# Where Did The Time Go? The Effects of China's Two-Day Weekend Policy on Labor Supply, Household Work, and Leisure Activities

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ABSTRACT

Research on the effect of working time policy yields ambiguous results. The outcome depends on the tradeoff between leisure, consumption, and wage-earning opportunities. Using China Health and Nutrition Survey data, we examine the effects of China's Two-Day Weekend Policy, which legislatively changed weekly working days from six to five in May 1995, on labor supply, household work, physical and leisure activities. The results show that the Chinese policy significantly reduced the work hours of wage earners by 4%, increased the probability of having a second job by 3%, and decreased the time spent on household work and physical activities.

**Keywords:** Labor supply, Time allocation, Household production, China

JEL Classifications: J22, J28

## Introduction

The effect of working time legislation on labor supply and household work has drawn much attention from researchers because of its theoretical perceptions, empirical challenges, and policy implications. The standard income-leisure model often ignores the time input in consumption that may lead to misleading conclusions in that both cooking a meal and taking a vacation, for example, require the input of valuable time in addition to materials such as raw foods and airline tickets. Such time input, as argued by Hamermesh (2019), is arguably one of the most valuable resources. The literature on the impact of changes in working hours on time use of labor supply, household work, and leisure activities, however, tends to find ambiguous results.

When the People's Republic of China was founded in 1949, the country has been under the six-one policy—six days of work and one day off on Sunday—for decades. In 1995, the Two-Day Weekend Policy was implemented to encourage consumption, stimulate the economy, and create jobs for those who had been laid off by the state-owned enterprise reform as a result of major structural reforms in the public sector beginning in 1993. In theory, the effects of the policy change on labor supply, household work, personal care, and leisure activities are indefinite, leading to various outcomes.[1] The tradeoff between leisure and work could explain such ambiguity; the stage of economic development and cultural norms may also account for the mixed findings.

Our empirical analysis uses the implementation of the 1995 Two-Day Weekend Policy as a natural experiment and the longitudinal Chinese Health and Nutrition Survey (CHNS) dataset—which contains primary and secondary job-related variables and detailed information from respondents regarding time allocations over the 1989–2015 period—to study how Chinese workers respond to the 1995 workweek reduction policy on labor supply, household work, and leisure activities.[2] Consistent with our theoretical predictions, the difference-in-differences estimates (DID) show that the policy change reduced the hours of work in both public and private sectors and raised worker's wages, echoing the extant literature on the wage and productivity effects from a working time reduction policy. The 1995 workweek reduction policy

[1] Hamermesh (2019) summarizes the outcomes for the U.S. evidence.
[2] The information is essential to disentangle the aggregate effect of the Two-Day Weekend Policy on working hours, having a second job, and time spent on household production, personal care, and leisure activities.

also reduced the time spent on household work and on almost all routine and time-intensive activities such as buying food, preparing food, and washing clothes; but with one notable exception—the time spent on the less frequent task of housecleaning increased.

In Western countries, American and European workers tend to use the reduced working hours to have more leisure time than to seek income-earning opportunities. On the contrary, our results show that Chinese workers responded to the workweek reduction policy by decreasing leisure time but increasing the probability to take on a second job. Such findings differ from the experience of the U.S. and European countries where people take longer vacations (Alesina et al., 2005) and enjoy more leisure time (especially women) when working hours were reduced (Freeman et al., 2005). Although the total leisure hours decreased, Chinese people spent more time on sedentary activities—such as playing video and computer games and surfing the internet—but less on physical activities, including playing Ping Pong and practicing Taichi.

Our findings complement the results in Ma and Shi (2020) in which they use the same CHNS data between 1993 and 1997 to study the 1994–1995 workweek reduction policy on spousal labor supply.[3] They find that a decrease in wives' labor supply significantly increased that of husbands, but a decrease in husbands' labor supply had an insignificantly negative effect on that of their wives. They also show that a decrease in the labor supply of one spouse decreased the time spent on housework by the other one. Our paper further examines the impact of the 1994–1995 workweek reduction policy on the probability of taking on a second job and on the amount of time spent on several categories of housework (such as buying food and housecleaning) and different kinds of sedentary (such as watching TV and playing video games) and physical activities (such as playing soccer, basketball, Ping Pong and practicing Taichi).

The evidence that Chinese workers were more likely to take on a second job when working hours of the primary job reduced can be, in part, attributable to the decrease in time spent on household work. The stage of China's economic development at the time of the policy change and cultural norms play a pivotal role in that Chinese workers place a higher value on labor earnings than on other tasks such as household work. The reduced time spent on physical activities and increased time spent on sedentary activities can be explained by that after years of

[3] An earlier version of our paper was circulated as IZA Discussion Paper (2018) No. 11698 under the title "How Has the Two-Day Weekend Policy Affected Labour Supply and Household Work in China?" In a recent paper, Geng (2021) uses the CHNS data and examines the 1994 workweek reduction policy on wages and unemployment. The author finds that the employment of the treatment group decreased after the policy.

hard and overtime working in physically demanding jobs such as manufacturing, Chinese workers tend to enjoy more leisure activities without taking much physical effort, in particular for men. Our finding implies that the workweek reduction policy of "forced leisure" prompted Chinese workers to shift their leisure time away from chores to relaxing leisure activities.

## 1. The Two-Day Weekend Policy

The existing scheme of working time in China dates back to May 1995, as shown in Figure 1, when the State Council of China officially cut the weekly working days from six to five through the signing of Executive Order 174 by the Premier Li Peng, promulgating the "Decision of the State Council on Amending 'the Provisions of the State Council on Working Hours'." Before this, the road to the reform of working hours had been long and controversial.

[Figure 1 about here]

When the Communist government was established in 1949, the working hours of workers were only loosely regulated. The Common Agenda of the First Political Consultation suggested limiting working hours to 8–10 hours per day. People across the country commonly worked overtime without receiving much leisure time or equivalent compensation, and it gradually became a common phenomenon that workers would take a day off on Sunday only, forming the early round of the "six-one" policy—six days of work and one day off per week.

Drawbacks of such a work system gradually emerged. First, the six-day work system kept employees in an overloaded status for a long period, leading to low efficiency. Reading newspapers, knitting sweaters, chatting, and temporarily leaving the position without permission were common for employees across the country. The only day for rest—Sunday—became the busiest day during the week since all housework, such as washing clothes, changing gas, and purchasing daily necessities, had been left over as reflected in a popular saying: fighting Sunday and fatigue Monday. In response to the concerns, in 1986, the Ministry of Labor convened a research team and proposed to the central leadership a Pilot Plan of Reducing the Weekly Working Days from Six to Five. The plan was controversial and it did not gain support from leaders in the government. As a result, the proposal was put on hold for years.

After Deng Xiaoping's South China Tour in early 1992, the proposal of reducing working hours was brought back into the discussion.[4] On February 3 of 1994, Premier Li Peng signed an Executive Order introducing a policy of two-day off every other week and slightly reduced working hours from 48 to 44 per week. The policy, however, encountered problems in practice. People forgot to rest on some Saturdays and went to work as usual. It disrupted the rhythm of life for most people, consequently, doomed the policy to early termination.

Coinciding with the reform of working hours, the reform of state-owned enterprises—which was put forward in 1993—led to millions of layoffs following the bankruptcy of most state-owned enterprises or being merged by private enterprises. To reduce the pressure from rising unemployment, redesigning the working hour policy received the government's attention, hoping to create new jobs that can absorb those who were laid off by the reform. About the same time, China's accession to the World Trade Organization (WTO) underwent difficulty to progress. The WTO required more reforms from China, including the working hour policy, to align with its members around the world. For such reasons above, China passed the Two-Day Weekend Policy—five working days with 40 working hours a week—on May 1, 1995.

## 2. Literature Review

Research on the working hour system in China remains scarce. Among the few Chinese studies, Ngok (2008), from the supply side, overviews the changes in the labor policy and legislation since the PRC was established in 1949. He notes that the most fundamental reason for the labor policy change is the pressure from the unemployment crises in the 1970s and the 1980s. The reduction of weekly working hours from 48 to 40 in 1995 highlights the greatest importance in China's labor regulation reform because the policy coincides with the period when China reinstated its economic reform after Deng Xiaoping's Southern Tour in 1992. The 1990s reform attempted to transform lifelong employment—the iron bowl—from the legacy of the planned economy to contract-based employment under a market economy, hoping to replace the government-assigned employment system with a competitive labor market model. Studies conducted in the U.S. and Europe generally find consistent results of the effects of reducing

[4] During the tour, Deng made an important speech that restored the government's commitment to economic reforms and opening-up policies, reigniting the transition to a market economy.

working hours on wage and productivity. But there is a clear dearth of consensus on the employment effect.

Lin and Yang (2003) present a labor-adverse selection model and study the effects of reduced working hours from a welfare economics perspective. They conclude that shorter working hours benefit firms' profits and employment by increased labor quality and a Pareto improvement. Scott and Spadavecchia (2011) argue that the drawbacks of a 48-hour week for British industrial workers, indicating that long working time is a key factor that depresses workers' productivity. They look into three major exporting industries in Great Britain and analyze how the change in the working time regime would influence industrial productivity in the short run. Their findings show that three typical industries do not experience significant losses by the cut in working hours because of the rise in employees' incentives for higher productivity; thus, the loss in hours is compensated.

Regarding the effects of reducing working time on employment, results vary considerably depending on theoretical and empirical models used as well as different factors and contexts considered. Hart (1987) theoretically and empirically studies the relationship between the reduction in working hours and the level of employment, pointing out that the employment effect depends on the type of unemployment, the production function, and many other factors. A policy focused on reducing working time does not significantly lead to a reduction in the unemployment level. Calmfors (1985) discusses the effects of a reduction in working time on wages and employment and finds that the effect is unclear when overtime is considered a proxy for employment. Marimon and Zilibotti (2000) use a general equilibrium model with search-matching frictions to analyze the impact of working time reduction and find that a small reduction in working time helps improve employment, but a great reduction in working time is not helpful. After a mandatory reduction in working hours from 40 to 39 hours a week in France, Crépon and Kramarz (2002) find that workers who worked 40 hours or more per week were more likely to lose their jobs than those who worked fewer hours. By testing the impact of working hour reduction from 44 to 40 on employment in the Canadian province of Quebec between 1997 and 2000, Skuterud (2007) find insignificant improvement in employment. Even though there are some productivity gains to men, it is not enough to offset the decrease of production by reducing working hours. By testing the impact of French workweek reduction on spousal labor supply, Goux et al. (2014) find that husbands of treated wives tend to cut about

half to one hour while wives of treated husbands could not because they are more heavily constrained by shorter work hours in the first place or lack of managerial controls.

The effect of shorter work hours on labor demand has been extensively discussed in the literature but the results are mixed. Hoel (1986) finds that a firm's labor demand is ambiguous when hourly wages or daily wages are kept constant in the manufacturing or service sectors. Using a labor turnover model, Hoel and Vale (1986) find that unemployment may increase as working time lowers while firms have to bear higher training costs—labor demand thus declines as working time reduces. Booth and Schiantarelli (1987) find that labor demand could decrease by a shortened working week using the monopoly union and efficient bargaining models. Using data from Australia and the U.K., Booth and Ravallion (1993) find that labor demand in the U.K. increases by a legislated cut in hours, but the effect in Australia is ambiguous. Freeman (1998) finds that labor demand increases and employment could increase by a working hour reduction because of work-sharing generated by the market. Jacobson and Ohlsson (2000), however, do not find that work-sharing helps increase employment. In contrast, Hunt (1999) uses German individual-level data across industries and finds that standard hour reductions reduce employment while increasing the hourly wage rate. By studying the impact of working hours reduction in Portugal in 1996, Raposo and Van Ours (2010) find that employment increased as job destruction reduced.

On the supply side, Altonji and Paxson (1988) and Martinez-Granado (2005) find that most U.S. employees prefer to reduce labor supply rather than to take higher wage premiums when facing a working hours restriction. The restriction on working hours, however, prohibits employees from moving freely to other jobs to meet satisfactory working hours. Böheim and Taylor (2004) use British panel data and reach similar conclusions to those conducted in the U.S. They conclude that working time constraints greatly impair employees' benefits by lowering labor mobility. Tijdens (2003) focuses on the banking sector in the Netherlands and investigates employees' opinions on the reduction of working time in different groups. The results indicate that low-income and part-time workers and supervisors tend to be less in favor of the working time cut, while female workers show high enthusiasm for such a reduction. Böheim and Taylor (2004) use the British Household Panel Survey in the U.K. to study connections with subsequent behavior in the labor market. Their evidence demonstrates that most British workers are satisfied with the number of hours they work, even though some are constrained in their labor

supply. The constrained full-time workers tend to be overemployed, while constrained part-time workers are underemployed.

## 3. Theoretical Predictions

### *3.1 The Effect of Working Time Reduction on Labor Supply and Household Work*

The exogenous change in working hours in 1995 provides an excellent opportunity to study how the reduction of working hours affects labor supply, household work, leisure, and physical activities. We propose a theoretical model to investigate the effects of working hour reduction and then provide empirical evidence based on Chinese microdata to test theoretical predictions.

In Chang et al. (2007), the demand side of employment is considered in the discussion of how a reduction in working time affects the demand for newly hired workers and employment stock. The supply side of employment is absent. In our paper, we consider the supply side of employment and discuss how a reduction in working time affects employment in a partial equilibrium model.

Following Chang, et al. (2007), we consider two sectors: the private sector, in which agents can determine their labor supply, and the public sector, in which the labor supply is fixed and determined by labor law. Furthermore, we follow Chang, et al. (2007) and assume that the actual number of working hours in the public sector, $h_{1s}$, is equal to a constant number of working hours, $\bar{h}$, which can be called the legal maximum hours. Agents earn a salary, $w_s$, for their constant labor supply. In the private sector, if the actual number of working hours, $h_{1p}$, is greater than $\bar{h}$, and agents can receive an overtime premium for $h_{1p} - \bar{h}$, such that their labor income equals $w_p h_{1p} + \emptyset w_p (h_{1p} - \bar{h})$, where $w_p$ is the hourly wage rate and $\emptyset$ captures the degree of the overtime premium.

