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Hours of Work in Old and New Worlds: The Long View, 1870-2000

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This paper brings a long-term perspective to the debate on the causes of worktime differences among OECD countries. Exploiting new data sets on hours of work per week, days at work per year, and annual work hours between 1870 and 2000, we challenge the conventional view that Europeans began to labor fewer hours than Americans only in the 1980s. Like Australians and Canadians, Americans tended to work longer hours, after controlling for income, beginning around 1900. Labor power and inequality, which are held to be important determinants of worktime after 1970, had comparable effects in the period before 1913. To explain the longstanding predisposition of the New World to give more labor time, we examine the effects of three initial factors in 1870, culture, human capital, and geography on hours of work in 2000. We find that geography – the low population density of the New World that has led to shorter commutes and lower fixed costs of getting to work – has had an enduring impact on supply of labor time.

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The bottom line indicates that, given similar incentives, people make similar choices about labor and leisure. Free European workers from their tax bondage and you will see an increase in gross domestic product (oh, and you might see a pretty significant increase in gross national happiness, too). The same holds true for Americans.

Edward C. Prescott, *The Wall Street Journal*, October 21, 2004.

The crude Chicago of those days [the 1920s] was described by an English visitor as a string of industrial villages from factory to factory.

Saul Bellow, *The New Yorker*, April 25, 2005, pp. 80-82.

Introduction

The ever growing divide between leisure-bent continental Europe and much of the rest of the world has become something of a vexed concern to economists and political scientists. Explanations of recent worktime differences across OECD countries are as numerous as they are diverse. Bell and Freeman (1995, 2001) attributed the trend toward longer hours in the U.S. to rising inequality; Prescott (2004) claimed that higher taxes in the Old World have reduced the incentive to supply labor time; Burgoon and Baxandall (2004) considered that worktimes in the U.S. and Europe represented the preferences of liberal, social democratic, and Christian democratic regimes; and finally, Alesina, Glaeser, and Sacerdote (2005) ascribed the bulk of the difference in worktime between the U.S. and Europe to differences in labor regulation and unionization rates.[1] Although their points of departure differ, these views share the claim that divergences are recent in origin. Freeman and Bell (2001, p. 104) are explicit. "The gap [U.S. vs Germany] is not a longstanding historical pattern." In their view, Americans began working longer than Germans sometime between the 1970s and the early 1980s. Similarly, Prescott (2004, p.1) wrote: "Americans now work 50 percent more than do the Germans, French, and Italians. This was not the case in the early 1970s."

The attention to current developments has its shortcomings. Using contemporary data it is difficult to disentangle the separate influences of incentives, institutions, and policy, and to separate these factors from cultural and other fixed factors. Consider Bell and Freeman's incentive-based argument that those who work longer move up in the wage distribution, and the gains for doing so are greater the more unequal the wage distribution.[2] This outcome may well be a response to the local institutional environment – the porous safety net – or the result of weaker unionization rates in the U.S. that underlie wage inequality (DiNardo, Fortin, and Lemieux 1996). These forces may in turn be a product of a deeper longstanding work ethic or the basic drive to emulate some better off reference group (Bowles and Park 2004). There is no simple way to

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[1] For other explanations, see Gordon (2004); Freeman and Schettkat (2005).
[2] More precisely, Bell and Freeman argue that those who work longer move up in the wage distribution at the workplace, and the gains for working hard are greater the more unequal the wage distribution.

disentangle these explanations, and while certain econometric specifications control for some of these factors, the pitfalls of omitted and endogenous variables persist.

Historical studies do not suffer from some of these problems to the same extent. At the end of the nineteenth century, labor markets were relatively free from legislative interference and unions were relatively weak. These early, unfettered episodes thus provide a reference point to separate the role of institutions from other factors that may have affected work patterns (Fishback 1998). This is the approach taken in this paper. We ask whether the recent trend toward relatively long work hours in the United States, as well as in Australia and Canada – the New World – has historic precedents.[3] We answer in the affirmative. At comparable levels of income – well before modern tax structures, welfare states, high degrees of unionization, and the like – the New World labored longer hours than elsewhere. Contrary to the view espoused by Prescott cited earlier, the current institutional environment was as much a response to as a cause of worktime patterns. There are deeper, more fundamental reasons why New World workers toil longer than Europeans. Specifically, we isolate the role of initial factor endowments, the intersection of geography and economics, to explain work patterns today.

Our argument proceeds in three stages. First, we introduce three new data sets on work hours per week, workdays per year, and annual work hours for a sample of New and Old World countries from 1870 to 2000. The historical record reveals two long-term tendencies that need to be explained. First, from 1870 Europeans had fewer days at work than their colonial offshoots; second, from an early date the decline in worktimes was consistently greater in the Old World. Still, Europeans did have longer total (annual) hours, but the gap across continents had narrowed substantially before 1913. The interwar years, in the wake of the depression, saw different political experiments with regard to the length of the workweek; France and the U.S. had the shortest work year in our sample of countries. These were exceptional years, however. Historical trends reasserted themselves after the war. A New World employee had fewer days off than a European, and the decline in worktimes was greater in the Old World. In the 1980s, the Old World began to work fewer total hours, but in historical perspective this reversal was the culmination of a long-term process. Compared to workers elsewhere, Europeans had a stronger preference for leisure beginning in 1870. This trends clearly emerges after controlling for levels of income. Even at early stages of development New World workers had a predisposition to supply more labor time.

In the second stage of the paper, we evaluate the determinants of changes in worktime in the periods before 1913 and after 1950. In our baseline model, the estimated coefficients of a regression of hours on wages are roughly similar across the two periods. These results are robust after controlling for demographic, economic, and social variables. We also consider whether inequality in the early period had the same effect that Bell and Freeman found for the U.S. and Germany today. Again, there are historical precedents. Inequality in the New World led to longer hours. We consider as well Alessina et al.'s hypothesis on unionization rates. For the period after 1950 we are able to replicate their findings, but we find that labor power, proxied by the percentage of the male population eligible to vote, reduced working hours in Europe before 1913 as well. The upshot is that the basic determinants of worktime changes in 1900 were no different than those one hundred years later.

The third stage of the paper speculates on the origins and the persistence of the New World choice to supply relatively more labor time. We investigate whether initial conditions in 1870, captured by geography (population density), human capital (school enrolment), and culture

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[3] Hours of work in New Zealand increased over the same period (OECD 2004).

(religion), can help to explain worktimes today. The underlying intuition is that worktime choices today are circumscribed by decisions taken at some earlier date.

Our findings suggest that geography trumped culture and human capital. Cross-country differences in worktimes today are related to the ability of Americans, as well Canadians and Australians, to have gotten to work more rapidly sometime in the past. As ever, Saul Bellow's characterization of Chicago during the 1920s, cited above, seems to ring true for the New World. Located closer to their place of employment, North Americans and Australians supplied more labor time because of lower travel costs. For similar reasons – for a given workweek – they also preferred shorter days as opposed to fewer days of work. This pattern was visible by 1900.

The variety of unemployment insurance schemes among our sample of countries illustrates how initial labor market outcomes became institutionalized. It was common practice for European workers, who had a strong preference for days off, to workshare during recessions. Accounting for this feature, short-time workers were eligible for unemployment insurance when the early legislation was introduced on the continent. In Australia, Canada, and the U.S., where a full-week of work was the norm, worksharing was less common – except for a brief period in U.S. history in the mid 1930s. As a result, short-time workers were excluded from UI benefits in the New World. Once in place, UI rules reinforced initial predispositions toward work. In this light, the longer worktimes in the New World in 2000 can indeed be situated on trajectory set sometime in the past.

Worktimes from 1870 to 2000: The basic data

This section introduces the stylized facts of worktimes from 1870 to 2000. We study three components or dimensions of worktime: work hours per week (or per day), days of work per year (or weeks of work), and annual work hours. This breakdown is essential to our explanation of international differences, because how workers allocate their labor time may shed light on long-run trends in worktime. Annual hours can mask these differences. Owing to varying fixed costs in labor-market participation, workers may not be indifferent between different combinations of days of work and hours per day (or per week); there may be significant differences along these lines between men and women. The sources of change along the dimensions of labor supply have also varied across countries and regions. Unions have often taken the lead in fighting for a shorter workday; while governments have often taken the initiative to mandate vacation days.[4]

Hours of work per week

Table 1 presents an overview of the length of the workweek from 1870 for a sample of New and Old World countries. The unit of measurement is weekly hours of the average full-time worker (male and female) in non-agricultural activities.[5] These values control for days of work.[6]

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[4] Hamermesh (1996, p. 14) made this point. Because workdays and work hours are different dimensions of the labor supply decision, "the existence of fixed costs along a particular dimension [days vs length of the work week]…can produce the unusual result of large jumps in labor supply along that dimension when the worker's wage rate changes."

[5] There was little part-time work in the period before 1913 and the interwar years. After 1945, the contribution of part-time workers to changes in the average length of the workweek varied considerably by county. It was most evident in the Netherlands and the U.K. (OECD 1998, 2004). That said, for most countries, recorded average hours of full-time and part-time workers moved together. As for women's hours, these tended to be close to those of men

Our estimates until 1913 are from a firm-level survey assembled by the U.S. Department of Labor in 1900. Huberman (2004) describes the sample and weights used in calculating national averages from sectoral figures. For 1929 to 2000, we have taken estimates from the International Labour Organization, except where indicated otherwise.[7] For 2000, the table reports male and female work hours. By 2000, both European men and women worked less than their counterparts elsewhere.[8]

Notwithstanding recent changes in the composition of labor supply and the rise of part-time work, the long-term pattern is clear (see Figure 1). In 1870, New World countries had a shorter workweek (or fewer hours per day) than elsewhere, but the rate of change in hours was nearly twice as great in the Old World. There were adjustments as well across sectors (Huberman 2004). Services had initially longer hours than manufacturing, a gap that widened in certain countries from 1870 to 1913; across countries, iron and steel had the shortest hours in this period. By the 1920s national and sectoral worktimes had converged.

In order to explain the trend toward convergence, the literature has pointed to political and social changes before and after World War One. At the national level, the spread of universal suffrage and rising unionization rates in Europe exerted pressure on governments to reduce worktime. In the New Word, suffrage rates, which were greater in 1870, remained relative constant. Moreover, the New World entrusted legislation to the provinces or states, and decentralization may have slowed the movement to a national standard. The comparison between Belgium and Canada is instructive. In the former, the adoption of universal male suffrage in 1893 triggered a series of legislative reforms that curtailed the workweek (Vandervelde 1911, 1920); but even in the most progressive province in Canada, Ontario, the few statutory interventions had modest effect.[9] In the New World, reductions in work hours appear to have been the "outcome of bargains struck between workers and employers, in the context of a competitive labor market (Margo 2000, p. 232)." After the war, the foundation of the ILO in 1919 and its sponsorship of a common standard, the eight-hour workday, gave added presence to the forces of convergence (Cross 1988).

Despite these political forces, the period of convergence was shortlived. The U.S. and the U.K. failed to ratify the eight-hour resolution adopted by the ILO, and by the mid 1920s certain national authorities, like Switzerland and Belgium, had loosened their commitments to the common standard. In the wake of the depression most countries seem to have gone their own way. Some, like France, opted for large cuts in worktime in the 1930s. The U.S. was a close second. Historians have traced these divergent trends to the various public and private strategies put in place to meet the rising demand for leisure from those employed and the demand for worksharing from the unemployed (Cross 1988). In France, the state legislated reduction in hours; in the U.S.,

Washington used its powers of moral suasion to encourage worksharing. Australia and Canada provide an example of the third way: job sharing and hour cutbacks were relatively unimportant (Gregory, Ho, and McDermott 1988; Green and MacKinnon 1988). We give a more extensive description of worksharing in the last section of this paper.

In the aftermath of World War II, old patterns reasserted themselves. New World workers tended to labor shorter weeks than their Old World colleagues, but as before 1913 the rate of change was greater in Europe. It was sometime between 1980 and 1990 that Europeans on average began to work fewer hours per week than elsewhere – but this was essentially the culmination of a century long trend.

