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Distributional Effects of Tax Reforms in Japan

Micro-simulation Approach

Prepared by Takuma Hisanaga

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Distributional Effects of Tax Reforms in Japan
Micro-simulation Approach
Prepared by Takuma Hisanaga

Authorized for distribution by Ranil Salgado
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ABSTRACT: This paper conducts micro-simulations to study the distributional effects of several tax measures in Japan, considering households' heterogeneity in terms of both income and wealth. Simulation results suggest that increasing the consumption tax rate and strengthening the recurrent tax on immovable property would weigh more heavily on low-income households with large wealth than on those of comparable incomes with small wealth, and that introduction of a consumption tax credit would be effective in containing a rise in tax burden of low-income households.

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WORKING PAPERS

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Prepared by Takuma Hisanaga¹

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1. Introduction

Since 2020, Japan has responded to the COVID-19 pandemic decisively with sizeable fiscal stimulus packages. The resultant wider fiscal deficits, the unprecedented level of public debt, and the rising demographic pressures point to a need for medium-term fiscal consolidation once the recovery firmly takes hold. On the expenditure side, social security spending is set to grow as the population ages, while the size of Japan's non-social security spending is already low among the advanced economies. On the revenue side, Japan's tax revenue in percent of GDP is low relative to the other G7 countries. In this context, revenue-enhancing measures could play a critical role in Japan's medium-term fiscal consolidation.

At the same time, tax reforms affect distribution of income and wealth and perceptions of fairness of the tax system. Market income inequality in Japan has been on the rise (Colacelli and Anh, 2018), making Japan close to the average of G7 economies.² The pandemic likely exacerbated this trend (Kikuchi et al., 2021). Redistributive effects of the tax system (including the social security premium) in Japan are limited relative to other advanced economies (OECD, 2008). It is also important to look at wealth distribution in Japan, because retirees—who often live on low-incomes but with large wealth—account for a growing share of the population³. The perspective of wealth distribution becomes crucial when we consider property taxation, one of promising avenues for future revenue increase in Japan.

Against this backdrop, this paper first lays out tax reform options to either increase revenues or strengthen redistributive effects. Those options are:

- Unify the consumption tax reduced rate of 8 percent with the standard rate of 10 percent,
- Raise the consumption tax standard rate from 10 to 15 percent,
- Introduce a Consumption Tax Credit,
- Eliminate the preferential treatment for residential land embedded in the Fixed Asset Tax,
- Streamline the Employment Income Deductions in the personal income taxes,
- Streamline the Pension Income Deductions in the personal income taxes, and
- Raise the capital income tax rate from 20 to 25 percent.

Second, this paper analyzes the distributional effects of those measures—considering the heterogeneity of households in terms of both income and wealth. The analysis is done by running an arithmetic micro-simulation model which computes each household's tax burden based on households' survey data. This paper adds to the literature that studies the distributional effects of tax and social security policies in Japan relying on arithmetic micro-simulation models.⁴ For example, Tajika and Furutani (2003) simulated the elimination of the Pension Income Deduction, Takayama and Shiraishi (2010a) studied the introduction of a refundable income tax credit, and Ohno et al. (2021) analyzed the deductions in the personal income tax. In terms of the household survey data used in micro-simulation models, most of previous studies relied on either (i) the National Survey of Family

² This rise is partially attributable to the demographic transition, to the extent that the intra-generational inequality among the elderly is generally higher than that among the youth. On the other hand, aging leads to an increase in the redistributive effect, as more people depend on pensions and other transfers. Reflecting these two factors, disposable income inequality (the Gini coefficient of income after redistribution) in Japan remains stable, while a gap between the Gini coefficient of market income and that for income after redistribution has widened.

³ Kitao and Yamada (2019) documents that inequality in financial wealth rose over the past three decades in Japan. Shikata (2011) finds that financial assets held by the elderly in Japan stand out in value relative to other advanced economies.

⁴ Yada (2010) provides a thorough survey on micro-simulation research in Japan.

Income and Expenditure (NSFIE),⁵ (ii) the Comprehensive Survey of Living Conditions (CSLC), or (iii) one of the two-closely coordinated surveys conducted by Keio University—the Japan Household Panel Survey (JHPS) and the Keio Household Panel Survey (KHPS).⁶ This paper builds on Doi (2017) and Kawade (2018), and uses the KHPS. The contribution of this paper to the literature is two-fold. First, it covers more tax measures in the simulations—the consumption tax, a Consumption Tax credit, property taxes, and personal income taxes including the capital income tax. Second, it sheds light on the distributional effects of tax reforms on households' wealth, in addition to income which is the focus of the literature.⁷

The rest of the paper is structured as follows. Section 2 identifies potential tax reform measures to increase revenues and improve inequality through a comparison of Japan's tax system with the other G7 countries. Section 3 explains the methodology of the micro-simulations. Section 4 presents and discusses the results. Section 5 concludes.

2. Tax Reform Options

A. Overview

Japan's tax revenues including social security contributions were 31 percent of GDP in 2019. The consumption tax and social security contributions contributed to a steady increase in the tax revenue-to-GDP ratio over the last decade (left chart in Figure 1). Compared to the other G7 countries, Japan collects more revenues from the corporate income tax and social security contributions (right chart in Figure 1). It is notable that social security contributions now account for 41 percent of Japan's tax revenues. On the other hand, the share of goods and services taxes which is mainly comprised of the consumption tax in Japan is lower than the other G7 countries except the U.S., suggesting room for further revenue increase. Another promising tax is property tax, whose share in revenues in Japan stands on the lower end in G7. Therefore, we start our discussion from the consumption tax and the property taxes, followed by the personal income tax including the capital income tax.⁸

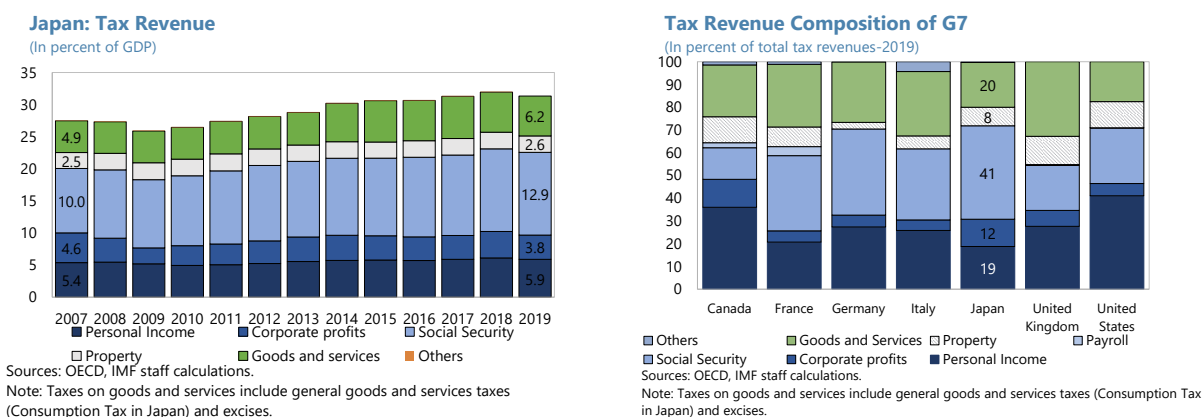
⁵ In 2019, NSFIE changed its name to the National Survey of Family Income, Consumption and Wealth with several changes to the questionnaire.

⁶ NSFIE is conducted by the Japanese Statistics Bureau every five years with a large sample size of 55,000 to 60,000 households. NSFIE is not a panel data. CSLC is conducted by the Ministry of Health, Labour and Welfare, with a sample size of about 40,000 households. KHPS is a panel survey with about 4,000 households. See Kitao and Yamada (2019) for a detailed comparison of these three surveys.

⁷ Hiki (2018) constructs a micro-simulation model that features households' wealth. However, households' income is not included in the model, as its focus is on redistributive effects of the inheritance tax.

⁸ This paper focuses on reforms of these three taxes, whose distributional effects are analyzed in the subsequent sections. Please see Lopez Murphy and Hisanaga (2022) for discussion on other taxes including the corporate income tax and the environmental taxes. Lopez Murphy and Hisanaga (2022) also presents estimated revenue gains from each reform measure.