In the private sector, agents can work overtime. Their preference is as follows:

$$U = \max_{(h_{1p}, h_{2p})} \theta_1 lnc_{1p} + \theta_2 ln\left(H - h_{1p} - h_{2p}\right) + \left(1 - \theta_1 - \theta_2\right) lnc_{2p} \tag{1}$$

$$\text{s.t.} \qquad c_{1p} = w_p h_{1p} + \varnothing w_p \left(h_{1p} - \bar{h}\right) \tag{2}$$

$$c_{2p} = h_{2p}^{\gamma} \tag{3}$$

where $c_{1p}$ denotes pure consumption, such as dining in restaurants and buying clothing; $c_{2p}$ denotes the consumption of household production, such as preparing and eating meals at home, or the consumption from the income of a second job; $H$ is the total time endowment; $h_{1p}$ is the labor supply for earning wage income; household production is a concave function of time, $h_{2p}$, with $0 < \gamma < 1$; and $L_p \equiv H - h_{1p} - h_{2p}$ is pure leisure, such as exercising, reading, watching movies, and traveling. Agents may enjoy $h_{2p}$, such as preparing meals at home; however, for simplicity, we consider only the enjoyment of $c_{2p}$ because $h_{2p}$ can be interpreted as a second job performed by agents in addition to the main job. Thus, $h_{2p}^{\gamma}$ is the income from the second job with the hourly wage rate normalized to one, and this income is used for consumption, $c_{2p}$. Substituting equations (2) and (3) into (1) gives

$$U = \theta_1 ln\left(w_p h_{1p} + \varnothing w_p\left(h_{1p} - \bar{h}\right)\right) + \theta_2 ln\left(H - h_{1p} - h_{2p}\right) + \left(1 - \theta_1 - \theta_2\right)\gamma ln h_{2p} \tag{4}$$

F.O.C. with respect to $h_{1p}$ and $h_{2p}$ gives

$$\frac{\left(1+\varnothing\right)\theta_1}{h_{1p} + \varnothing\left(h_{1p} - \bar{h}\right)} - \frac{\theta_2}{H - h_{1p} - h_{2p}} = 0 \tag{5}$$

and

$$-\frac{\theta_2}{H - h_{1p} - h_{2p}} + \frac{\left(1 - \theta_1 - \theta_2\right)\gamma}{h_{2p}} = 0. \tag{6}$$

By (5) and (6), we obtain Lemma 1.

Lemma 1: *The optimal labor supply and time spent on household production are given as follows:*

$$h_{1p}^{*} = \frac{\left(1+\varnothing\right)\theta_1 H + \varnothing\bar{h}\left(\theta_2 + \left(1 - \theta_1 - \theta_2\right)\gamma\right)}{\left(1+\varnothing\right)\left(\theta_1 + \theta_2 + \left(1 - \theta_1 - \theta_2\right)\gamma\right)} \tag{7}$$

$$h_{2p}^{*} = \frac{\left(1 - \theta_1 - \theta_2\right)\gamma\left(H - h_{1p}^{*}\right)}{\theta_2 + \left(1 - \theta_1 - \theta_2\right)\gamma} = \frac{\left(1 - \theta_1 - \theta_2\right)\gamma\left(H + \left(H - \bar{h}\right)\varnothing\right)}{\left(1+\varnothing\right)\left(\theta_1 + \theta_2 + \left(1 - \theta_1 - \theta_2\right)\gamma\right)}. \tag{8}$$

From (2), (3), (7) and (8), we observe that an exogenous change in the legal maximum hours $\bar{h}$ can affect $h_{1p}^{*}$, $h_{2p}^{*}$, $c_{1\mathrm{p}}$ and $c_{2\mathrm{p}}$, respectively. Next, we discuss how it affects each in turn.

Differentiating (7) with respect to $\bar{h}$ gives

$$\frac{\partial h_{1p}^{*}}{\partial \bar{h}} = \frac{\varnothing\left(\theta_2 + \left(1-\theta_1-\theta_2\right)\gamma\right)}{\left(1+\varnothing\right)\left(\theta_1+\theta_2+\left(1-\theta_1-\theta_2\right)\gamma\right)} > 0. \tag{7a}$$

Equation (7a) tells us that as $\bar{h}$ decreases, $h_{1p}^{*}$ also decreases. That is, agents provide less labor supply when the government reduces working days from six to five. Such a finding is consistent with the finding of Chang, et al. (2007) that if firms can determine the amount of overtime worked, employment will decrease as $\bar{h}$ decreases. Equation (7a), however, also shows that the decrease in $h_{1p}^{*}$ depends significantly on parameter values, such as $\theta_1, \theta_2, \gamma, \emptyset$. In particular, the overtime premium, $\emptyset$, is more critical than the other parameters. In the private sector, if the employer pays no or little overtime premium, especially after the reduction in working days, then this working day reduction policy may have little impact on $h_{1p}^{*}$. The result is consistent with Skuterud (2007) who finds that the Quebec policy failed to increase employment as the policy did not require employers to increase wages to compensate workers for lost hours. By contrast, if the government could provide tax credits or subsidies to compensate firms for higher labor costs, as discussed in Lepinteur (2019), significant satisfaction of job and leisure of workers was found in Portugal and France after cutting workweek hours.

In our paper, we assume that a) there are no contracts in the private sector and b) that workers are free to control their hours at a given firm. If a worker was previously working 48 hours and now has a maximum of 40 hours after which he must be paid a premium, the worker and the firm can simply reduce the regular wage in such a way that the worker gets the same weekly salary and works the same hours. The worker will want to work more, but she does not have the flexibility to adjust her hours in this way. If it is impossible to contract on hours and weekly earnings, the firm will still have an incentive to limit the worker's hours by setting the overtime premium, $\emptyset$, to zero or a small value. Taking the logarithm of (7a) and differentiating it with respect to $\gamma$ gives

$$\frac{\partial}{\partial \gamma} ln\left(\frac{\partial h_{1p}^{*}}{\partial \bar{h}}\right) = \frac{\theta_1\left(1-\theta_1-\theta_2\right)}{\left(\theta_2+\left(1-\theta_1-\theta_2\right)\gamma\right)\left(\theta_1+\theta_2+\left(1-\theta_1-\theta_2\right)\gamma\right)} > 0. \tag{7b}$$

Equation (7b) tells us that if the return from household production or the second job is high, i.e., $\gamma$ is large, then $h_{1p}^{*}$ decreases rapidly with $\bar{h}$. This finding implies that the more agents can

benefit from household production or a secondary job, the more they will be likely to reduce their labor supply when the government reduces working days.

Equation (8) tells us that as $\bar{h}$ decreases, $h_{2p}^*$ increases. That is, agents will spend more time working a second job after the working days reduction, as they put more weight on the revenue from the second job, i.e., high $(1-\theta_1-\theta_2)$, or the return from the second job is high, i.e., high $\gamma$. The term $c_{2p}$ can also include consumption from household production. If agents place little weight on it (or even negative weight if they value the second job very highly) or the return is low, the time spent on household production could decrease with lower $\bar{h}$. Overall, $h_{2p}^*$ increases as $\bar{h}$ decreases. Workers in China are more likely to take a second job because the average income in China is still low compared with that in developed countries. Chinese workers may seek a second job while reducing the time spent on household production when they have two-day weekends. Such an analysis has lacked attention in the literature. In the empirical section, we test it explicitly.

By equations (7) and (8), we obtain leisure as follows:

$$L_p = \frac{\theta_2\left(H+\left(H-\bar{h}\right)\varnothing\right)}{\left(1+\varnothing\right)\left(\theta_1+\theta_2+\left(1-\theta_1-\theta_2\right)\gamma\right)}. \tag{9}$$

Equation (9) tells us that as $\bar{h}$ decreases, $L_p$ increases. That is, agents have more leisure time as working days are reduced. The parameter $\theta_2$ captures the substitution effect between consumption and leisure, while the parameter $\emptyset$ captures the income effect. Thus, if agents do not care much about leisure, i.e., $\theta_2$ is low, or if the degree of overtime premium is low, i.e., $\emptyset$ is low, then their leisure may not increase much in response to a decrease in $\bar{h}$.

Substituting (7) in (2) yields

$$c_{1p} = \frac{w_p\theta_1\left(H+\left(H-\bar{h}\right)\varnothing\right)}{\theta_1+\theta_2+\left(1-\theta_1-\theta_2\right)\gamma}. \tag{10}$$

The equation shows that as $\bar{h}$ decreases, $c_{1p}$ increases for a given $w_p$ because the agent's income increases due to overtime premium. The agent can thus consume more. It also implies that after a reduction in working days, labor costs in the private sector increase. To reduce labor costs, employers may reduce wage rates, $w_p$, or working hours, resulting in a negative impact on $c_{1p}$.

The overall effect of the policy, thus, is ambiguous. Equations (3) and (8) show that $c_{2p}$ will increase as $\bar{h}$ decreases because agents may have more time to work at a second job after a reduction in working days.

In the public sector, agents cannot decide their working hours, which are determined by labor law. Their wages are paid at a fixed monthly rate, which remains constant even after changing the policy to extend the weekend from one day to two days.

In the public sector, the agent's preference is the same as in (1), subject to the following budget constraints:

$$c_{1s} = w_s \tag{11}$$

and function $c_{2s}$ is the same as in (3) except that $h_{2p}$ is replaced by $h_{2s}$.
Substituting (11) and (3) in (1) gives

$$U = \theta_1 ln\left(w_s\right) + \theta_2 ln\left(H - \bar{h} - h_{2s}\right) + \left(1 - \theta_1 - \theta_2\right)\gamma \ln(h_{2s}) \tag{12}$$

F.O.C. with respect to $h_{2s}$ gives

$$-\frac{\theta_2}{H - \bar{h} - h_{2s}} + \frac{\left(1 - \theta_1 - \theta_2\right)\gamma}{h_{2s}} = 0. \tag{13}$$

Lemma 2: *The optimal time spent at a second job or on household production satisfies*

$$h_{2s}^{*} = \frac{\left(1 - \theta_1 - \theta_2\right)\gamma}{\theta_2 + \left(1 - \theta_1 - \theta_2\right)\gamma}\left(H - \bar{h}\right). \tag{14}$$

Below, we discuss how an exogenous change in $\bar{h}$ can affect $h_{2s}^{*}$ and $c_{2s}$.

Equation (14) shows that as $\bar{h}$ decreases, $h_{2s}^{*}$ increases. That is, agents will spend more time on household production or a second job. As argued in Jacobson and Ohlsson (2000), policymakers should be able to influence the actual working time to increase employment. In the public sector in China, the government can control working time directly and strictly. As shown by Equation (14), our study confirms the argument in Jacobson and Ohlsson (2000). Equation (3), therefore, shows that the consumption of household production or income from the second job increases accordingly. Similar to $h_{2p}^{*}$, if agents place little weight (or even negative weight) on the consumption from household production or if the return from

household production is low, agents may decrease their $h_{2s}^*$ in response to a reduction in $\bar{h}$. On the contrary, if agents place much weight on the second job, overall, $h_{2s}^*$ increases as $\bar{h}$ decreases.

Since labor supply is determined by the labor law and fixed at a constant level, $\bar{h}$, a decrease in $\bar{h}$ reduces the labor supply of agents who work in the public sector. The labor income, however, is paid at a fixed monthly rate. Consumption $c_{1s}$, therefore, does not change.

By equation (14), we obtain leisure as follows:

$$L_s = \frac{\theta_2}{\theta_2 + (1-\theta_1-\theta_2)\gamma}\left(H - \bar{h}\right). \tag{15}$$

The equation shows that as $\bar{h}$ decreases by the policy change, $L_s$ increases accordingly. The parameter $\theta_2$ captures the substitution effect between consumption $c_{1s}$ and leisure. If agents do not care much about leisure, i.e., $\theta_2$ is small, then their leisure may not increase much in response to a decrease in $\bar{h}$.

### *3.2 Summary of Predictions*

In short, our model predicts that as working hours are reduced: 1) labor supply in both private and public sectors will decline, 2) if agents care more about their household production or a second job, they are more likely to reduce their labor supply, 3) if agents place little weight or even a negative weight on household production, time spent on household production will decrease, and 4) agents will spend more time on a second job after a reduction in working days if they place a high weight on income from the second job.

## 4. Data and Summary Statistics

### *4.1 Work Hours, Jobs, and Time Use Data*

To examine the effects of the Two-Day Weekend Policy, our empirical analysis is based on individual-level longitudinal survey data from the CHNS for the years 1989, 1991, 1993, 1997, 2000, 2004, 2009, and 2011, preceding and following the year in which the policy was established in 1995.[5] The CHNS covers four economic regions that are either provinces or

[5] The CHNS has been conducted for more than two decades in China and is an international collaborative project between the Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute

municipalities in Mainland China, such as Beijing, Shanghai, Shandong, Jiangsu, and Zhejiang in the east; Heilongjiang and Liaoning in the northeast; Henan, Hubei, Hunan, and Guangxi in the center; and Yunnan, Chongqing, Guizhou, and Shaanxi in the west. The survey was designed to examine the effects of health, nutrition, and family planning programs and how individual time is allocated for household work (such as preparing food, washing clothes, and housecleaning); and how the social and economic transformation of Chinese society affects the health and nutritional status of the population.

We use several longitudinal master files from the CHNS: the master ID file, which contains individual characteristics, such as birth date, gender, hukou status, marital status, and previous IDs for people who have lived in multiple households; the income- and job-related files, which cover education, wages, work hours and occupation (primary and secondary), household businesses, subsidies and other income, and household assets; the individual education file, which covers completed years of schooling and the highest level of educational attainment; and the urbanization index file and time use file, which contain hours that individuals spend caring for their home, parents, and children. Then, we link all the data files by a unique personal identification number and obtain longitudinal data for 35,703 individuals over the nine years—with a total of 156,645 observations. Our analysis restricts the sample to individuals aged 16 to 60 who report positive work hours. Annual wages are adjusted for inflation and differential costs of living across provinces by the PPP-adjusted deflator developed by Brandt and Holz (2006).[6] After removing observations with missing values for any of the key variables in the analysis—hours worked per week, time spent on household production activities, and primary/secondary occupations, the final data consist of 21,232 observations in total.[7]

### *4.2 Summary Statistics*

for Nutrition and Health at the Chinese Center for Disease Control and Prevention. The survey adopts a multistage, random cluster process to draw a sample of approximately 7,200 households with over 30,000 individuals in 15 provinces and municipalities that vary substantially in terms of geography, economic development, public resources, and health indicators.

