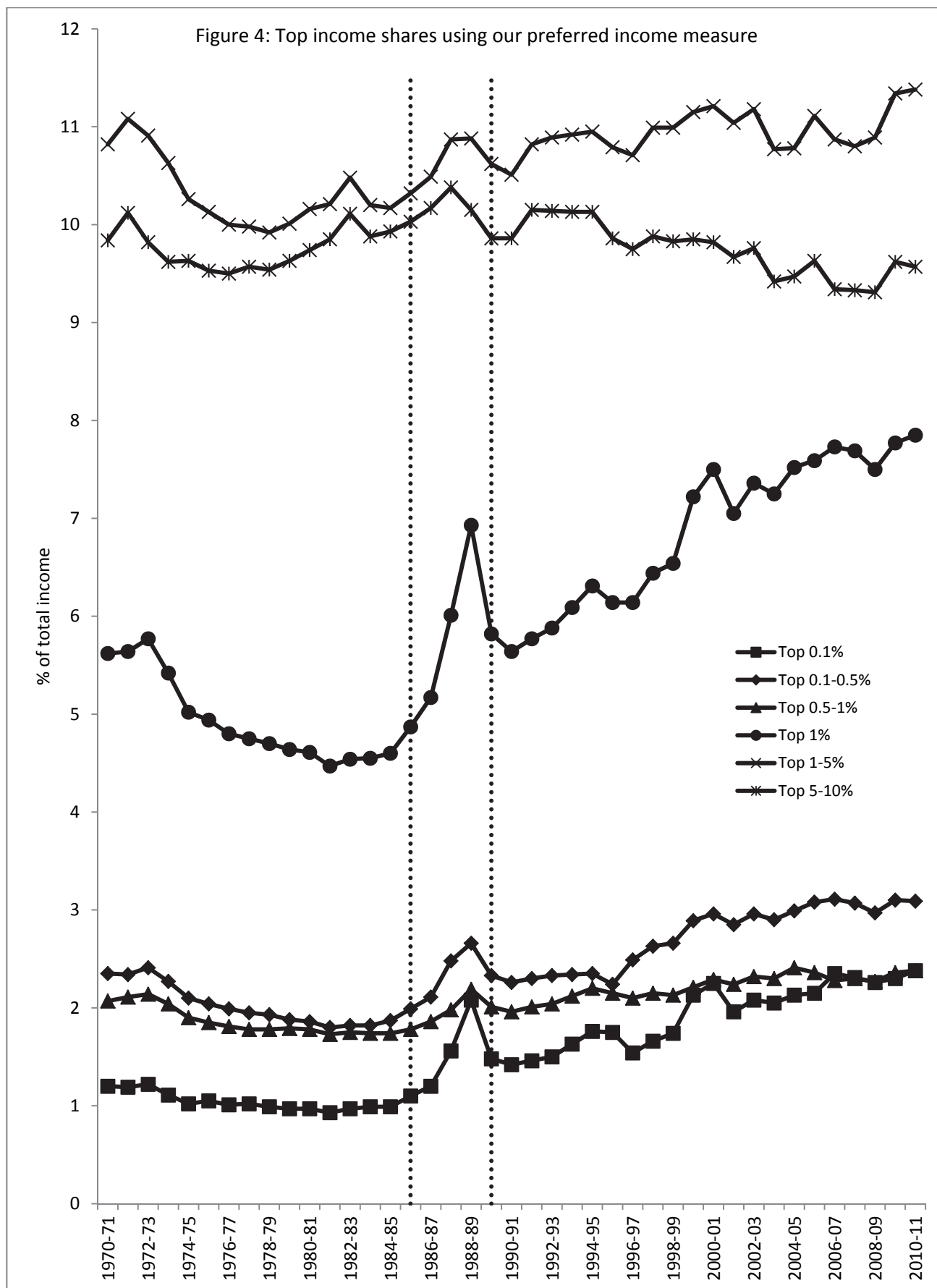
Figure 2: Portfolio of income of the top 1 per cent



Source: Authors' calculations.



Source: Authors' calculations. The percentage increase is equal to the difference between income share (2) and income share (4), expressed as a percentage of income share (4).



Source: Authors' calculations.

Table 1: Share of dividends and tax credits in portfolios of top income groups, 1985 to 1989 (%)

	1985-86	1986-87	1987-88			1988-89			1989-90		
	Dividends	Dividends	Dividends	Primary imputation credits	Subsidiary imputation credits	Total	Dividends	Primary imputation credits	Subsidiary imputation credits	Total	
Top 0.1%	5.4	4.5	10.6	4.9	7.0	22.5	20.2	18.3	9.6	48.2	18.3
Top 0.1-0.5%	2.8	3.1	6.0	6.0	0.0	12.1	11.2	10.1	2.5	23.8	11.7
Top 0.5-1%	2.0	2.4	2.6	2.0	0.0	4.6	3.3	2.8	0.6	6.7	5.8
Top 1%	3.1	3.1	6.0	4.5	1.7	12.2	11.8	10.8	4.2	26.8	11.0

Source: Authors' calculations.

Table 2: Distribution of alternative measures of capital gains, 2006 and 2009

	Realized taxable capital gains		Accrued taxable capital gains		Accrued non-taxable capital gains		Accrued taxable and non-taxable capital gains	
	\$	(%)	\$	(%)	\$	(%)	\$	(%)
2006-07								
<i>Location in income distribution</i>								
Bottom 90%	1,054	57.7	6,522	25.8	18,666	47.3	28,180	43.5
Percentiles 91 to 95	2,336	6.8	60,806	13.3	113,379	16.0	176,916	15.2
Percentiles 96 to 99	5,986	14.5	171,055	30.1	196,802	22.1	352,033	24.1
Top percentile	34,727	20.9	707,523	30.8	518,277	14.6	999,406	17.1
Total	26,229,391,372	100.0	362,514,535,198	100.0	565,036,702,409	100.0	927,551,236,616	100.0
Mean	1,648		22,772		35,494		58,267	
Median	1,037		0		6,833		14,327	
2009-10								
<i>Location in income distribution</i>								
Bottom 90%	385	68.3	2,027	37.8	7,637	41.8	10,463	44.3
Percentiles 91 to 95	545	5.1	18,096	18.8	50,123	15.2	62,509	14.6
Percentiles 96 to 99	1,963	15.4	30,796	25.6	103,035	25.1	130,859	24.6
Top percentile	5,700	11.2	86,849	17.8	295,979	17.9	351,798	16.5
Total	8,669,889,477	100.0	82,186,727,070	100.0	280,353,965,813	100.0	362,540,692,440	100.0
Mean	509		4,822		16,447		21,269	
Median	359		0		0		0	

Notes: Negative capital gains are set equal to zero. For capital gains by location in the income distribution, individuals are ordered in each column by the income measure indicated in the column heading. Dollar amounts are in 2009-10 Australian dollars.

Sources: Authors' calculations using data from Release 11.0 of the HILDA Survey confidentialised unit record file and taxation data from *Taxation Statistics* (various years).

Table 3: Distribution of income including alternative measures of capital gains, 2006 and 2009

	Income without capital gains		Income with realized taxable capital gains		Income with accrued taxable capital gains		Income with accrued non-taxable capital gains		Income with accrued taxable and non-taxable capital gains	
	\$	(%)	\$	(%)	\$	(%)	\$	(%)	\$	(%)
2006-07										
<i>Location in income distribution</i>										
Bottom 90%	29,170	63.7	30,225	63.5	38,078	53.5	50,685	59.4	61,002	55.1
Percentiles 91 to 95	97,515	11.3	99,851	11.1	155,854	12.1	200,468	13.1	262,520	13.2
Percentiles 96 to 99	147,899	14.3	153,884	14.3	299,539	18.7	322,104	16.7	465,219	18.7
Top percentile	441,509	10.6	476,236	11.0	1,009,953	15.7	830,369	10.8	1,293,981	13.0
Total	657,294,375,852	100.0	683,523,765,745	100.0	1,019,808,907,295	100.0	1,222,331,073,521	100.0	1,584,845,606,549	100.0
Mean	41,290		42,937		64,062		76,784		99,556	
Median	29,233		31,208		37,211		47,810		54,576	
2009-10										
<i>Location in income distribution</i>										
Bottom 90%	30,104	63.7	30,489	63.7	32,647	61.8	39,974	60.8	42,973	60.5
Percentiles 91 to 95	102,568	11.3	103,113	11.3	116,539	12.3	144,664	12.2	158,530	12.3
Percentiles 96 to 99	155,032	14.5	156,996	14.5	180,211	15.2	239,665	16.2	262,666	16.4
Top percentile	449,227	10.5	454,927	10.5	514,755	10.7	637,765	10.7	691,214	10.8
Total	727,831,670,558	100.0	736,501,561,146	100.0	810,018,397,253	100.0	1,008,185,635,605	100.0	1,090,372,362,213	100.0
Mean	42,699		43,208		47,521		59,147		63,969	
Median	29,996		30,644		31,996		39,566		41,696	

Notes: Negative capital gains are set equal to zero. For incomes by location in the income distribution, individuals are ordered in each column by the income measure indicated in the column heading. Dollar amounts are in 2009-10 Australian dollars.

Sources: Authors' calculations using Release 11.0 of the HILDA Survey confidentialised unit record file and taxation data from *Taxation Statistics* (various years).

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Additional tables and figures

Table A1: Atkinson and Leigh top income shares (%)

Year	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%
1970-71	27.65	17.30	5.92	3.74	1.26	0.79	0.27
1971-72	28.24	17.59	5.92	3.70	1.25	0.78	0.27
1972-73	27.80	17.50	6.06	3.81	1.29	0.81	0.28
1973-74	26.74	16.73	5.67	3.54	1.17	0.73	0.24
1974-75	25.87	15.87	5.22	3.24	1.06	0.65	0.21
1975-76	25.54	15.65	5.13	3.22	1.10	0.68	0.23
1976-77	25.20	15.35	4.99	3.11	1.05	0.65	0.21
1977-78	25.15	15.25	4.92	3.08	1.06	0.67	-
1978-79	25.01	15.14	4.87	3.02	1.03	0.65	-
1979-80	25.17	15.20	4.83	2.97	1.02	0.65	-
1980-81	25.39	15.31	4.79	2.95	1.02	0.66	-
1981-82	25.31	15.15	4.61	2.83	0.96	0.62	-
1982-83	25.82	15.44	4.67	2.87	1.00	0.63	-
1983-84	25.32	15.16	4.68	2.89	1.02	0.66	-
1984-85	25.50	15.25	4.75	2.96	1.03	-	-
1985-86	25.93	15.63	5.02	3.19	1.14	0.75	0.35
1986-87	26.61	16.17	5.39	3.48	1.29	0.85	0.36
1987-88	28.66	17.94	6.67	4.53	1.89	1.41	0.60
1988-89	30.28	19.84	8.41	6.04	2.99	2.13	0.98
1989-90	27.64	17.46	6.43	4.29	1.79	1.31	0.51
1990-91	27.66	17.37	6.34	4.24	1.79	1.33	0.55
1991-92	28.22	17.70	6.41	4.28	1.81	1.35	0.57
1992-93	28.52	17.95	6.55	4.38	1.87	1.37	0.57
1993-94	29.40	18.66	6.96	4.69	2.08	1.46	0.61
1994-95	29.42	18.87	7.13	5.10	2.56	1.65	0.71
1995-96	29.13	18.76	7.23	4.95	2.14	1.52	0.73
1996-97	29.16	18.77	7.24	4.93	2.07	1.44	0.65
1997-98	30.41	19.73	7.81	5.38	2.32	1.64	0.75
1998-99	30.11	19.63	7.84	5.43	2.37	1.67	0.76
1999-00	31.48	20.95	8.84	6.29	3.04	2.15	-
2000-01	31.28	20.98	9.03	6.44	3.06	2.24	-
2001-02	30.61	20.33	8.31	5.75	2.51	1.75	-
2002-03	31.34	20.90	8.79	6.11	2.68	1.87	-
2003-04	32.04	21.49	9.18	6.46	2.89	2.05	-
2004-05	30.08	20.32	8.89	6.35	2.93	2.11	-
2005-06	30.54	20.72	9.12	6.52	3.05	2.19	-
2006-07	31.81	21.91	10.06	7.38	3.65	2.66	-
2007-08	31.51	21.61	9.84	7.23	3.58	2.63	-
2008-09	29.34	19.85	8.59	6.15	2.91	2.11	-
2009-10	30.56	20.69	8.88	6.33	2.93	2.09	-
2010-11	30.98	21.10	9.17	6.59	3.15	2.29	-

Source: Authors' calculations.

Table A1.2: Top income shares using updated tax tables that distinguish components of income (%)

Year	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%
1970-71	27.65	17.30	5.92	3.74	1.26	0.79	0.27
1971-72	28.24	17.59	5.92	3.70	1.25	0.78	0.27
1972-73	27.80	17.50	6.06	3.81	1.29	0.81	0.28
1973-74	26.74	16.73	5.67	3.54	1.17	0.73	0.24
1974-75	25.87	15.87	5.22	3.24	1.06	0.65	0.21
1975-76	25.54	15.65	5.13	3.22	1.10	0.68	0.23
1976-77	25.20	15.35	4.99	3.11	1.05	0.65	0.21
1977-78	25.15	15.25	4.92	3.08	1.06	0.67	-
1978-79	25.01	15.14	4.87	3.02	1.03	0.65	-
1979-80	25.17	15.20	4.83	2.97	1.02	0.65	-
1980-81	25.39	15.31	4.79	2.95	1.02	0.66	-
1981-82	25.31	15.15	4.61	2.83	0.96	0.62	-
1982-83	25.82	15.44	4.67	2.87	1.00	0.63	-
1983-84	25.32	15.16	4.68	2.89	1.02	0.66	-
1984-85	25.50	15.25	4.75	2.96	1.03	-	-
1985-86	25.93	15.63	5.02	3.19	1.14	0.75	0.35
1986-87	26.61	16.17	5.39	3.48	1.29	0.85	0.36
1987-88	28.66	17.94	6.67	4.53	1.89	1.41	0.60
1988-89	30.28	19.84	8.41	6.04	2.99	2.13	0.98
1989-90	27.58	17.40	6.37	4.23	1.73	1.25	0.46
1990-91	27.58	17.28	6.25	4.15	1.70	1.24	0.46
1991-92	28.12	17.59	6.31	4.18	1.71	1.25	0.47
1992-93	28.51	17.93	6.49	4.31	1.79	1.28	0.48
1993-94	29.00	18.39	6.82	4.57	1.98	1.36	0.53
1994-95	29.49	18.86	7.15	4.84	2.17	1.44	0.58
1995-96	29.01	18.67	7.08	4.80	2.18	1.44	0.59
1996-97	29.07	18.73	7.14	4.84	1.98	1.36	0.56
1997-98	30.23	19.65	7.69	5.26	2.21	1.52	0.63
1998-99	30.04	19.58	7.79	5.38	2.33	1.62	0.70
1999-00	31.50	20.89	8.83	6.27	2.95	2.12	-
2000-01	31.37	21.00	9.03	6.44	3.06	2.24	-
2001-02	30.57	20.24	8.31	5.75	2.51	1.75	-
2002-03	31.53	21.00	8.79	6.11	2.68	1.87	-
2003-04	32.01	21.46	9.19	6.46	2.89	2.05	-
2004-05	30.13	20.31	8.88	6.35	2.93	2.11	-
2005-06	30.51	20.71	9.11	6.51	3.05	2.19	-
2006-07	31.81	21.92	10.01	7.38	3.65	2.66	-
2007-08	31.46	21.60	9.80	7.23	3.58	2.63	-
2008-09	29.26	19.82	8.58	6.15	2.91	2.11	-
2009-10	30.51	20.71	8.88	6.33	2.93	2.09	-
2010-11	31.20	21.30	9.21	6.64	3.17	2.31	-

Source: Authors' calculations.