Figure 1. Japan's Tax Revenue and Composition



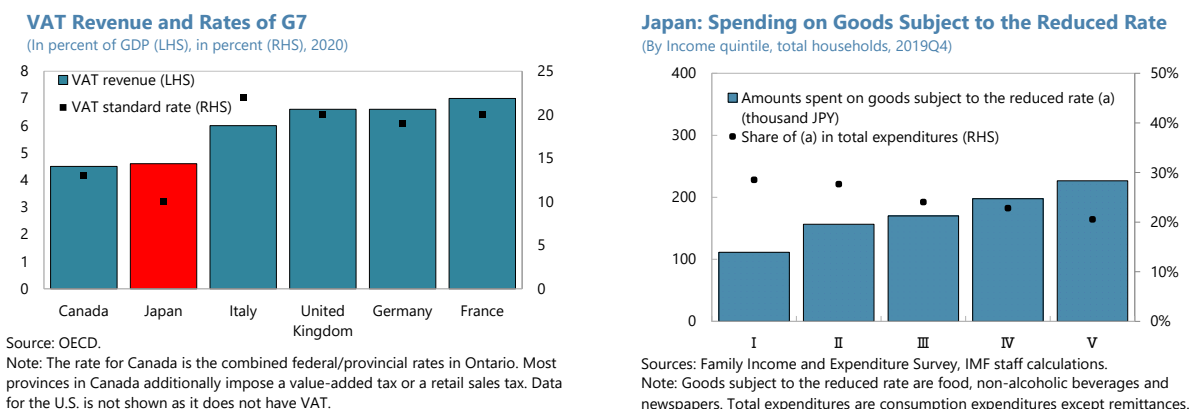
B. Consumption Tax

Japan has room to raise the consumption tax rate further. Japan's consumption tax was introduced in 1989 with a tax rate of 3 percent, followed by three rate increases: to 5 percent in April 1997, to 8 percent in April 2014, and to 10 percent in October 2019. Still, Japan's consumption tax revenues are in the lower range among the G7 countries (left chart in Figure 2). The consumption tax is an appealing source of revenues for Japan because (i) it serves as a stable source of revenue, (ii) its distortionary effects on labor, saving, and investment are limited compared to income taxes, and (iii) it distributes the tax burden equitably across generations (Keen et al., 2011). A model-based study by IMF staff demonstrated that the consumption tax rate needs to reach 15 percent by 2030 if the rising cost of aging is to be financed by the consumption tax (McGrattan et al., 2018).

To protect the vulnerable from the consumption tax rate increase, a reduced rate of 8 percent—applicable to consumption of food, non-alcoholic beverages, and newspapers—was introduced in October 2019. However, the reduced rate is a blunt instrument to protect low-income households. According to household survey data for the first quarter after introduction of the reduced rate (the fourth quarter of 2019), the share of spending on the goods subject to the reduced rate in total spending was the highest for the bottom income quintile. However, in terms of amounts, the top income quintile spent twice as much on those goods as the bottom income quintile did (right chart in Figure 2).⁹ This illustrates large revenue foregone that comes with the reduced rate. Looking ahead, the government could consider replacing the reduced rate with more targeted support to vulnerable households such as a refundable tax credit scheme (Morinobu, 2014). Merging the reduced rate with the standard rate could also improve efficiency through alleviating administration costs and distortion in firms' input choices and consumers' spending decisions (Mirrlees et al., 2011, Acosta-Ormaechea and Morozumi, 2019).

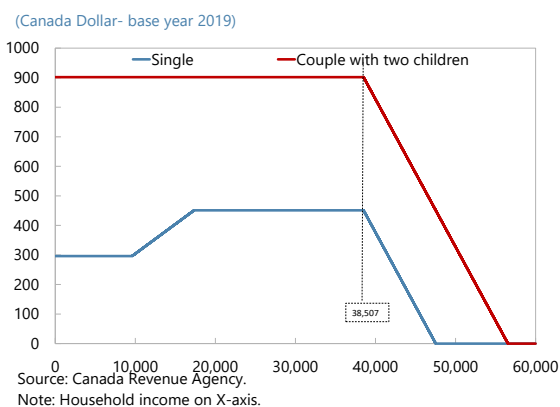
⁹ These findings are broadly consistent with experiences in other countries (OECD and KIPF, 2014).

Figure 2. Consumption Tax/Value-Added Tax



Japan could draw on its peers' experiences of targeted support schemes. For example, Canada introduced the GST (Goods and Services Tax)/HST (Harmonized Sales Tax) Credit in 1991. It is a quarterly cash transfer targeted at low- and modest-income households, which is intended to offset all or a part of the GST/HST they pay. The transfer amount is flat until a household's income reaches the income threshold of about 39 thousand CAD, except for single households for whom the amount increases in order to strengthen work incentives (Figure 3). This scheme is known for limited cases of fraud/misreporting because its design is simple, and its eligibility is assessed and screened by tax officers.

Figure 3. GST/HST Credit in Canada



C. Property Tax

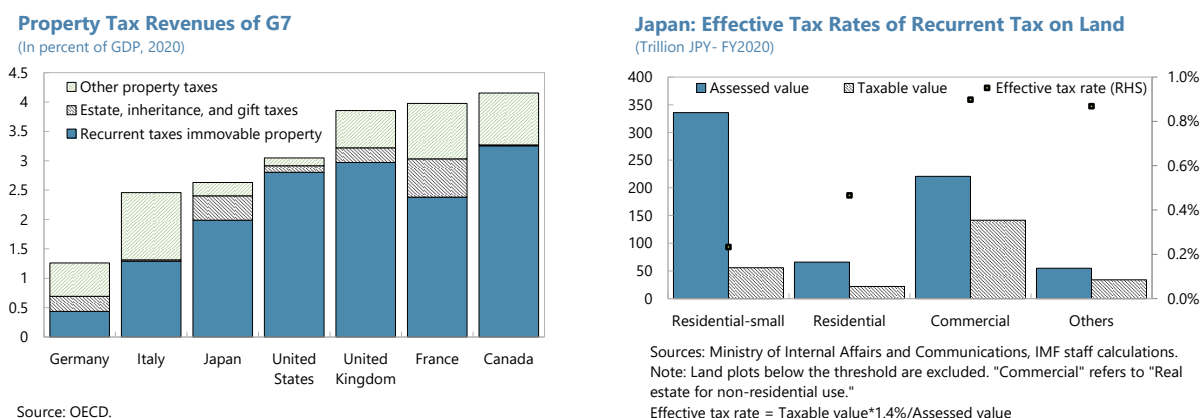
In most G7 countries, property tax revenues are mainly comprised of recurrent taxes on immovable property. In Japan, municipal governments levy a recurrent tax called the Fixed Asset Tax at a standard rate of 1.4 percent on immovable properties—land, buildings, and depreciable assets. Additionally, the City Planning Tax is imposed on buildings and land in urban areas. Revenues from these two taxes are about 2 percent of GDP in 2020, placing Japan in the third from the bottom among the G7 countries (left chart in Figure 4).

The effective tax rate of Japan's Fixed Asset Tax is low (Sato, 2013). Taxable values of residential land plots—especially land plots smaller than 200m²—are heavily discounted from assessed values (Figure 5). As a result, the effective tax rate of small residential land plots is about 0.2 percent (right chart in Figure 4), against the standard statutory rate of 1.4 percent.

This preferential treatment for residential land could be gradually eliminated for four reasons. First, a tax on immovable property is growth-friendly because its immovable nature limits distortionary effects on decisions to invest (Arnold, 2008). Second, the current low effective tax rate on residential land could be contributing to a rise in unoccupied houses in urban areas, as many homeowners do not want to relinquish the preferential status even if they do not live there.¹⁰ Third, raising the holding cost of properties could incentivize property owners to put their properties to productive uses (Norregaard, 2013). Fourth, from an equity point of view, the current size-based approach is not well-targeted at vulnerable households, because most of the urban high-value residential plots fall within the small-land threshold (200m²) (Honda, 2016).

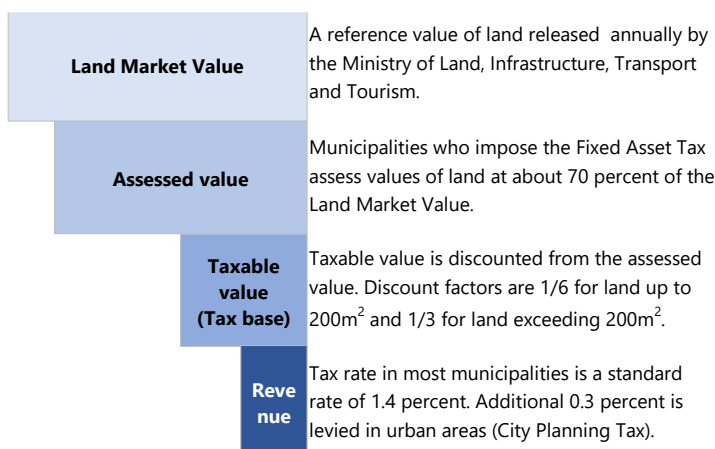
Other taxes in property taxation include inheritance and gift taxes. However, Japan's tax revenues from these taxes are already higher than the other G7 countries except France (left chart in Figure 4), pointing to a limited scope for additional revenues from these taxes.¹¹

Figure 4. Property Tax



¹⁰ A legislative change in 2016 partially addressed this issue by disallowing the discount from assessed values when unoccupied houses meet certain criteria such as a high risk of collapse.

¹¹ In an effort to increase the tax base of the inheritance tax and strengthen redistribution, the Government of Japan narrowed the basic deduction applicable to every inheritance and raised the tax rate for the top bracket from 50 to 55 percent in 2015.

Figure 5. Illustration of Residential Land Valuation in Japan

Sources: Ministry of Internal Affairs and Communications, IMF staff.

D. Personal Income Tax

Japan's personal income tax has a progressive tax rate schedule, with the top statutory rate of about 55 percent,¹² the highest among G7 countries. However, revenues from Japan's personal income tax are the lowest among G7 countries, chiefly due to generous deductions that erode the tax base (right chart in Figure 6). A deduction is in principle less progressive (or could be regressive) than a tax credit, as deductions tend to benefit high-income earners because of the high marginal tax rate applied to their taxable incomes (Abdel-Kader and De Mooij, 2020). In particular, there are two deductions that could be streamlined: the Employment Income Deduction (EID) and the Public Pension Income Deduction (PID).

