Top Incomes in Taiwan, 1977-2013

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Introduction

Traditionally, there have been two standard ways of measuring income inequality, one being the Gini coefficient, and the other the ratio between the average income of the richest 20% group and the poorest 20% group (hereafter referred to as the 20% average income ratio). In Figure 1 we depict these two measures for Taiwan in the past half a century (1964-2013). It can be seen from Figure 1 (and Table A1 in the Appendices for the detailed numbers) that at the initial stage of Taiwan's economic development in 1964, Taiwan's 20% average income ratio was 5.33. It then dropped to its lowest level of 4.17 in 1980, after which the inequality index began to rise. The same pattern can be observed from the Gini index. This U-shaped pattern of inequality dynamics seems to contrast with the famous inverted-U hypothesis of Kuznets (1953). Such a seemingly unique U-shaped pattern of inequality indexes along with Taiwan's rapid economic growth in the '60s and '70s caught the attention of many economic researchers. A renowned book *Growth with Equity: the Taiwan Case* was published by John Fei et al. (1979), and was followed by many related articles. The decline in inequality along with the rapid economic growth in Taiwan before 1980 was then praised as a "miracle" in economic development, and differed from the doctrinal inverted-U hypothesis of Kuznets.[1]

Insert Figure 1 about here.

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[1] The incomes used in calculating the 20% income ratios and Gini coefficients in Figure 1 are obtained from Taiwan's Family Income and Expenditure Surveys (FIES), where the notion of income is "family disposable income". In particular, welfare transfers and various tax-free incomes are included. For income data obtained from the tax authorities (which we use to draw Figure 2), however, welfare transfers and tax-free incomes are not included. Our later analysis will be based mainly on data from the tax authorities, and readers should note the embedded differences in income definitions. There are also other differences in the definition of family units between FIES and the tax authorities, of which the details will be explained in Section 2.2.

The above-mentioned "miracle" as claimed by Fei et al. (1979) began to be challenged after 1980, in data as well as in theory. Both the Gini coefficient and the 20% average income ratio started to climb following that year, as can be seen from Figure 1. For instance, the 20% average income ratio climbed to 5.18 in 1990 and reached its highest level of 6.34 in 2009. This ratio declined slightly after 2010, but has still remained above or around 6.15. Such a recent trend of increasing inequality either invalidates the so-called "miracle", or invalidates Kuznets's inverted-U hypothesis as a general pattern. Perhaps the general trend of income dynamics is that inequality continues to increase along with development, and what Kuznets observed was just a temporary short time series, as Piketty (2014) noted.[2]

Moreover, from Figure 1 and Table A1 in the Appendices, we see that the Gini coefficient and the 20% average income ratio may be too rough for us as measures to observe real changes in income inequality. By using tax filing data, Chu and Kang (2014, in Chinese) have shown that the more refined 5% average income ratio (the average income of the richest 5% over that of the poorest 5%) has increased from 32.74 in 1998 to 96.56 in 2011 (see Figure 2). Although the definitions of income by the tax authorities and by the income and expenditure surveys (based on which the 20% average income ratios and Gini coefficients are calculated) differ, the evident increasing trend of the 5% ratio in Figure 2 indicates that the traditional 20% income ratio simply

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[2]Since the launch of this FIES in 1964, there have been only minor changes in the income items included in the survey. As for the abrupt increases in the Gini coefficient and the 20% average income ratio from 2000 to 2001 shown in Figure 1, according to the official FIES report of the Directorate-General of Budget, Accounting and Statistics (DGBAS), it was primarily because the economic recession in 2001 had increased the unemployment rate (from 2.99% in 2000 to 4.57% in 2001) and decreased the labor force participation rate (from 57.68% in 2000 to 57.23% in 2001) simultaneously, which had affected the low-income households more than the high-income ones, so that there was a deterioration in income inequality. The inequality was subsequently lessened in 2002 due to the economic recovery.

cannot capture the very rich groups' income percentage changes. We therefore sense the need to investigate the changes in the top income group's income share in more detail, as has been done in the WTID database by many countries.

Insert Figure 2 about here.

According to the WTID webpage, as of December 2014, a total of 30 countries had uploaded their top income analysis into the WTID database, of which Tanzania had only historical data and China had only estimates from family surveys. For those 28 countries with more complete data, only 6 of them are Asian countries (Japan, India, Indonesia, Malaysia, Singapore and Korea). Our efforts to compile the WTID database for Taiwan will make it the seventh Asian country that is included in the WTID database, and it can then be compared and analyzed together with other countries.

More importantly, apart from the tax statistics tables that are usually needed for calculating top income shares, starting from 1998 Taiwan's tax authority has maintained very good electronic records of individual and household income data. With the support of Taiwan's Fiscal Information Agency (FIA) of the Ministry of Finance, we are able to construct a 16-year (1998-2013) whole-population data base for various top income groups. This constructed dataset can be compared with the results obtained from Pareto estimation using statistical tables in order to check the latter's robustness.

Other than such individual and household income data, starting from 2003 Taiwan has also maintained whole population records of individual assets, including land and housing, stocks of publicly-offered companies, cars, and estimated savings. The last item is calculated from individual interest income filed in tax returns, and the former

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three items are mandatory registration requirements for sustaining the validity of legal ownership. These 11-year (2003-2013) asset data allow us to explore the unique properties of income and asset dynamics, as well as explain the changes in trends. Sometimes the asset data can help us resolve the puzzling questions related to income data, and vice versa. Although much of the asset data analysis will not be included here, it will be uploaded into the future WTID asset database.

1.   Data and Methodology

Most countries use the data tabulated by the tax authorities to estimate their top income shares. Our methodology is similar to that for the years between 1977 and 2013. The earliest tabulated data we can retrieve are those for 1970. However, the quality of the data before 1976 was called into question by Hong and Cheng (2013, in Chinese),[3] and we basically agree with their concerns. Hong and Cheng used the tabulated tax statistical data and performed the Pareto interpolation, as in Atkinson et al. (2011). The Pareto distribution function F has the property that $1 - F(y) = (k/y)^{\alpha}$ where k and α are two constants. The analysis by Hong and Cheng is rigorous and solid, and they also used a 1/50 sample of the 1999 data to redo the estimation, obtaining roughly consistent results. We have double-checked their results by re-doing their analysis, and find the analysis valid and the numerical results reliable. Because their analysis only covers the period 1977-2010, we have added two more years (2011-12) of data before performing the corresponding interpolation analysis in this paper.[4]Figures and tables obtained from

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[3] For instance, between 1974 and 1976, the top 1% income shares calculated based on Pareto interpolation are about 10% more than those obtained after 1977. This is quite unlikely. We do not know why this happened, and hence cannot find ways to make reasonable adjustments.
[4]As of December 2014, the 2013 tabulated data have not been published yet, the 2013 micro data have been available.

such data will be denoted as FIA-tabulated data, or FIA-T in abbreviated form.

An additional contribution of this paper is that we use the whole-population data from the FIA of the Ministry of Finance and perform a direct calculation. Because such electronic data are available only after 1998, we can perform some comparisons after 1998 concerning the possible differences between the results obtained from the Pareto estimation and the direct calculation using the whole-population data. Figures and tables obtained from such data will be denoted as FIA-microdata, or FIA-M in abbreviated form.[5]

2.1 Introduction to the Income Tax System in Taiwan

From a historical perspective, Taiwan's income tax system came into existence in 1956, and became the current comprehensive and consolidated income system since the tax reform committee in 1968 led by T. C. Liu. The Ministry of Finance started to compile and publish tax statistics in 1974. For a brief introduction to the evolution of Taiwan's income tax system, see Table 1.

[Insert Table 1 here]

For the years for which we retrieved and computed top incomes, personal income tax in Taiwan has followed the territorial principle and has required residents to file a consolidated income tax return based on the tax household unit.[6] The definition of a tax

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[5] Although FIA-T presents a longer time series, its precision and consistency suffers from a mismatching problem between taxable income and comprehensive income. We discuss this issue in Section 4.3.
[6] For those who are required to file the Alternative Basic Income Tax return, overseas income needs to be filed.

household unit in Taiwan will be explained below. Because Taiwan does not have formal diplomatic relations with most developed countries in the world, very few effective tax treaties have been signed.[7] This hinders the effective implementation of a global income tax assessment by the tax authorities.

An individual's consolidated gross income is the total of the following categories of Taiwan-source incomes: (1) Business profits, including dividends, profits distributed by cooperatives and partnerships, profits from a sole proprietorship, and profits from sporadic business transactions; (2) Income from a professional practice;[8] (3) Salaries, wages, allowances, stipends, annuities, cash awards, bonuses, pensions, subsidies and premiums paid by an employer for group life insurance that offer payment on maturity (however with the exception of the voluntary pension contribution and the voluntary annuity insurance premiums as pursuant to the Labor Pension Act, capped under 6% of the individual's monthly wage or salary); (4) Interest income; (5) Rental income and royalties; (6) Self-employment income from farming, fishing, animal husbandry, forestry and mining; (7) Gains from sales of rights and properties other than land;[9] (8) Cash or payments-in-kind for prize awards or lotteries; (9) Retirement payments, severance pay, non-insured old-age pension payments and insurance payments made under annuity insurance based on the Labor Pension Act; (10) Other income (mostly professional practices and option spreads relevant to the share-based compensation).

Concerning item (4) above, interest income from public debt, corporate bonds, short-term commercial paper and beneficiary securities (Financial Asset Securitization

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[7] As of December 2014, only 27 countries have signed comprehensive tax treaties with Taiwan.
[8] Note that the income reported in the category is the *net* value after deducting necessary expenses associated with the practice.
[9] Taiwan adopts a very unique Land Incremental Value tax which is independently taxed and *not* consolidated into income tax.

Act; Real Estate Securitization Act) are taxed separately at a rate of 10%, and are not included in the general income.

As for item (7), few capital gains in Taiwan are brought under the regular income tax (and therefore included in our estimates), of which the most important one is gains from housing transactions. The tax base of housing transaction capital gains, however, is not the increase in the *real* transaction price, but that in the price *assessed* by the government, which is usually 30%-50% of the market price.[10] In practice, gains from transactions of stocks are presumably the most significant capital gain, but they are tax-free and are not included in regular incomes in our data period. In Taiwan, capital gains tax has never been a significant part of tax sources. In the year 2012, for instance, incomes subject to capital gains tax accounted for only about 0.31% of all incomes subject to income tax.

The full-fledged stock exchange capital gains tax is scheduled to begin by 2016 (to appear in data by 2017), with many qualifications. The major target is focused on the capital gains of IPOs. Since it is beyond the data period for now, we will update those parts in future years. Other than the above, not much change needs to be documented for our analysis. Some minor changes in income tax brackets and applicable tax rates are given in Table A2 in the Appendices.

For the tax authority data, the individual and household incomes include items listed above. For the FIA-tabulated data, some items may be combined and aggregated under one category. The items of taxable income did not change much in the data period, as

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[10]Other capital gains included in personal income taxes are from transactions of patents, foreign exchange, intangible assets, etc., which account for around20% of all capital gains. The housing transaction capital gains in 2013 account for the remaining 80% or so of all capital gains.

shown in Table 1. In 1998, Taiwan adopted the imputation system of corporate dividend income and personal income, allowing a full deduction of dividend as taxpayers file their personal income taxes. For that purpose, the term "dividend income" was separated from the original broad category "business profit income".

Despite the income tax structure not having changed much in the past 40 years, the tax rates of many other related activities have involved significant deductions. These deductions are listed in Table 2. As of 2014, Taiwan was one of the countries with the lowest tax burden ratio (total tax revenue/GDP being less than 13%). Later we will analyze how such tax deductions might have favored the rich, and how they may affect the top income proportion.

Insert Table 2 about here.

2.2 Definitions of Income and Household

The unit of measurement of income for the Family Income and Expenditure Survey (FIES) is the household. The FIA data that we use contain both individual and household level information, although the household's definition differs from that of the FIES, which will be explained in detail below.

The household term adopted by the FIA is compatible with tax filing, but is usually inconsistent with the traditional definition of the household or family. The previous inequality indexes such as the 20% income ratio and Gini coefficient were calculated from the FIES conducted by the DGBAS. In the FIES, a household is defined as an

economic unit which consists of individuals living in the same residence. As to the FIA data, dependent family members of the taxpayer and his or her spouse, whether co-residing or not, can be filed under the same taxing unit of the taxpayer. Income earned by the spouse of the taxpayer and dependents claimed in the taxpayer's income tax return shall be consolidated and reported together with the income received by the taxpayer. Due to tax-avoidance or cost-sharing considerations, the composition of household members in the FIA may deviate from that in the FIES. For example, an adult child with income could form an independent taxing unit in the FIA, but belong to the same household with his or her parents in the FIES at the same time.

2.3 Number and Incomes of Households Not-filing Tax Returns

There are always some households that choose not to file any income tax. They choose to do so mainly because their incomes are lower than the taxable minimum or they have illegal incomes, possibly from the underground economy. Because our purpose is to estimate the top income "share", a premise of our calculation is that we should get the "denominator" right; that is, we should have estimates of the total number of households and total incomes of both tax filers and non-filers.

The total number of households is estimated following the same method as in Piketty and Saez (2007). We use the Population Census data compiled by the Ministry of the Interior to estimate the total number of households as "married males + divorced or widowed singles + unmarried males and females aged 20 or older". These numbers are listed in Table 3. Such estimates are assumed to be the total number of households. The difference between total households and tax-filing households is the potential tax-units

not filing. While there may be cultural uniqueness about Chinese families, we choose to stick to Piketty and Saez's (2007) definition in order to make a consistent comparison with international data.

Insert Table 3 about here.

As for the estimation of the income of non-filing households, we provide two alternatives. The first one is to follow Piketty and Saez (2007), and use 20% as the estimate of the income proportion of those households not filing tax returns. This was done for the analysis in the US case. Conceptually, total incomes calculated in this way constitute the "taxable income", and we refer to as income control total 1.[11]

We have also adopted the National Account approach of Atkinson (2014a), where the income control total is defined as the balance of family incomes plus social benefits other than transfers in kind, employers' liability insurance, employers' actual social contributions, imputed rents of owner-occupiers, the attributed property of insurance policyholders, imputed social contributions, housing benefits, and fixed capital consumption. This is done for the analysis in the case of the U.K., and we call it income control total 2.[12]

For income control total 1, Hong and Cheng (2013) have had some long discussions concerning Taiwan's slightly higher underground economy percentage as estimated by

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[11]As a reference, the (constant-price) average income per household together with the price index of Taiwan are drawn in Figure A1 in the Appendices, as Piketty and Saez did for the U.S.

[12]Income control total 2 is built from FIES's different components: the balance of family incomes (Tables for the past years-Table 1) plus social benefits other than transfers in kind (Table 2.A.5.(3)), employers' liability insurance ((Table 2.A.5.(4))), employers' actual social contributions (Table 2.B.2.(3)), imputed rents of owner-occupiers and housing benefits with fixed capital consumption deducted (Table 2.A.(4)), attributed property of insurance policyholders (Table 2.A.3).

