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Personal Income Tax Exemption and Labor Supply: A Preliminary Study*

Riatu Mariatul Qibthiyyah[1,★*]

Abstract
During 2013–2016, there are policy changes on Personal Income Tax (PIT) exemption, stated in PMK No. 162/PMK.011/2012, PMK No. 122/PMK.010/2015, and PMK No. 101/PMK.010/2016. Nonetheless, there is no empirical study yet, to my knowledge, that evaluates this policy. An increase of PIT exemptions can be viewed from distributive aspect, of how the incidence (benefit) distributed across taxpayers' disposable income, as well as on the efficiency aspect, whether it has or has not affected labor supply. This study explored on the efficiency aspect. The agents – taxpayers as workers – now may experience an increase in net income due to a more generous exemption, and whether the policy of PIT exemption may influence taxpayers' labor supply is more of an empirical question. I use SAKERNAS data from 2010–2018 and estimation model is limited to only consider paid (labor) employment rather than self-employment. On paid (labor) employment, firms function as withholding that can extract some of PIT from employee's salary, and thus paid (labor) employee may then file PIT return. My preliminary result shows that effect of PIT exemption policy change is heterogenous across group of population. PIT exemption expansion increases labor supply of paid (labor) employees of the previously lowest income bracket of PIT. However, although to an extent tax saving may be higher for middle to high income individuals, taxpayers referring to individuals in income bracket of 15% rate tend to be not affected by the policy of PIT exemption.

JEL Classification: H24; J21

Keywords
personal income tax — tax exemption — labor supply

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1. Introduction

During 2013-2016, there are policy changes on Personal Income Tax exemption, stated in PMK No. 162/PMK.011/2012, PMK No. 122/PMK.010/2015, and PMK No. 101/PMK.010/2016. The personal income tax (PIT) exemption consisted of exemption on basic income, exemption on dependents up to three dependents, and exemption on marriage status. Over the period of 2013–2016, there is an increase in these three types of exemption which lead to a relatively large expansion of PIT exemption. Nonetheless, there is no empirical study yet that evaluates this policy.

There are extensive studies evaluating effect of personal income tax reform on labor market, mostly due to changes in marginal tax rate (Feldstein, 1995; Eissa & Liebman, 1996; Eissa & Hoynes, 2004). There are also studies focused on the effect of specific type of PIT policy and or its alternative scheme on specific type labor supply, i.e women labor supply and or married couple labor supply. Studies specifically evaluating the effect of certain type of tax policy change, as in the case PIT exemption, are not frequent. It is plausibly due to simultaneous changes of other attributes of tax structure and or tax administration policies occurred in the case of tax reform.[1] For example, study on changes of exemption policy to credit system related to spousal tax exemption (Crossley & Jeon, 2007). Other study assesses policy change on PIT from family-based tax to individual tax and use Labor Force Survey (LFS) on evaluating response of labor supply (Kalíšková, 2014). Previous studies are on scheme of PIT exemption, impact of PIT credit expansion, as well as on policy change in PIT administration.

Certain tax policy changes are part of an overall tax reform. There are various attributes on tax structure and or on tax administration that have changed. There may be difficulties in assessing the impact on specific attribute of the tax reform as it needs to disentangle with other intervention. In the case of Indonesia, changes of PIT policy have predominantly limited on exemption policy, and thus it is possible to treat the condition as quasi experimental.

An increase of PIT exemptions can be viewed from distributive aspect, of how the incidence of the benefit distributed across taxpayers' in terms of an increase in disposable income. The policy can also have an efficiency effect as whether it has or has not affected labor supply. This study coverage is on the efficiency aspect. The agents, for example taxpayers as workers, have now experienced an increase in net income due to a more generous exemption. In this context, I would like to address whether the policy of PIT exemption may influence taxpayers' labor supply. Following period in which PIT exemption have changed, this study aiming to assess suggestive impact of PIT exemption expansion as well as on specific type of PIT exemption policy on labor supply related to labor force participation

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[1] There are also some studies identified the effect of tax reform on labor supply not only at the national level but also at the level of sub-national (Whittington, 1993), two countries aggregated comparison (Kalíšková, 2014), other than specific country policy effect (Eissa & Hoynes, 2004).

(LFP) and work hours.

In sum, this paper consists of introduction, overview on PIT structures and specifically on policy change of PIT exemption, brief description on the methodology and estimation specification, explanation on the data that are extracted from SAKERNAS survey and other sources, and analysis on the estimation results prior to conclusion.

2. Overview on Indonesia Personal Income Taxes (PIT)

The structure of Personal Income Taxes (PIT) marginal tax rate to an extent reflect distributive policies including from the adoption of exemption policies. PIT adopt a progressive graduated MTR in which tax rate is higher for individuals in higher annual income bracket. Table 1 shows taxable income bracket and its associated tax rate based on Law 36 2008. The tax is considered to be progressive not only due to tax rate as it can also influenced by other policy related to tax structure. Exemption policy which are intended for low income individuals is also viewed has made PIT a progressive tax. In this case, changes on PIT exemptions policy has increased threshold of non-taxable income from baseline of exemption that is stated in Law 36 2008 as shown in Table 2.

Depending on amount of income that can be exempted, higher non-taxable income for any given level of annual income may certainly reduce annual taxable income. There may be tax saving related to this increase of exemptions. The tax saving is higher for taxpayers in higher income bracket. However, as exemptions are fixed lumpsum amount of IDR, the tax saving may not be large in proportion to taxpayer's income. To an extent, large increase on PIT exemption may even lead to a lower income bracket for the taxpayers. For low income individuals, there may also be condition in which their annual income currently lower than the threshold of non-taxable income, and thus they are not required to file personal income tax return.

The issue of exploring the effect of exemption policy on labor supply, is whether this policy is the only intervention or there are other policy changes related to personal income tax during the period. For example, in the case of Law 36 2008, it is not only exemption policies that have changed, but also on filing scheme and associated treatment of personal income tax rate for married couple.[2]

2.1 PIT Exemptions Expansion After Law 36 2008

Table 3 shows policy changes on Indonesia PIT exemptions. During year 2013–2016, amount of PIT exemption has more than double. The sequential changes in 2013, 2016, and 2017 have created a unique policy time window differentiating prior and after that period of changes. The period between first change of PIT exemption after Law 36 2008 enacted to second expansion of PIT exemption is in three-year period, however it is only one year between second to third changes of PIT exemption. The latest PIT basic income exemption as stated in PMK No. 101/PMK.010/2016 is 2.4 times of basic income exemption as stated in Law 36 2008.

As shown in Table 3, PIT exemption expansion refers to overall type of exemption. By type of PIT exemption, there are non-taxable (basic) income, exemption on marriage status, and exemption of having dependents up to 3 dependents. Therefore, exempted income is higher for married in comparison to single taxpayers, and to taxpayers who have and can claim for dependents than taxpayers with no dependents. Dependents that can be claimed are not only children but also whether there are parents and or in laws that have no income and lived with the respective individuals who also taxpayers. There is no age limitation on children that can be claimed by the taxpayers as long as the children or parents (in laws) or grandchildren or grandparents have no income or are not registered taxpayers.