The EID is intended to provide a work-related expenses tax allowance on an estimation basis.¹³ The EID amount starts at 0.55 million JPY (about 5 thousand USD), and increases along with employment income until the amount reaches the ceiling of 1.95 million JPY.¹⁴ A similar scheme exists in France and Germany among the G7 countries, but in a modest scale compared to Japan (red bars in the right chart in Figure 6). Lowering the EID ceiling to 1.5 million JPY—about three-fourths of the current level—would expand the tax base without hurting low-income households.

The PID grants retired pensioners more generous deductions than the EID. The PID starts at 1.1 million JPY (about 10 thousand USD) and rises along with pension income until it reaches the ceiling of 1.95 million JPY. About three-fourths of pension benefits is estimated to be exempt from taxable income largely due to the PID (Kashiwase et al., 2012). An expected rise in the number of pensioners amid the population aging will amplify the magnitude of the base-erosion caused by the PID (Yashio and Hachisuka, 2014). The PID applies

¹² On top of a 45 percent rate imposed by the national government (excluding the special tax for reconstruction from the 2011 Great Eastern Japan Earthquake), local governments impose an additional 10 percent as the Resident Tax. The national government's top tax rate was raised from 40 to 45 percent in 2015.

¹³ Another justification for the generous EID used in the past was that corporate employees had lower capacity to pay taxes relative to the self-employed (Dalsgaard and Kawagoe, 2000). However, this comparison has become less relevant of late, as employees now account for about 90 percent of the total labor force excluding the unemployed (FY2012 Annual Tax Reform Package adopted by the Cabinet on December 10, 2011).

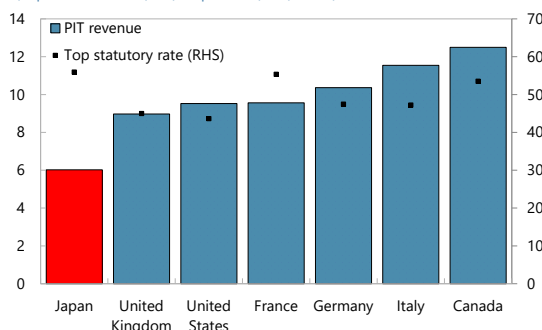
¹⁴ In 2018, the EID amount was reduced by 0.1 million JPY while expanding the Basic Exemption by the same amount and the ceiling was lowered from 2.2 to 1.95 million JPY except for households with children.

even to pensioners with large wealth, potentially exacerbating inter-generational inequality of wealth. One reform option to prevent this worsening base-erosion would be to set the PID on par with the post-reform EID (from 0.55 million JPY with a proposed ceiling of 1.5 million JPY).

Figure 6. Personal Income Tax

PIT Revenue and Rates of G7

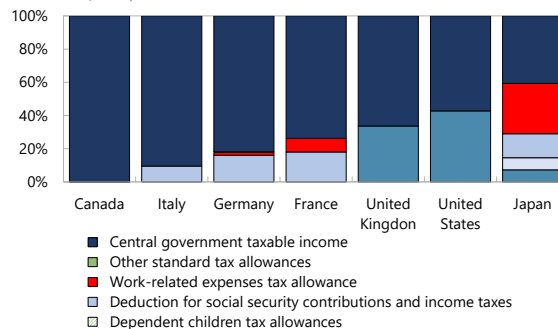
(In percent of GDP (LHS), in percent (RHS), 2020)



Source: OECD.

Share of Taxable Income in Gross Income of G7

(Percent of gross income, one-earner married couple with average earnings, 2 children, 2019)



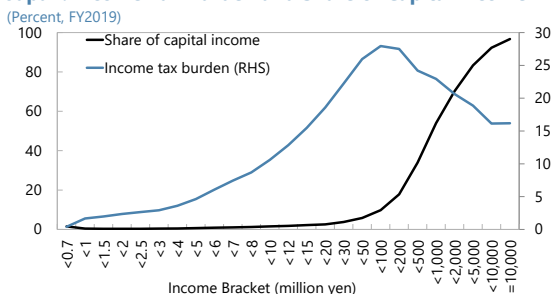
Sources: OECD 2020 "Taxing Wages," IMF staff calculations.

Another reform option in personal income taxes would be to raise the capital income tax rate. Under the principle of dual-income tax, capital gains, dividends of listed firms, and interest are subject to a flat rate of 20 percent in Japan, with a few exemptions intended to promote households' financial investments through the NISA (Nippon Individual Savings Account).¹⁵ In general, the share of capital income increases as households' income rise (left chart in Figure 7). Reflecting that the tax rate for capital income is lower than the top tax rate for labor income, the tax burden declines once an annual income exceeds about 100 million JPY (about 0.9 million USD) (Kumakura and Kojima, 2018). A cross-country comparison reveals that the marginal effective tax rate for various capital incomes is not high in Japan relative to its peers, especially for high-income earners (right chart in Figure 7). Concerns about tax evasion and avoidance could be alleviated by making use of the My Number scheme, the Automatic Exchange of Information with overseas jurisdictions, and a reporting requirement for those who have large wealth abroad.

¹⁵ The NISA scheme that exempts households' small-scale financial investments from income taxation was introduced when the capital income tax rate was raised from 10 to 20 percent in 2014.

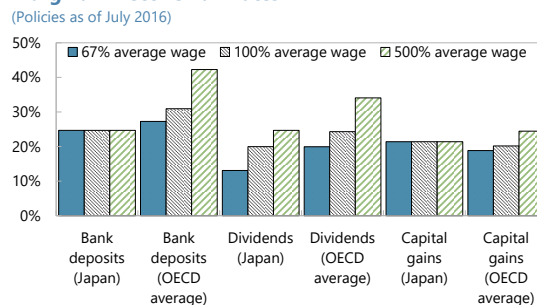
Figure 7. Capital Income Tax

Japan: Income Tax Burden and Share of Capital Income



Sources: National Tax Agency, Kumakura and Kojima (2018), IMF staff calculations.
 Note: Share of capital income=(interest receipt+dividends+capital gains)/total income. Income tax burden=(sum of taxes paid at the time of tax returns and taxes deducted at source)/total income.

Marginal Effective Tax Rates



Source: OECD "Taxation of Household Savings" (2018), IMF staff calculations.
 Note: See Annex A of OECD (2018) for methodology of METR. METR for dividends refer to the "100% distribution" scenario for purchase of corporate shares. Each country's actual inflation is used.

3. Micro-simulation Model

This section provides an overview of the micro-simulation model. It explains the household survey data used, how to calculate each household's income, wealth, and tax burden in the model, and the basic information about households' incomes and wealth. It then shows the average tax burden ratio in each income and wealth quantile under current policies. The section closes by enumerating reform options to be simulated and briefly discussing how the micro-simulation is performed. The detailed methodology underlying the calculation of income, wealth, tax, and social security premiums is provided in the Appendix.

A. Data

The KHPS (Keio Household Panel Survey) is an annual household survey that has been conducted by Keio University since 2004. The survey questionnaire covers broad topics such as composition of a household, employment and education status of each household member, and households' income and expenditure with detailed breakdowns.

Compared to the other two household surveys often used in micro-simulations, the KHPS is the only survey that compiles assessed values of land plots and buildings respondents own, which are key inputs to study the impact of property taxes. The KHPS is preferable to the CSLC because the latter lacks data about composition of households' expenditures.

We use 16th wave of the KHPS conducted in January 2019. Out of 2,572 individuals surveyed in the KHPS 16th wave, 2,378 individuals responded (the collection rate of 93 percent). After dropping 196 samples that we view unreliable, data for 2,186 individuals (2,186 households, because each respondent reports data of a household which he/she belongs to) are used in the model. See Appendix for details of the criteria used for data-cleaning.¹⁶

¹⁶ The Gini coefficient of equivalent disposable income in our dataset is 0.296. This is comparable to 0.288 which is reported by the Statistics Bureau of Japan based on the National Survey of Family Income, Consumption and Wealth for 2019, but lower than

B. Calculation of Income, Wealth, and Tax Burden

The income of a respondent, a respondent's spouse, and other household members are calculated separately. These incomes are summed up to obtain a household's gross income, and households divided into deciles based on their equivalent gross income—gross income divided by the square root of the number of household's members¹⁷. Also, to capture wealth distribution, households are divided into quintiles based on their equivalent net worth—real and financial assets less borrowings divided by the square root of the number of household's members.

Next, the tax codes and the social security system as of FY2021 are applied to each individual's income and a household's expenditure and wealth to estimate a theoretical amount of taxes and social security premiums for each household. Taxes and social security premiums considered in the model are:

- Personal Income Tax (PIT)
- Resident Tax (the income tax imposed by the prefectural and municipal governments)
- Consumption Tax
- Fixed-Asset Tax
- Pension, healthcare/long-term care, and employment insurance premiums

The amount of taxes and social security premiums are divided by gross income to obtain each household's tax burden ratio and an average tax burden ratio for each income decile and each wealth quintile.

