Contributing to the Individual Income Tax Reform Debate in China: Is Family Based Filing of Individual Income Tax Returns a Feasible Solution to the Social Problems arising from the Increasing Family Income Inequality in China?

Abstract

China’s new wave of Individual Income Tax Reform is currently hotly debated. The Finance Minister, Lou Jiwei was reported to say that the relevant government departments in China – the State Council, the Ministry of Finance, and the State Administration of Finance had worked out a reform plan together in 2015. One goal of this plan is to move China’s scheduler individual income tax to a global structure, and to put in place policies that contribute to income redistribution that takes into consideration family related expenditure, such as looking after the elderly and childcare.

A review of the literature shows that Chinese scholars and commentators suggest that China could learn directly from the US, and adopt their global income tax system and allow family based filing of individual income tax returns. The literature does not provide reasons for this suggestion.

This paper performs a feasibility study to assess whether China could adopt the suggestions proposed by the prevailing literature. The study is performed based on a “revenue neutrality” analysis that compares projected revenue from existing policies, and that collectable if China allows family based individual income tax filing.

Results from a pilot study reports that the projected revenue from allowing family based individual income tax filing would be at a level that is closer to 40% of revenue collectable if China does not allow family based individual income tax filing. This result suggests that policy makers in China need to take careful considerations of costings before proceeding with the reform.

1. Introduction

Individual income tax reform in the People’s Republic of China (PRC) has become key part of the PRC’s fiscal policy reform agenda. The PRC’s rapid economic growth over the past years
has seen the income of urban residents increasing sharply. Individual income tax plays an increasingly important role in increasing government revenue and adjusting income distribution. The immaturity of the contemporary individual income tax system in the PRC induced to some extent the unjustified wealth redistribution.

There have been numerous attempts at individual income tax reform, the current round of reform discussions began in 2011, after the tax rate reforms. Recent reform suggestions suggested that the PRC should move from individual filing to family filing of tax returns.

Chinese scholars and commentators suggested that the People’s Republic of China (PRC) could learn directly from the US, and adopt their global income tax system and allow family based filing of individual income tax returns. This paper reports a pilot feasibility study that assesses whether it is appropriate for the PRC to adopt family based filing of individual income tax returns. The study is performed based on a “revenue neutrality” analysis that compares projected revenue from existing policies, and that collectable if the PRC allows family based individual income tax filing.

A pilot study is a small scale preliminary study conducted before the intended study in order to evaluate feasibility of the intended study. The reported feasibility study is the pilot study for further research on individual income tax reform that captures tax filing issues. The design of the feasibility study is a quantitative experiment that has two modules. The first module is a
forecast analysis\textsuperscript{9} of the total individual income tax revenue based on the existing filing system. The data can be found from the National Bureau of Statistics of the People’s Republic of China. Since the prevailing literature\textsuperscript{10} proposes that the PRC learns from the US by considering its family based individual income tax filing system, module 2 replicates the US’s filing system into the PRC. The second module is the estimation of the net present value of the forecasted total income tax revenue over 10 years under the family filing approach. The module calculates the average family income of a sample of couples matched according to different income earning capabilities. The second model applies the US filing methods into the PRC’s current individual income tax system, calculates the national total net present value of individual income tax, the study then compares the revenue gap between the two filing systems.

The quantitative research aims to quantify the magnitude of the revenue gap between module one and two. Finally, whether it is appropriate to adopt family based individual income tax filing is assessed according to the criteria of tax revenue neutrality.\textsuperscript{11}

1.1 The Revenue Neutrality Criteria

This pilot study of a feasibility study is based on a “revenue neutrality” analysis. The term “revenue neutrality” describes the situation\textsuperscript{12} that despite changes in tax laws, the government should still receive the same amount of revenue. In order to maintain the same level of tax revenue, the government may lower taxes for one particular group of people, while increase taxes for another group. The term “revenue neutral” implies there is no change in the amount of government revenue as the result of changes in the tax laws.\textsuperscript{13}

\textsuperscript{10}Above n234.
A tax reform proposal that is revenue neutral will result in neither increases nor decreases in tax revenues compared to existing tax system. That is, a proposal to increase taxes for one economic group must\(^\scriptstyle 14\) include a mechanism to decrease tax revenues from another group in order to offset the revenue increase.

The “revenue neutral” concept has been implemented with the aim to improve the efficiency of the American tax system, which was the decisive factor in drafting the *Tax Reform Act\(^\scriptstyle 15\)* of 1986 in the United States. Provisions estimated to add tax revenue were offset by opposite provisions to reduce revenue, which achieves revenue neutrality of the new bill for generating the same amount of revenue compared with previous law.\(^\scriptstyle 16\)

The adoption of the value added tax in many European countries and the evidence of the *Tax Reform Act\(^\scriptstyle 17\)* of 1986 in the US, were claimed to be consistent with “revenue neutrality” criteria. The element\(^\scriptstyle 18\) to achieve the goal of “revenue neutrality” includes lowering certain tax rates, broadening the tax base, closing loopholes and eliminating deductions. After analysing the concept of revenue neutrality, Brennan and Buchanan\(^\scriptstyle 19\) claimed that the total amount of tax revenue works as the function of the tax base, as the broader the tax base means more tax revenue will be collected. The *Tax Reform Act of 1986* contributed to major changes and constructions in the U.S. tax structure and it became effective in 1987. The purpose of the reform act was claimed by all parties to create a more efficient\(^\scriptstyle 20\) tax system with the aim to raise the same amount of revenue, which is considered to be a revenue neutral reform.


\(^{15}\) *Tax Reform Act of 1986*.


\(^{17}\) Above n15.


\(^{20}\) Above n245.
Brennan and Buchanan argued that broadening the tax base and lowering tax rates would result in the same amount of revenue being collected with lower excess burden. They examined data from 1986 U.S. Reform and the tax reforms in the European countries. Both cases showed that the tax reforms were undertaken with the aim to achieve revenue neutrality, at the same time lowering the excess burden of taxation. As one of the costs of taxation, if the excess burden is being reduced, it is reasonable to expect the government could collect more taxes. The theory behind the facts is that a reduction in the excess of burden of taxation reduces the political cost of imposing taxes. Their conclusion was that, as revenue neutral tax reform could raise the same value of revenue with lower excess tax burden, the total government revenue would be increased and that is the reason why the government would like to maintain “revenue neutrality” criteria.

The second purpose to adopt “revenue neutrality” criteria relates to the equity objectives, which aims to improve both vertical and horizontal dimensions about tax equity. Vertical equity in taxation refers to the idea that people with unequal income should be treated unequally, commensurately higher tax liabilities should be levied on taxpayers with higher incomes. On the other hand, horizontal equity in taxation is generally taken to require that individuals with similar income should pay the same amount in taxes.

Redistributive taxation reform refers to the enhancement of equity from vertical dimension through reduction of after-tax income inequality, where policy makers implemented the reform plans with the intention to leave the income distribution fundamentally unchanged, which is known as distributional neutral reform. Rectifying inequity from the horizontal dimension is

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21 Above n246.
23 Ibid.
the ordinary intention for the government to perform redistributive and distributional neutral tax reform.

1.2 Study Methodology

This study focuses on individual income tax. The pilot study\(^28\) has consulted the optimal income tax model theories proposed by Edgeworth\(^29\) and Stern\(^30\) and the optimal income tax model proposed by Mirrlees.\(^31\) These theories are the basis for performing income tax analyses on public policies. They are integral parts of the public economics and tax economics literature.\(^32\)

The pilot study has an experimental research design. Experimental research\(^33\) describes the process that a researcher undergoes of controlling certain variables and manipulating others to observe if the results of the experiment reflect that the manipulations directly caused the particular outcome.

This study has two modules, module 1 estimates the net present value\(^34\) of national individual income tax revenue under the individual filing approach. Module 2 predicts the net present value of national individual income tax revenue under the family based filing approach.

The revenue forecast procedures are:

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1. Find the most recent data on total individual income tax revenue in the PRC under the two filing approaches, and then apply the growth rate factor to inflate and forecast the amount for the next 10 years.

2. Once the estimated amounts of individual income tax over the next 10 years have been calculated, apply the discount factor to discount the estimated future value back to the initial year for comparative purpose.

3. Add the present value from each year’s forecast together and get the total net present value.\(^{35}\)

1.3 Determinants of the Growth Rate

In order to construct revenue forecast over ten years, the research inflates the individual income tax from the base year to the next 10 years based on the growth rate. The section discusses the determinants of the growth rate.

1.3.1 Growth Rate Determinants: GDP Growth

Within this research, the growth rate for income tax revenue was determined by the growth rate of gross domestic product (GDP) in the secondary and tertiary industries of the PRC of the base year.

Gross domestic product\(^{36}\) refers to the market value of all officially recognised final goods and services produced within a country in a given period of time. GDP is commonly used as an indicator of a country’s economic health, as well as to gauge a country's living standard.\(^{37}\)

\(^{35}\)Ibid.


Increasing the rates of economic growth will result in increased consumption, improved public services and reduced unemployment and poverty.

Tax\textsuperscript{38} is a finance charge or other levy imposed upon a taxpayer (an individual or legal entity) by government such that failure to pay is punishable by law.