2.2 PIT Exemptions Policy and Labor Supply

The amount of PIT exemptions that have increased over the years is likely to have effect on labor supply. Individuals may experience an increase in net income due to higher exemptions. Individuals may increase its labor supply assuming that substitution effect dominates income effect, and vice versa, individuals could also response by reducing labor supply given that income effect dominates substitution effect.

As PIT exemptions applied to all taxpayers, it is not only low-income workers (individuals) that benefited from exemptions policy. Given a progressive statutory tax rate of personal income tax, as discussed, tax saving from PIT exemption expansion to an extent is higher for individuals in a higher taxable income bracket. Nonetheless, as PIT exemption in general is lumpsum fixed amount, the tax saving to some extent will not be large in proportion to income for high income individuals.

If there is any, the effect of PIT exemption expansion may not be the same between individuals across and within brackets of income. Referring to Figure 1, higher non-taxable income shifting out (increasing) budget line as there is higher net income (net wage) for workers on each his or her decision on work hours allocation, including decision to work or not to work. Individuals who are working that are previously not taxpayers or have income below or the same to the threshold of non-taxable income may not be affected directly by this policy. Therefore, individuals who are not or unlikely to be affected by the policy can be viewed as control group.

In the case that PIT exemption expansion increase labor supply, it implies that substitution effect dominates income effect assuming that leisure (time) is a normal good. The reverse can also occur, a condition in which PIT exemption would instead lead individual(s) to reduce labor supply, indicating that income effect rather than substitution effect that is relatively dominant. From the following Figure 2,

[2]PIT filing of married couple in which husband and wife are both work or have income (double earners), previously can only be treated as joint filing. The tax filing is conducted by husband and tax would be levied to husband income while wife's income as final – net of tax that is deducted by firm – would be reported in the filing. Therefore, on joint filing, wife taxable income would be treated as final and thus would not add to increase tax rate applied to husband taxable income. After 2008, PIT filing of married couple (double earners) can also be conducted as separate filing. However, in the case of separate filing, married couple still need to combine their income and calculate the tax rate applied to this combined income, which then the tax liability is divided in proportion to share of each income.

Table 1. Personal Income Bracket Tax Rate

Annual Taxable Income	Tax Rate
Up to 50 million IDR	5 %
50 – 250 million IDR	15%
250 – 500 million IDR	25%
> 500 million IDR	30%

Source: Law 36 2008

Table 2. Personal Income Tax Exemption based on Law 38 2008

Number of Dependence	Exemption Male or Female (Single) IDR
0	15,840,000
1	17,160,000
2	18,480,000
3	19,800,000

Number of Dependence	Exemption Single Earner (Married) IDR
0	17,160,000
1	18,480,000
2	19,800,000
3	21,120,000

Number of Dependence	Exemption Double Earner (Married) IDR
0	33,000,000
1	34,320,000
2	36,640,000
3	37,960,000

Source: Law 36 2008

Table 3. Individual Income Tax Exemptions Policy

2012

Number of Dependence	Exemption Male or Female (Single) IDR
0	24,300,000
1	26,325,000
2	28,350,000
3	30,375,000

Number of Dependence	Exemption Single Earner (Married) IDR
0	26,325,000
1	28,350,000
2	30,375,000
3	32,400,000

Number of Dependence	Exemption Double Earners (Married) IDR
0	50,625,000
1	52,650,000
2	54,675,000
3	56,700,000

2015

Number of Dependence	Exemption Male or Female (Single) IDR
0	36,000,000
1	39,000,000
2	42,000,000
3	45,000,000

Number of Dependence	Exemption Single Earner (Married) IDR
0	39,000,000
1	42,000,000
2	45,000,000
3	48,000,000

Number of Dependence	Exemption Double Earners (Married) IDR
0	75,000,000
1	78,000,000
2	81,000,000
3	84,000,000

2016

Number of Dependence	Exemption Male or Female (Single) IDR
0	54,000,000
1	58,500,000
2	63,000,000
3	67,500,000

Number of Dependence	Exemption Single Earner (Married) IDR
0	58,500,000
1	63,000,000
2	67,500,000
3	72,000,000

Number of Dependence	Exemption Double Earners (Married) IDR
0	112,500,000
1	117,000,000
2	121,500,000
3	126,000,000

Source: Extracted from related Ministry of Finance Decree

Note: PMK No. 162/PMK.011/2012 is issued in October 2012 and the regulation is effective starting year 2013;
PMK No. 122/PMK.010/2015 is issued in June 2015 to be effective in 2016;
PMK No. 101/PMK.010/2016 is issued in June 2016 to be effective in 2017.

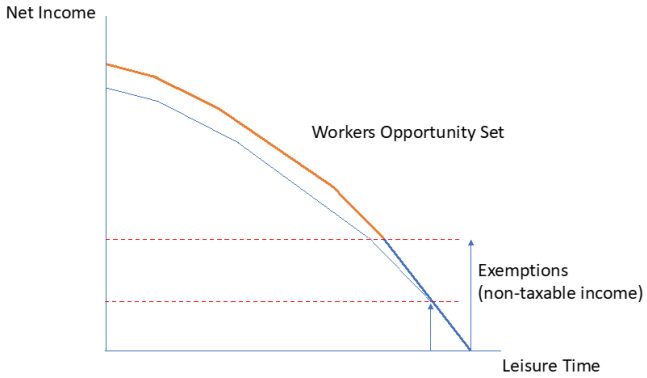

Figure 1. PIT Exemption Policy and Change of Workers Opportunity Set

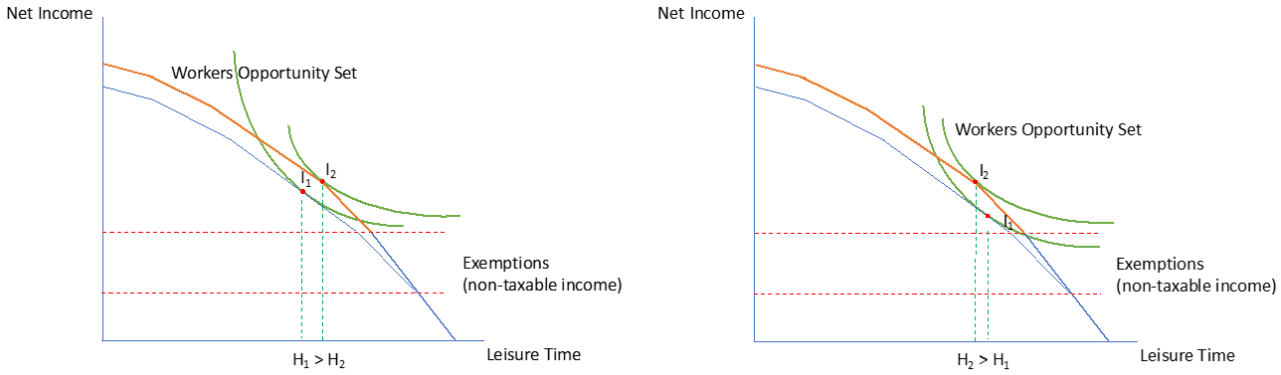

Figure 2. PIT Exemption Policy and Taxpayers Work Hours

referring to the right-hand side (RHS) of Figure 2, PIT exemption expansion lead to an increase in labor supply for the case of Individual *i*, a worker who already become a taxpayer and her associated income equivalent to PIT middle income bracket. Nonetheless, the contrasting effect is also plausible, in which PIT exemption expansion lead to a reduction in worker labor supply as shown in the left-hand side (LHS) of Figure 2.[3]

There could also be a condition in which PIT exemption expansion result to a reduced marginal tax rate for the taxpayers suggesting that these taxpayers have moved to a lower taxable income bracket. These workers benefited by exemption policies at it leads to lower marginal tax rate. PIT exemption policy can also change a status of taxpayers, referring to individuals that are previously have income above the taxable income who have been able to be non-taxpayer group of income.

