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A CENTURY OF WORK AND LEISURE

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ABSTRACT

Has leisure increased over the last century? Standard measures of hours worked suggest that it has. In this paper, we develop a comprehensive measure of non-leisure hours that includes market work, home production, commuting and schooling for the last 105 years. We also present empirical and theoretical arguments for a definition of "per capita" that encompasses the entire population. The new measures reveal a number of interesting 20th Century trends. First, 70 percent of the decline in hours worked has been offset by an increase in hours spent in school. Second, contrary to conventional wisdom, average hours spent in home production are actually slightly higher now than they were in the early part of the 20th Century. Finally, leisure per capita is approximately the same now as it was in 1900.

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I. Introduction

In his 1930 essay "Economic Possibilities for Our Grandchildren," John Maynard Keynes predicted that a rise in productivity would result in a large increase in leisure during the next 100 years. He speculated that the central problem for humanity would be using its abundant leisure time in a meaningful way. According to a number of observers, Keynes' prediction about leisure is coming true. For example, Lebergott (1993) and Greenwood and Vandenbroucke (2005) argue that leisure has increased dramatically over the last century.

In contrast, modern growth and business cycle theories accept the long-run stability of leisure per capita as a stylized fact. For example, Prescott (1986) states: "A key growth observation which restricts the utility function is that leisure per capita, l_t, has shown virtually no secular trend while, again, the real wage has increased steadily." This type of statement has been repeated countless times in the RBC literature. In a representative agent model, leisure can be stationary in the face of dramatic rises in the real wage only if the income and substitution effects of real wage changes exactly cancel.

The standard measure of leisure is the difference between the endowment of time and the hours of market work. By this measure, the stability of leisure per capita implies stability of market work per capita. Has market work per capita been stable over the long-run? Maddison's (1982, 1995) data show that hours worked per employed person in the U.S. have fallen from around 2,700 hours a year to almost 1,600 hours a year. This number is misleading, however, because it does not take into account changes in labor force participation rates or the high rate of absenteeism among some workers in the early part of the century (e.g. Slichter (1919)). As an alternative, Figure 1 shows the behavior of the most widely used measure of hours per capita from the real business cycle literature. This series divides total hours worked in business by the civilian noninstitutional population ages 16 and over. The standard post-WWII series is extended back to 1900 using Kendrick's estimates and Census data. (The data appendix gives details of all data construction.) By this measure, hours worked per capita have fallen substantially over the last 105 years, from almost 1600 hours a year to below 1000 hours a year.

On its face, Figure 1 suggests that leisure per capita has increased significantly, by almost 550 hours per year. It therefore casts doubt on the types of utility functions used in most DGE models and raises questions about the existence of a balanced growth path.

In this paper, we present evidence that per capita leisure, when properly measured, has not increased at all. We offer a new measure that counts the entire population and takes into account other major non-leisure uses of time. In particular, we develop comprehensive "time accounts" showing the importance of including government employment, time spent in formal schooling, and time spent on housework. Our earlier work on the effects of technology shocks on historical fluctuations adjusted the potential labor force for government employment, school enrollment, and older population to form a new hours per capita measure (Francis and Ramey (2004)). In this paper we develop more comprehensive and better measurements of hours of non-leisure time and the potential workforce.

The new measures reveal a number of interesting 20th Century trends. First, a more comprehensive measure of "per capita" suggests a less dramatic decline in hours worked. Second, most of the decline in hours worked per capita has been offset by an increase in hours spent in school. Third, contrary to conventional wisdom, average hours spent in home production are actually higher now than they were in the early part of the 20th Century. Finally, leisure per capita is approximately the same now as it was in 1900.

II. Rethinking Measures of Per Capita

Most macroeconomic researchers use a measure of the "working age" population to construct their per capita variables. The most widely used "working age" population variable is the civilian non-institutional population ages 16 and over. This is the series reported by the BLS for the post-WWII period. Presumably, the goal is to measure the potential labor force. Children are omitted because their potential to work is severely limited by labor laws, particularly in the post-WWII period. Inmates of institutions are omitted because their status could prohibit market work. Persons in the armed forces are omitted because they are not available for civilian work.

It is not clear, though, why working age population is a better measure than the total population for most applications. To see this, consider the following three arguments.

First, consider the measurement of standards of living. When comparing consumption per capita across countries or time, one always includes the consumption of children in the numerator and the population of children in the denominator. Thus, to be consistent one should do the same when measuring leisure per capita.

The second argument is practical in nature. A problem with focusing on "the working age population" is changing norms about what constitutes "the working age population." The exclusion of all children ages 0 to 15 from the potential workforce is not necessarily suitable for the entire 20th century since the restrictions on child labor have changed so much over the last 100 years. For example, children were considered an important labor input on family farms. Indeed, the current school schedule owes to the historic demand for children's farm labor during the summer. According to the 1910 Census, 25 percent of male children ages 10 to 15 were employed.[1] By 1900 standards, children ages 10 and up were certainly part of the potential workforce. This issue also arises for older people. The standard RBC measure includes everyone ages 65 and older in the working-age population. On the other hand, many studies exclude those ages 65 and older (e.g. Prescott (2004)). Thus, there is no clear argument for particular age-cutoffs.

The third argument is theoretical in nature. To the extent that the representative household cares about all of its members, interactions between different age groups may be important for understanding trends in adult leisure. Rather than completely ignoring the time of children the way most RBC models do, we propose a new baseline utility function in which the consumption and leisure of adults and children are perfectly substitutable in household utility. While one might argue for alternative weighting schemes for child versus adult consumption and leisure, our baseline model has the advantage that it does not require separate data on consumption and leisure by demographic group.

Consider the following simple static model of household maximization. The representative household maximizes:

$$U = \ln[\theta c_1 + (1-\theta)c_2] + \phi \ln[T - \theta h_1 - (1-\theta) h_2]$$

subject to: $w_1 \theta h_1 + w_2 (1-\theta) h_2 = \theta c_1 + (1-\theta) c_2$ and $h_1, h_2, c_1,$ and $c_2 \geq 0$

where the subscript *1* denotes children and *2* denotes adults, c represents per capita consumption, and h represents per capita hours worked. Hours worked could represent both

[1] These numbers are based on the fraction that are "gainfully employed" from the *Statistical Abstract*.

market work and home production. T is the per capita time endowment and θ is the fraction of the household that is children.[2]

It is easy to see that if $w_1 \leq w_2$, meaning that children are less productive than adults in their work, then it is optimal to set $h_1 = 0$ and $h_2 = \frac{T}{(1+\phi)(1-\theta)}$. Thus, an increase in the fraction of children (θ) leads to an increase in per capita hours worked by adults. This prediction is consistent with cross-section evidence. For example, time use data from the BLS in 2004 shows that an additional child in the household raises hours spent in market work plus home production by 3.2 hours per week.[3] Hence, the increase in leisure per capita of adults since 1965 documented by researchers such as Robinson and Godbey (1999) and Aguiar and Hurst (2006) might be explained at least in part by the decline in the fraction of children in the population. Adults do not have to work so hard because they are supporting fewer children. Average per capita hours of work for the entire population is given by: $\bar{h} = \frac{T}{(1+\phi)}$, which is independent of the fraction of children or the wage. Thus, an increase in the fraction of children raises adult per capita hours but leaves total per capita hours unchanged.

One can readily embed this simple illustrative model in a dynamic general equilibrium model and obtain qualitatively similar results. For example, suppose output is produced with a Cobb-Douglas production function with exponents on child labor, adult labor, and capital equal to α_1, α_2, and 1- α_1 - α_2, respectively. Assume also that the exponent for child labor is much smaller than the exponent for adult labor. Then per capita hours worked of adults will be higher

[2] Children's wage does not include allowances from parents. It reflects earnings from the market and/or returns from home production.

[3] According to the data, an increase in the number of household children raises the hours spent in home production for both men and women. An increase in the number of children raises market work for men, but lowers it for women.

than for children in steady-state, and the steady-state adult hours worked per capita rises when the fraction of children in the household rises. One could further embellish the model to include schooling, along the lines of Rios-Rull (1993) and Caselli and Coleman (2001), or to include endogenous fertility choices. Such a model would be necessary to explain the trends in schooling and demographics that we document later in the paper. The current model is not intended to explain those trends but rather to motivate our basic point: when child and adult hours are closer substitutes in utility than in production, the demographic composition of the household affects hours worked per adult.

In practice, omitting or including the young and the old can have significant effects on per capita measures. Figure 2 shows the ratio of population ages 0 to 15 divided by the entire population. This ratio falls from 36 percent to 22 percent over the period under study, with a bulge during the 1950s and 1960s resulting from the baby boom. Thus, part of the measured decline in hours worked per capita may owe to the use of the restricted population measure in denominator. Figure 3 shows the fraction of the population that is 65 and over. This ratio rises from four percent in 1900 to over twelve percent in 2000. Thus, including or excluding this group can also have a significant effect on long-term trends in hours.

In sum, we have given three arguments for why the entire population should be included when studying work and leisure per capita. Thus, we include the entire population in our measures of per capita.

III. Comprehensive Measures of Non-Leisure Time

Standard models assume that there are only two uses of time: leisure and private market work. Understanding the trends in leisure and hours of work demands a more complete accounting of time use. We focus on four uses of time: a more comprehensive measure of paid work, including government hours; time spent commuting; time in formal education; and time spent in home production. Lucas (1988), Rios-Rull (1993), Perli and Sakellaris (1998), and Caselli and Coleman (2001) all consider models with human capital accumulation where one of the costs is the time cost. We will explicitly estimate the amount of time spent in school work over the last century. Benhabib, Rogerson and Wright (1991), Greenwood and Hercowitz (1991), Rios-Rull (1993), among others, consider time spent in home production and how its addition can improve the ability of the DGE model to explain cyclical fluctuations. We will develop estimates of hours spent in home production for the past 100 years.