Days of work

Table 2 gives the number of days of work (vacations and national holidays) over the long twentieth century. We have taken values for 1870 and 1900 from Huberman (2004); those for 1938 to 1990 from a series of contemporary studies of vacation days conducted by the ILO (1939, 1995), the U.S. Department of Labor (Monthly Labor Review 1955) and EIRO (1982); values for 2000 are from a variety of sources, including EIRO, the OECD, and official websites.[10]

At the outset, days off were rooted in the traditional religious and social calendar and there was much sharing of work patterns across the Atlantic.[11] North American workers observed the Old World ritual of Saint Monday (Gutman 1973), while Europe adopted May Day, a U.S. creation. But by 1900 a clear pattern had emerged. In Catholic Europe many of the religious festivals had been transformed into secular holidays (Strikwerda 1997), and, although in certain Northern Europe countries the work year was long, the Old World had on average more than twice the number of days off as in the New.[12] Until 1913 paid holidays and vacations were rare.

From the end of hostilities until the 1930s, the change in the number of days off was greater in the New World – not surprising given their initial low level – but absolute increases were about the same in the two regions. The transformation of religious festivals into secular days had run its course, explaining to some extent the catch-up of the New World. In these years, European states and employers found themselves under growing pressure to convert days off into paid vacation days (Furlogh 1998). These programs were not initiated or restricted to France of the *Front Populaire* as commonly held. The Soviet Union and eastern European countries were the first to introduce paid vacations, and faced by growing labor power most western and northern European states emulated their programs (ILO 1939).

In North America legislation was not forthcoming and the story unfolded differently. Those employers who had instituted paid vacations as a part of a larger plan to win over workers from unions in the 1920s appear to have dropped them in the 1930s. Some of these firms replaced

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[10] There has been little change in vacation days in our sample of countries since 1990. There are discrepancies between thee figures in Table 2 and those reported elsewhere, owing to different measures used by the ILO, EIRO, and the OECD. Alesina et al. (2005) report a similar problem with the French data.

[11] The New World was in the forefront of many innovative programs to reduce the work year. French and Belgian workers viewed admiringly the handful of U.S. firms that had introduced paid vacations before WWI, and were envious of American workers' tenacity in fighting for an eight-hour day (Hunnicut 1998). Australia was in fact the first country to institute this type of legislation on a broad scale (Coghlan 1918). Before World War II, continental social reformers considered the Fair Labor Standards Act of 1938 as a model piece of legislation.

[12] Social historians confirm that that were fewer days off in the New than in the Old World. Rosenzweig (1983) found that American workers had only three official days off around 1870; Labor Day was the only additional holiday granted before 1913. (Although promoted by Abraham Lincoln to commemorate the Civil War, it was only in 1941 that the US congress proclaimed Thanksgiving a federal holiday.)

longer holidays with four-day weeks, but workers rejected these types of programs, preferring the customary five and a half days of work.[13] In a contemporary study, the U.S. National Industrial Conference Board found that more than half of the 300 establishments surveyed had either suspended or discontinued their paid vacation plans after the depression.[14] All told, the average North American production worker had about one-week paid vacation in the 1930s, about half that of a European worker, and considerably fewer public holidays.

After 1945, the historical pattern persisted. Again the absolute change was the same in the two regions. In Europe, legislation mandated further increases in paid vacation time, and, while Canadian workers were able to negotiate similar benefits, in the U.S. and Australia there is still no statutory minimum paid leave (Alesina et al., 2005, p. 6).

One would be hardpressed to say that the European preference for more days off is a recent phenomenon. This choice appears to have been fixed at early date. Although the decline in days worked was slow, about two days per decade over the twentieth century, the cumulative effect was large. By 2000, using figures for days of work from Table 2, the greater number of vacation days in Germany compared to the U.S. explains 45 percent of the gap in annual worktimes between the two countries.[15]

Underlying this pattern was the longstanding difference in the allocation of worktime – given a fixed number of hours per week – between days at work and hours per day in the two regions. Europeans have had a time-honored preference for longer hours of work per day and fewer days. In the New World, the obverse held.[16] Although we postpone a full discussion of this paper pattern to later in the paper, we take note that, from an early date, workers and firms around the world had made divergent choices along the different dimensions of labor supply. Since these choices have persisted, understanding their origins may help to explain current worktime trends across countries.

Annual hours of work

Table 3 presents annual work hours for our sample of countries from 1870 until today. The figures for 1870 to 1913 are from Huberman (2004) who constructed annual measures of full-time production workers from estimates of the number of weeks worked (adjusted for days absent) and hours per week. The interwar observations have been calculated from Tables 1 and 2 using the same method. The figures for both these periods are consistent with other estimates.[17] From 1950 on, we have taken the series available from the University of Groningen database

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[13] More popular during the depression were worksharing programs that entailed a reduction in the length of shifts as opposed to fewer days of work. See Nemirow (1984, p. 35).

[14] This study was summarized in the Canadian *Labour Gazette* (September 1935, vol. XXXV, p. 743).

[15] About 5 percent of the gap between the two countries is explained by the shorter workweek; the remainder is explained by differences in labor force participation. Bell and Freeman (2001), Freeman and Shekttat (2005), and Alesina et al. (2005) produce a similar result.

[16] Goldin (1988) reported a similar tradeoff within the U.S. Women in manufacturing employment worked fewer days in states having longer hours per day. Women workers, who lived in the new suburbs often traveled far to their place of employment - men, on the other hand had shorter commutes - and this may explain the tradeoff they made (Harris and Lewis 2001, pp. 277-78). We explore the implications of commuting times in more detail later in the paper.

[17] Our figures for these years are consistent with other estimates. Matthews et al. (1982) reported 2,219 hours for Britain in 1924; Marchand and Thélot (1991), 2,287 hours for France in 1929; Maddison (2001), 2,342 hours for the U.S. in 1929.

(2005).[18] These figures are estimates of total work hours divided by the number of workers. The splice of datasets is appropriate because of the increase in women's labor force participation (and the fact that full-time women work a shorter week then men) and the rise of part-time work in the second half of the century.[19]

The New World labored fewer work hours than the Old for one hundred years. However, the average annual rate of change was greater in Europe (0.53 percent per annum) than in the New World (0.36 percent). The gap moved in favor of the Old World in the mid 1970s, and thereafter slowly widened (Figure 2). These results are not novel. Nonetheless, the long-run perspective is doubly revealing. First, it exposes the exceptional nature of the interwar years. The standard deviation of work hours (measured by the coefficient of variation) for the sample of countries is about the same in 1900 as in 2000, but the 1929 figure is half this value. This finding sheds light on debates about the impact of globalization on worker welfare. It is commonly held that in periods of deep international integration, like that before 1913 and after 1950, wages and employment conditions would have tended to converge. But hours of work in our sample show the opposite tendency. Evidently, globalization is consistent with different work patterns and conditions across countries.

Second, the long-run perspective exposes that, despite distinctive histories at the national level, New World countries today all work relatively long hours – they just achieved this outcome in different ways. The average U.S. worker spent the same numbers of hour on the job as a Belgian by 1913, even though the latter toiled almost 400 hours longer in 1870. The U.S. worker did see her hours cut dramatically in the interwar years, but resumed to longer work schedules after the war. Canadians actually toiled the longest in the interwar period, a degree of effort that persisted into the post 1945 years. The Australian pattern summarizes the histories of Old and New Worlds. In 1870, it had the shortest work year in the world, by the interwar years the duration of work was equal to our sample's average, and by 2000 it had converged to levels found in Canada and the United States.

From the perspective of 130 years, the current divergence highlighted by Bell and Freeman (1995, 2001) and others does not look that spectacular. There were longstanding reasons that underlie the less rapid decline of worktimes in the New World. The mobility of workers within and across New World countries, a process that was tied to international flows, tilted workers' collective decision against worktime cuts (Shiells 1990). Faced by the choice between wage increases that all workers relished and cuts in work hours that a smaller number desired, the collective decision in the New World favored greater earnings. In subsequent sections of the paper, we substantiate these claims.

Figure 3 makes the point of historical origins of international differences somewhat differently. We compare annual work hours at the same level of incomes for a sample of Old and New World countries. At extremely low levels of per capita income, less than $3,000, there was

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[18] These numbers are superior to other available estimates. Maddison's (2001, p. 347) annual figures for 1990 show remarkably no difference between Germany and the U.S.; while the OECD (2001) reports a gap of 300 hours in favor of Germany. The Groningen figures fall in between these two. For a discussion, see van Ark and McGukin (1999).

[19] The figures after 1950 provide a check on the estimates for the early period. The difference in annual worktime for Denmark in 1950 using the same technique employed in constructing the 1870-1939 estimates and the corresponding figure from the Groningen database is 17 hours. This assumes 44.4 hr/wk in 1950 (Table 1) and 46.2 weeks of work (the value for 1938 calculated from Table 2). The method used for calculating annual hours in the earlier period is inappropriate for later years owing to changes in the composition of labor supply. Thus for Denmark in 2000, the difference using the technique for 1870-1939 and the Groningen estimate is 161 hours.

little difference across countries, but as incomes rose the gap in labor effort widened between the U.S. and Europe. At GDP per capita of $5,000, which the U.S. achieved in 1910 and France in 1950, the annual work year of an American was 30 percent longer. Blanchard (2004) has performed a similar exercise for 2000, claiming that the lower level of work effort in France was compensated by rising productivity. This argument does not transfer across time. In 1900, output per hour was twice as great in the U.S. (Maddison 2001, p. 351). The question remains: Why does – and did – the New World work longer?

Explaining work hours: Is there a common model?

In this section we compare the determinants of changes in worktime for two sub-periods, 1870-1900 and 1970-2000. From a long-term perspective, the interwar years were exceptional; anyway the available data permit a detailed examination of the early and late periods only. For the early period, we have used information on wages and hours contained in the U.S. Department of Labor study previously referred to; for the later period, we have constructed a data set from surveys collected by the ILO.

Our research strategy is to estimate baseline models and then to ask whether the determinants of worktime varied over the two periods because of social, political, or demographic changes. Variables that are 'fixed', such as religion, are dealt with in a later section. If the coefficients remain roughly similar across the two periods, we cannot reject the hypothesis that there was no major break in the determinants of worktime over the long twentieth century.

Determinants of worktime: 1870-1900

Column 1 of Table 4 gives the baseline results for the first period with controls for countries, sex, occupation, and year.[20] For males, a 10 percent increase in the wage led to a 1 percent decline in the workweek, about 35 minutes based on the figure for 1900 from Table 1. The estimated coefficient corresponds to other estimates.[21] Column 2 shows a similar, albeit, smaller coefficient for manufacturing only.[22] Column 3 adds a dummy variable for region to the baseline regression. Recall than in the previous section we found that initially Europeans had a longer workweek, but the decline in their worktimes was greater than that of workers in the western offshoots. The regression confirms this. The relative rise in wages in the Old World is driving this result. For a given wage change, New World workers were less predisposed to take more leisure. To begin to explain these differences across continents, in regression 4 we add indicators of the dependency ratio and proportion of workers in agriculture.[23] The signs of the estimated coefficients are what we would have expected. The larger the agricultural population

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[20] The data were classified into five occupations: services, manufacturing, textiles, mining and construction, and iron and steel. We have deflated wages (which the Department of Labor recorded by the day) using the price indexes cited by Williamson (1995).

[21] These are uncompensated labor supply elasticities and fall within the range of other estimates (see Pencavel 1986). The point of the exercise in this section is not to improve on previous estimates with new data, but simply to assess the stability of the estimated coefficients over time. See Costa (2000) for comparable U.S. estimates for the 1890s.

[22] Regressions of like those in Table 4 may perform poorly because of a built-in spurious correlation. Daily earnings are themselves constructed from information on weekly earnings and on hours per week (Costa 2000, p. 165). To check for this possibility, we regressed hours on lagged wages for the UK observations. Again the results do not change substantially. These regressions are available from the authors.

[23] The dependency ratio is defined as the number of males less than 16 years of age plus males over 65 plus all females divided by males between 16 and 65.

and the greater the dependency ratio, the longer the workweek. Despite these additions, however, the wage coefficients remain roughly stable.

Recent papers by Alesina et al. (2005) and by Burgoon and Baxandall (2004) make the strong case that reduced worktime in Europe after 1970 was associated with greater levels of unionization. For the period before 1913, union density was not a significant determinant of worktime, a not surprising result given the low levels of unionization.[24] That said, male suffrage rates are perhaps a better indicator of labor power in this period because an increase in the number of voters was often manifested in pro-labor legislation. Figure 4 graphs the positive relation between the change in voter turnout from 1870 to 1913 and the reduction in work hours per week (from Table 1) for the same year.[25] In many countries hours' legislation was restricted to the years after 1900 which falls outside the period covered by the sample studied in Table 4. Nonetheless, for the subsample of Old World countries (there was little or no change in rates of suffrage in the New World between 1870 and 1900) the coefficient on voter turnout in column 6 World has a coefficient of -.04, and is significant at the 15 percent level. To illustrate, the Netherlands had a lower voter turnout than France in 1880 (20 vs 65 percent). If it had the same turnout as in the hexagon, weekly hours would have fallen by about two hours.[26]

Table 5 examines the country patterns in more detail, with controls for occupation and sex. Although the results are sensitive to sample size, some national characteristics that continue to persist into the late twentieth century reveal themselves. For a given wage increase, the Danes and Germans were willing to take more leisure than Americans. Still, the latter gave labor less time than Canadians and Australians, who in turn, compared to the British, Belgians, and Spaniards, preferred the opportunities of wage work.