[6]The updated version (extended to 2014) was downloaded from Carsten Holz's website: http://carstenholz.people.ust.hk/SpatialDeflators.html.

[7] We deleted any individual whose hours worked per week were less than 10 or greater than 70 as well as extreme values in the time spent on household production variables, which were less than 0.1% of the total observations. To deal with the outliers commonly reported in wage and income variables, we also winsorized the real wage at the 3rd and 97th percentiles. We conducted a series of sensitivity tests and found the results to be consistent.

Table 1 reports the summary statistics for the main variables of interest. The sample means show that the average age was 36, and 58% were male. The individuals had, on average, 10 years of schooling; 64% were married with a spouse present, and 59% had an urban hukou. Of the worker class, 58% worked for another person or firm as a permanent employee. After adjusting for inflation and differential costs of living across provinces, the mean real annual wage was 9608 RMB, or approximately 800 RMB a month.

[Table 1 about here]

For our main variables of interest, the average hours worked per week was 45.3 over the 1989–2011 period, covering the years before and after 1995 when the government began to implement the Two-Day Weekend Policy. On average, 82% worked in the public sector, in which we expected a stronger effect than in the private sector, where the policy was less binding.[8] The mean probability of our second dependent variable, whether individuals had a second job, was approximately 0.06 with a substantial variation of 0.23 standard deviation.

The third dependent variable is the time allocation of household production. We are interested in how and to what extent the policy affects individuals' time use allocation when work hours are reduced. As the model in Section 3 predicts, people may use the extra time to take on a second job or perform household work. Table 1 shows that the time spent on household production activities, as defined previously, was approximately 543 minutes per week. Among other activities, each week, individuals spent an average of 50 minutes buying food, 256 minutes preparing food, 37 minutes washing clothes, 58 minutes housecleaning, and 143 minutes caring for children.

The lower section of Table 1 reports the information related to the primary occupation. The sample means show that about 20% were in less-skilled occupations compared with 15% in skilled occupations. Approximately 13% were service workers, the third most common occupation. The distribution in other professional occupations was approximately one-third of the observations: senior professional/technical is 7%, junior professional/technical is 8%, administrator/executive/manager is 8%, and office staff is 10%.

[8] The public sector is defined as the type of work unit for a worker's primary occupation, including government, state service/institute, state-owned enterprise, or small or large collective enterprise.

## 5. Estimating Equations and Empirical Results

### *5.1 Difference-in-Differences (DID) Model*

To evaluate the policy effect, we use a DID regression model. Our identification strategy relies on the key assumption of the parallel trend of the DID model that the treatment groups have similar trends to the control groups in the absence of treatment. Figure 2 provides visual evidence of such a trend, showing that the treatment and control groups—defined as full-time wage earners vs. nonwage earners in panel A and public sectors vs. private sectors in panel B—have a common trend in average weekly hours worked prior to the Two-Day Weekend Policy change in 1995. Since then, however, the work hours of the treatment groups dropped markedly, but not the work hours of the control groups.

[Figure 2 about here]

We define our treatment group—individuals who are assumed to have been affected by the Two-Day Weekend Policy—as an indicator function such that

$$\begin{aligned} TREAT_i &= 1 \text{ if works for another person or enterprise as a permanent employee} \\ &= 0 \text{ otherwise,} \end{aligned}$$

where the control group is defined as $TREAT_i = 0$ if any individual reports positive work hours and is either self-employed, an independent operator with no employees, a contractor for other people or enterprises, a temporary worker, or a paid or unpaid family worker. These individuals are supposed to be unaffected by the policy. Analogously, we define $Post_t$ as a binary variable that equals zero in the period before the Two-Day Weekend Policy ($t < 1995$) and one in the post-policy period ($t \geq 1995$).

The estimation equation is specified as follows:

$$Y_{it} = \beta_0 + \beta_1 Treat_i + \beta_2 Treat_i \times Post_t + \eta X_{it} + \sigma_p + \gamma_t + Z_{rt} + Trend_t + \varepsilon_{it}. \quad (16)$$

where $Y_{it}$ denotes the labor supply and household work of individual *i* in year *t*, alternatively measured as the log of hours worked per week of wage earners or log of hours worked per week of workers in the public sector, whether the worker has a second job, and minutes per week spent on household production activities. The matrix *X* represents individual-level controls, including

log income, gender, years of schooling, age, age squared, marital status, Hukou status (household registration), a set of dummy variables for occupations, and an urbanization economic component index to control for differing economic development across localities. We additionally include province fixed effects, $\sigma_p$, to capture time-invariant unobserved heterogeneity on the level of province $p$, and year fixed-effects, $\gamma_t$, to control for unobserved factors that are time-varying but constant across entities. $\varepsilon_{it}$ is the idiosyncratic error term. To compare with the most basic DID model, we further include region-year fixed effects $Z_{rt}$ to control for unobserved time-varying region-specific factors and province-specific linear time trends $Trend_t$ to relax the common time trend assumption. The OLS estimate of the coefficient $\beta_2$ of the interaction term—$Treat_i \times Post_t$—captures the policy effect on labor supply, household work, and leisure activities.

### *5.2 Effects on Household Work and Having a Second Job*

Table 2 reports the DID estimates of the interaction term $\beta_2$—the Two-Day Weekend Policy effect on labor supply and household production. Each regression, particularly that in Model (1), contains a set of individual controls, as discussed in Section 4. To address unobserved omitted variables that could potentially bias our results, Model (2) includes province and year fixed-effects, and Models (3) and (4) additionally control for region-year fixed-effects and province-specific linear time trends. All standard errors are clustered at the household level.

[Table 2 about here]

Panel A of Table 2 presents the policy effect on hours worked per week for wage earners who worked for an enterprise or another person as permanent employees. The log-linear specifications in all four models show that the policy resulted in a 4.4 to 4.8% reduction in hours worked per week, where all estimated effects are statistically significant at the 1% level. For an average of 45.3 hours per week in our sample, the empirical results imply an approximate reduction of two working hours per week. Panel B examines the effects on workers in the public sector, and the results consistently indicate a statistically significant 5.1 to 5.4% reduction in working hours per week. The estimated coefficients are larger than those in panel A, which shows that the policy is more binding in the public sector than in the private sector.

Since the policy reduces work hours, we are interested in understanding the tradeoff regarding whether, in the Chinese context, workers are more likely to allocate the reduced work hours to take on a second job or to spend the time on household work. Panels C and D of Table 2 report the effects of working time reduction on having a second job and household production, respectively. Panel C shows that, on average, workers were 3 percentage points more likely to have a second job after the Two-Day Weekend Policy was implemented. By contrast, individuals reduced their time on household work by approximately 98 to 107 minutes per week, depending on the model specifications. The estimated coefficients in all specifications are statistically significant at the 1% level, showing that the policy encouraged Chinese workers to use the hours freed by not working on Saturdays to engage in a second job rather than participating in more household production activities.

### *5.3 Effects on Household Work by Category*

In the last section, the empirical results show that the Two-Day Weekend Policy resulted in a reduction in the number of hours workers spent on household work. Thanks to the detailed information available from the CHNS data, we are able to further examine the reduction of time spent on household work by category—buying food, preparing food, washing clothes, house cleaning, and caring for children.[9]

Table 3 reports the policy effect estimates with a full set of worker controls and fixed effects as well as province linear time trends. The results show that after the policy was implemented, workers tended to reduce their time spent buying food by approximately 21 minutes per week, preparing food by 47 minutes per week, and washing clothes by 16 minutes per week, and increased their time spent on housecleaning by 13 minutes per week. These estimates are statistically significant at the 1% or 5% level, depending on the category. In contrast, the time spent caring for children was reduced by 26 minutes per week, but the estimate was not statistically significant.

[Table 3 about here]

[9] The CHNS also provides time allocation information for caring for elderly parents. The number of observations in this category, however, was too small to obtain reliable estimates. We thus decided not to include it in our analysis.

In sum, the outcome is consistent with the finding that Chinese workers responded to the workweek reduction policy by taking on a second job while reducing their time spent on household work, such as buying food, preparing food, washing clothes, and caring for children (though the last reduction is not significant). The explanation for the increased time spent on housecleaning could be that such household work is performed less frequently and can be completed all at once during the extended weekend as a result of the Two-Day-Weekend Policy.

### *5.4 Effects on Physical and Sedentary Activities*

How did Chinese workers use the time on leisure activities after gaining extra hours from the Two-Day Weekend Policy? We analyze the policy effect by two broad categories: 1. physical activities—martial arts, gymnastics, dancing, and acrobatics, running and swimming, soccer, basketball, and tennis, badminton and volleyball, Ping Pong and Taichi; 2. sedentary activities—watching TV, watching videos (VCR, VCD, DVD), watching movies, playing video games, surfing the internet, joining chatrooms, playing computer games, reading, writing, painting, and other sedentary activities.[10]

[Figure 3 about here]

We present the results by plotting the policy effect estimates in Figure 3, in which range bars and horizontal lines represent 90 and 95% confidence intervals, respectively. In physical activities, we find no change in martial arts and a one-percentage-point increase in gymnastics, dancing, and acrobatics, but the change is not significant. We also find no effects on running and swimming, soccer, basketball, and tennis, badminton and volleyball. In contrast, there is a significant three percentage-point reduction in playing Ping Pong and practicing Taichi. Furthermore in sedentary activities, we find no changes in watching TV, videos, and movies, but Chinese workers significantly increased their time spent playing video games by two percentage

[10] In addition to leisure activities, we analyze the policy effect on the most important personal care activity—sleeping—and find no effects. Unfortunately, the CHNS does not have questions on other personal care activities, such as eating or having sex. We instead probe into the effect on sleep hours of men and women and show the results in Figure 4. Yet again, the results show that men slept 0.1 hour less and women 0.2 hour more, but neither effect is significant.

points, playing computer games by seven percentage points, and surfing the internet by eight percentage points.[11]

### *5.5 Effects on Wages*

Our results show that the Two-Day Weekend Policy significantly reduced Chinese workers' work hours. Were workers' wages affected as the result of the policy change? We present the wage effect by male and female workers in Figure 5, which shows that the wages of male and female wage earners significantly increased by 42% and 53%, respectively. Likewise, a substantial but relatively smaller effect is found in the public sector for male (30%) and female workers (36%).

The large positive wage effect could be partly attributable to Chinese workers becoming more productive—the Two-Day Weekend Policy helped balance the work-life time allocation, which improves worker efficiency. Another interpretation could also be the consequence of massive layoffs resulting from the reform of SOEs, which we discuss in the subsequent section.

[Figure 5 about here]

### *5.6 Effects on Women and Men*

Understanding gender differences in time use matters because it helps to understand how men and women view and treat each other and to understand whether the difference is the consequence of fundamental biological differences, the traditional culture rooted in society, or technological and incentive changes (Hamermesh, 2019). It also helps predict the roles that men and women will play and how they will develop in the coming decades, which is particularly important for the largest developing country in the world.

[Figure 6 and Figure 7about here]

Figure 6 plots the gender effect on work hours and having a second job and Figure 7 shows the effect on household production activities. We find that male wage earners in both sectors of the economy and workers in the public sector significantly reduced work hours, while female

[11] Although we find two and five percentage-point increases in joining chatrooms and other sedentary activities, the effects are not statistically significant. In addition, Chinese workers spent three percentage points less time on reading, writing, and painting, but yet again, these changes are statistically insignificant.

wage earners also reduced work hours, but not those in the public sector. We also find that the policy change tends to increase the likelihood of having a second job for men by four percentage points but has no effect for women—such a finding is consistent with the Chinese culture. For household production activities, the total effect is larger for women than for men. Among the activities, women reduced their time spent buying food by 26 minutes per week, washing clothes by 19 minutes per week, taking care of young children by 65 minutes per week, and taking care of older parents by about one minute, while increasing the time spent cleaning the house by 18 minutes per week.[12] Comparatively, men reduced the time spent per week buying food by 18 minutes per week, washing clothes by 12 minutes per week, and taking care of older parents by two minutes and young children by three minutes per week. In particular, men substantially reduced the time spent preparing food by 68 minutes but only increased the time spent cleaning the house by eight minutes per week.

[Figure 8 about here]

For leisure activities shown in Figure 8, we find that most of the effects come from men—the time spent on Ping Pong and Taichi was reduced by 4 percentage points, while that of playing video games increased by three percentage points, surfing the internet increased by eight percentage points, and playing computer games increased by seven percentage points. In contrast, the policy has no significant effects on women's physical activities and only has an impact on sedentary activities by increasing the time spent playing computer games by seven percentage points.