For individuals who previously not working, a significant increase in PIT exemption may exceed individual reservation wage, and thus create incentive to work as shown in Figure 3. On paid workers, firms function as withholding on labor payroll tax and firms will also distribute to workers tax forms that will be further used for filing individual income tax.

Married or single workers can take advantage of exemption policy from an increase of basic exemption, as well as an increase of unearned income if the spouse, or other related household member(s) who is also working and thus affected from the changes in PIT exemption. Nonetheless, labor supply responses can also be different across individuals or group of individuals. From Figure 4, individual *A* previously choose to work in A_1 and individual *B* choose to work in B_1. However, given increase in exemptions resulted to a significant increase of unearned income, individual *A* may choose to decrease work hours reflected by decision in A_2. Meanwhile, individual *B* may have a response by choosing not to work as reflected by decision in B_2, given that in this specific condition she could achieve the same level of utility by not working.

3. Estimation Model

As discussed in previous section, PIT exemption may affect both taxpayers or non-taxpayers and to an extent to non-working and working individuals as it also may influence decision to enter or exit labor market. Therefore, we estimate if there is any effect of this PIT exemption policy on labor force participation as well as on hours of work.

The estimation model below refers to estimation model for the full sample and disaggregated into (group) sub-sample of labor supply estimation:

$$P(Y_{it}) = \beta_0 + \sum \beta_1 E_{it} + \sum \beta_k T_t + \sum \beta_l T_t E_{it} + \sum \delta_m X_{it} + \varepsilon_{it} \quad (1)$$

Where:

Y_{it} : weekly (hours of work) or participation in labor force (employment status);

E_{it} : exemption eligibility characteristics;

T_t : dummy year for period after PIT exemption changes (2013–2015; 2016–2018);

[3] Figure 2 only one example in the case PIT exemption expansion has not changed PIT income bracket of individuals.

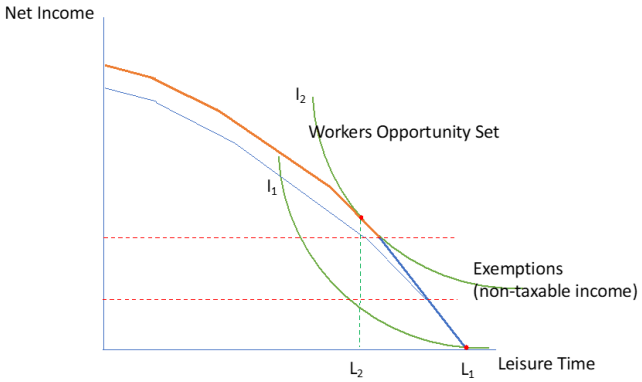

Figure 3. PIT Exemption Policy and Labor Force Participation

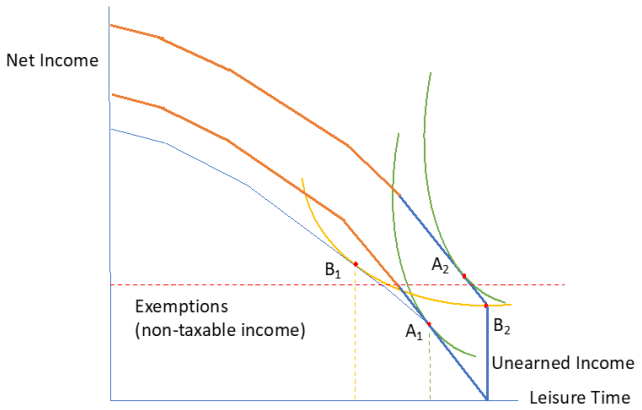

Figure 4. PIT Exemption Policy and Household Labor Supply

$T_t E_{it}$: interaction dummy;
X_{it} : other explanatory variables.

I include classification of income group as explanatory variables as well as on individual and or household characteristics that refers to eligibility criteria for PIT exemptions. I differentiate labor supply estimation into labor force estimation model which predicts on the effect to decision to work and hours work estimation model referring to weekly hours work estimation model. On labor supply estimation referring to labor force estimation model, there are existing studies that explore Indonesia labor force estimation model (Cameron et al., 2018), and work hours estimation model have been also commonly used in the context of Indonesia labor supply (Shasta Pratomo, 2014; Allen, 2016).

On estimation model specification, labor force participation estimation model use probit estimation model, while work hours estimation model will be based on tobit estimation given the characteristic of each respective dependent variable. The two estimation models referred as labor supply estimation model.

PIT exemption expansion occurred not only on basic income exemption, but also increase exemption for dependents, and marriage exemption. Therefore, the classification criteria of treatment and control group is plausible based on income group, marriage status, and to an extent on whether individuals have dependents. To note, classification of group characteristic based on income is due to assumption that respective income group will also reflect individuals that experienced lower marginal tax rate that associated with lower income bracket given that there is higher non-taxable income.[4]

Variable of unearned income is included in estimation model. Observations cover not only group of working population but also non-working population. Even though the estimation model is on individual level, one can identify (unearned) income within the same household. Decision to participate in labor market as well as work effort may also be influenced by characteristic of household, which in this case refers to amount of unearned income.[5]

There may also be response from demand of labor in which response is based on gross wage (gross income). Thus, labor supply estimation needs to also control indicators and or factor related to aggregate labor market. The explanatory variables in the estimation model also include community and provincial level aggregate variable such as province unemployment rate, variable of province minimum wage, and variable that represent urban area characteristic.

For this study, the observations are classified in a different estimation model for men and women across this socio-demographic group classification: (1) unmarried individuals, and (2) married individuals, which also reflect PIT exemption eligibility characteristic other than non-taxable basic income. Following existing literatures on labor force partic-

[4]The observations are classified in aggregate of group of income as a proxy of individuals that will generally have a lower tax bracket due to PIT exemption expansion as the treatment group, which in this case the control group refers to group of individuals that plausibly stays the same in terms of PIT rate.

[5]Keane (2011) pointed out that non-labor or unearned income not only refers to other household or family member (salary) income. Unearned income can consist of many other types of income such as interest income, government transfers payment, etc. However, SAKERNAS data only covers work-related income.

ipation estimation model and hours work estimation model, labor supply estimation is generally differentiated based on gender, marriage status, and to an extent other socio-demographic characteristic such as education level, household size, age, or type of work characteristics (Killingsworth & Heckman, 1986; Mincer, 1962; Hill, 1983; Bick & Fuchs-Schündeln, 2017).