Table A2: Top income shares using updated population and National Accounts data and updated tax tables that distinguish components of income (%)

Year	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%
1970-71	26.29	16.45	5.62	3.55	1.20	0.75	0.26
1971-72	26.82	16.71	5.63	3.52	1.18	0.74	0.25
1972-73	26.52	16.70	5.79	3.64	1.23	0.77	0.27
1973-74	25.71	16.09	5.45	3.40	1.12	0.70	0.23
1974-75	24.92	15.29	5.03	3.13	1.02	0.63	0.21
1975-76	24.62	15.09	4.95	3.10	1.06	0.66	0.22
1976-77	24.31	14.81	4.81	3.00	1.01	0.62	0.20
1977-78	24.31	14.74	4.76	2.98	1.02	0.65	-
1978-79	24.17	14.64	4.71	2.92	0.99	0.63	-
1979-80	24.33	14.69	4.66	2.87	0.98	0.63	-
1980-81	24.55	14.80	4.63	2.85	0.98	0.64	-
1981-82	24.53	14.68	4.47	2.74	0.93	0.60	-
1982-83	25.15	15.03	4.55	2.79	0.97	0.61	-
1983-84	24.64	14.76	4.56	2.82	0.99	0.64	-
1984-85	24.71	14.78	4.61	2.87	1.00	-	-
1985-86	25.24	15.21	4.88	3.10	1.11	0.73	0.34
1986-87	25.97	15.79	5.27	3.39	1.26	0.83	0.35
1987-88	27.95	17.50	6.50	4.41	1.84	1.38	0.58
1988-89	29.67	19.44	8.24	5.91	2.93	2.08	0.96
1989-90	26.95	17.00	6.23	4.14	1.69	1.22	0.45
1990-91	26.61	16.67	6.03	4.00	1.64	1.20	0.45
1991-92	27.31	17.08	6.13	4.06	1.66	1.21	0.46
1992-93	27.55	17.32	6.27	4.17	1.73	1.24	0.46
1993-94	27.95	17.73	6.57	4.41	1.91	1.31	0.51
1994-95	28.36	18.14	6.88	4.65	2.09	1.39	0.56
1995-96	27.87	17.93	6.80	4.61	2.10	1.39	0.57
1996-97	27.75	17.88	6.81	4.62	1.89	1.30	0.53
1997-98	28.75	18.69	7.31	5.00	2.10	1.45	0.60
1998-99	28.89	18.83	7.49	5.17	2.24	1.56	0.68
1999-00	29.95	19.86	8.40	5.97	2.80	2.02	-
2000-01	30.33	20.30	8.73	6.22	2.96	2.16	-
2001-02	29.18	19.32	7.93	5.49	2.40	1.67	-
2002-03	29.88	19.90	8.33	5.79	2.54	1.77	-
2003-04	29.48	19.76	8.46	5.95	2.66	1.89	-
2004-05	30.08	20.28	8.87	6.34	2.93	2.10	-
2005-06	31.00	21.05	9.26	6.62	3.10	2.22	-
2006-07	31.62	21.79	9.95	7.34	3.63	2.64	-
2007-08	30.93	21.24	9.64	7.11	3.53	2.59	-
2008-09	29.60	20.06	8.68	6.23	2.95	2.14	-
2009-10	30.62	20.79	8.92	6.36	2.95	2.10	-
2010-11	30.77	21.02	9.10	6.56	3.13	2.28	-

Source: Authors' calculations.

Table A3: Top income shares using updated data and tax tables and excluding dividend imputation credits (%)

Year	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%
1970-71	26.29	16.45	5.62	3.55	1.20	0.75	0.26
1971-72	26.82	16.71	5.63	3.52	1.18	0.74	0.25
1972-73	26.52	16.70	5.79	3.64	1.23	0.77	0.27
1973-74	25.71	16.09	5.45	3.40	1.12	0.70	0.23
1974-75	24.92	15.29	5.03	3.13	1.02	0.63	0.21
1975-76	24.62	15.09	4.95	3.10	1.06	0.66	0.22
1976-77	24.31	14.81	4.81	3.00	1.01	0.62	0.20
1977-78	24.31	14.74	4.76	2.98	1.02	0.65	-
1978-79	24.17	14.64	4.71	2.92	0.99	0.63	-
1979-80	24.33	14.69	4.66	2.87	0.98	0.63	-
1980-81	24.55	14.80	4.63	2.85	0.98	0.64	-
1981-82	24.53	14.68	4.47	2.74	0.93	0.60	-
1982-83	25.15	15.03	4.55	2.79	0.97	0.61	-
1983-84	24.64	14.76	4.56	2.82	0.99	0.64	-
1984-85	24.71	14.78	4.61	2.87	1.00	-	-
1985-86	25.24	15.21	4.88	3.10	1.11	0.73	0.34
1986-87	25.97	15.79	5.27	3.39	1.26	0.83	0.35
1987-88	27.42	17.01	6.10	4.10	1.60	1.17	0.48
1988-89	28.22	18.04	7.07	4.84	2.14	1.53	0.59
1989-90	26.51	16.61	5.93	3.90	1.53	1.12	0.39
1990-91	26.17	16.28	5.72	3.74	1.46	1.08	0.38
1991-92	26.91	16.73	5.85	3.82	1.50	1.10	0.39
1992-93	27.12	16.94	5.98	3.91	1.56	1.13	0.38
1993-94	27.40	17.23	6.21	4.08	1.70	1.17	0.40
1994-95	27.68	17.52	6.44	4.24	1.84	1.22	0.42
1995-96	27.18	17.28	6.35	4.19	1.87	1.22	0.45
1996-97	27.11	17.30	6.41	4.27	1.68	1.15	0.44
1997-98	28.04	18.06	6.86	4.63	1.87	1.29	0.52
1998-99	28.16	18.20	7.02	4.80	2.00	1.39	0.59
1999-00	29.09	19.11	7.81	5.50	2.49	1.74	-
2000-01	29.40	19.48	8.12	5.74	2.65	1.88	-
2001-02	28.61	18.83	7.58	5.23	2.25	1.54	-
2002-03	29.20	19.31	7.91	5.46	2.35	1.61	-
2003-04	28.72	19.11	8.01	5.56	2.45	1.70	-
2004-05	29.22	19.55	8.38	5.90	2.67	1.90	-
2005-06	30.09	20.26	8.71	6.18	2.84	2.04	-
2006-07	30.48	20.81	9.29	6.77	3.29	2.39	-
2007-08	29.88	20.32	9.01	6.56	3.20	2.35	-
2008-09	28.60	19.18	8.06	5.71	2.63	1.91	-
2009-10	29.67	19.95	8.34	5.88	2.64	1.88	-
2010-11	29.78	20.12	8.50	6.04	2.81	2.03	-

Source: Authors' calculations.

Table A4: Top income shares using updated data and tax tables and excluding dividend imputation credits and net capital gains (%)

Year	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%
1970-71	26.29	16.45	5.62	3.55	1.20	0.75	0.26
1971-72	26.84	16.73	5.64	3.53	1.19	0.75	0.26
1972-73	26.50	16.67	5.77	3.62	1.22	0.76	0.26
1973-74	25.67	16.05	5.42	3.38	1.11	0.69	0.23
1974-75	24.91	15.28	5.02	3.12	1.02	0.62	0.20
1975-76	24.60	15.07	4.94	3.09	1.05	0.65	0.22
1976-77	24.30	14.80	4.80	2.99	1.01	0.62	0.20
1977-78	24.30	14.73	4.75	2.97	1.02	0.65	-
1978-79	24.16	14.62	4.70	2.92	0.99	0.63	-
1979-80	24.28	14.65	4.64	2.85	0.97	0.62	-
1980-81	24.52	14.77	4.61	2.83	0.97	0.63	-
1981-82	24.52	14.68	4.47	2.73	0.93	0.60	-
1982-83	25.14	15.03	4.54	2.79	0.97	0.61	-
1983-84	24.63	14.74	4.55	2.81	0.99	0.63	-
1984-85	24.70	14.77	4.60	2.86	0.99	-	-
1985-86	25.22	15.19	4.87	3.09	1.10	0.72	0.34
1986-87	25.83	15.66	5.17	3.31	1.20	0.79	0.34
1987-88	27.27	16.88	6.01	4.03	1.56	1.13	0.45
1988-89	27.96	17.81	6.93	4.74	2.08	1.51	0.58
1989-90	26.30	16.44	5.82	3.81	1.48	1.09	0.38
1990-91	26.01	16.15	5.64	3.68	1.42	1.05	0.36
1991-92	26.73	16.59	5.77	3.76	1.46	1.08	0.38
1992-93	26.91	16.77	5.88	3.84	1.50	1.09	0.36
1993-94	27.14	17.01	6.09	3.97	1.63	1.14	0.38
1994-95	27.38	17.25	6.31	4.11	1.76	1.19	0.40
1995-96	26.79	16.93	6.14	3.99	1.75	1.15	0.39
1996-97	26.60	16.85	6.14	4.03	1.54	1.05	0.39
1997-98	27.31	17.43	6.44	4.29	1.66	1.15	0.43
1998-99	27.36	17.53	6.54	4.40	1.74	1.21	0.47
1999-00	28.22	18.37	7.22	5.02	2.13	1.43	-
2000-01	28.53	18.71	7.50	5.22	2.25	1.51	-
2001-02	27.77	18.09	7.05	4.81	1.96	1.28	-
2002-03	28.30	18.54	7.36	5.04	2.08	1.36	-
2003-04	27.43	18.02	7.25	4.95	2.05	1.32	-
2004-05	27.77	18.30	7.52	5.11	2.13	1.41	-
2005-06	28.33	18.70	7.59	5.23	2.15	1.44	-
2006-07	27.95	18.60	7.73	5.45	2.35	1.65	-
2007-08	27.82	18.49	7.69	5.38	2.31	1.61	-
2008-09	27.71	18.39	7.50	5.23	2.26	1.59	-
2009-10	28.73	19.11	7.77	5.40	2.30	1.61	-
2010-11	28.80	19.23	7.85	5.47	2.38	1.66	-

Source: Authors' calculations.

Table A4.1: Increase in top income shares from including imputation credits and taxable realized capital gains (%)

Year	Top 10-5%	Top 5-1%	Top 1%	Top 1-0.5%	Top 0.5-0.1%	Top 0.1%
1985-86	0.00	0.10	0.21	0.00	0.00	0.91
1986-87	0.20	0.29	1.93	0.54	1.42	5.00
1987-88	0.67	1.20	8.15	5.56	3.63	17.95
1988-89	0.79	2.94	18.90	6.39	12.41	40.87
1989-90	0.91	1.41	7.04	3.98	5.15	14.19
1990-91	0.81	1.33	6.91	3.57	4.42	15.49
1991-92	0.69	1.29	6.24	2.99	4.35	13.70
1992-93	0.89	1.47	6.63	3.43	4.29	15.33
1993-94	0.89	2.20	7.88	1.89	6.84	17.18
1994-95	0.89	2.83	9.03	0.91	9.36	18.75
1995-96	0.81	3.24	10.75	1.86	12.05	20.00
1996-97	1.23	3.36	10.91	4.29	9.64	22.73
1997-98	1.82	3.55	13.51	7.44	10.27	26.51
1998-99	2.24	3.18	14.53	8.92	10.15	28.74
1999-00	2.34	2.78	16.34	9.95	9.34	31.46
2000-01	2.04	3.30	16.40	9.17	10.14	31.56
2001-02	1.96	3.17	12.48	9.38	8.42	22.45
2002-03	2.25	3.49	13.18	9.48	9.80	22.12
2003-04	3.08	4.92	16.69	9.13	13.45	29.76
2004-05	3.48	5.84	17.95	4.98	14.05	37.56
2005-06	3.32	6.12	22.00	11.86	14.29	44.19
2006-07	5.35	8.83	28.72	14.91	18.97	54.47
2007-08	3.86	7.41	25.36	10.00	16.61	52.81
2008-09	2.47	4.50	15.73	8.37	10.44	30.53
2009-10	2.08	4.76	14.80	8.47	10.32	28.26
2010-11	1.88	4.75	15.92	6.72	11.00	31.51

Source: Authors' calculations based on Appendix Tables A2 and A4. Estimates for top x% income group are calculated as: $100 * [\text{top } x\% (A2) - \text{top } x\% (A4)] / \text{top } x\% (A4)$.

Table A4.2: Top income shares using updated data and tax tables and excluding dividend imputation credits and net capital gains (%)

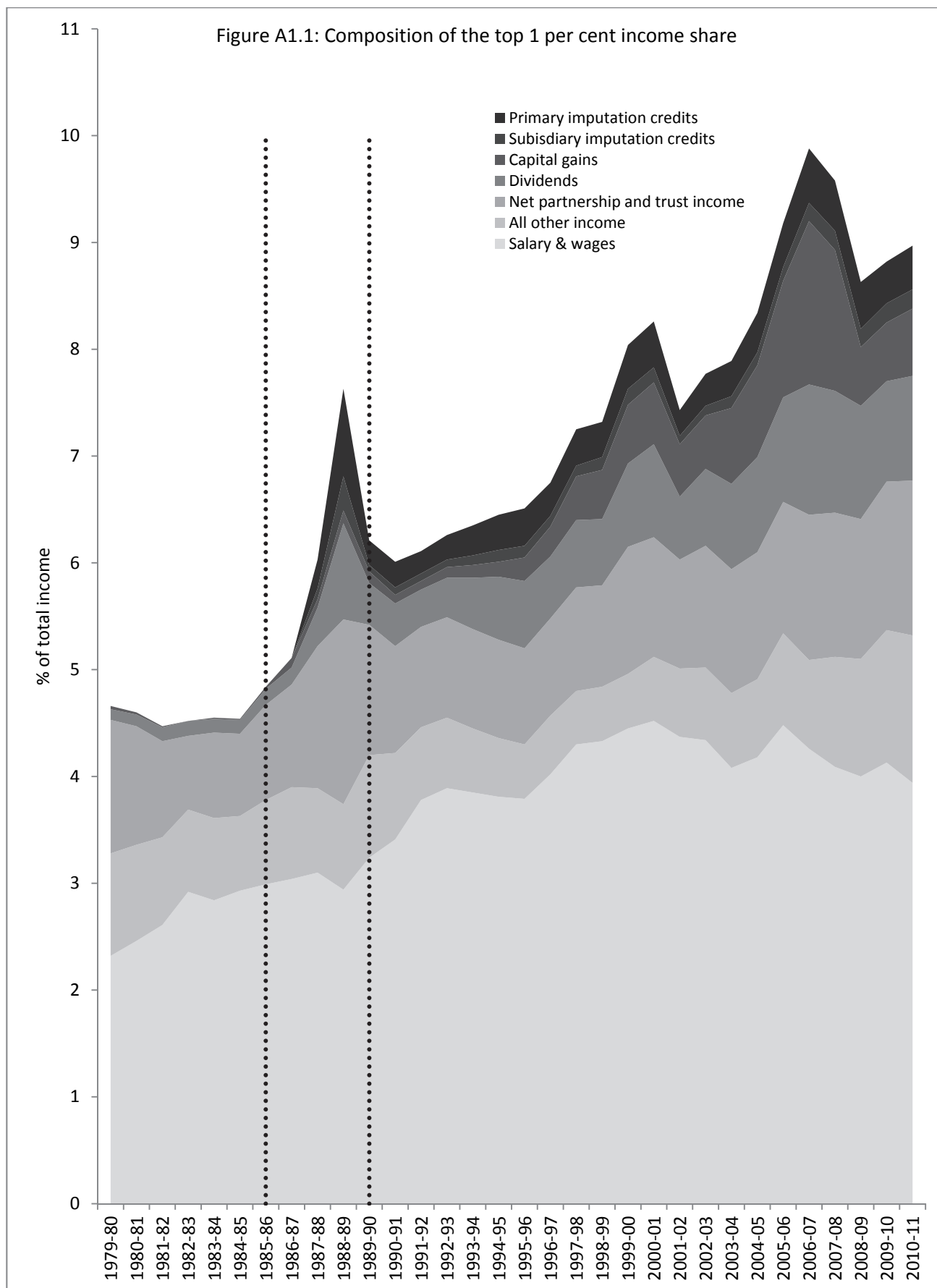
Year	Top 10-5%	Top 5-1%	Top 1%	Top 1-0.5%	Top 0.5-0.1%	Top 0.1%
1970-71	9.84	10.82	5.62	2.07	2.35	1.20
1971-72	10.12	11.08	5.64	2.11	2.34	1.19
1972-73	9.82	10.91	5.77	2.14	2.41	1.22
1973-74	9.62	10.63	5.42	2.04	2.27	1.11
1974-75	9.63	10.26	5.02	1.90	2.10	1.02
1975-76	9.53	10.13	4.94	1.85	2.04	1.05
1976-77	9.50	10.00	4.80	1.81	1.99	1.01
1977-78	9.57	9.98	4.75	1.78	1.95	1.02
1978-79	9.54	9.92	4.70	1.78	1.93	0.99
1979-80	9.63	10.01	4.64	1.79	1.88	0.97
1980-81	9.74	10.16	4.61	1.78	1.86	0.97
1981-82	9.85	10.21	4.47	1.73	1.80	0.93
1982-83	10.11	10.48	4.54	1.75	1.82	0.97
1983-84	9.88	10.20	4.55	1.74	1.82	0.99
1984-85	9.93	10.17	4.60	1.74	1.87	0.99
1985-86	10.03	10.32	4.87	1.78	1.99	1.10
1986-87	10.17	10.49	5.17	1.86	2.11	1.20
1987-88	10.38	10.87	6.01	1.98	2.48	1.56
1988-89	10.15	10.88	6.93	2.19	2.66	2.08
1989-90	9.86	10.62	5.82	2.01	2.33	1.48
1990-91	9.86	10.51	5.64	1.96	2.26	1.42
1991-92	10.15	10.82	5.77	2.01	2.30	1.46
1992-93	10.14	10.89	5.88	2.04	2.33	1.50
1993-94	10.13	10.92	6.09	2.12	2.34	1.63
1994-95	10.13	10.95	6.31	2.20	2.35	1.76
1995-96	9.86	10.79	6.14	2.15	2.24	1.75
1996-97	9.75	10.71	6.14	2.10	2.49	1.54
1997-98	9.88	10.99	6.44	2.15	2.63	1.66
1998-99	9.83	10.99	6.54	2.13	2.66	1.74
1999-00	9.85	11.15	7.22	2.21	2.89	2.13
2000-01	9.82	11.21	7.50	2.29	2.96	2.25
2001-02	9.67	11.04	7.05	2.24	2.85	1.96
2002-03	9.76	11.18	7.36	2.32	2.96	2.08
2003-04	9.42	10.77	7.25	2.30	2.90	2.05
2004-05	9.47	10.78	7.52	2.41	2.99	2.13
2005-06	9.63	11.11	7.59	2.36	3.08	2.15
2006-07	9.34	10.87	7.73	2.28	3.11	2.35
2007-08	9.33	10.80	7.69	2.30	3.07	2.31
2008-09	9.31	10.89	7.50	2.27	2.97	2.26
2009-10	9.62	11.34	7.77	2.36	3.10	2.30
2010-11	9.57	11.38	7.85	2.38	3.09	2.38