## 6. Robustness of Empirical Results

### *6.1 Causal Inference: Anticipatory and Post-Treatment Effect*

The key identifying assumption in a DID model is that the treated group has a similar trend to the control group in the absence of treatment. In the spirit of Granger (1969) in terms of testing for causality, we assess the common trend assumption by estimating the following equation used in Autor (2003) and Angrist and Pischke (2009):

[12] The policy has a small and negligible effect on taking care of older parents. Women spent 12 minutes less preparing food per week, but the effect is insignificant.

$$Y_{it} = \underbrace{\sum_{\tau=1}^{m} \beta_{-\tau} D_{it-\tau}}_{\text{Post-treatment effects}} + \beta_0 D_{it} + \underbrace{\sum_{\tau=1}^{q} \beta_{+\tau} D_{it+\tau}}_{\text{Anticipatory effects}} + \mathbf{X}'_{it}\eta + \sigma_r + \gamma_t + \varepsilon_{it}, \quad (17)$$

where $D_{it}$ is the product of the time and treatment dummy indicators and $\tau$ is the time. Equation (18) is an outcome equation of the contemporaneous treatment with leads and lags. The coefficients $\beta_{-\tau}$ measure the impact of the treatment delivered at time *t* that affects the outcome at time $t + \tau$; if $\beta_{-\tau} \neq 0$, the current treatment at time *t* has a lagged impact (post-treatment effects) on the future outcome at time $t + \tau$. Likewise, $\beta_{+\tau}$ measure the impact of the treatment delivered at time *t* that affects the outcome at time $t - \tau$; if $\beta_{+\tau} \neq 0$, the current treatment at time *t* has an impact (anticipatory effects) on the past outcome at time $t - \tau$.[13]

Granger causality tests whether the past $D_{it}$ predicts $Y_{it}$, while the future $D_{it}$ does not (Angrist and Pischke, 2009). Hence, under the assumption of no anticipatory effect, $D_{it}$ causes $Y_{it}$ and $\beta_{+j} = 0$ for $j = 1, \ldots, J$, we can test the joint hypotheses $H_0: \beta_{+1} = \beta_{+2} = \ldots = \beta_{+J} = 0$. Rejecting $H_0$ invalidates the causal interpretation of the estimates.[14]

Table 4 shows the results of estimating Equation (18) for wage earners and the public sector, with all models using clustered standard errors at the household level. Model 1 (columns 1 and 3) includes province and year fixed effects, while Model 2 (columns 2 and 4) additionally controls for province-specific linear time trends to relax the common time trend assumption of the most basic DID model. The estimated coefficients from three time periods to one time period before the Two-Day Weekend Policy are statistically insignificant, showing no anticipatory effects on work hours. Then the coefficients begin to show sharp declines at time *t+1*: after the year of intervention in 1995. Furthermore, we do not reject the joint null hypotheses for wage earners and the public sector (at the 5% level for Model 1).

[Table 4 and Figure 9 about here]

Figure 9 provides visual evidence of such a trend by plotting the estimates taken from columns 1 and 3 of Table 4. The pattern of the coefficients seems consistent with our baseline DD estimates and provides causal interpretations that the Two-Day Weekend Policy led to the

[13] If $\beta_0 \neq 0$, current treatment at time *t* affects the current outcome at time *t* (contemporaneous effects).
[14] Note that Granger causality tests whether causes happen before consequences and not vice versa. Not rejecting $H_0$ implies only a necessary condition for the parallel trend assumption to hold.

changes in work hours, having a second job, household production, and leisure activities, rather than vice versa.

### *6.2 Placebo Tests: Hypothetical Policy Change Years*

To examine whether the impact on labor supply and household work is attributable to the 1995 Two-Day Weekend Policy or other concurrent events, we check the robustness of our results by using the same data in two different hypothetical policy years—some years before or after 1995—by falsely assuming that the Two-Day Weekend Policy was implemented in 1992 or 1998 instead of in 1995. If our previous findings for 1995 are true, we should not observe any estimated effect in 1992 or 1998.

Table 5 shows the estimated hours of work per week for wage earners in both sectors, workers in the public sector, whether a worker has a second job, and time spent on household production for the hypothetical year 1992 in panel A and the other hypothetical year 1998 in panel B. The estimation model in each group contains a full set of worker controls, while the second specification includes province and year fixed-effects, region-year fixed-effects, and province linear time trends to control for unobserved factors that could contaminate our results. The estimates in panel A show that when we falsely assume that the policy was implemented in 1992, the DID estimates using the actual data show no effects on labor supply and household production. Likewise, if we falsely assume that the policy was implemented in 1998, again we find no significant effects on labor supply and household work in the model with the full set of specifications.[15]

[Table 5 about here]

Taken together the results of testing false policy years and anticipatory effects indicate that our findings from the baseline estimates are robust. The policy impacts on labor supply and household production are indeed attributable to the Two-Day Weekend Policy that was implemented in 1995. The Two-Day Weekend Policy has a direct impact on labor supply and

[15] The estimate without controlling fixed effects and time trend for the public sector in Panel B is marginally significant at the 10% level. Our preferred results, however, are those controlling for unobserved heterogeneity that could potentially bias our outcomes.

household work, and with this additional test, we show that the effects are unlikely to have been caused by other events or policies that may affect our outcome variables.

### *6.3 Using Matched Samples to Assess the Bias from Compositional Change*

Some researchers have voiced concerns about the comparability of the treatment and control groups as well as the selection of unobservable factors in a standard DID model setting. If such concerns were true in our case, they would make our results inconsistent and biased. We follow the approach proposed by Heckman et al. (1997) and Blundell and Dias (2009) who first used a kernel-based propensity score matching technique to obtain treatment and control groups that are comparable in terms of observed individual characteristics. Once the potential selection bias has been removed, we then implement a DID regression approach to estimate the effects of the introduction of the Two-Day Weekend Policy on labor supply and household work.

As suggested in Caliendo and Kopeinig (2008), we choose matching algorithms that include both parametric and nonparametric matching estimators and determine the region of common support. The matching estimators include kernel matching, radius matching (Dehejia and Wahba, 2002), nearest-neighbor matching, and Mahalanobis matching.[16] Subsequently, we evaluate the matching quality by calculating the standardized bias proposed by Rosenbaum and Rubin (1985), which assesses the distance in marginal distributions of the covariates $X$ variables as well as the distributions of the propensity scores of treated and untreated individuals who are in the range of common support. The approach has been used in many studies, such as Lechner (1999), Sianesi (2004), and Caliendo et al. (2008).

[Table 6 about here]

Table 6 shows the results of the matched samples that combine four different matching algorithms with DID regression analysis. We estimate the effects of the introduction of the Two-Day Weekend Policy for hours per week for wage earners in both sectors, and workers in the

[16] For nearest neighbor matching, we implemented 1-1, 2-1, 3-1, 4-1, and 5-1 nearest neighbor matching with replacement, and the results are qualitatively consistent. We report the 3-1 NN matching outcomes in the paper. For the radius and Mahalanobis matchings, we use a range of calipers (propensity range) from 0.01 to 0.5 standard deviation, and we report the results using 0.2 standard deviations, as suggested in Wang et al. (2013). Likewise, for kernel matching, we carried out the algorithm with a full range of bandwidths and report the outcome of 0.2 bandwidth in the paper since other results are qualitatively the same. We report selected other matching results in Appendix Figure 1, and all results are available upon request.

public sector, whether a worker has a second job, and time spent on household production, with full sets of worker controls, fixed effects, and province time trends. The same patterns of policy effects persist for the kernel and radius matchings in Table 6, where the estimates are for wage earners, and workers in the public sector are negative and significant at the 5% level, once again indicating that the introduction of the Two-Day Weekend Policy reduced work hours by 2–3.5% for wage earners and by 3−4% in the public sector. The results that show an increase of three percentage points in having a second job and a decrease of 102–120 minutes per week in time spent on household production are consistent with our baseline estimates in Section 5.

For nearest neighbor matching, although the coefficients are insignificant in the public sector, the figures are in line with the previous results.[17] We assess the matching quality by showing the standardized bias and distributions of untreated and treated individuals on and off the common support in Appendix Figure 2. The graphs consistently indicate that the bias is substantially reduced after matching and also signal that the distributions of propensity scores in treated and untreated groups overlap well in the range of common support. In short, since the treatment and control groups are much more similar after matching, our findings remain robust and consistent after removing the potential selection bias.

### *6.4 Effects from the Reform of State-Owned Enterprises in the 1990s*

The Two-Day Weekend Policy was implemented in 1995, which is around the same time when China started the SOE reform that created massive layoffs—millions of workers were removed from their positions. Our research spans the years between 1990 and the early 2000s, and the SOE reform peaked during the second half of the 1990s, which could potentially contaminate our results. To reduce the concern, we use a selected sample in which individuals never changed their jobs throughout the period.

[Table 7 about here]

[17] Note that Mahalanobis matching shows insignificant results for having a second job and engaging in household production and relative larger and significant coefficients for wage earners and the public sector. The Mahalanobis matching may not perform well when the covariates are not normally distributed or when there are many covariates (Gu and Rosenbaum, 1993) as in our paper. Rubin (1979) and Zhao (2004) show that Mahalanobis distance can work quite well when there are relatively few covariates, for example, fewer than 8.

Table 7 reports the policy effect estimates from the selected sample by four model specifications. Consistent with our baseline outcomes in Section 5, the Two-Day Weekend Policy significantly reduced work hours per week by 4% for wage earners, increased the relative likelihood of taking on a second job by three percentage points, and decreased the time spent on household production by 171–182 minutes per week. The results in Table 7, therefore, support our main findings.

## 7. Concluding Remarks

In the paper, we construct a theoretical model to examine the effects of changes in working time policy on the supply side of employment, in contrast to Chang, et al. (2007) who focus on the demand side of employment in response to the working time reduction policy. The theory complements Chang, et al. (2007) and we present an analysis regarding the impact of the working time reduction on labor supply and household production, physical and leisure activities, and the probability of having a second job in both private and public sectors.

We contribute to the literature by testing the theoretical predictions and taking advantage of the CHNS dataset, which contains primary and secondary job-related variables and detailed information from respondents regarding time allocation, such as time spent on household production activities, including buying and preparing food, washing clothes, house cleaning, and caring for elderly parents and children. Such information is essential to disentangle the effects of the Two-Day Weekend Policy on working hours, the probability of having a second job, and time spent on household production, personal care, and physical and leisure activities. We argue that such a policy change creates a tradeoff between income and substitution effects, resulting in an ambiguous overall effect that is an empirical question.

We find that the Two-Day Weekend Policy in 1995 consistently and significantly reduced hours of work in both the public and private sectors and across different model specifications. Surprisingly, the policy change also significantly reduced the time spent on household production (buying food, preparing food, and washing clothes) with one notable exception – the time spent on the less frequent task of housecleaning increased. In contrast to Western countries, Chinese workers reduced their time spent on physical activities such as Ping Pong and Taichi but increased the time on sedentary activities such as playing video, and computer games and surfing the internet.

We contend that such decreases in time spent on household production and physical activities can be explained by the significant increase among Chinese workers in holding a second job and increase in the time on sedentary activities after the policy change, which is consistent with the stage of Chinese economic development in which Chinese workers place a higher value on labor earnings than on other tasks of their lives, such as household production and work-life balance. Future research should replicate this study by looking into the effects of subsequent changes in working time policy in China.

## References


**Alesina, Alberto; Edward Glaeser and Bruce Sacerdote.** 2005. "Work and Leisure in the United States and Europe: Why So Different?" *NBER Macroeconomics Annual*, 20, 1-64.

**Altonji, Joseph G. and Christina H. Paxson.** 1988. "Labor Supply Preferences, Hours Constraints, and Hours-Wage Trade-Offs." *Journal of Labor Economics*, 6(2), 254-76.

**Angrist, Joshua David and Jörn-Steffen Pischke.** 2009. *Mostly Harmless Econometrics : An Empiricist's Companion*. Princeton: Princeton University Press.

**Autor, David H. .** 2003. "Outsourcing at Will: The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcing." *Journal of Labor Economics*, 21(1), 1-42.

**Blundell, Richard and Monica Costa Dias.** 2009. "Alternative Approaches to Evaluation in Empirical Microeconomics." *The Journal of Human Resources*, 44(3), 565-640.

**Böheim, René and Mark P. Taylor.** 2004. "Actual and Preferred Working Hours." *British Journal of Industrial Relations*, 42(1), 149-66.

**Booth, Alison and Martin Ravallion.** 1993. "Employment and Length of the Working Week in a Unionized Economy in Which Hours of Work Influence Productivity*." *Economic Record*, 69(4), 428-36.

**Booth, Alison and Fabio Schiantarelli.** 1987. "The Employment Effects of a Shorter Working Week." *Economica*, 54(214), 237-48.

**Brandt, Loren and Carsten A. Holz.** 2006. "Spatial Price Differences in China: Estimates and Implications." *Economic Development and Cultural Change*, 55(1), 43-86.

**Caliendo, Marco; Reinhard Hujer and Stephan L. Thomsen.** 2008. "The Employment Effects of Job-Creation Schemes in Germany: A Microeconometric Evaluation," R. C. H. Tom Fomby, Daniel L. Millimet, Jeffrey A. Smith, Edward J. Vytlacil, *Modelling and Evaluating Treatment Effects in Econometrics.* Emerald Group Publishing Limited, 381-428.

**Caliendo, Marco and Sabine Kopeinig.** 2008. "Some Practical Guidance for the Implementation of Propensity Score Matching." *Journal of Economic Surveys*, 22(1), 31-72.

**Calmfors, Lars.** 1985. "Work Sharing, Employment and Wages." *European Economic Review*, 27(3), 293-309.

**Chang, Juin-jen; Chun-chieh Huang and Ching-chong Lai.** 2007. "Working Hours Reduction and Wage Contracting Style in a Dynamic Model with Labor Adjustment Costs." *Journal of Economic Dynamics and Control*, 31(3), 971-93.

**Crépon, Bruno and Francis Kramarz.** 2002. "Employed 40 Hours or Not Employed 39: Lessons from the 1982 Mandatory Reduction of the Workweek." *Journal of Political Economy*, 110(6), 1355-89.

**Dehejia, Rajeev H. and Sadek Wahba.** 2002. "Propensity Score-Matching Methods for Nonexperimental Causal Studies." *The Review of Economics and Statistics*, 84(1), 151-61.

**Freeman, Richard.** 1998. "Work-Sharing to Full Employment: Serious Option or Populist Fallacy?," *Generating Jobs: How to Increase Demand for Less-Skilled Workers.* NY: Russell Sage Foundation, Chapter 6.

**Freeman, Richard B.; Ronald Schettkat; Esther Duflo and Tullio Jappelli.** 2005. "Marketization of Household Production and the Eu-Us Gap in Work." *Economic Policy*, 20(41), 7-50.

**Geng, Bing.** 2021. "Worktime Regulation and Unemployment: Evidence from Eight Hours Worktime Reduction in China," *2021 The 5th International Conference on E-Commerce, E-Business and E-Government.* Rome, Italy: Association for Computing Machinery, 129–40.

**Goux, Dominique; Eric Maurin and Barbara Petrongolo.** 2014. "Worktime Regulations and Spousal Labor Supply." *American Economic Review*, 104(1), 252-76.