Before proceeding, it is important to define what we mean by "leisure." Hawrylshyn (1971) distinguishes leisure from household work by defining household work activities as "those economic services produced in the household and outside the market, but which could be produced by a third person hired on the market without changing the utility to members of the household." This definition is a useful starting point, but it can be limiting in some cases. For example, some activities, such as cooking, would not generally be considered leisure although for some people the sense of accomplishment of having done it themselves generates additional utility. We define leisure hours as those activities that give direct enjoyment. To categorize activities as leisure or non-leisure, we use a survey reported in Robinson and Godbey (1999) as a general guideline. As part of the 1985 Time Use Survey, individuals were asked to rate their enjoyment of various activities, with 10 being the highest and 0 being the lowest. Table 1 summarizes some of the key activities listed in Robinson and Godbey's Table 0. The activities with the highest enjoyment scores (sex, playing sports, etc.) are ones that one would generally classify as leisure. The activities shown in bold face are activities that we classify as non-leisure.

These include market work, basic childcare, housework, care of other adults, commute time, attending classes and doing homework. Most of the sociology literature classifies any interaction with children as a non-leisure activity. Based on this table, however, we concur with Aguiar and Hurst (2006) that activities such as talking to, playing with, and reading to children are high enjoyment activities, and thus classify them as leisure.

A. Paid Work

Most macroeconomic studies use private hours or nonfarm private hours as the measure of paid work. One reason for this choice is the absence of quarterly frequency data on total hours worked.[4] Another reason is that the RBC model assumes that workers and capital are hired based on market incentives, assumptions that may not hold for the government sector.

Omitting the hours of government workers, however, induces significant low frequency movements in hours per capita. Figure 4 shows hours worked in government (both civilian and military) as a percent of total hours worked.[5] Other than the two spikes during the two world wars, the most noticeable movement is the upward trend in government hours as a fraction of total work hours. It is clear that the failure to account for this movement will bias the estimates of hours per capita down in the second half of the century. Moreover, this series has an inverted U-shape in the post-WWII period, matching the U-shape of the standard series that uses only private hours. Government hours as a percent of total hours has a post-WWII peak in 1968. Increased employment of teachers, resulting from the educational demands of the baby boomers, accounts for a third of the increase in government employment from 1948 to 1968.

[4] The BLS quarterly hours index does not include government workers.

[5] Hours worked in government enterprises, such as the post office, are included in private hours, both in the Kendrick series before 1947 and the BLS series from 1947 to the present.

In order to characterize accurately trends in hours per capita and in leisure, measured hours should include both private and government hours. We therefore create a measure of total market hours. The data from 1900 to 1946 are from Kendrick.[6] Forming this series for the post-WWII period is more difficult. The BLS reports an index of total hours worked in private business, including establishments, sole proprietors, and unpaid family workers. It does not, however, report hours worked in government. On the other hand, the BEA reports total hours worked in both private and government establishments, but does not include hours worked by sole proprietors or unpaid family workers. The BEA does offer another series of full-time equivalent persons engaged in private and government industry, including sole proprietors, but excluding unpaid family workers. Separately, the BLS has series on the number of unpaid family workers. Therefore, for 1947-2003, we use the ratio of full-time equivalent persons plus unpaid family workers engaged in total industries relative to private industries to up-weight the BLS private hours index. We then splice this series to Kendrick's series. See the data appendix for more details. This forms our measure of "market hours."

In order to compare this hours series to other series in the literature, we study the implied hours per worker. The worker series from 1900 to 1947 is Kendrick's *person's engaged series* from Table A-V, which includes full-time equivalent employees, proprietors and unpaid family workers. Kendrick's 1900 number is very close to the Census number for persons who said they were part of the labor force (Integrated Public Use Microdata Series (IPUMS) variable *labforce* = 2), 27.295 million from Kendrick versus 27.483 million from the Census. The worker series

[6] Siu (2004) argues that Kendrick undercounts government hours during WWII because he assumes that military personnel work the same number of hours as civilians. We had not corrected for this problem. This undercounting during WWII does not affect the long-term trends which are the focus of our analysis.

from 1948 to the present consists of persons engaged from the BEA, which includes employees and the self-employed, plus the BLS series on unpaid family workers.

Figure 5 shows the implied hours per worker. Kendrick's numbers show average annual hours of work per employee of 2,765 in 1900, which is about two percent higher than Maddison's (1982) numbers. This amounts to 55 hours a week if workers are employed 50 weeks per year. Hours worked per worker declined fairly steadily over the next one hundred years, so that by 2004, annual hours per worker was 1,861 hours per year, translating into 37 hours per week, 50 weeks a year.

Our hours series in the latter years is close to an alternative number derived from the IPUMs Census in 2000. To create this number, we estimated hours by multiplying the weeks worked by the usual hours of work. For those individuals who were employed (IPUMs variable empstatg=1), annual hours were 1,868.9. Our hours per worker series in 2000 was 1,920 hours. Thus, our hours of work series is just 2.7 percent higher than the series derived from the Census.[7]

B. Commute Time

The time diary method for accounting for time spent usually adds travel time to the activity in question. In our estimates of home production, we include travel time as home production. To be consistent, we also account for travel time to work.

The only time diary studies that measure commute time, however, begin in 1965. Time diary data summarized in Robinson and Godbey (1999), Juster and Stafford (1991) and the 2003 and 2004 BLS Time Use Survey suggest that the average time spent commuting has been a relatively constant ten percent of hours of work from 1965 to 1985, falling slightly to eight

[7] It should be noted that Census estimates of hours are not available before 1940, so we cannot make a comparison to the Census for the beginning of our sample.

percent in 2003 and 2004. There is little systematic evidence on commute times in the first half of the 20th Century. For urban workers, average commute distances were much lower but modes of transportation (walking and public transit) were slower than during the second half of the 20th Century. By some estimates, the time spent commuting for urban workers remained relatively constant over the 20th Century (Rodrigue (2004)), about 1.2 hours per day. In the early part of the century, though, a significant fraction of the workers lived in small towns rural areas and were self-employed or unpaid family workers in agriculture. Most of these workers lived at their place of work and spent no time commuting. Thus, the average commute time for all workers would have been somewhat lower in the early part of the 20th Century. In the absence of firm evidence, we assume that commute times in the early part of the sample were also ten percent of total hours worked, just as they were in the last 40 years of the sample. This assumption implies commute times per employed person were higher in the early part of the 20th Century than in the last part, since hours worked per employed person were higher. This implication is not unreasonable since part of the increase in hours per employed person was accomplished by working a sixth day, which required an extra day of commuting.

C. Schooling

One of the most striking trends of the last 100 years is the amount of schooling attained in the United States. Goldin (1999) chronicles the rise in schooling overall, and Goldin and Katz (1998) describe the rise of secondary education in particular. These trends are important for understanding the changes in hours of work and the implications for leisure.

Figure 6 shows the high school enrollment rate, the number of days of school attended per enrolled student in grades K-12, and the college enrollment rate. All three series show significant increases over time. The percent of children ages 14 to 17 enrolled in high school rose from 10 percent in 1900 to 95 percent in 2003. Moreover, for all children enrolled in grades K-12, the number of school days attended rose from under 100 days a year to over 160 days a year. Part of this increase was an increase in scheduled school days and part was a decrease in days absent. Finally, college enrollment rates (relative to the 18-22 age group) rose significantly, particularly after WWII.

These trends translate into a large increase in hours spent in school. We estimate annual school hours as follows:

$$
\begin{aligned}
\text{Annual school hours} = {} & (\text{enrollment in grades K} - 8) \cdot (\text{avg. days attended by enrollee}) \cdot 5.5 \text{ hours} \\
& + (\text{enrollment in grades 9 - 12}) \cdot (\text{avg. days attended by enrollee}) \cdot 7 \text{ hours} \\
& + \{(\text{enrollment in college}) \cdot [(\text{fraction full-time}) \\
& + 0.3 \cdot (\text{fraction part-time})] \cdot 165 \text{ days} \cdot 8 \text{ hours}\}
\end{aligned}
$$

The enrollment data, average days attended by enrolled student (grades K-12), and fraction enrolled in college that are full-time are available from Goldin (1999), the *Digest of Education Statistics*, and *Mini Historical Statistics.* We do not have measures of days attended for college. We assume that annual days spent in college are a constant 165, calculated from 33 weeks times 5 days a week. Our estimates of hours spent on school work per day attended come from various sources, including the Lynd's (1929) classic study of Muncie, Indiana, interviews with Kathryn Ramey about the length of the school day in California from the 1930s to the present, and time use data. According to those estimates, the length of the school day plus homework time has been relatively constant, about five and one-half hours for kindergarten through eighth grade, seven hours for high school, and eight hours for college, per day attended. See the data appendix for the details. We did not have information on how much time part-time college students spent. We assumed that they spend one-third of the time that full-time students spend.