Source: Authors' calculations derived from Appendix Table A4.

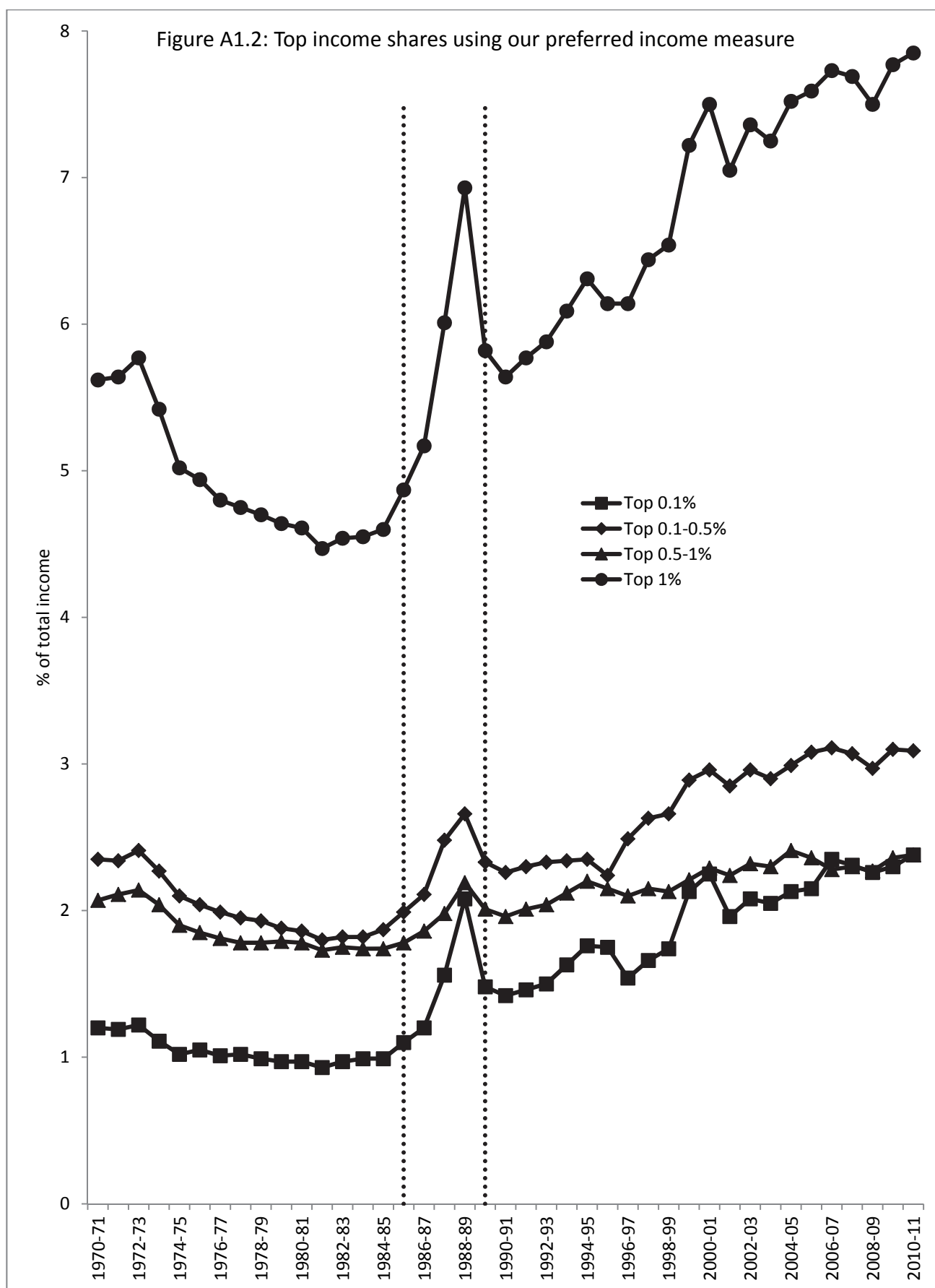
Table A5: Percentage point change in top income shares as a result of excluding imputation credits and taxable capital gains (%)

Year	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.05%	Top 0.01%
1970-71	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1971-72	0.02	0.02	0.01	0.01	0.01	0.01	0.01
1972-73	-0.02	-0.03	-0.02	-0.02	-0.01	-0.01	-0.01
1973-74	-0.04	-0.04	-0.03	-0.02	-0.01	-0.01	0.00
1974-75	-0.01	-0.01	-0.01	-0.01	0.00	-0.01	-0.01
1975-76	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	0.00
1976-77	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00
1977-78	-0.01	-0.01	-0.01	-0.01	0.00	0.00	-
1978-79	-0.01	-0.02	-0.01	0.00	0.00	0.00	-
1979-80	-0.05	-0.04	-0.02	-0.02	-0.01	-0.01	-
1980-81	-0.03	-0.03	-0.02	-0.02	-0.01	-0.01	-
1981-82	-0.01	0.00	0.00	-0.01	0.00	0.00	-
1982-83	-0.01	0.00	-0.01	0.00	0.00	0.00	-
1983-84	-0.01	-0.02	-0.01	-0.01	0.00	-0.01	-
1984-85	-0.01	-0.01	-0.01	-0.01	-0.01	-	-
1985-86	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	0.00
1986-87	-0.14	-0.13	-0.10	-0.08	-0.06	-0.04	-0.01
1987-88	-0.68	-0.62	-0.49	-0.38	-0.28	-0.25	-0.13
1988-89	-1.71	-1.63	-1.31	-1.17	-0.85	-0.57	-0.38
1989-90	-0.65	-0.56	-0.41	-0.33	-0.21	-0.13	-0.07
1990-91	-0.60	-0.52	-0.39	-0.32	-0.22	-0.15	-0.09
1991-92	-0.58	-0.49	-0.36	-0.30	-0.20	-0.13	-0.08
1992-93	-0.64	-0.55	-0.39	-0.33	-0.23	-0.15	-0.10
1993-94	-0.81	-0.72	-0.48	-0.44	-0.28	-0.17	-0.13
1994-95	-0.98	-0.89	-0.57	-0.54	-0.33	-0.20	-0.16
1995-96	-1.08	-1.00	-0.66	-0.62	-0.35	-0.24	-0.18
1996-97	-1.15	-1.03	-0.67	-0.59	-0.35	-0.25	-0.14
1997-98	-1.44	-1.26	-0.87	-0.71	-0.44	-0.30	-0.17
1998-99	-1.53	-1.30	-0.95	-0.77	-0.50	-0.35	-0.21
1999-00	-1.73	-1.49	-1.18	-0.95	-0.67	-0.59	-
2000-01	-1.80	-1.59	-1.23	-1.00	-0.71	-0.65	-
2001-02	-1.41	-1.23	-0.88	-0.68	-0.44	-0.39	-
2002-03	-1.58	-1.36	-0.97	-0.75	-0.46	-0.41	-
2003-04	-2.05	-1.74	-1.21	-1.00	-0.61	-0.57	-
2004-05	-2.31	-1.98	-1.35	-1.23	-0.80	-0.69	-
2005-06	-2.67	-2.35	-1.67	-1.39	-0.95	-0.78	-
2006-07	-3.67	-3.19	-2.22	-1.89	-1.28	-0.99	-
2007-08	-3.11	-2.75	-1.95	-1.73	-1.22	-0.98	-
2008-09	-1.89	-1.67	-1.18	-1.00	-0.69	-0.55	-
2009-10	-1.89	-1.68	-1.15	-0.96	-0.65	-0.49	-
2010-11	-1.97	-1.79	-1.25	-1.09	-0.75	-0.62	-

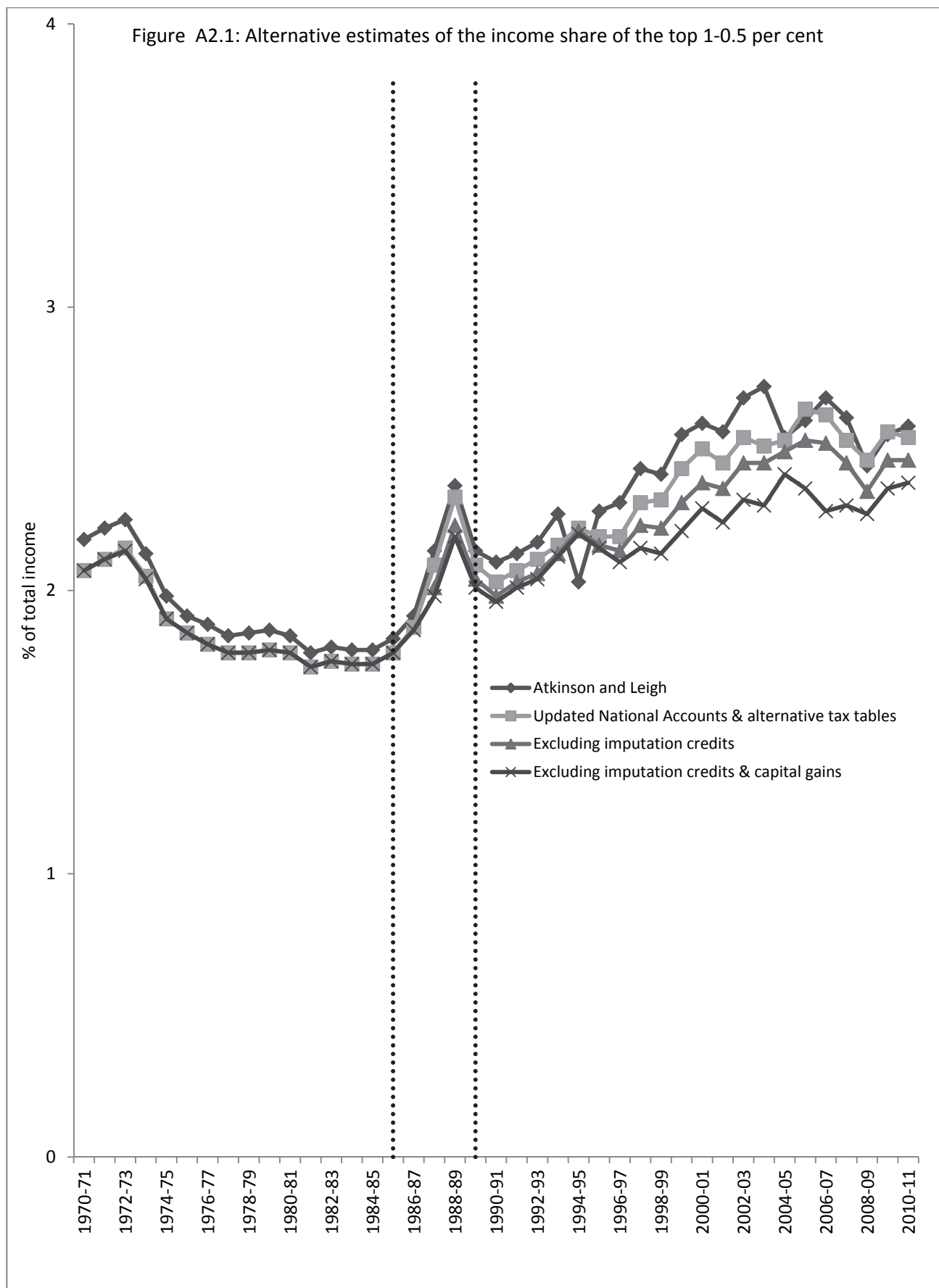
Source: Authors' calculations. Note: Estimates are obtained by subtracting each estimate in Table A4 from the corresponding estimate in Table A2.



Sources: Authors' calculations.