How sensitive was labor supplied before 1913 to inequality? Recall that Bell and Freeman claimed that rising in inequality is behind the trend toward longer hours in the U.S. More precisely, those who work longer move up in the wage distribution at the workplace, and the gains for working hard are greater the more unequal the wage distribution. Although the underlying story may be different, inequality did lead to longer hours in the earlier period. Figure 5 traces the positive relation between average annual changes in inequality, as measured by the O'Rourke-Williamson (1999, p. 176) index for 1870 to 1913, and reductions in the length of the workweek over the same period. Sweden and Denmark were well above average, exhibiting increased equality and large cuts in hours; the U.S. and Canada were below average.

The micro data we have collected data confirm this result. For each occupation in the sample, we calculated the difference between maximum and minimum wages for each year.[27] Column 2 in Table 5 reports results of a regression of hours on inequality. In the U.S. and Canada, greater inequality led to longer hours, holding wage levels constant. In Belgium, Denmark, Great Britain, and Italy the opposite held, while in France, Germany, the Netherlands, Spain, and Sweden there was no relation between inequality and hours. Although Australia and Switzerland were exceptions, the dynamics seem to be different between regions.

These results suggest, however, that the causes of inequality were perhaps different before 1913 than after 1970. The Bell and Freeman explanation of long hours after 1970 turns on

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[24] These regressions are available from the authors.

[25] Sources for voter turnout are Flora (1983) and Lindert (2004). The correlation coefficient of the relation in Figure 4 is 0.38. Italy is excluded from the figure. It had a large rise in voter turnout, but no change in work hours.

[26] Using decadal values for both Old and New World between 1870 and 1913 from Table 3, we regressed annual hours on GDP per capita, the share of the population in agriculture, country dummies, and voter turnout. In this specification, the coefficient of voter turnout was negative and significant at the 0.05 level.

[27] This indicator is close to the Theil index of interindustry wage inequality.

incentives within the firm. Our findings are not restricted to sectors in which large firms dominated. At least for North America, Bowles and Park 's (2004) model of social emulation, or Veblen effects – the desire of workers across occupations to imitate a richer reference group – provides a better fit for the early period. The economic history literature makes this point differently. In the New World, workers were relatively scarce and their mobility was great (Fishback 1998; Long and Ferrie 2005). Inequality, Pope (2000, p. 139) wrote, is endemic in fluid and dynamic economies like that of the late nineteenth century U.S, where new participants entered relocated, changed occupations, and took " risks to capture the opportunities before them." The results from our sample are consistent with this story. Across occupations, skilled workers in the U.S. and Canada would not forsake the opportunity of long hours.

Determinants of worktime: 1970-2000

For this period, we used evidence collected by the ILO from 1970 on full-time weekly hours and wages (per hour) by sector of activity.[28] Columns 1 and 2 of Table 6 present the baseline estimates with controls for sex, countries, sector, and year. For a larger group of heterogeneous industries, the coefficient is positive but close to zero. For a subset of comparable sectors the absolute size of the coefficient on wages is smaller than in the earlier period, but because the level of aggregation of the underlying data differs across the two samples, it would be premature to conclude that there is any substantial differences across periods. A similar result holds for manufacturing only in regression 3. In this period, the New World dummy is not significant, a result perhaps of the sectors included in our sample. That said, the difference in the duration of the workweek between regions was not as great in this period as the difference in the number of days worked and annual hours. Column 5 adds control variables for population structure and the percentage of the labor force engaged in agriculture. Again, the addition of these variables alters only modestly the wage coefficient. Column 6 adds unionization rates. Labor power, as in the period before 1913, has succeeded in cutting the length of the workweek, a finding consistent with Alesina et al. (2005) and Burgoon and Baxandall (2004).

Table 7 examines country patterns in more detail for the late twentieth century. We restrict ourselves to those countries for which we were able to separate male and female workers, although the results for men are most directly comparable with those in Table 5. The estimated coefficients (controlling for sector) for men are more variable than in the first period, but they fall within the range of other modern studies of labor supply. For some countries, like Belgium, Germany, Great Britain, and Ireland, the results are pretty much identical with those for the first period. The coefficient for Australia changes signs, but the absolute difference is not great. For Canada and the U.S., most recent studies report uncompensated wage elasticities of 0.0 to -0.7 for men, pretty much what we have found for the early period (Pencavel 1986).

The regression results of Tables 4-7 suggest that there has been no dramatic change in the determinants of hours of work over 130 years. The wage coefficient has been relatively stable, and labor power and inequality have continuously exerted pressure on hours and in opposite directions. The persistence of these fundamental relationships is found in Table 8, where a model of nineteenth century hours is used to predict weekly work hours between 1970 and 1990. Two stripped-down versions of the model in Table 4 are considered. In the first, hours

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[28] The sectors included were: construction, finance, manufacturing, sales, mining, service, transport, and utilities. Because the coverage of male and female workers was uneven across sectors, countries, and time, in some cases we use a smaller sample of 'comparable industries' consisting of construction, manufacturing, and mining.

between 1870 and 1900 were regressed against log wages and a dummy for sex; the second model adds the dependency ratio and the proportion of the population in agriculture. The coefficients from this regression are then combined with actual average values for the same set of variables from the Old and New Worlds between 1970 and 1990 to predict hours in recent decades. The predicted values are within ten percent of actual weekly hours in each decade, and the model does predict rising relative (weekly) worktime in the New World. Model 1 predicts a gap of 30 minutes less than the actual difference in 1980. These results do not sit well with the view that sometime after 1970 a new regime of international worktimes emerged in which Americans began to toil longer than Europeans.

In all, the standard model identifies satisfactorily the causes of *changes* in hours worked over the long run. It does not explain entirely, however, the initial differences in *levels* of work times in the New and Old Worlds as illustrated in Figure 2. The puzzle remains. Why did and do North Americans and Australians work longer?

Deep variables and working hours

The labor supply decision melds short and long-run considerations. In the preceding section we have concentrated on determinants, like labor power and inequality, that exhibit a considerable degree of variability across time, the relative importance of which has been the subject of much of the recent literature on worktime differences since 1950. But the labor market decision is conditioned by deep-seated variables that are not only economic, but social and geographic in origin as well. These variables may have their origin well before 1950. In this section, we contend that the gap between Old and New World hours today is as much a response to short-run as to these long-run factors. We focus on three initial factors that may have had irreversible effects, at least to varying degrees, on the different dimensions of worktime: culture, human capital, and geography.[29]

Culture Landes (1999, p. 175) has renewed the debate on the relation between religion and the work ethic. The Puritan mantra of the seventeenth century, 'Time is short and the work is long,' summarizes well his argument. "Puritans," other historians (Rodgers 1978, p. 9) observed, "threw out the "irregular carnival of saints' days, and replac[ed] it with the clocklike rhythm of the weekly Sabbath." Undoubtedly, as Rodgers (1978, p. 11) has written, the work ethic of the nineteenth century did not have the theological trappings of its earlier versions; but "the ascetic injunctions of the Protestant ethic [were] retained and multiplied their force." Today, although the moral force has dissipated, the legacy of the work ethic remains. There are fewer public holidays in New World countries and for long periods of their histories governments were less inclined to place limits on labor supply. Over the long run, work hours have become a positional good (Frank 1985), the demand for which has increased because long hours on the job are seen to bring relative advantages not strictly related to income. In empirical work, these forces are difficult to identify. The correlation between the percentage of the population who were Protestant in 1870 and worktime in 2000 (the same result holds if we consider the change in worktime from 1870 to 2000) in Figure 6 is weak (r = -0.04).

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[29] Hall and Jones (1999) use an analogous concept, 'social infrastructure', in their study of long-term economic growth. Engerman and Sokoloff (1997) relate how the interaction between geography and population density impacted on growth performance in the Americas.

Human Capital Kniesner (1976) proposed that U.S. work hours after 1950 stabilized because the average worker chose to acquire additional schooling. This effect is different than that associated with an increase in wages (and hours) caused by an exogenous increase in the demand for labor of a certain quality. Individuals who have increased their market earning power through further education are expressing their commitment to market work. This should lead us to expect that at a given wage rate individuals with greater schooling will probably work longer than others.[30] Kniesner's argument transfers across space and time. Countries with initially high levels of enrolment in the late nineteenth century would have put in place incentives that perpetuated the relation between schooling and work, perhaps along the lines suggested by Lucas (2002). These forces may have waned over the century, however. The common indicator of education levels one hundred years ago is primary school enrolment – the measure adopted in this paper – but as this level of education became uniform across our sample of countries, its explanatory power would have weakened.[31] Still, school enrolment in the New World was 50 percent greater than in the Old World in 1870, and 37 percent greater in 1913. Figure 7 shows that century-old enrolment levels did have a lasting effect on worktime. The coefficient of correlation between human capital in 1870 and annual hours today is 0.15.

Geography In the textbook model of labor supply, the greater the fixed-time cost of taking on a job, the higher the reservation wage, and the fewer the hours supplied. The point is illustrated in Figure 8. Higher commuting costs shift the labor supply curve of the individual to the left. We also show that the reservation number of *hours of work* may rise when time costs rise. The result is twofold. The labor force has contracted and those who remain will work fewer hours.[32]
In Figure 8 the individual European's labor supply curve in the late nineteenth century is represented by L_{ow}; the worker in the New World by L_{nw}. At the same wage, the average Old World worker gives fewer hours.

Urban historians frequently refer to the close proximity of workers in the New World to their place of employment.[33] Even in large cities like Montreal, many laborers resided in the same 'quartiers' as their work sites (Lewis 2000).[34] European cities were simply older and land was scarce (Kaelble 1988). Before 1913 Belgians commuted daily by rail transport, up to one and half hours (in one direction) in some cases, to their work sites (Mahaim 1910). When factories were established on in the city outskirts in Europe workers tended to live either in the city cores or in satellite towns some distance away; only managers could afford the new suburbs. With suburbanization in the New World, both workers and managers moved to the greenfield sites

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[30] Put differently, the regressions reported in the previous section, which neglect the separate role of education, bias upward the estimated wage coefficients.

[31] Our schooling measure is primary-school students per 1000 children of ages 5-14. Source: Lindert (2004).

[32] The reduction in hours of work stems from the fact that the reduction in total usable time is shared between reductions in leisure and work. However, the net reduction of the supply of labor will cause wage rates to rise for the labor market as a whole. Of course, market wages in the New World were always above the reservation wage of the average Old World worker and we do not observe the lower portion of L_{nw}

[33] On the scope of the U.S. labor market, see Rosenbloom (2002). On Chicago, Melbourne, and Toronto, see Borchert (1996), Frost (2001), Harris (1998). Echoing Augie March, Harris and Lewis (2001, p. 272) wrote: "From an early date, immigrants and workers had followed industry away from the center [of Chicago]. The Stockyards from the 1860s, Pullman in the 1880s, and the Central and Clearing districts after 1900 are prominent examples. By 1920, there was a close association between industry and working-class settlement."

[34] The title of Monkkonen's (1984) volume on labor mobility in the U.S., "Walking to Work," is apt.

outside the city center. Although they resided in different districts, both groups remained close to their places of employment.

Social observers like Rowntree (1910), who were concerned about urban conditions at the turn of the century, described fully these distinctive regional patterns of commuting. In the interwar period, commuting became the focus of attention in ILO studies on the effects of the depression on participation and unemployment rates. One study which compared auto assembly plants in the Midlands and Michigan (Liepmann 1944, pp. 50-65) found that 25 percent of workers coming into Birmingham traveled between 6 and 10 km one way, and another 25 percent more than 10 km; in Flint, two-thirds of laborers traveled by car about 15 minutes to and from work – and returned the short distance home for lunch. Heim (2000) confirms these distances for the U.S.