The PRC’s economy has leapt forward since the PRC embarked on a major program of economic reform to encourage the formation of rural enterprises and private businesses, promote foreign investment and trade and invest in industrial production.\textsuperscript{39} The tax system also contributed to the evolution. For example, GDP and tax revenue of Hebei\textsuperscript{40} Province have achieved both developments since the 1994 tax-sharing reform. As individuals tend to earn increasing amount of income and over the years during the stages of economic growth, more income tax liability will be incurred correspondingly, the relationship between the increase in income tax rate and GDP growth rate is high correlated.

\textbf{1.3.2 Considerations of Not Adopting the Urban Economy Growth Rate as the Inflation Factor}

The development of the urban economy includes the broad aspects of urban issues such as\textsuperscript{41} public transit, housing, local government finance, crime and education. The vast differences\textsuperscript{42} in development between Western and Eastern China revealed the issue of unbalanced regional developments in the PRC. Giani\textsuperscript{43} selects Xinjiang, Gansu and Sichuan provinces as representatives for Western China and Shanghai, Shandong and Zhejiang to represent Eastern

\textsuperscript{38}Khoury D, \textit{Tax}, 8th ed. (Chatswood: LexisNexis Butterworths, 2015), at 34.
\textsuperscript{41}Smith ME & Hamilton BW, \textit{Urban Economics}, (US: Scott Foresman, 1994).
\textsuperscript{42}Dijk MP, ‘A Different Development Model in China’s Western and Eastern Provinces’, (2011) \textit{2 Modern Economy} 757-768.
\textsuperscript{43}Giani C, China’s Unbalanced Development and What can Learn from It. \textit{Senior Theses}, Trinity College Hartford, 2014.
China, and calculates the GDP Per Capita and education spending figure from the National Bureau of Statistics from 1980 to 2010 and puts them into charts to demonstrate the comparison.
Table 1 GDP Per Capita and Education Spending in West and East China from 1980 to 2010

| GDP Per Capita | West       |          |          | East       |          |          |
|               | Xinjiang   | Gansu    | Sichuan  | Shanghai   | Shangdong | Zhejiang |
| 1980          | 410        | 388      | 320      | 2725       | 402       | 471      |
| 1985          | 820        | 608      | 570      | 3811       | 887       | 1067     |
| 1990          | 1713       | 1099     | 1136     | 5911       | 1815      | 2138     |
| 1995          | 4701       | 2316     | 3043     | 17779      | 5701      | 8149     |
| 2000          | 7372       | 4129     | 4956     | 30047      | 9326      | 13415    |
| 2005          | 13108      | 7477     | 9060     | 49649      | 19934     | 27062    |
| 2010          | 25034      | 16113    | 21182    | 76074      | 41106     | 51711    |

| Education Spending | Xinjiang   | Gansu    | Sichuan  | East       |          |          |
|                   |            |          |          | Shanghai   | Shangdong | Zhejiang |
| 1980              | 206.58     |          |          |            | 532.96    |          |
| 1985              | 456.41     |          |          |            | 975.65    |          |
| 1990              | 749.37     |          |          |            | 2020.6    |          |
| 1995              | 1878.32    | 3782.81  |          |            | 5237.54   |          |
| 2000              | 3135.38    | 2754.77  | 6480.48  | 8410.31    | 11810.42  | 7819.43  |
| 2005              | 7265.17    | 6748.31  | 14052.6  | 18294.15   | 24874.84  | 23154.89 |
| 2010              | 31383.56   | 22823.29 | 54065.46 | 41727.75   | 77044.72  | 60654.31 |

Table 1 demonstrates the figure of GDP Per Capita and education spending in the West and East of China over the 30 years.

44Ibid.
Table 2 Western and Eastern Region Economic Development

Table 2 shows the economic growth measured in GDP per Capita in both Western and Eastern Region.

45 Above n270.
It is clear from the three above tables, the GDP per Capita in Eastern China is nearly four times of that in Western China, and as is clearly visible at a first glance, the Eastern regions have an economic development that is increasing at a rate much greater than that of the Western regions.

This research aims to forecast\(^{46}\) the national wide individual income tax revenue. Due to the development imbalance between the cities in China, it is argued that the urban economy growth rate would not serve as the most accurate measure to compound\(^{47}\) income tax revenue over the years.

There is another concern about the appropriateness to consider the growth rate of citizen’s income\(^ {48}\) in the urban area as the growth rate of individual income tax. As the individual income tax is the result of the application of progressive tax rate on the individual income, the growth rate of income cannot serve as the only determinants of the income tax rate growth. Thus, it is required from a more general approach to decide on the growth rate for individual income tax.

1.3.3 Considerations for Not Adopting CPI as the Growth Rate

The Consumer Price Index\(^ {49}\) (CPI) is a measure that examines the weighted average prices of a basket of goods and services for consumption, such as transportation, food, beverage and medical care. Each good in the basket is weighted according to the proportion of average household expenditure accounted for by that good. The CPI\(^ {50}\) demonstrates the change in prices of the basket from the base year to the particular given year. Changes in the CPI are used as indicators to illustrate price changes associated with the living cost.


The PRC’s CPI figure is reported by the National Bureau of Statistics of China from 1986 to 2016. The average figure\textsuperscript{51} for CPI is 105.46 Index Points, reaching a peak of 128.40 Index Points in February of 1989 and a bottom of 97.80 Index Points in April of 1999. There is a decrease in Index Points from 2011 to 2012, reaching at 104.3 Index Points at the start of year 2012.

The CPI is one of the most frequently used indicator measures for inflation, while it is not the most proper figure to measure the growth rate for income tax revenue growth.

Based on its definition, the CPI is the index number calculated using a specific set of 600 retail goods and services\textsuperscript{52}, the calculation procedures involved selecting a certain period as the base period and calculating the prices for a basket of goods and services, then collecting price data for the same basket of goods on a monthly basis, and comparing the prices from the base period with the prices from a different time period.

The CPI represents prices paid by consumers (or households) for their consumption, while the individual income tax is the tax levied on taxable income.\textsuperscript{53} Income is the process of production,\textsuperscript{54} which means people earn revenue based on the goods or service generated by themselves.\textsuperscript{55} Conceptually, the consumption based measurement of CPI Index does not match the core production based income tax concept.

Secondly, the CPI measures the price level of consumer goods for households from both rural and urban area. In the rural area, people’s major income source comes from the primary industry.\textsuperscript{56} Based on the source of income, individual income tax is most likely not to be levied...
on individuals from rural area. So the CPI is not able to correctly reflect the individual income tax features.

1.3.4 Reasons for not Including Primary Industry in the Calculation

The calculation for the growth rate includes the GDP growth rate of secondary and tertiary industries rather than the primary sector. The primary sector in China is the sector of an economy making direct use of natural resources. This includes agriculture, fishing, mining and forestry. In contrast, the secondary sector converts the raw material produced by primary sector into commodities and produces manufactured goods, and the tertiary industry concerned with the production of services.

The eleven categories of income taxable by the individual income tax are prescribed by Article 2 of *Individual Income Tax Law of the People’s Republic of China*.59

<table>
<thead>
<tr>
<th>Table 3 Eleven Categories of Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Income from salaries and wages</td>
</tr>
<tr>
<td>2 Income from production, operation derived by industrial and commercial households</td>
</tr>
<tr>
<td>3 Income from contractual or leasing operations to enterprises or institutions</td>
</tr>
<tr>
<td>4 Income from remuneration for personal services</td>
</tr>
<tr>
<td>5 Income from author's remuneration</td>
</tr>
<tr>
<td>6 Income from royalties</td>
</tr>
<tr>
<td>7 Income from interest, dividends and bonuses</td>
</tr>
<tr>
<td>8 Income from the lease of property</td>
</tr>
<tr>
<td>9 Income from the transfer of property</td>
</tr>
<tr>
<td>10 Incidental income</td>
</tr>
<tr>
<td>11 Income from other sources specified as taxable by the department of finance under the State Council</td>
</tr>
</tbody>
</table>

Table 3 is a summary of the eleven categories of income as prescribed in the individual income tax law. Income derived from primary industry ordinarily are not included in the taxable

57 Ibid.
58 Ibid.
income base, it is common in the PRC that only people living in the urban areas would normally lodge individual income tax returns. The growth rate for the primary sector in the PRC is thereby not related\textsuperscript{60} to income tax revenue growth, and, it is unnecessary to include the GDP growth rate of primary industry into the calculation.

The next step in the study is to apply the average growth rate to calculate the forecasted value\textsuperscript{61} over the 10 years. The compound formula to calculate the future value is:

\[
P_n = P_0(1 + r)^n
\]

\(P_n\) is future value of \(P_0\)

\(P_0\) is original amount invested

\(r\) is the rate of interest

\(n\) is the number of compounding periods (years, months, etc.)

1.3.5 The Determinants of the Discount Rate

After calculating forecasted amount for income tax revenue in each year, the discounted cash flow\textsuperscript{62} method is applied to estimate the present value. Discounted cash flow analysis uses future cash flow amount and discounts them back to a present value estimate. The following is the formula for net present value:

\[
DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \cdots + \frac{CF_n}{(1+r)^n}
\]

\(CF\)=Cash Flow

\(r\)=discount rate (WACC)

\(CF_n\) refers to the estimated national individual income tax revenue in each year since the base year, DCF is the sum of the net present value. As the estimated amount could be, the only determinant in this case is the discount rate “\(r\)”.