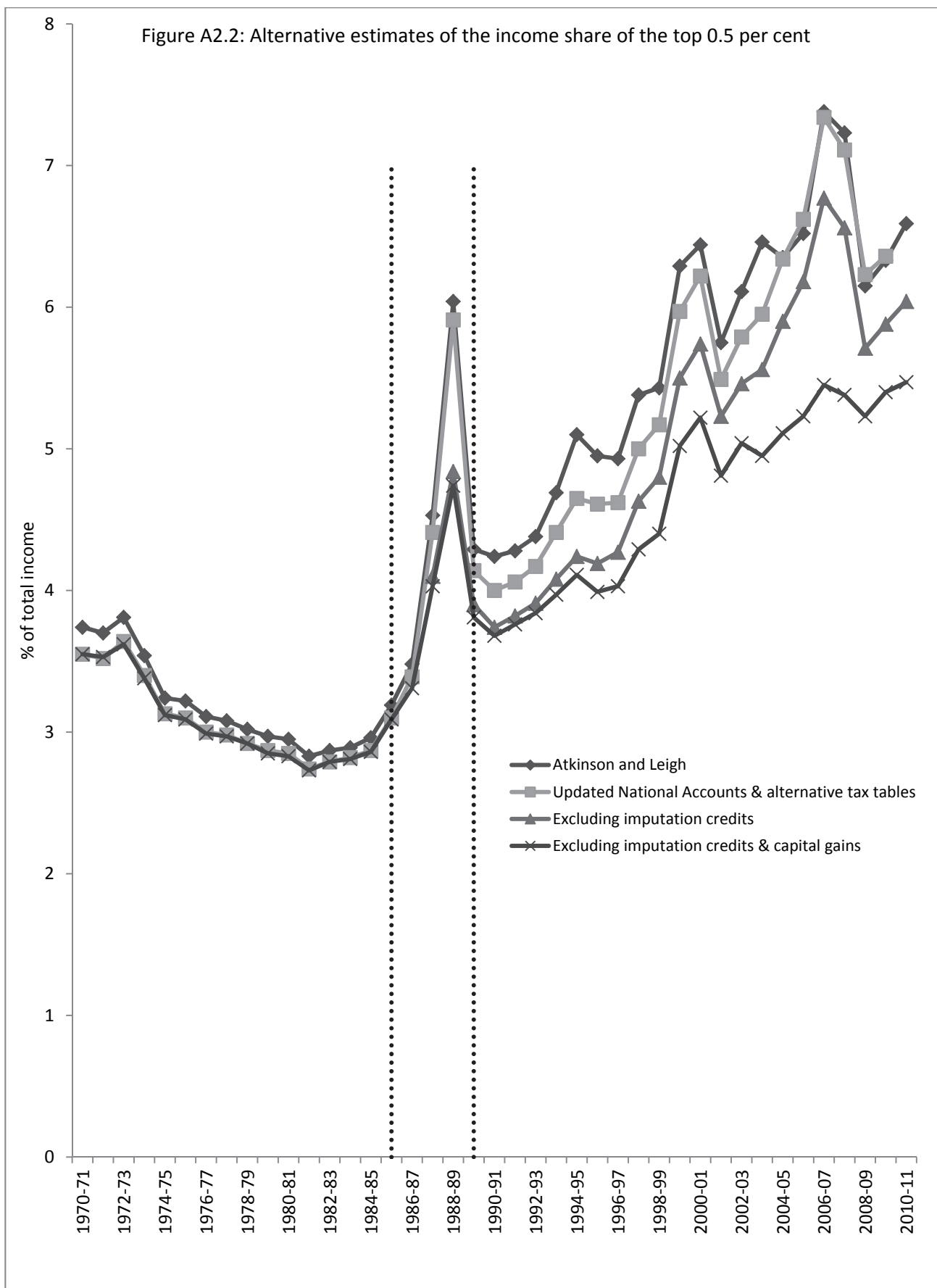


Sources: Authors' calculations.



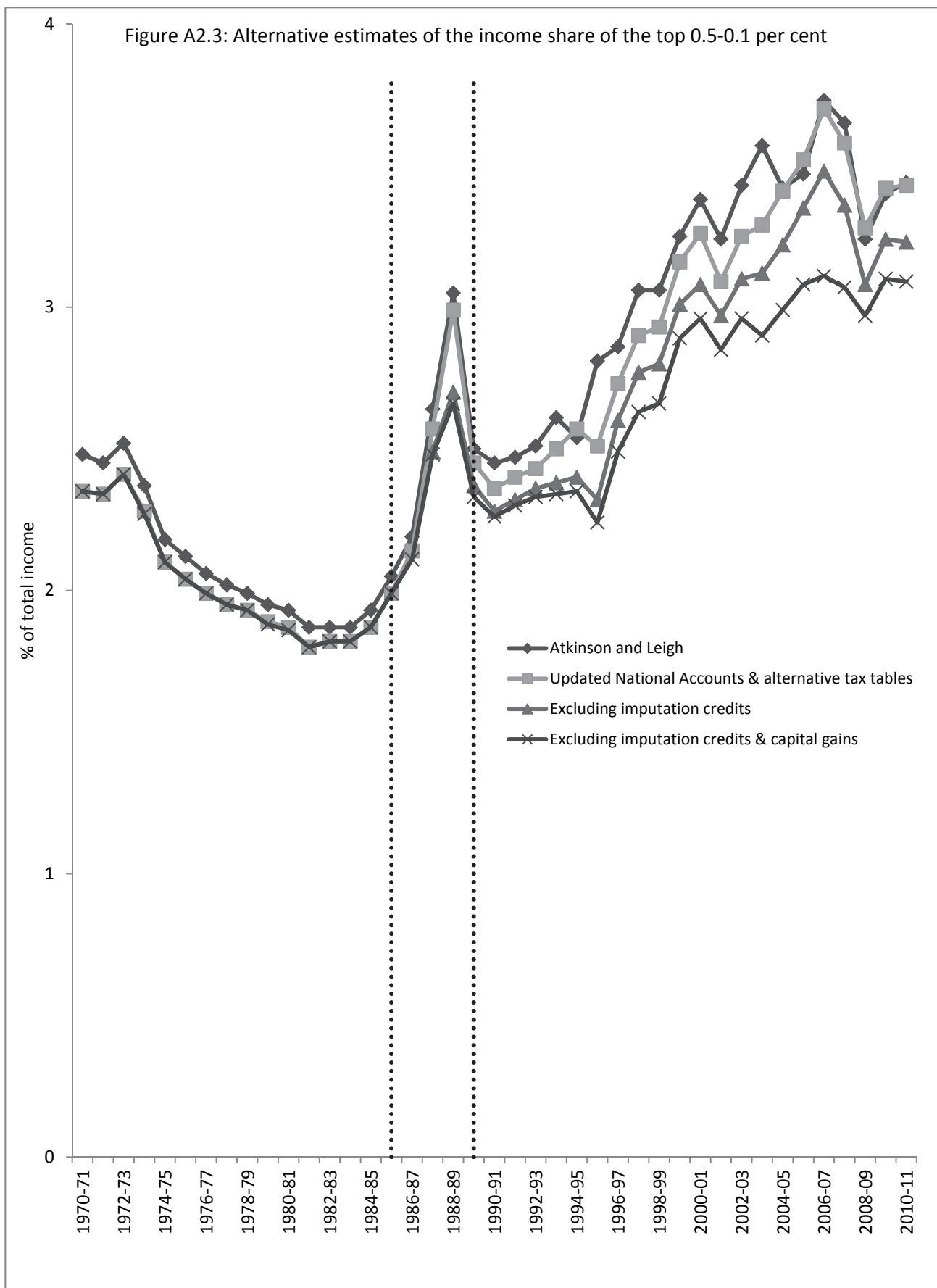
Source: Authors' calculations.

Figure A2.2: Alternative estimates of the income share of the top 0.5 per cent



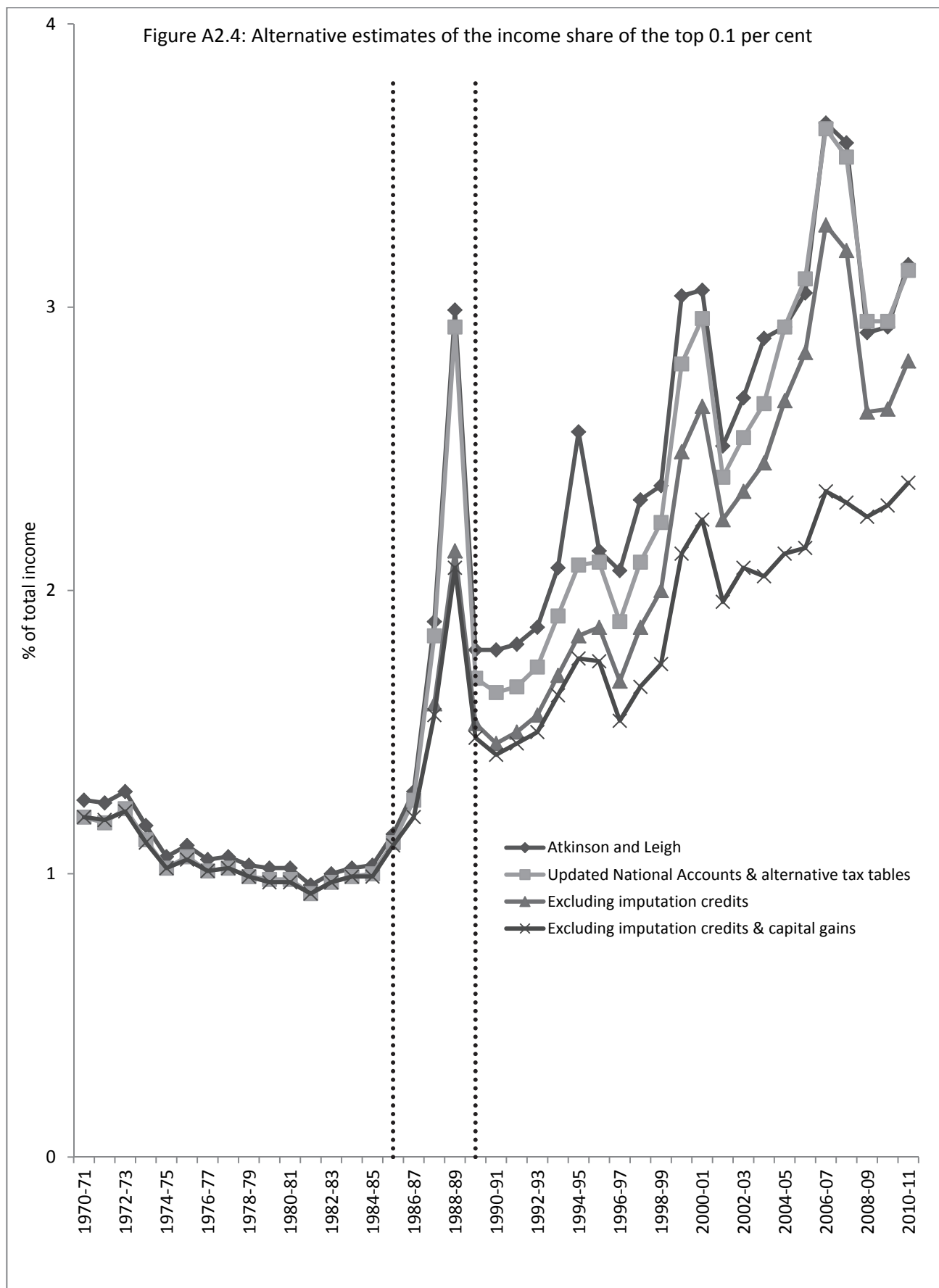
Source: Authors' calculations.

Figure A2.3: Alternative estimates of the income share of the top 0.5-0.1 per cent



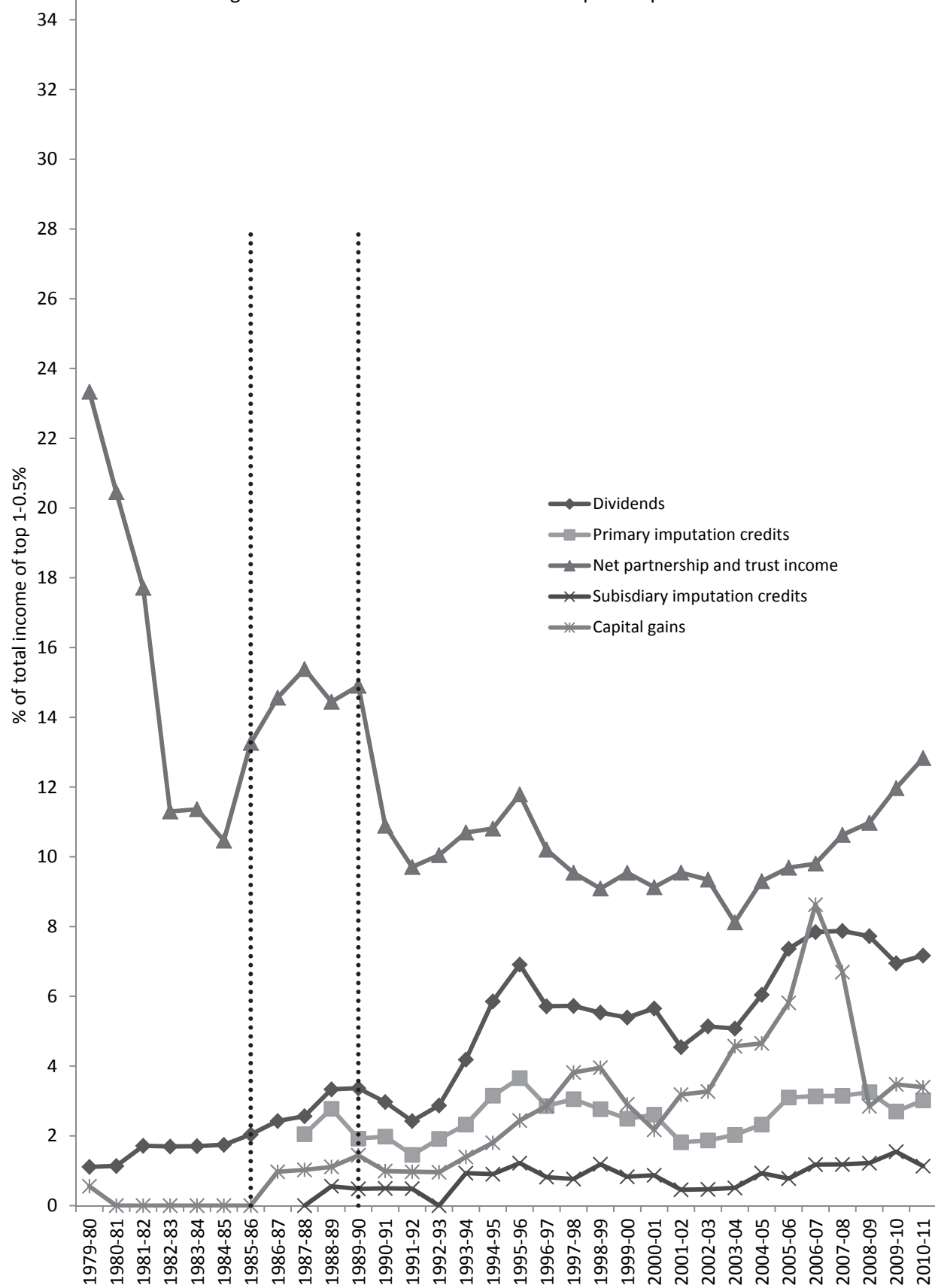
Source: Authors' calculations.

Figure A2.4: Alternative estimates of the income share of the top 0.1 per cent



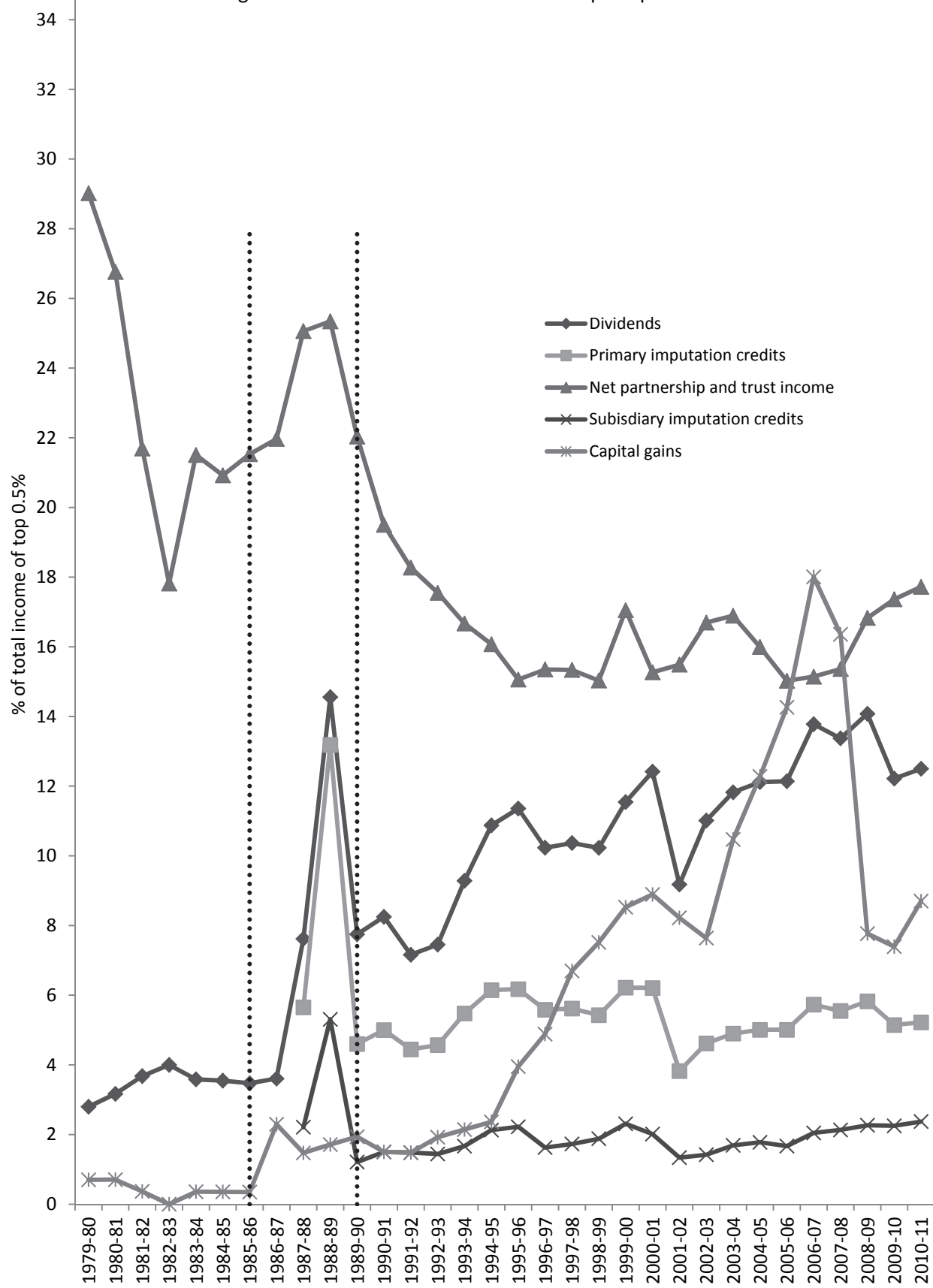
Source: Authors' calculations.