The relative ease with which New World workers entered the labor market had long-term implications for the amount of effort they supplied, as well as the allocation between days of work and hours per day.[35] At the margin, Europeans preferred more days off, compared to Americans, because of longer commuting times. The ILO study concluded bluntly on the preference of Europeans for additional days off:

The five-day week is a helpful device: it reduces by a full sixth the number of journeys and with it the cost, loss of time and strain involved. To minimise the employees' travelling is one of the main considerations prompting firms to introduce the five-day week. The working hours lost through not opening on Saturday morning are usually added to the five remaining days.

The upshot is that factor endowments affected total hours supplied as well as individual preferences for the scheduling of work – the two features we identified earlier that distinguished Old and New Worlds over the long run. In this paper we use country size, measured in sq. km, divided by population, and weighted by the proportion of country area that is habitable, as a indicator of population density.[36] Figure 9 illustrates a negative correlation (r=-0.79) between commuting times and this measure of area in 2000.[37] For the same year, longer commuting times were correlated (r=-0.52) with shorter annual hours. This relation has deep historical roots. Figure 10 traces the strong positive relation (r=0.68) between area (and short commuting times) in 1870 and annual work hours in 2000. This relation is positive (r = 0.12) for the subsample of European countries as well. Around the globe, low population density in 1870 seems to have had a persistent effect on worktimes. All this does not deny that contemporary Americans may now face longer journeys to work; indeed the rise in commuting times in the U.S. big cities has

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[35] Hammermesh (1996, p. 36) observed the historic trend in his recent study of U.S. and German worktimes: "[T]he relative flexibility of the American labor market compared to one European labor market, Germany, is manifested chiefly in greater dispersion of days worked, not daily hours."

[36] Our indicator of habitable area is the percentage of urban extent in each country. These figures range from less than 0.5 percent for Australia to 41 percent in Belgium. The definition of urban area is a population unit of over 2,500. Source Centre for International Earth Science Information Network: http://beta.sedac.ciesin.columbia.edu/gpw/global.jsp#summary.

[37] Commuting-time estimates for 2000 are from:
Europe: http://www.eiro.eurofound.eu.int/print/2002/07/feature/ie0207202f.html; Australia: http://www.tai.org.au/Publications_Files/DP_Files/DP78Sum.pdf; Canada: http://www.emrg.sfu.ca/EMRGweb/pubarticles/Reports%20on%20Municipalities%20and%20Transportation/cantranspref.pdf; U.S.: http://www.ameristat.org/Content/NavigationMenu/Ameristat/Topics1/2000Census1/Going_to_Work__Americans_Commuting_Patterns_in_2000.htm

coincided with the advent of telecommuting in lieu of more days off in the 1990s (Hammermesh 1998). But these are new developments that will prove difficult to redress a century old pattern of more days of work per year in the New World. In the next section we illustrate how early unemployment insurance legislation codified these commuting practices, thereby impacting on labor market outcomes today.

Estimating the contribution of deep variables

Table 9 reports results of a series of regressions with annual data on work hours from 1950 to 2000 and weekly hours from 1970-2000 as dependent variables.[38] As is customary with annual data, we use GDP per capita as an independent variable. Columns 2 and 3 confirm our previous finding that the New World is different than the Old World, and that labor power has brought down working times, even with the addition of unemployment rates. In the fourth and fifth regressions, we add the deep variables, with values for 1870. Geography and initial levels of human capital have had enduring effects on annual hours of work today, and in the anticipated direction. Religion, however, seems to have had, inexplicably, a negative effect. All together, comparing columns 4 and 3, the deep variables explain as much of the changes in worktime as do unionization and unemployment rates.

Columns 6 to 8 exploit data on full-time weekly hours collected by the ILO (which underlie Tables 6 and 7) for 1970-2000. In this specification geography is significant, but has a negative effect on weekly hours. This result is expected. Recall that historically New World workers preferred shorter workdays (but more days) than Europeans. Note that religion and enrolment have changed signs in comparison with Columns 4 and 5. It is hard to distinguish whether these changes are due to the sectoral makeup of data set, or to a different and unknown, relationship between these deep variables and the length of the workweek. In any event, the impact of a change in area on worktimes is greater than that of the other deep variables.[39] We conclude that geography alone has had considerable importance on worktimes in 2000.

Geography, Hours, and Institutions: The Case of Unemployment Insurance

"Even if, later on, institutions may ultimately affect the evolution of factor endowments, the initial conditions with respect to factor endowment had long, lingering effects (Engerman and Sokoloff 1997, pp. 275-76)."

The variety of UI programs across countries illustrates how initial factor endowments had enduring effects on worktimes. In this section, we sketch, first, how eligibility requirements for UI programs in Old and New Worlds encoded different preferences for days of work, and, second, how once in place these rules reinforced initial predispositions toward worktime.

In the decades before the introduction of UI, Old and New World workers and firms responded to downturns in strikingly distinctive ways. In the New World, despite long periods of

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[38] Annual data are from the Groningen database (2005).

[39] From the estimates of regression 5 in Table 9, using the highest and lowest values of the independent variables for 1870, we calculated the following: if Italy had the same proportion of Protestants as Sweden, its worktimes would have been 1.6 percent *shorter*; if Italy had the same enrolment levels as the U.S., its hours would have been 3.1 percent longer; if Ireland had the same urban area per capita as Canada, its hours would have been 5.8 percent longer. Calculations available from authors.

downtime before 1913, worksharing was rarely resorted to.[40] In the 1930s, Washington had encouraged worksharing, but this was an exceptional episode and many of the programs that were instituted did not engender much enthusiasm anyway (Jacoby 1985). In Australia and Canada, job sharing and hour cutbacks were relatively unimportant in the depression (Gregory, Ho, and McDermott 1988; Green and MacKinnon 1988). Wherever possible, in good and bad times, workers sought out full-year contracts.[41] That said, there was much seasonal work in the New World. But Engerman and Goldin (1993) provide examples of workers moving between agriculture and manufacturing employment into the early twentieth century, a practice that was feasible because of the low transport and related fixed costs of going to work.[42] Although the process was imperfect and workers did face periods of unemployment, dovetailing provided the possibility of a long, if not interrupted work year, filling seasonal demands in the two sectors.[43] The point here is that when manufacturing firms in the U.S. turned to full-time production in the 1920s they had to offer workers full-time contracts – as opposed to part-time schedules or worksharing arrangements – because they had to compete for workers who had grown accustom to long work years.

In the Old World before the advent of formal UI schemes, worksharing was more widespread. Again geography mattered. In Belgium, there was a surplus of agricultural workers, and those workers who lived in the countryside and commuted to their places of employment in manufacturing, rarely found alternative work when laid off. Dovetailing, one authority (Rubinow 1913, p. 444) on unemployment speculated, was less common in the Old World. Often, unemployment meant one or two days off per week (Vandervelde 1903), the burden of which was reduced for thosewho had considerable daily fixed costs of getting to work. This pattern persisted in the interwar years in Belgium (Goossens, Peeters, and Pepermans 1988) and elsewhere on the continent. The upshot is that in the period before UI was legislated, part-time work schedules, like worksharing, were prevalent throughout Europe – put in place to accommodate the lack of alternative employment, as well as workers' preference for fewer days of work (Huberman 1997).

Unemployment insurance legislation codified the different labor market histories of Old and New World countries. Social insurance legislation in Europe when it came to be written incorporated the widespread use of worksharing arrangements. The German case was unambiguous. Summarizing its 1927 UI Act, one historian (Weigart 1934, p. 34) wrote: "Part-time employment is not penalized; instead it is encouraged." Throughout Europe, short-time workers were eligible for benefits, a situation that persists until today. It was often the case that a minimum level of weekly earnings was required for eligibility. Contemporary Belgium, it should come as no surprise, has the most generous system on the continent with regard to eligibility and payments for short-timers (Abraham and Houseman 1993).

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[40] Atack, Bateman, and Margo (2002) reported that U.S. manufacturing consistently operated far below full-time work hours in this period.

[41] Goldin (1990, p. 182) observed that part-time work in the U.S. before World War II was practically "unobtainable."

[42] Home ownership was higher in the New World, but this did not constrain mobility (Monkonnen 1988, p. 197).

[43] Seasonal unemployment in the U.S. became more of concern in the 1920s when manufacturing turned toward full-time schedules, reducing dovetailing and thereby explaining the concerns of architects of UI legislation for this type of unemployment. See below.

In Canada and the U.S., early UI legislation excluded part-time workers, again an outcome that persists across many states today.[44] The Canadian legislation was based on a model worker who gave 180 days of work in the year, with the assumption of a six-day workweek.[45] In the U.S., from the outset short-time compensation payments out of state UI trust funds ran counter to the federal standard in the original law (Title IX of the 1935 Social Security Act).[46] The contrast between Old and New Worlds was not simply another example of munificent and flexible Europe versus miserly and strict North America; rather it represented the outcome of the deep-rooted preferences toward worktime we identified earlier. The average worker in the New World could meet the qualifying conditions because of the predisposition to work more days per year than the representative European whose preference was to give longer hours per day.

Thus UI legislation responded to initial factor endowments and workers' preferences in Old and New Worlds. But the relation between institutions and preferences was mutually reinforcing. Consider the experiences in Germany and Canada with worksharing in the 1980s and early 1990s.[47] On the one hand, German workers have long been accustomed to short-time work, partly because it was subsidized by UI, and they are open to the possibility of working less, even if this means lower wages. Canadian workers, on the other hand, have had little experience with short-time since for a long period it was not eligible under UI rules, and when offered the choice of a reduced work week, they have refused it. These histories came to play in the experiences of two large companies, Volkswagen and Bell Canada, which introduced worksharing programs to meet the downturn of the early 1990s. The former's program was deemed a success; the latter's was abandoned after less than one year. Canadian workers' lack of enthusiasm for a shorter work schedules in the 1990s was not out of place given their age-old predisposition toward labor time, an inclination that originated in the geography of the New World and then reinforced by UI legislation.[48]

Conclusion: History and Policy

The debate on worktimes in OECD countries has tended to focus on the period after 1950, if not later. We believe that worktime differences can best be understood in a long-term perspective in which the separate effects of incentives and institutions and fixed factors can be

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[44] In their overview of the origins of the U.S. unemployment insurance program of 1935, Baicker, Goldin, and Katz (1998) provide another example how geography mattered. They argue that the 'distinctive' characteristic of the American system is experience or merit rating, by which firms' contributions are based on the number of workers laid off. They attribute this feature to the prevalence of seasonal unemployment. That experience rating did not encourage more worksharing is counterintuitive. However, experience rating was never complete, because seasonal employers successfully lobbied to receive transfers from non-seasonal industries.

[45] There were important modifications in the Canadian UI system in the 1970s, but short-timers were integrated into the system only in the 1990s (Green and Riddell 1993). Australia's system of unemployment benefits – it was not conceived as an insurance scheme – came into effect in 1944; until then the States had their own forms of social assistance. In Queensland a system of unemployment insurance was established in 1921. The system provided benefits based on days of work, and although it allowed casual laborers to contribute and receive partial benefits, the system was biased toward full-time workers. To qualify, a worker had to make contributions for six months in the year preceding the UI claim (Bland 1934). A British (Ince 1937, pp. 19-20) observer, comparing the U.K. and Queensland systems, wrote that in Australia the "desire [is] to put a premium on casual employment in place of regular employment… thus encouraging the substitution of casual workers for regular workers."

[46] On this, see Blaustein (1993, p. 337); for the situation today, see Storey and Neiesner (1997).

[47] This paragraph summarizes Huberman (1997)

[48] In 2000, part-time employment as a proportion of total employment in the U.S (13.3 percent) was lower than the average of the European Union (16.4 percent). Source: OECD (2004).

identified. To this end, we first have assembled new data series on various dimensions of worktime, and then offered an interpretation of the major trends. Our new 'stylized facts' of worktime are:

• The history of hours of work in the U.S. was not exceptional. Its experience was shared by other New World countries.

• From an early date the Old and New Worlds made different choices about the number of days at work and hours of work per week and per day. Since 1870, the Old World has had more days off and a faster decline in hours per week.

• With regard to annual hours, the Old World began working shorter years than the New World sometime after 1970, but this reversal was by no means a sea change; rather it was the culmination of a long-term trend in Europe. Beginning in 1900 or so, the Old World worked less than the New after controlling for levels of income.

Our interpretation of these basic facts is:

• Labor power and inequality, factors that are deemed to be important determinants of worktime after 1970 or so, had comparable effects in the period before 1913. These factors help explain the greater *change* in worktime in the Old than in the New World throughout the period. But the *gap* in worktimes between the Old and New Worlds at comparable levels of income and from an early date still begs an explanation.