C. Average Income, Wealth, and Age for Each Quintile

The two tables in Table 1 show mean values of equivalent gross income, real assets, financial assets, borrowings, equivalent net worth, and ages of households' heads for each income decile (denoted by I–X) and wealth quintile (denoted by i–v). A few observations can be made. First, on the left table, a gap in financial assets between low-income and high-income households is larger than that in real assets, suggesting that the distribution of financial assets is more skewed to the high-income households relative to real assets. Second, on the right table, households in the bottom wealth quintile have on average negative net worth due to large borrowings, but earn higher incomes than those in the middle three quintiles (ii–iv). This suggests a large heterogeneity among households in the bottom wealth quintile; while some are low-income households, others are high-income households with borrowings—for example, mortgages in the case of working-age households, or business loans in the case of the self-employed and owners of micro enterprises.

0.334 reported by the OECD based on the CSLC for 2018. See Tanabe and Suzuki (2013) on how different methodologies of these surveys contribute to differences in the Gini coefficient.

¹⁷ This adjustment enables us to measure households' incomes relative to the needs of those households. See the OECD's note (<https://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf>) for details.

Table 1. Mean Values of Income, Asset, Borrowing, and Age**By Income Decile**

(In ten thousands JPY except for Age of Household Head (years old))

Income Decile	Equivalent Gross Income	Real Asset	Gross Financial Asset	Borrowing	Equivalent Net Worth	Age of Household Head
I	129.2	532.6	548.4	90.0	694.7	64.0
II	205.6	624.8	908.3	210.9	958.9	63.4
III	250.3	1,054.1	750.2	248.6	997.7	60.3
IV	295.7	781.3	875.3	399.7	868.1	59.8
V	342.2	1,002.1	1,111.4	453.2	1,119.3	59.3
VI	391.1	1,278.3	1,119.8	629.0	1,239.2	56.1
VII	444.6	1,123.2	1,396.6	530.0	1,299.1	56.7
VIII	522.8	1,259.8	1,189.2	687.0	1,133.6	55.2
IX	640.7	1,284.3	1,612.2	571.1	1,463.8	56.6
X	1,071.5	1,237.9	2,071.4	1,349.4	1,450.3	55.8

Sources: KHPS, IMF staff calculations.

Note: Income deciles are based on a household's equivalent gross income. Gross financial asset is a sum of deposits and securities.

By Wealth Quintile

(In ten thousands JPY except for Age of Household Head (years old))

Wealth Quintile	Equivalent Gross Income	Real Asset	Gross Financial Asset	Borrowing	Equivalent Net Worth	Age of Household Head
i	463.0	387.0	221.1	1,789.1	-687.0	51.1
ii	317.5	117.5	136.9	171.3	52.3	58.0
iii	422.3	524.8	529.9	271.2	476.6	58.8
iv	441.2	1,093.5	1,260.6	230.2	1,352.1	61.1
v	501.1	2,966.3	3,643.7	118.6	4,422.2	64.6

Sources: KHPS, IMF staff calculations.

Note: Wealth quintiles are based on a household's equivalent net worth. Gross financial asset is a sum of deposits and securities.

Figure 8 shows average tax burden ratios by income deciles (left chart) and wealth quintiles (right chart). The left chart indicates that the current tax and social security system is overall progressive, with average tax burden ranging from 19 percent for the bottom income decile to 26 percent for the top decile. Looking at each component, the Personal Income Tax and the Resident Tax are progressive, while the consumption tax, the Fixed Asset Tax, and the healthcare insurance premium are regressive. The burden of the pension insurance premium is hump shaped. The burden of the pension insurance premium gets lighter for the top two deciles mainly due to the ceiling of the Employees' Pension Insurance premium, while the small burden for the bottom two deciles mainly reflects a large share of the retirees who do not pay premiums.

The right chart shows tax burden by wealth quintile. The tax burden for the bottom quintile is comparable to or higher than that in the middle three quintiles, reflecting high income of households in the bottom quintile as discussed above. Again, the small burden of the pension insurance premium for the top quintile likely reflects a large share of the retirees (note that the average age of household's head is high in the top quintile, as shown in Table 1).

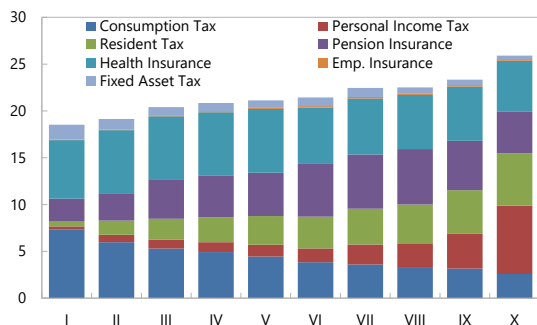
Figure 9 shows the average tax burden by each wealth quintile in each income decile. For example, the left-most blue bar represents the average tax burden of households who belong to both the bottom income decile and the bottom wealth quintile. Divergence of the tax burden across wealth quintiles is the most pronounced in the bottom income decile.¹⁸ In the other income deciles, divergence of the tax burden across wealth quintiles is small.

¹⁸ The tax burden for the top wealth quintile in the bottom income decile is high at about 30 percent, mainly because a few individuals with large financial assets reported large capital losses, which reduced their income and increased their tax burden ratio through a small denominator.

Figure 8. Tax Burden under the Current Policies

By Income Decile

(Tax and social security premiums over gross income, in percent)

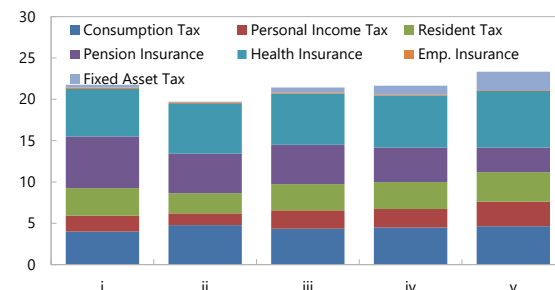


Sources: KHPS, IMF Staff calculations.

Note: Deciles are based on a household's equivalent gross income.

By Wealth Quintile

(Tax and social security premiums over gross income, in percent)

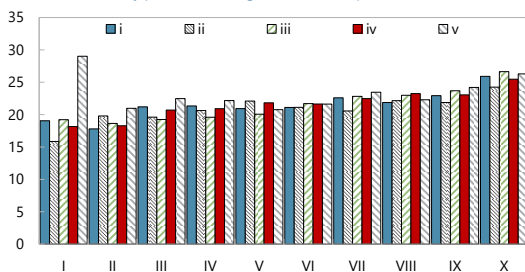


Sources: KHPS, IMF Staff calculations.

Note: Quintiles are based on equivalent net worth (financial and real assets net of borrowing).

Figure 9. Tax Burden by Income Decile and Wealth Quintile

(Tax and social security premiums over gross income, in percent)



Sources: KHPS, IMF Staff calculations.

Note: Horizontal axis (I~X) denotes an income decile (based on equivalent gross income). Each bar (i~v) represents an average tax burden ratio of each wealth quintile (based on equivalent net worth) in each income decile.

D. Micro-Simulations

To analyze distributional effect of each reform option, parameters and formulas are changed (tax rates, deduction ceilings, etc.) in the model accordingly, and the average tax burden for each quantile is recalculated (income decile and wealth quintile), and compared with those under the current policies. Table 2 lists reform options simulated, building on the discussion in Section 2. This simulation is static, assuming no behavioral response to policy changes.

Table 2. Tax Reform Options

Tax Handles	Current Policies	Options
Consumption Tax	The standard rate and reduced rate of the consumption tax are 10 percent and 8 percent, respectively. The reduced rate is applicable to foods, non-alcoholic beverage, and newspapers.	Unify the reduced rate with the standard rate.
Consumption Tax	The same as above.	Raise the rate (both standard and reduced) to 15 percent.
Consumption Tax credit	N/A	Introduce a Consumption Tax Credit to support low-income households.
Fixed Asset Tax	Fixed Asset Tax gives preferential treatment to residential land, by treating only a fraction of assessed values as taxable values.	Eliminate the preferential treatment for residential land.
Personal Income Tax/ Resident Tax	The Employment Income Deduction (EID), a work-related expenses tax allowance, starts at 0.55 million JPY, and increases along with an employment income until it reaches the ceiling of 1.95 million JPY.	Lower the ceiling of the EID from 1.95 to 1.5 million JPY. Resident tax is reformed accordingly.
Personal Income Tax/ Resident Tax	The Pension Income Deduction (PID), a deduction for pensioners, starts at 1.1 million JPY and rises along with a pension income until it reaches the ceiling of 1.95 million JPY.	Lower the floor and the ceiling of the PID from 1.1 to 0.55 million JPY and from 1.95 to 1.5 million JPY, respectively. Resident tax is reformed accordingly.
Capital Income Tax	Capital gains, dividends of listed firms, and interests are subject to a flat rate of 20 percent.	Raise the capital income tax rate from 20 to 25 percent.
All combined	N/A	Implement the above options simultaneously.

Sources: IMF staff.