Figure A3.1: Portfolio of income of the top 1-0.5 per cent



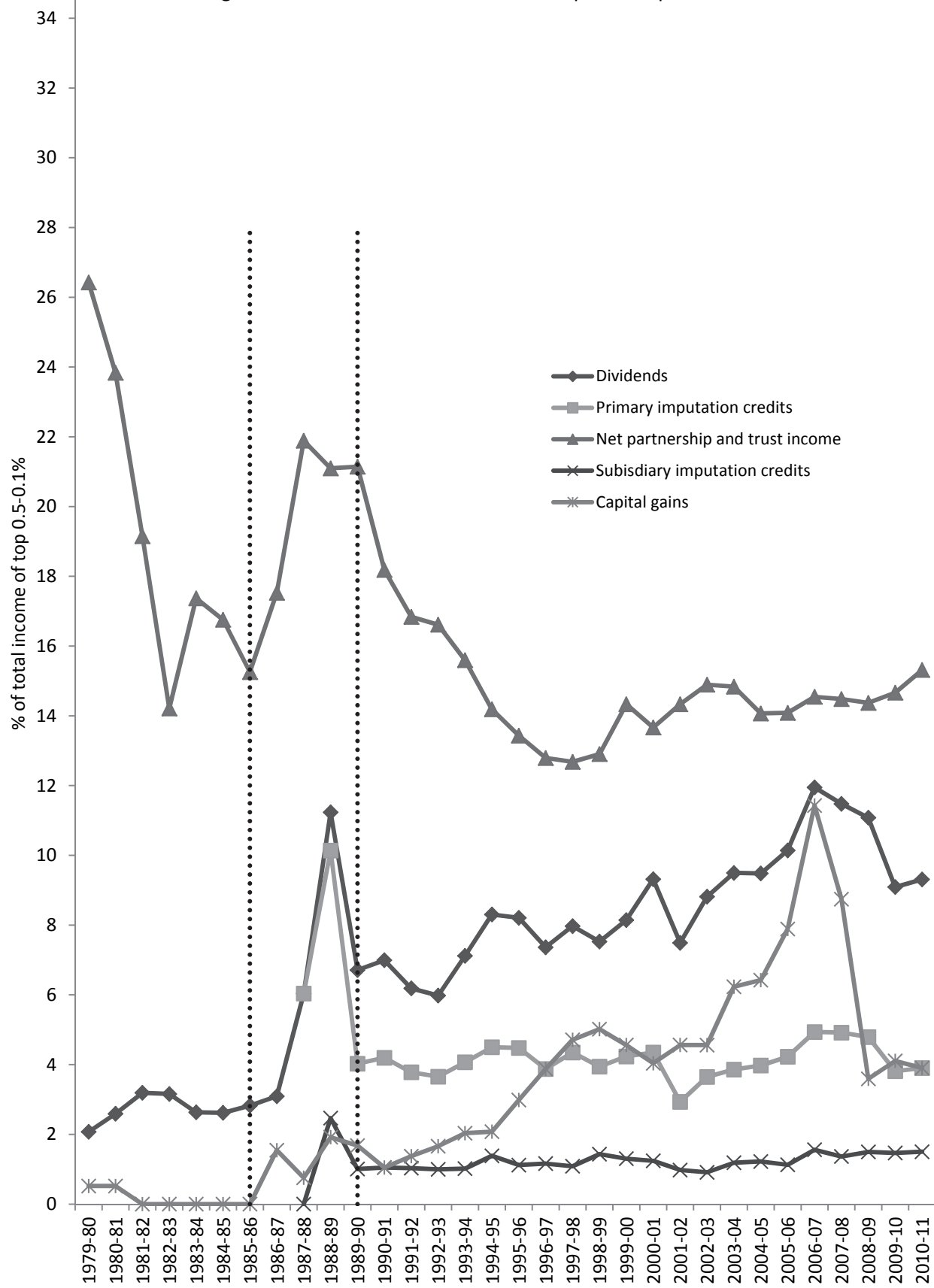
Source: Authors' calculations.

Figure A3.2: Portfolio of income of the top 0.5 per cent



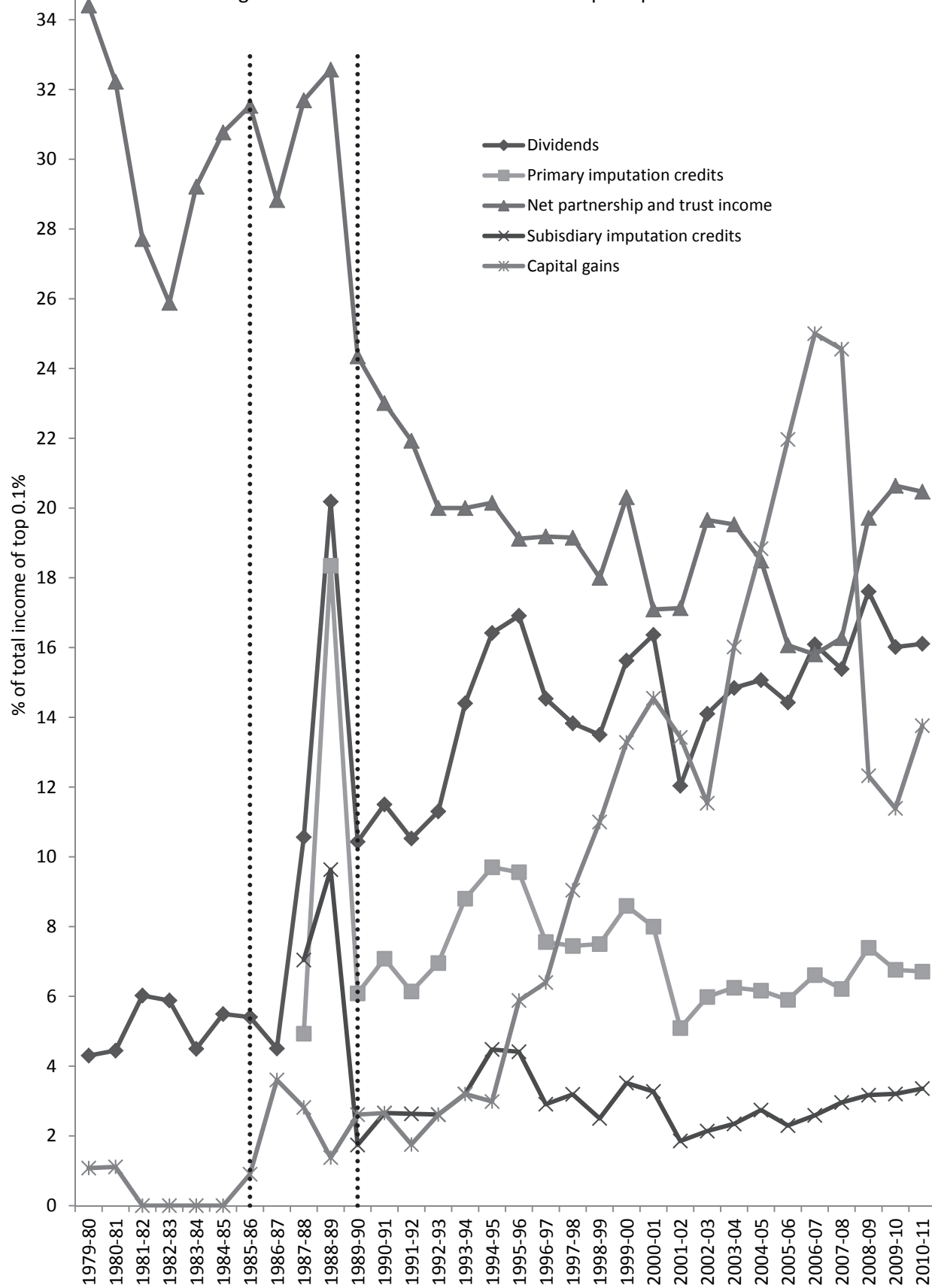
Source: Authors' calculations.

Figure A3.3: Portfolio of income of the top 0.5-0.1 per cent



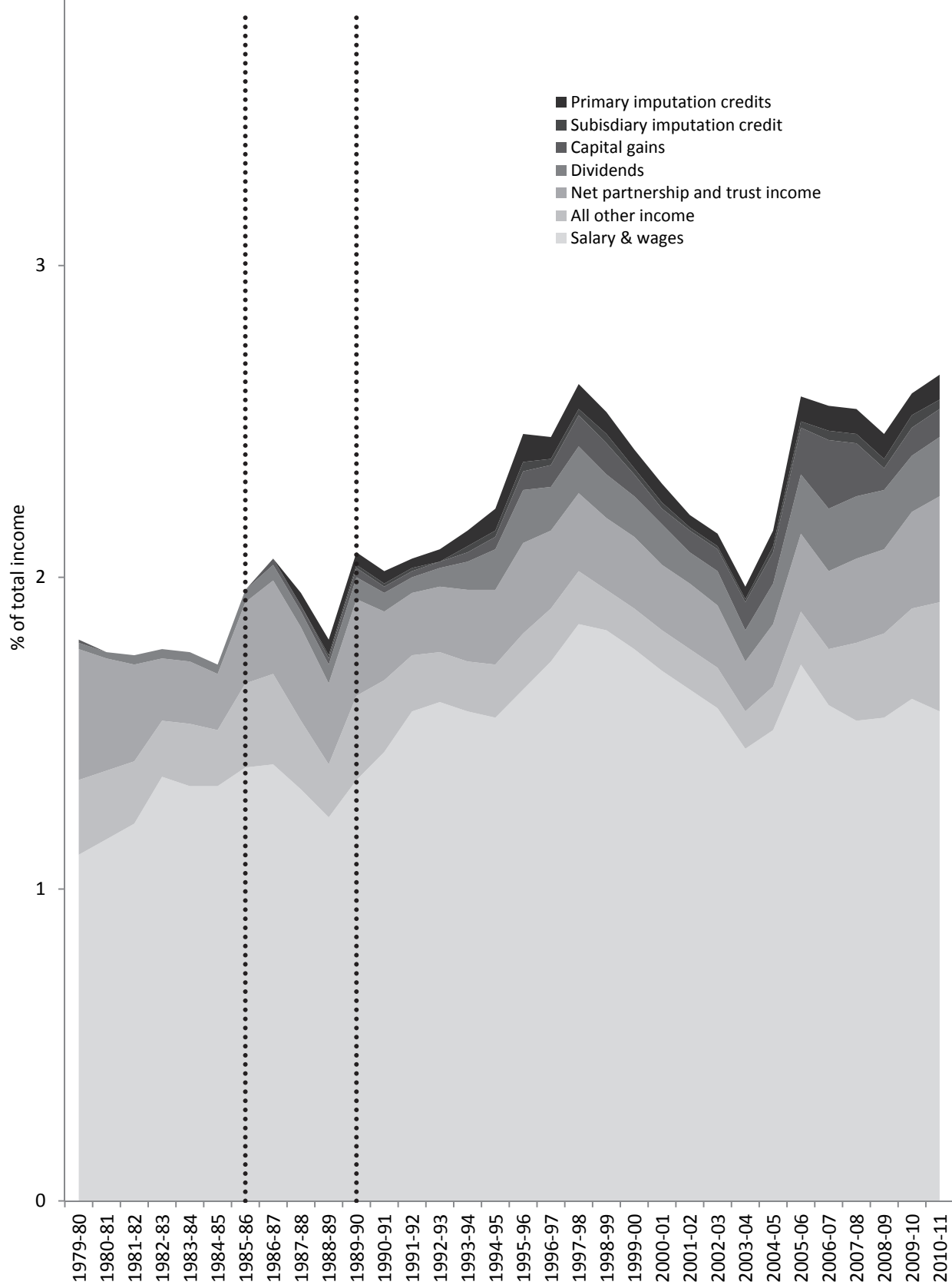
Source: Authors' calculations.

Figure A3.4: Portfolio of income of the top 0.1 per cent



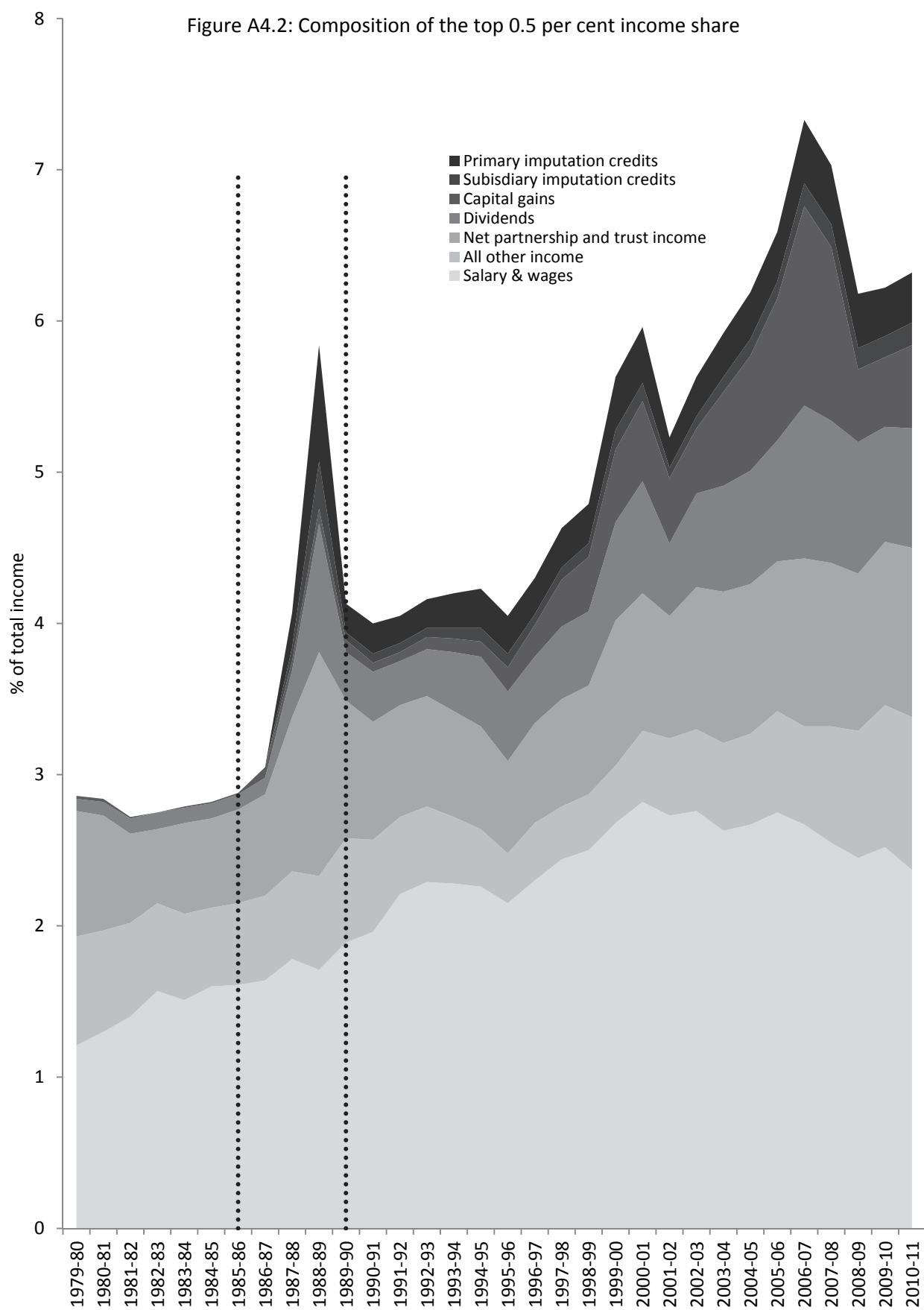
Source: Authors' calculations.