Figure 7a shows our estimate of annual school hours per person ages 5 to 22. Hours per person spent in schoolwork for this part of the population rose dramatically over the century from 330 hours per year to almost 900 hours per year. The combined effects of increases in enrollments and an increase in days attended by those enrolled led hours spent in school to increase significantly over the last century. Figure 7b shows total school hours divided by total market hours. Hours spent on schoolwork as a fraction of total (non-school) work hours hit peaks above 35 percent in the late 1960s and early 1970s. Thus, this allocation of time is important on an aggregate basis. The large effect of the post-WWII baby boom is also evident.

When calculating leisure later in the paper, we also subtract out the travel times to school. Evidence from the later time use surveys suggest that these are roughly ten percent of hours spent on school. Thus, we estimate travel times to school as a constant ten percent of hours spent on school.

C. Home Production

A complete accounting of non-leisure time must include time spent in home production. Xenophon (4th century BC) believed that home production was as important as market production, and devoted half of his work *Oeconomicus* to issues of household management (Leeds (1917)). More recently, Becker's (1965) article made modern economists aware of the importance of measuring and modeling home production. To this end, we combine results from various studies to construct a series showing trends in the average number of hours spent on home production.

A number of cross-validation studies show time use diaries to be the most accurate source of estimates for housework (and market work for that matter) (Juster and Stafford (1985, 1991)). Thus, we use estimates based on time diary data to the extent possible.

The historical studies generally including the following activities in home production: planning, purchasing, care of family members, general cleaning, care of the house and grounds, preparing and clearing away food, making, mending, and laundry of clothing and other household textiles (Vanek (1973), page 57). Activities such as playing and talking with and reading to children are usually included in childcare in the time use studies from 1965 on. We exclude them for two reasons. First, these activities rank high on the enjoyment index and hence are more properly classified as leisure. Second, while little time was devoted to these activities in the studies from 1900 to 1965, they have become an increasingly important in terms of time expenditures. Thus, including them in home production would lead to noticeably higher estimates at the end of the sample. Our measure of childcare included in home production is basic child care plus time spent in homework help, teaching, and meeting with teachers. See the data appendix for more details.

Our studies of the time diary literature indicate that the most important distinctions are for age, gender and employment status. Our strategy for constructing total hours spent in home production is as follows. For each of the relevant age, gender and employment status cells, we first gather as much information as possible on hours of housework for that category. We then interpolate values between years of the time diary studies. Finally, we weight the estimated hours of housework of each cell by the fraction of the population that falls in that cell.

Non-employed Women Ages 18-64

Contrary to the claims of Lebergott (1993) and Greenwood, Seshadri and Yorukoglu (2005), most of the evidence does not suggest a decline in housework by full-time housewives during the time of rapid diffusion of appliances. We will begin our analysis by reviewing the various studies.

Vanek (1973, 1974) surveyed a large number of time diary studies, with samples totaling 3,414 households from the 1920s to the 1950s, and concluded that full-time housewives spent as much time on housework in 1965 as they did in the 1920s. Why, then, does Lebergott (1993, p. 58) argue that the average time spent on housework by women fell from 70 in 1900 to 30 by 1981? His conclusion is based on a faulty extrapolation from the working hours of servants, an incorrect reading of Leed's (1917) dissertation, and reliance on a social commentator who gathered no data. Lebergott cites a 1900 survey of the working hours of domestic servants, as reported by their employers in Boston. It is fallacious to assume that housewives worked the same hours. First, the hours of servants reported were mostly likely the hours they were on call, not how many hours they were actually working. Second, half of the domestic servants in Boston were Irish immigrants, which, because of their large numbers, did not have much bargaining power on wages and hours. Thus, there is little similarity between the average housewife and domestic servant in Boston at that time.[8] Lebergott's second mistake is his claim that Leeds' study shows housewives spend 44 hours a week on kitchen work alone (pages 51 and 59). He mistakenly uses the hours spent by all people in the household, including hired help. We will discuss below why it does not make sense to assume that a housewife in a family too

[8] See Hotten-Somers (2001) for a description of the working conditions of Irish domestic servants from 1860 to 1920.

poor to afford domestic help worked as many hours as a middle or upper class housewife and her servants.

Figure 8 shows various estimates of time spent on housework by housewives and all non-employed women. The two estimates from 1912 are based on Leed's (1917) study of sixty American-born families in Pennsylvania. All of the families were earning enough to reach a level of "decency" which was generally defined as earning at least $1,000 a year. The average of the sixty housewives' estimates of time spent on housework was 55.8 hours per week. This may be an overestimate, though. For the twelve families that kept time diaries, the estimates of total time spent (by the housewife and her assistants) were on average 18 percent above the actual time spent according to the diaries.

The estimates from the 1920s through 1968 were taken from Vanek's (1973) Table 3.2, summarizing fourteen different studies, the U.S. Department of Agriculture (1944), and Walker (1969). Vanek's table shows the estimates from a number of time diary studies of full-time housewives, typically between the ages of 22 and 64. Some estimates were for farm wives, some for rural nonfarm, and some for town and urban. In the figure, we do not distinguish the wives' locations because the estimates are surprisingly similar across these three categories of women. Estimates for 1965, 1975, 1985, 1993, 2003, and 2004 are based on our definitions of home production using Aguiar and Hurst's (2006) database, which links time use studies, and are generally consistent with those discussed by Robinson and Godbey (1999). They apply to non-employed women ages 18-64. The circles represent estimates for women who call themselves "housewives" and the triangles are all non-employed women.

What is clear from this graph is the constancy of the weekly hours of housework of full-time housewives from 1912 to the mid-1960s. With the exception of two high estimates that both come from one small study of Idaho families (Crawford (1927)), the estimates from 1912, the 1920s and 1930s all hover between 51 and 56 hours per week.[9] The same is true for the estimates from the 1940s through the 1960s.

Some have argued that estimates from the earlier studies are biased because most of the studies were convenience samples, and were not nationally representative (e.g. Cain (1984)). In response to this issue, Bryant (1996) restricted his analysis to time use studies that asked almost identical questions and adjusted the estimates for women's education, place of residence and family size to make them nationally representative. According to his weighted estimates, the average married, nonemployed women in the mid-1920s spent 7.35 hours per day on housework, or 51.5 hours a week (Table 4, page 368). In 1968, she spent 6.84 hours per day, or 47.9 hours per week (Table 5, page 370). The estimates we use are generally consistent with Bryant's estimates because, although our data shows no decline before 1965, they do show a steep decline between 1965 and 1975.

One might worry, though, that the estimates from 1912 are not typical of the average full-time housewife. Leeds' families were certainly better off than the low income families living in the tenements in big cities at that time. It is not clear, though, that more housework was done by wives in lower income families. Hartmann (1974) argues that the estimates from the farm families in the 1920s are indicative of the housework routines of an earlier age because farm families in the 1920s lacked modern conveniences and had little access to paid household help or market-produced goods. For example, in Wilson's (1929) study of families in the early 1920s, only 28 percent of the farm households had electricity, only 38 percent had modern plumbing and only 25 percent had a power washing machine. Wilson found that a higher fraction of non-

[9] The Crawford (1927) study is also suspect because the estimated time spent in personal care is 10 hours per week less than reported in all of the other studies shown in Vanek's Table 3.1. One suspects that some personal care

farm households had more modern conveniences, yet they spent equivalent times in home production as farm households. Thus, it is entirely reasonable that the estimates from the first decade of the century should be similar to those we have from the 1920s.

How could the poor maintain a household with no hired help and no modern appliances? A home economist noted during that time "if one is poor it follows as a matter of course that one is dirty" (Hansen (1913)). Having clean clothes, clean dishes, a clean house, and well-cared for children was just another luxury the poor could not afford. Consistent with this observation, Maud Pember Reeves (1913) described the simplicity of the meals of working-class families in London. Many meals consisted of simple, unheated foods because families could not afford the fuel to cook. According to the Lynds' (1929) study, in the late 1890s buying baker's bread rather than baking one's own bread was considered "poor-folksy." Only the working class bought their bread instead of making it themselves. Thus, it appears that home production output was substantially higher in middle and upper class households.

It is surprising that housework did not fall between 1912 and the 1960s, a time of significant diffusion of household appliances. One would think that the introduction of mechanical washing machines alone would have reduced the amount of housework. According to time use studies, it took 4 hours to do a load of laundry by hand and 4.5 hours to iron it. Using electric appliances, it took 41 minutes to wash the load of laundry and under 2 hours to iron it (Greenwood et al (2005)). However, a large number of time diary studies that compared women who had electric appliances to those who did not found that there was no difference in the time spent on housework (Vanek (1973), Bittman et al (2004)). As Ruth Schwartz Cowan points out in her 1983 book *More Work for Mother,* in the pre-appliance era many families hired laundresses or sent out their laundry to commercial facilities. Because of the large waves of

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activities were misclassified as housework.

immigration during the early part of the century, the real price of hiring full-time or part-time help was relatively low. At the same time that appliances diffused, immigration restrictions were imposed and the number of domestics employed fell precipitously. These two factors led to a shift from the market to the home in the production of a number of commodities.

In *The Feminine Mystique*, Betty Friedan (1963) explained the constancy of time spent on housework with the law that "housewifery expands to fill the time available." Mokyr (2000) argues that the failure of labor-saving appliances to save labor during this period was the result of a different type of technological progress: the revolution in sanitation and cleanliness, the germ theory of disease, and knowledge about the consequences of nutrition for health. Mokyr presents evidence and a model suggesting that at the very time electric appliances were diffusing, the public became aware of the importance of cleanliness and nutrition for families' health. Thus, the demand for housework rose just as the appliances were introduced. Many have noted that the diffusion of washing machines appeared to cause women to do the laundry much more often. For example, Friedan talks about the 1950s housewife whose family demanded that she launder their sheets twice a week.