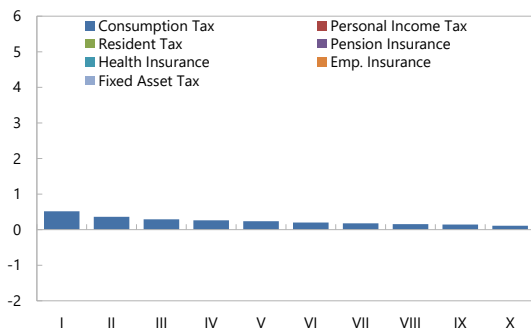
4. Simulation Results

A. Unify the Reduced Consumption Tax Rate with the Standard Rate

Elimination of the reduced consumption tax rate has a modestly regressive effect, raising the tax burden of the bottom income decile by about 0.5 percentage points, as shown in the left chart of Figure 10. Its impact is comparable across wealth quintiles in each income decile, as shown in the right chart of Figure 10. This is because expenditures on necessity goods that are subject to the reduced rate do not differ much between the wealthy and non-wealthy households.

Figure 10. Distributional Effects of Unifying the Reduced Consumption Tax Rate with the Standard Rate**By Income Decile**

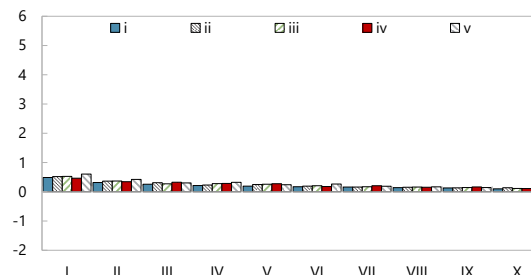
(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

By Income Decile and Wealth Quintile

(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

Note: Horizontal axis (I~X) denotes an income decile (based on equivalent gross income). Each bar (i~v) represents an average tax burden ratio of each wealth quintile (based on equivalent net worth) in each income decile.

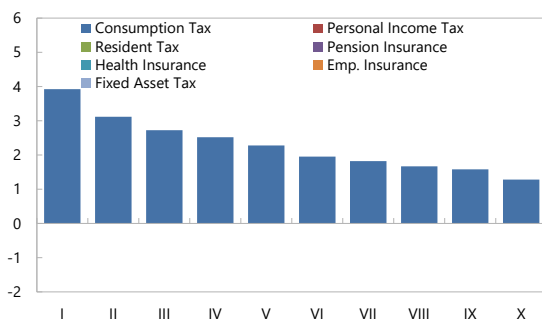
B. Raise the Consumption Tax Rate to 15 percent without the Reduced Rate

An increase in the consumption tax rate to 15 percent has a regressive impact. It raises the tax burden of the bottom income decile by about 4 percentage points, while the tax burden of the top income decile rises by about 1 percentage point (left chart of Figure 11).

In lower income deciles (I and II in particular), the rise in the tax burden is larger for wealthy households, as shown in the right chart of Figure 11. In contrast to the discussion on the elimination of the reduced rate, this reflects that wealthy households tend to consume more of non-necessity goods and services relative to non-wealthy households in the same income decile, possibly due to wealth effects on consumption.¹⁹

Figure 11. Distributional Effects of Consumption Tax Rate Increase to 15 Percent**By Income Decile**

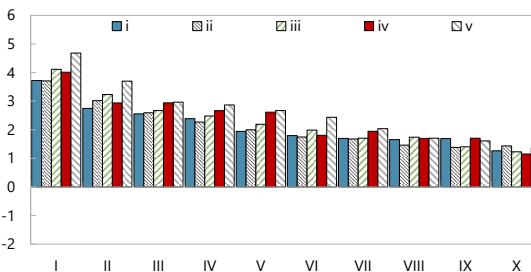
(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

By Income Decile and Wealth Quintile

(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

Note: Horizontal axis (I~X) denotes an income decile (based on equivalent gross income). Each bar (i~v) represents an average tax burden ratio of each wealth quintile (based on equivalent net worth) in each income decile.

¹⁹ See, for example, Takayama and Arita (1992) and Unayama and Komura (2014) for discussion of wealth effects on consumption in Japan.

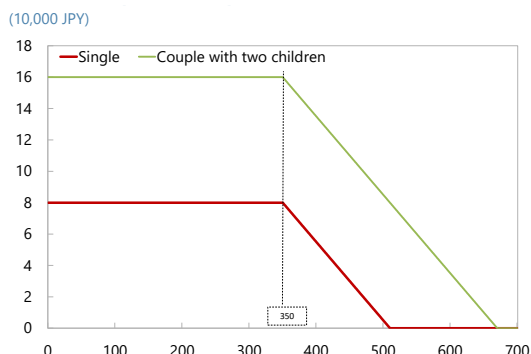
C. Introduce a Consumption Tax Credit

The next option is to introduce an equivalent of the GST Credit in Canada, which we name a Consumption Tax Credit. It is a quarterly cash transfer targeted at low- and modest-income households, intended to offset all or a part of the consumption tax they pay.²⁰

In this simulation, we set annual full benefits at 80 thousand JPY for single households and 100 thousand JPY for couples. These amounts roughly correspond to amounts of the consumption tax which average low- to modest-income households pay for purchase of food. Following the GST Credit scheme, we also set a top-up benefit of 30 thousand JPY for each child below the age of 19. The income threshold for the full benefit is set at 3.5 million JPY, which roughly corresponds to 67 percent of average before-tax gross earnings of a single person (OECD, 2020). Once a household's income surpasses the threshold, the benefit gradually declines at the rate of 5 percent (i.e., the benefit declines by 5 JPY when the income increases by 100 JPY). Figure 12 illustrates this scheme.²¹

Figure 13 documents the progressive impact of this option. The tax burden of the bottom income decile declines by about 6 percentage points, as shown in the left chart. As the right chart shows, the impact of the Consumption Tax Credit is broadly comparable between wealthy and non-wealthy households in each income decile.

Figure 12. Consumption Tax Credit (illustrative)



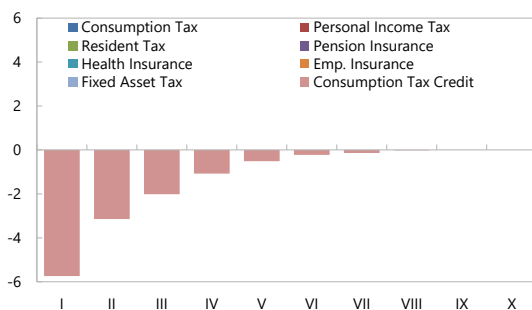
²⁰ While it is assumed here that implementation of the Consumption Tax Credit is feasible in Japan, administrative challenges could emerge. For example, Canada's GST Credit system builds on taxpayers' income information submitted through their annual tax returns, while most employees in Japan do not file annual tax returns. See also Lopez-Murphy and Hisanaga (2022).

²¹ Takayama and Shiraishi (2011b) reports simulation results of introducing a VAT Credit (similar to the Consumption Tax Credit in this paper) with various income thresholds (30 thousand JPY, 40 thousand JPY, and 50 thousand JPY).

Figure 13. Distributional Effects of a Consumption Tax Credit

By Income Decile

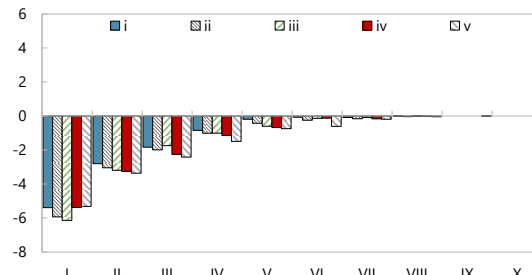
(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

By Income Decile and Wealth Quintile

(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

Note: Horizontal axis (I~X) denotes an income decile (based on equivalent gross income). Each bar (i~v) represents an average tax burden ratio of each wealth quintile (based on equivalent net worth) in each income decile.

D. Eliminate the Preferential Treatment for Residential Land in Fixed Asset Tax

The elimination of the preferential treatment for residential land in the Fixed Asset Tax raises the tax burden of the bottom income decile by about 1½ percentage points, while the change in tax burden is modest for the top income decile at about 0.3 percentage point (left chart in Figure 14).

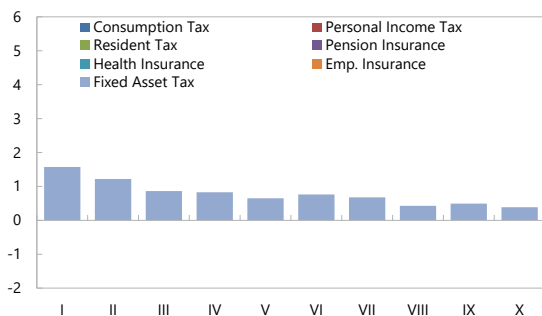
The right chart of Figure 14 illustrates a stark contrast in terms of the change in the tax burden between the wealthy and non-wealthy households in the same income decile, especially in the low-income deciles. The tax burden of the wealthiest households in the bottom income decile rises by about 8 percentage points. This large increase could warrant a mitigation measure to cushion the impact on low-income, but wealthy households. It is also noteworthy that, in the bottom income decile, those with least wealth face larger incremental tax burdens than those with the second least wealth, which is because the former often has both real estate assets—which are subject to Fixed Asset Tax—and borrowings.

One qualification about this result is that if land-owners' high tax burden is passed on to renters, the tax incidence of this reform falls on renters. In this case, the disparity of impacts between wealthy and non-wealthy households becomes less accentuated.