4. Data

I use SAKERNAS data from 2010–2018. The survey data of SAKERNAS are not longitudinal survey.[6] Individuals that are surveyed in previous year is not tracked, and thus they may not be surveyed in current or next year surveys. However, I mitigate an issue of non-panel characteristics by exploring the sample as group of individuals. Pooled sample of observations may still be representative, as discussed further in labor sample formulation. Previous studies on labor market in general, has also commonly used pooled data of country labor survey to estimate labor supply (Kalíšková, 2014).

4.1 Employment Status

The status of workers is limited to paid (labor) employment rather than self-employment. In the case of paid (labor) employment, firms function as withholding and thus extract some of PIT from workers salary, and thus paid (labor) employees may then file PIT return.

The (paid) workers are assumed to be taxpayers once his or her income exceed non-taxable income threshold. The sample of (paid) workers to an extent can be referred as formal sector employees, defined as individuals who work and received salary regularly. On labor supply estimation, the use of weekly work hours to some extent may still be valid and associate with earning income. In the case of Indonesia, Allen (2016) views of Indonesian labor market is still dominated by short-term contract, and thus it may also link to variation on work hours.

Variation in work hours may also due to individuals having more than one job. Especially for low income individuals, intensity of work may also be influenced of whether individuals have multiple jobs or not. In SAKERNAS, information on presence of multiple job can be identified, as there is a question that asked individuals who work on primary job, whether they have also secondary job. This dummy variable of whether individuals have multiple job is one of explanatory variables included in the estimation model.

4.2 Income Group – Tax Bracket

On type of wage that will be used, SAKERNAS data provides net wage data from working in a (previous) month. Individual response on labor supply is based on net income and not gross income. Individual net wage that is used in the estimation model is actual monthly net wage.[7]

Employee's annual income is used to classify the treatment group. This tax base of individual income tax is assumed to be observable especially in the case of low to middle income individuals and paid (labor) employee, in which source of income may be dominated from salary. The individual income tax filing depends also on what have been reported by firms. Given payroll tax as part of individual income tax is a withholding tax, employees (paid workers) as taxpayers may likely (or are assumed) to file individual income tax returns.

SAKERNAS data sample more of low to middle income and does not adequately capture high-income individuals, and therefore feasible comparison only for individuals in or above the threshold up to second brackets or individuals referring to 5% and 15% MTR of Personal Income Tax. The sample of income group only up to second bracket of income, which is from 50 to 250 million IDR of taxable income. The first and second highest personal income tax bracket may still be in the sample, however it needs to be carefully assessed, given very few individuals in this income group.

Furthermore, taxpayers' characteristic that experience lower PIT income bracket can plausibly proxy only in aggregate group of income. There are three classification of income group as follow[8]: (1) income less than 54 million IDR but more than 15.84 million IDR, (2) income more than 63.4 million IDR but less than 101.5 million IDR, and (3) income more than 275.84 million IDR but less than 314 million IDR. The three income groups refer to proxy of annual net income that experienced a lower tax rate (income bracket) due to changes in PIT exemption policy.[9] To note income group classification is based on individual or other household member net income (unearned income) if the individual is not working.

4.3 Socio-Demographic Characteristics

I classify the affected and control group as all individuals who are working or not working and potentially are taxpayers, and thus should at least eligible to have tax identification number (age 18 and above). Individuals who work will apply a tax ID number, referred as *Nomor Pokok Wajib Pajak* (NPWP), when age of individual is at least 18 years old.

I also identified for SAKERNAS data of whether for working individuals have work experiences of at least one year assuming of a minimal period that enable them or a firm to file for personal income tax. I use limitation of minimum of period of work of one year given also that data of SAKERNAS is not panel data and thus it is assumed that given length of work, majority of the sample may experience of both prior and after PIT exemption changes of at least one time PIT change. In the questionnaire of labor survey (SAKERNAS), the question is 'how long (how many years and months) individual has worked?'. Exception is for the data in 2018, which the sample length of work has a

[6] Data limitation is one of drawback from SAKERNAS data. SAKERNAS dataset lack of unique identification of individuals and households that are surveyed.

[7] The static assumption is net wage as exogenous variable implying that individuals act more as a price taker.

[8] Given that the income refers to net wage, minimum income is level of income stated as non-taxable income, which is for single worker with no dependents equivalent to 15.84 million IDR for period 2010–2012.

[9] The threshold of the sample non-taxable income will be adjusted in line with the associated exemption value of income for married worker that are used in LFP or weekly work hours estimation model of married workers.

minimum of two years of work experience to accommodate possibility that individuals experienced period prior of PIT exemption policies.

Related to (paid) employment, especially in relation to formal sector, educational degree may influence of employability of individuals. The variable to reflect educational background of individuals is dummy variable equals to one when individual has at least degree of upper level secondary education. I also use variable of whether individuals located in urban or rural areas as this variable is also commonly used related to labor supply estimation in Indonesia (Cameron et al., 2018; Shasta Pratomo, 2014). Individuals lived in urban areas may as well have higher probability to engage in (paid) employment.

On other socio and demographic characteristic, I classify the sample based on the status of marriage (single or married) and by gender. As discussed in previous section, marriage exemption has also increased over the period of 2013–2016. PMK No. 122/PMK.010/2015 stated on marriage exemption amounted of 4 million IDR from previously $2\frac{1}{4}$ million IDR as stated in PMK No. 162/PMK.011/2012. The marriage exemption has also increased to $4\frac{1}{2}$ million IDR starting 2016 as stated in PMK No. 101/PMK.010/2016. In the case of PIT exemption policy related to whether taxpayers have dependent and number of dependents, I use proxy of overall number of household size.

5. Overview SAKERNAS Data

A higher income group which reflect a higher personal marginal tax rate, as discussed above on data section, is classified into three income group. Given the trend of average weekly work hours, as shown in Figure 5, there seem to be a relatively lower average weekly work hours for higher income group. Over the years, there is variation on average weekly hours work as well as in terms of share of individuals employed across income group as shown in Figure 6.

Figure 5 shows the trend of a relatively high average weekly work hours for both men and women identified as low income – working individuals in income group (IG) 1. Working men or women with initially low income tend to have higher work intensity compares to higher income working men and women. From Figure 5, there is an increasing trend of average weekly work hours on both women and men in lowest income group (income group - IG 1) referring to income group that are not required to pay tax in post period of PIT exemption expansion. Individuals in this group of income are previously subject to 5% PIT rate. The trend of average weekly work hours in this group tends to increase especially for low-income working women in income group 1 (IG 1). There is slightly increase of average weekly work hours for men in income group – IG 1.

The different trend of average weekly work hours prior and after period of PIT exemption expansion observed for both women and men that previously assumed subject to 15% PIT rate. During 2016–2018, there seem to be a declining trend of average weekly work hours especially for single men and married women. Given average weekly work hours tend to fluctuate over the years, it is not clear of whether the variation at individuals level may also be influenced by PIT exemption policy. A relatively different pattern of average weekly work hours imply that it is plausible that the response of PIT exemption policies may also be different across category of income, in which income as discussed in previous section, refers to earned or unearned income.