**Granger, C. W. J.** 1969. "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods." *Econometrica*, 37(3), 424-38.

**Gu, Xing Sam and Paul R. Rosenbaum.** 1993. "Comparison of Multivariate Matching Methods: Structures, Distances, and Algorithms." *Journal of Computational and Graphical Statistics*, 2(4), 405-20.

**Hamermesh, Daniel S.** 2019. *Spending Time: The Most Valuable Resource*. New York: Oxford University Press.

**Hart, Robert.** 1987. *Working Time and Employment*. London: Routledge.

**Heckman, James J.; Hidehiko Ichimura and Petra E. Todd.** 1997. "Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme." *The Review of Economic Studies*, 64(4), 605-54.

**Hoel, Michael.** 1986. "Employment and Allocation Effects of Reducing the Length of the Workday." *Economica*, 53(209), 75-85.

**Hoel, Michael and Bent Vale.** 1986. "Effects on Unemployment of Reduced Working Time in an Economy Where Firms Set Wages." *European Economic Review*, 30(5), 1097-104.

**Hunt, Jennifer.** 1999. "Has Work-Sharing Worked in Germany?" *The Quarterly Journal of Economics*, 114(1), 117-48.

**Jacobson, Tor and Henry Ohlsson.** 2000. "Working Time, Employment, and Work Sharing: Evidence from Sweden." *Empirical Economics*, 25(1), 169-87.

**Lechner, Michael.** 1999. "Earnings and Employment Effects of Continuous Off-the-Job Training in East Germany after Unification." *Journal of Business & Economic Statistics*, 17(1), 74-90.

**Lepinteur, Anthony.** 2019. "The Shorter Workweek and Worker Wellbeing: Evidence from Portugal and France." *Labour Economics*, 58, 204-20.

**Lin, Chung-Cheng and C. C. Yang.** 2003. "A Labor-Adverse Selection Model of Reducing Working Time." *Journal of Post Keynesian Economics*, 25(3), 515-24.

**Ma, Yueyuan and Xinzheng Shi.** 2020. "Are Spousal Labor Supplies Substitutes? Evidence from the Workweek Reduction Policy in China." *Journal of Development Economics*, 145, 102472.

**Marimon, Ramon and Fabrizio Zilibotti.** 2000. "Employment and Distributional Effects of Restricting Working Time." *European Economic Review*, 44(7), 1291-326.

**Martinez-Granado, Maite.** 2005. "Testing Labour Supply and Hours Constraints." *Labour Economics*, 12(3), 321-43.

**Ngok, Kinglun.** 2008. "The Changes of Chinese Labor Policy and Labor Legislation in the Context of Market Transition." *International Labor and Working-Class History*, (73), 45-64.

**Raposo, Pedro S. and Jan C. Van Ours.** 2010. "How a Reduction of Standard Working Hours Affects Employment Dynamics." *De Economist*, 158(2), 193-207.

**Rosenbaum, Paul R. and Donald B. Rubin.** 1985. "Constructing a Control Group Using Multivariate Matched Sampling Methods That Incorporate the Propensity Score." *The American Statistician*, 39(1), 33-38.

**Rubin, Donald B.** 1979. "Using Multivariate Matched Sampling and Regression Adjustment to Control Bias in Observational Studies." *Journal of the American Statistical Association*, 74(366), 318-28.

**Scott, Peter and Anna Spadavecchia.** 2011. "Did the 48-Hour Week Damage Britain's Industrial Competitiveness?" *The Economic History Review*, 64(4), 1266-88.

**Sianesi, Barbara.** 2004. "An Evaluation of the Swedish System of Active Labor Market Programs in the 1990s." *The Review of Economics and Statistics*, 86(1), 133-55.

**Skuterud, Mikal.** 2007. "Identifying the Potential of Work‐ Sharing as a Job‐ Creation Strategy." *Journal of Labor Economics*, 25(2), 265-87.

**Tijdens, Kea, G.** 2003. "Employees' and Employers' Preferences for Working Time Reduction and Working Time Differentiation: A Study of the 36-Hour Working Week in the Dutch Banking Sector." *Acta Sociologica*, 46(1), 69-82.

**Wang, Yongji; Hongwei Cai; Chanjuan Li; Zhiwei Jiang; Ling Wang; Jiugang Song and Jielai Xia.** 2013. "Optimal Caliper Width for Propensity Score Matching of Three Treatment Groups: A Monte Carlo Study." *PloS one*, 8(12), e81045-e45.

**Zhao, Zhong.** 2004. "Using Matching to Estimate Treatment Effects: Data Requirements, Matching Metrics, and Monte Carlo Evidence." *The Review of Economics and Statistics*, 86(1), 91-107.

Table 1 Summary Statistics, 1989–2011

| Variable | Mean | S.D. | Min. | Max. |
|---|---|---|---|---|
| Age | 36.01 | 10.68 | 16 | 60 |
| Male | 0.58 | 0.49 | 0 | 1 |
| Years of schooling | 9.96 | 3.70 | 0 | 18 |
| Married with spouse present | 0.64 | 0.48 | 0 | 1 |
| Urban hukou | 0.59 | 0.49 | 0 | 1 |
| Works for another person or enterprise as a permanent employee | 0.58 | 0.49 | 0 | 1 |
| Annual wage (real, RMB) | 9608.06 | 9344.33 | 555.62 | 47541.30 |
| Hours worked per week | 45.30 | 11.24 | 10 | 70 |
| Public sector | 0.82 | 0.39 | 0 | 1 |
| Has a second job | 0.06 | 0.23 | 0 | 1 |
| Time spent on household production (minutes per week) | 543.35 | 913.71 | 7 | 7980 |
| Buying food | 49.82 | 168.25 | 10 | 2100 |
| Preparing food | 256.08 | 566.97 | 7 | 4200 |
| Washing clothes | 37.00 | 87.54 | 10 | 960 |
| Housecleaning | 57.71 | 124.22 | 7 | 2100 |
| Caring for children | 142.74 | 577.73 | 7 | 4600 |
| Primary occupation (%) | | | | |
| Senior professional/technical | 6.92 | Army officer, police officer | | 0.29 |
| Junior professional/technical | 7.85 | Ordinary soldier, policeman | | 0.70 |
| Administrator/executive/manager | 7.98 | Driver | | 3.27 |
| Office staff | 9.99 | Service worker | | 13.27 |
| Farmer, fisherman, hunter | 11.59 | Athlete, actor, musician | | 0.38 |
| Skilled worker | 14.73 | Other | | 3.22 |
| Nonskilled worker | 19.80 | | | |

Note: The number of observations is 21,232. Wages have been adjusted for inflation (2000 base year) and the differing living costs among provinces accounted for by applying the PPP-adjusted deflator developed by Brandt and Holz (2006).

Table 2 Difference-in-Differences Estimates of the Two-Day Weekend Policy

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| A. Dependent variable: Hours per week for wage earners in both private and public sectors (log) | | | | |
| Policy effects | -0.048*** | -0.045*** | -0.044*** | -0.044*** |
| | (0.011) | (0.011) | (0.011) | (0.011) |
| *N* | 21232 | 21232 | 21232 | 21232 |
| Adj. $R^2$ | 0.048 | 0.060 | 0.062 | 0.062 |
| B. Dependent variable: Hours per week for workers in the public sector (log) | | | | |
| Policy effects | -0.054*** | -0.051*** | -0.052*** | -0.052*** |
| | (0.017) | (0.017) | (0.017) | (0.017) |
| *N* | 21232 | 21232 | 21232 | 21232 |
| Adj. $R^2$ | 0.048 | 0.063 | 0.063 | 0.063 |
| C. Dependent variable: Has a second job (dummy) | | | | |
| Policy effects | 0.027*** | 0.028*** | 0.028*** | 0.027*** |
| | (0.008) | (0.008) | (0.008) | (0.008) |
| *N* | 21232 | 21232 | 21232 | 21232 |
| Adj. $R^2$ | 0.082 | 0.088 | 0.088 | 0.088 |
| D. Dependent variable: Minutes per week for household production activities (level) | | | | |
| Policy effect | -107.398*** | -106.454*** | -99.304*** | -97.687*** |
| | (29.036) | (28.998) | (29.089) | (29.093) |
| *N* | 21232 | 21232 | 21232 | 21232 |
| Adj. $R^2$ | 0.099 | 0.100 | 0.100 | 0.100 |
| Province & year fixed effects | No | Yes | Yes | Yes |
| Region × year fixed effects | No | No | Yes | Yes |
| Province linear time trend | No | No | No | Yes |

Note: Policy effects are the estimated coefficients of the Post × Treat interaction term. Each regression includes a full set of individual characteristics. Clustered standard errors at the household level are in parentheses. Treat is a dummy that equals one if the individual works for another person or enterprise as a permanent employee and zero otherwise. Post is a dummy that equals one if the year is after 1995 and zero otherwise. * p<0.10, ** p<0.05, *** p<0.01.

Table 3 Difference-in-Differences Estimates of the Two-Day Weekend Policy on Household Work by Category

| Dependent variable: minutes per week (level) | Buying food | Preparing food | Washing clothes | House cleaning | Caring for children |
|---|---|---|---|---|---|
| Policy effects | -20.892*** | -47.340** | -15.903*** | 12.699*** | -26.252 |
| | (5.585) | (18.485) | (3.013) | (3.054) | (19.020) |
| Province & year fixed effects | Yes | Yes | Yes | Yes | Yes |
| Region × year fixed effects | Yes | Yes | Yes | Yes | Yes |
| Province linear time trend | Yes | Yes | Yes | Yes | Yes |
| *N* | 21232 | 21232 | 21232 | 21232 | 21232 |
| Adj. $R^2$ | 0.043 | 0.079 | 0.158 | 0.196 | 0.020 |

Note: Policy effects are the estimated coefficients of the Post × Treat interaction term. Each regression includes a full set of individual characteristics and year fixed-effects. Clustered standard errors at the household level are in parentheses. Treat is a dummy that equals one if the individual works for another person or enterprise as a permanent employee and zero otherwise. Post is a dummy that equals one if the year is after 1995 and zero otherwise.

* p<0.10, ** p<0.05, *** p<0.01.

Table 4 Dynamics of the Two-Day Weekend Policy Effects

| Dependent variables | Hours per week for wage earners in both private and public sectors (log) | | Hours per week for workers in the public sector (log) | |
|---|---|---|---|---|
| | (1) | (2) | (1) | (2) |
| Leads (anticipatory effect) | | | | |
| *Policy change*$_{t+3}$ | 0.041 | 0.358 | 0.032 | 0.659 |
| | (0.423) | (0.498) | (0.474) | (0.549) |
| *Policy change*$_{t+2}$ | -0.320 | -0.210 | -0.040 | -0.063 |
| | (0.385) | (0.399) | (0.424) | (0.436) |
| *Policy change*$_{t+1}$ | 0.211 | 0.167 | 0.641 | 0.570 |
| | (0.355) | (0.356) | (0.388) | (0.390) |
| Lags (post-treatment effects) | | | | |
| *Policy change*$_{t-1}$ | -1.294*** | -1.444*** | -0.884** | -1.077*** |
| | (0.337) | (0.349) | (0.361) | (0.379) |
| *Policy change*$_{t-2}$ | -1.392*** | -1.584*** | -1.037*** | -1.280*** |
| | (0.316) | (0.341) | (0.333) | (0.366) |
| *Policy change*$_{t-3}$ | -1.114*** | -1.289*** | -0.823*** | -1.044*** |
| | (0.290) | (0.319) | (0.297) | (0.336) |
| $H_0$: *Policy change*$_{(t+1,t+3)}$ = 0 | 1.20 | 1.31 | 2.22 | 2.08 |
| | [0.307] | [0.268] | [0.083] | [0.101] |
| Province & year fixed effects | Yes | Yes | Yes | Yes |
| Province linear time trend | No | Yes | No | Yes |
| *N* | 21250 | 21250 | 17377 | 17377 |
| Adj. $R^2$ | 0.074 | 0.074 | 0.080 | 0.080 |

Note: Clustered standard errors at the household level are in parentheses. F statistics are in the table for the joint hypothesis $H_0$: *Policy change*$_{(t+1,t+3)}$ = 0 and p-values are in brackets.
** p<0.05, *** p<0.01.

Table 5 Placebo Test: Hypothetical Policy Change Year

| Dependent variables | Hours per week for wage earners in both private and public sectors (log) | | Hours per week for workers in the public sector (log) | | Has a second job (dummy) | | Minutes per week for household production activities (level) | |
|---|---|---|---|---|---|---|---|---|
| | A. Hypothetical policy change year in 1992 | | | | | | | |
| Policy effects | 0.391 | 0.399 | 1.546 | 1.494 | 0.182 | -0.054 | -73.675 | -80.105 |
| | (0.611) | (0.610) | (1.168) | (1.169) | (0.664) | (0.780) | (48.626) | (48.943) |
| *N* | 6259 | 6259 | 6259 | 6259 | 6259 | 6259 | 6259 | 6259 |
| Adj. $R^2$ | 0.045 | 0.045 | 0.045 | 0.045 | 0.086 | 0.088 | 0.120 | 0.128 |
| | B. Hypothetical policy change year in 1998 | | | | | | | |
| Policy effects | -0.297 | -0.244 | -1.588* | -1.411 | -0.017 | -0.016 | -55.335 | -57.659 |
| | (0.607) | (0.614) | (0.963) | (0.973) | (0.013) | (0.013) | (43.094) | (43.678) |
| *N* | 6529 | 6529 | 6529 | 6529 | 6529 | 6529 | 6529 | 6529 |
| Adj. $R^2$ | 0.056 | 0.070 | 0.058 | 0.072 | 0.089 | 0.093 | 0.102 | 0.102 |
| Province & year fixed effects | No | Yes | No | Yes | No | Yes | No | Yes |
| Region × year fixed effects | No | Yes | No | Yes | No | Yes | No | Yes |
| Province linear time trend | No | Yes | No | Yes | No | Yes | No | Yes |

Note: Policy effects are the estimated coefficients of the Post × Treat interaction term. Each regression includes a full set of individual characteristics. Clustered standard errors at the household level are in parentheses. Treat is a dummy that equals one if the individual works for another person or enterprise as a permanent employee and zero otherwise. Post is a dummy that equals one if the year is after 1995 and zero otherwise.
* p<0.10, ** p<0.05, *** p<0.01.