A similar phenomenon occurred with time spent on childcare. According to Bryant and Zick (1996), the amount of time married women spent on childcare in 1981 was slightly greater than in 1924, even though family size decreased significantly over that time period. Total time did not decrease because the time spent per child increased. One source of the increase per child was the increase in the education of the population – educated parents tend to spend more time with their children. Another source of the increase may have been the widely-publicized studies on the effects of parental interaction on children's development.

Although all of the evidence suggests no significant decrease in hours spent in home production by nonemployed housewives between 1900 and 1965, the estimates of housework fall significantly between 1965 and 1975. Housewives' hours fell from 52 hours a week in 1965 to 45 hours a week in 1975 and stayed relatively constant after that.

Based on the estimates presented above we therefore assume that the average hours of housework of non-employed women between ages 18 and 64 were 56 in 1912 and before, fell gradually to 52 hours a week in the early 1920s where they stayed until after 1965. Assuming that all non-employed women spent as many hours in home production as those who were identified as "housewives" may be an over-estimate, though. According to the IPUMs, in 1900 18 percent of nonemployed women between the ages of 18 and 64 lived in a household in which they were neither the head of the household or the spouse of the head and they did not have children. 88% of these women were not currently married. This fraction had fallen to 7.6 percent by 1960. It is likely that these "maiden aunts" or "unmarried daughters" assisted the primary housewife in home production. It is not clear, though, whether these women were spending as much time on home production as the housewives.

For 1965 and after, we use the actual time use data estimates for all nonemployed women from the Aguiar and Hurst (2006) and BLS data bases in 1965, 1975, 1985, 2003, and 2004 and linearly interpolate for the intervening years. We do not use the estimates from 1993 because of the problems with those estimates discussed by Robinson and Godbey (1999, pages 323-324).

Employed Women Ages 18-64

Vanek (1973, p. 140) reports that a small study found that rural employed women spent 26.8 hours on housework and urban employed women spent 23.6 hours on housework in 1936.

More recent estimates Robinson and Godbey's estimates show that housework hours of employed women fell from 27.7 to 24.5 between 1965 and 1975, and then rose slightly to a relatively constant 25 hours from 1985 to 2004. Thus, the available estimates for housework by employed women from the pre-WWII period are very similar to those in the post-WWII period. We use the average of the two earlier estimates of 25 hours a week for 1936 and interpolate between 1936 and 1965. We assume that hours were equal to 25 a week before 1936.

Figure 9 shows the average of the available estimates by gender and employment status for individuals ages 18 to 64. The second line from the top shows the average estimates for employed women.

Non-employed Men Ages 18-64

The only estimates for housework hours of non-employed men are from 1965 and later. They are shown in the second line from the bottom in Figure 9.[10] Hours of non-employed men rose by about 7 hours a week between 1965 and 1985, and remained relatively constant between 1985 and 2004.

In the absence of early estimates for this group, we assume that they did as many hours of housework in the early part of the century as they did in 1965. In particular, we use the 1965 value of 15 hours for the earlier years as well. The potential biases from the lack of data should have very little impact on long-run trends because non-employed men represent a very small segment of the population in the early part of the sample. There are, however, potential biases in the implications for the cyclical behavior of housework by this category. Our estimates are based in part on the amount of time non-employed men spent on housework in 1965. It is

[10] For 1965 only, we use Robinson and Godbey's (1999) estimate because they had a larger sample. The estimates from the Aguiar-Hurst data base seem unusually large in 1965 and are based on only 23 observations.

possible that men unemployed for business cycle reasons may do more home production than men not working for other reasons. According to the 1965 survey, unemployed men did more housework than men not working for other reasons. The sample sizes are so small though (10 and 13 observations) that we do not trust them. According to the bigger samples in the 1975 and 1985 surveys these two classes of men did the same amount of housework. In contrast, in 2003 and 2004 men who classified themselves as "unemployed" did about five to six more hours of home production than men who were not working for other reasons. Given how much the numbers switch from decade to decade, we do not feel comfortable making a distinction between the two types of nonemployed men.

Employed Men Ages 18-64

Finally, the bottom line in Figure 9 shows estimates of the housework done by employed men. The estimates from various studies during the 1920s indicate that employed men spent very little time doing housework, between two and three hours a week (Wilson (1929), Vanek (1973)). In contrast, by 1965, they averaged around 11 hours per week, and by 2004, they averaged 16 hours a week.

Are the numbers for the 1920s too low? One question is the accuracy of wives' estimates of husbands' housework time. A recent study using various methods for measuring time spent on housework found that wives' estimates of husbands' housework hours were lower than husbands' estimates of their own housework hours. However, husbands' estimates of housework hours were higher than actual time spent, based on monitoring. In fact, wives' estimates were much closer to actual time spent by husbands than husbands' estimates (Lee and Waite (2005)). Thus, we do not have a reason to believe that wives' estimates are biased downward.

A second factor that makes the lower estimates of employed men's housework in the 1920s plausible is the correlation between housework and the length of the workweek. Robinson (1977, Table 3.2) investigates the effect of workweek length on employed men's housework using the 1965 studies. Whereas men who work 30-39 hours a week average 10.5 hours on housework, those working 55 or more hours a week average 6.4 hours on housework. During the early decades of the century, employed men worked significantly more hours per week than they did in later decades. Thus, it is not so surprising that they helped less with the housework.

Another possible bias is single versus married men. All of the men in the 1920s studies were married. Do single men do more housework? Our analysis of the 1965 data shows that whereas the average employed married man in 1965 spent 11.1 hours on home production per week, the average employed single man spent 9.7 hours on housework. Thus, single employed men tend to do less housework than married employed men, so the 1920s estimates are not likely to be biased downward.[11]

Individuals Ages 65 and Over

The estimates presented so far have dealt only with the 18-64 age group. 1975 was the first year that the 65 and older age groups was included in time diary studies. For 1975, the estimates of housework range from 32.7 hours for nonemployed women to 12.5 hours for employed men. Non-employed women ages 65 and older spend less time than non-employed women ages 18-64 because most women ages 65 and older do not have young children. After 1975, women's hours fall slightly and men's hours increase substantially. There are no estimates for housework for those ages 65 and over before 1975. To extend the data earlier than 1975, we assumed that the change in home production between 1965 and 1975 for those ages 65 and over was the same as for those ages 55-64, since those groups followed similar patterns in later years. Consistent with estimates for other groups, we assume no change before 1965. This age group was a relatively small part of the population in the first half of the century, so changes in the estimates do not have much effect.

Children

Finally, we consider the housework done by children. According to Vanek (1973), in 1926 homemakers reported an average 3.3 hours of housework from children ages 6 to 14 and 5 hours of housework for children ages 15 to 18. Estimates from Juster and Stafford (1991) and Timmer, Eccles and O'Brien (1985) suggest similar numbers for 1981, around 3 hours for grade school children and 5 hours for teenagers. Thus, housework by children has been about constant based on these estimates 60 years apart. We assume that children ages 5-13 worked a constant three hours a week and children ages 14-17 worked five hours a week on housework.

Summary Measures of Housework

As discussed above, we construct measures of total housework by weighting the estimates of each cell by the fraction of the population in that cell. The data appendix gives details on how we constructed weights for gender, age, and employment categories.

Figure 10 shows the estimates based on several subcategories. The top panel of Figure 10 shows average weekly hours for men and women between ages 18-64. Although average hours within employment category did not change much before 1965, average hours of women

[11] One might ask how single men can survive with so little housework done. Single men are much more likely to turn to the market for their meals and other traditional home production commodities. For example, Chinese

decreased gradually because of the increase in women's employment rates. Since 1965, average housework done by women has decreased noticeably. Average housework done by men has increased gradually over the century.

The bottom panel of Figure 10 shows average weekly hours of housework by age group for both sexes combined. Before 1930, those ages 18-64 did about as much housework as those ages 65 and up. After 1930, older individuals did more housework on average than prime age individuals. The increase in housework hours is due to two forces. One is the decrease in male labor force participation rates in this age group. Second, because of changing life expectancies, women became a greater fraction of the population ages 65 and over. (Recall that women do more housework than men.) After a peak in 1965, hours decline somewhat so that by 2003 they are about equal to their 1940s levels. The housework of children ages 0 to 17 averages around 2.5 hours a week.

IV. The New Measures of Market Work, Schooling, Home Production and Leisure

A. Trends in Non-Leisure Components

We now have estimates for all of the components needed to measure per capita leisure. Figure 11 shows the components of the total non-leisure hours measure divided by the entire population. The first thing to note is that the addition of the government and the use of the total population imply that market hours do not fall nearly as much as the standard measure suggests. According to our measure, average annual market hours per capita have only fallen by about 140 hours, rather than 550 hours. School hours, on the other hand, have increased by 100 hours.

Per capita home production hours are now slightly higher, 67 hours annually, than in 1900. This increase is entirely due to the changing composition of the population rather than to

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restaurants were first established in the U.S. because there were so many single, male Chinese immigrants.

within-cell changes. The simple theoretical model we presented earlier in the paper explains clearly how a decline in the number of children can reduce the hours of work (in this case housework) of prime age individuals while resulting in little or no change in hours per capita for everyone. Although women between the ages of 18 and 64 do less housework now, that effect is swamped by the other factors.