For period before 2013, there is also a declining trend in average weekly work hours on higher income group referring to individuals in income group 3 (IG 3) which partly associate with 25% PIT tax rate. An increasing trend of weekly work hours are observed for both men and women for period after 2013.

On the extensive margin of labor supply, Figure 6 shows share of working individuals across income group that are assumed to experience a lower rate of PIT due to higher non-taxable income as PIT exemption increased. In general, share of working individuals or labor force participation on women is much lower than labor men labor force participation. Meanwhile, across income group, there is a high share of working individuals in individuals in lowest income group (income group - IG 1) referring to either her income or other household member income are assumed initially within the threshold of net annual income of 5% PIT rate. From Figure 6, share of working individuals, especially for men, in lowest income group (income group - IG 1) tends to be higher than for group of individuals that assumed from his or other household member annual net income is previously subject to 15% PIT rate (income group – IG 2).

PIT exemption related to marriage status has also increased implies that taxpayers who are married either he is a secondary and or primary earner as long as he files PIT, amount of income that can be exempted is higher that unmarried taxpayers. On labor force participation, married individuals as commonly belief has higher LFP than single individuals. As shown in Figure A1 in annex, both women and men LFP have higher LFP over period 2010–2018. There is an exception on trend of LFP between single women and married women, in which LFP for single women is higher than LFP of married women in 2017. Meanwhile on men labor force participation, LFP for single men have increased for the year 2016–2018. There seem to be a consistent higher LFP from married men in comparison to single men over period of 2010–2018.

Figure 7 shows of (unweighted) labor participation rate between single women and single men with no dependents. As noted earlier, an increase in PIT exemption also include higher income that can be exempted per dependent claimed by taxpayers. Expansion of PIT exemption on dependents implies of plausible labor supply response for individuals and or taxpayers affected by this policy. In the context of PIT exemption expansion on dependents, control group would be individuals with no dependents. From Figure A1 (see in annex), over period 2010–2018, there is an increase trend of LFP of single individuals that have no dependents in the last two years, 2017 and 2018.

From common trend in Figure A2 in Annex, LFP of

[10]Given limited sample of individuals with income more than 275.84 million IDR and less than 314 million IDR due to characteristic of LFS data, individuals are classified in this income group as long as income is more than 275.84 million IDR. Meanwhile, referring to threshold of income for married workers, income group classification for married individuals has included PIT marriage's exemption in it.

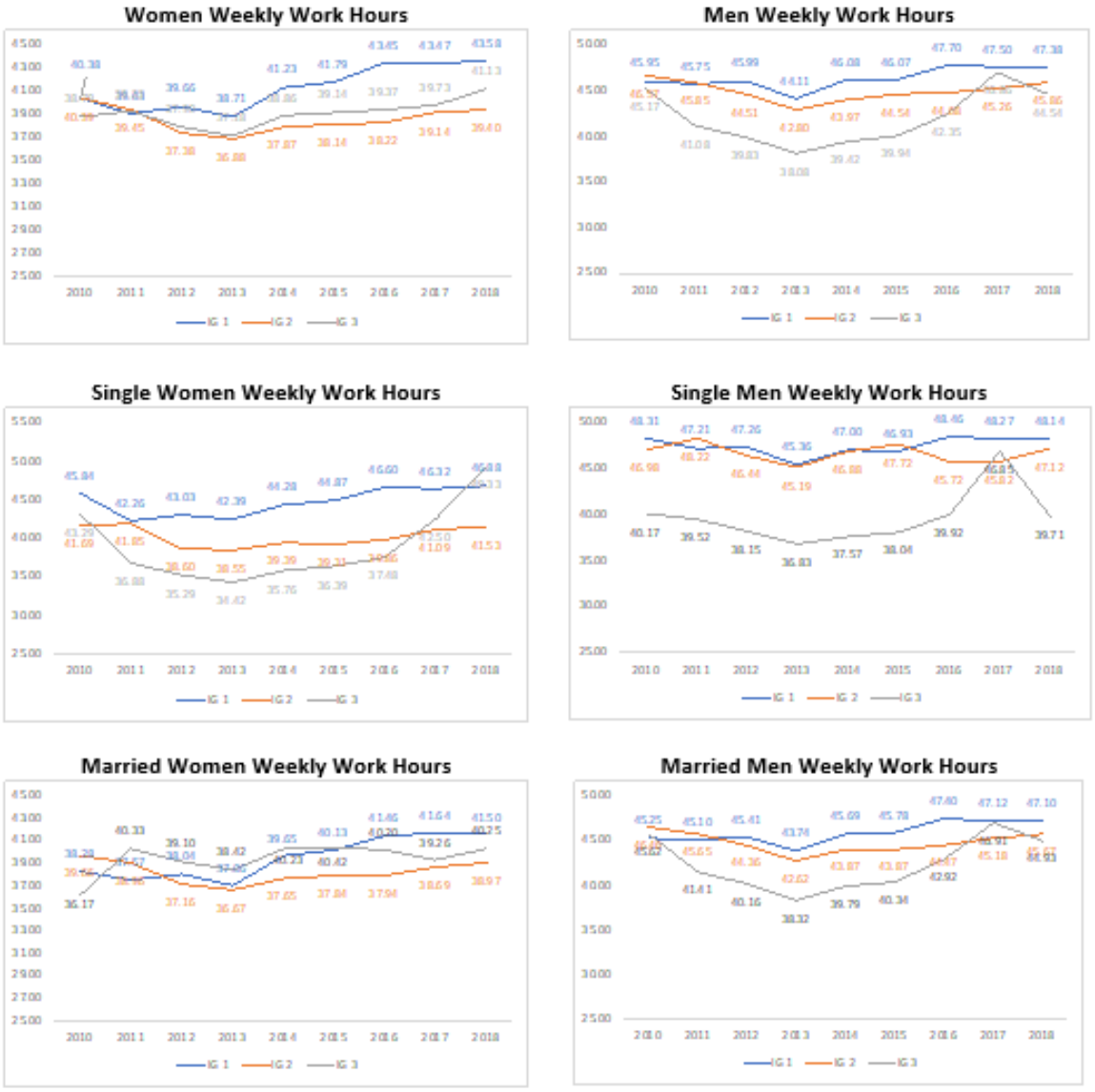

Figure 5. Average Weekly Work Hours of Men/Women across Income Group

Source: Calculated from SAKERNAS 2010–2018

Note: IG 1 is individuals in income group 1 defined by income less than 54 million IDR but more than 15.84 million IDR, IG 2 is income group 2 which will classify individuals that have income more than 63.4 million IDR but less than 101.5 million IDR, and IG 3 or income group 3 refers to individuals with income more than 275.84 million IDR[10]

married men with dependents, referring to children, grandchildren, and or (parents or in laws) in a household, is lower in comparison to married men with no dependents. After a period of 2013, there is instead a wider gap of LFP between married men with dependents and LFP of married men with no dependents, though it narrowed in last three years.[11] However, average weekly work hours of married men with dependents tend to be higher than average weekly work hours of married men with no dependents as shown in Figure A3 (in Annex). In contrast, LFP of married women with no dependents are not much of a different, in terms of a trend, to LFP of married women with dependents. In this case, there are periods in which LFP of married women with dependents exceed LFP of married women with no dependents.