Table 6 Difference-in-Differences Estimates from Matched Treatment and Control Sample

| Dependent variables | Hours per week for wage earners in both private and public sectors (log) | | Hours per week for workers in the public sector (log) | | Has a second job (dummy) | | Minutes per week for household production activities (level) | |
|---|---|---|---|---|---|---|---|---|
| *Matching algorithms* | | | | | | | | |
| | | | A. Kernel matching | | | | | |
| Policy effects | -0.029** | -0.023* | -0.042** | -0.036** | 0.030*** | 0.032*** | -120.448*** | -106.951*** |
| | (0.013) | (0.013) | (0.019) | (0.019) | (0.011) | (0.011) | (43.393) | (43.533) |
| *N* | 21185 | 21185 | 20275 | 20275 | 21185 | 21185 | 21185 | 21185 |
| Adj. $R^2$ | 0.037 | 0.059 | 0.044 | 0.064 | 0.059 | 0.073 | 0.091 | 0.097 |
| | | | B. Radius matching | | | | | |
| Policy effects | -0.035** | -0.027** | -0.039** | -0.033* | 0.031*** | 0.033*** | -114.296*** | -101.624** |
| | (0.013) | (0.013) | (0.018) | (0.018) | (0.011) | (0.011) | (41.458) | (41.525) |
| *N* | 21185 | 21185 | 20275 | 20275 | 21185 | 21185 | 21185 | 21185 |
| Adj. $R^2$ | 0.036 | 0.058 | 0.043 | 0.063 | 0.059 | 0.072 | 0.091 | 0.097 |
| | | | C. Nearest neighbor matching | | | | | |
| Policy effects | -0.029* | -0.025 | -0.022 | -0.024 | 0.025* | 0.029** | -116.603** | -107.868** |
| | (0.017) | (0.016) | (0.038) | (0.036) | (0.014) | (0.014) | (55.751) | (53.864) |
| *N* | 17281 | 17281 | 20036 | 20036 | 17281 | 17281 | 17281 | 17281 |
| Adj. $R^2$ | 0.033 | 0.060 | 0.048 | 0.070 | 0.069 | 0.084 | 0.097 | 0.106 |
| | | | D. Mahalanobis matching | | | | | |
| Policy effects | -0.045** | -0.042** | -0.079*** | -0.084*** | 0.024 | 0.028 | -105.904 | -85.085 |
| | (0.021) | (0.021) | (0.029) | (0.030) | (0.021) | (0.020) | (83.702) | (83.227) |
| *N* | 4681 | 4681 | 3883 | 3883 | 4681 | 4681 | 4681 | 4681 |
| Adj. $R^2$ | 0.058 | 0.093 | 0.062 | 0.098 | 0.051 | 0.080 | 0.074 | 0.088 |
| Province & year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Province time trend | No | Yes | No | Yes | No | Yes | No | Yes |

Note: Policy effect is the estimated coefficient of the Post× Treat interaction term. Each regression includes a full set of individual characteristics. Clustered standard errors at the household level are in parentheses. Treatment and control groups are obtained by the propensity score matching method. P-values are reported for the balance test at the pretreatment period in brackets. Radius and Mahalanobis matchings use a caliper of 0.2 standard deviations, and kernel matching uses a bandwidth of 0.2. In C, it implements 3-to-1 nearest neighbor matching with replacement. * p<0.10, ** p<0.05, *** p<0.01.

Table 7 Robustness Check: Effects from the State-Owned Enterprise Reform

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| A. Hours per week for wage earners in both private and public sectors (log) | | | | |
| Policy effects | -0.038** | -0.037** | -0.036* | -0.037** |
| | (0.019) | (0.019) | (0.018) | (0.018) |
| *N* | 6423 | 6423 | 6423 | 6423 |
| Adj. $R^2$ | 0.064 | 0.080 | 0.081 | 0.081 |
| B. Dependent variable: Hours per week for workers in the public sector (log) | | | | |
| Policy effects | -0.021 | -0.019 | -0.019 | -0.022 |
| | (0.025) | (0.025) | (0.025) | (0.025) |
| *N* | 6423 | 6423 | 6423 | 6423 |
| Adj. $R^2$ | 0.065 | 0.081 | 0.082 | 0.082 |
| C. Dependent variable: Has a second job (dummy) | | | | |
| Policy effects | 0.030** | 0.029** | 0.027* | 0.028* |
| | (0.015) | (0.015) | (0.014) | (0.014) |
| *N* | 6423 | 6423 | 6423 | 6423 |
| Adj. $R^2$ | 0.089 | 0.099 | 0.099 | 0.099 |
| D. Dependent variable: Minutes per week for household production activities (level) | | | | |
| Policy effects | -182.483*** | -179.079*** | -171.162*** | -173.369*** |
| | (51.034) | (50.926) | (50.574) | (51.045) |
| *N* | 6423 | 6423 | 6423 | 6423 |
| Adj. $R^2$ | 0.099 | 0.098 | 0.098 | 0.099 |
| Province & year fixed effects | No | Yes | Yes | Yes |
| Region × year fixed effects | No | No | Yes | Yes |
| Province time trend | No | No | No | Yes |

Note: Policy effects are the estimated coefficients of the Post× Treat interaction term. The sample is restricted to workers who did not change their jobs during the state-owned enterprise reform in the 1990s. Clustered standard errors at the household level are in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Figure 1 Evolution of Statutory Weekly Hours of Work in China

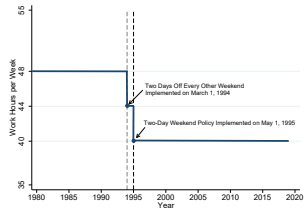
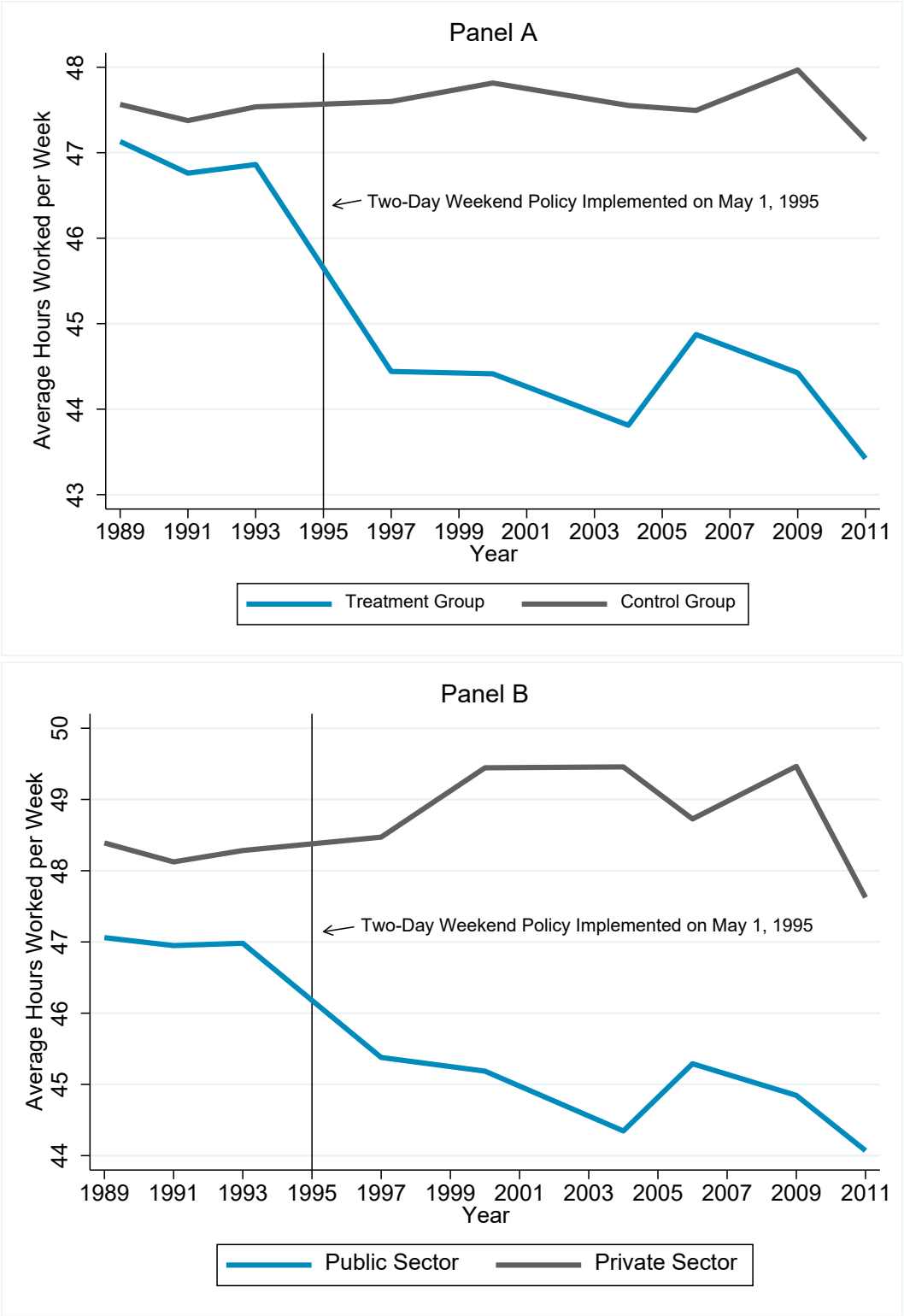
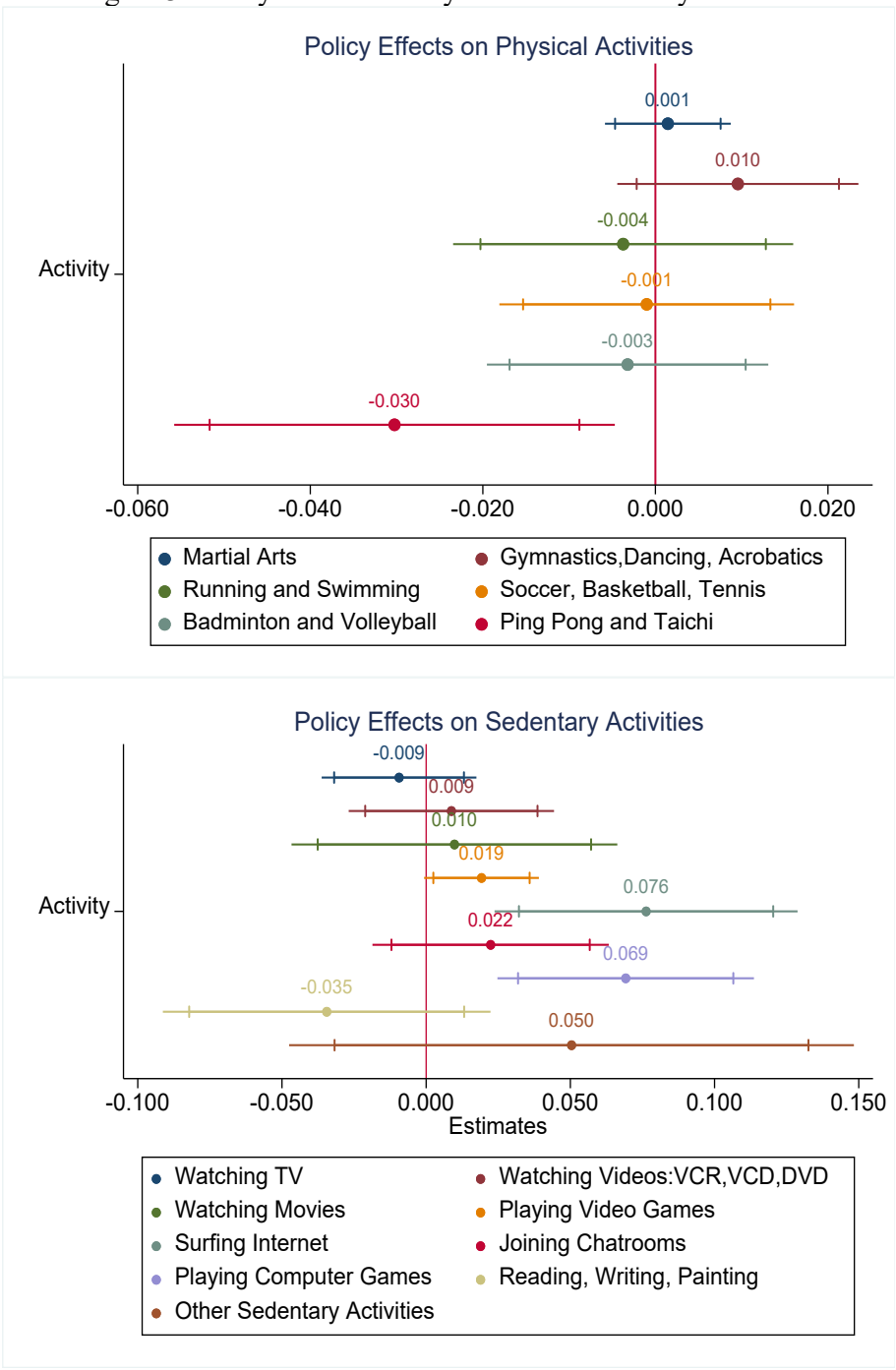


Figure 2 Average Weekly Hours Worked by Group, 1989-2011



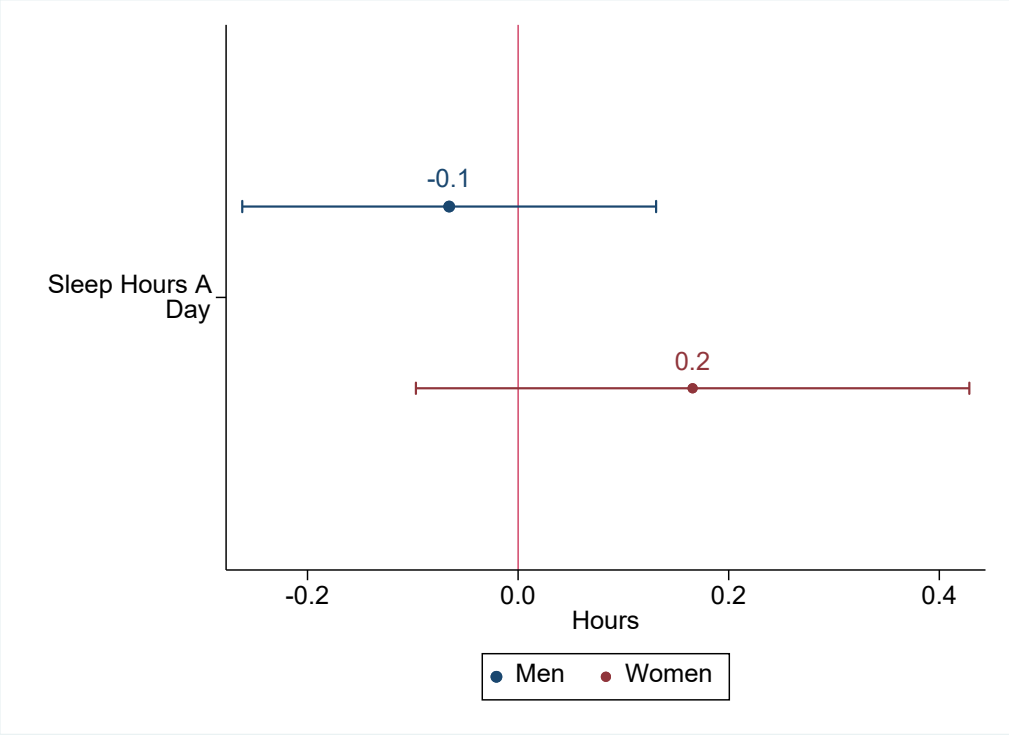

Note: The treatment group consists of workers who work for other persons or enterprises as permanent employees and the control group is those who are self-employed, temporary workers, independent operators, and contractors. The average weekly hours worked are calculated from the 9 waves of the CHNS over 1989-2011.