Schneider and Enste (2000) and Schneider et al. (2010), which may suggest a larger percentage of the non-filers' income shares. However, Hong and Cheng also raised other reasons that suggest otherwise. Their main point is that the effective land and housing tax rates are low and the stock-exchange capital gains tax is not effective in Taiwan, which results in the rich people's income in the FIA records also being underestimated. This underestimation may help offset the slightly large proportion of the underground economy, which hides the non-filers' incomes. Hong and Cheng finally chose the 20% estimate as the non-filers' income proportion, but also provided a 30% estimate in their complementary analysis. In this paper we use 20% as the estimate so that we can perform a better comparison with other WTID countries.

As we can see in Table A3, there is a large difference between income control total 1 and total 2; for instance in 2012, the latter is 121.9% of the former. Because of this large difference in the denominator, the top income *shares* will be very different when distinct total incomes are used. Again for 2012, the top 1% share (including capital gains) is 13.79% using income control total 1, and is 11.31% using income control total 2. For the remaining part of this paper, we will mainly present the result using income control total 2. This facilitates us to do international comparison with Korea and Singapore, where income control total 2 is used in their estimation.[13]

2.4 The Pareto Estimation

Following Atkinson et al. (2011), Hong and Cheng used Pareto estimation to assess the

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[13]The large gap between income control totals 1 and 2, to our knowledge, reveals the very narrow tax base of Taiwan. As we mentioned, the tax burden (tax revenue/GDP) in Taiwan is lower than 13%, less than most countries in the world. Other than the wide tax deductions and exemptions, the lack of tax treaties signed between Taiwan and other countries also provides tax evaders with the convenience of hiding their income elsewhere.

income shares of the richest 5%, 1% and 0.1%. Their analysis ended in 2010, and we extend the estimation to 2012, to have a complete comparison between the interpolation of the tabulated data and the direct calculation of the whole-population micro data. The Pareto interpolation method is the same as that in other countries, and therefore we do not repeat the methodology here. The results will be presented in the next section, together will comparisons of various aspects.

In Table A4 we present the estimates of income shares for the top 10%, 5%, 1%, 0.1% and 0.01%, respectively. In this Table, two columns are listed under each percentile, one from the estimation using the FIA-tabulated data, and the other from the direct calculation using the FIA-micro data. From the data we note that the top 10-1% group and the top 20-10% group are mostly concentrated in the very populated bottom three income brackets (tabulated data). There is usually much noise in those ranges which as a consequence yields less precise interpolation figures. This may be a major reason behind the difference with the micro-data estimates. Some background information behind this Table should be reminded.[14]

Taiwan FIT's tabulation format is *a priori* problematic. Although the published income brackets are progressively marginal-tax-rate-based (0%, 5%, 12%, 20%, 30%, 40%, 40% and 40% correspondingly in 2012), the bracket boundaries are actually defined by "taxable income minus exemption/deduction" - as opposed to what we would like to have, the before exemption/deduction comprehensive income. Hence the shares of the very top groups are similar no matter whether we use the tabulation or the micro data (since exemption and deduction become less important).

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[14]We thank Facundo Alvaredo for pointing out this.

In Table A4 we further construct a "linked" column. For 1999-2013, the linked series are the FIT-M series; for 1998 and before, the series are linked backwards by adding the 14 years (1999-2012) average difference to FIA-T to compensate the FIA-T's underestimation. We will present further comparisons of these columns in Section 4.

3 Trends and Other Findings

In Figures 3-7, we depict the dynamics of the income share changes for the richest 10%, 5%, 1% 0.1%, and 0.01%, respectively. Detailed statistics for the top income shares are given in Table A4 in the Appendices.[15] In each figure, there are three columns, one obtained from Pareto interpolation using the FIA- tabulated data, one calculated using the whole-population FIA-microdata, and the other (linked) obtained by adding to the before-1998 FIA-T series the 1998-2013 average difference between FIA-T and FIT-M . After 1998, the linked series is the same as FIA-M. There are several points we would like to make, which we have separated into subsections as listed below.

Insert Figures 3-7 about here.

3.1 The Macro Trend

As we can see from Figures 3-7, the top income shares in Taiwan, regardless of whether they are 10%, 5%, 1%, 0.1% or 0.01%, have exhibited a common increasing trend since the late 1990s. From the time series of the Pareto interpolation, the top income share exhibits a local, temporary peak toward the end of the 1980s, perhaps due to the stock

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[15]Several other Figures show features similar to Figures 3-7, and hence are omitted. They are, however, available from the authors upon request.

market peak in the same period. The Taiwan Stock Exchange index increased from 636 points in July 1985 to 12,682 points in February 1990, reflecting a jump of nearly twenty times without much change in Taiwan's economic fundamentals.[16] Furthermore, there were also several ups and downs during this 5-year period, suggesting large returns or losses in different years. Because rich people are main stockholders, that their income shares exhibit a corresponding rising trend and fluctuations during this period is not a surprise.

As one can see from Table A4, the top income shares began to rise significantly in the latter half of the 1990s. For instance, the top 1% income share rose from 6.95% in 1996 to 8.88% in 2004, and to 11.31% in 2011, according to the Pareto interpolation estimation (including capital gains with income control 2). For the direct calculation, the trend is the same, and the percentage is even higher. Again using the top 1% as an example, the 1996, 2004, and 2011 income shares are respectively 7.30%, 9.12% and 11.74%. The same trend can be found for the top 5%, top 0.1%, and top 0.01%. This increasing trend is very much consistent with other countries documented in Piketty (2014).

3.2 Changes in some Particular Years

First, there is a common trend of a dropping top income share in 2009, one year after the financial crisis of 2008. Since rich people tend to be hurt more seriously when asset prices decline, both methods obtain consistent results. We can see more of this as we

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[16] At least one major reason behind this stock market surge was the appreciation of the Taiwan currency, which rose from nearly NT 40/US 1 in December 1985 to NT 25.7/US 1 in December 1991. This evident trend of appreciation under the pressure of the U.S. government attracted much hot money that flowed into Taiwan, at least part of which went into the stock market.

move to the income source analysis.

Second, there is a low point for the very rich group in 1998 and a peak in all top income shares in 2003 as we use the direct micro-data calculation method (red lines). These are observations not found from the FIA-tabulated data (blue lines). For 1998, which is the starting year for our FIA-micro data, since Taipei city found their file missing for some reason, the 1998 top income share is calculated using observations other than those for Taipei city. However, because Taipei is the richest city in Taiwan, leaving it aside might have a serious underestimating effect on the calculation of the very top income percentages, but an overestimation of the top 5% and 10% shares in 1998.

So far we do not have a good explanation for the peak in 2003. By inspecting the data closely, we find that this peak was mainly due to the drag of the richest rich, the top 0.01%. We do not know exactly what happened in 2003, even after discussing the matter with officials from the Taiwan tax authorities.

Third, Figures 3 to 7 also show a drop in the top income shares in 2011-2013, a phenomenon that the tabulated data also reveal. After looking at the FIA data and carefully discussing the issue with the tax authorities, we believe that this may be related to the poor performance of a particular large company hTC, compared with previous years. hTC's annual profits in the years 2011-2013 were respectively (in billions of NT dollars) 62,299, 17,621 and -1,323 (a loss). Because its income accounts for 2% of Taiwan's GDP, and its dividends and returns contribute significantly to the top income share, its poor performance in this period might have pulled the statistics as a whole down in Figures 3-7.

3.4 Shares within Shares

Figure 8 shows Taiwan's income shares for the top X% within the top 10X% (with X=1, 0.1, and 0.01) from 1977 to 2013, which demonstrate the concentration of incomes within the top-income groups. Several observations can be made from Figure 8. First, in the period 1977-2013, the mean levels of the shares for the three groups are 27.25%, 32.49%, and 41.66% respectively, indicating that the top tenth share of the richest rich income group is greater than the top tenth share of the less rich group. Second, for X=1, 0.1, and 0.01, the shares of the top X% within the top 10X% are roughly flat before the mid-1980s. However, these three ratios all started to increase toward the end of the 1980s. This pattern shows that for each rich percentile group, the distribution within that group started to become more unequal ever since the 1990s.

Insert Figure 8 about here.

Third, the slopes of these three share-within-share percentages are different. Between 1977 and 2013, the average annual income growth rates of the 0.01%/0.1%, 0.1%/1%, and 1%/10% were respectively 0.40%, 0.94% and 0.99%. Fourth, the fluctuation in the richest group's share in the late-1980s is large, compared with that for the other groups. As we explained in Section 3.1, this may be due to the serious turbulence in Taiwan's stock market in this period, and rich people are especially vulnerable to such turbulence because they own larger shares. Finally, the richest group's spike in 2003 and the common drop in 2009 have been addressed in the previous subsection. Detailed

statistics for these three shares within shares are given in Table 4.[17]

Insert Table 4 about here.

In Table 5 we present the income shares of four disjoint income groups after the year 2000 so that we can explore the possible causes behind the growth of the top 10% share in this period. These four groups are the "1X%-9X% of the top 10X%". This calculation is implemented using the exact income data from the FIA (FIA-M). The growth in the share of the P90-99 group is 0.365% per year, smaller than the 0.40% of the top 1% of people. Furthermore, the income shares of the other three groups are respectively 0.135%, 0.051% and 0.047%, which are also smaller than the richest top 1/10 subgroups that they respectively belong to. This indicates that the income shares of the 1X%-9X% of the richest groups are not really growing. This evidence strengthens the argument of deteriorating inequality even within rich groups, a finding which is consistent with that found in Piketty and Saez (2006).

Insert Table 5 about here.

4 Income Composition and Comparisons

4.1 Sources of Top Income

We present Taiwan's fractions of income derived from five sources: wages and salaries (including pensions; item 3 in Section 2.1), business and professional practicing

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[17]Alternatively, one can compare the top10-1%, top 5-1%, and the top 1% figures; and also the top 1.0-0.5%, top 0.5-0.1 and top 0.1% figures. These are depicted in Figures A2-A3.

incomes (items 2 and 6 in Section 2.1, called BPP incomes), capital incomes (interest, dividends, and rents; items 1,4, and 5 in Section 2.1) and realized capital gains (gains from sales of rights and properties other than land; items 7 in Section 2.1), and other incomes.[18]Note again that the share of capital income is rather insignificant because of a very limited tax base and a much lower than fair market valuation method to calculate real estate gains. In the following discussion we denote K-Income as the sum of capital incomes and capital gains. This is possible only by using the electronic whole-population micro data, for the source-specific tabulated data do not provide enough details.

Insert Figures 9-10 about here

Figures 9 and 10 show that wage and K-Income fluctuated between 1998 and 2001, and stabilized afterwards. For the top 1% of households, wages and K-Income were the two major sources, and the proportion of wage income remained around 50% from 1999 onward. However, for the top 0.1%, K-Income has become the single most important source of income, and wages and salaries have never accounted for more than 30% of the total income since 1999. For the top 5% (0.01%) group, the wage share is even larger (smaller), and the K-Income share smaller (larger); the analysis is roughly the same, and hence is skipped.

It is also helpful to pick out one particular year and see how the income sources change as we move toward richer families. As we can see from Figure 11, in the year 2012, the K-income share increases significantly (and the wage-income share decreases significantly), as we move toward richer groups. The wage income proportion for the

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[18]See our discussion in Section 2.1 and footnote 10.

top 20% group is 75.9%, but declines to 13.8 for the top .01% very rich group. The K-income proportion for the top 20% is 21.4%, but increases to 83.8% for the .01% group.

Insert Figure 11 about here

The momentum of increase in the shares of capital income for the very top income group is also correlated with the transition from the original "classical" system to the imputation system in 1998. As we explained in Section 2.1, Taiwan adopted the imputation system for corporate dividend income and personal income, allowing for a full deduction of dividends as taxpayers file their personal income taxes. Since then, the payment of dividends has become more attractive to businesses, replacing the old regime where dividends were subject to both corporation and personal income tax.[19] Detailed proportions of income sources for the top income groups are provided in Table A5 in the appendices.

4.2 International Comparisons

Figures 12-16 provide a comparison of Taiwan's top 10% to top 0.01% income shares with those of three major Asian countries (Singapore, Korea and Japan), the U.S. and some EU countries. To be on the same basis as the other countries' figures, our discussion for Taiwan will be based on those obtained by linked adjustment. The income control total used in this subsection is income 2, mainly to be consistent with the series obtained in Singapore and Korea. These figures show that Taiwan's top

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[19] As Atkinson and Leigh (2007) note in their study on Australia's introduction of the imputation system in 1987, they believe that "insofar as capital gains are missing from the estimates but dividends are covered, a switch towards (away from) dividend payment will increase (reduce) the apparent shares." The effect of the introduction of imputation in Australia in 1987 is evident in their statistics.

income shares are relatively low among Asian countries, in particular Korea and Singapore. Our discussion will mainly focus on the top 1% group.

Insert Figures 12-16 about here.

Taiwan and Singapore's top income shares roughly follow a similar trend. Singapore's top 1% income share experienced a sharp rise in the late 1990s but it declined between 2002 and 2004. In all years of our data, Singapore's top 1% income share was higher than Taiwan's by about 3% to 7%, but both countries followed a similar time trend. However, after the financial crisis, Taiwan's and Singapore's top income shares seemed to follow separate paths. While Taiwan's top 0.1% income share rebounded in 2010, Singapore's top 0.1% income share did not fully recover from the drop.

Japan's top 1% income share is significantly lower than those for Korea and Singapore and similar to that of Taiwan, but does not exhibit an obvious time trend until the late 1990s. As is true for other countries, the top income share for Japan increased in the early 2000s. However, these top income shares follow a smoother trajectory. While the top income shares of Taiwan, the U.S. and Singapore exhibited a sharp drop in 2009 due to the financial crisis, Japan's did not show a discernible drop. Japan's top income share rose sharply in the late 1980s and, after a brief period of decline, rose steadily until 2000, when the dot-com bubble burst. By contrast, Taiwan's top income share wiggled in the late 1980s and early 1990s and began to rise in the mid-1990s.

It is particularly interesting to see that Korea's top income shares are higher than that of Taiwan for the top 10%, 5%, and 1% groups for most years in the past decade, but they are lower than that of Taiwan for the very rich, the top 0.01%. For Japan, despite its top

income shares being higher than Taiwan, the gap between Japan and Taiwan decreases

and eventually reverses as we move toward the richest group. This seems to suggest that

either rich families in other Asian countries are increasingly better at hiding their

incomes abroad (so that their incomes are not shown in the domestic tax authority data),

or that Taiwan's environment for the very rich people to make money has been

increasingly more favorable. This is an area worthy of further exploration in the future.

The U.S.'s top income share was higher than those of the other countries depicted in the

figures in the post-1987 period. Before 1987, the U.S.'s top income share was lower or

similar to that of Singapore. However, it rose rapidly from then on. Except for some

brief periods of stability (1989-1995 and 2005-2008) or decline (2001 and 2009), the

U.S. top income share followed a rapid upward trend.

Overall, we see in Figures 12-16that the top income shares of the U.S. and Singapore

are high and volatile compared with that for Japan. The ups and downs of their top

income shares quickly reflect the state of their economies. Other EU countries are

shown in the figures for reference purposes, but detailed comparisons are not specified

here.