As commonly known, there is a lower labor supply of women than men, referring to weekly work hours that have been generally higher for men than women. As shown in Figure A3 (see Annex), average women weekly work hours have been relatively lower in comparison to average men weekly work hours especially between married women and married men. A relatively low labor supply of women is mirroring previous Figures on labor force participation (LFP). Figure A1 and A2 show a relatively low women labor force participation (LFP) which is in the range of 50%–55% irrespective of whether they are married or single as well as whether there are dependents or no dependent. Indonesian women LFP is relatively low in comparison to other Asian countries and this is despite a relatively high educational attainment and low fertility rate (Cameron et al., 2018).

Furthermore, in contrast to popular belief, married women with dependents tend to have higher average weekly work hours than married women with no dependent. On average,

[11] based on a relatively similar study on labor supply in other countries, LFP of married men with dependents are higher than married men with no dependents (Kalíšková, 2014).

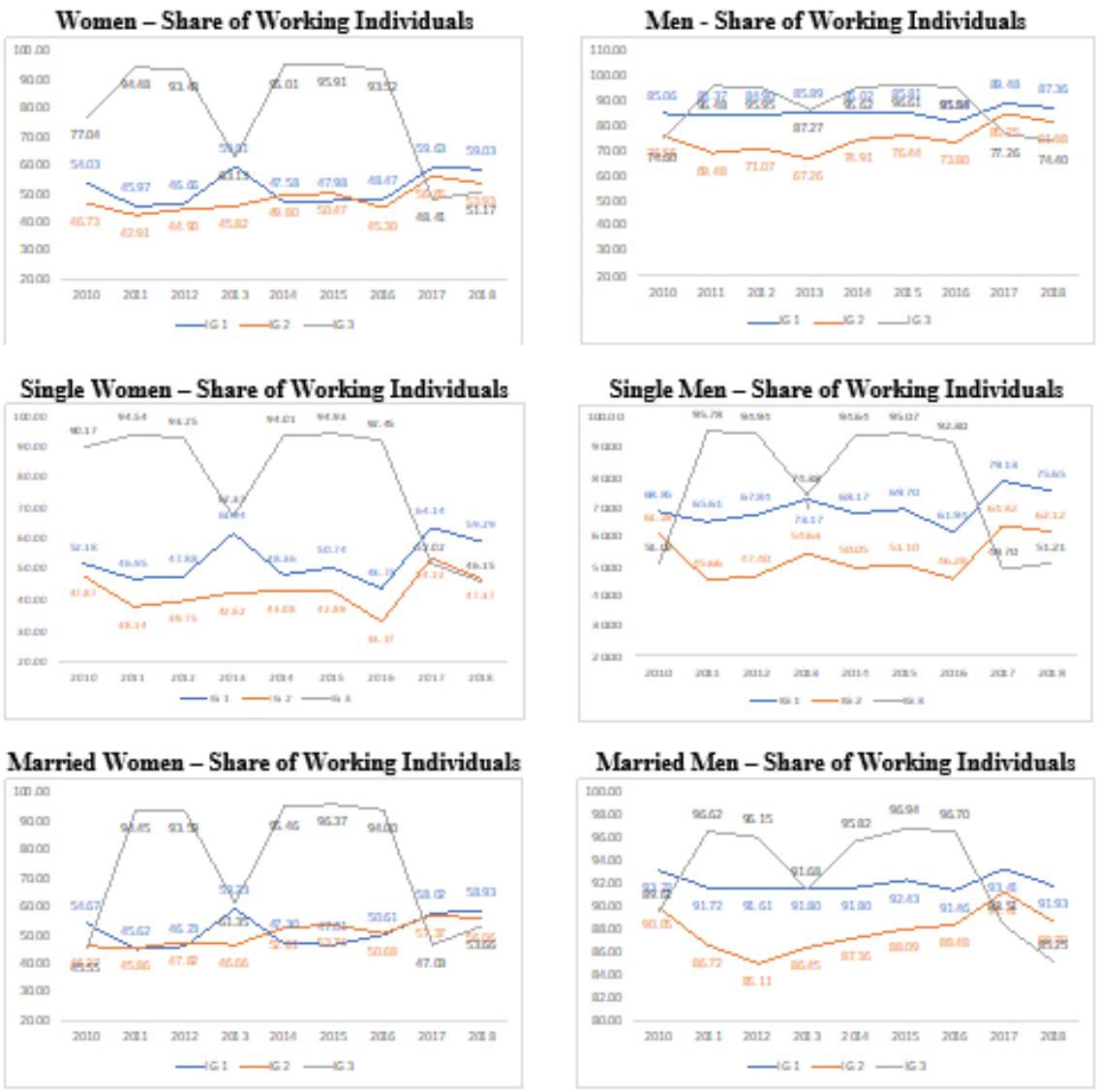

Figure 6. Share of Working Individuals of Men/Women across Income Group
Source: Calculated from SAKERNAS 2010–2018

married women with no dependent has also allocated less hours of work than single women with dependents. This condition cannot be separated from the fact that average weekly work hours of single women is still relatively higher than average weekly work hours of married women. Meanwhile, men average weekly work hours have been quite similar between single and married men especially during 2016–2018. There is not much of a different on average weekly work hours between single and married men with no dependents during the observed period.

6. Results

The estimation results show the effect of PIT exemption on labor supply varies across income group based on full and sub sample estimation referring to men and women labor supply estimation model. Following empirical studies on labor supply estimation, there are different average effect and plausibly different channels and characteristics across men and women in regard to participation into labor market as well as on length of work. Table 4 provides summary of findings.

PIT exemption expansion tends to have positive association on both labor force participation as well as weekly work hours for low income individuals that previously assumed would be in 5% PIT income bracket. As shown in Table 4, labor force participation (LFP) tend to increase for low income individuals referring to individuals with unearned income and or annual income within the threshold of non-taxable income. Similarly, PIT exemption expansion for this treatment group (interaction of income group – IG 1 and dummy post-year period) also associate with longer weekly work hours. Exception only observed from single men labor force participation estimation result for the period of 2016–2018, in which response of this group of low-income individuals is lower probability to work due to PIT exemption expansion.

In the case of individuals that are assumed experienced a lower income bracket from 15% to 5% PIT rate, there is inconclusive evidence that expansion on PIT exemption may affect decision to work or not to work. For period of 2013–2015 that covered first policy change of PIT exemption after last stated in Law 36 2008, the findings in Table 4 shows that

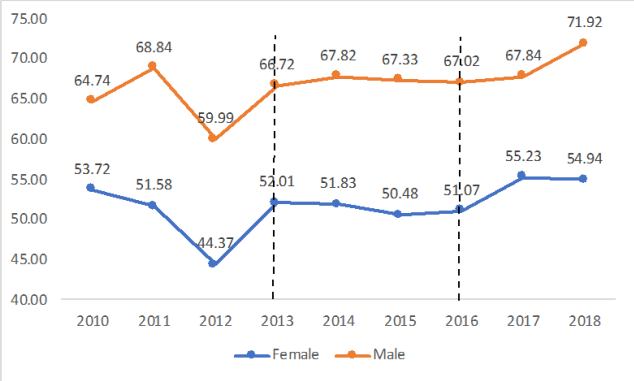

Figure 7. Single Men and Single Women LFP (age above 17 years) with no Dependences
Source: Calculated from SAKERNAS 2010–2018, not weighted.