Figure 3 Policy Effects on Physical and Sedentary Activities



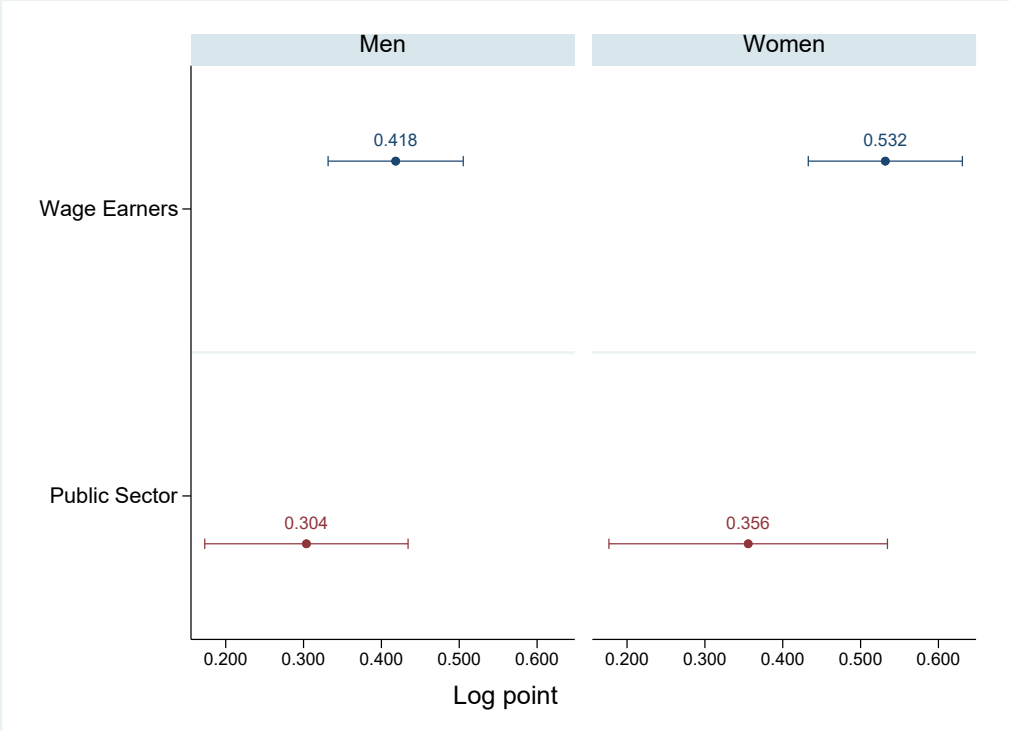

The range bars and horizontal lines in the graphs are 90% and 95% confidence intervals, respectively.

Figure 4 Policy Effects on Sleep Hours, by Gender



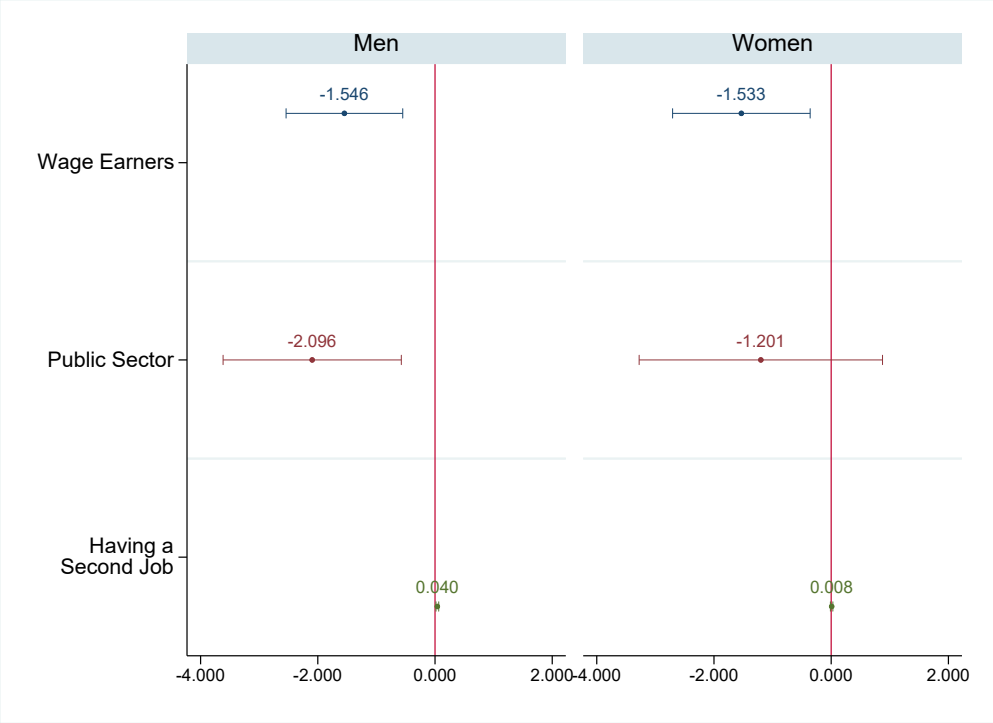

The range bars in the graph are 95% confidence intervals.

Figure 5 Policy Effects on Wages, by Gender



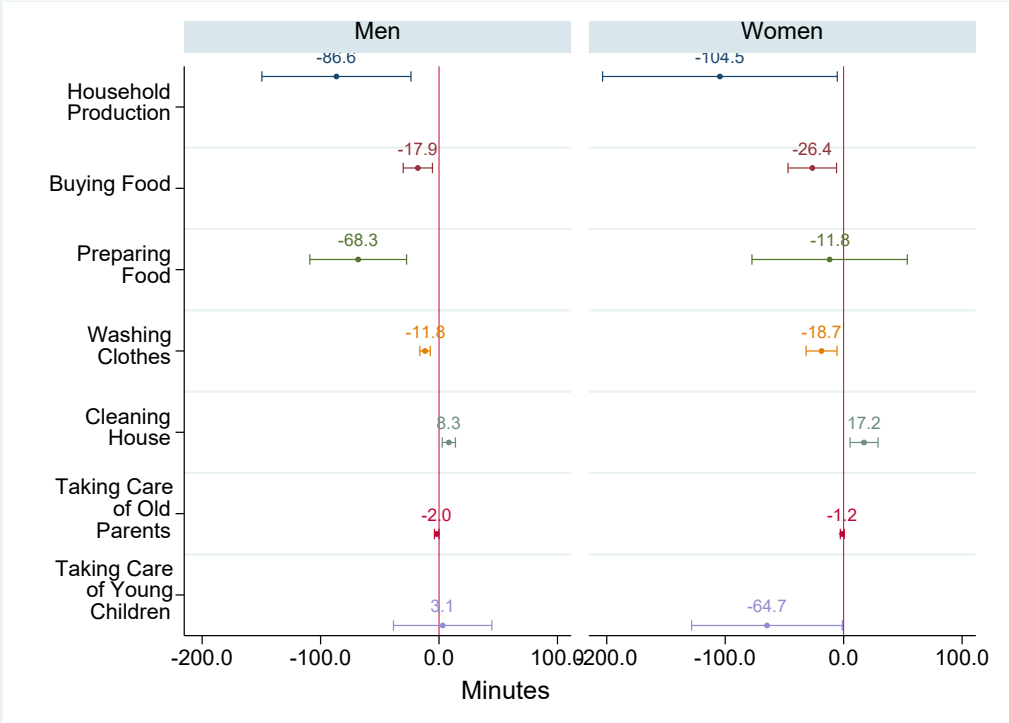

The range bars in the graph are 95% confidence intervals.

Figure 6 Policy Effects on Work Hours and Having a Second Job, by Gender



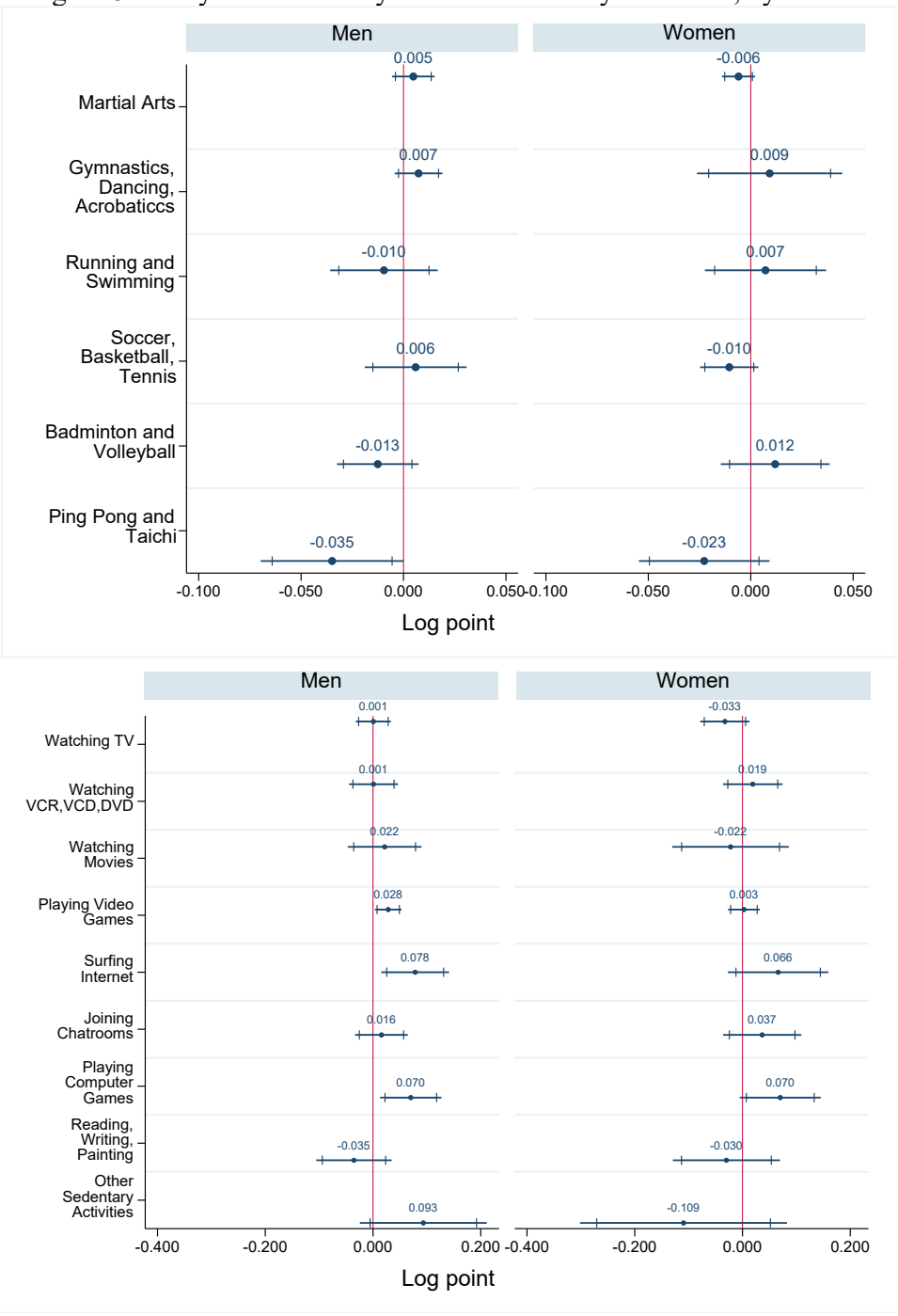

The range bars in the graph are 95% confidence intervals.