One should keep the caveat in mind that different countries have distinct tax laws,

deductions, welfare systems, and tax-evasion penalties, etc. Therefore, the international

comparison cannot be swallowed literally. We should note, however, that the Gini

coefficients for Singapore and many countries listed in the figures are higher or lower

than that for Taiwan,[20] and the differences in Gini coefficients are not fully consistent

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[20]As for the Gini coefficient for 2011, it was .342 for Taiwan, .310 for Korea, .271 for Japan, .448 for Singapore, .450 for the US, .330 for the U.K., .290 for Germany, and .308 for France.

with the figures, as we have seen from the case comparison of Singapore, Korea, Japan and Taiwan. It is interesting to explore whether and how much the differences in the tax structure or social welfare system can explain such discrepancies. Further analysis along these lines is needed in the future.

4.3 Comparison of FIA-M and FIA-T

Since our method of direct calculation does not rely on any functional or parametric assumptions, it is not surprising that the resulting income percentages are different from those obtained using the interpolation method. In each of Figures 3 to 7, we can see a similar rising pattern, except for some minor differences. First, the direct calculation almost always results in higher top income ratios than those obtained from the Pareto estimation. This shows that, at least in Taiwan, the Pareto interpolation underestimates the true parameters of the Pareto distribution based on the tabulated data.

In Table 6, we show the Pareto-Lorenz coefficients obtained using two methods. The first approach is to perform the estimation using the FIA-tabulated data, and the alternative approach is to re-construct the tabulation first using the FIA-micro data, and then estimate the Pareto coefficient using the constructed tax table. These two coefficients are both listed in Table 5. As one can see, the difference in coefficients is larger (in absolute value) for the 5% and 1% levels, and is smaller for the 0.1% and 0.01% levels.

Insert Table 6 about here.

In Figure 17, we draw three lines, respectively, estimation case 1 (Pareto interpolation,

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blue line), estimation case 2 (Pareto estimation, red line) and the directly calculated results. Estimation case 1 refers to obtaining β by $\beta = \log(P_i/P_j)/\log(I_i/I_j)$, where P_i is the population percentage below (including) interval *i*, and I_i is the income percentage below (including) interval *i*. For estimation case 2, β is obtained by the formula $\beta = \text{mean (top 1\% income)}/\text{min (top 1\% income)}$, where the mean and the minimum are derived from micro tax-return data. The direct calculation method (green line) simply calculates the income shares directly from the micro data so that the estimation of β is not required.

Insert Figure 17 about here.

As one can see from Figure 17, the patterns of these three methods are roughly the same, but in years when there are sharp drops or rises, the case-1 estimation is too smoothed to pick up the change. For instance, in 2003 when SARS attacked Taiwan and in 2008-2009 during the financial crisis period, the three lines exhibit fairly large differences. Moreover, we find that the case-1 estimation may be sensitive to the rounding of decimal points. This is left as a future methodological exercise.

Finally, we examine the validity of the Pareto distribution assumption by performing the following exercise. We follow Atkinson (2014b) and define the M(F) function as follows. M relates the average income of people with income above y(F) to y(F), this being the F-percentile. As noted by Atkinson(2014b), M does not depend on the income control total, since the mean cancels out when the share is divided by the percentile ratio. In the Pareto case, M is a constant, equal to β, so that a simple test of the Pareto assumption is to check how M varies as we consider different points in the distribution.

For the case of Taiwan, it appears from Figure 18 that the Pareto assumption of constant β may not hold. However, we do not have a statistical test for the constant β hypothesis, and neither do we have a complete comparison across countries. Perhaps this can be done in the future when country-specific data have a more common scale.

Insert Figure 18 about here.

5. Conclusions

In this paper we have performed the top income share analysis using the data for Taiwan. The first data set consists of the tabulated data from the tax statistics, and the second data set is made up of rare electronic individual data from the FIA. The basic macro trend of Taiwan coincides with that found in other developed countries, in that the top income shares started to increase in the 1990s.In periods for some local events such as the 1985-1990 stock market and housing bubbles, the 2003 SARS attack, and the downward pressure in 2012 caused by the performance of the giant company hTC, Taiwan showed particular income share changes.

Overall, our research shows that the top 1% income share in Taiwan increases significantly from 8.00% in 1998 to 10.68% in 2013, and the shares of the top 0.1% and the top 0.01% groups increase at about the same pace. As to the international comparison, Taiwan's top income share pattern is smaller than in most Asian countries, but this pattern tends to be weakened as we move toward the richest group.

Increasing inequality around the world has created many academic concerns as well as political impacts. However, international comparisons of statistics should be made

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cautiously because the numbers are cross-sectional and static in nature, and also contain sophisticated cultural and tax-law background factors.

The unique and complete panel nature of Taiwan's dataset, however, gives us a rare chance to investigate many interesting and important questions in the future. Here we list some of them. First, in Taiwan, we ask the question: is it the case that "once a top 1%, always a top 1%"? Or put differently, is the case of Taiwan similar to what Chetty et al. (2014a, b) have observed: "the rungs of the ladder have grown further apart, but children's chances of climbing from lower to higher rungs have not changed." Secondly, by linking parents' and children's information, we can also estimate the intergenerational income mobility coefficients, another important statistics for the study of intergenerational inequality (Solon 1999, Black and Devereux 2011). In addition, from our asset data we can also tabulate the top 1 % (or 0.1%, 0.01%) share of asset holdings. The income (flow) and asset (stock) results together should give us a more complete picture about inequality dynamics. Finally, the Taiwan government has implemented a lot of tax cuts in the past 25 years. In Table 2 we have listed the tax cuts that took place in the past. As one can see, most of these tax cuts benefit the rich, and not the salary group. We can use our panel dataset to evaluate whether and how much these tax cuts favor the wealthy group.

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Table 1: Major Changes in the Income Tax System in Taiwan, 1895-present

Year	1895-1945	1946-1956	1956-1973	1974 onward
Major Changes in Tax Statutes	Colonial Era; Separate Income Tax.	Dual Income Tax System.	Adoption of the ComprehensiveIncome Tax System.	1998 Adoption of Dividend Imputation system. 2010 Interest income from public debt, corporate bonds or financial bonds, short-term commercial paper and beneficiary securities taxed separately at 10% (Financial Asset Securitization Act; Real Estate Securitization Act).
Changes in Taxable Incomes	1910 Category I Corporate Income taxed; 1921 Category II Personal Income and Category III Security and Interest Income taxed.	Separate Income Tax, and high incomes are subject to consolidated income tax.	1963, change from Residential System (Worldwide incomes) to Territorial System (Local Incomes).	2011 Military personnel and Primary and Secondary teachers' wages resumed income taxation (originally tax-free) 2015 Top marginal tax rate increases from 40% to 45%. 2016 Stock exchange capital gains resume income taxation.
Taxing Unit	Individual		Household (consolidated tax returns)	

Sources: Yearbook of Tax Statistics, 1974-2007; Yearbook of Financial Statistics 2008-2014; Guide to ROC Taxes (2014), available from http://www.mof.gov.tw/ct.asp?xItem=70412&ctNode=2829&mp=66
Notes: 1) Taiwan was under Japanese colonial rule from 1895-1945. 2) Effective from 2006, the Alternative Minimum Income Tax has applied to residents who report over NT$ 1 million foreign source income annually after 2010, insurance payments of over NT$ 30 million, capital gains derived from unlisted stocks and privately-held trust funds, and who claim for a noncash charity deduction in the general income tax return. These incomes are add-on incomes and hence are   not factored into our estimates of top income shares.

Table 2: Taiwan's Tax-cuts list, 1980-2013

Year	Tax deduction items
1980	Business Tax
1988	Amusement Tax
1989	Land Value Tax, Land Value Increment Tax
1990	Income Tax, Amusement Tax, Commodity Tax
1991	Land Value Tax
1992	House Tax
1993	Securities Transactions Tax
1994	Income Tax, Land Value Tax, Business Tax
1995	License Plate Tax, Estate and Gift Tax, Business Tax
1997	Land Value Increment Tax, Commodity Tax
1998	Imputation System, Income Tax
1999	Deed Tax, Business Tax
2001	Income Tax, License Plate Tax
2002	Land Value Increment Tax
2005	Land Value Increment Tax
2009	Estate and Gift Tax
2011	Enterprise Income Tax
2013	Income Tax

Table 3: Number of Estimated Total and Exact Tax-filing Household Numbers

Year	Estimated # of households	Exact # of tax-filing households
1977	6,017,012	2,100,819
1978	6,218,728	2,297,569
1979	6,441,680	2,444,154
1980	6,646,302	2,653,277
1981	6,845,321	2,763,622
1982	7,062,798	2,871,611
1983	7,259,876	2,920,102
1984	7,487,815	3,129,869
1985	7,696,631	3,213,971
1986	7,897,513	3,463,133
1987	8,105,114	3,627,881
1988	8,303,339	3,719,538
1989	8,495,740	3,894,788
1990	8,714,022	3,927,753
1991	8,889,194	4,013,900
1992	9,055,696	4,171,672
1993	9,228,631	4,305,196
1994	9,417,186	4,432,327
1995	9,604,330	4,427,367
1996	9,818,596	4,518,679
1997	10,040,017	4,694,756
1998	10,310,437	4,768,753
1999	10,567,339	4,912,712
2000	10,815,000	5,047,375
2001	11,077,527	4,972,786
2002	11,329,353	4,950,581
2003	11,561,297	4,977,044
2004	11,802,649	5,135,554
2005	12,008,471	5,182,450
2006	12,188,812	5,235,330
2007	12,362,147	5,385,801
2008	12,545,766	5,469,774
2009	12,730,050	5,349,318
2010	12,918,441	5,509,478
2011	13,059,797	5,669,361
2012	13,223,338	5,964,017
2013	13,379,547	5,991,481

Table 4: Taiwan Shares within Shares Change, 1977-2013

Year	1%/10%	0.1%/1%	0.01%0.1%
1977	25.99	29.01	37.42
1978	26.05	30.81	41.82
1979	25.85	29.71	37.08
1980	25.94	29.53	37.27
1981	25.26	29.25	38.20
1982	25.02	27.08	37.46
1983	24.94	26.17	33.07
1984	25.20	26.64	35.14
1985	25.34	28.07	39.20
1986	24.95	27.24	35.71
1987	26.79	33.70	47.92
1988	26.37	30.30	38.63
1989	28.25	34.89	46.83
1990	26.57	31.49	40.13
1991	27.54	35.99	50.05
1992	25.62	30.27	40.33
1993	25.10	29.80	40.35
1994	25.49	27.65	43.49
1995	25.39	30.44	41.59
1996	25.07	29.31	40.02
1997	25.72	30.02	38.90
1998	26.11	31.03	40.37
1999	26.61	31.52	39.18
2000	28.29	35.03	42.62
2001	28.11	35.00	43.71
2002	28.18	35.95	45.79
2003	29.64	39.18	47.47
2004	28.79	35.33	43.08
2005	29.57	36.66	44.38
2006	29.66	36.81	44.98
2007	30.53	37.38	43.73
2008	30.88	38.44	45.29
2009	28.67	33.93	41.72
2010	30.77	37.57	45.52
2011	31.19	38.32	45.74
2012	29.59	36.55	43.85
2013	29.34	36.18	43.50
average	27.25	32.49	41.66
Average Growth rate %	0.40	0.94	0.99

Table 5: Income Shares of 1X%-9X%, Taiwan 2001 - 2013

	P90-99	P99-99.9	P99.9-99.99	P99.99-100
2001	23.39%	5.95%	1.80%	1.32%
2002	21.85%	5.49%	1.67%	1.40%
2003	21.81%	5.59%	1.89%	1.41%
2004	22.56%	5.90%	1.83%	1.71%
2005	23.52%	6.26%	2.01%	1.39%
2006	23.56%	6.28%	2.01%	1.61%
2007	24.50%	6.74%	2.27%	1.65%
2008	25.47%	7.00%	2.39%	1.76%
2009	24.05%	6.38%	1.91%	1.98%
2010	25.20%	6.99%	2.29%	1.37%
2011	25.90%	7.24%	2.44%	1.92%
2012	26.91%	7.18%	2.32%	2.06%
2013	25.71%	6.81%	2.18%	1.81%
linear trend	**0.365%***	**0.135%***	**0.051%***	**0.047%***

Note: ***, **, and * denote significance levels of 1%, 5%, and 10%, respectively.

Table 6: Pareto-Lorenz coefficients

Year	5%		1%		0.10%		0.01%	
	FIA-M	**FIA-T**	**FIA-M**	**FIA-T**	**FIA-M**	**FIA-T**	**FIA-M**	**FIA-T**
1977		1.72		1.71		1.94		2.14
1978		1.72		1.75		2.13		3.28
1979		1.72		1.76		1.95		1.90
1980		1.72		1.74		1.88		2.62
1981		1.70		1.75		1.95		2.14
1982		1.72		1.65		1.85		2.22
1983		1.73		1.63		1.73		2.03
1984		1.69		1.67		1.77		2.30
1985		1.71		1.67		1.88		2.42
1986		1.69		1.65		1.83		1.89
1987		1.77		1.86		2.41		2.93
1988		1.74		1.77		2.06		2.14
1989		1.83		1.94		2.50		2.84
1990		1.78		1.75		2.24		2.24
1991		1.79		1.96		2.72		3.11
1992		1.71		1.73		2.12		2.26
1993		1.69		1.68		2.11		2.27
1994		1.71		1.72		2.19		2.47
1995		1.72		1.69		2.13		2.35
1996		1.72		1.66		2.01		2.21
1997		1.74		1.70		2.14		2.14
1998	2.22	1.77	1.55	1.71	1.76	2.25	2.15	2.25
1999	2.42	1.80	1.79	1.76	2.28	2.33	2.45	2.33
2000	2.53	1.88	1.92	2.04	2.59	2.55	2.60	2.55
2001	2.56	1.88	1.90	2.04	2.61	2.61	2.78	2.61
2002	2.55	1.85	1.92	1.82	2.73	2.84	2.91	2.84
2003	2.65	1.88	2.04	1.84	3.04	2.53	2.92	2.96
2004	2.64	1.91	1.93	2.09	2.59	2.62	2.72	2.62
2005	2.73	1.96	1.98	2.05	2.69	2.63	2.80	2.63
2006	2.74	1.96	1.98	2.08	2.72	2.57	2.89	2.57
2007	2.83	2.08	2.03	2.10	2.72	2.65	2.73	2.65
2008	2.85	2.02	2.07	2.23	2.83	2.82	2.84	2.82
2009	2.69	1.89	1.89	1.87	2.48	2.52	2.65	2.52
2010	2.85	1.98	2.04	1.99	2.76	2.69	2.91	2.69
2011	2.89	2.02	2.07	2.21	2.83	2.72	2.93	2.72
2012	2.76	1.94	1.99	2.15	2.67	2.66	2.77	2.66
2013	1.84		1.97		2.64		2.75	