Table 4. Effect of Personal Income Tax Exemptions Policy: Summary of Estimation Results

Exemption Policy	2013 - 2015					2016 - 2018				
	Income			Dependents	Marriage	Income			Dependents	Marriage
	IG 1	IG 2	IG 3			IG 1	IG 2	IG 3		
Labor Force Participation										
Probit estimation coeff.										
Women	0.250***	0.316***	0.252***	-0.002*	-0.034***	0.089***	-0.041***	0.014	-0.027***	0.132***
Men	0.079***	0.042**	0.453***	-0.000	0.053***	0.150***	0.164***	0.204**	-0.001	0.028***
Single Women	0.081***	0.219***	-0.092	0.016***		0.128***	0.007	-0.214	-0.014***	
Single Men	0.089***	0.135***	0.014	-0.003		-0.112***	-0.044	-0.188	-0.013***	
Married Women	0.284***	0.294***	0.285***	-0.003***		0.081***	-0.038**	0.106	-0.028***	
Married Men	0.024**	-0.161***	0.207*	-0.000		0.132***	0.125***	0.334***	0.023***	
Weekly Work Hours										
Tobit estimation coeff.										
Women	3.702***	1.210***	17.735***	-0.052***	-1.059***	1.686***	-2.917***	7.372***	-0.463***	1.288***
Men	3.684***	1.039***	30.992***	-0.011	0.390***	2.297***	0.327	13.578***	-0.001	0.086***
Single Women	3.477***	0.468	11.544***	0.086***		2.636***	-3.113***	5.414***	-0.430***	
Single Men	3.818***	2.048***	25.718***	-0.023		3.356***	-1.120***	3.200*	-0.203***	
Married Women	3.505***	1.348***	21.317***	-0.113***		1.039***	-2.665***	9.838***	-0.426***	
Married Men	2.999***	0.485	13.886***	-0.070***		0.781***	0.334	16.670***	0.291***	

Notes: *** 1% significance level, ** 5% significance level, *10% significance level, on tobit estimation, right censored on weekly hours work that is above 70 hours.
Explanatory variables consisted of age, education of minimum upper secondary level, marriage status, household size, two dummy year 2013–2015 and 2016–2018, monthly net wage, net annual unearned income, dummy of whether individual hold multiple jobs, dummy of urban area, province unemployment rate, and province minimum wage level.

the effect of respective variable (interaction of income group – IG 2 and dummy year period of 2013–2015) is in reverse between single and married men LFP. There is an average positive effect of PIT exemption expansion on single men LFP and the respective coefficient is instead negative on married men LFP. Positive effect from an increased PIT exemption on married men LFP occurred for period 2016–2018. In this regard, positive effect of PIT policy change on women LFP, referring to both single as well as married women LFP, is also observed only for period 2013–2015. For period 2016–2018, there is an insignificant effect of PIT exemption expansion on single women LFP, and the respective coefficient is negative on married women LFP.

From estimation results on weekly work hours, the interaction variable of income group 2 (IG 2) and dummy year period of 2013–2015 is significantly positive for men weekly work hours and on both single and married men weekly work hours. Meanwhile, a positive effect of PIT exemption expansion on women weekly hours of work occurred for married women only. From Table 4, the findings show that PIT exemption expansion has negative effect on both men and women labor supply in this respective income group for period 2016–2018. To some extent, a differing result of PIT exemption policy effect on weekly hours work estimation for this interaction variable of income group (IG 2) between period 2013–2015 and period of 2016–2018 imply there is a possibility that effect of PIT exemption expansion only occurred in short-term.

Table 4 also shows of specific impact PIT exemption expansion. For example, as shown in Table 4, an increase of PIT exemption on dependents may instead lead to reduction both on LFP and weekly hours work on married men and women with dependents. The findings shown in Table 4 signal that both married men and married women may work shorter hours as a result of an increase of PIT exemption on dependents. There is also a negative effect of PIT exemption expansion on LFP of married women with dependents, though the effect of PIT policy is insignificant - and thus it is relatively neutral – for married men with dependents. Meanwhile, an increase of PIT exemption related to marriage

status tend to have positive effect in the case of men labor force participation and hours of work. However, the effect of PIT exemption related to expansion of marriage allowance on women labor supply is inconclusive. Women LFP and work hours are both negatively affected during 2013–2015 period, though the effect of PIT exemption expansion has become positive for period 2016–2018.

7. Conclusion

The objective of PIT exemption is intended to support working population whom are also low- income households. However, the scheme of PIT exemption applied to all taxpayers including high income individuals (households). In this case, it is still unclear on the effect of PIT exemption expansion, in terms of whether it may change the incentive to work and thus whether individuals' behavior related to work may also change.

Using labor force survey (LFS) data, referring to SAKERNAS, I construct the estimation of labor supply across group of population. To note, SAKERNAS respondents survey dominated by individuals and households of low to middle income, possibly beneficiaries target of the policies. Overall, PIT exemption expansion has impact on both labor force participation and weekly work hours, though the effect varies across income group and individual (household) characteristics of the respective taxpayers. From this study estimation results, there is not yet evidence of PIT exemption expansion is a disincentive to low income individuals in terms of labor supply response.

The estimation results from this study indicate suggestive findings at least in the short-term that there is no evidence PIT exemption expansion may reduce labor force participation (LFP) and discourage work effort on individuals that based on initial or unearned income categorized in 15% tax rate from PIT taxable income bracket. PIT exemption expansion seems to create incentive to labor supply especially on group of income near the threshold of taxable income and taxpayers in the least bracket of taxable income whom being levied a 5% PIT rate. PIT exemption expansion tends to also associate with an increase probability to work to both men and women in this treatment group. Similarly, as discussed, there is a positive effect from an increase in PIT exemption on work effort for this treatment group.

This study suggestive findings that PIT exemption expansion seem not distorting labor market is only viewed in the context of labor supply. For an overall assessment, the effectiveness of the policy – expansion of PIT exemption needs to be also evaluated in terms of its distributive incidence as well as in the context of its impact on government PIT revenues.