\textsuperscript{60} Above n283.


According to Caplin and Leahy,\(^\text{63}\) social discount rate is the discount rate applied to social funds. When the social fund lasts over a long period, the discount rate is a critical parameter in cost-benefit analysis whenever costs and benefits differ in their distribution over time.\(^\text{64}\) The choice of the appropriate discount rate will affect the quality of the cost-benefit analysis,\(^\text{65}\) which will be used to improve decision making by systematically evaluating the social benefits and costs of government policies, with the emphasis on valuing them in monetary terms.\(^\text{66}\)

Many scholars used the social discount rate as the discount factor to find the present value of the estimated government revenue.\(^\text{67}\) The individual income tax forms an important and continuous stream of national revenue for the PRC, so it is appropriate to use the social discount rate in this pilot study. The social discount rate in 2014 is 7%.\(^\text{68}\)

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\(^{68}\)Above 291.
2. Feasibility Study Results

This part illustrates the calculation procedures for Module 1 and Module 2, and there are three steps in Module 2 to conclude the forecasted national individual income tax revenue under family based approach in the People’s Republic of China (PRC).

2.1 Module 1: Revenue Forecast under Individual Based Filing Approach

Module 1 generates the calculation of the 10-year-forecast for individual income tax revenue of the PRC under the existing individual based income tax filing system.

The revenue forecast procedures are:

1. Find the most recent data on total individual income tax revenue in the PRC, and then apply the growth rate factor to inflate and forecast the amount for the next 10 years.

2. Once the estimated amounts of individual income tax over the next 10 years have been calculated, apply the discount factor to discount the estimated future value back to the initial year for comparative purpose.

3. Add the present value from each year’s forecast together and get the total net present value.69

The most recent data for individual income tax can be found at the National Bureau of Statistics of China website. The website gives the available data until year 2014. From the chart, the total amount of individual income tax in 2014 is RMB 7,376.61bn.70

Table 471 Annual Tax Figure in 2014 in the PRC

<table>
<thead>
<tr>
<th>Database : Annual</th>
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</table>

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70 Equivalent to AUD 1475.32bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep.2016.
### Table 4

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxes (RMB billion)</td>
<td>119,175.31</td>
</tr>
<tr>
<td>Domestic Value-added Tax (RMB billion)</td>
<td>30,855.36</td>
</tr>
<tr>
<td>Business Tax (RMB billion)</td>
<td>17,781.73</td>
</tr>
<tr>
<td>Domestic Consumption Tax (RMB billion)</td>
<td>8,907.12</td>
</tr>
<tr>
<td>Tariffs (RMB billion)</td>
<td>2,843.41</td>
</tr>
<tr>
<td>Individual Income Tax (RMB billion)</td>
<td>7,376.61(^{72})</td>
</tr>
<tr>
<td>Corporate Income Tax (RMB billion)</td>
<td>24,642.19</td>
</tr>
<tr>
<td>Data Sources: National Bureau of Statistics</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 lists individual income tax amount as in year 2014. The research sets 2014 as the initial year to construct the 10-year-forecast from year 2014 to year 2024. The reason to set the forecast timeline as 10 years is that the input for the estimation such as the inflation factor and discount factor is reasonable and accessible, which adds reliability to the research. It is a common timeline chosen by scholars\(^{73}\) to construct their revenue side forecast.

\(^{72}\)Ibid.

2.1.1 Calculation and Application of the Growth Rate

The research then inflates the individual income tax as in 2014 to the next 10 years based on the growth rate.

I. Calculation of the Growth Rate

The calculation of the growth rate involves two processes. The first step works out the difference between the amount of GDP in the secondary and tertiary industries in the years 2013 and 2014, and the second step divides the increase amount by the GDP in the secondary and tertiary industry in 2013.

The growth of GDP (\(\triangle \text{GDP}\)) in the secondary and tertiary industries from 2013 to 2014 equals the sum of GDP in the secondary and tertiary industries \([\text{GDP}_{2014} (S.I. + T.I.)]\) in 2014 less the sum of GDP in the secondary and tertiary industries in 2013. \([\text{GDP}_{2013} (S.I.+T.I.)]\)

The GDP growth rate \([GR]\) equals to the increase amount of GDP (\(\triangle \text{GDP}\)) from 2013 to 2014 divided by the amount of GDP in secondary and tertiary industry in 2013. \([\text{GDP}_{2013} (S.I.+T.I.)]\)

The formula used to calculate the GDP growth rate \([GR]\) in 2014 is

\[
\]

Table 5: Annual GDP of Secondary and Tertiary Industries

| Database: Annual |
|------------------|------------------|
| Year: LATEST10   | Indicators       |
|                  | 2014             | 2013             |
| Gross National Income (RMB 1 billion) | 644,791.1 | 590,422.4 |


<table>
<thead>
<tr>
<th>Gross Domestic Product (RMB 1 billion)</th>
<th>643,974.0</th>
<th>595,244.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value-added of the Primary Industry (RMB 1 billion)</td>
<td>58,343.5</td>
<td>55,329.1</td>
</tr>
<tr>
<td>Value-added of the Secondary Industry (RMB 1 billion)</td>
<td>277,571.8</td>
<td>261,956.1</td>
</tr>
<tr>
<td>Value-added of the Tertiary Industry (RMB 1 billion)</td>
<td>308,058.6</td>
<td>277,959.3</td>
</tr>
<tr>
<td>Per Capita GDP (RMB)</td>
<td>47,203</td>
<td>43,852</td>
</tr>
</tbody>
</table>

Table 5 lists the annual GDP of secondary and tertiary industries in 2013 and 2014.

The GDP growth rate \( GR = \frac{(277571.8+308058.6) - (261956.1+277959.3)}{(261956.1+277959.3)} = 0.084671 = 8.46\% \)

The average rate for income tax growth is approximately 8.5%.

II. Compound for Future Value

Money has a different value over the course of time,\(^76\) as time passes, the value of money was deflated by inflation and opportunity cost. So money for today is worth than money for tomorrow.

The next step in the study is to apply the average growth rate to calculate the forecasted value\(^77\) for total individual income revenue for 2015 to 2024. The compound formula to calculate the future value is:

\[
P_n = P_0(1 + r)^n
\]

- \( P_n \) is future value of \( P_0 \)
- \( P_0 \) is original amount invested
- \( r \) is the rate of interest
- \( n \) is the number of compounding periods (years, months, etc.)

In this research, \( P_0 \) is the initial amount of the forecast, \( P_0 = \text{RMB 7376.61bn}\(^78\)

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\(^78\)Equivalent to AUD 1475.32bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
R is the average growth rate, \( r = 8.467\% \)

Calculate the corresponding forecasted future amount for each year. The results are reported in Table 2.3

### Table 6 Module 1: Individual Income Tax Forecast under Individual Based Filing Approach.

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</tr>
</thead>
<tbody>
<tr>
<td>Forecasted Amount</td>
<td>7377</td>
<td>8001</td>
<td>8679</td>
<td>9413</td>
<td>10210.55</td>
<td>11075.082</td>
<td>12013</td>
<td>13030</td>
<td>14133</td>
<td>15330</td>
<td>16628</td>
</tr>
</tbody>
</table>

Table 6 is the summary of the results of forecasted income tax revenue under individual based filing approach.

**2.1.2 Application of the Discount Rate and Calculation of the Net Present Value**

After calculating forecasted amount for income tax revenue in each year, the discounted cash flow\(^{79}\) method is applied to estimate the present value. Discounted cash flow analysis uses future cash flow amount and discounts them back to a present value estimate. The following is the formula for net present value:

\[
DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \cdots + \frac{CF_n}{(1+r)^n}
\]

\( CF = \)Cash Flow
\( r = \)discount rate (WACC)

This study substitutes the forecasted amount into the discounted cash flow formula, with the social discount rate at 7\%.\(^{80}\) (\( r = 7\% \))

\( CF_n \) is the forecasted amount in each year developed in the previous stage.

\(^{79}\)Above n289.
\(^{80}\)Above n291.
\[ DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \cdots + \frac{CF_n}{(1+r)^n} \]

\( CF = \text{Cash Flow} \)

\( r = \text{discount rate (WACC)} \)

\[ DCF = \frac{7376.61}{(1+7\%)^1} + \frac{8001.193}{(1+7\%)^2} + \frac{8678.659}{(1+7\%)^3} + \frac{9413.487}{(1+7\%)^4} + \frac{10210.530}{(1+7\%)^5} + \frac{11075.065}{(1+7\%)^6} + \frac{12012.8}{(1+7\%)^7} + \frac{14133.18}{(1+7\%)^8} + \frac{15329.849}{(1+7\%)^9} + \frac{16627.838}{(1+7\%)^{10}} \]

Table 7 summarises the net present value for the forecasted amount as in each year, and the sum of those net present values is the total net present value.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecasted Amount</td>
<td>7377</td>
<td>8001</td>
<td>8679</td>
<td>9413</td>
<td>10211</td>
<td>11075</td>
<td>12013</td>
<td>13030</td>
<td>14133</td>
<td>15330</td>
<td>16628</td>
</tr>
<tr>
<td>Net Present Value</td>
<td>7377</td>
<td>7478</td>
<td>7580</td>
<td>7684</td>
<td>7790</td>
<td>7896</td>
<td>8005</td>
<td>8114</td>
<td>8226</td>
<td>8338</td>
<td>8453</td>
</tr>
<tr>
<td>Total Net Present value</td>
<td>86941</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the chart, the total net present value of total income tax revenue for Module 1 is RMB 86,941bn.\(^{81}\)

### 2.2 Module 2: Revenue Forecast under Family Based Filing Approach

In the second module, the research applies the filing model in the US into the PRC’s individual income tax system, in order to forecast total income tax revenue based on family filing in the next 10 years.