Figure 1: Gini Coefficients and 20% Average Income Ratios for Taiwan, 1964-2013

Source：DGBAS, THE SURVEY OF FAMILY INCOME AND EXPENDITURE. Income is household disposable income
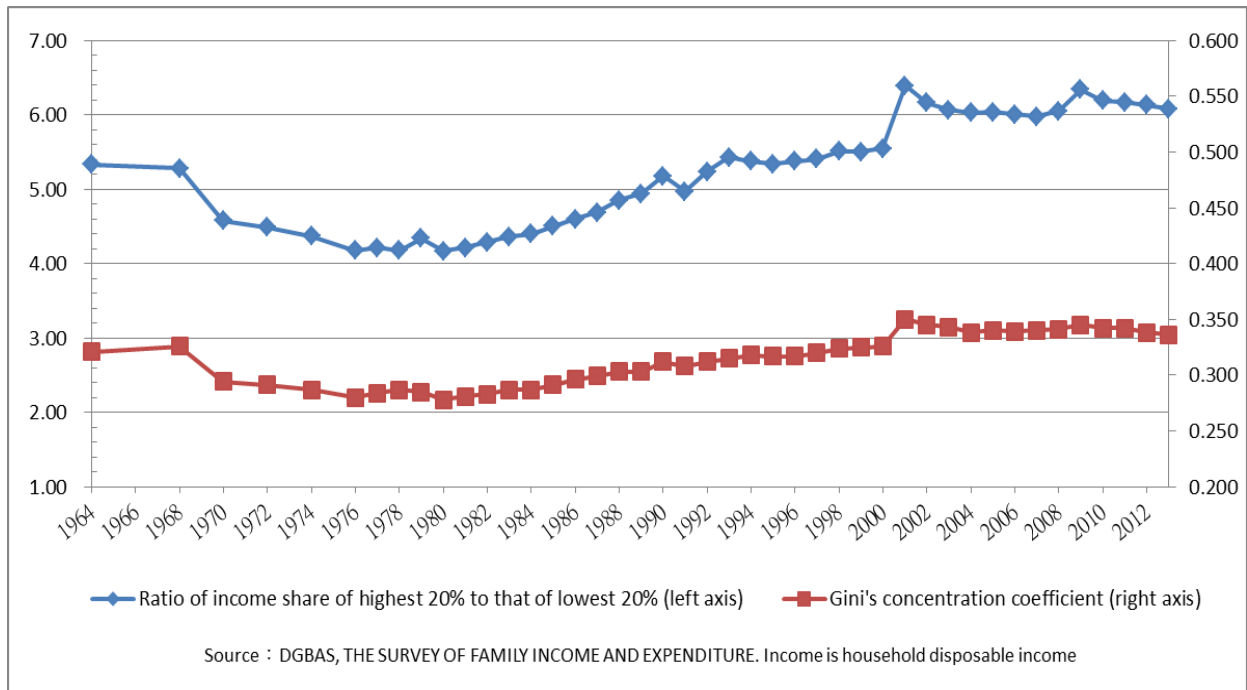
Figure 2: The Highest 5% of Average Income / The Lowest 5% of Average Income, 1998-2011

The highest 5% average income divided by the lowest 5% average income, 1998-2011

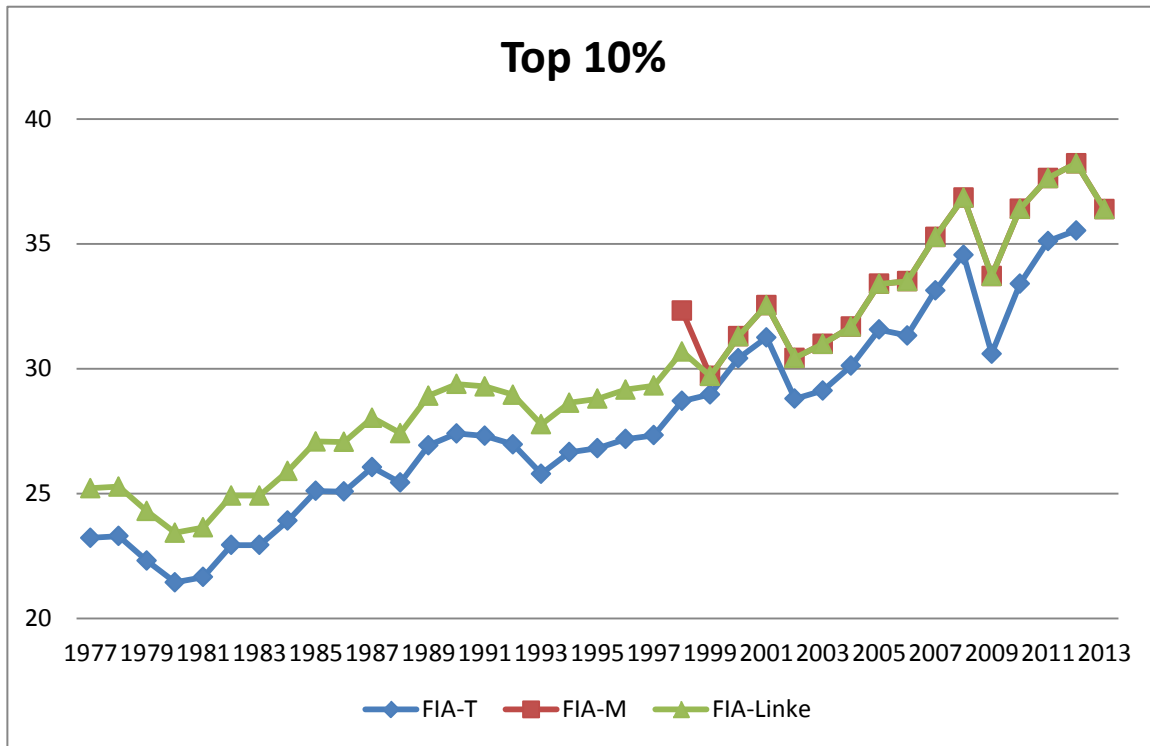Source: Fiscal Information Agency, Ministry of Finance. Income is family taxable income.
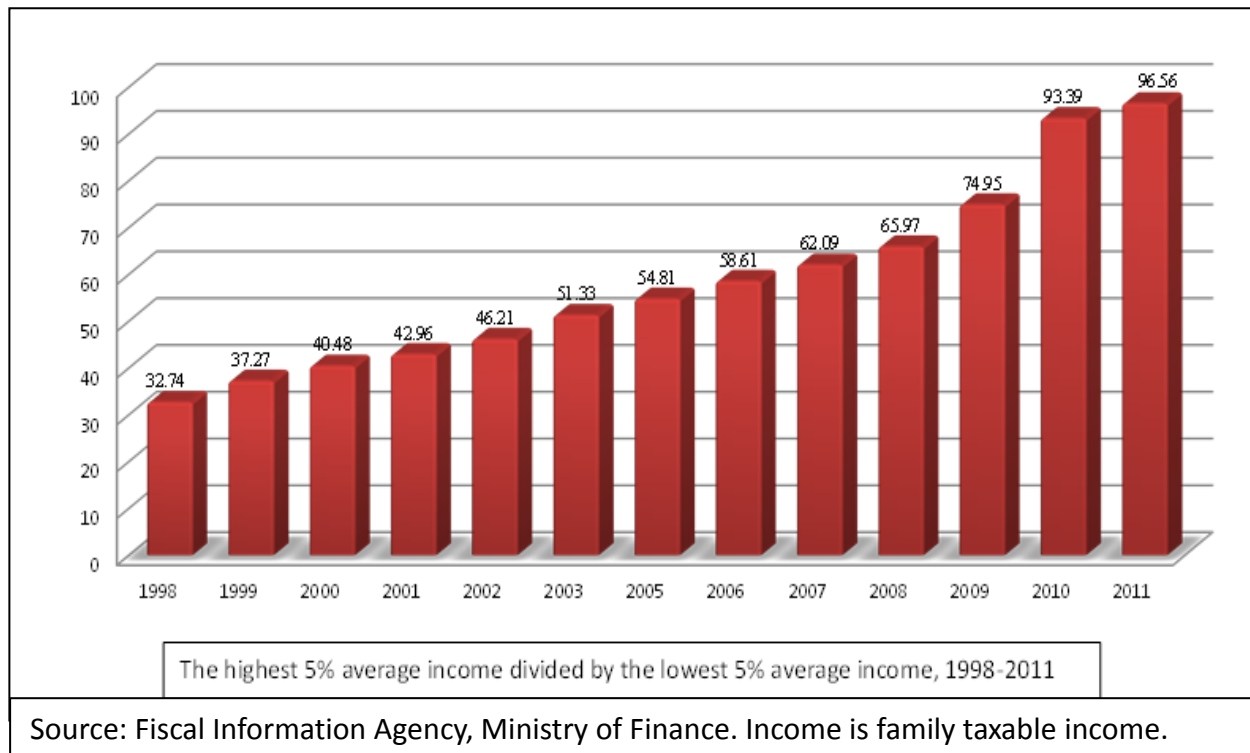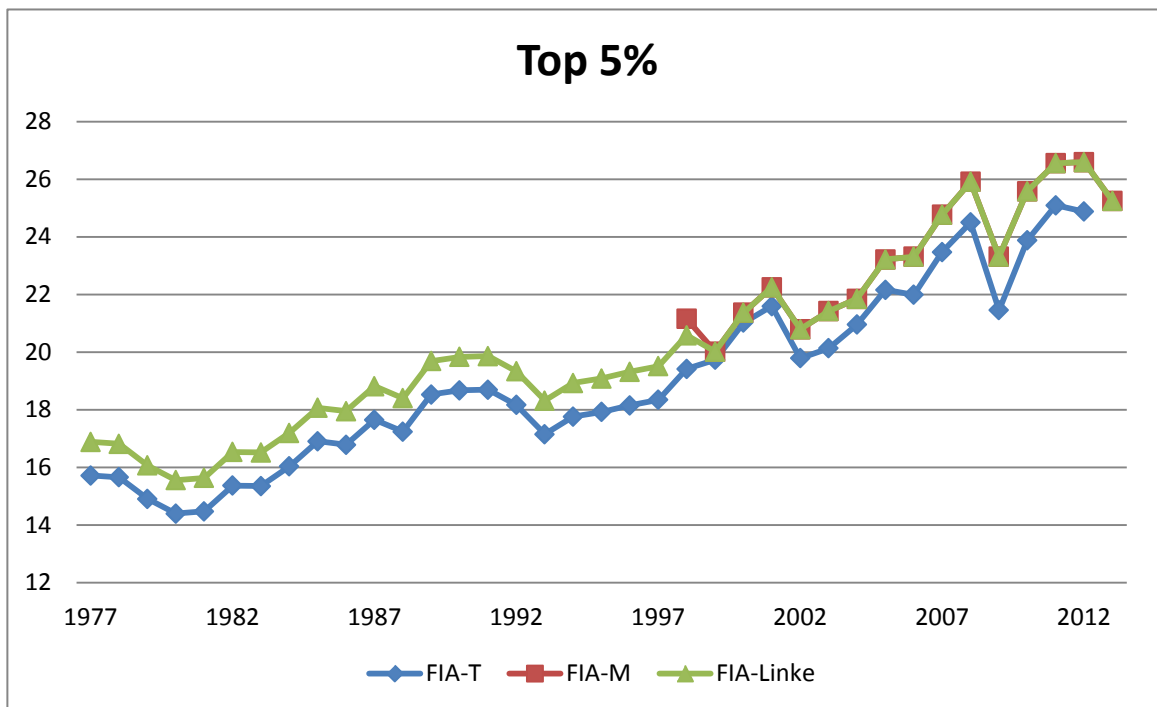
Figure 3: Top 10% Income Shares

