



## A gift of time

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### ABSTRACT

How would people spend time if confronted by permanent declines in market work? We identify preferences off exogenous cuts in standard hours that raised employers' overtime costs in Japan around 1990 and Korea in the early 2000s. We use time diaries to relate the probability that an individual was affected by the legislation to behavioral changes. Reduced-form estimates show that the direct effect was a substantial reduction in market time, with the freed-up time in Japan reallocated to leisure, in Korea partly to household production. Simulations using GMM estimates of a Stone–Geary utility function suggest no effect on household production in either country. A household model shows only sparse evidence that spouses shared the time gift, or that one spouse's non-market time use changed when the other spouse's market work was exogenously reduced.

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## 1. Introduction

Time spent in market work is the second most important human activity in rich countries (see e.g., Burda et al., 2013) after sleep. Nonetheless, it did diminish in the U.S. between 1900 and 1940 (Kniesner, 1976) and dropped sharply from 1950 to 1980 in most of Western Europe (Huberman and Minns, 2007). Given this secular decrease and continuing pressures for further reductions, both to “spread work” (Nickell, 2008) and to move society away from a rat-race equilibrium (Akerlof, 1976; Landers et al., 1996), asking what people would do with their extra time if they were confronted with a large decline in market hours remains an important question. It is important for understanding how people will keep busy if they do little work for pay (Keynes, 1930), and for inferring whether more “free time” will, for examples, lead to more investment in the human capital of children, to more leisure or to the substitution of household for market production.

The difficulty in answering this question is that changes in individuals' time allocations arise from the interaction of changes in the technology of the production of Beckerian commodities with consumers' preferences for those commodities. That makes it impossible to identify how workers would respond to a permanent cut in market work, or to

infer the general equilibrium effects of that cut on time allocation in an entire population, by looking at historical changes. Over time the technologies do change and can explain some of the changing time allocation (Greenwood et al., 2005). Those changes might in turn explain the apparent increase in leisure in the U.S. in the last half century that did not accompany any decline in market work (Aguiar and Hurst, 2007), a change that was mirrored in some European countries (Gimenez-Nadal and Sevilla-Sanz, 2012). But the changing technologies prevent one from inferring preferences for different kinds of non-market activities.

Various authors have considered how time allocations respond to temporary changes in the time available for non-market and market activities. Thus Hamermesh (2002) demonstrated that even an abrupt, fully-anticipated and temporary increase in available time (resulting from a switch off summer time) is non-neutral, with a disproportionate fraction of the increase consumed as additional personal maintenance activities, mostly sleep. Using data from three Western countries, Burda and Hamermesh (2010) showed that a temporary, but presumably unexpected decrease in market work (resulting from cyclical changes in employment) is disproportionately taken up by increased household production, a result on cyclical changes that is complemented by Aguiar et al. (2013) for the U.S. during the Great Recession.

Those studies all examined temporary shocks, not permanent legislated changes that altered work hours. In an effort to reduce work hours, between 1988 and 1997 Japan shortened the standard workweek, resulting in a substantial reduction in market work (Kawaguchi et al., 2008). Korea followed suit over a decade later. Both changes essentially

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raised the cost of an hour of overtime work, which we know (Trejo, 1991; Hamermesh and Trejo, 2000) reduces market work time. In related work (Lee et al., 2012) we considered how aggregate patterns of non-market time use changed after these legislated permanent shocks to market work time. That study, however, simply examined aggregates of time use in the two countries before and after the legislation, with no attempt to infer causality from the legislation to the change in aggregate behavior. For that reason it is quite possible that it merely demonstrated a changing preference in favor of non-market activity over the decades that we examined and may imply nothing causal about the changes in time allocations.

No study has examined how individual workers' time allocations respond to an exogenous permanent decline in market work, nor has any looked at the effects of such a decline on patterns of time use across household members.<sup>1</sup> None could—there have been very few permanent exogenous shocks to market work; and, in any event, the continuing time-diary information required to analyze the impact of these shocks on the distribution of non-market time has rarely been available. A few countries have indirectly imposed changes in hours of work by introducing legislated changes in laws regulating the standard workweek (e.g., France, see Crépon and Kramarz, 2002) or giving union-management negotiators incentives to alter standard hours (e.g., Germany, see Hunt, 1999); but these changes have been small and have, in any case, not always been permanent.

Quinquennial Japanese time-diary data are available from 1976, and Korean time diaries are available from 1999 to 2009. In both countries we can link the exogenous policy shock to the implied changes in labor demand that they induced, allowing us to examine how changes in individuals' time use related to their propensities have been affected by the policy change. We use the time diaries to measure how someone whose market time became constrained reallocated the time freed up from the reduction in paid work, thus measuring the average treatment effect of the legal change on someone who was directly affected. We also complement the experimental approach by specifying a utility function that allows using the relationships between the propensity to be affected by the law and changes in time allocations to infer the nature of individuals' preferences for different uses of time. Those estimates in turn allow checking whether the reduced form yields results consistent with the underlying structure.