• We speculate that factor endowments were one reason why the New World was inclined to give more labor time. Because of low population density, which went hand in hand with a high degree of mobility, New World workers were able to reside close to their place of employment. They gave more work, because it was less costly to do so.

• Labor market outcomes in New and Old Worlds were codified in state regulations and workplace institutions. The integration of worktime schedules in UI programs is an example of this process.

If history does matter, as the evidence would seem to suggest, then policy proposals to transform the Old World into the New, and vice versa, by changing tax schedules or consumption patterns in one direction or another, need to be reconsidered. It is problematic to claim that policy is transferable and will have similar effects everywhere. Because attitudes to worktime have diverged over a long period, we cannot be certain that workers of the world today are intrinsically alike and will respond similarly to the same incentives. Over time, nurture has come to dominate nature.

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TABLE 1

Hours of Work per Week, 1870-2000

	1870	1880	1890	1900	1913	1929	1938	1950	1960	1970	1980	1990	2000 (M)	2000 (F)
Belgium	72,2	69,3	66,5	64.2	59.5	48.2	48.0		42.5	39.9	38.5	36.6	37.3	36.5
Denmark	69.9	64.6	59.9	56.0	55.8	48.5	47.6	46.0	44.4	39.0	37.5	35.0	39.3	37.7
France	66.1	66.0	65.9	65.9	62.0	48.0	39.0	44.8	45.9	44.8	40.7	39.9	36.9	34.6
Germany	67.6	66.3	65.1	64.0	57.0	46.0	48.5	48.2	45.6	43.8	41.6	39.0	40.8	39.0
Ireland	63.8	62.0	60.2	58.6	56.4	46.6	48.2	45.0		42.7	41.1	42.1	40.7	38.0
Italy	63.3	63.4	63.6	63.8	62.5	48.8	48.5	47.8	42.4	42.9	42.5	39.6	41.4	35.4
Netherlands	65.0	63.4	61.9	60.5	58.6	48.1	48.5	49.2		45.1	40.8	34.0	37.6	30.1
Spain	64.7	62.7	60.8	59.1	56.7	48.5	47.0				40.0	38.9	36.9	34.0
Sweden	69.6	64.6	59.9	56.0	56.0	48.0	46.3	46.8	43.4		37.7	38.2	39.1	36.3
Switzerland	65.4	63.1	60.9	59.0	56.3	48.5	46.3	47.5	46.1		43.8	41.6		
UK	56.9	56.6	56.3	56.0	56.0	47.0	48.6	45.7	44.7	42.0	40.0	42.4	42.0	38.9
Australia	56.2	53.3	50.5	48.1	44.7	45.5	45.0	39.6	39.6	39.6	39.2	40.1	42.6	38.5
Canada	57.2	59.0	60.9	62.6	57.9	49.0	47.2	42.3	40.7	39.7	38.5	38.0	42.8	36.0
US	62.0	61.0	60.0	59.1	58.3	48.0	37.3	42.4	40.2	38.8	39.1	39.7	43.3	37.2
Old World	65.9	63.8	61.9	60.3	57.9	47.8	47.0	46.8	44.4	42.5	40.4	38.7	39.2	36.1
New World	58.5	57.8	57.1	56.6	53.6	47.5	43.2	41.4	40.2	39.4	38.9	39.4	42.9	37.2
World	64.3	62.5	60.9	59.5	57.0	47.8	46.1	45.4	43.2	41.7	40.1	38.9	40.1	36.3
s.d	4.92	4.10	4.08	4.63	4.13	1.07	3.56	2.82	2.33	2.35	1.82	2.47	2.35	2.45

Notes: Hours of work per week of full-time production workers.
Sources: 1870-1913 – Huberman (2004); 1929-1938 – ILO (1934-38), except for values for Canada (Ostry and Zaidi 1972), the U.S. (Jones 1963, Owen 1988), and for Australia (Butlin 1977); 1950-1980 – ILO (1950-1980), except for U.S (McGratten and Rogerson 2004), and Australia (Butlin 1977); 1980-2000 – ILO (2005), except for U.S (McGratten and Rogerson 2004), Canada (Heisz and LaRochelle-Côté 2003), and Denmark (Eurostat, various years).

TABLE 2

Vacation and Holidays, 1870-2000

	1870	1900	1938	1950	1980	1990	2000
Belgium	18	21	30	28	34	34	33
Denmark	13	14	27	27	30	35	37
France	19	23	33	28	30	36	36
Germany	13	18	31	29	29	35	42.5
Ireland	14	20	33	20	28	28	30
Italy	23	24	37	24	35	40	41.5
Netherlands	4	5	21	24	33	35	37.5
Spain	31	31	44		30	35	36
Sweden	11	13	28	29	30	37	38
Switzerland	13	18	33	25	28	28	33
United Kingdom	14	20	30	24	28	30	32.5
Australia	8	9	22	22	32	32	32
Canada	8	9	22	22	25	25	24
US	4	5	17	18	22	23	20
Old World	16	19	32	26	30	34	36
New World	7	8	20	21	26	27	25

Sources: 1870 and 1900 – Huberman (2004); 1938 – ILO (1939); 1950 and 1980 – European Industrial Relations Review (1982), Green and Potepan (1988), *Monthly Labor Review* (1955); 1990 – ILO (1995); 2000 – EIRO (2003) and OECD (2004).

TABLE 3

Annual hours of work. 1870-2000

	1870	1880	1890	1900	1913	1929	1938	1950	1960	1973	1980	1990	2000
Belgium	3483	3344	3177	3064	2841	2229	2196	2404	2289	1851	1736	1699	1547
Denmark	3434	3172	2933	2742	2731	2301	2203	2071	1929	1871	1693	1492	1473
France	3168	3165	3119	3115	2933	2198	1760	2045	2025	1849	1696	1558	1443
Germany	3284	3223	3108	3056	2723	2128	2187	2372	2144	1808	1696	1541	1463
Ireland	3108	3017	2869	2795	2690	2182	2171	2437	2320	2103	1954	1992	1686
Italy	3000	3008	3006	3014	2953	2153	2162	1951	2012	1825	1724	1674	1612
Netherlands	3274	3194	3105	3037	2942	2233	2281	2156	2002	1709	2000	1414	1352
Spain	2968	2876	2787	2710	2601	2342	2030	2052	2042	2124	1968	1832	1815
Sweden	3436	3187	2937	2745	2745	2152	2131	2009	1902	1683	1523	1550	1645
Switzerland	3195	3083	2925	2834	2704	2281	2085	2092	1952	1835	1721	1617	1597
UK	2755	2740	2669	2656	2656	2257	2200	2112	2134	1919	1758	1698	1653
Australia	2792	2647	2501	2385	2214	2186	2109	2023	1945	1837	1815	1806	1797
Canada	2845	2934	3017	3102	2868	2354	2212	2111	2014	1874	1825	1830	1825
US	3096	3044	2983	2938	2900	2316	1756	2008	2033	1942	1853	1840	1878
Old World	3191	3092	2967	2888	2774	2223	2128	2155	2068	1871	1770	1642	1572
New World	2911	2875	2834	2808	2661	2285	2026	2047	1997	1884	1831	1825	1833
World	3131	3045	2938	2871	2750	2230	2133	2132	2053	1874	1783	1682	1627
s.d.	238.8	194.1	186.1	212.2	192.4	73.0	128.8	157.0	126.8	122.8	129.9	163.2	161.2

Sources: 1870-1913 – Huberman (2004); 1929 and 1938 – Tables 1 and 2, with deductions for days absent; 1950-2000 – University of Groningen (2005).

TABLE 4

Determinants of Hours of Work, 1870-1900

	(1)	(2)	(3)	(4)	(5)	(6)
						Full sample Old World
	Full sample	Manuf. only	Full sample	Full sample	Full sample	
Log wage	-.106	-.070	-.123	-.106	-.106	-.091
	(-76.44)	(-17.19)	(-88.15)	(-76.30)	(-76.27)	(-27.40)
Female	-.068	-.068	-.077	-.068	-.068	-.057
	(-34.93)	(-13.16)	(-37.31)	(-34.76)	(-34.76)	(-11.69)
New World			.095			
			(58.56)			
Dependency ratio				.073	.074	.027
				(4.48)	(4.47)	(0.92)
Proportion agriculture				.115	.118	-.299
				(2.91)	(2.81)	(-4.15)
Voter turnout					-.004	-.040
					(-0.19)	(-1.60)
Country dummies	yes	yes	no	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes
Occupation dummies	yes	no	yes	yes	yes	yes
Constant	3.79	3.85	3.84	3.65	3.65	4.09
	(433.55)	(160.98)	(673.73)	(147.32)	(147.04)	(60.42)
R-square	0.49	0.35	0.42	0.50	0.50	0.62
F-test	416	39	410	400	393	163
N	20886	3267	20886	20796	20796	4392

Notes: OLS estimates. t statistics in parentheses.
Sources: U.S. Department of Labor (1900). Dependency ratio, defined as the number of males less than 16 years of age plus males over 65 plus all females divided by males between 16 and 65, is calculated from Lindert and Mitchell (1980); proportion of population in agriculture from Flora (1983), Lindert (2004), and Mitchell (1980); voter turnout from Flora (1983) and Lindert (2004).

TABLE 5

Hours Regressions by Country: 1870-1900

	Log wage	Log wage gap	R-square	F-test	N
Australia	-.058 (-3.03)		.09	9.2	93
	-.037 (-2.10)	-.011 (-4.64)	.25	14.8	92
Belgium	-.089 (-4.85)		.13	23.5	158
	-.085 (-4.44)	-.005 (-1.85)	.14	12.2	155
Canada	-.018 (-2.56)		.01	6.6	452
	-.020 (-2.80)	.006 (2.18)	.02	5.7	452
Denmark	-.165 (-7.53)		.59	56.6	42
	-.122 (-4.98)	-.032 (-3.61)	.70	43.3	41
France	-.063 (-10.06)		.15	101	583
	-.063 (-9.89)	-.002 (-0.55)	.15	50.7	583
Germany	-.112 (-15.67)		.32	246	524
	-.111 (-15.47)	-.003 (-1.28)	.32	124	524
Ireland	-.044 (-4.47)		.07	20.0	268
	-.056 (-4.73)	.005 (2.20)	.09	12.4	253
Italy	-.058 (-7.24)		.17	52.4	261
	-.046 (-5.68)	-.012 (-4.54)	.22	38.5	261
Netherlands	-.031 (-1.72)		.02	3.0	140
	-.034 (-1.87)	.003 (1.20)	.03	2.2	140
Spain	-.102 (-3.53)		.15	12.5	75
	-.099 (-3.39)	-.008 (-1.07)	.16	6.7	74
Sweden	.018 (0.76)		.03	0.6	21
	.015 (0.61)	.002 (0.52)	.04	0.4	21
Switzerland	-.076 (-9.27)		.46	86.0	103
	-.076 (-8.32)	.003 (1.90)	.42	34.8	99
United Kingdom	-.087 (-22.56)		.18	509	2311
	-.087 (-22.70)	-.007 (-2.77)	.18	259	2311
United States	-.094 (-82.05)		.30	6752	15859
	-.096 (-79.13)	.008 (4.22)	.30	3379	15859

Notes: OLS estimates. t statistics in parentheses. Inequality is calculated as the difference between maximum and minimum wages for each year. These regressions include dummies for occupation and sex.

TABLE 6

Determinants of Hours of Work, 1970-2000

	(1) Full sample	(2) Comparable industries	(3) Mfg. only	(4) Comparable industries	(5) Comparable industries	(6) Comparable industries
Log wage	.015	-.056	-.035	-.120	-.059	-.056
	(2.95)	(-6.49)	(-3.78)	(-16.75)	(-6.82)	(-6.49)
Female	-.136	-.160	-.116	-.174	-.161	-.160
	(-41.12)	(-37.23)	(-26.33)	(-36.72)	(-37.40)	(-37.30)
Male and Female	-.032	-.015	-.023	-.043	-.014	-.015
	(-10.32)	(-4.23)	(-8.25)	(-12.20)	(-4.07)	(-4.27)
New World				-.002		
				(-0.05)		
Dependency ratio					.022	.020
					(0.80)	(0.73)
Proportion agriculture					-.200	-.150
					(-2.47)	(-2.17)
Union density						.001
						(3.55)
Country dummies	yes	yes	yes	no	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes
Occupation dummies	yes	yes	yes	yes	yes	yes
R-square	0.62	0.61	0.73	0.45	0.61	0.61
N	4840	2277	950	2277	2277	2277

Notes: OLS estimates. t statistics in parentheses.
Sources: ILO (2005); proportion agriculture from Mitchell (1980) and OECD (2004); dependency ratio from OECD (2004); union density from Friedman (2003).