#### 2.2.1 Assumptions for Module Two

This feasibility study makes three assumptions.

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\(^{81}\)Equivalent to AUD 17,388bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep.2016.
Assumption 1: The family unit in this research is the urban nuclear family.

Assumption 2: All married taxpayers choose “married filing jointly” as the filing status.

Assumption 3: The singles rate in the urban population is the same as the singles rate for the whole population.

A nuclear family is a family group consisting of two legally married adults and their dependents. Since China is going to learn directly from the U.S. about their family based filing approach, so the quantitative research design will use nuclear family as the family structure as well. In the PRC’s urban area, the common family structure is two married individuals with a dependent child. According to the Sixth National Population Census of the People’s Republic of China, the average number in a family is 3.1 in 2011, therefore, the nuclear family is the predominant family structure in Chinese cities.

In the US, the federal tax filing status prescribes the type of tax return form an individual could use. There are three possible filing statuses for family lodgement; Married Filing Jointly, Married Filing Separately, and Head of Household. If more than one filing status applies to the taxpayer, the taxpayer will choose the one that gives them the lowest tax liability. This pilot study chooses married filing jointly as the filing status and assumes this method gives the taxpayers the lowest tax. In reality, everything being equal, taxpayers will only choose the one which gives them the most tax benefits among those available filing status.

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82 The Internal Revenue Code of 1986, Section 1.
87 Above n312.
88 Above n309.
89 Above n309.
90 The Internal Revenue Code of 1986, Section 2.
91 Ibid.
statutes, so the actual total individual income tax revenue could only be less than the estimated amount based on married filing jointly status.

2.2.2 Internal Methodology

This research estimates the total individual income tax revenue for 10 years from year 2014, based on a family based individual income tax filing system. Under the assumption of urban nuclear family, the research starts with the individual annual income of each spouse, then calculates the family annual income by combing their income, and then divides the total family annual income by 2 for the average family annual income per person.

The study divides the average income per person based on family unit by 12 to calculate the monthly income\(^9\) and applies the progressive individual income tax rate for the monthly income tax payable. Finally, the research multiplies the monthly income tax by 12 to get the annual income tax amount per person, and identifies the total population\(^9\) in the urban labour force. In order to get the total national income tax revenue of taxpayers who are married and filed the income tax return on family basis, the research multiplies the annual individual income tax per head by the population in the labour force.

For one person households, taxpayers should continue with the current income tax filing system to lodge their income tax on an individual basis. There are two types of taxpayers; taxpayers who are part of an urban nuclear family, and taxpayers who are in a one person households. In order to calculate the amount of individual income tax for single taxpayers, it is required to apply the singles rate of the taxpayers within the labour force to current national individual

\(^9\)The Individual Income Tax Law of the People’s Republic of China prescribes the tax rates for monthly income.

income tax amount in 2014. The singles rate out of the total population is applied to total urban individual income tax revenue of the base year 2014.

**2.2.3 Step 1 Changes in National Individual Income Tax Revenue**

This step aims to compare the NPV of the 10-year-forecast\(^9\) for national individual income tax revenue under the existing filing approach with the forecasted NPV of 10 years’ income under family based filing status.

**2.2.3.1 Calculate the NPV under the Family Based Filing Approach.**

Under the urban nuclear family assumption, the research needs to estimate family annual income. Families then use their respectively total income amount to prepare for the filing of the individual income tax return for each income earning member under the family based filing system. In order to estimate family income, the first step is to estimate the individual family member’s annual income separately. The assumption determines there are two income earners in the urban nuclear family.\(^9\)

The National Bureau of Statistics of China prepares statistics for seven unevenly distributed income brackets as shown in Table 8. The per Capita Total Income\(^9\) is the average individual annual income within the bracket.

### Table 8 Per Capita Total Income of Urban Households

<table>
<thead>
<tr>
<th>Decile Groups</th>
<th>Per Capita Total Income of Urban Households(RMB) 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per Capita Total Income of Urban Households, Lowest Income Households(10%)(RMB)</td>
<td>9209.5</td>
</tr>
</tbody>
</table>


\(^9\)Above n312.

Table 8 is reproduced from the 2012 statistics.\textsuperscript{98} In order to ascertain that the result of the estimation is representative, this research selects\textsuperscript{99} individuals from the seven different groups and match them as a pair, resulting in 28 types of pairs.

Each of the seven income distribution groups are assigned their own order ID (see Table 2.6), the aim to sort numerically. Then two order ID are combined from the groups to generate the pair matching\textsuperscript{100}. The matching pairs need to cover all possible combinations.

<table>
<thead>
<tr>
<th>Order ID for Income Distribution Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decile Groups Year 12</td>
</tr>
<tr>
<td>Per Capita Total Income of Urban Households, Lowest Income Households (0-10%) (RMB)</td>
</tr>
<tr>
<td>Per Capita Total Income of Urban Households, Low Income Households (10%-20%) (RMB)</td>
</tr>
<tr>
<td>Per Capita Total Income of Urban Households, Lower Middle Income Households (20%-40%) (RMB)</td>
</tr>
</tbody>
</table>

\textsuperscript{100}Casella G, Statistical Design, (Berlin: Springer, 2008), at 447.  
| Per Capita Total Income of Urban Households, Middle Income Households (40%-60%) (RMB) | 24531.4 | 4 |
| Per Capita Total Income of Urban Households, Upper Middle Income Households (60%-80%) (RMB) | 32758.8 | 5 |
| Per Capita Total Income of Urban Households, High Income Households (80%-90%) (RMB) | 43471 | 6 |
| Per Capita Total Income of Urban Households, Highest Income Households (90%-100%) (RMB) | 69877.3 | 7 |

Table 9 lists the seven income distribution groups with their own order ID.

2.2.3.2 Matched Pairs

Table 10 reports the possible combinations of the pair matching. The numerical number represents the Order ID of different income groups.

Table 10 Possible Combination Groups of Income from Urban Households

<table>
<thead>
<tr>
<th>All Possible combinations among 7 different groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1</td>
</tr>
<tr>
<td>1,2 2,2</td>
</tr>
<tr>
<td>1,3 2,3 3,3</td>
</tr>
<tr>
<td>1,4 2,4 3,4 4,4</td>
</tr>
<tr>
<td>1,5 2,5 3,5 4,5 5,5</td>
</tr>
<tr>
<td>1,6 2,6 3,6 4,6 5,6 6,6</td>
</tr>
<tr>
<td>1,7 2,7 3,7 4,7 5,7 6,7 7,7</td>
</tr>
</tbody>
</table>

Table 10 is the summary of the possible combinations of the pair matching. There are 28 combinations to pair a couple based on different income groups. Family income of each of the 28 pairs are calculated, then the family income of each pair is evenly attributed to the individuals. Individual income tax rate is then applied to calculate the individual income tax liability.\(^{102}\) Note, the data is only available to 2012, the income tax result is for the year 2012.

For each matched pair, the research sets the per Capita Total Income of Urban Households\(^{103}\) from each bracket as the family member’s annual income, sums the two members’ income for

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\(^{102}\)《中华人民共和国个人所得税法》Individual Income Tax Law of the People's Republic of China 2011 (Standing Committee of the National People's Congress), Art 4.

the family’s income, then divides the total family income by 2 to calculate the average annual income in that family, and finally divides the result by 12 for the individual’s average monthly income.

This pilot study tests the revenue neutrality if China adopts the US individual income tax filing scheme, where taxpayers are allowed to file as a member of a family. The family revenue reported are comprehensive, and are not separated into the eleven categories in the Individual Income Tax Law of the People’s Republic of China, thereby per family member monthly income calculated in this research captures all income types of the taxpayer. The results illustrate the income derived from a global individual income tax system.

The US implements a progressive individual income tax rate, where the single rate was applied to the total comprehensive global income derived by an individual. From the determinants of the filing status to the actual lodgement methods of tax, the PRC learns directly from the US. This study therefore adopts the progressive income tax rate.

The income tax rate adopted in this study is compatible with the tax rate prescribed in Article 3, Individual Income Tax Law of the People’s Republic of China.

For illustrative purposes, the progressive rate scale for wages and salary income is applied to the comprehensive income of all taxpayers.