Figure A4.1: Composition of the top 1-0.5 per cent income share

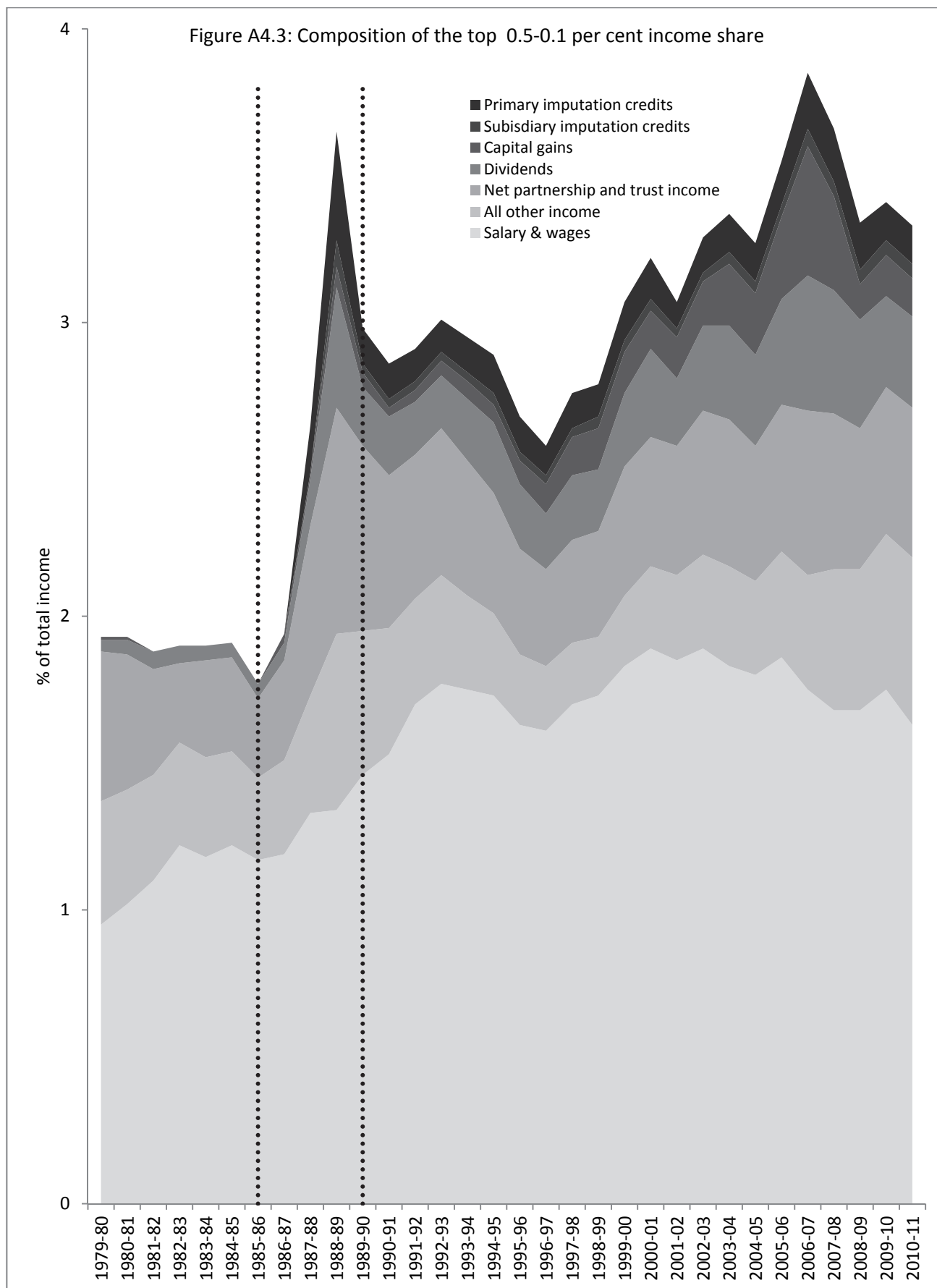


Source: Authors' calculations.

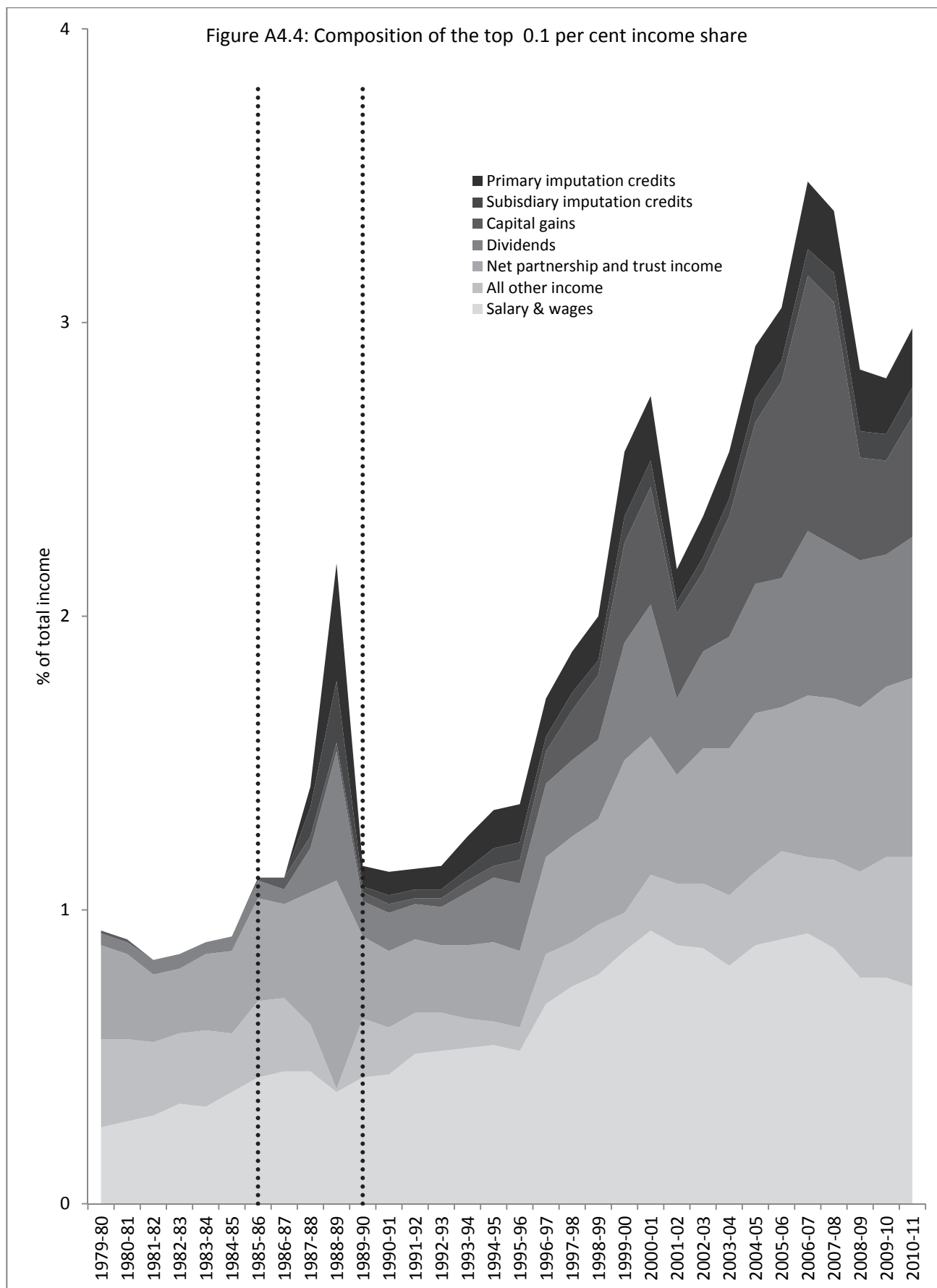
Figure A4.2: Composition of the top 0.5 per cent income share



Source: Authors' calculations.



Source: Authors' calculations.



Source: Authors' calculations.

Table A6: Alternative Table 2 —Distribution of alternative measures of capital gains, 2006 and 2009—Including negative capital gains values

	Realized taxable capital gains		Accrued taxable capital gains		Accrued non-taxable capital gains		Accrued taxable and non-taxable capital gains	
	\$	(%)	\$	(%)	\$	(%)	\$	(%)
2006-07								
<i>Location in income distribution</i>								
Bottom 90%								
Percentiles 91 to 95	1,054	57.7	6,522	25.8	11,876	36.3	22,163	38.2
Percentiles 96 to 99	2,336	6.8	60,806	13.3	113,683	19.3	173,443	16.6
Top percentile	5,986	14.5	171,055	30.1	196,967	26.8	344,453	26.4
Total	34,727	20.9	707,523	30.8	517,867	17.5	982,989	18.7
Mean	26,229,391,372	100.0	362,514,535,198	100.0	468,264,416,549	100.0	830,778,951,202	100.0
Median	1,648		22,772		29,415		52,188	
	1,037		0		6,833		12,994	
2009-10								
<i>Location in income distribution</i>								
Bottom 90%								
Percentiles 91 to 95	385	68.3	889	21.8	-1,878	-21.3	89	0.7
Percentiles 96 to 99	545	5.1	16,812	22.9	50,156	31.6	61,907	26.6
Top percentile	1,963	15.4	29,608	32.2	103,339	52.1	125,368	43.3
Total	5,700	11.2	85,238	23.1	297,788	37.6	343,534	29.4
Mean	8,669,889,477	100.0	62,650,186,282	100.0	135,077,051,913	100.0	197,727,237,587	100.0
Median	509		3,675		7,925		11,600	
	359		0		-14		0	

Notes: For incomes by location in the income distribution, individuals are ordered in each column by the income measure indicated in the column heading. Dollar amounts are in 2009-10 Australian dollars.

Table A7: Alternative Table 3—Distribution of income using alternative measures of capital gains, 2006 and 2009—Including negative capital gains values

	Income without capital gains		Income with realized taxable capital gains		Income with accrued taxable capital gains		Income with accrued non-taxable capital gains		Income with accrued taxable and non-taxable capital gains	
	\$	(%)	\$	(%)	\$	(%)	\$	(%)	\$	(%)
2006-07										
Location in income distribution										
Bottom 90%	29,170	63.7	30,225	63.5	38,078	53.5	43,995	56.0	54,948	52.9
Percentiles 91 to 95	97,515	11.3	99,851	11.1	155,854	12.1	199,891	14.1	259,085	13.9
Percentiles 96 to 99	147,899	14.3	153,884	14.3	299,539	18.7	320,957	18.2	459,103	19.7
Top percentile	441,509	10.6	476,236	11.0	1,009,953	15.7	829,959	11.7	1,275,568	13.6
Total	657,294,375,852	100.0	683,523,765,745	100.0	1,019,808,907,295	100.0	1,125,558,787,542	100.0	1,488,073,320,574	100.0
Mean	41,290		42,937		64,062		70,705		93,477	
Median	29,233		31,208		37,211		45,830		52,500	
2009-10										
Location in income distribution										
Bottom 90%	30,104	63.7	30,489	63.7	31,590	61.3	31,010	55.1	33,073	54.8
Percentiles 91 to 95	102,568	11.3	103,113	11.3	115,079	12.4	140,648	13.9	151,835	14.0
Percentiles 96 to 99	155,032	14.5	156,996	14.5	177,622	15.3	235,964	18.6	256,294	18.9
Top percentile	449,227	10.5	454,927	10.5	509,726	11.0	625,241	12.4	673,798	12.3
Total	727,831,670,558	100.0	736,501,561,146	100.0	790,481,856,906	100.0	862,908,722,287	100.0	925,558,907,738	100.0
Mean	42,699		43,208		46,375		50,624		54,299	
Median	29,996		30,644		30,996		35,327		36,996	

Notes: Includes negative capital gains. For incomes by location in the income distribution, individuals are ordered in each column by the income measure indicated in the column heading. Dollar amounts are in 2009-10 Australian dollars

Sources and methods used to calculate top income shares using taxation data

Calculation of top income shares using taxation data is undertaken by drawing on tabulations of the number of taxpayers in each of a number of income ranges or brackets. These tables permit identification of the number of taxpayers above specified thresholds and the total income they declared to the tax office. This information is then brought together with information on the total number of people in the population and estimates of the total income of the population, commonly referred to in the literature as control totals for population and income.

Because we are interested in particular population thresholds (such as the top 1 per cent) that will almost certainly not coincide with the tabulated income brackets, we need a method to impute incomes of those members of the lowest income band containing the population of interest. For example, if the 99th percentile falls in the \$200,000 to \$220,000 income band, to obtain the income share of the top 1 per cent, a method is required for imputing the incomes of the members of the top 1 per cent in that income band. Two methods have been used in the literature: Pareto imputation and the mean-split histogram method. We use the mean-split histogram method to be consistent with the existing Australian literature.

The methods described below resemble closely those in Atkinson and Leigh (2005, 2007)—henceforth AL. Throughout the text, we will mention whenever our methods deviate from AL. In this Appendix we first introduce the control totals for population and income, followed by a description of the taxation tables and related issues. We then describe how we exclude dividend imputation credits and capital gains from the top income share series. Finally, we provide a description of the mean-split histogram method.

Control total for population

We choose as the control population every person aged 15 years and over. We use the most recent population estimates from Australian Bureau of Statistics (ABS) published data in *Australian Demographic Statistics, Sep 2012: Table 59. Estimated Resident Population By Single Year Of Age, Australia* (Catalogue No. 3101.0) (ABS 2013a). This table contains population estimates for Australia by tax year (financial year), gender and age. The control total for the population is simply the total number of persons aged 15 and over in each year.

The population totals we use are slightly different from those used by AL, who use different releases of the population estimates, whereas we only use the most recent release, which contains population estimates for all years back to 1970. In principle, using different versions may affect the consistency of the top income shares over time. Our analysis shows, however, that this does not in practice significantly affect population totals.

Control total for income

The control total for income is calculated from various income aggregates found in the National Accounts, in particular in the household income account. The data are published by the ABS in *The Australian System of National Accounts 2011-12: Table 36. Household Income Account, Current Prices* (Catalogue No. 5204.0) (ABS 2012). This table contains income earned by persons living in Australia and by unincorporated businesses owned by Australian households.

The income total is defined as the sum of gross mixed income, compensation of employees, interest, dividends, workers' compensation, and social assistance benefits, minus interest payable by unincorporated enterprises and household sector consumption of fixed capital. Table A8 provides descriptions of the main components. It is notable that most capital gains are not included in the control total for income—some capital gains of unincorporated enterprises may be included in gross mixed income, but no other capital gains are captured.