TABLE 7

Hours Regressions by Country: 1970-2000

	Female sample				Male sample			
	Log wage	R-square	F-test	N	Log wage	R-square	F-test	N
Australia	.018 (0.84)	.002	0.7	474	.009 (0.85)	.002	0.7	477
Belgium	-.076 (-1.71)	.30	2.9	9	-.054 (-1.89)	.34	3.6	9
France	.067 (0.22)	.004	0.1	15	.040 (1.04)	.08	1.1	15
Germany	-.080 (-4.41)	.29	19.5	49	-.147 (-10.44)	.53	109	100
Ireland	-.120 (-1.39)	.02	1.9	81	-.025 (-1.52)	.02	2.3	109
Netherlands	-.258 (-7.73)	.29	59.7	146	-.141 (-8.75)	.27	76.6	211
Sweden	.123 (2.53)	.04	6.4	143	.046 (3.53)	.07	12.4	165
Switzerland	-.115 (-0.71)	.05	0.5	12	-.155 (-0.37)	.001	0.7	21
United Kingdom	-.099 (-8.40)	.22	70.6	255	-.163 (-12.27)	.32	151	317

Notes: OLS estimates. t statistics in parentheses.

TABLE 8

Predictions of Work Hours per Week, 1970-2000

	1970	1970	1980	1980	1990	1990	2000 (M)	2000 (M)
	Old World	New World	Old World	New World	Old World	New World	Old World	New World
Actual weekly hours (from Table 1)	42.5	39.4	40.4	38.9	38.7	39.4	39.2	42.9
Actual gap		*3.1*		*1.5*		*-0.7*		*-3*
Predicted hours, regression 1	43.4	42.3	42.6	41.6	42.2	41.7	42	41.4
Predicted gap		*1.1*		*1*		*0.5*		*0.6*
Predicted hours, regression 2	38.1	36.7	37.5	36.4	37	36.5	36.9	36.1
Predicted gap		*1.4*		*1.1*		*0.5*		*0.8*

Notes: In regression 1, hours for 1870-1900 were regressed against log wages and a dummy for sex; regression 2 adds dependency ratios and the proportion of the population in agriculture. The coefficients from this regression were combined with actual average values for Old and New Worlds between 1970 and 1990 to predict hours in recent decades.

TABLE 9
Regression Results of Hours of Work on Deep Variables, 1950-2000

	(1) 1950-2000 Annual hours	(2) 1950-2000 Annual hours	(3) 1950-2000 Annual hours	(4) 1950-2000 Annual hours	(5) 1950-2000 Annual hours	(6) 1970-2000 Weekly hours	(7) 1970-2000 Weekly hours	(8) 1970-2000 Weekly hours
Log GDP per capita	-.111 (-10.62)	-.138 (-13.66)	-.087 (-5.23)	-.097 (-5.97)	-.164 (-6.73)			
Log wage						-.059 (-8.01)	-.066 (-8.15)	-.077 (-9.10)
New World		.061 (10.03)						
Dependency ratio			.127 (4.56)		.124 (4.53)	.248 (14.54)		.196 (8.10)
Union density*100			-.082 (-5.64)		-.065 (-4.03)	-.023 (-2.62)		-.069 (-6.49)
% Unemployment			.002 (1.78)		.001 (0.67)	-.003 (-6.30)		-.002 (-3.18)
% Protestant, 1870				-.057 (-6.60)	-0.016 (-1.49)		.062 (9.09)	.078 (8.38)
Primary enrolment, 1870				.002 (0.55)	.001 (2.10)		-.018 (-7.86)	-.007 (-2.01)
Log urban area per capita, 1870				.011 (4.15)	0.015 (5.70)		-.011 (-7.06)	-.007 (-4.17)
Sex dummies						Y	Y	Y
Year dummies	Y	Y	Y	Y	Y	Y	Y	Y
Constant	8.65 (91.15)	8.88 (97.18)	8.96 (110.68)	8.61 (62.64)	9.09 (40.06)	3.55 (117.18)	3.83 (159.84)	3.60 (79.93)
R-square	.68	.73	.66	.71	.77	.45	.43	.47
F-test	28	34	455	29	31	50	46	50
N	714	714	587	714	587	2168	2241	2168

Notes: OLS estimates. t statistics in parentheses. Sources: For deep variables, see text and Figures 6-7, 9-10.

FIGURE 1

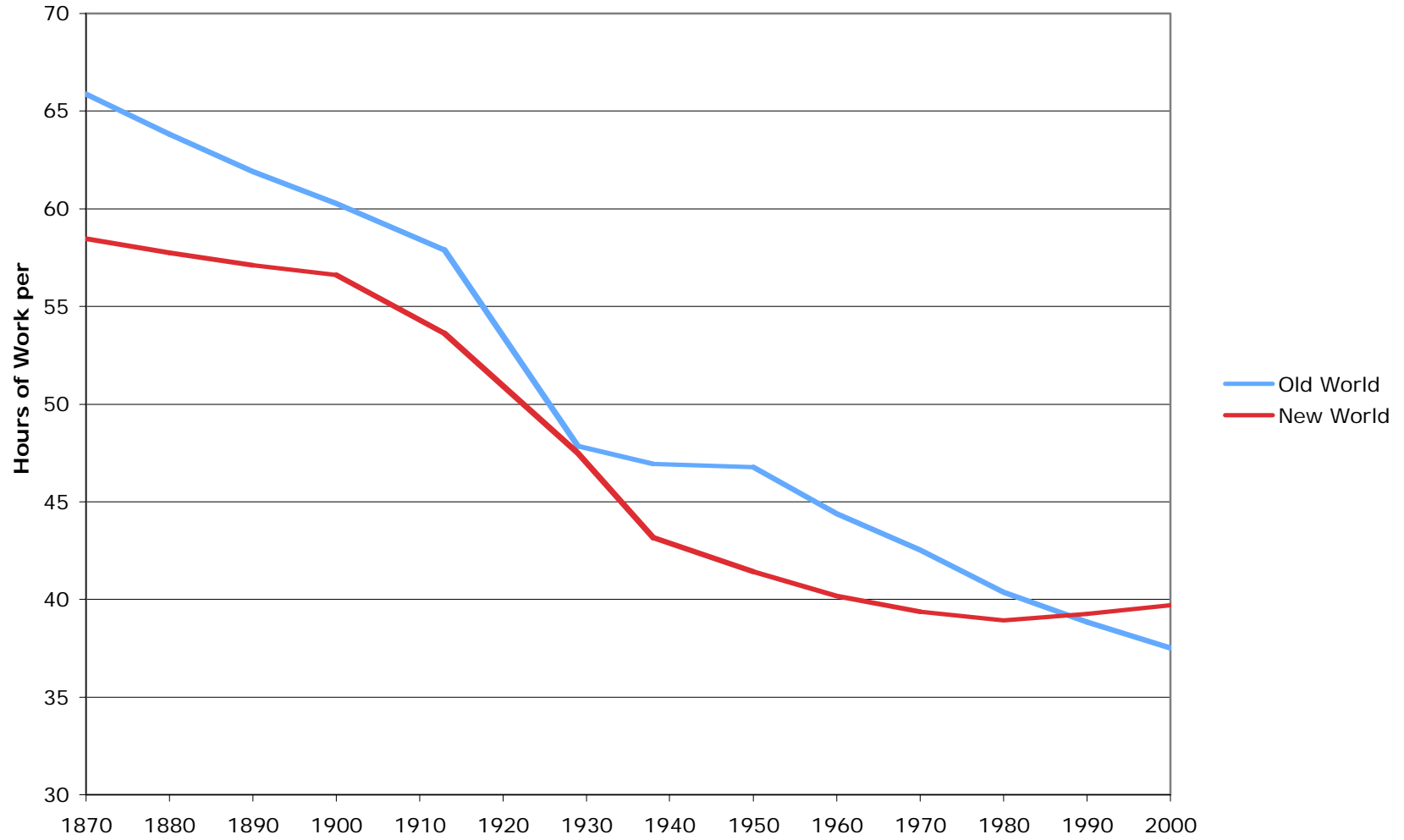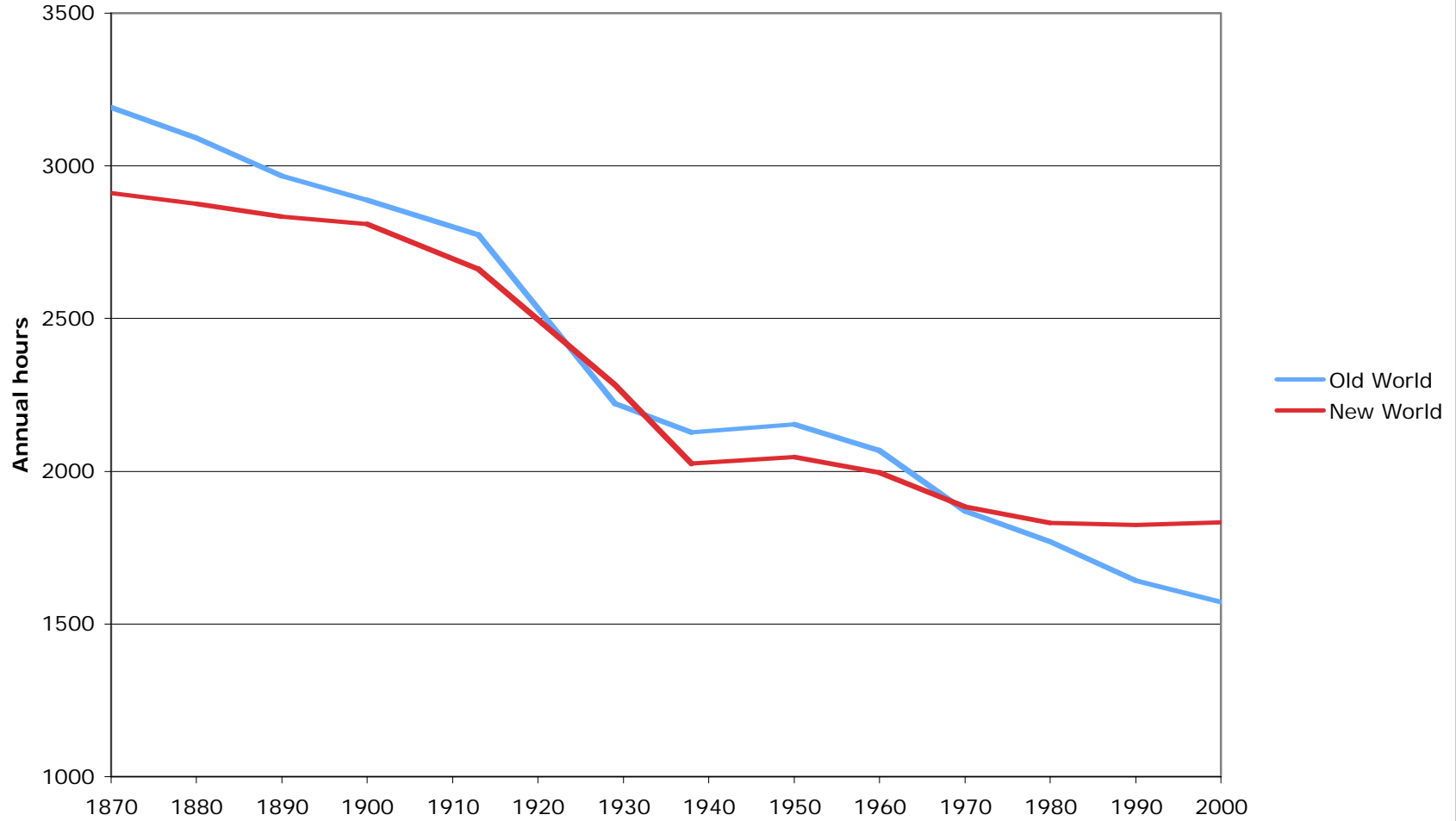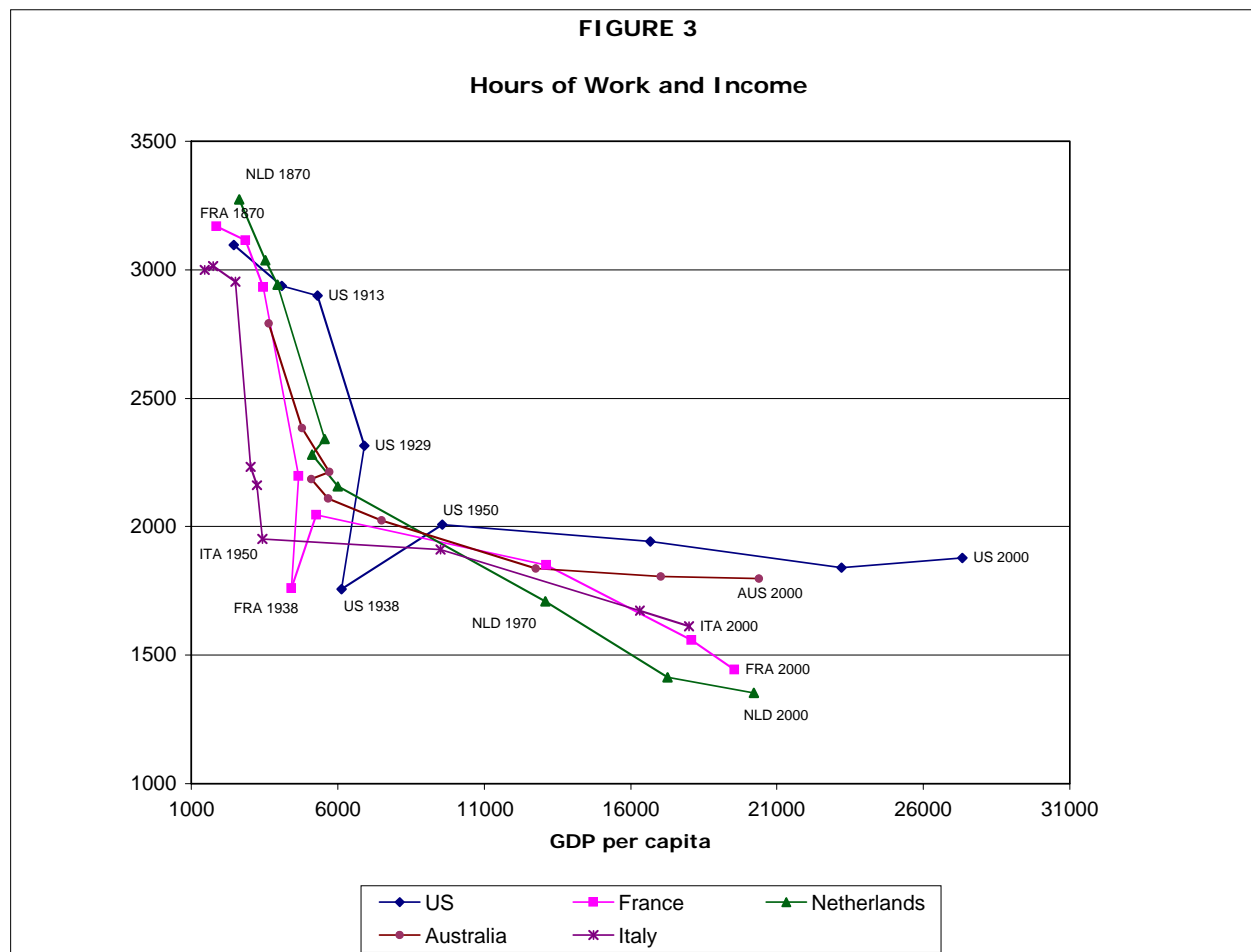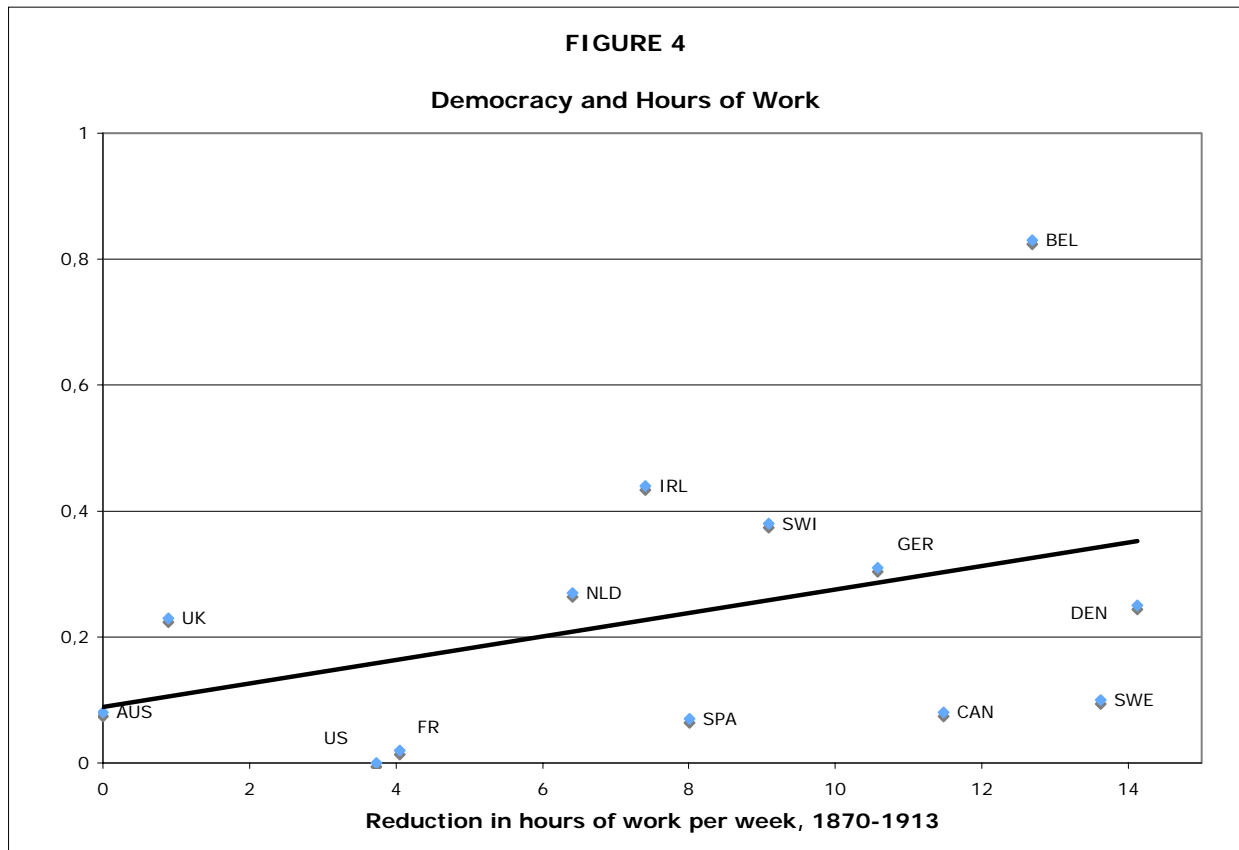**Hours of Work per Week
Old and New Worlds, 1870-2000**