Figure 4: Top 5% Income Shares

Figure 5: Top 1% Income Shares

TOP 1%

Legend: FIA-T, FIA-M, FIA-Linke

Figure 6: Top 0.1% Income Shares
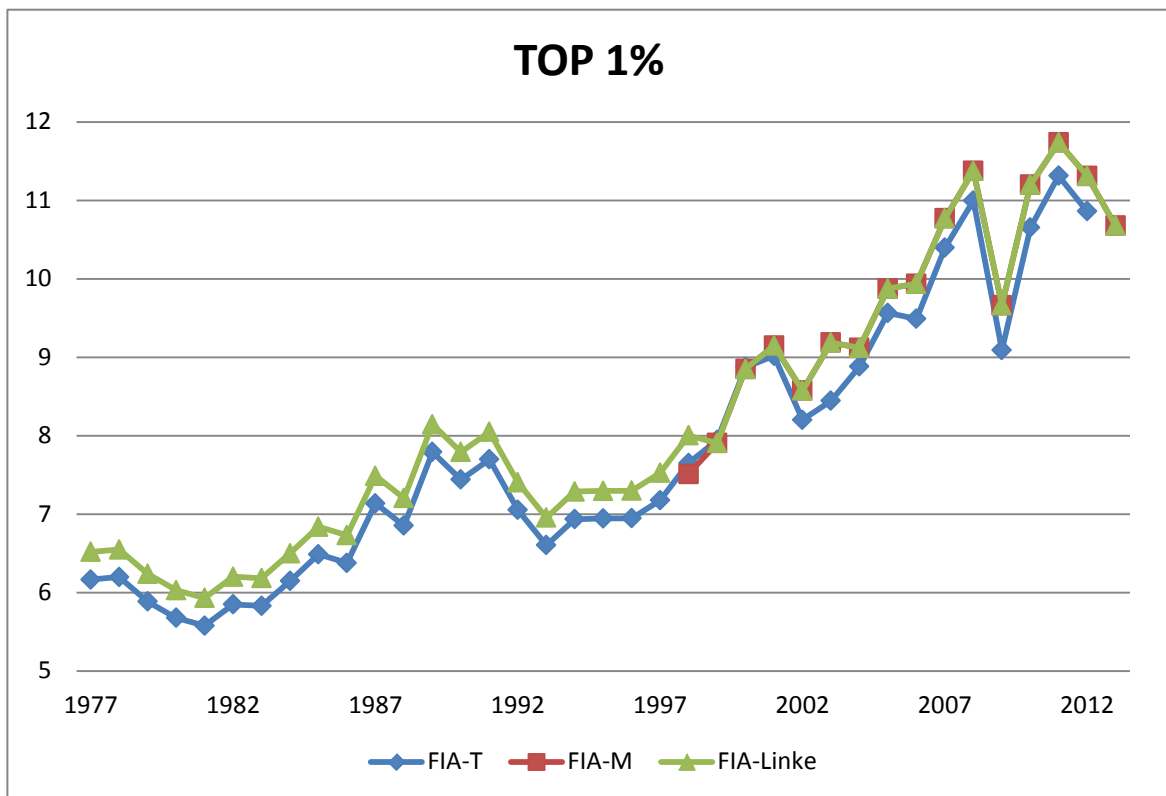

Top 0.1%

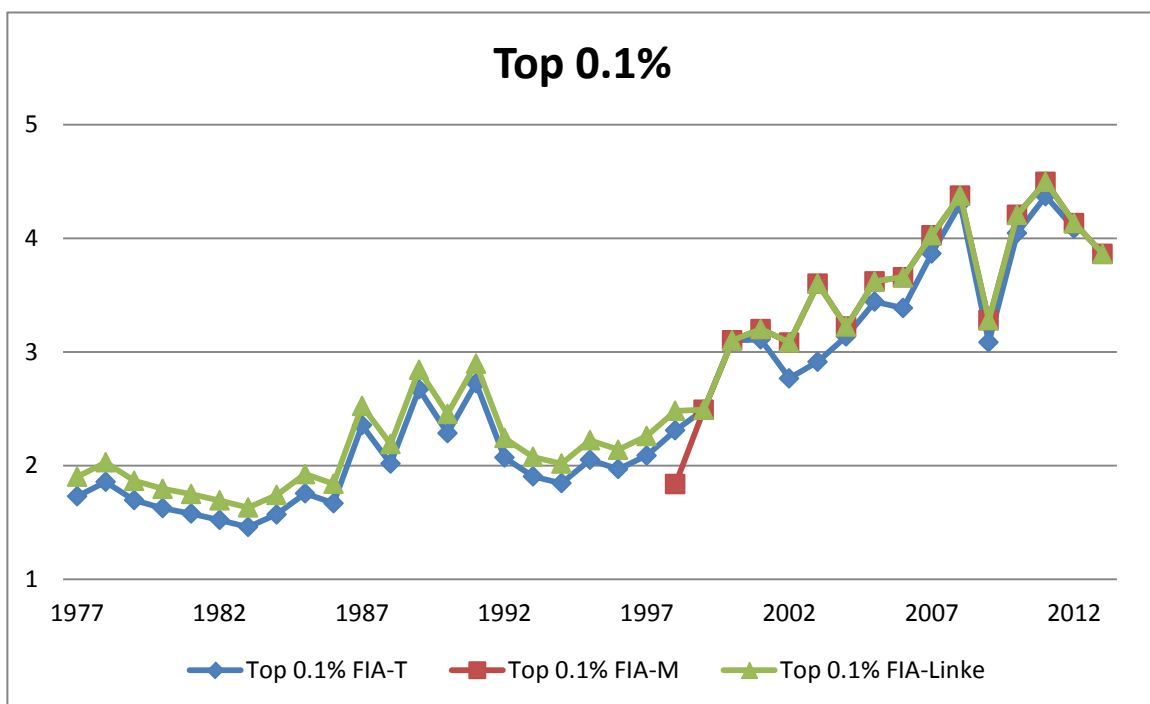Legend: Top 0.1% FIA-T, Top 0.1% FIA-M, Top 0.1% FIA-Linke
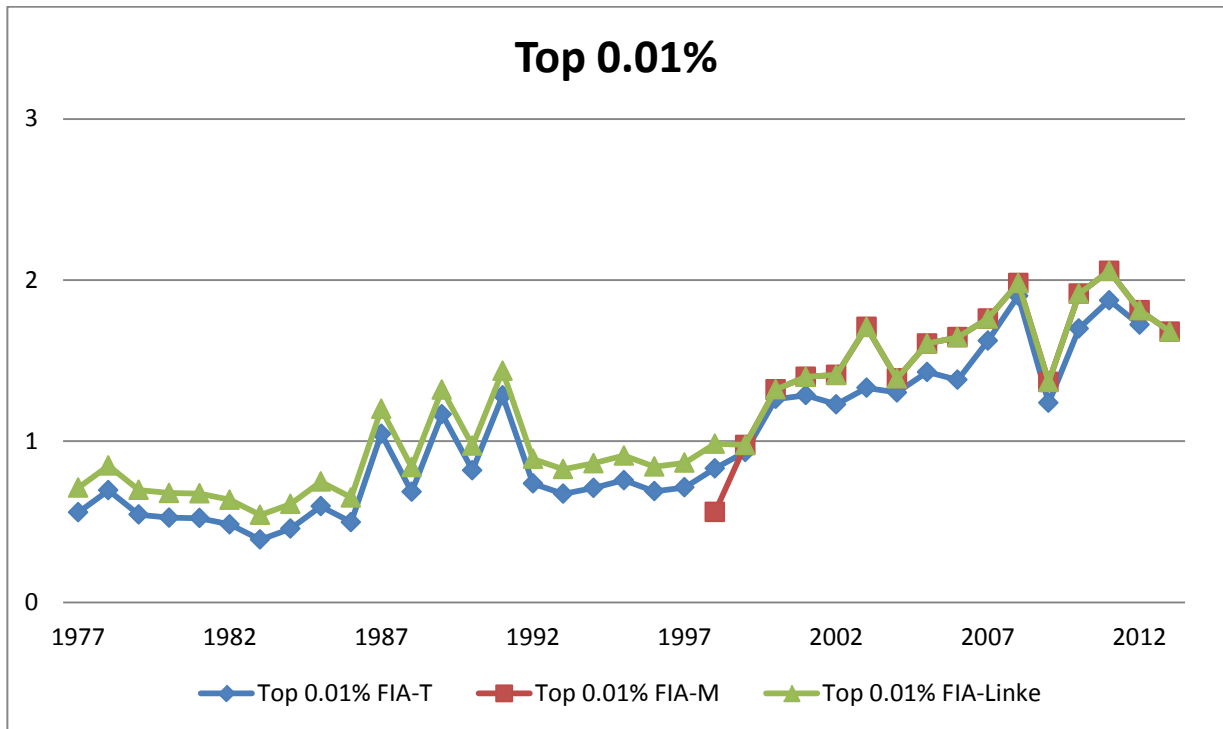
Figure 7: Top 0.01% Income Shares

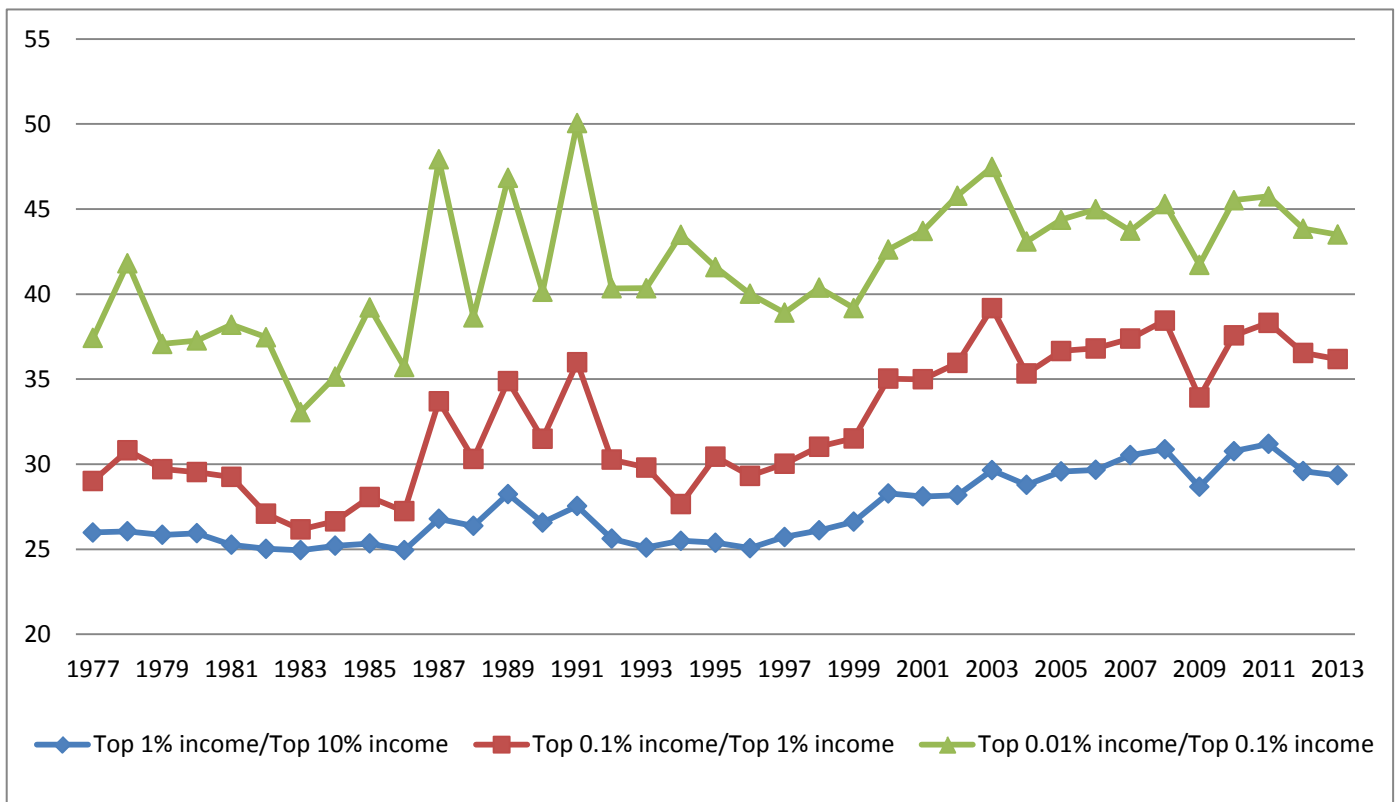**Figure 8: Taiwan Shares within Shares Change, 1977-2013**

Figure 9: The Top 1% Income Composition in Taiwan, 1998–2013

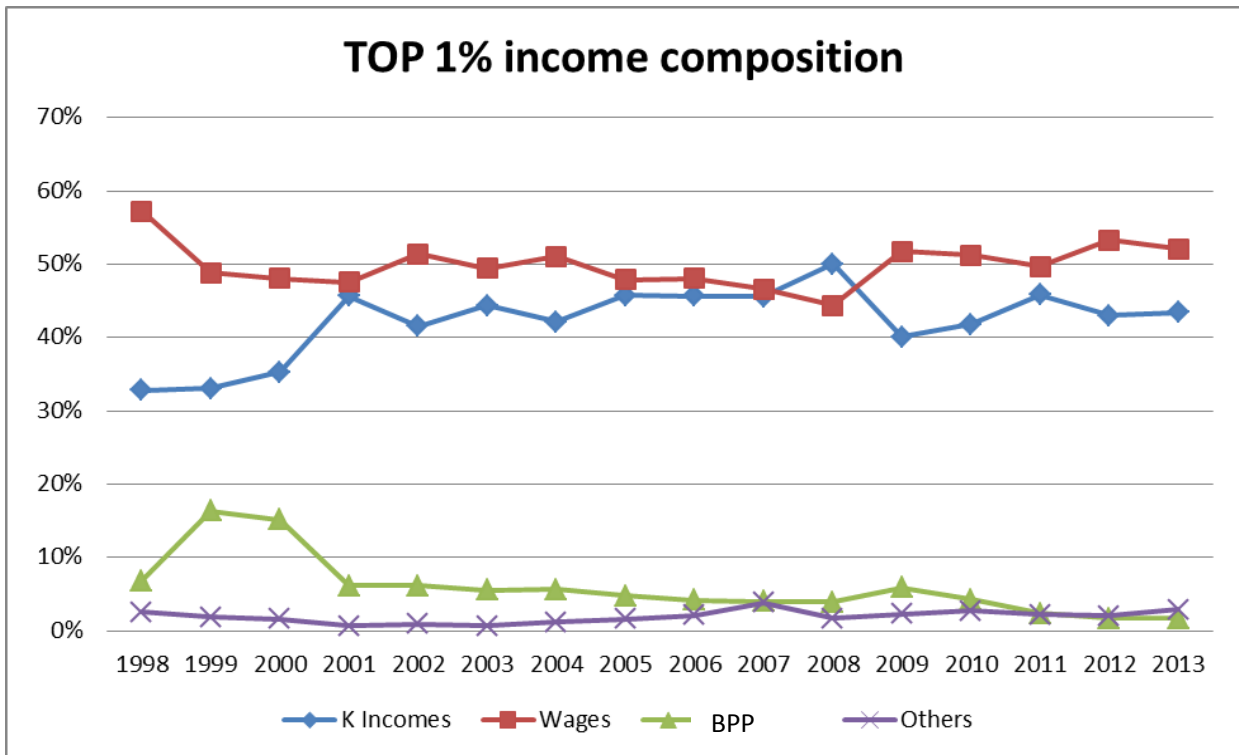*Sources*: Table A.5, composition columns for top 1%.

Figure 10: The Top 0.1% Income Composition in Taiwan, 1998–2013
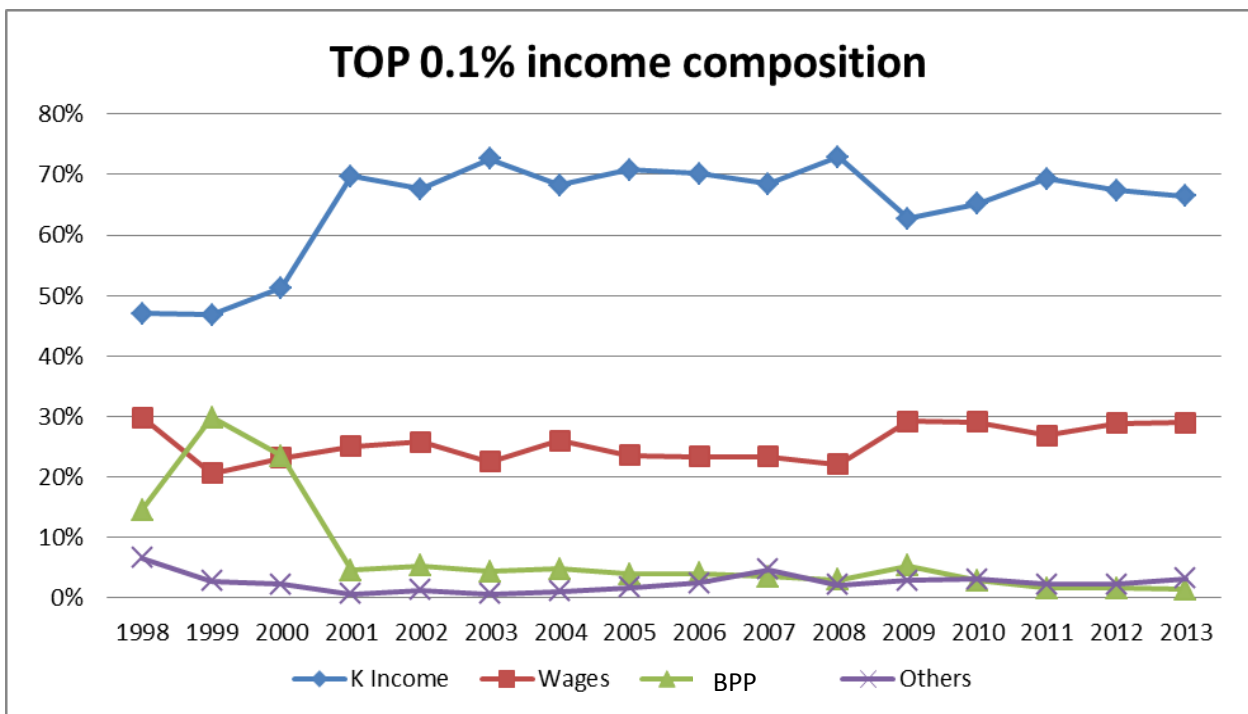
Sources: Table A.5, composition columns for top 0.1%.