Figure 14. Distributional Effects of Fixed Asset Tax Reform

By Income Decile

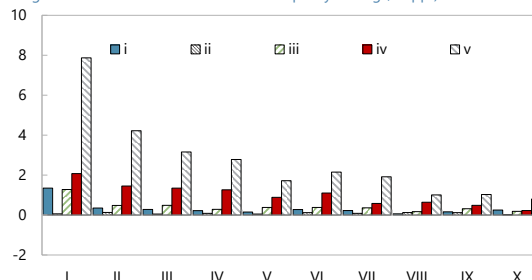
(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

By Income Decile and Wealth Quintile

(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

Note: Horizontal axis (I~X) denotes an income decile (based on equivalent gross income). Each bar (i~v) represents an average tax burden ratio of each wealth quintile (based on equivalent net worth) in each income decile.

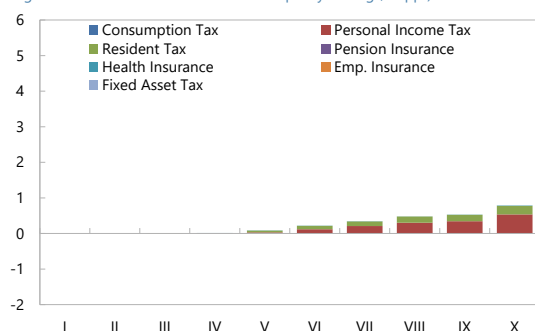
E. Streamline the Employment Income Deduction

Lowering the ceiling of the EID from 1.95 to 1.5 million JPY has a progressive effect, raising the tax burden of the top income decile by about 1 percentage point while leaving the low-income households unaffected, as shown in the left chart of Figure 15. The impact is broadly comparable between the wealthy and non-wealthy households in the same income decile, as shown in the right chart of Figure 15.

Figure 15. Distributional Effects of Streamlining the Employment Income Deduction

By Income Decile

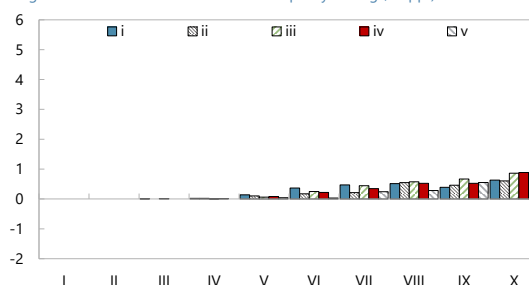
(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

By Income Decile and Wealth Quintile

(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

Note: Horizontal axis (I~X) denotes an income decile (based on equivalent gross income). Each bar (i~v) represents an average tax burden ratio of each wealth quintile (based on equivalent net worth) in each income decile.

F. Streamline the Pension Income Deduction

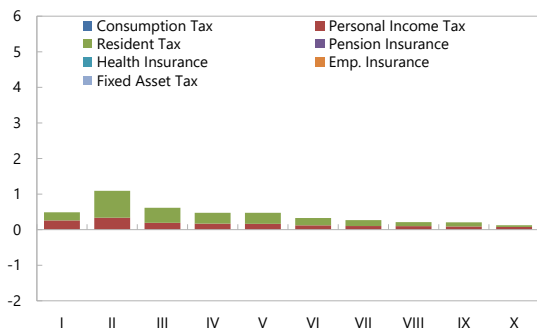
Lowering the PID's floor from 1.1 to 0.55 million JPY, and the ceiling from 1.95 to 1.5 million JPY raises the amount of the Personal Income Tax and the Resident Tax, notably for the second income decile (left chart of Figure 16).²² Those in the bottom income decile are less affected because the PID's lower floor (0.55 million JPY) still covers a majority of their low pension income. The impact is distinctively larger for wealthy households than for non-wealthy households in the same income decile (right chart of Figure 16). This is because the share of pensioners is higher in the top wealth quintile than in the bottom wealth quintile.

²² Technically, pensioners' larger taxable incomes as a result of the leaner PID could increase their healthcare insurance premiums, because calculation of the healthcare premiums are based on taxable incomes of the insured. However, our simulation results show no change in the healthcare insurance premiums because we assume that the healthcare insurance system would adjust so that pensioners do not face higher premiums due to a reduction in the PID.

Figure 16. Distributional Effects of Streamlining the Pension Income Deduction

By Income Decile

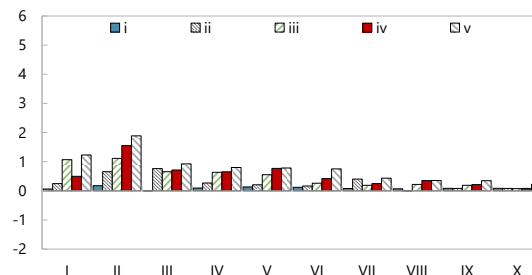
(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

By Income Decile and Wealth Quintile

(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

Note: Horizontal axis (I-X) denotes an income decile (based on equivalent gross income). Each bar (i-v) represents an average tax burden ratio of each wealth quintile (based on equivalent net worth) in each income decile.

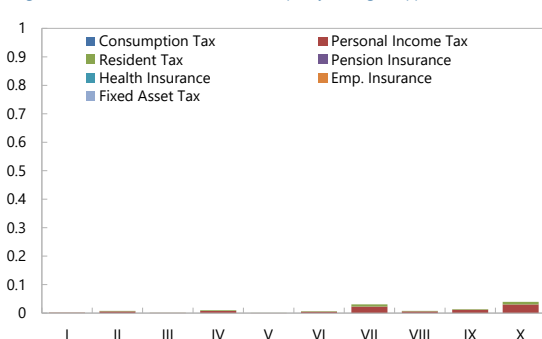
G. Raise the Capital Income Tax Rate to 25 percent

Increasing the capital income tax rate has little effect across income deciles and wealth quintiles, with a 0.04-percentage point increase even for the top income decile (left chart in Figure 17). This reflects a small share of capital incomes in gross income across households (Figure 18).²³ In the same income decile, those with large wealth tend to face higher tax burdens in comparison to those with little wealth, albeit by a small margin (right chart in Figure 17).

Figure 17. Distributional Effects of Capital Income Tax Rate Increase to 25 Percent

By Income Decile

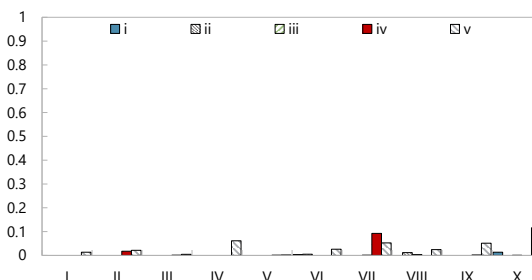
(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

By Income Decile and Wealth Quintile

(Change in tax burden relative to the current policy settings, in ppt)

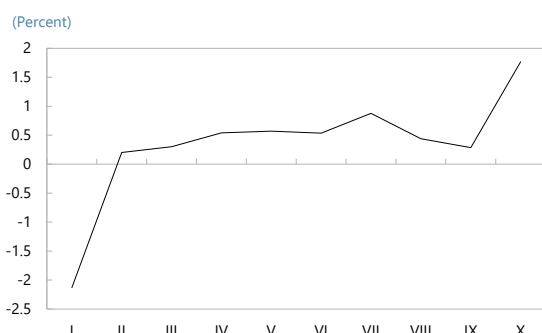


Sources: KHPS, IMF Staff calculations.

Note: Horizontal axis (I-X) denotes an income decile (based on equivalent gross income). Each bar (i-v) represents an average tax burden ratio of each wealth quintile (based on equivalent net worth) in each income decile.

²³ This could be due to under-reporting by respondents. However, the Japan National Tax Authorities' data, which is likely more accurate, also show a small share of capital incomes (left chart in Figure 7).

Figure 18. Share of Capital Income in Gross Income



Sources: KHPS, IMF Staff calculations.

Note: Average capital income for the bottom income decile is negative due to capital losses.

H. Implement Every Option

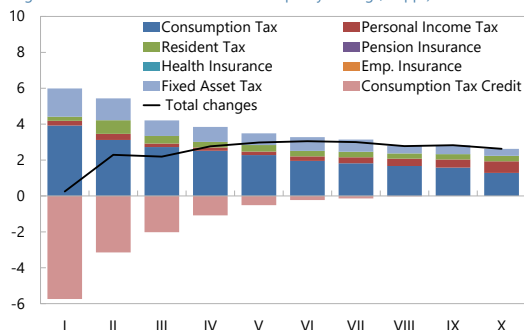
If every option is implemented, the tax burden for each decile increases by 0 to 4 percentage points (left chart in Figure 19). The Consumption Tax Credit is effective in suppressing the rise in the tax burden for the low-income households, leaving the tax burden of the bottom income decile broadly unchanged.

The change in the tax burden is significantly larger for those with wealth relative to those without wealth in the same income decile, especially for low- to modest-income deciles (right chart of Figure 19). This heterogeneous effect across the wealth distribution largely reflects uneven impacts of the consumption tax rate increase and the Fixed Asset Tax reform.