FIGURE 2

**Annual Hours of Work
Old and New Worlds 1870-2000**

FIGURE 3

Hours of Work and Income

Notes and sources: The vertical axis is annual hours. GDP is in 1990 international U.S. dollars from University of Groningen (2005).
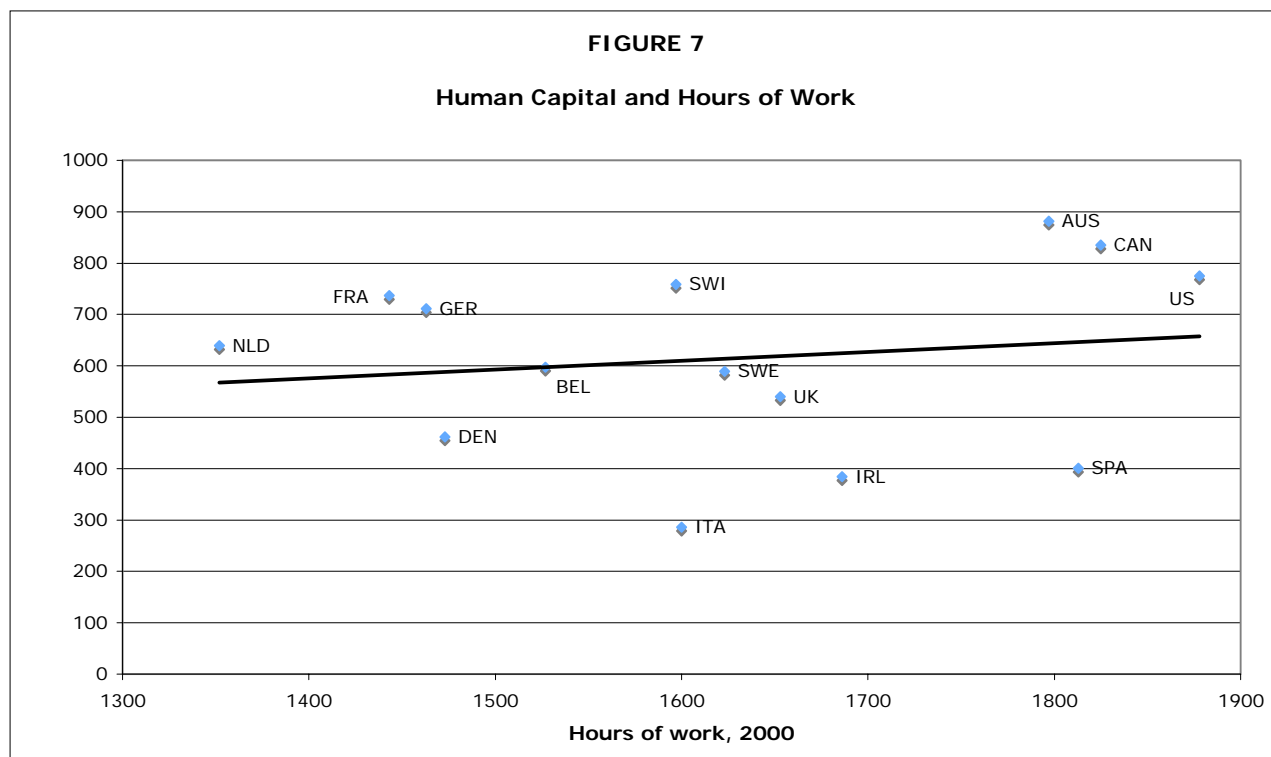
FIGURE 4

Democracy and Hours of Work

Sources: The vertical axis is percentage increase in voters, 1870-1913. Voter turnout from Flora (1983) and Lindert (2004).

FIGURE 5

Inequality and Hours of Wo
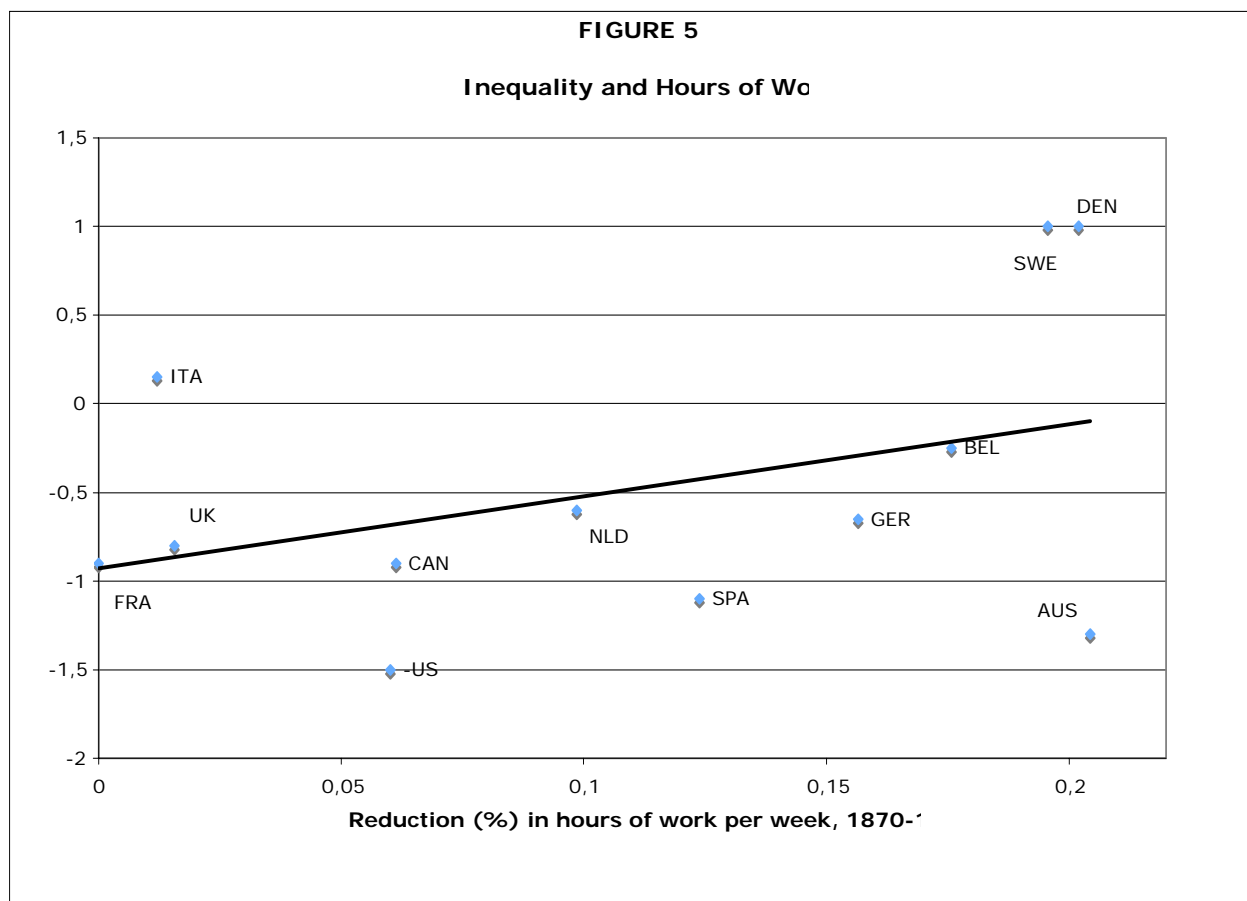
Notes and source: The vertical axis is the annual percentage change in inequality, 1870-1913. Inequality index from O'Rourke and Williamson (1999, p. 176).