Figure 12 shows hours devoted to market work and to market work plus school. This graph makes clear that a substantial part of the decline in market hours of work over the last century was a reallocation of effort to human capital formation. Counting market work and hours spent in school together, average hours in activities oriented toward current or future market work have decreased only 40 hours since 1900. Thus, 70 percent of the decline in market hours is accounted for by the increase in hours spent in school.

B. Leisure Per Capita

To measure annual hours of leisure per capita, we subtract hours spent in market work, school work, commuting to work and school, and housework from the time endowment. Much of the literature also subtracts personal care time, such as sleeping and eating, from the time endowment in calculating leisure. We do not subtract personal care time for the following two reasons. First, as is evident from Table 1, time spent in most "personal care" activities create substantial enjoyment, and thus should be categorized as leisure according to our classification system. Second, Biddle and Hamermesh (1990) argue that time spent sleeping is affected by market incentives and thus should not be accepted as solely a biological necessity. Based on these arguments, we count the total time endowment as 24 hours a day, 365 days per year.

Figure 13 shows our new measure of leisure per capita. According to this measure, leisure per capita was essentially the same in 1900 as it was in 2004, 6,657 hours per year in 1900 and 6,634 hours per year in 2004. These estimates imply 128 hours of leisure per week. If one wishes to subtract the average amount spent in personal care time of 75 hours a week, this leaves 53 hours a week of non-personal care leisure time.

Thus, this new measure implies long-run constancy of leisure per capita. Despite massive increases in wages and significant changes in household composition, leisure per capita has no trend.

There are, nevertheless, some low frequency movements during the century. Leisure per capita hit an all-time high during the Great Depression and an all-time low during WWII. As discussed earlier in the paper, however, we may have underestimated the amount of home production done during the Great Depression. Another omission that might affect our estimates of the cyclicality of leisure is time spent on job search by the unemployed. According to the time use surveys from 1975 on, unemployed individuals spend between 2 and 2.5 hours a week on job search activities. We constructed a series on total hours spent in job search based on these numbers and found the total per capita hours spent to be miniscule. Even during the Great Depression, it amounted to only 12 hours per year on a per capita basis, so we did not include the series in our non-leisure activities. Actual time spent on job search during the Great Depression may have been higher, but without firm evidence, we have no basis to increase our estimates.

In sum, adequately accounting for non-leisure time and considering the entire population overturns the conclusions drawn from the standard series. While leisure per capita has varied over the last 105 years and has exhibited some low frequency movements, it is the same now as it was 105 years ago. Keynes' predictions on the increase in productivity are proving correct, but it appears that his predictions about a great increase in leisure are not proving true so far for the U.S.

The results also imply that the standard RBC assumption that income and substitution effects cancel may be consistent with the long-run data. What looked like a secular rise in leisure over time using standard measures was actually a mismeasurement of leisure.

C. Comparison to Other Post-WWII Studies

A number of other studies have analyzed trends in work and leisure in the post-WWII period. A controversial study by Schor (1991) argued that leisure declined between the late 1960s and the 1990s. Roberts and Rupert (1995) challenged her conclusions using data from the Panel Study of Income Dynamics. They show that total paid work plus housework hours have been relatively constant for husbands and wives (combined) between the mid-1970s and the late 1980s. Robinson and Godbey (1999) argue that "free time" increased by about six hours a week between 1965 and 1995. Aguiar and Hurst (2006) find the same increase in leisure between 1965 and 2003.

Our results, however, are not at odds with Robinson and Godbey's and Aguiar and Hurst's results for two reasons. First, our measures cover all age groups, whereas their analysis of trends focuses only on individuals ages 18 to 64. Second, we count time spent in schooling as non-leisure time whereas Robinson and Godbey count it as free time.

The simple theory presented in the first part of the paper explains the differing trends across all individuals versus prime age individuals. According to our simple theory, a decrease in the fraction of children in the population should raise per capita leisure of adults while leaving total per capita leisure unchanged.

V. Conclusion

This paper has studied trends in market work, home production, schooling and leisure. We first argued that the standard practice of using the civilian non-institutional population ages 16 and over as a measure of per capita was not justified from a representative agent perspective. We used both empirical arguments and a theoretical model to show why it was important to consider the entire population. We then developed more comprehensive measures of non-leisure time, including work in government, hours spent in school, and home production. We used a variety of data sources to produce series on aggregate hours spent in school and in home production back to 1900.

The new measures give a very different impression of trends in leisure. In contrast to the standard measure, which implies that per capita leisure time has increased by 550 hours per year, the new measure suggests that leisure per capita now is essentially the same as it was in 1900. Thus, Keynes' prediction about an increase in leisure has not yet materialized.

Whether this finding implies balanced growth remains to be seen. Although leisure per capita has no trend, there are important trends in the underlying components, such as the amount of schooling. Recent work by Ngai and Pissarides (2005) has suggested models that can explain some of these patterns.

Finally, one should be mindful of the degree of imprecision of our estimates. While the data for the post-WWII period is quite good for measuring long-run changes, the data from the early part of the century is far less precise. Our measures of hours worked in the market depend entirely on Kendrick's measures. We have shown, however, that his measures are consistent with other sources. Our early measures of home production depend on a remarkable set of studies done in the first decades of the 20th Century. While the research conducted was quite impressive given the resources available, there are concerns about the extent to which the samples were nationally representative. Our nearly exhaustive search of the related literature convinced us that the biases were not great. Finally, while we think our series give good estimates of long-run trends in time use, we are much less confident about the cyclicality of time use. The data on market hours worked and hours spent in school is fairly precise because most of it was collected annually. On the other hand, the cyclical movements of home production are based on the difference in home production done by employed versus non-employed individuals at a few points in time. Thus, these estimates are very imprecise. The estimates we have produced are probably correct on the directions of movements over the business cycle, but are very imprecise estimates of the quantitative movements. Thus, our estimates should not be used to calibrate models of short-term fluctuations in home production or total leisure.

Data Appendix

Population:

Estimates of population by age group are from the Census and the CPS. Specific sources are *Mini Historical Statistics*, *Statistical Abstract, Demographic Trends in the 20th Century, Economic Report of the President, 2005*, Table B-34, IPUMS Census, and CPS statistics from the BLS. Only the resident population was available before 1939 and after 1980. To obtain a better estimate of the total population, we added the number of armed forces overseas during WWI. Most series were available annually. Several subcategories were available only decennial. We interpolated fractions of larger categories between decades in these cases.

Institutional Population:

Decennial values for 1900-1950 for inmates of institutions were from Census extracts from IPUMS, using the variable "Relate." Later decennial values were from published Census tables. The fraction institutionalized was interpolated between decennial years.

Market Hours

1900 -1947 data are from Kendrick *Productivity Trends in the United States*, 1961, Table A-X. From 1948-2002, we used a variety of sources to create total, private and government hours. We multiplied the BLS private hours index by a factor to convert it to total hours. This factor is the ratio of total full-time equivalent employment to private full-time equivalent employment. The series for these calculations are available from the BLS, Bureau of Economic Analysis, Tables 6.5, 6.8, and 6.9, and BLS data on unpaid family workers (http://www.bls.gov/webapps/legacy/cpsatab5.htm). Both the Kendrick and BLS series include hours of employees, the self-employed and unpaid family workers in the private sector, as well as hours worked in government enterprises (such as the post office). We used the full-time equivalent employees in government (excluding government enterprises) as government employment and full-time equivalent persons engaged in the private sector plus government enterprises plus unpaid family workers as private employment. (The BEA "persons engaged" series includes the self-employed but not unpaid family workers.) We obtained annual measures of average hours of full-time equivalent workers in government versus the private sector by dividing the BEA series of total hours of employees (full time and part time) by the full-time equivalent number of employees.

School Hours:

Enrollment: The K-12 school enrollment numbers were obtained by combining information from the *Digest of Education Statistics, 2002* and Claudia Goldin "A Brief History of Education in the U.S." August 1999, NBER working paper H0119. Higher education enrollment was from *Mini Historical Statistics, HS-21.* For several years, the numbers were only reported every other year. Missing years were filled in with interpolation.

Average days attended per enrolled student: Data for K-12 students are from Goldin, Table CG.A.6. We assume that full-time college students engage in significant school activities for 5 days a week, 33 weeks a year.

Fraction of college students who are full-time: The fraction of college students who were enrolled fulltime was available only from 1963 – 1998 from the *Digest of Education Statistics*. We used the 1963 fraction for the years before 1963 and the 1998 fraction for the years after 1998.

Hours spent per day in school: According to the Lynd's (1929) classic study of Muncie, Indiana, hours spent in school exclusive of recess was five hours daily for all students in 1890. In 1924, it ranged from almost four hours a day for grades 1 and 2 to almost six hours a day for high school. We were also able to obtain information about school hours in California since the 1930s. Our data are based on interviews with Kathryn Ramey, a professional educator who kept records on the length of the school day and number of homework hours in California since the 1930s. The length of the school day appears to have been relatively constant in California over the last 70 years. Grade school typically lasts 7 hours, with about 1 - 1.5 hours for recess and lunch. Homework averages between zero and half an hour a night. Thus, we assume that time spent on schoolwork per day attended is 5.5 hours for grades K-8. The high school day lasts about as long as grade school, but the recess and lunch time is shorter and the amount of homework is greater. These numbers are consistent with those from Timmer, Eccles, and O'Brien's (1985) time use study of children in 1981.