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Annexes

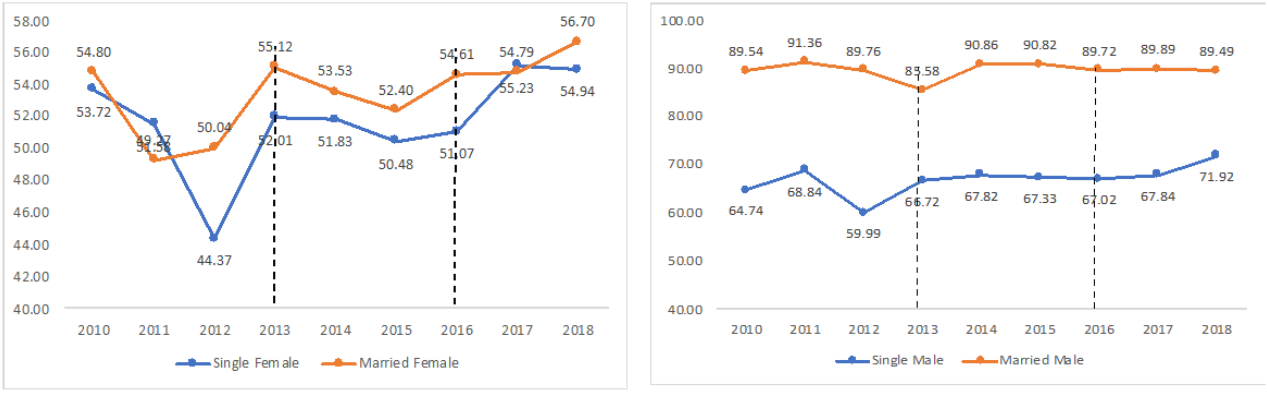

Figure A1. Single and Married Female/Male LFP (age above 17 years) with no Dependents
Source: Calculated from SAKERNAS 2010–2018, not weighted

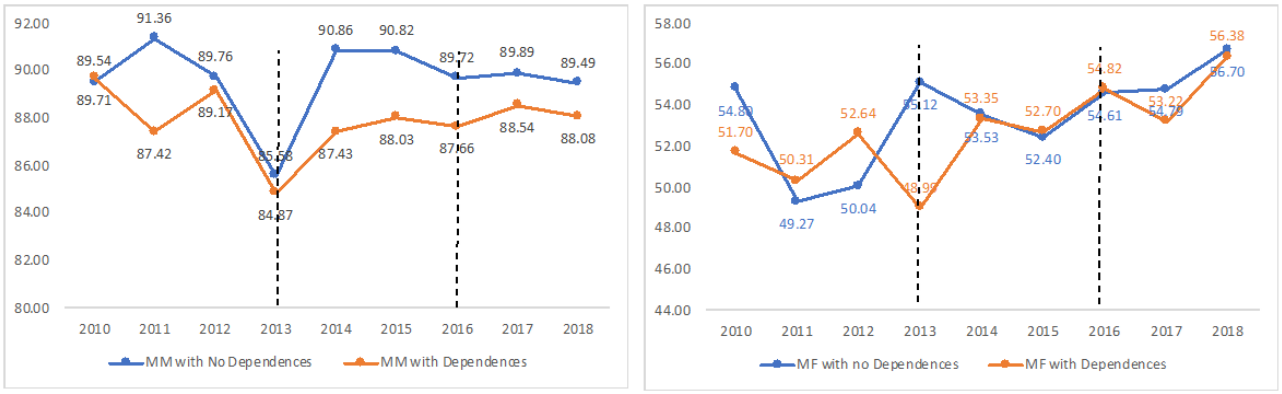

Figure A2. Married Female/Male LFP (age above 17 years) with Dependents and No Dependents
Source: Calculated from SAKERNAS 2010–2018, not weighted
Notes: SF: single female, SM: single male, MF: married female, MM: married male.

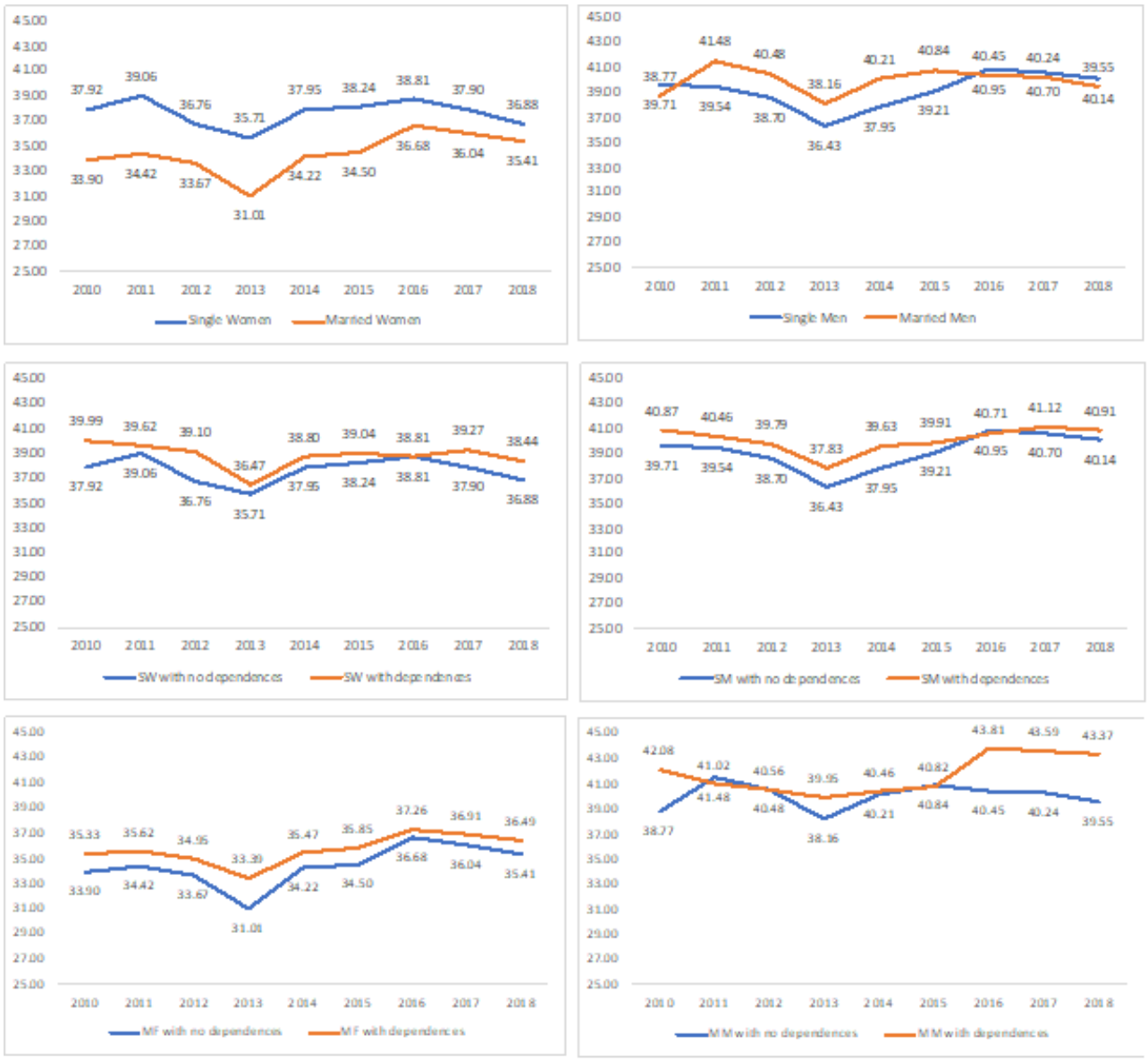

Figure A3. Average Weekly Hours of Work of Single/Married Women and Men (age above 17 years) with Dependents and No Dependent

Source: Calculated from SAKERNAS 2010–2018, not weighted

Notes: The first row refers to Women and Men with no dependents, SW: single women, SM: single men, MW: married women, MM: married men.

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