Table 11 Monthly Marginal Income Tax Rate

<table>
<thead>
<tr>
<th>Taxable Income (RMB)</th>
<th>Tax Rate</th>
<th>Tax Payable (RMB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1,500</td>
<td>3%</td>
<td>nil</td>
</tr>
<tr>
<td>1,501-4,500</td>
<td>10%</td>
<td>45 + 10% of excess over 1,500</td>
</tr>
<tr>
<td>4,501-9,000</td>
<td>20%</td>
<td>345 + 20% of excess over 4,500</td>
</tr>
</tbody>
</table>

104 Above n329.
106 Ibid.
107 Ibid.
108 Above n329.
109 Adapted from 《中华人民共和国个人所得税法》 Individual Income Tax Law of the People’s Republic of China 2011 (Standing Committee of the National People’s Congress), Art 1, para (1) sch 1.
<table>
<thead>
<tr>
<th>Income Range</th>
<th>Tax Rate</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,001-35,000</td>
<td>25%</td>
<td>1,245 + 20% of excess over 9,000</td>
</tr>
<tr>
<td>35,001-55,000</td>
<td>30%</td>
<td>7,995 + 30% of excess over 35,000</td>
</tr>
<tr>
<td>55,001-80,000</td>
<td>35%</td>
<td>13,995 + 35% of excess over 55,000</td>
</tr>
<tr>
<td>Over 80,000</td>
<td>45%</td>
<td>22,745 + 45% of excess over 80,000</td>
</tr>
</tbody>
</table>

Table 11 presents the results of the progressive tax rate format. The income tax free threshold is RMB 3500 per month, thus for the amount of taxable income below RMB 3500, there is no income tax levied. Only members of 6 married pairs among the total 28 groups are required to pay individual income tax, namely:

Family (3,7) with average annual income of RMB 44,126.04 per member, and with annual tax payable of RMB 63.72.

Family (4,7) with average annual income of RMB 47,204.4 per member, and with annual tax payable of RMB 156.24.

Family (5,7) with average annual income of RMB 51,318 per member, and with annual tax payable of RMB 279.72.

Family (6,7) with average annual income of RMB 56,674.2 per head, and with annual tax payable of RMB 440.28.

Family (6,6) with average annual income of RMB 43,470.96 per head, and with annual tax payable of RMB 44.28.

Family (7,7) with average annual income of RMB 69,877.32 per head, and with annual tax payable of RMB 1527.6.

For full calculation, see the footnote.\footnote{Ibid.}

The total amount of income tax for year 2012 equals to the annual income tax payable per member multiply by the number of people in the labour force in the urban area, which is 371.021 million\footnote{National Bureau of Statistics of the People’s Republic of China, <http://data.stats.gov.cn/easyquery.htm?cn=C01&zb=A0403&sj=2014>} reported by the National Bureau of China.
2.2.3.3 Calculation of Income Tax

The total amount of individual income tax revenue under family filing approach in 2012 (TY) equals to the sum of all possible matched pairs' individual income tax amount. For each pair, the amount of total income tax revenue equals to the amount of annual income tax per head (Y.PP.) , times the number of people in the labour force in the urban area (N), and then times the possibility (1/p) of the occurrence of a particular matched pair.

Total income tax revenue under family filing approach
\[ TY = \sum (\text{annual average income tax amount per head per pair} \times \frac{1}{\text{number of all matched pairs}}) \]

In this research, 
N=371.021 million 
P=28 
See Table 2.9 for the whole calculation procedures. Based on the calculation, the total income tax revenue for 2012 under family based filing estimation is RMB 332.8367bn,\(^{113}\) which is approximately RMB332.84bn.

\(^{113}\)Equivalent to AUD 70.53bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
Table 12 Calculation of Total Individual Income Tax under Family Filing Basis in 2012 (RMB)

<table>
<thead>
<tr>
<th>Decile Groups</th>
<th>Per Capita Total Income of Urban Households (RMB)</th>
<th>Order ID</th>
<th>Matched Pairs</th>
<th>Family Member A Annual Income</th>
<th>Family Member B Annual Income</th>
<th>Sum of Family Annual Income</th>
<th>Average Annual Income per Person</th>
<th>Income per Month per Person</th>
<th>Income Tax per Month per Person</th>
<th>Annual Income Tax Amount per Person</th>
<th>Numbers of people in the labour force in the urban area (Million)</th>
<th>Total Income Tax Amount (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%-20%</td>
<td>2011</td>
<td>1</td>
<td>1,6</td>
<td>9209.5</td>
<td>4387</td>
<td>13696.5</td>
<td>6848.3</td>
<td>570.1</td>
<td>0</td>
<td>371.02</td>
<td>9209.5</td>
<td>0</td>
</tr>
<tr>
<td>20%-40%</td>
<td>2011</td>
<td>2</td>
<td>1,6</td>
<td>9209.5</td>
<td>4387</td>
<td>13696.5</td>
<td>6848.3</td>
<td>570.1</td>
<td>0</td>
<td>371.02</td>
<td>9209.5</td>
<td>0</td>
</tr>
<tr>
<td>40%-60%</td>
<td>2011</td>
<td>3</td>
<td>1,6</td>
<td>9209.5</td>
<td>4387</td>
<td>13696.5</td>
<td>6848.3</td>
<td>570.1</td>
<td>0</td>
<td>371.02</td>
<td>9209.5</td>
<td>0</td>
</tr>
<tr>
<td>60%-80%</td>
<td>2011</td>
<td>4</td>
<td>1,6</td>
<td>9209.5</td>
<td>4387</td>
<td>13696.5</td>
<td>6848.3</td>
<td>570.1</td>
<td>0</td>
<td>371.02</td>
<td>9209.5</td>
<td>0</td>
</tr>
<tr>
<td>80%-90%</td>
<td>2011</td>
<td>5</td>
<td>1,6</td>
<td>9209.5</td>
<td>4387</td>
<td>13696.5</td>
<td>6848.3</td>
<td>570.1</td>
<td>0</td>
<td>371.02</td>
<td>9209.5</td>
<td>0</td>
</tr>
<tr>
<td>90%-100%</td>
<td>2011</td>
<td>6</td>
<td>1,6</td>
<td>9209.5</td>
<td>4387</td>
<td>13696.5</td>
<td>6848.3</td>
<td>570.1</td>
<td>0</td>
<td>371.02</td>
<td>9209.5</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 12 is the demonstration of the calculation procedures for the total individual income tax.

For each family unit, the total national individual income tax revenue equals to the income tax payable per year for each individual times the total labour force in the urban area. Since there are 28 possible matched pairs of families, the possibility for the occurrence of a certain matched pair is \( \frac{1}{28} \), so the research multiplies the national income tax revenue for a particular family by \( \frac{1}{28} \) after taking the possibility into consideration. Finally, the research illustrates that only six hypothetical families are liable for individual income tax, and calculates the total

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individual income tax revenue under the family filing approach by summarising those 6 families’ income tax payable and divides the result by 28.

2.2.3.4 Calculation of the Inflated Value as in 2014

While Module One sets 2014 as the base year for future cash flows to be discounted to, statistics for Module Two is only updated to 2012. In order to prepare clear comparison between the amount under the existing filing status and family based status, it is necessary to inflate the amount of RMB332.84bn to the year of 2014. The same inflation method as Module One is applied.

I. Calculate the Growth Rate in 2012;

The formula used to calculate the GDP growth rate \([GR]\) in 2012 is

\[
[GR] = \frac{\Delta GDP}{GDP_{2011} (S.I.+ T.I.)}
= \frac{GDP_{2012} (S.I.+ T.I.) - GDP_{2011} (S.I.+ T.I.)}{GDP_{2011} (S.I.+ T.I.)}
\]

Table 13 the Annual Gross National Income for Primary and Secondary Industries\(^{115}\)

<table>
<thead>
<tr>
<th>Database: Annual</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Year: LATEST10</td>
<td></td>
</tr>
<tr>
<td>Indicators</td>
<td>2012</td>
</tr>
<tr>
<td>Gross National Income(1billion)</td>
<td>539,116.5</td>
</tr>
<tr>
<td>Gross Domestic Product (1billion)</td>
<td>540,367.4</td>
</tr>
<tr>
<td>Value-added of the Primary Industry (1billion)</td>
<td>50,902.3</td>
</tr>
<tr>
<td>Value-added of the Secondary Industry (1billion)</td>
<td>244,643.3</td>
</tr>
<tr>
<td>Value-added of the Tertiary Industry (1billion)</td>
<td>244,821.9</td>
</tr>
<tr>
<td>Per Capita GDP(RMB)</td>
<td>40,007</td>
</tr>
</tbody>
</table>

Table 13 lists The Annual Gross National Income for Primary and Secondary industries.

Identify the GDP of secondary and tertiary industry for year 2011 and 2012.

The growth rate in 2012 = The increase amount of GDP in secondary and tertiary industry from 2011 to 2012 / The amount of GDP in secondary and tertiary industry in 2011

\[ [GR] = \frac{\Delta \text{GDP}}{\text{GDP}_{2011} (\text{S.I+T.I})} \]

The GDP growth in the secondary and tertiary industries from 2011 to 2012 = (2012 secondary industry GDP + 2012 tertiary industry GDP) - (2011 secondary industry GDP + 2011 tertiary industry GDP)

\[ \Delta \text{GDP} = \text{GDP}_{2012} (\text{S.I} + \text{T.I}) - \text{GDP}_{2011} (\text{S.I} + \text{T.I}) \]

The GDP growth in the secondary and tertiary industries (\( \Delta \text{GDP} \)) = (244,643.3 + 244,821.9) - (227,038.8 + 216,098.6) = RMB 46,327.8bn

2011 secondary industry GDP & 2011 tertiary industry GDP [GDP

\[ \text{GDP}_{2011} (\text{S.I} + \text{T.I})] = 227,038.8 + 216,098.6 = \text{RMB 443,137.4bn} \]

The growth rate in 2012 [GR] = 46327.8/443137.4 = 0.104545

As a result, the growth rate for year 2012 is approximately 10.45%.