Figure 11: Taiwan Income Composition, 2012

Figure 12: Top 10% Income Share – International Comparison

Figure 13: Top 5% Income Share – International Comparison

Figure 14: Top 1% Income Share – International Comparison

Figure 15: Top 0.1% Income Share – International Comparison
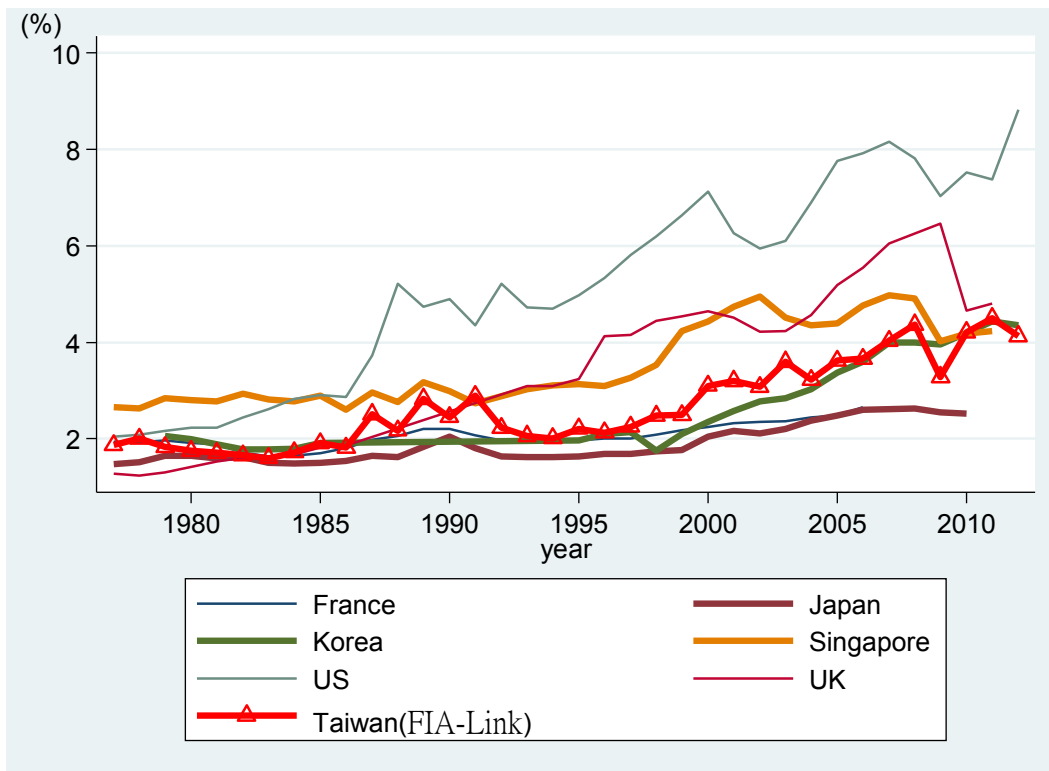
Figure 16:Top 0.01% Income Share – International Comparison
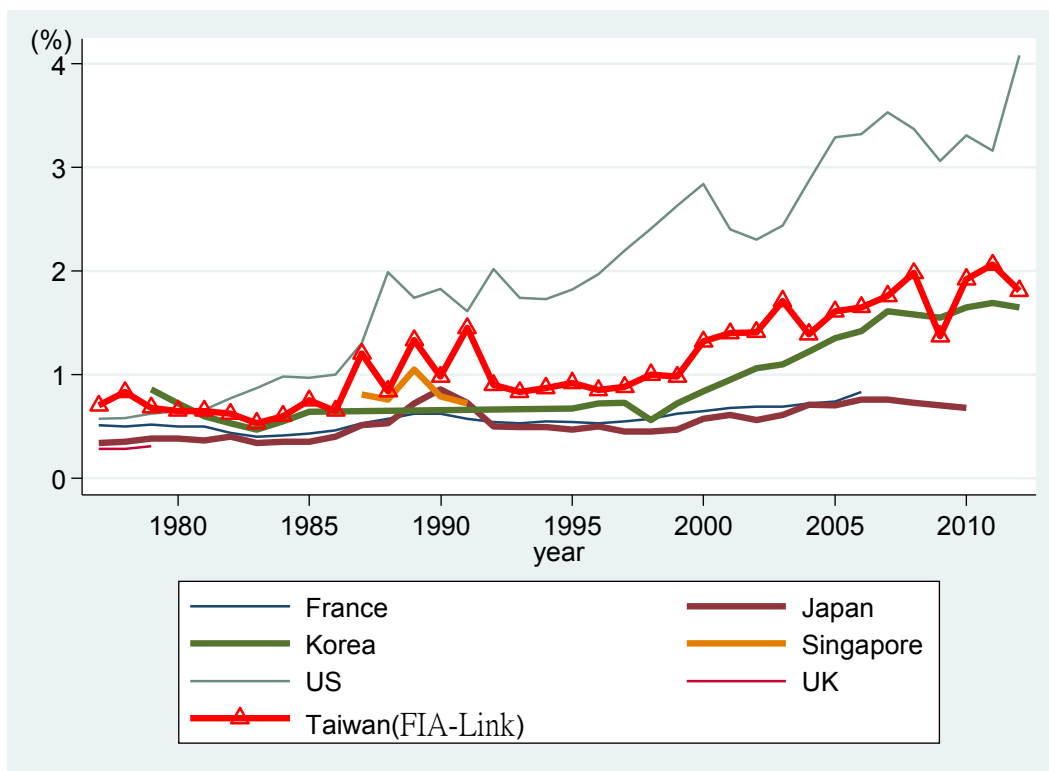
Figure 17: Comparison of 3 Methods: The Case of the Top 1%
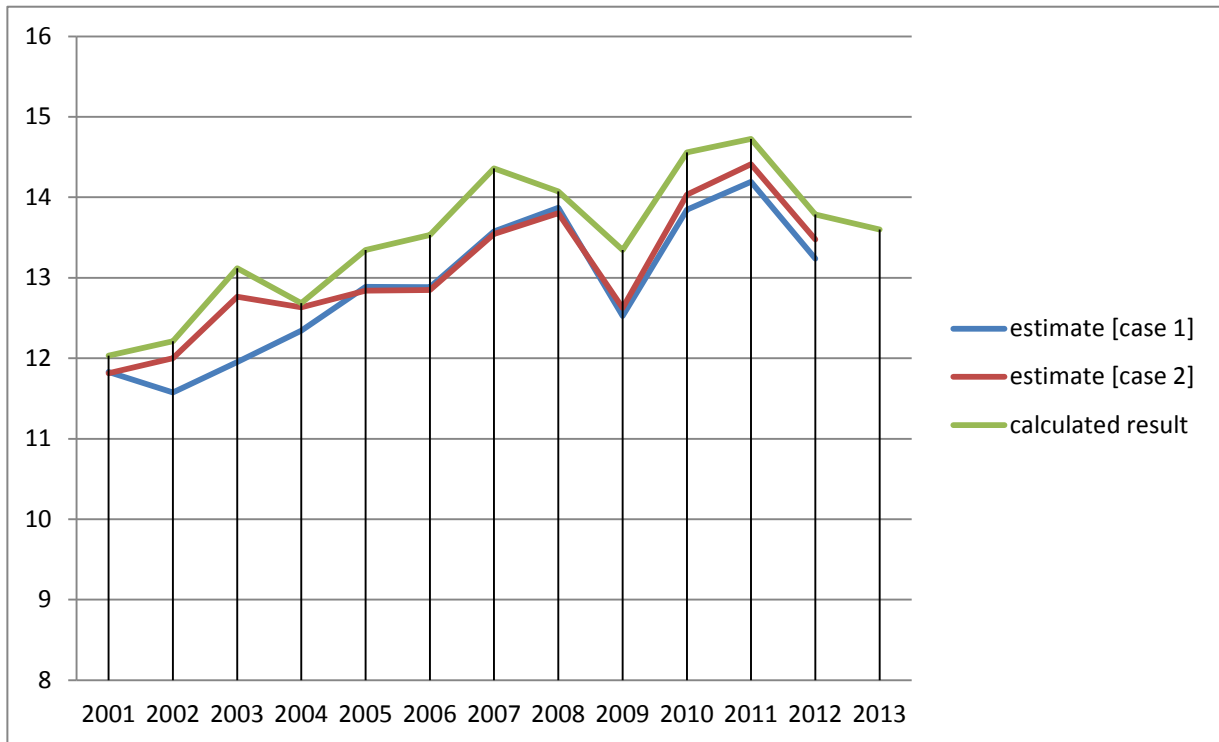
Figure 18-1: M curve, 2000-2012
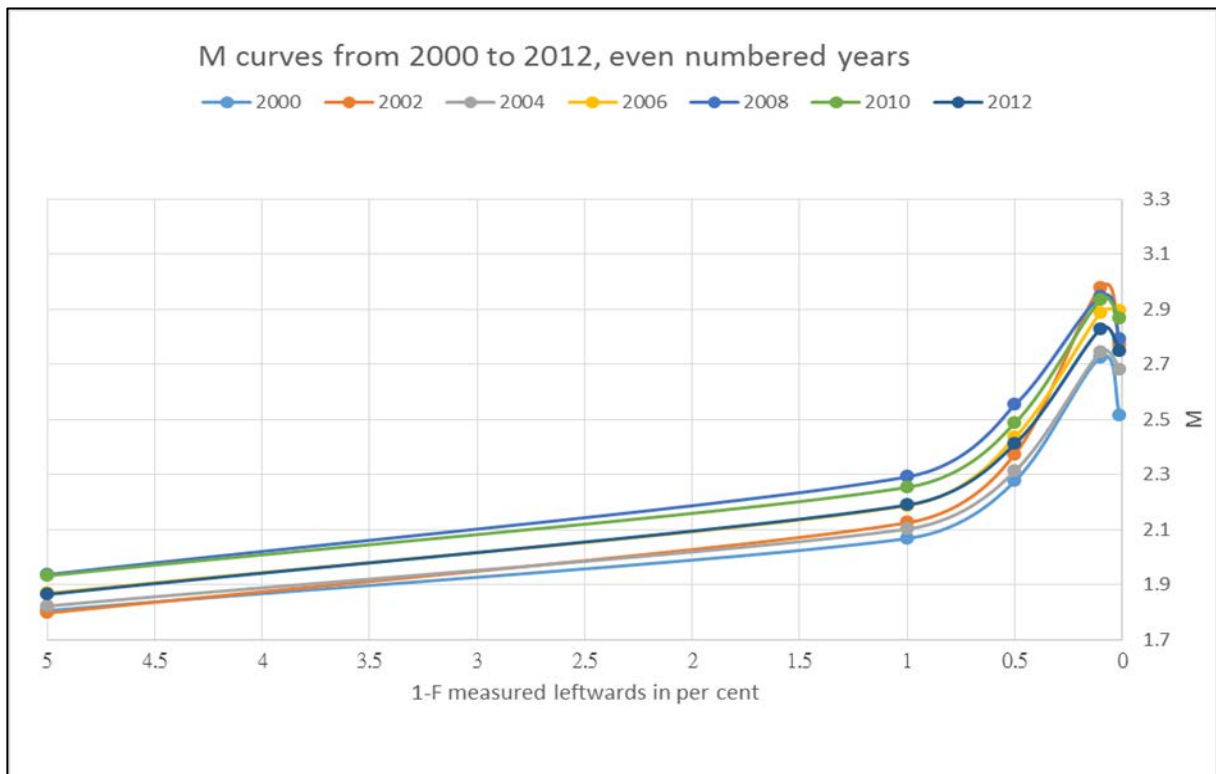
Figure 18-2: M curve, 2000-2012
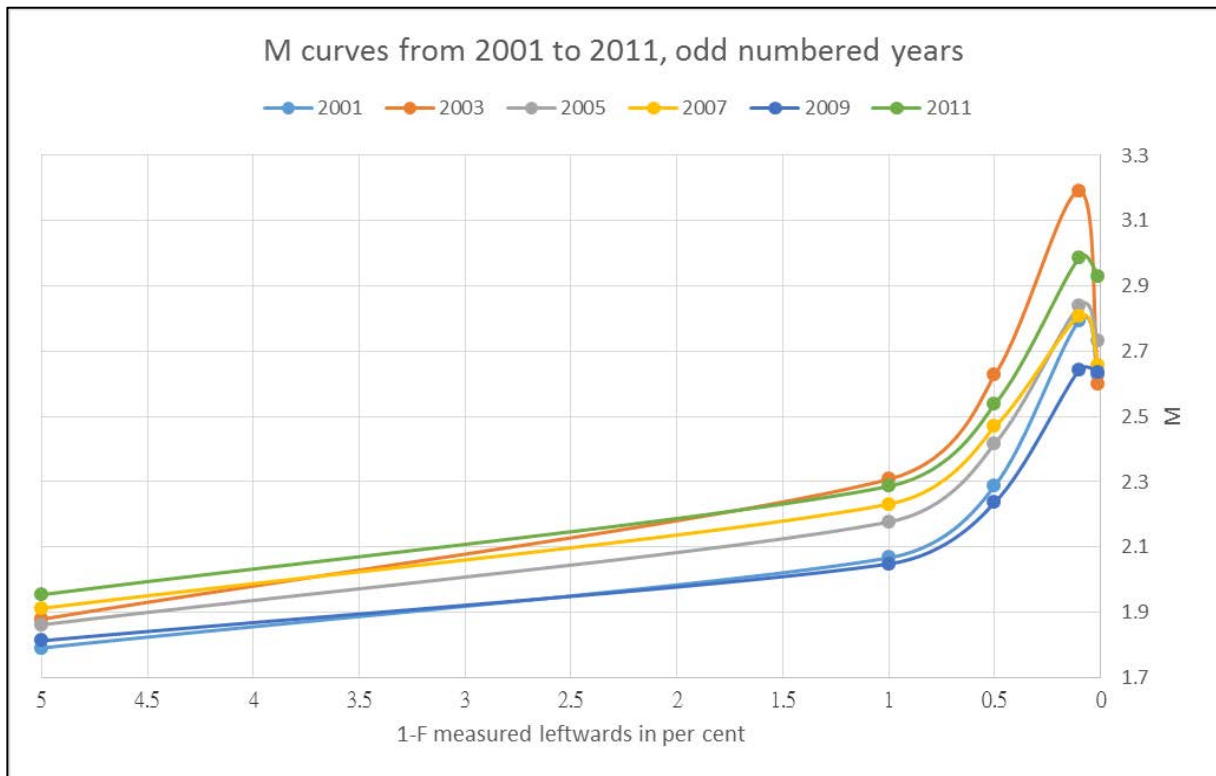
Appendices