We also obtained some information from the BLS Time Use Surveys. The BLS Time Use Surveys include only those ages 15 and up. From the 2003 survey, we found that full-time students between the ages of 15 and 17 spend eight hours on school and homework per day attended. We believe that these figures include lunch and recess. Once breaks are excluded, this is roughly 7 hours per day attended. The 2003 survey indicates that college students spend less time in class and more time on homework, amounting to over eight hours per day attended. Thus, we assume that college students spend 8 hours a day per day attended. The BLS time use survey gives hours averaged over the entire year. We thus impute 8 hours per day attended by multiplying the BLS numbers by 365/165, based on our assumption of 165 days of classes per year.

Home Production:

Within age-gender-employment group, the main data for home production is from Leed's (1917) dissertation, Vanek's (1973) dissertation, Robinson and Godbey (1999), articles in the Juster and Stafford (1985) volume, Juster and Stafford's (1991) survey, and data from the Aguiar and Hurst (2006) data set and the 2004 BLS Time Use Survey.

To create total hours spent in housework, we had to use employment-population ratios and fractions of the population by age and gender. The following is a description of the procedures used.

1. For the period from 1900-1920, we used decennial census estimates of population and labor force by gender from IPUMs. To convert labor force to employment, we used Weir's (1992) unemployment estimates. The 1930 Census gives employment and labor force numbers. According to the 1930 data women's unemployment rates were 78% of men's unemployment rates. We assume the same ratio for the earlier years. The census of 1910 was known to have overcounted female employment in agriculture because of the nature of questions asked, so we do not use information from that census.

2. To interpolate between decennial numbers between 1900 and 1930 in a way that captures the cyclicality of employment, we first calculate the annual ratio of total employment (from Kendrick) to the population ages 14 and over. Second, we calculate the ratio of the decennial employment-population ratio for each age and gender group relative to the Kendrick-based number. Third, we interpolate the ratio and then multiply it by the Kendrick number to obtain an estimate of annual employment-population ratios for each group.

3. For 1930 – 1940 we have annual CPS employment numbers, but not by gender and not by age. We use the CPS employment-population ratios to interpolate the ratios for each of our groups.

4. For 1940-1947, we have annual CPS employment numbers by gender. We use the implied ratios to interpolate for each of our groups.

5. For 1948 on, we have annual CPS civilian employment numbers by gender and age. We add military employment by gender to the 18-64 age group. The military data are from Mini Historical Statistics and official DOD data.

6. We weight the estimates of housework for each of the following cells by the fraction of the population involved: (1) employed males ages 18-64; (2) non-employed males ages 18-64; (3) employed females ages 18-64; (4) non-employed females ages 18-64; (5) employed males 65+; (6) non-employed males 65+; (7) females 65+; (8) children ages 5-13; (9) children ages 14-17.

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Table 1: Enjoyment of Various Activities in 1985
(Adapted from Robinson and Godbey (1999))

9.3	Sex	6.9	
9.2	Play sports	6.8	
9.1	Fishing	6.7	**Second job**
9	Art, music	6.6	**Cook, work at home, shop**
8.9	Bars, lounges	6.5	
8.8	Play with kids, hug and kiss	6.4	**Child care, help adults**
8.7		6.3	**Work commute**
8.6	Talk/read to kids	6.2	
8.5	Sleep, church, attend movies	6.1	Dress
8.4		6	**Pet care, classes**
8.3	Read, walk	5.9	**Errands**
8.2	Work break, meals out, visit	5.8	**Housework**
8.1		5.7	
8	Talk with family	5.6	
7.9	Lunch break	5.5	**Home repair, grocery shopping**
7.8	Meal at home, TV, read paper	5.4	
7.7	Knit, sew	5.3	**Homework**
7.6		5.2	**Pay bills, iron**
7.5	Recreational trip	5.1	
7.4		5	**Yardwork**
7.3	Hobbies	4.9	**Clean house, dishes**
7.2	**Baby care,** exercise, meetings	4.8	**Laundry**
7.1	**Gardening**	4.7	**Child health,** doctor, dentist
7	**Work, homework help,** bathe	4.6	**Car repair shop**

Figure 1
Annual Hours Worked in Business
Divided by Civilian Non-Institutional Population Ages 16+