Because the time-diary surveys were administered to all adults in a household on the same day, we can use them to analyze how the shocks to one spouse's market work time spill over to affect the time allocation of the other spouse. This allows us to examine household decision-making in a way that has not previously been done and that is impossible with the now widely-used American Time Use Study data (which only include one person per household). We are able to separate changes resulting from changing opportunities from those arising from changes in household technology and household formation because the data sets allow us to measure idiosyncratic changes within households.

## 2. The shocks and the data

### 2.1. Legislated changes in work hours

Statutory working hours in Japan had historically been set at 48 per week and 8 per day. In December 1985 a study group organized by the Ministry of Labor published a report suggesting 45 hours per week and

8 hours per day as new statutory working hours.<sup>2</sup> Following this report the Central Labor Standards Commission, consisting of public, employer and employee representatives, recommended temporarily setting standard hours at 46 per week, followed by 44, and eventually dropping to 40. The Commission also requested a temporary exemption for small- and medium-sized firms. In accordance with its recommendation, the law was revised in 1987 and implemented from April 1, 1988.

This revision in the law immediately set standard hours at 46 per week. An additional revision in December 1990 further reduced standard hours to 44 from April 1, 1991. The Labor Standards Act was further revised in 1993 to implement 40 hours per week beginning in April 1994. In this reduction process, particular exemptions were given to industries with long work hours and smaller establishment sizes. These exemptions ended by March 1997, by which time the standard had become 40 hours per week uniformly across industries and establishment sizes, with only a few exceptions (which required agreement between management and the union representing its workers).<sup>3</sup>

Standard hours in Korea had become 44 per week for all workplaces (Kim and Kim, 2004) by 1991. After the Asian economic crisis in November 1997, reducing statutory weekly working hours from 44 to 40 began to be discussed by the Korean Economic and Social Development Commission. In October 2000 the Commission announced the "Basic Agreement on Work Hour Reduction," which included: 1) A reduction in work hours to 40 hours per week and 2000 hours per year; and 2) Gradual adoption depending on industry and firm size. In July 2002 the five-day workweek was first officially adopted in the banking and finance sector. In August 2003 the law indicating the schedule for the adoption of the five-day workweek passed Congress.

The law mandated introducing a five-day workweek on a phased schedule, with workplaces of more than 1000 employees becoming covered in July 2004, phasing into workplaces with between 20 and 49 employees by July 2008 (and with smaller workplaces still not covered today). The government provided some financial incentives for firms to adopt the five-day workweek before it became mandatory on them, and overtime regulations were also altered to encourage adoption. A fair conclusion from all this is that the movement toward reduced workweeks in Korea was very widespread, perhaps nearly universal by 2009.

In both countries there is a penalty applied to hours beyond the statutory standard. In Japan this penalty is 25%, with no maximum of but extra penalties for work on legal holidays and at night hours of overtime per week. In Korea the penalty was 50% with a maximum of 12 overtime hours per week before the legislated changes. After the new law became fully effective the penalty on the first 4 hours decreased to 25%, with the 50% penalty applying on the remainder up to a maximum of 16 overtime hours per week.

Kawaguchi et al. (2008) report that the legislative change reduced hours per worker in affected establishments but did not reduce either the monthly salary or the annual bonus payment. Kim and Lee (2012) find that in Korea the introduction of the forty-hour workweek slightly increased the hourly wage rate. Since the legislative change reduced working hours, monthly wages did not change significantly.

<sup>1</sup> Goux et al. (2011) examine the impact of the French change in the standard workweek on the labor supply of spouses of workers who were affected by the legislated change. The focus was only on the spouse's hours of market work. Stancanelli and van Soest (2011) study the impact on time allocation of the discrete jump in incentives to retire in France after one's 60th birthday, an incentive that is permanent and well-known to workers while planning the time paths of their allocations of time.

<sup>2</sup> The Labor Standards Act (LSA) in Japan prohibits employers from employing workers exceeding daily and weekly statutory working hours, currently set at 40 hours per week and 8 h per day (LSA Section 32). Employers can set hours worked to exceed these legal limits only under an agreement with a workers' group that represents the majority of employees (LSA Section 36). Overtime under this agreement must be compensated by at least a 25-percent wage premium (LSA Section 37). See Sugeno (2002, Chapter 3, Section 5) for an overview of the Japanese legal system on standard hours. Hamaguchi (2004, Chapter 12, Section 2) describes the legal process of reducing the standard hours between 1987 and 1997. Umezaki (2008) also describes the process of the LSA revision based on interviews with two government officials who played central roles in it.

<sup>3</sup> Exceptions apply to employees in commerce and service industries in establishments that usually employ fewer than ten workers.

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