II. Apply the Growth Rate for the amount as in 2013

The research applied the growth rate\(^{116}\) and calculates the estimated amount for 2013,

RMB332.84bn * (1 + 0.104545) = RMB367.64bn\(^{117}\)

III. Calculate the Growth Rate in 2013

The formula used to calculate the GDP growth rate [GR] in 2013 is

\[ [GR] = \frac{\Delta \text{GDP}}{\text{GDP}_{2012} (\text{S.I+T.I})} \]

\[ \text{GDP}_{2013} (\text{S.I+T.I}) - \text{GDP}_{2012} (\text{S.I+T.I}) \]

\[ \text{GDP}_{2012} (\text{S.I+T.I}) \]

---

\(^{116}\) Above n301.

\(^{117}\) Equivalent to AUD 77.90bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016
Table 14 lists The Annual Gross National Income for Primary and Secondary industries.

Identify the GDP of the secondary and tertiary industries for year 2012 and 2013.

The growth rate in 2013 = The increase amount of GDP in secondary and tertiary industry from 2012 to 2013 / The amount of GDP in secondary and tertiary industry in 2012

\[ GR = \frac{\Delta GDP}{GDP_{2012} (S.I. + T.I.)} \]

The GDP growth of the secondary and tertiary industry from 2012 to 2013 = (2013 secondary industry GDP+2013 tertiary industry GDP)-(2012 secondary industry GDP+2012 tertiary industry GDP)

\[ \Delta GDP = GDP_{2013} (S.I. + T.I.) - GDP_{2012} (S.I.+T.I.) \]

The increase amount of GDP in secondary and tertiary industry= (261,956.1+277,959.3) - (244,643.3+244,821.9) =RMB50450.2bn

2012 secondary industry GDP & 2012 tertiary industry GDP [GDP_{2012} (S.I. + T.I.)]=244,643.3+244,821.9= RMB489465.2bn

The growth rate in 2013 [GR] = 50450.2/489465.2=0.103072

As a result, the growth rate for year 2012 is approximately 10.31%.

IV. Apply the Growth Rate for the Amount as in 2014

The research applies the growth rate and calculates the estimated amount for 2014,
RMB 367.64bn \(\times (1+0.103072) = \text{RMB 405.53bn}^{121}\)

V. Apply the Average Growth Rate for the 10 year Forecast

The research then applies the average growth rate to calculate the forecasted value for the total individual income revenue as in year 2015 to 2024. The compound formula\(^{122}\) to calculate the future value is listed as follows:

\[
P_n = P_0 (1+r)^n
\]

- \(P_n\) is future value of \(P_0\)
- \(P_0\) is original amount invested
- \(r\) is the rate of interest
- \(n\) is the number of compounding periods (years, months, etc.)

In this research, \(P_0\) is the initial amount of the forecast,

\[P_0 = \text{RMB 405.53bn}^{123}\]

\(R\) is the average growth rate, \(r=0.084671^{124}\)

The research substitutes 405.53 of \(P_0\) and calculates the corresponding forecasted future amount for each year. The results are reported in Table 2.12.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount</td>
<td>405.53</td>
<td>439.87</td>
<td>477.11</td>
<td>517.51</td>
<td>561.33</td>
<td>608.85</td>
<td>660.41</td>
<td>716.32</td>
<td>776.97</td>
<td>842.76</td>
<td>914.12</td>
</tr>
</tbody>
</table>

Table 15 reports the results of forecasted individual income tax (RMB billion) from 2014 to 2024.

VI. Discount the Forecasted Value to the Present Value

\(^{121}\)Equivalent to AUD 85.93bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
\(^{122}\)Above n304.
\(^{123}\)Equivalent to AUD 82.25bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
\(^{124}\)Adapt from Step One.
At this stage, the research applies the discount factor as stated in previous section of 7% to calculate the present value for the estimated amount as in 2014.

The detailed calculation procedures are explained and demonstrated in the previous section, so this section only reports the results.

Table 16 Present Value of Individual Income Tax (RMB billion) from 2014 to 2024

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecasted Amount</td>
<td>405.53</td>
<td>439.87</td>
<td>477.11</td>
<td>517.51</td>
<td>561.33</td>
<td>608.85</td>
<td>660.41</td>
<td>716.32</td>
<td>776.97</td>
<td>842.76</td>
<td>914.12</td>
</tr>
<tr>
<td>Discounted Amount</td>
<td>405.53</td>
<td>411.09</td>
<td>416.727</td>
<td>422.44</td>
<td>434.1</td>
<td>440.06</td>
<td>446.09</td>
<td>452.21</td>
<td>458.41</td>
<td>464.69</td>
<td></td>
</tr>
</tbody>
</table>

Table 16 reports the results of presented individual income tax (RMB billion) from 2014 to 2024. The research adds the 10 values together to conclude the net present value. From the Table 6.14, the NPV under the family based filing approach is RMB 4779.6bn.126

2.2.4 Step 2 Consideration of the Singles in the Population

Step 1 identified the net present value of total income for the 10-year-forecast based on the current filing method and the family based filing method. It explained the key elements for the calculation under the two different bases. A further step is necessary to review the experiment design to improve the robust of the research, since not all taxpayers are married.

The quantitative research is based on the assumption of the urban nuclear family in the PRC. For the calculation of total income tax revenue according to the current filing method, it has been assumed that the majority of individual income tax is in the urban area. For the family

125 Above n291.
126 Equivalent to AUD 1012.8bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
based filing approach, Step 1 only generated the model suitable for taxpayers who are part of a family, while ignoring the individual income tax lodgement for single individuals. One-person households include singles, divorces and widows. The estimation of total individual income tax revenue based on family filing should also include one-person households.

2.2.4.1 Calculation of the Income Tax Revenue Levied on One-Person Households

The way for individuals from the one-person households to lodge their individual income tax is the same as what taxpayers did under the current approaches. After the taxpayers receive their taxable income, as they do not have other family members for tax purposes, they need to prepare their Individual Income Tax Return Form on an individual basis. As the same lodgement approach is used for all taxpayers, the reported total national individual income tax revenue in 2014 is used for calculations, and the singles rate is also considered.

I. Calculation of the Singles Rate

The research collected the data from the National Bureau of PRC. The NBC selected a sample population size of 938,993 to account for people who are 15 and above. According to the definition from the OECD, the working age population is defined as those aged 15 to 64. This research takes into consideration the lower age limit of 15, but does not limit the income earning age to 64. The quantitative design aims to forecast the individual income tax levied on taxable income, those individuals over 64 usually receive a pension if they are part of an

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129 Ibid.
132 《基本养老保险基金投资管理办法》 Measures for Administration of Basic Pension Insurance Fund Investment 2015 (State Council), Art 2.
urban family in the PRC. Therefore, under the global income approach, the source of income from pension funds also need to be included in the taxable income.

Table 17\textsuperscript{133} Three Types of Singles Population in the Sample Population

<table>
<thead>
<tr>
<th>Database : Annual Year: LATEST10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicators</td>
</tr>
<tr>
<td>Population Aged 15 and Over (Sample Survey)(person)</td>
</tr>
<tr>
<td>Male Population Aged 15 and Over (Sample Survey)(person)</td>
</tr>
<tr>
<td>Female Population Aged 15 and Over (Sample Survey)(person)</td>
</tr>
<tr>
<td>Population Aged 15 and Over, Never Married (Sample Survey)(person)</td>
</tr>
<tr>
<td>Male Population Aged 15 and Over, Never Married (Sample Survey)(person)</td>
</tr>
<tr>
<td>Female Population Aged 15 and Over, Never Married (Sample Survey)(person)</td>
</tr>
<tr>
<td>Population Aged 15 and Over, Divorced (Sample Survey)(person)</td>
</tr>
<tr>
<td>Male Population Aged 15 and Over, Divorced (Sample Survey)(person)</td>
</tr>
<tr>
<td>Female Population Aged 15 and Over, Divorced (Sample Survey)(person)</td>
</tr>
<tr>
<td>Population Aged 15 and Over, Widowed (Sample Survey)(person)</td>
</tr>
<tr>
<td>Male Population Aged 15 and Over, Widowed (Sample Survey)(person)</td>
</tr>
<tr>
<td>Female Population Aged 15 and Over, Widowed (Sample Survey)(person)</td>
</tr>
</tbody>
</table>

Table 17 lists the amount of different types of singles population among the sample. There are three categories of one person households; among the sample population for people above 15, 184,890 were single and have never being married, taking up 19.7% of the total sample size; 16,291 were divorced but not remarried, accounting for 1.73% of the total sample; and 50,409 have been widowed and not remarried, accounting for 5.4% of the total sample. The research adds up the total number of people from the three groups and divides the amount by the total size to calculate the singles rate.