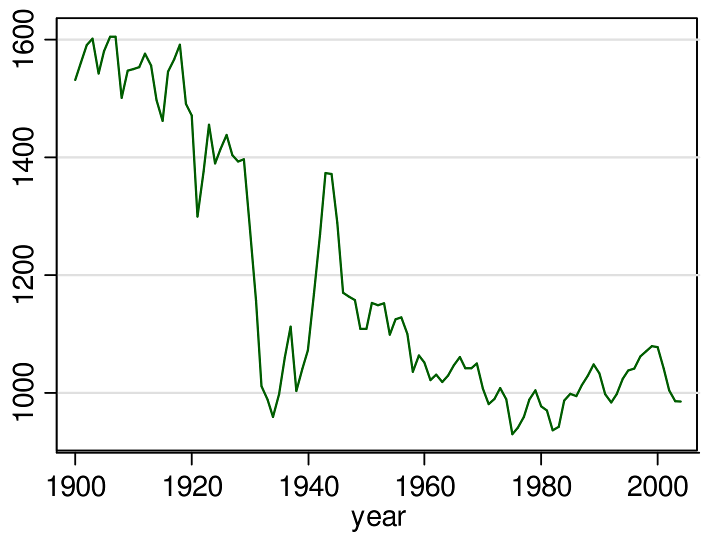

Figure 2
Population Ages 0-15 as a Fraction of Total Population

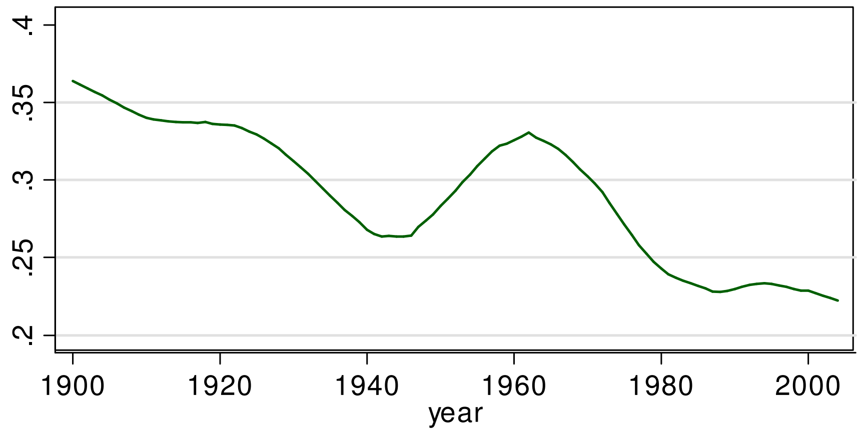

Figure 3
Population Ages 65+ as a Fraction of Total Population

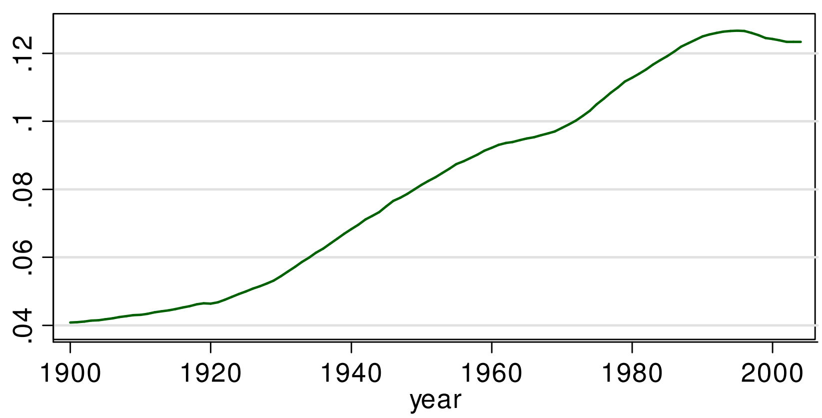

Figure 4
Government Hours as a Fraction of Total Work Hours

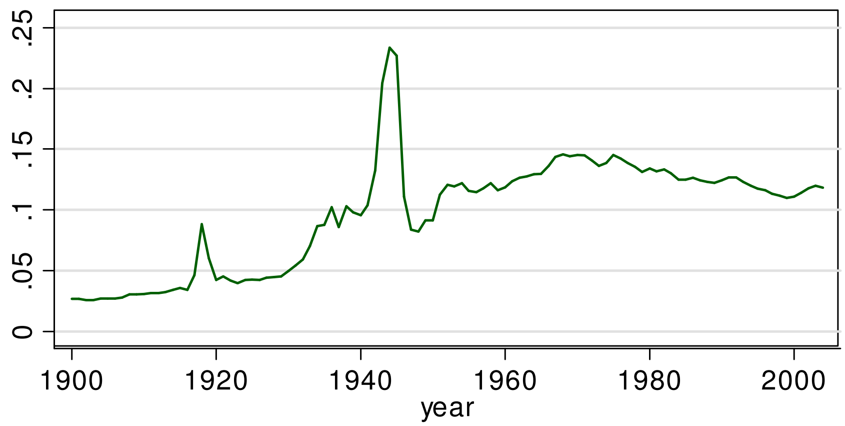

Figure 5
New Estimates of Annual Market Hours Per Worker

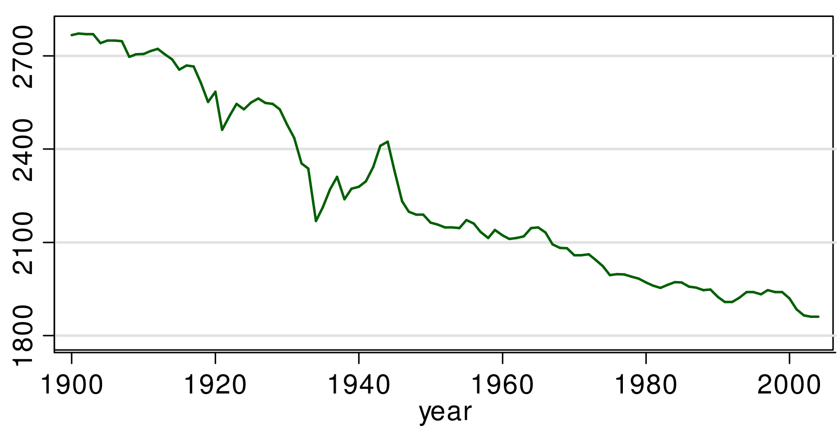

Figure 6. School Enrollment Rates

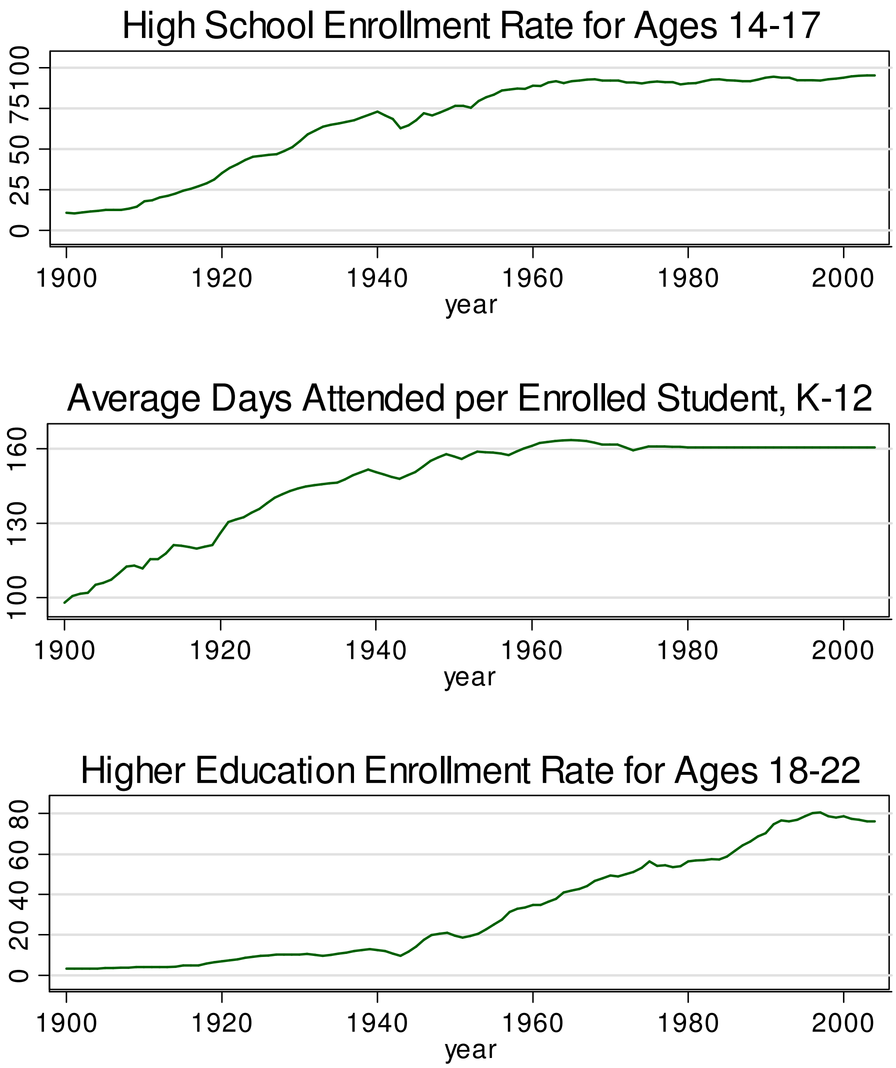

Figure 7A
Annual Per Capita Hours Spent on School for Ages 5-22

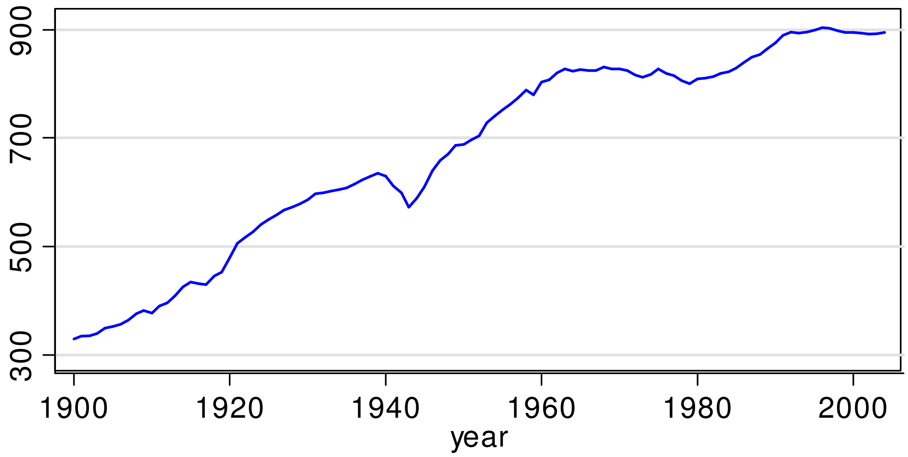

Figure 7B.
Hours Spent in School as a Fraction of Total Market Work

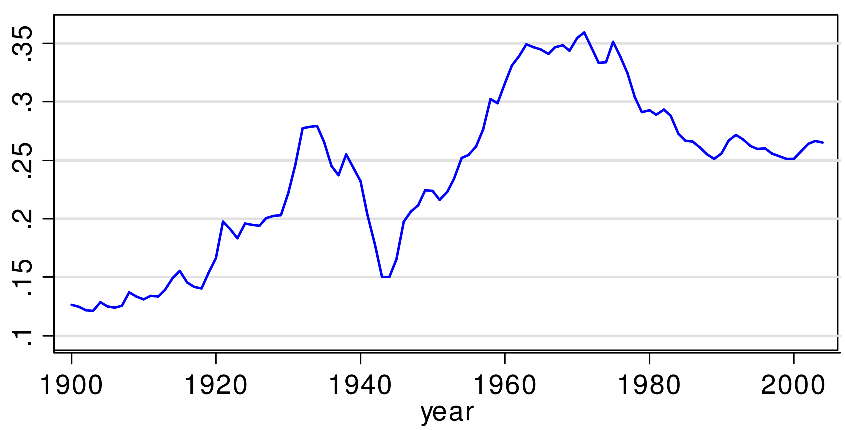

Figure 8. Estimates of Hours of Housework per Week by Housewives and All Non-employed Women Ages 18-64
(Size of the marker indicates sample size of the study)

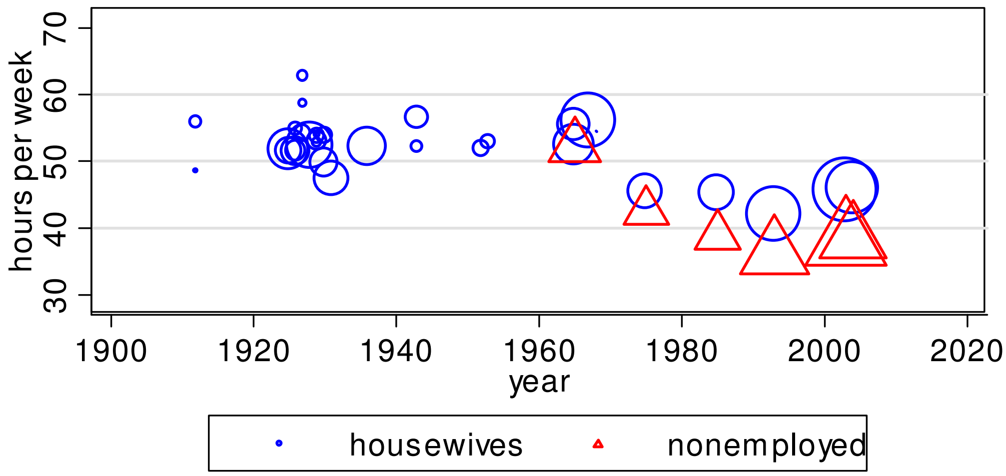

Figure 9. Estimates of Housework by Employment & Sex Category (ages 18-64)