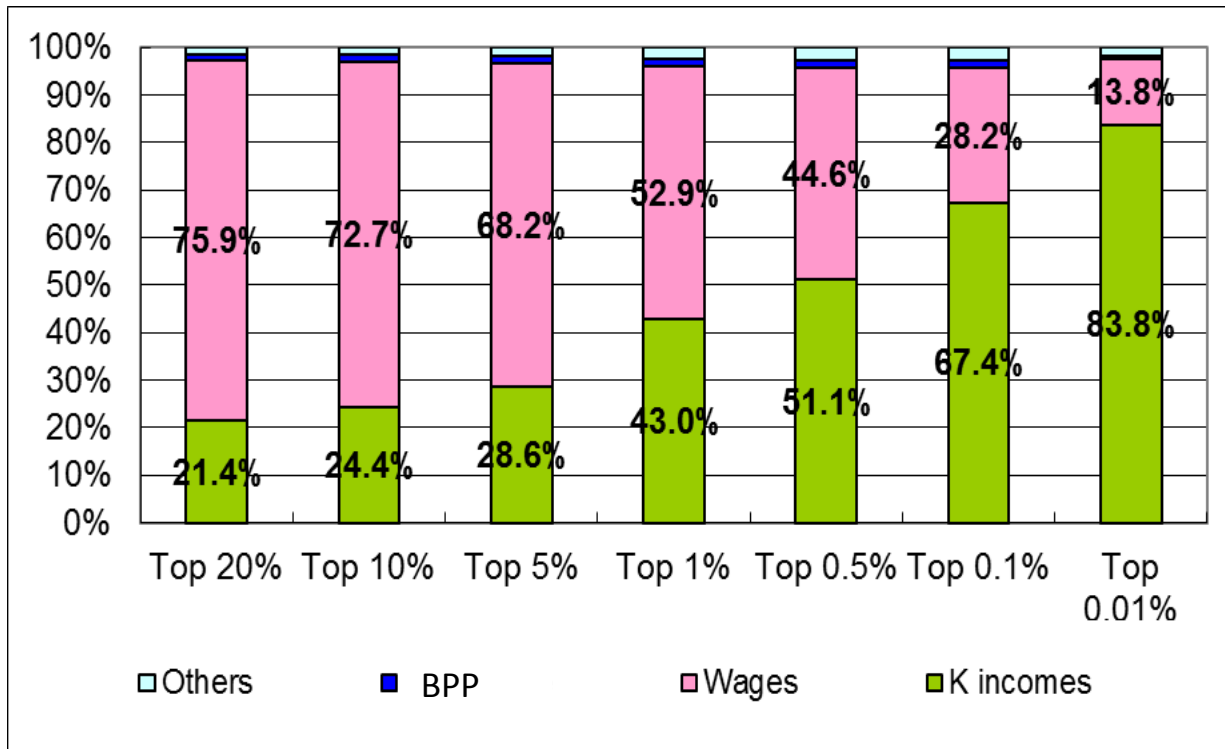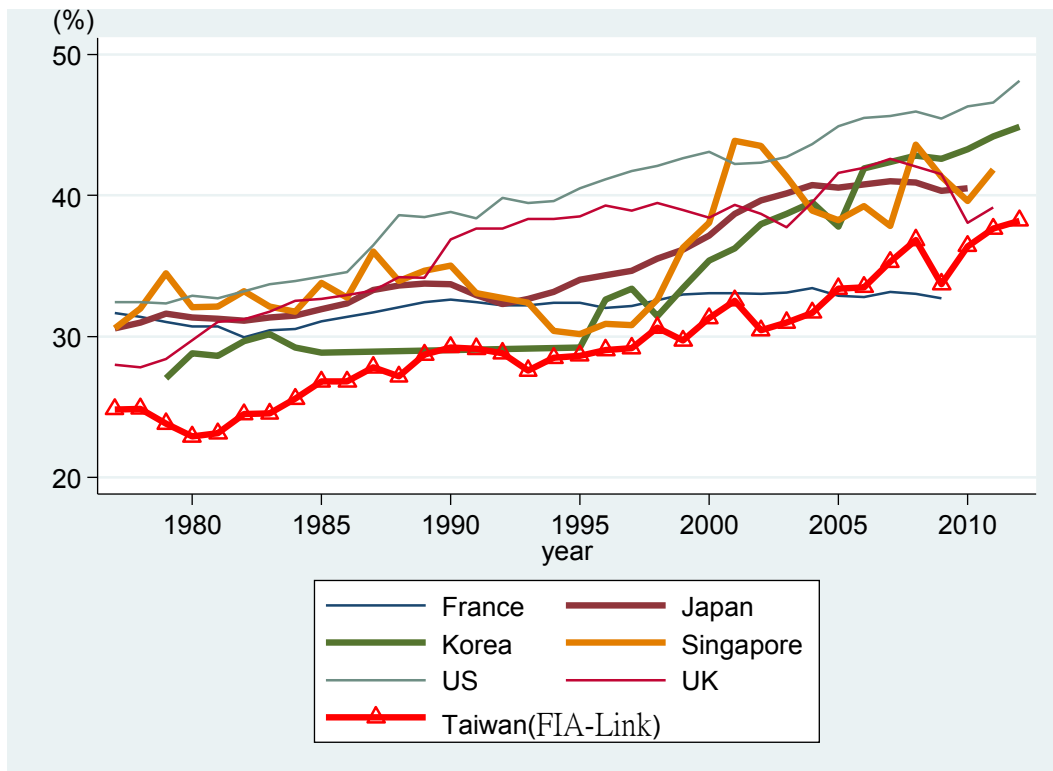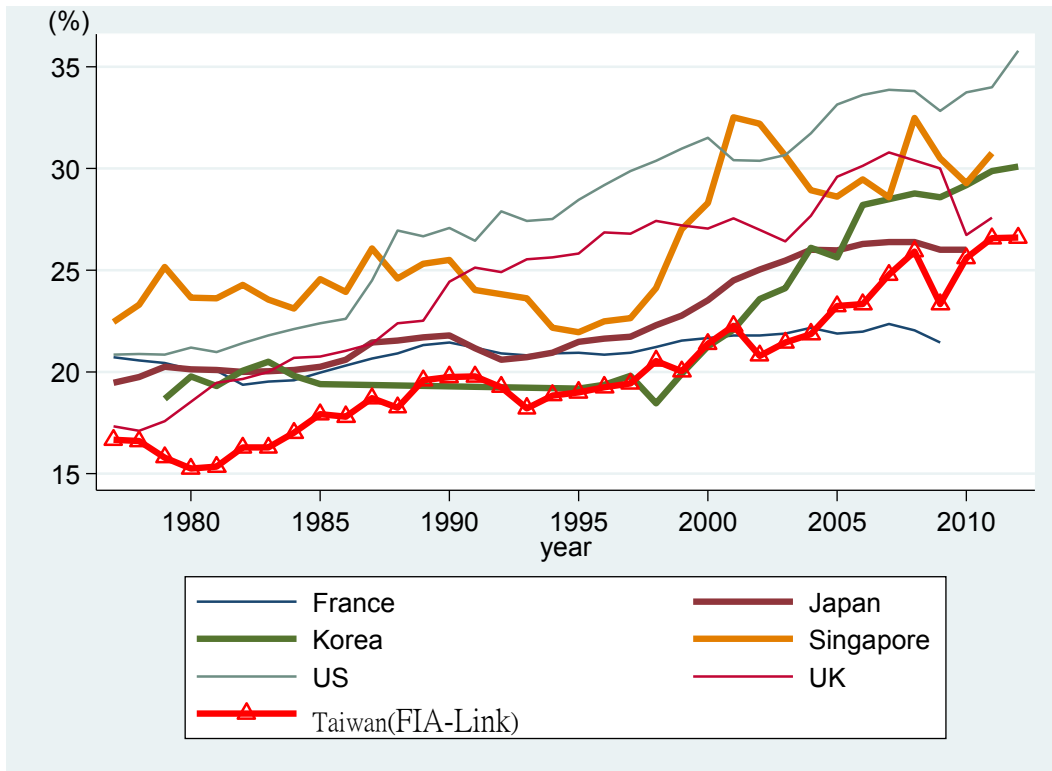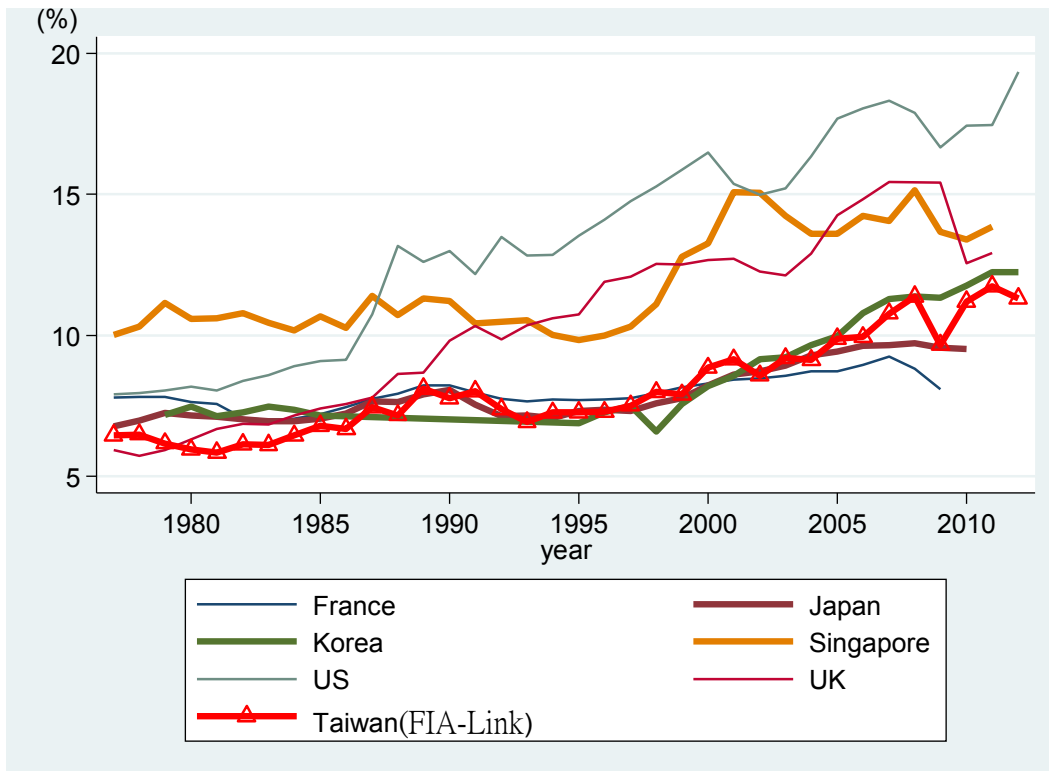**Table A1: Gini Coefficients and 20% Average Income Ratios, 1964-2013**

Year	Gini coefficient	20% average income ratio	Year	Gini coefficient	20% average income ratio
1964	0.321	5.33	1993	0.315	5.43
1968	0.326	5.28	1994	0.318	5.38
1970	0.294	4.58	1995	0.317	5.34
1972	0.291	4.49	1996	0.317	5.38
1974	0.287	4.37	1997	0.320	5.41
1976	0.280	4.18	1998	0.324	5.51
1977	0.284	4.21	1999	0.325	5.50
1978	0.287	4.18	2000	0.326	5.55
1979	0.285	4.34	2001	0.350	6.39
1980	0.278	4.17	2002	0.345	6.16
1981	0.281	4.21	2003	0.343	6.07
1982	0.283	4.29	2004	0.338	6.03
1983	0.287	4.36	2005	0.340	6.04
1984	0.287	4.40	2006	0.339	6.01
1985	0.291	4.50	2007	0.340	5.98
1986	0.296	4.60	2008	0.341	6.05
1987	0.299	4.69	2009	0.345	6.34
1988	0.303	4.85	2010	0.342	6.19
1989	0.303	4.94	2011	0.342	6.17
1990	0.312	5.18	2012	0.338	6.13
1991	0.308	4.97	2013	0.336	6.08
1992	0.312	5.24			

Table A2: Taiwan's Income Tax Rates, 1998 to 2014

2013 to 2014

Income Brackets (Unit: NT$)			Tax Rate (%)
0	-	520,000	5%
520,001	-	1,170,000	12%
1,170,001	-	2,350,000	20%
2,350,001	-	4,400,000	30%
4,400,000 and over			40%

2010 to 2012

Income Brackets (Unit: NT$)			Tax Rate (%)
0	-	500,000	5%
500,001	-	1,130,000	12%
1,170,001	-	2,260,000	20%
2,260,001	-	4,230,000	30%
4,230,000 and over			40%

2008 to 2009

Income Brackets (Unit: NT$)			Tax Rate (%)
0	-	410,000	6%
410,001	-	1,090,000	13%
1,090,001	-	2,180,000	21%
2,180,001	-	4,090,000	30%
4,090,000 and over			40%

1998 to 2007

Income Brackets (Unit: NT$)			Tax Rate (%)
0	-	370,000	6%
370,001	-	990,000	13%
990,001	-	1,980,000	21%
1,980,001	-	3,720,000	30%
3,720,000 and over			40%

Table A3: GDP and Income control totals, 1 and 2 (unit: NTD)

year	nominal GDP	GDP deflator (2011)	Income control 1	Ratio to GDP	Income control 2	Ratio to GDP
1977	1630343000000	51.87	271161231147	32.07%	446859379004	52.84%
1978	1851349000000	54.64	333329646831	32.95%	556701678060	55.03%
1979	2014890000000	60.53	400865592963	32.87%	700156761628	57.41%
1980	2176864000000	69.95	495124581379	32.52%	905193001379	59.45%
1981	2331586000000	77.42	603452173312	33.43%	1086333291570	60.18%
1982	2443449000000	79.33	689987274313	35.60%	1170192299854	60.37%
1983	2664424000000	81.44	778950767482	35.90%	1302641381848	60.03%
1984	2932155000000	82.50	890574051861	36.82%	1424306897650	58.88%
1985	3073105000000	82.52	965827790536	38.09%	1492002641487	58.83%
1986	3426991000000	86.57	1077275316894	36.31%	1647084094000	55.52%
1987	3862305000000	86.61	1224885658217	36.62%	1826547413604	54.60%
1988	4172003000000	86.66	1400490010537	38.74%	2146074740068	59.36%
1989	4537024000000	88.89	1706395392149	42.31%	2529606671824	62.72%
1990	4793163000000	93.47	2030717106685	45.33%	2925979064200	65.31%
1991	5193843000000	96.73	2363007565854	47.03%	3407949337938	67.83%
1992	5624580000000	99.82	2675137630194	47.65%	3812350247232	67.90%
1993	6007177000000	103.30	3017625530705	48.63%	4437712672552	71.51%
1994	6457362000000	105.07	3371630591072	49.69%	4842778145842	71.38%
1995	6877169000000	107.55	3634913454314	49.14%	5229542060509	70.70%
1996	7301854000000	110.06	3838743463543	47.77%	5460815998897	67.95%
1997	7748223000000	112.51	4124602366957	47.31%	5904613651654	67.73%
1998	8074502000000	116.18	4484069957498	47.80%	6154263058717	65.60%
1999	8616866000000	113.91	4687247624744	47.75%	6433526413815	65.54%
2000	9170116000000	112.88	4963957067902	47.96%	6612077627923	63.88%
2001	9054580000000	112.19	4973855757228	48.96%	6541940905141	64.40%
2002	9559334000000	111.73	4704730904746	44.05%	6699617848539	62.73%
2003	9953235000000	110.17	4762556162050	43.43%	6801077824491	62.02%
2004	10600793000000	109.89	5022942513162	43.12%	6984388726016	59.96%
2005	11174918000000	108.21	5308342990131	43.90%	7170373201612	59.30%
2006	11803335000000	107.10	5418952767304	42.87%	7378291786619	58.37%
2007	12572550000000	106.64	5787531675625	43.17%	7560154983971	56.39%
2008	12661079000000	103.87	6002765413620	45.64%	7576029154315	57.61%
2009	12462729000000	104.00	5420221893334	41.82%	7488175168737	57.77%
2010	13787642000000	102.40	5813933042873	41.18%	7558954415476	53.54%
2011	14312200000000	100.00	6295426835635	43.99%	7895148982719	55.16%
2012	14607569000000	100.54	6671952227668	45.43%	8134318303405	55.39%
2013	14933673000000	101.93	6561927905915	43.11%	8358717417638	54.91%