Total amount of single persons in the sample

\[184,890 + 16,291 + 50,409 = 251,590\]

Singles rate = Total number of single person / Total population within the sample

Singles rate: 251,590 / 938,993 = 0.267936

The singles rate is approximately 26.8% in the PRC.

II. The Calculation Procedure

a. Calculation of Income Tax Revenue for the One-Person Households

Individual income tax revenue for the one-person household is calculated by applying the singles rate to the total individual income tax revenue in 2014. The same procedures have been adopted for the calculation of the forecasted amount in each year, by inflating the amount of income tax revenue from 2014 to 2024 with the same growth rate as in step 1. After the calculation of the forecasted amount for the next 10 years, the research discounts those forecasted amount to the base year of 2014 using the given social discount rate of 7%. The total net present value of national income tax revenue for one-person household is the sum of the ten net present values.
The formula\textsuperscript{134} developed to calculate the total income tax revenue for singles is:

Total income tax revenue for singles (TYS) = Total income tax revenue (TY) * singles rate (S)

\[ TYS = TY * S \]

In this research, the amount of total income revenue in 2014 is RMB 7,376.61bn. So the total income tax revenue for singles is RMB 1,976.459bn.\textsuperscript{135}

Total income revenue in 2014 for singles = 7376.61* 0.267936
RMB 1976.459bn

The growth rate and discount rate applied in this step is exactly the same as the previous step, and the calculation procedures are the same, so step 2 only reports the result of the forecast.

Table 18 Present Value of Individual Income Tax (RMB billion) from 2014 to 2024 for Singles

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecasted Amount</td>
<td>1976.459</td>
<td>2143.808</td>
<td>2325.326</td>
<td>2522.214</td>
<td>2735.772</td>
<td>2967.413</td>
<td>3218.667</td>
<td>3491.194</td>
<td>3786.797</td>
<td>4107.429</td>
<td>4455.209</td>
</tr>
<tr>
<td>NPV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23294.55bn</td>
</tr>
</tbody>
</table>

The total net present value of income tax revenue for one-person households under the family based filing approach is RMB 23294.55bn.\textsuperscript{136}

b. Estimation of Income Tax Revenue for the Urban Nuclear Family

The calculation procedures are all the same as step 1 except changing the number of people in the labour force in the urban area. Step 2 only includes married people for family revenue estimation.

\textsuperscript{134} Above n332.

\textsuperscript{135} Equivalent to AUD 395.29bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.

\textsuperscript{136} Equivalent to AUD 4658.91bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
This step subtracts the amount of one-person household from the total number of people in the urban labour force.

Number of married people in the labour force in urban area\textsuperscript{137} \(N_{\text{married}}\) = Total population in the workforce in the urban area \(N_{\text{total}}\) * single rate in the urban area \(S\)

\[ N_{\text{married}} = 371.02 \times (1 - 0.267936) = 271.61 \text{(Million)} \]

The calculation process for the estimated total individual income tax revenue is the same in this step compared with the previous step, except for changing the number of people in the labour force in the urban area from 371.02 (million) to 271.61 (million).

The calculation of the estimated amount of individual income tax for households under the family based filing approach in 2012 is demonstrates in the following table.

\textsuperscript{137} Above n332.
Table 19 Calculation of Total Individual Income Tax under Family Filing Approach in 2012 (RMB) for Households

<table>
<thead>
<tr>
<th>Decile Groups</th>
<th>Per Capita Total Income of Urban Households (RMB)</th>
<th>Order ID</th>
<th>Married Plans</th>
<th>Family Member A Annual Income</th>
<th>Family Member B Annual Income</th>
<th>Sum of annual Income</th>
<th>Average Annual Income per person</th>
<th>Income per month per person</th>
<th>Income Tax per month per person</th>
<th>Annual Income tax amount per person</th>
<th>People in the labour force in the urban area (Million)</th>
<th>Total Income Tax (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%-100% 39205.9</td>
<td>3.7</td>
<td>39205.9</td>
<td>69877.3</td>
<td>37998.4</td>
<td>35943.4</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
</tr>
<tr>
<td>80%-90% 37245.4</td>
<td>3.7</td>
<td>37245.4</td>
<td>69877.3</td>
<td>35943.4</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>70%-80% 35284.9</td>
<td>3.7</td>
<td>35284.9</td>
<td>69877.3</td>
<td>3295.2033</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>60%-70% 33324.4</td>
<td>3.7</td>
<td>33324.4</td>
<td>69877.3</td>
<td>3295.2033</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>50%-60% 31363.9</td>
<td>3.7</td>
<td>31363.9</td>
<td>69877.3</td>
<td>3295.2033</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>40%-50% 29403.4</td>
<td>3.7</td>
<td>29403.4</td>
<td>69877.3</td>
<td>3295.2033</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>30%-40% 27443.9</td>
<td>3.7</td>
<td>27443.9</td>
<td>69877.3</td>
<td>3295.2033</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>20%-30% 25483.4</td>
<td>3.7</td>
<td>25483.4</td>
<td>69877.3</td>
<td>3295.2033</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>10%-20% 23523.9</td>
<td>3.7</td>
<td>23523.9</td>
<td>69877.3</td>
<td>3295.2033</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0%-10% 21563.4</td>
<td>3.7</td>
<td>21563.4</td>
<td>69877.3</td>
<td>3295.2033</td>
<td>3295.2033</td>
<td>0</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td>271.61</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

The research then inflates the total individual income tax for households from 2012 to 2014.

The growth rate of 10.45%\textsuperscript{138} for income tax in year 2012 (calculated in previous section) is applied and the amount of income tax revenue for 2013 is calculated as follows:

\[243.66 \times (1 + 0.1045) = \text{RMB} \ 269.12bn\textsuperscript{139}\]

The amount for income tax revenue in 2013 for households is RMB 269.12bn.

\textsuperscript{138}Adapted from Step One.

\textsuperscript{139}Equivalent to AUD 57.08bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep 2016.
The growth rate of 10.31%\(^{140}\) for income tax in year 2013 (calculated in previous section) is applied and the amount of income tax revenue for 2014 is calculated as follows:

\[
269.12 \times (1 + 0.1031) = \text{RMB} \ 296.87 \text{bn}^{141}
\]

The amount for income tax revenue in 2014 for households is RMB 296.87bn.

The step further applies the growth rate of 8.47% and the discount rate of 7% to inflate the projected cash flows and then discount those cash flows to the base year.

Table 20 Present Value of Individual Income Tax (RMB billion) from 2014 to 2024 for Households

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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount</td>
<td>297</td>
<td>322</td>
<td>349</td>
<td>379</td>
<td>411</td>
<td>446</td>
<td>483</td>
<td>524</td>
<td>569</td>
<td>617</td>
<td>669</td>
</tr>
<tr>
<td>Present Value</td>
<td>297</td>
<td>300</td>
<td>305</td>
<td>309</td>
<td>313</td>
<td>318</td>
<td>322</td>
<td>327</td>
<td>331</td>
<td>336</td>
<td>340</td>
</tr>
<tr>
<td>NPV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RMB3499Billion</td>
</tr>
</tbody>
</table>

Table 20 summarises the presented value of individual income tax from 2014 to 2014 for households.

c. Report the Final Results

Step 2 considers the income tax lodgement for the one-person households and the families, based on previous calculation, the NPV of family based total income tax is RMB 3,499bn\(^{142}\) the NPV of one-person households’ total income tax is RMB 23,294.55bn,\(^{143}\) and the NPV of total individual income tax is RMB 26,793.55bn.\(^{144}\)

\(^{140}\)Adapted from Step One.

\(^{141}\)Equivalent to AUD 62.91bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep.2016.

\(^{142}\)Equivalent to AUD 699.8bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep.2016.

\(^{143}\)Equivalent to AUD 4658.91bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep.2016.

\(^{144}\)Equivalent to AUD 5358.71bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep.2016.
2.2.5 Step 3 Take Singles and Equal Random Sample into Account

After reviewing the previous two steps for the quantitative design, an issue of random sampling distribution\(^{145}\) has been identified and will addressed in this step.

For the measure of individual income tax revenue estimation according to family based filing, the first and second step directly used the seven levels of annual income groups classified by the National Bureau of Statistics. When reviewing the measurement, the distribution of those seven income groups in the population is not equal. Group 1 represents 10% of population who earned the least annual income in the urban area, the second least earning group also takes up 10% of the total population. Groups 3, 4 and 5 occupies 20% of the total population, and Groups 6 and 7 are the two groups with the highest annual income, accounting for 10% of total population respectively. Since the proportion of Groups 3,4 and 5 earners are twice as Groups 1,2,6 and 7, if a random person is selected from the total population, the probability for the person’s income falling into Groups 3,4 and 5 is two times of the probability of falling into Groups 1,2,6 and 7.

In order to make the pair matching of couples randomly distributed, Step 3 for this research considers redistributing the family groups. Group 1 and 2 can be combined to form the new Group 1’, accounting for 20% of the total population. The annual income for the new Group 1’ is the average amount of the old group 1 and 2;

\[(9209.5+13724.7)*0.5=RMB 1,1467.10\]

At the same time, combing group 6 and 7 to create the new Group 5’, which also accounts for 20% of the total population. The annual income for the new Group 5’ is the average amount of the old groups 6 and 7;

Now the newly arranged groups with their Per Capita Total Income and Order ID are shown in the following table.