Table A8: Components of control total for income

	ABS description (if available)
Positive components:	
1. Gross mixed income	The surplus or deficit accruing from production by unincorporated enterprises. It includes elements of both compensation of employees (returns on labour inputs) and operating surplus (returns on capital inputs).
2. Compensation of employees	The total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done by the employee during the accounting period. It is further classified into two sub-components: wages and salaries; and employers' social contributions. Compensation of employees is not payable in respect of unpaid work undertaken voluntarily, including the work done by members of a household within an unincorporated enterprise owned by the same household. Compensation of employees excludes any taxes payable by the employer on the wage and salary bill (e.g. payroll tax).
3. Property income receivable: Interest	
4. Property income receivable: Dividends	
5. Secondary income receivable: Social benefits receivable: Workers' compensation	
6. Secondary income receivable: Social benefits receivable: Social assistance benefits	Includes current transfers to persons from general government in return for which no services are rendered or goods supplied. Principal components include: scholarships; maternity, sickness and unemployment benefits; family allowances; and widows', age, invalid and repatriation pensions.
Negative components:	
7. Property income payable: Interest payable: Unincorporated enterprises	
8. Household sector consumption of fixed capital	The reduction in the value of fixed assets used in production during the accounting period resulting from physical deterioration, normal obsolescence or normal accidental damage. Unforeseen obsolescence, major catastrophes and the depletion of natural resources are not taken into account.

Note: The control total for income is the sum of the positive components minus the sum of the negative components.

We employ the most recent release of the National Accounts data available (as at the time of writing), which was published in November 2012. This release provides the best and most consistently measured income data currently available for all years that we examine. That is, the most recent release incorporates, for all years under study, all revisions to estimates made subsequent to first release and, insofar as possible, applies consistent definitions and approaches to measurement across all years. AL, on the other hand, use various different releases after 2003, so that estimates do not take into account changes to definitions and measurement or revisions to estimates made subsequent to 2003 for pre-2003 estimates, or changes and revisions subsequent to first release for post-2003 estimates.

Taxation Statistics

Similar to many other studies of top income shares based on taxation data, we rely on published taxation statistics. For the period from 1970 to 1994, tables published by the Australian Taxation Office (ATO) are available only in printed form. For the period from 1994 to 1999, the tax tables we use come from CD-ROMs that accompanied the printed publications, while for the period from 1999 to 2010 all tables have been downloaded from the ATO website.

During our period of interest, the relevant tables present the number of persons and total income, dividends, dividend imputation credits and taxable capital gains in each of a number of taxable income brackets.³¹ Table A9 provides details on the tax tables we use and the definitions of the relevant income variables in each tax year. In common with AL, in tax years 1985 to 1988, we combine two sets of tables: the “main” tables, and “supplementary” tables, which provide tabulations on persons with taxable incomes of \$500,000 and over. This increases the number of income brackets at the top of the distribution and allows for more accurate imputation of top income shares in those years.³² Note, however, that we use different main tables from AL for the years 1993-1999, because we are interested in imputation credits and net capital gains, and the tables used by AL do not contain this information. However, our results show that these differences in methodology have little effect on the top income shares series, as evidenced by the very small differences in estimates between Tables A1 and A1.2.

Table A9 shows that tabulations are by “net income” from 1970 to 1978 and by “taxable income” thereafter. However, the two variables are defined very similarly. Net income is defined as total assessable income—which comprises ordinary gross income plus income items made specifically assessable, such as dividend imputation credits (from 1987-88 onwards)—less total deductions for expenses incurred in gaining that income; taxable income is defined as total assessable income less any deductions allowed under the

³¹ We will be using the ATO definitions of income throughout this Appendix. These definitions will be described in the next paragraph.

³² AL also use supplementary tables that are available from 1989 to 1998. However, we do not use them because they are not required for 1989, 1990 and 1991 (the number of income brackets available in the main tables were increased), while from 1992 to 1998, the income variable in the supplementary tables is *taxable* income, which is not comparable with the main tables, for which the income variable is *total* income.

“Income Tax Assessment Act 1936 (or 1997).” A limited number of deductions allowable under the Act do not relate to expenses incurred in gaining income, so taxable income is slightly lower than net income. The table also shows that, after combining the main and supplementary tables for 1985 to 1988, the number of income brackets by which variables can be tabulated ranges from a low of 12 (in 1994) to a high of 32 (in 1985).

The income measure is “net income” from 1970 to 1991, “total income” from 1992 to 1999, and “total income or loss” from 2000 to 2010. Both “total income” and “total income or loss” are defined as total assessable income (i.e., income before deductions). The income measure is thus consistently defined from 1992 onwards. However, there is a significant inconsistency between the pre-1992 income measure and the income measure available from 1992. In common with AL, we make no adjustment to address this inconsistency, but it should be noted that, since total income is larger than net income (and the control total for income is unaffected), this will cause a spurious increase in measured top income shares post-1991 compared with the earlier period.

The analysis described to this point differs little from that undertaken by AL. However, we are interested in creating a series that excludes dividend imputation credits and capital gains.

Imputation credits

As described in Section 2, a change to dividend taxation took effect from July 1, 1987. From July 1, 1940 to June 30, 1987, dividends were taxed twice: as profits through the company tax system; and as shareholders’ income through the personal income tax system. Double taxation ended from July 1, 1987 with the implementation of an imputation system whereby shareholders receive tax credits that can be used to offset their personal income tax liability. The change was announced on 19 September 1985, legislated on 10 December 1986, and took effect from 1 July 1987. As a result of this change, included in the tax records from the 1987 tax year onwards are imputation or franking credits, which equal the company tax paid that is attributable to the dividends received by tax filers. Thus, imputation credits added to dividends equal the imputed gross or pre-tax dividend income received by the tax filer. This creates an inconsistency with the pre-1987 tax records, which contain only dividends net of company tax.

Table A9: Taxation Statistics—Details on sources and data items used

Year	Tax tables ¹	Tabulation by... (number of brackets)	Income measure	Taxable realized capital gains	Dividends	Primary imputation credits	Subsidiary imputation credits
1970-71 and 1971-72	1.5, 1.15	Net income (38)	Net income	Profit (or loss) from sale of real estate, shares, etc.	[not separately tabulated]	N/A	N/A
1972-73 to 1973-74	1.3, 1.14(a)	Net income (35)	Net income	Profit (or loss) from sale of real estate, shares, etc.	[not separately tabulated]	N/A	N/A
1974-75	1.13, 1.14(a)	Net income (28)	Net income	Profit (or loss) from sale of real estate, shares, etc.	[not separately tabulated]	N/A	N/A
1975-76	1.3, 1.14(c)	Net income (26)	Net income	Profit (or loss) from sale of real estate, shares, etc. ¹	[not separately tabulated]	N/A	N/A
1976-77	1.4, 1.7(a)	Net income (29)	Net income	Profit (or loss) from sale of real estate, shares, etc.	[not separately tabulated]	N/A	N/A
1977-78	1.1, 1.5(a)	Taxable income (29)	Net income	Profit (or loss) from sale of real estate, shares, etc. ¹	[not separately tabulated]	N/A	N/A
1978-79	1.12, 1.16(a)	Taxable income (24)	Net income	Profit (or loss) from sale of real estate, shares, etc.	[not separately tabulated]	N/A	N/A
1979-80 to 1981-82	1.4	Taxable income (27)	Net income	Profit (or loss) from sale of real estate, shares, etc.	Interest and dividends ²	N/A	N/A
1982-83 to 1984-85	1.5	Taxable income (27)	Net income	Profit (or loss) from sale of real estate, shares, etc.	Net dividends ³	N/A	N/A
1985-86	1.5, 1.24	Taxable income (32)	Net income	Sale of property	Gross dividends / Dividend income ⁴	N/A	N/A
1986-87	1.5, 1.24	Taxable income (32)	Net income	Sale of property + Net capital gains	Gross dividends / Dividend income ⁴	N/A	N/A
1987-88	1.5, 1.24	Taxable income (31)	Net income ¹	Sale of property + Net capital gains	Gross dividends – Total / Dividend income ⁴	Imputation credit	Imputation credit
1988-89	1.5, 1.24	Taxable income (31)	Net income ¹	Net capital gains	Gross dividends – Total / Dividend income – Total ⁴	Imputation credit primary	Imputation credit total less Imputation credit primary
1989-90	1.5	Taxable income (26)	Net income ¹	Net capital gains	Gross dividends – Total ⁴	Imputation credit primary	Imputation credit total less Imputation credit primary
1990-91 and 1991-92	1.5	Taxable income (26)	Net income ¹	Net capital gains	Gross dividends – Total ⁴	Primary imputation credit	Total imputation credit less Primary imputation credit
1992-93	1.5	Taxable income (26)	Total income ¹	Net capital gains	Gross dividends – Total ⁴	Primary imputation credit	Total imputation credit less Primary imputation credit
1993-94	<i>Taxation tables not used because of the limited number of income brackets. Top income shares are the average of the 1992-93 and 1994-95 shares.</i>						
1994-95	P18	Taxable income (10)	Total income	Net capital gains	Gross dividends received – Total ⁴	Primary imputation credits	Total imputation credits less Primary imputation credits
1995-96	I8	Taxable income (10)	Total income	Net capital gains	Gross dividends received – Total ⁴	Primary imputation credits	Total imputation credits less Primary imputation credits

Table A9 continued: Taxation Statistics—Details on sources and data items used

Year	Tax tables ¹	Tabulation by... (number of brackets)	Income measure	Taxable realized capital gains	Dividends	Primary imputation credits	Subsidiary imputation credits
1996-97	I11	Taxable income (16)	Total income	Net capital gains	Gross dividends received – Total ⁴	Primary imputation credits	Total imputation credits less Primary imputation credits
1997-98	I10	Taxable income (16)	Total income	Net capital gains	Dividends – Total ⁴	Imputation credit primary	Imputation credit total less Imputation credit primary
1998-99	I8	Taxable income (16)	Total income	Net capital gains	Dividends – Total ⁴	Primary imputation credits	Total imputation credits less Primary imputation credits
1999-00	5B, 5C	Taxable income (16)	Total income	Net capital gains	Total gross dividends ⁴	Primary imputation credit	Total imputation credit less Primary imputation credit
2000-01	5B, 5D	Taxable income (16)	Total income or loss	Net capital gain	Total dividends ⁴	Imputation credit primary	Total imputation credit less Imputation credit primary
2001-02 to 2003-04	5B, 5D	Taxable income (16)	Total income or loss	Net capital gain	Total dividends ⁴	Imputation credit primary	Total imputation credit (Franking tax offset) less Imputation credit primary
2004-05	5B, 5D	Taxable income (16)	Total income or loss	Net capital gain	Total dividends ^{3,4}	Franking credit	Total franking credit less Franking credit
2005-06	5B	Taxable income (22)	Total income or loss	Net capital gain	Total dividends ⁴	Franking credit	Share of franking credit from franked dividends
2006-07 to 2009-10	5B, 5D	Taxable income (22)	Total income or loss	Net capital gain	Total dividends ⁴	Franking credit	Total franking credit less Franking credit
2010-11	10	Taxable income (22)	Total income or loss	Net capital gain	Dividends unfranked amount ⁵ + Dividends franked amount ⁵	Dividends franking credit	Share of franking credit from franked dividends

Notes: ¹ Tax table numbers are as they appear in the Australian Taxation Office publication *Taxation Statistics* for the relevant tax year (Commissioner of Taxation, 1971 to 2009). ² From 1979 to 1981, dividends are combined with interest. For these three years, we impute dividends by assuming the 1982 ratio of dividends to interest in 1982 applies. ³ Net dividends are equal to gross dividend income less deductions for expenses incurred in gaining that income. ⁴ From 1985 to 2009, the tax tables contain total dividends, which include both franked and unfranked dividends. ⁵ In 2010, the income category 'Total dividends' is missing from the tax table and is therefore calculated as the sum of unfranked and franked dividends.

Imputation credits are identifiable in the more detailed Australian tax tables we use. These tables contain the total value of imputation credits by taxable income ranges in all years in which the imputation system has been in operation—that is, from 1987 on. Because we base our top income series on these more detailed tax tables we are able to subtract these credits from taxable income. From 1988, “primary” imputation credits can be distinguished from “subsidiary” imputation credits. Primary imputation credits derive from dividends on shares directly owned by the tax filer, while subsidiary imputation credits are those received indirectly as part of a distribution from a trust or partnership that owns shares attracting imputation credits. For 1987, to disaggregate total imputation credits into its primary and subsidiary components, we assume the 1988 ratio of primary to subsidiary credits applies.

Capital gains

As we explain in Section 2, prior to 1972, capital gains were essentially untaxed, although the 1936 Tax Act did make provision for capital gains taxation, and some capital gains did appear in the tax tables from 1969 to 1971 as “profit (or loss) from sale of real estate, shares, etc.” (as Table A9 shows for 1970 and 1971). However, the value of this item was very small, and it is unclear the conditions under which capital gains were deemed taxable. From 1972, all capital gains on certain assets held less than one year were explicitly made taxable, and all assets held for at least one year were explicitly made non-taxable. As Table A9 shows, these capital gains continued to appear in the tax records data as “profit (or loss) from sale of real estate, shares, etc.” until 1984. They appeared as “sale of property” in 1985 and as “sale of property” plus “net capital gains” in 1986. For the period from 1970 to 1978, only the total value of this income component is available—that is, it is not tabulated by taxable income bracket. We therefore imputed it for each income bracket by assuming the same distribution across income brackets as observed in 1979.³³

A change in tax law that was announced on 19 September 1985, passed into legislation on 10 December 1986 and which took effect from 1 July 1987 resulted in realized capital gains on assets acquired after 19 September 1985 being taxed comprehensively, with exceptions made for gains from the selling of the principal residence and gains from superannuation (private pensions) and life insurance. Capital losses can be used to reduce capital gains until they fully offset total capital gains in a given year. Net capital losses cannot be used to reduce tax liability of other income sources but will carry forward and reduce tax liability on capital gains in future years. The stock of net capital losses carries forward until exhausted.

Until 1999, only real capital gains were taxed (indexation method). Net capital gains were calculated as total capital gains less capital losses (total capital losses of the current year and net capital losses from previous years). A change in tax law in 1999 meant that capital gains of assets acquired after 20 September 1999 were taxed in nominal rather than real terms, but with a discount of 50 per cent applied to assets held

³³ The number of income brackets differs across the 1970 to 1979 tax years, requiring some brackets to be collapsed and others to be split to match the 1979 brackets. However, differences in income brackets are for the most part restricted to the lower income brackets, so this had little effect on estimates of capital gains relevant to top income groups.

more than 12 months (discount method). For assets acquired before 20 September 1999, taxpayers could (and can still) choose to use either the indexation or the discount method. If the discount method is applied, net capital gains are calculated as total (nominal) capital gains less capital losses (total capital losses of the current year and net capital losses from previous years) with a 50 per cent discount for assets held more than 12 months.

As mentioned previously, the taxation tables that AL use do not include information on imputation credits or capital gains. We therefore use alternative tables which contain capital gains information. Table A9 shows that tabulations of net capital gains by ranges of taxable income are available from 1986. Note that in 1986 and 1987, net capital gains are available only for a limited number of income brackets. They are therefore imputed by assuming the same distribution across income brackets as in 1985 (for 1986) and 1988 (for 1987). In practice, this has no significance because the net capital gains recorded in the tax data relate only to assets acquired after 19 September 1985 (if held more than one year), which were close to negligible in 1986 and 1987.

Removing imputation credits and capital gains from the top incomes shares series

With the more detailed tax tables, we create a series beginning in 1986 that excludes imputation credits and net capital gains. To do this, we simply subtract imputation credits and net capital gains from the income measure (net income from 1986 to 1991; total income from 1992 to 2010) in each income bracket before calculating the top income shares.

Importantly, we implicitly assume that imputation credits and capital gains within an income bracket are the same proportion of total income for all individuals within the bracket. That is, we assume no change to the ranking of individuals after removal of imputation credits and capital gains. This is because the income brackets are defined in terms of income including imputation credits and capital gains, and are fixed—we simply subtract total imputation credits and capital gains of individuals in that bracket from the total income of individuals in that bracket to obtain our revised income total. It is, however, likely that imputation credits and capital gains within each income bracket are not so distributed. For example, if the means of imputation credits and capital gains within an income bracket arise from a few individuals with large values (with most individuals having little or no imputation credits or capital gains), then excluding imputation credits and capital gains will result in those individuals moving down the income distribution relative to other individuals. This would mean that some individuals in our top x per cent should not actually be in our top x per cent—and some individuals in lower income brackets (inclusive of imputation credits and capital gains) who are not in our top x per cent *should* be in our top x per cent. This will cause us to underestimate the total income of the top x per cent, implying our estimates will understate the true income share of the top x per cent.