Table A4: Top Income Shares, Using Income Control 2

	Top 10%			Top 5%			Top 1%			Top 0.1%			Top 0.01%		
Year	FIA-T	FIA-M	linked	FIA-T	FIA-M	linked	FIA-T	FIA-M	linked	FIA-T	FIA-M	linked	FIA-T	FIA-M	linked
1977	23.22		25.21	15.72		16.88	6.17		6.52	1.73		1.90	0.56		0.71
1978	23.29		25.28	15.65		16.81	6.20		6.55	1.86		2.03	0.69		0.85
1979	22.31		24.29	14.90		16.07	5.89		6.24	1.69		1.87	0.54		0.70
1980	21.44		23.43	14.39		15.55	5.68		6.03	1.62		1.80	0.53		0.68
1981	21.65		23.64	14.47		15.63	5.58		5.93	1.58		1.75	0.52		0.68
1982	22.93		24.91	15.37		16.53	5.85		6.20	1.52		1.69	0.48		0.64
1983	22.93		24.92	15.35		16.51	5.83		6.18	1.46		1.63	0.39		0.54
1984	23.91		25.89	16.03		17.20	6.15		6.50	1.57		1.74	0.46		0.61
1985	25.10		27.08	16.90		18.07	6.49		6.84	1.75		1.93	0.60		0.75
1986	25.08		27.06	16.78		17.95	6.38		6.73	1.67		1.84	0.50		0.65
1987	26.05		28.03	17.65		18.81	7.14		7.49	2.35		2.52	1.05		1.20
1988	25.43		27.41	17.23		18.40	6.85		7.20	2.02		2.19	0.69		0.84
1989	26.93		28.91	18.52		19.69	7.79		8.14	2.67		2.84	1.17		1.32
1990	27.40		29.38	18.67		19.83	7.44		7.79	2.28		2.45	0.82		0.97
1991	27.31		29.29	18.69		19.86	7.70		8.05	2.72		2.90	1.28		1.44
1992	26.97		28.95	18.17		19.33	7.05		7.40	2.07		2.24	0.74		0.89
1993	25.79		27.77	17.15		18.31	6.60		6.95	1.90		2.08	0.67		0.83
1994	26.65		28.63	17.76		18.92	6.93		7.29	1.84		2.02	0.71		0.86
1995	26.81		28.79	17.92		19.08	6.94		7.30	2.05		2.22	0.76		0.91
1996	27.18		29.16	18.15		19.31	6.95		7.30	1.97		2.14	0.69		0.84
1997	27.33		29.32	18.34		19.51	7.17		7.53	2.09		2.26	0.71		0.87
1998	28.70	32.32	30.68	19.42	21.15	20.58	7.65	7.51	8.00	2.31	1.84	2.48	0.83	0.56	0.98
1999	28.97	29.70	29.70	19.73	20.01	20.01	7.94	7.90	7.90	2.49	2.49	2.49	0.93	0.98	0.98
2000	30.41	31.29	31.29	21.02	21.37	21.37	8.87	8.85	8.85	3.10	3.10	3.10	1.26	1.32	1.32
2001	31.25	32.54	32.54	21.59	22.25	22.25	9.02	9.15	9.15	3.11	3.20	3.20	1.28	1.40	1.40
2002	28.79	30.43	30.43	19.79	20.79	20.79	8.20	8.57	8.57	2.77	3.08	3.08	1.23	1.41	1.41
2003	29.12	30.99	30.99	20.13	21.42	21.42	8.45	9.19	9.19	2.91	3.60	3.60	1.33	1.71	1.71
2004	30.11	31.68	31.68	20.96	21.85	21.85	8.88	9.12	9.12	3.14	3.22	3.22	1.30	1.39	1.39
2005	31.56	33.40	33.40	22.16	23.22	23.22	9.56	9.88	9.88	3.44	3.62	3.62	1.43	1.61	1.61
2006	31.32	33.50	33.50	21.99	23.31	23.31	9.49	9.94	9.94	3.39	3.66	3.66	1.38	1.65	1.65
2007	33.13	35.28	35.28	23.47	24.76	24.76	10.40	10.77	10.77	3.87	4.03	4.03	1.62	1.76	1.76
2008	34.55	36.85	36.85	24.50	25.91	25.91	11.00	11.38	11.38	4.30	4.37	4.37	1.90	1.98	1.98
2009	30.60	33.71	33.71	21.45	23.31	23.31	9.09	9.66	9.66	3.08	3.28	3.28	1.24	1.37	1.37
2010	33.40	36.40	36.40	23.87	25.58	25.58	10.65	11.20	11.20	4.05	4.21	4.21	1.70	1.92	1.92
2011	35.11	37.64	37.64	25.09	26.55	26.55	11.31	11.74	11.74	4.37	4.50	4.50	1.87	2.06	2.06
2012	35.53	38.22	38.22	24.88	26.59	26.59	10.86	11.31	11.31	4.08	4.13	4.13	1.72	1.81	1.81
2013		36.39	36.39		25.25	25.25		10.68	10.68		3.86	3.86		1.68	1.68

FIA-M: micro data; FIA-T: tabulated data; all based on income control total 2.

Table A5: Income Composition in Top Income Groups, Taiwan, 1998-2013

	Top 1%					Top 0.1%					Top 0.01%				
	K income w/oK gain	Capital gain	Wages	BPP	Others	K income w/oK gain	Capital gain	Wages	BPP	Others	K income w/oK gain	Capital gain	Wages	BPP	Others
1998	0.32527	0.00301	0.57246	0.06837	0.02518	0.46522	0.00481	0.29792	0.14493	0.06531	0.58236	0.0049	0.10441	0.09902	0.14373
1999	0.32594	0.00417	0.48841	0.16328	0.01816	0.45784	0.00976	0.20616	0.29828	0.02782	0.64577	0.02321	0.08203	0.20001	0.04865
2000	0.34981	0.00262	0.48065	0.15129	0.01562	0.50794	0.00439	0.23138	0.23424	0.02206	0.74545	0.00669	0.08866	0.12523	0.03397
2001	0.45524	0.0012	0.4754	0.0615	0.00666	0.69665	0.0007	0.25029	0.04573	0.00663	0.84364	0.00021	0.13432	0.01488	0.00694
2002	0.41349	0.00215	0.51366	0.06128	0.00941	0.67341	0.00277	0.25782	0.05331	0.0127	0.84221	0.00333	0.11816	0.02034	0.01596
2003	0.44181	0.00199	0.49384	0.05554	0.00682	0.72454	0.0019	0.22476	0.04301	0.00578	0.88972	0.00095	0.09259	0.01286	0.00387
2004	0.41869	0.00285	0.51087	0.05596	0.01163	0.67895	0.00318	0.2596	0.04794	0.01032	0.84988	0.00265	0.12446	0.01804	0.00497
2005	0.45341	0.00409	0.47868	0.04798	0.01585	0.70089	0.00665	0.23598	0.03933	0.01715	0.85159	0.00993	0.11108	0.01488	0.01253
2006	0.4529	0.00351	0.48046	0.04175	0.02138	0.69795	0.00404	0.23322	0.04016	0.02462	0.85874	0.00274	0.10322	0.02029	0.01501
2007	0.44999	0.00546	0.46609	0.04004	0.03843	0.67756	0.00741	0.23364	0.03486	0.04652	0.83504	0.00695	0.11189	0.01604	0.03008
2008	0.49478	0.00548	0.44346	0.03916	0.01713	0.72135	0.00761	0.22024	0.02988	0.02091	0.86345	0.00682	0.09746	0.01379	0.01848
2009	0.39378	0.00719	0.51761	0.05861	0.02281	0.61761	0.0093	0.2916	0.05255	0.02895	0.79264	0.00809	0.14246	0.02815	0.02865
2010	0.41121	0.00672	0.51237	0.04217	0.02753	0.64306	0.00812	0.29032	0.0281	0.0304	0.81845	0.00431	0.1451	0.01075	0.02138
2011	0.45132	0.00679	0.49637	0.02389	0.02163	0.6848	0.00857	0.26843	0.01633	0.02188	0.84503	0.00633	0.13047	0.00611	0.01206
2012	0.42443	0.00549	0.53308	0.01702	0.01998	0.66657	0.00713	0.2883	0.01634	0.02167	0.83135	0.00615	0.13961	0.00598	0.01691
2013	0.42906	0.00475	0.52054	0.01694	0.02872	0.65962	0.00472	0.28997	0.01407	0.03163	0.82262	0.00339	0.14536	0.00359	0.02504

Notes: Percentages are defined by the size of total income. For each percentage, the five columns give the percentage of wages and salaries (including pensions), business and professional income, capital income (interest, dividends, and rents and gains from sales of rights and properties other than land), and other income.

Sources: Computations based on FIA tax return data.

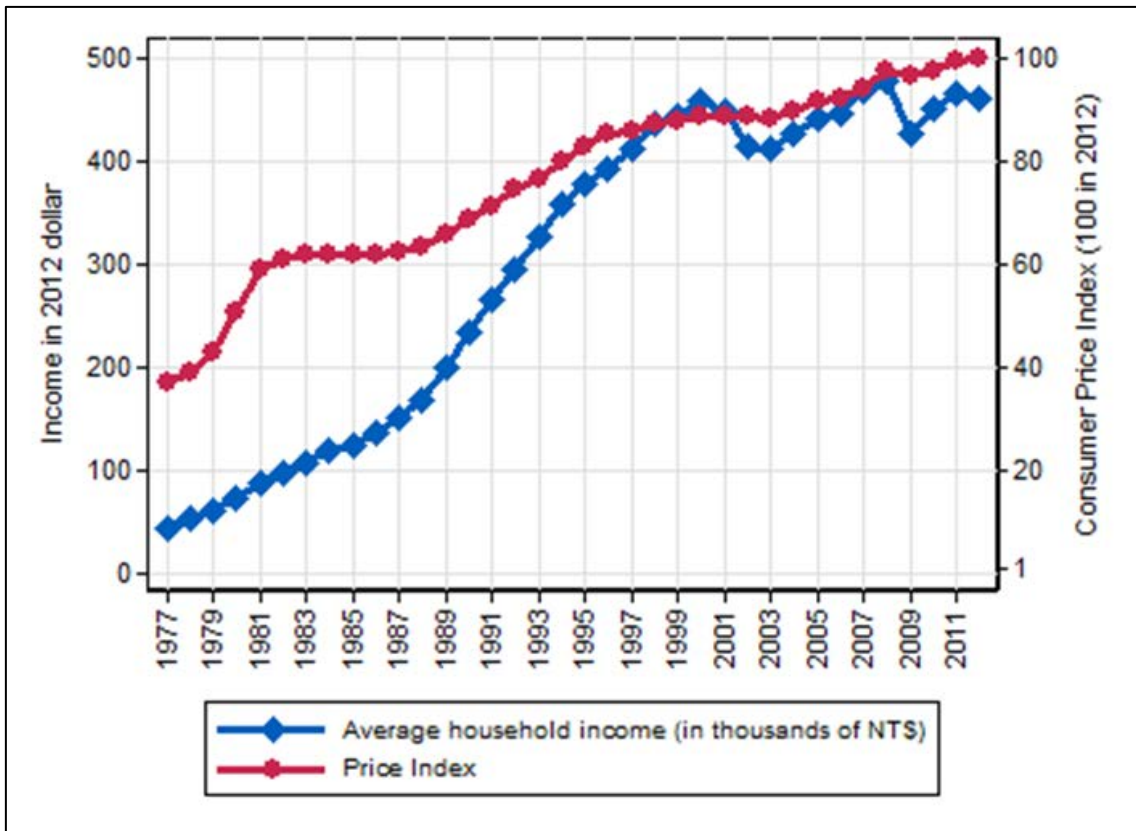**Figure A1: Average Household Income and Price Indexes**

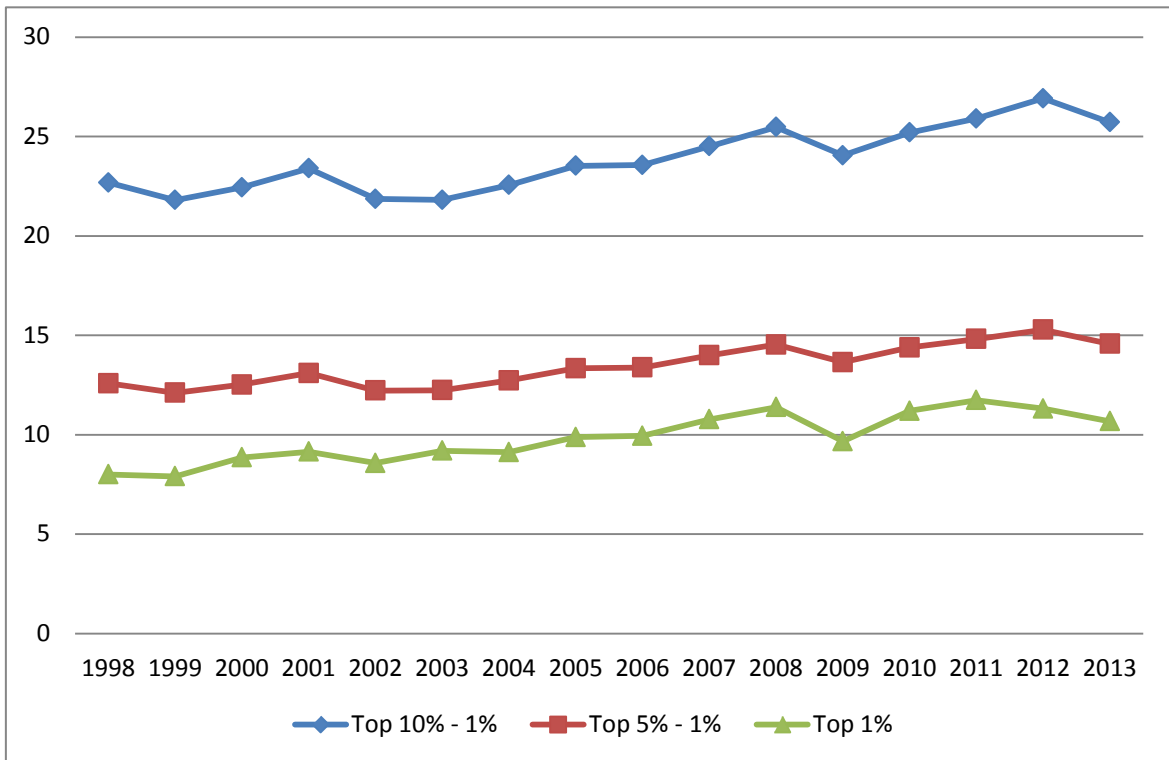**Figure A2: Income Shares of the Top 10-1%, the Top 5-1%, and the Top 1%**

Figure A3: Income Shares of the Top 1-0.1%, the Top 0.1-0.01% and the Top0.01%