Figure 19. Distributional Effects of Implementing Every Option

By Income Decile

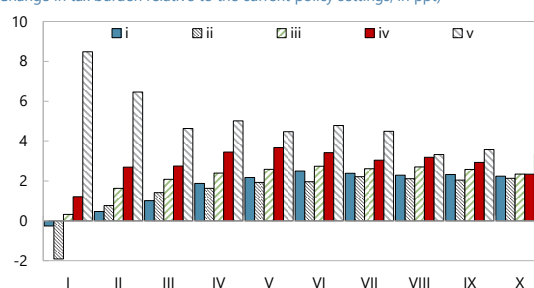
(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

By Income Decile and Wealth Quintile

(Change in tax burden relative to the current policy settings, in ppt)



Sources: KHPS, IMF Staff calculations.

Note: Horizontal axis (I-X) denotes an income decile (based on equivalent gross income). Each bar (i-v) represents an average tax burden ratio of each wealth quintile (based on equivalent net worth) in each income decile.

I. Change in Gini Coefficients

Lastly, we calculate changes in Gini coefficients after implementation of each option. The results are summarized in Table 3. Column (A) shows Gini coefficients based on equivalent disposable income defined as equivalent gross income less tax and social security liabilities (see Appendix D). Column (B) shows Gini coefficients based on adjusted equivalent disposable income which takes account of consumption tax payments and receipt of the Consumption Tax Credit, with an aim to measure distributional effects of consumption tax

reforms. Unification of the reduced consumption tax rate with the standard rate, the consumption tax rate increase, elimination of the preferential treatment for residential land in the Fixed Asset Tax, and streamlining of the PID increase Gini coefficients, indicating their regressive effects. However, such effects are offset by introduction of the Consumption Tax Credit, lowering the ceiling of Employment Income Deduction, and a rise in the capital income tax rate, resulting in little change in Gini coefficients after implementation of every option.

Table 3. Changes in Gini Coefficients

	Equivalent disposable income (A)	Adjusted equivalent disposable income (B)	
Gini coefficient before reforms	0.296	0.303	
Unify the reduced consumption tax rate with the standard rate	-	0.001	
Raise the consumption tax rate (both standard and reduced) to 15 percent	-	0.005	
Introduce a Consumption Tax Credit	-	-0.006	Changes in Gini coefficient after implementation of each option
Eliminate the preferential treatment for residential land in Fixed Asset Tax	0.002	0.002	
Lower the ceiling of the Employment Income Deduction in personal income taxes	-0.002	-0.002	
Lower the floor and the ceiling of the Pension Income Deduction in personal income taxes	0.001	0.001	
Raise the capital income tax rate from 20 to 25 percent	-0.000	-0.000	
Gini coefficient after implementation of every option	0.297	0.302	

Sources: KHPS, IMF staff calculations.

Note: Equivalent disposable income is obtained by subtracting tax and social security liabilities (sum of the Personal Income Tax, the Resident Tax, the Fixed Asset Tax, and the social security premiums) from equivalent gross income. Adjusted equivalent disposable income adds consumption tax (net of the Consumption Tax credit) to tax liabilities, with an aim to measure distributional effects of consumption tax reforms.

5. Conclusions

This paper first explored Japan's current tax system to identify options for revenue mobilization that could be considered in the post-pandemic fiscal consolidation. On the consumption tax, there is room to raise the rate further. The reduced consumption tax rate could be eliminated, and instead a targeted support scheme could be introduced. On property taxes, the preferential treatment for residential land embedded in the Fixed Asset Tax could be gradually eliminated. For personal income taxes, the relatively narrow tax base could be expanded through streamlining the pension and employment income deductions. The capital income tax rate could be raised.

Next, this paper conducted a micro-simulation to study distributional effects of these reform options, in view of both households' income and wealth. Simulation results showed that the tax burden of each income decile increases by 0 to 4 percentage points if every option is implemented. Notable findings include that a consumption tax rate increase and strengthened property taxation weigh heavily on low-income households with large wealth

relative to households with comparable income but little wealth, and that introduction of the Consumption Tax Credit is effective in containing a rise in the tax burden of low-income households.

This versatile model would allow further policy simulations drawing on the findings of this paper. For example, distributional effects of various targeted support schemes—such as an earned income tax credit that assists working-age households with in-work incentives, or customized support to low-income households with large wealth who would face a sharp increase in the tax burden by strengthened property taxation—could be studied and compared. One could delve into inter-generational disparities by analyzing impacts of tax reforms for the working-age households and the retirees separately. Also, while our study did not find large distributional effects of stronger capital income taxation, this result could be verified by using theoretical capital incomes instead of reported capital incomes.²⁴ One limitation of this paper is that we employ a static, arithmetic micro-simulation model which does not consider behavioral responses to policy changes. Another avenue for future research is to take advantage of the panel structure of the KHPS and investigate households' behavioral responses to past tax policy changes in an effort to lay a foundation for a dynamic micro-simulation model.

²⁴ Matsumoto et al. (2020) discuss an issue of misreporting of dividend and interest incomes in NSFIE, and estimates theoretical dividend and interest incomes using data of households' financial assets available in NSFIE and the expected rate of return for each financial instrument.

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Appendix. Calculation of Income, Wealth, Tax and Social Security Premiums

In this addendum, we present the methodology employed in the calculation of income, wealth, and tax and social security premiums, which broadly follows Kawade (2018) and Doi (2017).

A. Income

The KHPS 2019 asks amounts of following 11 income categories²⁵ in 2018 for a respondent, his/her spouse, and aggregates of other family members:

- i. Annual employment income
- ii. Self-employment, business, home-work income
- iii. Rent income
- iv. Interest and dividends
- v. Remittances and gifts
- vi. Public pension
- vii. Corporate and personal pensions
- viii. Unemployment benefits and child-care leave benefits
- ix. Child allowances and childcare allowances (household's total amounts only, without breakdown between household members)
- x. Welfare benefits (household's total amounts only, without breakdown between household members)
- xi. Other income

Annual employment incomes of a respondent and his/her spouse are divided into bonuses and monthly salaries, using information about bonuses which the KHPS asks separately. Gross incomes of a respondent and his/her spouse are obtained by adding up i~xi for each.²⁶ As for incomes of other family members which are available only in aggregates, we obtain each member's income by dividing i and ii by an estimated number of members who are currently at work, and vi and vii by an estimated number of pensioners.

A household's gross income is obtained by adding up incomes of a respondent, his/her spouse, and other family members, and capital gains of a household.²⁷

A sample is dropped if one of the following conditions is met, out of concerns about reliability of responses:

- A household's gross income is below 200 thousand JPY (about 1.8 thousand USD)
- A household's total expenditure is more than double of a household's gross income²⁸
- A household's total expenditures is zero

²⁵ The KHPS asks the amount of severance pay. However, the KHPS does not ask duration of employment which is a key input to calculation of the tax amount for severance pay. Therefore, severance pay is not considered in our model, following Kawade (2018).

²⁶ Since only household's total amount is available for ix and x, we treat those incomes as a part of a household's head's income.

²⁷ The KHPS 2019 asks an amount of capital gains of a household. Capital gains are subsumed in gross income in order to consider the distributional effect of the capital gains tax. Doi (2017) also includes capital gains in income.

²⁸ Since we multiply a household's expenditure in January by 12 to obtain a household's total annual expenditure, an annual expenditure could become unrealistically large if the expenditure in January includes one-off or seasonal purchases. Therefore, we deleted samples whose calculated expenditure is extremely large relative to income.

- A respondent's market income, defined as a sum of i, ii, iii, iv, v, and xi, is below his/her bonus
- A spouse's market income is below his/her bonus

As a result of this data cleaning, 192 out of 2,370 samples are dropped.

B. Wealth

The KHPS asks market values of respondent's houses and land plots—i.e., how much a respondent thinks his/her houses and land plots are worth. The value of household's real assets is calculated as a sum of these two amounts.²⁹ Real assets here do not include secondary houses or those for investment purposes, as the KHPS only asks values of land and housing of respondents' primary residences³⁰. The KHPS also asks values of households' financial assets, namely deposits and securities,³¹ and borrowings. We obtain the value of household's net worth by subtracting borrowings from real and financial assets.

C. Tax and Social Security Premiums

C-1. Personal Income Tax and Resident Tax

Among the incomes listed in A, we treat i–iv, vi, vii, and xi as taxable, and the rest (v, viii, ix, and x) as non-taxable incomes. We follow the steps below to estimate amounts of the PIT and the Resident Tax for each household member:

- We calculate the amount of the EID, and subtract the amount from i (Annual employment income). We also calculate the amount of the PID, and subtract the amount from the sum of vi (Public pension) and vii (Corporate and personal pensions).
- We calculate the amounts of the Social Insurance Premium Deductions and the following personal exemptions,³² and subtract those amounts from a total of a taxable income:
 - The Basic Exemption
 - The Exemption for Dependents
 - The Spousal Exemption and Special Spousal Exemption
- We calculate the amount of the PIT by applying the stipulated tax rate schedule to taxable income after the deductions and exemptions. Where applicable, we subtract the Mortgage Tax Credit and the Dividend Tax Credit from the PIT amount.³³

²⁹ Some respondents report market values that are lower than appraised values for the Fixed Asset Tax, which is not very likely (see Figure 5), or do not report market values while they report appraised values. In these cases, we use appraised values instead of market values in calculation of real asset values.