It is not possible to ascertain the extent of understatement (if any) of top income shares from the published tax tables themselves. However, as of the time of the writing of this paper, the ATO has released one per cent samples of unit record tax data for each tax year from 2003 to 2009. The samples contain individual-level tax record data for a limited number of income and tax components, including capital gains income and “franked” dividend income. While the sample files are inferior to the tax tables for calculating top income shares, both because of the limited sample sizes and because of top-coding of data items, their unit record structure allows us to gauge the impact of re-ranking. Specifically, we can replicate the tax table analysis for the unit record data—that is, create tax tables analogous to those used in the analysis reported in the main body of this paper, and estimate top income shares from these tables—but do this in two alternative ways:

- (1) Replicate our approach to removing capital gains and imputation credits using the ATO tax tables (as described below in this Appendix).
- (2) Create tax tables by ranges of an income variable that excludes capital gains and imputation credits, which we obtain by subtracting capital gains and imputation credits from the total taxable income of each individual prior to creating the tables.

The second approach produces “correct” estimates of top income shares, although the estimates will in fact contain errors due to imputation within income ranges (as described below in this Appendix). This is deliberate, so as to allow isolation of the effect of the re-ranking that occurs due to exclusion of capital gains and imputation credits. The difference between the “correct” estimate and the “replicated” estimate therefore provides a measure of the error due to re-ranking.

Note, however, that the sample files do not actually contain information on imputation credits. Rather, we have the value of “franked” dividends for each tax filer in the sample. This permits identification of the value of “primary” imputation credits, but not “subsidiary” imputation credits. Primary imputation credits are equal to the company tax payable on the profits from which dividends are paid. Over the 2003 to 2009 period, the company tax rate was 30 per cent, implying primary imputation credits are equal to 30 per cent of the grossed-up value of franked dividends—which translates to 42.9 per cent of franked dividends as reported in the taxation statistics (since franked dividends equal 70 per cent of grossed-up dividends). However, subsidiary imputation credits relate to distributions from public trusts and partnerships, which are not separately recorded in the sample files. For the purposes of this analysis, we make the assumption that, within each range of taxable income, subsidiary imputation credits are distributed across individuals in the same manner as primary imputation credits. In practice, this means that imputation credits of each individual are multiplied by a factor equal to one plus the ratio of subsidiary imputation credits to primary imputation credits in that individual’s income range. The total value of subsidiary imputation credits is approximately 30 per cent of the total value of primary imputation credits, so on average this factor is approximately 1.3.

Table A10 presents the results of this exercise for top 1 per cent income shares. It shows that not accounting for re-ranking results in a top 1 per cent income share between 0.16 and 0.26 percentage points lower than its true level. It is therefore clear that the approach taken in this paper leads to slight underestimation of the income share of the top 1 per cent. However, the table also shows that this error is substantially smaller in magnitude than the error (relative to a consistently measured top income share) in a series that fails to exclude imputation credits and capital gains. Compared with a consistently measured series, including imputation credits and capital gains will result in an overestimation of the income share of the top 1 per cent of between 0.54 and 2.21 percentage points. The extent of overestimation is especially large in 2006 and 2007, when capital gains incomes were at their highest over the 2003 to 2009 period.

Table A10: Top 1 per cent income shares based on unit record tax data (one per cent sample file)

	2003	2004	2005	2006	2007	2008	2009
(1) Including both imputation credits & capital gains – ‘Replicated’	8.40	8.42	8.82	9.98	8.01	7.22	7.51
Removing imputation credits only							
(2) ‘Replicated’	7.97	7.97	8.29	9.28	7.59	6.83	7.20
(3) ‘Correct’	7.95	7.96	8.32	9.25	7.59	6.90	7.26
Removing capital gains only							
(4) ‘Replicated’	7.72	7.58	7.85	8.24	6.70	6.71	7.12
(5) ‘Correct’	7.91	7.75	8.05	8.45	6.91	6.81	7.23
Removing both imputation credits and capital gains							
(6) ‘Replicated’	7.29	7.12	7.30	7.51	6.26	6.30	6.78
(7) ‘Correct’	7.46	7.29	7.54	7.77	6.49	6.46	6.97
Error with imputation credits and capital gains removed [(6) – (7)]	-0.17	-0.17	-0.24	-0.26	-0.23	-0.16	-0.19
Error with imputation credits and capital gains not removed [(1) – (7)]	0.94	1.13	1.28	2.21	1.52	0.76	0.54

Notes: All estimates are income shares of the top 1 per cent calculated from tax tables constructed to match those used in the analysis reported in the main body of this paper. ‘Replicated’ estimates assume no re-ranking of individuals across income brackets. ‘Correct’ estimates do not impose the assumption of no re-ranking of individuals.

Mean-split histogram method

The following description for the mean-split histogram imputation method draws upon Atkinson (2005).

The formula is:

$$\Omega = G(y(H))/\mu = \begin{cases} \Omega_i - \left[(H_i - H)y_i + \frac{1}{2} \frac{(H_i - H)^2}{\left(\frac{H_i - H_i^{MSH}}{\mu_i - y_i} \right)} \right] & \text{if } H_i > H > H_i^{MSH} \\ \Omega_{i+1} + \left[(H - H_{i+1})y_{i+1} - \frac{1}{2} \frac{(H - H_{i+1})^2}{\left(\frac{H_i^{MSH} - H_{i+1}}{y_{i+1} - \mu_i} \right)} \right] & \text{if } H_i^{MSH} \geq H \geq H_{i+1} \end{cases}$$

where:

$$H_i^{MSH} = \frac{H_i(\mu_i - y_i) + H_{i+1}(y_{i+1} - \mu_i)}{(y_{i+1} - y_i)}$$

y_i and y_{i+1} are the relative lower and upper bound of the income bracket i (relative to and thus divided by the overall mean income μ); μ_i is the relative mean of income bracket i ; H_i and H_{i+1} are the percentages of people with respective incomes equal to or above y_i and y_{i+1} (H_i and H_{i+1} thus indicate the top $H_i\%$ and $H_{i+1}\%$ of the income distribution); Ω_i and Ω_{i+1} are the respective income shares of the top $H_i\%$ and $H_{i+1}\%$.

We are interested in calculating $\Omega = G(y(H))/\mu$, which is the share of income held by the top $H\%$ of the income distribution. H is often set to 10%, 5% or 1%. The procedure is as follows:

1. For each income bracket i (of a taxation table such as table 4), calculate the mean income, percentage of persons and percentage of income held using the control totals for population and income.
2. For each income bracket i , calculate the cumulative percentage of persons (H_i) and percentage of income held (Ω_i) by adding up the percentages calculated in 1) from the last income bracket to the first income bracket.
3. Choose H (top $H\%$ of income distribution).
4. Find the income bracket i for which $H_i > H \geq H_{i+1}$.
5. For the chosen income bracket i , calculate the relative lower bound (y_i), relative upper bound (y_{i+1}) and relative mean income (μ_i) by dividing the (absolute) values given in the taxation table by the overall mean income μ .
6. Calculate H_i^{MSH} .
7. Calculate $\Omega = G(y(H))$.

As an example, suppose we want to calculate the income share held by the top 1 per cent for the tax year 2009. We are therefore using information from the 2009 Taxation Statistics (see Table A11). For this exercise, the income measure we are interested in is “Total income minus imputation credits and capital gains.” The results of steps 1 and 2 are listed in the right section of Table A11.

Since we have chosen $H = 1$, we will impute from income bracket $i = 19$. For this income bracket, H lies between $H_{19} = 1.18$ and $H_{20} = 0.57$. This income bracket has a lower bound of \$180,001 and an upper bound of \$250,000. The mean income is \$201,533. These values relative to the overall mean income ($\mu = 45,834$) are: $y_{19} = 3.93$ (relative lower bound); $y_{20} = 5.45$ (relative upper bound); and $\mu_{19} = 4.40$ (relative mean income). Using the formula for H_i^{MSH} we get:

$$H_{19}^{MSH} = \frac{1.18(4.40 - 3.93) + 0.57(5.45 - 4.40)}{(5.45 - 3.93)} = 0.75$$

Since $H = 1$ lies between $H_{19} = 1.18$ and $H_{19}^{MSH} = 0.75$, we will use the top branch of the formula for $\Omega = G(y(H))$. Using this formula and $\Omega_{19} = 8.45$ which is listed in table 4 we get:

$$\Omega = G(y(H = 1)) = 8.45 - \left[(1.18 - 1)3.93 + \frac{1}{2} \frac{(1.18 - 1)^2}{\left(\frac{(1.18 - 0.83)}{(4.40 - 3.93)} \right)} \right] = 7.72$$

Thus, in 2009, the top 1 per cent held 7.72% of the income (total income minus imputation credits and net capital gains). (Note that due to the use of rounded numbers, the top 1 per cent share calculated in this example (7.72%) is slightly different from the top 1 per cent share calculated using more precise numbers (7.74% in Table A4)).

Table A11: Taxation table from the 2009 Australian Taxation Statistics

From Table 5B											Calculations			
Range No. (<i>i</i>)	Bounds of taxable income (\$)		No. of persons	Total income (\$)	Imputation credits (IC) (\$)	Capital gains (CG) (\$)	Total income minus IC and CG (\$)	Mean (\$)	% of persons	Cumul. (<i>H_i</i>)	% of income	Cumul. (<i>Ω_i</i>)		
1	0	6,000	17,795	61,097,615	1,221,789	4,088,788	55,787,038	3,135	0.10	51.22	0.01	67.88		
2	6,001	10,000	7,665	66,945,059	974,349	3,089,157	62,881,553	8,204	0.04	51.12	0.01	67.88		
3	10,001	15,000	13,150	183,655,299	1,013,278	4,204,980	178,437,041	13,569	0.07	51.07	0.02	67.87		
4	15,001	20,000	576,390	11,002,730,828	72,426,942	113,404,343	10,816,899,543	18,767	3.24	51.00	1.33	67.85		
5	20,001	25,000	656,230	15,805,137,943	90,671,037	134,986,430	15,579,480,476	23,741	3.69	47.76	1.91	66.52		
6	25,001	30,000	699,455	20,546,554,114	146,558,410	182,258,402	20,217,737,302	28,905	3.93	44.07	2.48	64.61		
7	30,001	35,000	833,820	28,793,007,349	259,679,492	246,747,701	28,286,580,156	33,924	4.69	40.13	3.47	62.13		
8	35,001	40,000	820,470	32,423,527,762	238,639,584	239,165,613	31,945,722,565	38,936	4.61	35.44	3.92	58.66		
9	40,001	45,000	736,050	32,859,871,530	190,005,560	217,267,121	32,452,598,849	44,090	4.14	30.83	3.98	54.73		
10	45,001	50,000	650,770	32,445,111,067	183,392,627	216,604,804	32,045,113,636	49,242	3.66	26.69	3.93	50.75		
11	50,001	55,000	570,435	31,435,710,422	181,837,336	211,448,426	31,042,424,660	54,419	3.21	23.03	3.81	46.82		
12	55,001	60,000	499,605	30,136,847,659	174,605,996	216,587,194	29,745,654,469	59,538	2.81	19.82	3.65	43.01		
13	60,001	70,000	799,660	54,350,202,194	354,762,621	432,757,342	53,562,682,231	66,982	4.50	17.01	6.57	39.36		
14	70,001	80,000	647,450	51,013,235,351	696,941,971	526,493,917	49,789,799,463	76,901	3.64	12.51	6.11	32.79		
15	80,001	90,000	418,680	37,104,957,983	454,500,436	449,363,809	36,201,093,738	86,465	2.35	8.87	4.44	26.68		
16	90,001	100,000	270,060	26,752,071,476	303,036,133	373,618,005	26,075,417,338	96,554	1.52	6.52	3.20	22.23		
17	100,001	150,000	558,370	69,521,930,098	1,224,928,852	1,415,005,595	66,881,995,651	119,781	3.14	5.00	8.21	19.03		
18	150,001	180,000	120,500	20,749,623,483	757,087,292	639,466,915	19,353,069,276	160,606	0.68	1.86	2.37	10.83		
19	180,001	250,000	107,560	23,407,982,041	896,511,108	834,625,467	21,676,845,466	201,533	0.60	1.18	2.66	8.45		
20	250,001	500,000	75,740	26,337,287,330	1,281,063,912	1,012,274,365	24,043,949,053	317,454	0.43	0.57	2.95	5.79		
21	500,001	1,000,000	19,070	13,428,279,958	935,513,022	674,415,590	11,818,351,346	619,735	0.11	0.15	1.45	2.84		
22	1,000,001		7,045	15,274,373,372	1,734,799,703	2,200,912,689	11,338,660,980	1,609,462	0.04	0.04	1.39	1.39		
Total			9,105,970	573,700,139,933	10,180,171,450	10,348,786,653	553,171,181,830	60,748	51.22		67.88			
Control income	\$814,886,000,000													
Control population	17,779,266													
Mean income (<i>μ</i>)	\$45,834													

Estimation of accrued capital gains using the HILDA Survey data

Owner-occupied housing

Our estimate of accrued capital gains on the family home is based on estimates of home values provided by respondents in each wave of the survey. Thus, if the respondent did not change houses within the last two years, the estimated capital gain over the intervening year is simply equal to the change in the reported home value. For a household that sells the home between one wave and the next, the capital gain in that year is approximated by the ABS house price index over the last year for the capital city of the state of residence (*House Price Indexes: Eight Capital Cities*, Catalogue No. 6046.0—see Table A12) (ABS, 2013b), i.e.,

$$cg_{oh,t} = p_t v_{oh,t-1}$$

where: p_t is the percentage change (divided by 100) in the relevant house price index over year t and $v_{oh,t-1}$ is the value of other housing owned by the household in the previous year, as reported by the respondent.

Other assets

Our estimates of accrued capital gains on non-owner-occupied housing, unincorporated businesses, equities and superannuation funds are based on asset holdings in 2006 and 2010, when detailed household wealth data was collected in the HILDA Survey. Our estimates of accrued capital gains on non-owner-occupied housing are approximated by the ABS house price index for the capital city of the state of residence, while unincorporated businesses and equity and superannuation fund holdings are assumed to track the Australian Stock Exchange ASX200 share price index (see Table A12), i.e.,

$$cg_{i,t} = p_t v_{i,t-1}$$

Where: p_t is the percentage change (divided by 100) in the relevant (house or share) price index over year t and $v_{i,t-1}$ is the estimated value of holdings of asset class i in the previous year. For 2006-07, $v_{i,t-1}$ ($= v_{i,2006}$) is equal to the actual value reported by the respondent in 2006, while for 2009-10 it is equal to:

$$v_{i,2009} = \frac{v_{i,2010}}{(1 + p_{2010})}$$

Where: $v_{i,2010}$ is equal to the actual value reported by the respondent in 2010.

Thus, the accrued capital gain on a non-home asset in 2006-07 is based on the (initial) reported value of the asset in 2006 and the change in the relevant price index between 1 July 2006 and 30 June 2007. By contrast, the accrued capital gain in 2009-10 is based on the (final) reported value of the asset in 2010 and the change in the relevant price index between 1 July 2009 and 30 June 2010.

Note that actual capital gains in the intervals between 2006 and 2007 and between 2009 and 2010 may diverge from estimated capital gains because of heterogeneity in rates of return, and also because asset holdings may change over the interval: we will not capture capital gains on assets acquired between 2006 and 2007 and assets disposed of between 2009 and 2010; and we will incorrectly attribute (some) capital gains to assets disposed of between 2006 and 2007 and assets acquired between 2009 and 2010.

Table A12: House price and share price indices used to estimate accrued capital gains—
Percentage changes in each financial year

	2006-07	2009-10
House price indices		
New South Wales	6.67	11.64
Victoria	17.41	13.28
Queensland	19.17	3.61
Western Australia	3.77	6.18
South Australia	17.54	6.91
Tasmania	9.36	5.75
Northern Territory	12.15	8.91
Australian Capital Territory	13.18	11.45
Share price index (ASX200)	27.44	-3.39

Sources: ABS (2013b) House Price Indexes: Eight Capital Cities, Catalogue No. 6046.0; ASX200: Downloaded from <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6416.0Dec%202012?OpenDocument>.

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