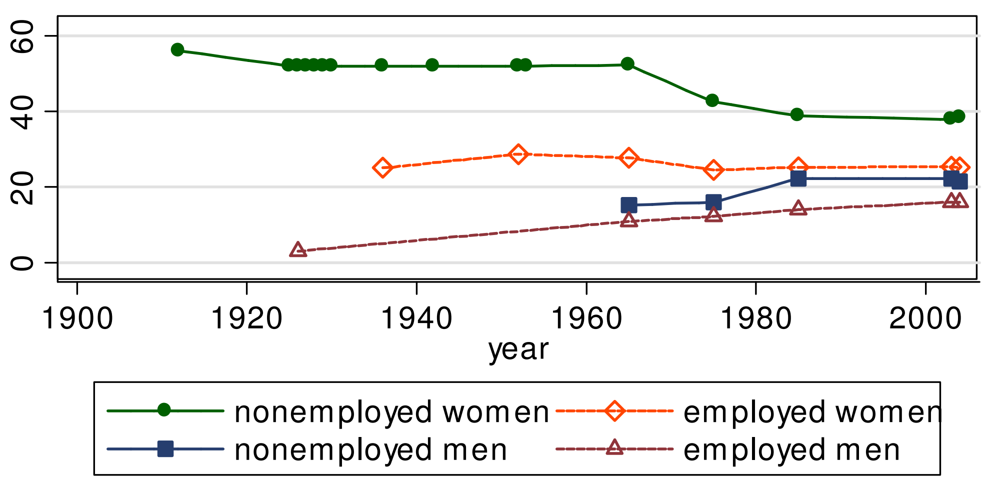

Figure 10. Average Weekly Hours of Housework

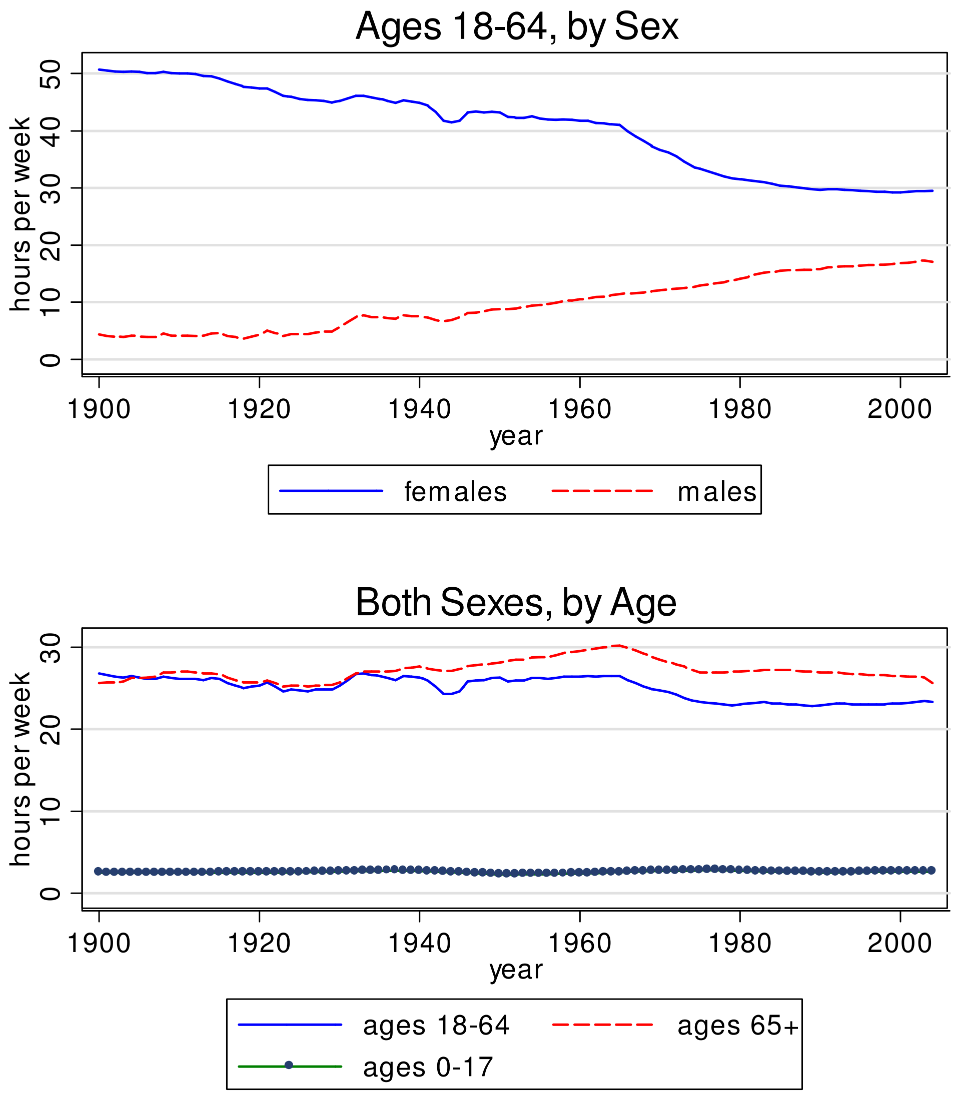

Figure 11. Hours Per Capita in Non-Leisure Activities

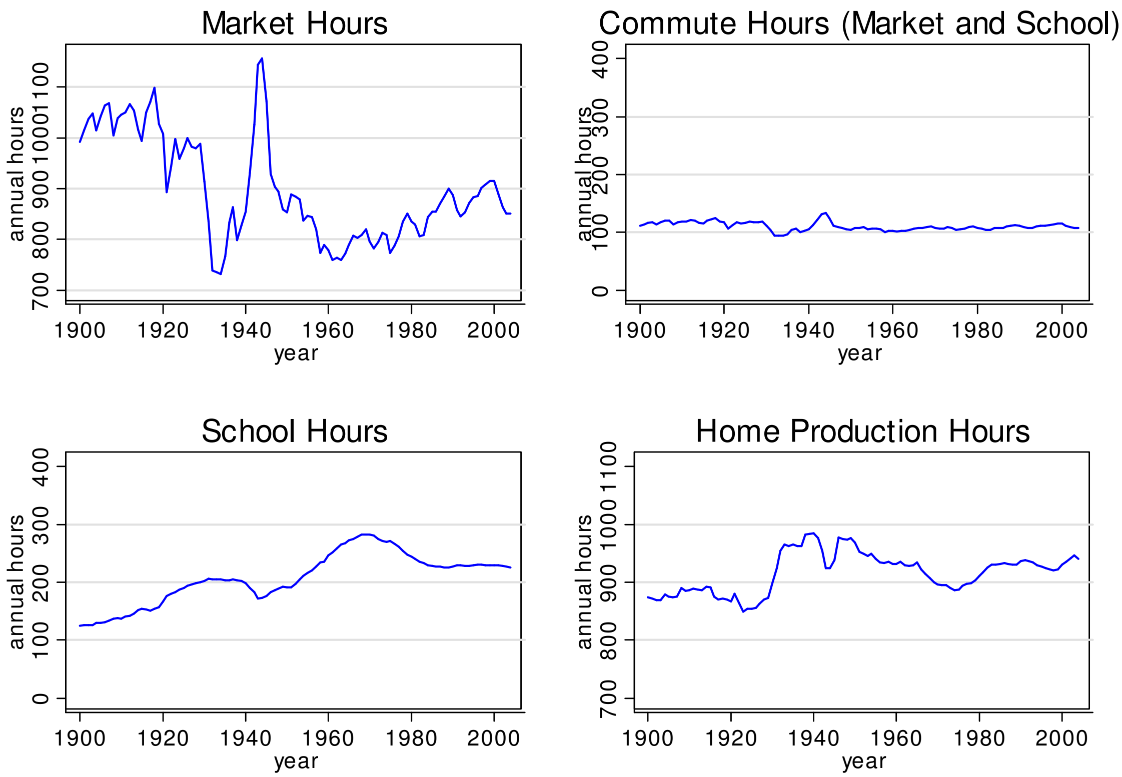

Figure 12. Per Capita Market-Oriented Hours

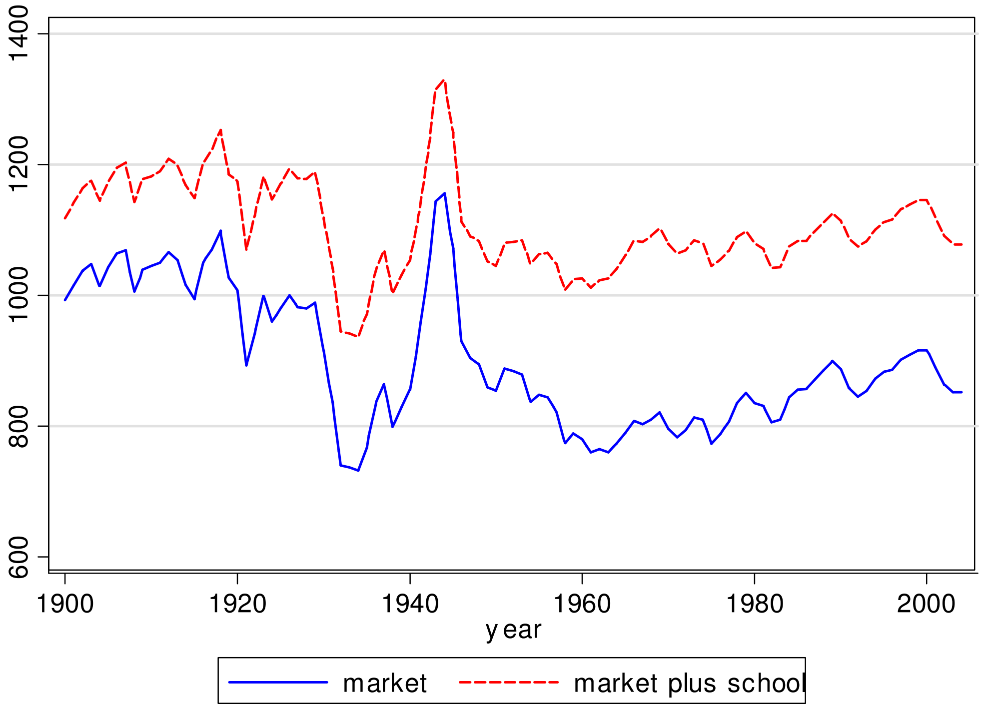

Figure 13. Annual Leisure Hours Per Capita