Table 21 Ranking of Per Capita Total Income of Urban Households (Rearrangement)

<table>
<thead>
<tr>
<th>Decile Groups</th>
<th>Per Capita Total Income of Urban Households (yuan)</th>
<th>Order ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per Capita Total Income of Urban Households, Low Income Households (0-20%) (RMB)</td>
<td>11467.1</td>
<td>1'</td>
</tr>
<tr>
<td>Per Capita Total Income of Urban Households, Lower Middle Income Households (20%-40%) (RMB)</td>
<td>18374.8</td>
<td>3</td>
</tr>
<tr>
<td>Per Capita Total Income of Urban Households, Middle Income Households (40%-60%) (RMB)</td>
<td>24531.4</td>
<td>4</td>
</tr>
<tr>
<td>Per Capita Total Income of Urban Households, Upper Middle Income Households (60%-80%) (RMB)</td>
<td>32758.8</td>
<td>5</td>
</tr>
<tr>
<td>Per Capita Total Income of Urban Households, High Income Households (80%-100%) (RMB)</td>
<td>56674.15</td>
<td>5'</td>
</tr>
</tbody>
</table>

Table 21 lists the 5 rearranged income distribution groups with their own order ID.

Once the 5 groups are formed, the next step is to select any two individuals from those five groups to form a family. There are 25 potential combinations with equal occurrence possibility.

---

Table 22 All Possible combinations among 5 different groups

<table>
<thead>
<tr>
<th>All Possible combinations among 5 different groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1',5'</td>
</tr>
<tr>
<td>1',5</td>
</tr>
<tr>
<td>1',4</td>
</tr>
<tr>
<td>1',3</td>
</tr>
<tr>
<td>1',1'</td>
</tr>
</tbody>
</table>

Table 22 is the summary of the possible combinations of the pair matching.

2.2.5.1 The Calculation Procedures

The other measurement methods and calculation procedures are exactly the same as Step 2 except for taking random distribution into account. Under the family based approach, for all of the 25 possible family combinations, Step 3 estimates the average family annual income per head and apply the corresponding tax rate to get the annual income tax amount per head. The research then multiplies the annual income tax per head by the total number of married people in the labour force in urban area to calculate the total amount of income tax revenue. Step 3 also constructs the discounted cash flow method to calculate the total net present value of national individual income tax revenue.

Calculation Procedure under Random Distribution for Households

This section adopts the new arranged matched pairs and the corresponding Order ID and Per Capita total income, the full calculation is shown in Table 2.20.
Table 23 Total Individual Income Tax under Family Filing Approach in 2012 for Random Distribution

Table 4.20 Calculation of Total Individual Income Tax Under Family Filing Basis in 2012 (RMB) for Households Random Distribution

<table>
<thead>
<tr>
<th>Decile Groups</th>
<th>Per Capita Total Income of Urban Households (RMB)</th>
<th>Per Capita Income of Family Member A</th>
<th>Per Capita Income of Family Member B</th>
<th>Average Per Capita Annual Income</th>
<th>Income Tax per person</th>
<th>Income Tax per month</th>
<th>Average Annual Income Tax per person</th>
<th>Total Income Tax (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20%</td>
<td>11467.1</td>
<td>1',1',5'</td>
<td>11467.1</td>
<td>11467.1</td>
<td>56674.15</td>
<td>56674.15</td>
<td>11467.1</td>
<td>11467.1</td>
</tr>
<tr>
<td>20%-40%</td>
<td>18374.8</td>
<td>3,1,1',5'</td>
<td>11467.1</td>
<td>18374.8</td>
<td>32758.8</td>
<td>32758.8</td>
<td>18374.8</td>
<td>18374.8</td>
</tr>
<tr>
<td>40%-60%</td>
<td>24531.4</td>
<td>4,1',1',4</td>
<td>11467.1</td>
<td>18374.8</td>
<td>24531.4</td>
<td>24531.4</td>
<td>18374.8</td>
<td>18374.8</td>
</tr>
<tr>
<td>60%-80%</td>
<td>32758.8</td>
<td>5,1',1',1</td>
<td>11467.1</td>
<td>18374.8</td>
<td>32758.8</td>
<td>32758.8</td>
<td>18374.8</td>
<td>18374.8</td>
</tr>
<tr>
<td>80%-100%</td>
<td>56674.15</td>
<td>5,5'</td>
<td>11467.1</td>
<td>56674.15</td>
<td>56674.15</td>
<td>56674.15</td>
<td>56674.15</td>
<td>56674.15</td>
</tr>
</tbody>
</table>

Table 23 is the demonstration of the calculation procedures about the total individual income tax amount in 2012. The amount is RMB 94.46bn.

The research inflates the amount to 2013:

94.46*(1+0.1045) = RMB 104.33bn

The research then inflates the amount to 2014:

104.33*(1+0.1031) = RMB 115.09bn

Step 3 then compounds the amount of total income tax revenue for married taxpayers into the next 10 years and constructs the discounted cash flow analysis to work out the NPV of the national income tax revenue under family based filing approach.

Table 24 Present Value of Individual Income Tax (RMB billion) from 2014 to 2024 for Households for Random Distribution

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Forecastsed Amount</td>
<td>115.09</td>
<td>124.83</td>
<td>135.4</td>
<td>146.87</td>
<td>159.31</td>
<td>172.79</td>
<td>187.42</td>
<td>203.29</td>
<td>220.51</td>
<td>239.18</td>
<td>259.43</td>
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<tr>
<td>Present Value</td>
<td>115.09</td>
<td>116.67</td>
<td>118.27</td>
<td>119.889</td>
<td>121.53</td>
<td>123.2</td>
<td>124.89</td>
<td>126.6</td>
<td>128.34</td>
<td>130.1</td>
<td>131.88</td>
</tr>
<tr>
<td>NPV</td>
<td>RMB 1356.5bn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

147Equivalent to AUD 24.39bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
Under the family based filing approach for the randomly distributed matched pairs, the final step applies the singles rate to the total income tax revenue for 2014 to calculate the amount for one-person household. There is no change between Step 2 and Step 3. The amount for the NPV of single households is RMB 23,294.55bn, the amount for the NPV of households under family based filing approach under the random distribution is RMB 13,565bn. The total amount of net present value is RMB 24,651.05bn.

2.3 Discussion of the Results from the Pilot Study

2.3.1 Summary for the Pilot Study

Based on the results from Module 1 and Step 3 of Module 2, the forecasted value for the total individual income tax revenue under the existing income tax filing status is RMB 86,940.62bn, whereas the amount under the family based filing approach is RMB 24,651.05bn. If government undertakes the individual income tax reform, it will only receive approximately 28.4% of the total tax revenue compared with the of the current approach. There is a significant gap between the revenue before and after the changing of the filing approach. This means there is a breach of the principle of “revenue neutrality.” The government will only provide the tax benefit to the taxpayers when the policy changes do not bring in a negative effect. From a revenue approach it is not appropriate for the Chinese government changing its income tax filing method from individual based to family based.

2.3.2 Implementation of the “Revenue Neutrality” Criteria

“Revenue neutrality” is selected as the criteria to assess the appropriateness for the People’s Republic of China (PRC) to consider family based individual income tax filing of the income

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148 Equivalent to AUD 4,658.91bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
149 Equivalent to AUD 17,388.12bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
150 Equivalent to AUD 14,753.22bn, the current exchange rate ratio between RMB and AUD is 5:1 as on 30 Sep. 2016.
tax returns. Based on the “revenue neutrality” criteria, changes of the filing approach for individual income tax should not materially affect the national individual income tax revenue in the PRC. If, finally, there is a significant difference in the estimated amount of national income tax revenue under the family filing approach and the individual based approach, the significant revenue gap would breach the “revenue neutrality” criteria.

2.3.3 Results and Conclusion

Results from the pilot study reports that the projected revenue from allowing family based individual income tax filing would be at a level that is closer to 30% of revenue collectable if the PRC does not allow family based individual income tax filing. This result breaches the “revenue neutrality” criteria. This result suggests that policy makers in the PRC need to take careful considerations of costings before proceeding with the reform.

Apart from the administrative aspect, the research costed the administrative reform plan proposed by scholars who suggested the family based filing approach. The amount of individual income tax liability relates to the vital interest of each individual, the change of filing approach ideally should to result in a lower individual income tax burden for taxpayers after the reform. On the other hand, tax is the major source of government revenue. From the results of the pilot study, the proposed reform plan will result in significant reduction in the national individual income tax revenue, which breaches the criteria of “revenue neutrality”. When there is a substantial national revenue loss after a reform, and the reform process is very complex as considering a lot of demographic and fiscal issues, there is not enough motivation for taxation authorities to continue the reform.

2.4 Conclusion

A review of the literature shows that Chinese scholars and commentators suggest that the PRC could learn directly from the US, and adopt their global income tax system and allow family based filing of individual income tax returns. The literature does not provide reasons for this suggestion.

This paper reports results from a feasibility study to assess whether the PRC could adopt the suggestions proposed by the prevailing literature. The study is performed based on a “revenue neutrality” analysis that compares projected revenue from existing policies, and that collectable if China allows family based individual income tax filing.