Figure 7 Policy Effects on Household Production Activities, by Gender



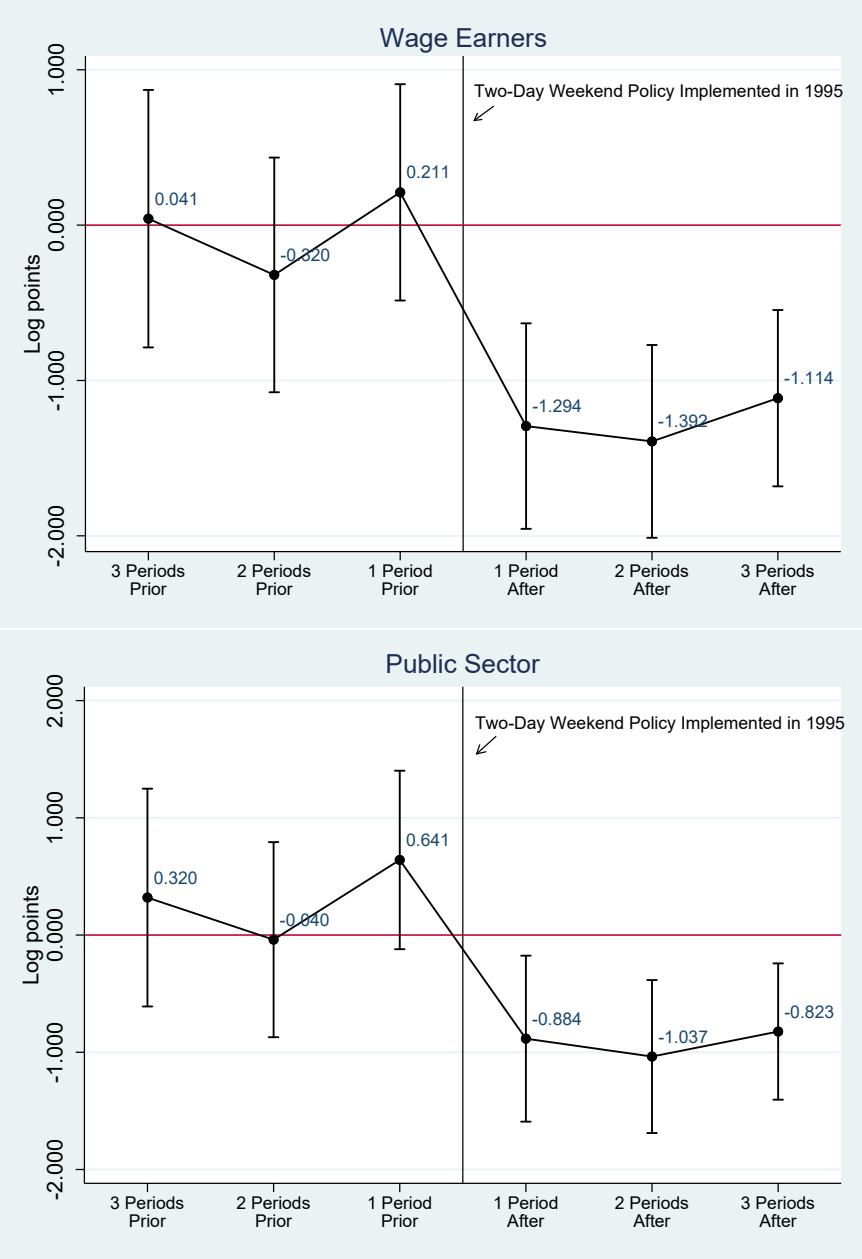

The range bars in the graph are 95% confidence intervals.

Figure 8 Policy Effects on Physical and Sedentary Activities, by Gender




The range bars and horizontal lines in the graphs are 90% and 95% confidence intervals, respectively.

Figure 9 Timeline of Dynamic Effects on Working Hours with Leads and Lags Relative to the Policy Change Year 1995




*Note*: The estimates are taken from Model (1) of Table 4 and include educational attainment, age, age squared, sex, marital status, hukou status, occupational dummies, local economic component scores, province and year fixed effects, and region linear time trends. The range bars in the graphs are 95 confidence intervals.

# For Online Publication

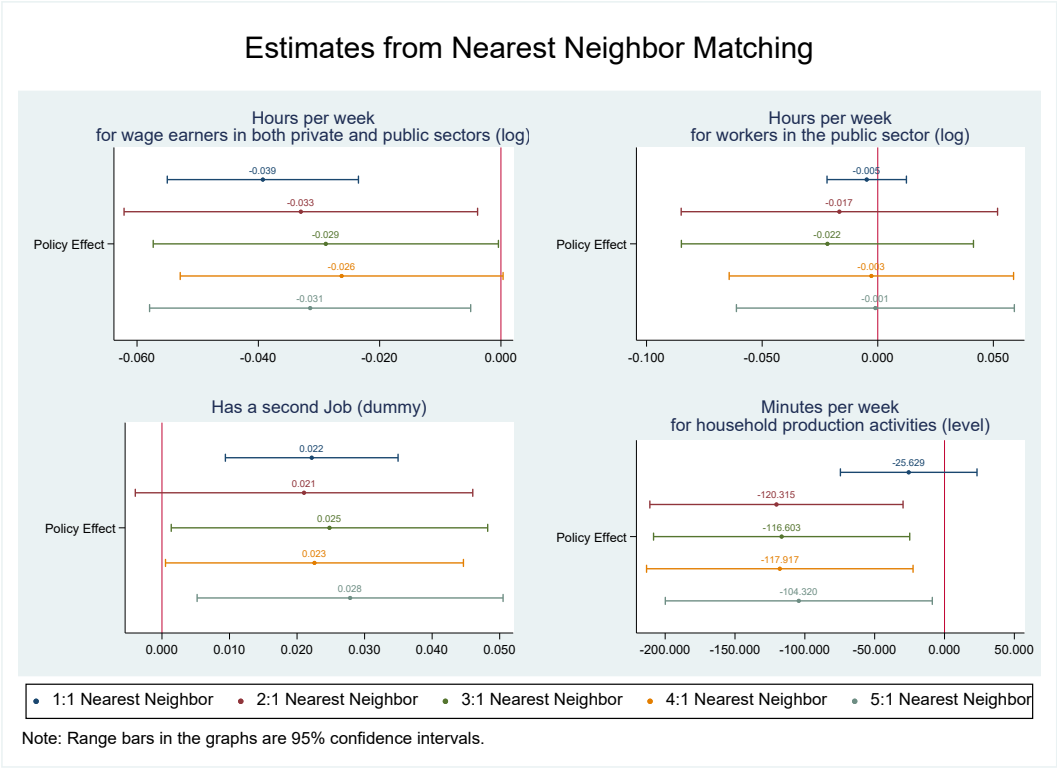
## Supplementary Material

Appendix Table 1 Two-Day Weekend Policy Effects on Wages

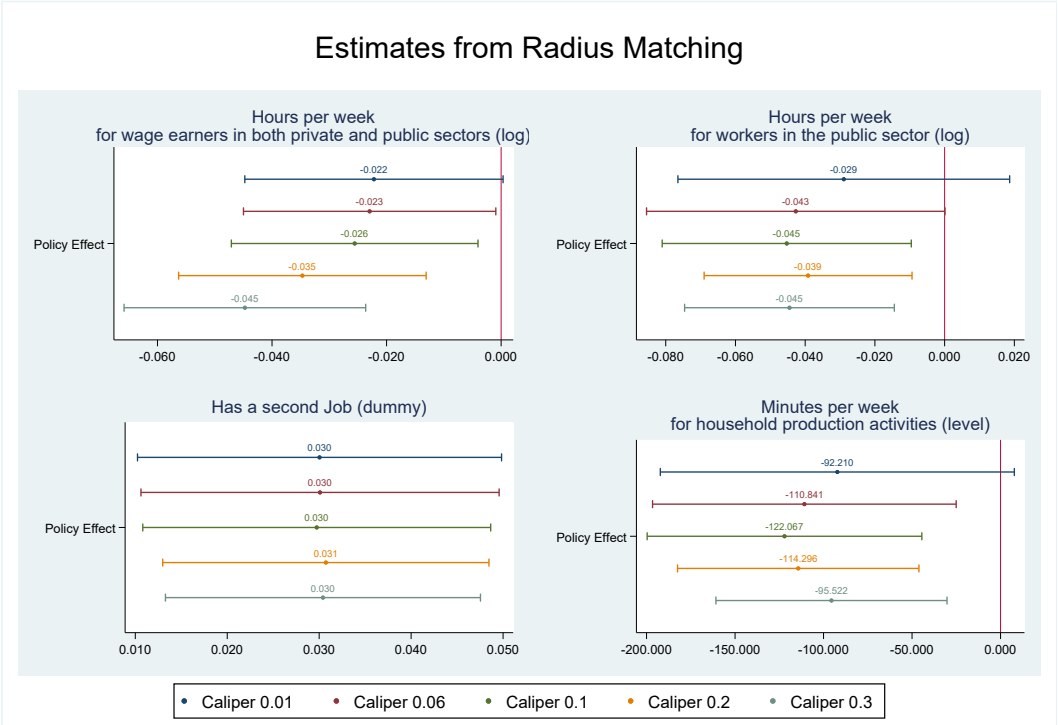
| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| A. Dependent variable: Hours per week for wage earners in both private and public sectors (log) | | | | |
| Policy effects | 0.508*** | 0.493*** | 0.474*** | 0.470*** |
| | (0.035) | (0.034) | (0.034) | (0.034) |
| *N* | 21250 | 21250 | 21250 | 21250 |
| Adj. $R^2$ | 0.134 | 0.198 | 0.2000 | 0.200 |
| B. Dependent variable: Hours per week for workers in the public sector (log) | | | | |
| Policy effects | 0.258*** | 0.341*** | 0.336*** | 0.330*** |
| | (0.056) | (0.054) | (0.055) | (0.055) |
| *N* | 21250 | 21250 | 21250 | 21250 |
| Adj. $R^2$ | 0.135 | 0.196 | 0.198 | 0.199 |
| Province & year fixed effects | No | Yes | Yes | Yes |
| Region × year fixed effects | No | No | Yes | Yes |
| Province linear time trend | No | No | No | Yes |

Note: Policy effects are the estimated coefficients of the Post × Treat interaction term. Each regression includes a full set of individual characteristics. Clustered standard errors at the household level are in parentheses. Treat is a dummy that equals one if the individual works for another person or enterprise as a permanent employee and zero otherwise. Post is a dummy that equals one if the year is after 1995 and zeroes otherwise. *** p<0.01.

Appendix Figure 1 Difference-in Differences Results of Matched Sample, by Matching Algorithms

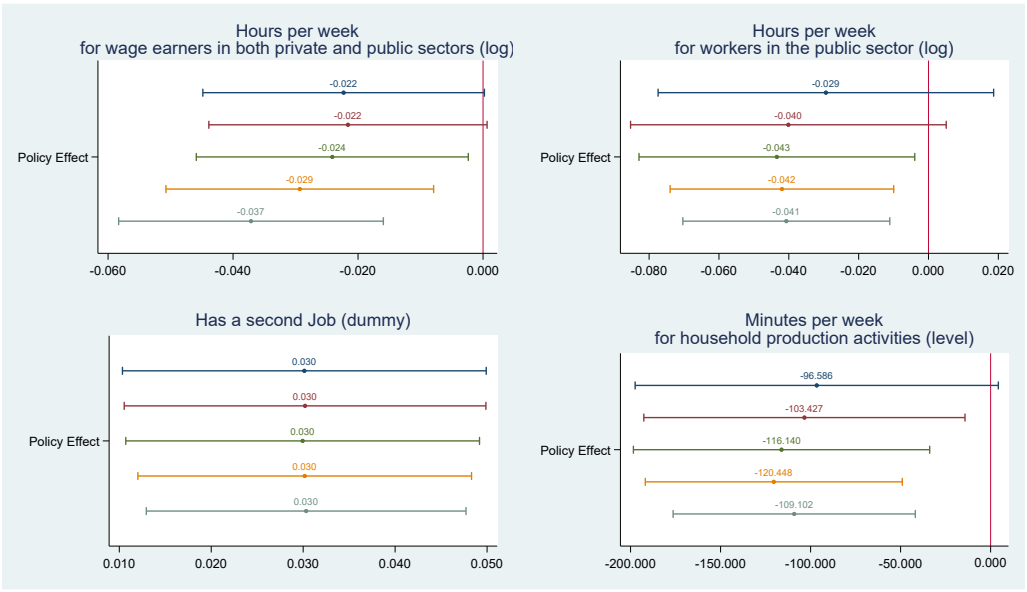



Note: Range bars in the graphs are 95% confidence intervals.



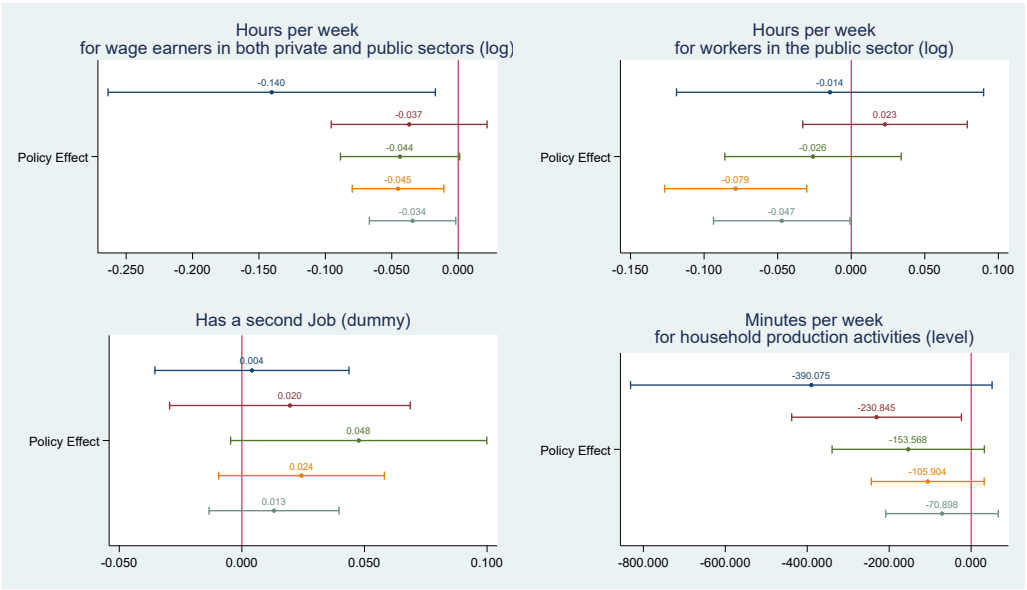

Note: Range bars in the graphs are 95% confidence intervals.

## Estimates from Kernel Matching




Note: Range bars in the graphs are 95% confidence intervals.

## Estimates from Mahalanobis Matching




Note: Range bars in the graphs are 95% confidence intervals.

Appendix Figure 2 Evaluating the Balance in Matched Samples: Standardized Bias and Common Support