³⁰ According to the National Survey of Family Income, Consumption and Wealth in 2019, values of land and housing of primary residences account for about 83 percent of total real asset values.

³¹ In the questionnaire, the KHPS defines securities as "Shares (market value), bonds (par value) and stock investment trusts (market value), corporate and public bond investment trusts (market value), loans in trust and money in trust (par value), etc."

³² Due to lack of data, we did not consider the other deductions (Deduction for Life Insurance Premiums, etc.) and exemptions (Exemption for Widows, etc.).

³³ On dividends, taxpayers have an option to include dividends from listed firms in their comprehensive incomes instead of paying capital income taxes separately at the rate of 20 percent. Since the latter is subject to the progressive tax schedule, low-income individuals can reduce tax liabilities by choosing this option. We assume that iv (Interests and dividends) are all dividend incomes of listed firms, and that individuals choose to subsume dividend incomes in their comprehensive incomes if their taxable income is below 6.95 million JPY, as they will face a marginal tax rate higher than 20 percent on beyond this threshold.

- We calculate the amount of the Resident Tax by applying the standard rate of 10 percent to taxable income after the deductions and the exemptions, and the standard per-capita levy of 5 thousand JPY. We apply a partial or full exemption of the tax amount if his/her income is below a certain income threshold.

There are two qualifications about the calculation of the Resident Tax. First, we assume that all local governments impose the standard rate which is set by the national government, though several local governments do impose tax rates different from the standard rate. Second, we calculate the Resident Tax based on annual income for 2018, even though that of the previous year (2017) is used in the actual system.

C-2. Consumption Tax

The KHPS asks amounts households spent on following goods and services in January 2019.

- a. Food
- b. Eating out and school lunches
- c. Rent, land rent, home repairs
- d. Multi-family housing common charges
- e. Electricity, gas, water
- f. Furniture, electric appliances, household supplies
- g. Digital consumer electronics purchases
- h. Clothing and shoes
- i. Healthcare
- j. Transportation
- k. Communications
- l. Internet communications
- m. Education
- n. Culture and amusement
- o. Entertaining and pocket money
- p. Remittances
- q. Other expenditures

We multiply each expenditure by 12 to obtain an annualized amount. We assume that c (Rent, land rent, home repairs), d (Multi-family housing common charges), p (Remittances), a half of i (Healthcare) and a half of m (Education)³⁴ are non-taxable, and that a (Food) is subject to the reduced rate of 8 percent. We apply the standard consumption tax rate of 10 percent to the rest of items.

C-3. Fixed Asset Tax

The KHPS asks appraised values of houses and land plots, which correspond to assessed values in Figure 5. We use responses to this question as inputs to the calculation of the Fixed Asset Tax. For land plots, we first discount appraised values by one-sixth for plots up to 200m², and one-third for plots exceeding 200m². Then we

³⁴ We assume that a half of healthcare- and education-related expenditures are tax-exempt, because they could include both non-taxable goods and services (e.g., covered medical services and school tuitions) and taxable goods and services (e.g., over-the-counter drugs and tuitions for private after-school classes).

apply the standard tax rate of 1.4 percent to obtain the tax amount. For houses, we first discount appraisal values by half if houses are recently built.³⁵ Next, we apply again the tax rate of 1.4 percent to obtain a tax amount. We sum up tax amounts of land plots and houses to arrive at the amount of the Fixed Asset Tax for each household.

While the Urban Planning Tax is imposed on real estate in urban areas, we do not calculate this tax because we do not have information to determine whether each real estate is located in an urban area or not.

C-4. Capital Gains Tax

A flat tax rate of 20 percent is applied to capital gains (15 percent as the Personal Income Tax, 5 percent as the Resident Tax).

C-5. Social Security Premiums

Social security premiums are the sum of the pension premium, the healthcare and long-term care premiums, and the employment insurance premium. Calculation of these premiums varies based on whether an individual is self-employed, an employee of firms, or a dependent spouse of an employee. As for pension, Table A.1 illustrates different treatments of these three types of individuals in the Japan's public pension system. A non-regular contract worker is insured as an employee (the second category) under the Employees' Pension Insurance (EPI) if he/she meets the eligibility criteria as described in the table. Dependent spouses of the eligible employees are exempt from pension premium payments. The rest is covered by the National Pension (NP). For those covered by the NP, we apply a partial or full exemption of premiums if their income is below the threshold.

Table A.1. Public Pension System in Japan

Categories	Program Names	Criteria (non-exhaustive)	Contributions	Benefits
1 Self-employed and their dependents, etc.	National Pension	Everyone except those who are insured under either Categories 2 or 3.	Fixed amount of 16,340 JPY per month.	Basic pension of 779,300 JPY per year (full benefit).
2 Employees	Employees' Pension Insurance	Those who work full-time (over 30 hours) as employees of a firm. Those who work as part-time employees are eligible if they work over 20 hours and earn more than 88 thousand JPY per month (roughly equivalent to 1.06 million JPY per year), and their employers employ 500 people or more.	Linked to their income (18.3% of monthly wage and bonus); A half of the contributions is paid by their employers.	The basic pension and earnings-linked benefits.
3 Employees' dependent spouses	Employees' Pension Insurance	Employees' dependent spouses whose gross incomes are below 1.3 million JPY.	No contribution.	The same as for Category 1.

Sources: Government of Japan, IMF staff compilations.
Note: As of March 2019.

³⁵ The appraisal values are discounted by half if houses were built within 5 years, or apartments/condominiums were built within 7 years. In the Tokyo Metropolitan Area, discounts are applicable only to resident buildings that are accredited as durable quality housing for the first five years of residence (seven years in the case of condominiums). However, data on duration of residence and whether residential buildings are accredited or not are unavailable in the KHPS survey. Therefore, we use the age of buildings as a proxy of duration of residence, and assume that houses (both detached and semi-detached) and steel/concrete condominiums meet accreditation criteria.

Japan's healthcare system similarly distinguishes these three types of individuals, but its insurance schemes are highly fragmented,³⁶ making it difficult to infer a specific insurer of each individual from the data. Therefore, we assume that all eligible employees are insured by the Japanese Health Insurance Association (JHIA) which mainly covers employees of small and medium-sized enterprises, and that the self-employed and pensioners are insured by the National Health Insurance (NHI).³⁷ Dependents of the eligible employees are exempt from healthcare premium payments. For those covered by the NHI, we apply a partial or full exemption of premiums if their income is below the threshold. All individuals aged 75 years and above move to the Latter-Stage Elderly Healthcare System, and pay a premium as prescribed by each prefecture.³⁸ We use annual income in 2018 for calculation of the NHI premiums in 2018, even though income of the previous year is used for calculation under the actual system.

We assume that those eligible for the EPI are covered by the Employment Insurance. Employment insurance premiums are 0.3 percent of his or her employment income, per the rate schedule for general businesses in FY2021.

As for household members other than respondents and their spouses, detailed information about their earnings and employment status (a size of a firm they work for, etc.) is not available in the KHPS. Hence, it is difficult to identify which insurance program covers each member for the pension and the healthcare insurance. Therefore, when calculating social security premiums of other household members, we assume that full-time employees are covered by the EPI, the JHIA, and the Employment Insurance, while the rest are dependent on a household's head.

The long-term care system in Japan covers those aged 65 years and above as the No. 1 insured persons, and those aged between 40 and 65 as the No. 2 insured persons. Among the No. 2 insured persons, dependent spouses of eligible employees are exempt from premium payments. We calculate and add the long-term care premiums accordingly.

D. Tax Burden Ratio and Disposable Income

First, we divide each amount of the Personal Income Tax, Resident Tax, consumption tax, Fixed Asset Tax, healthcare premium (including long-term care premium), pension premium, and employment insurance premium by a household's gross income, in order to obtain the tax burden ratio for each tax item. Next, we add up the tax burden ratios for each tax item to arrive at the total tax burden ratio of a household.

We present below descriptive statistics of the tax burden ratios (mean, median, 25/75th percentiles), with a breakdown of six age groups. The average tax burden ratio of the elderly (over 65 years old) is lower than that of the working-age households, with the average tax burden ratio of those between 45 and 54 years old being the highest at 24.2 percent.

³⁶ See Nozaki et al. (2014) for an overview of Japan's healthcare and long-term care systems.

³⁷ The premium rate schedules of the JHIA and the NHI differ by prefectures and municipalities, respectively. In the model, we use the rate schedule of the Tokyo Metropolitan Area for the JHIA, and that of Nakano-Ward in Tokyo for the NHI.

³⁸ We use the rate schedule of Tokyo Metropolitan Area in the model.

Table A.2. Tax Burden Ratio by Age Groups (in percent)

Age of Household Head	25 percentile	Median	75 percentile	Mean
~34	18.8	21.8	24.3	21.8
35~44	19.5	22.3	25.2	22.4
45~54	21.4	23.9	26.6	24.2
55~64	19.6	23.2	26.2	22.9
65~74	14.9	18.3	22.0	18.7
75~	14.2	18.3	22.0	18.8
Total	17.7	21.7	25.2	21.6

Sources: KHPS, IMF staff calculations.

Lastly, we calculate household's disposable income by subtracting the sum of the Personal Income Tax, the Resident Tax, the Fixed Asset Tax, and the social security premiums from household's gross income.



PUBLICATIONS

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