FIGURE 6

Culture and Hours of Work
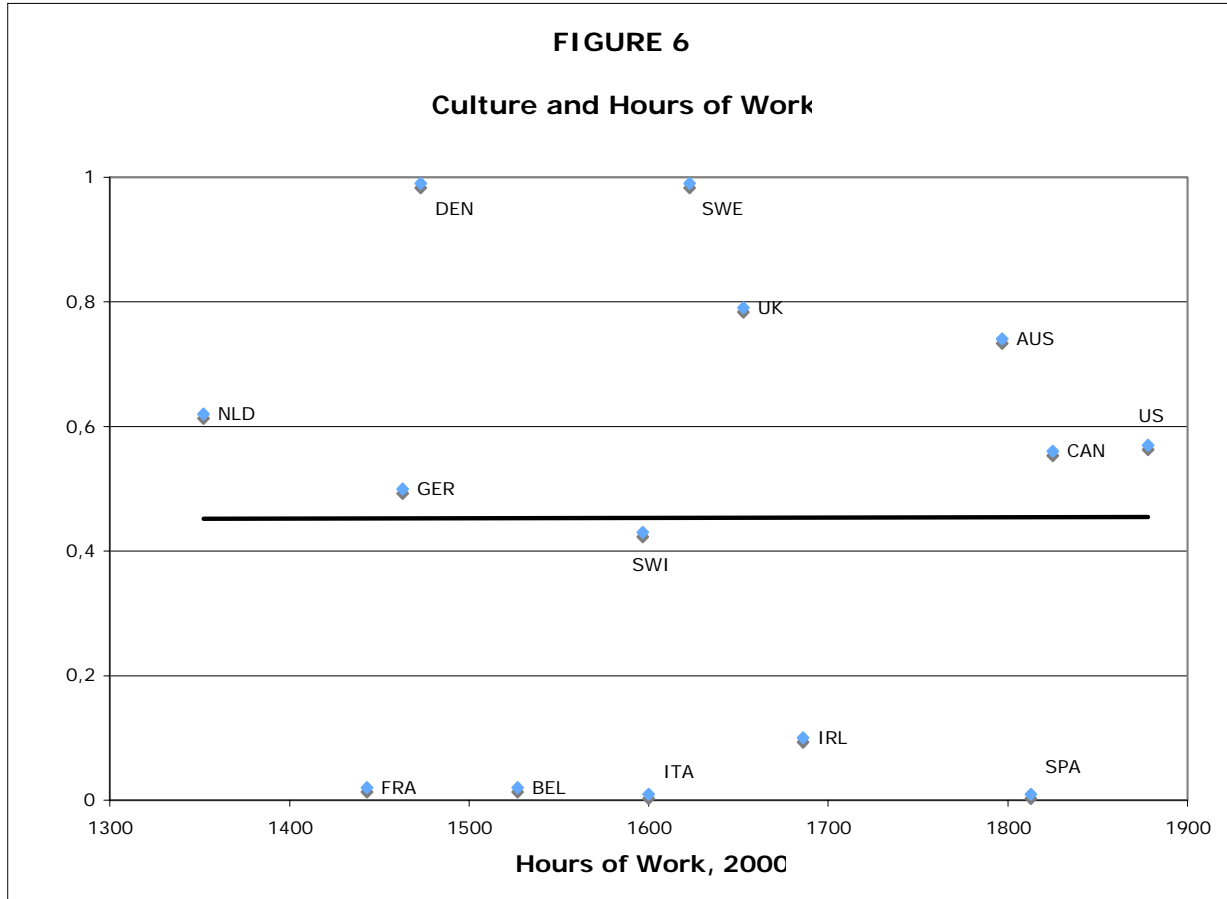
Notes and Source: The vertical axis is percent Protestant in 1880. Lindert (2004).

FIGURE 7

Human Capital and Hours of Work

Notes and source: The vertical axis is the enrolment rate in 1880. Enrolment is primary-school students per 1000 children of ages 5-14. Lindert (2004).

FIGURE 8

Labor Supply of Old and New World Worker

FIGURE 9

Commuting Times and Urban Area
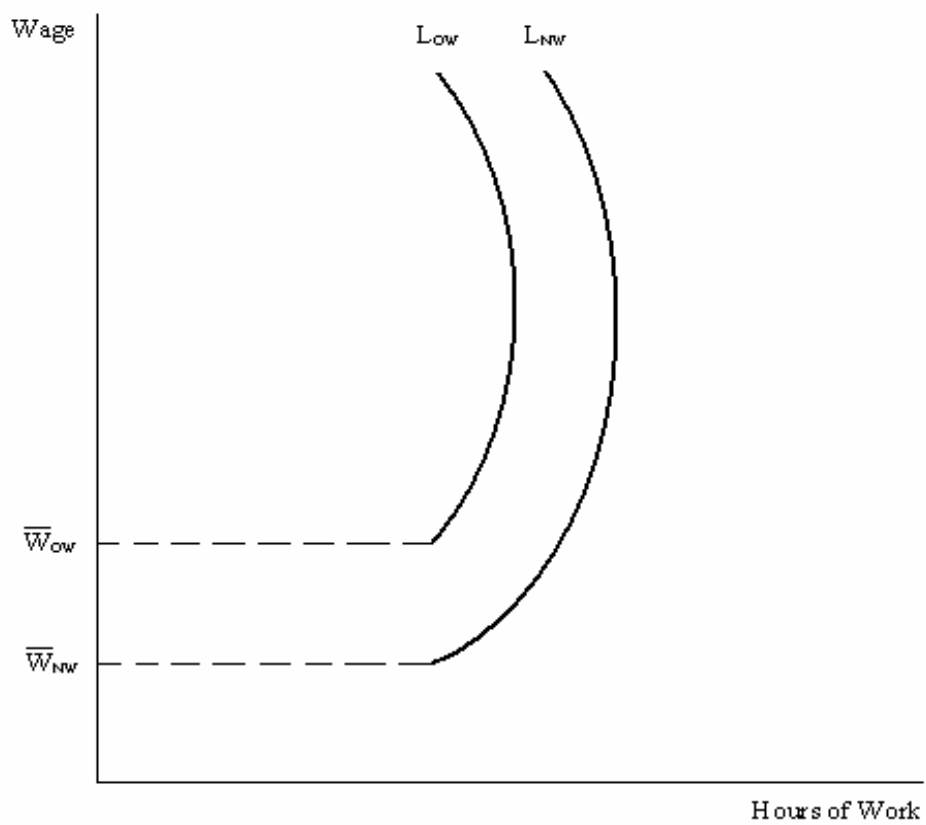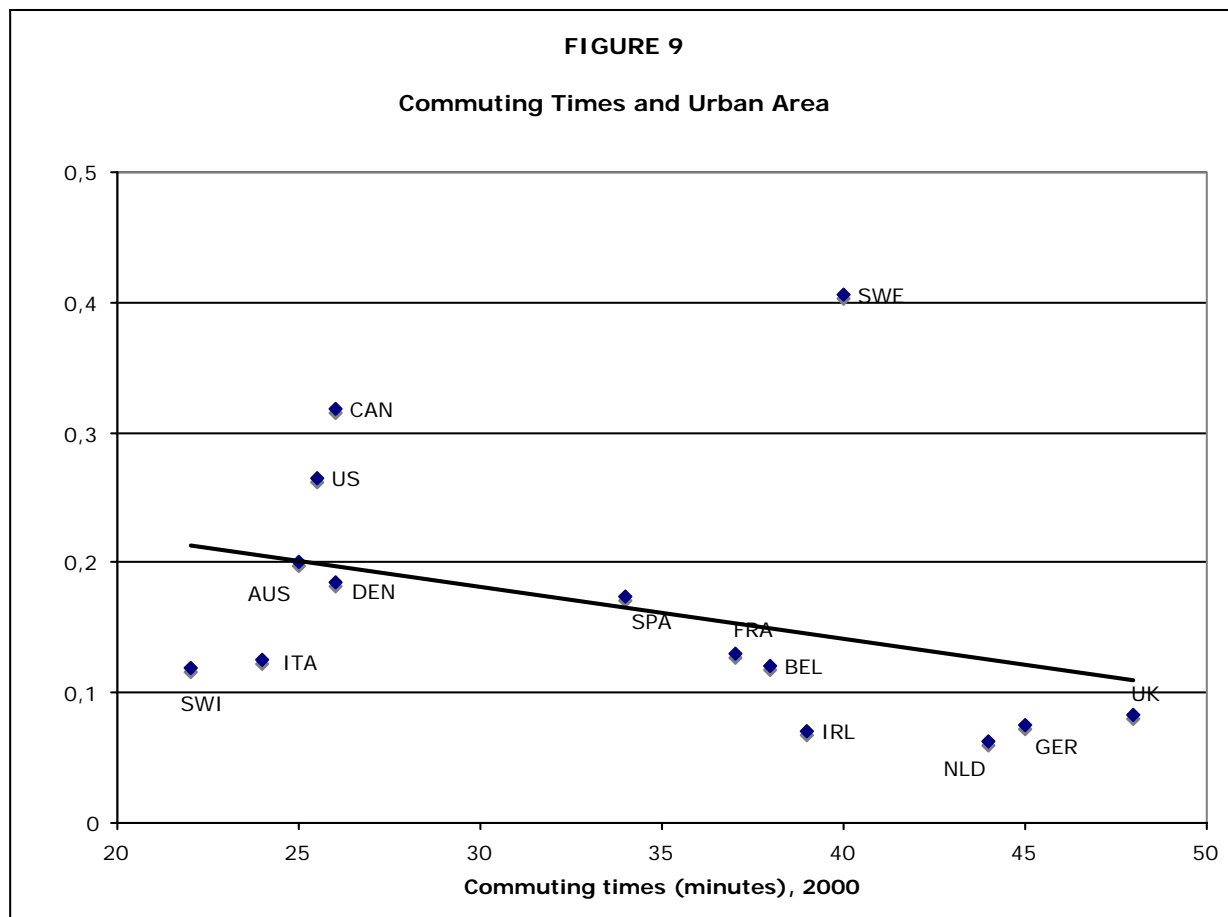
Notes and sources: The vertical axis is urban area per capita in 2000 (x100). Urban area per capita = ((area in sq km x urban extent)/population). All values are for 2000. Population is from University of Groningen (2005). Area and urban extent from Centre for International Earth Science Information Network: http://beta.sedac.ciesin.columbia.edu/gpw/global.jsp#summary. Commuting-time estimates for 2000 from: Europe: http://www.eiro.eurofound.eu.int/print/2002/07/feature/ie0207202f.html; Australia: http://www.tai.org.au/Publications_Files/DP_Files/DP78Sum.pdf; Canada: http://www.emrg.sfu.ca/EMRGweb/pubarticles/Reports%20on%20Municipalities%20and%20Transportation/cantranspref.pdf; U.S.: http://www.ameristat.org/Content/NavigationMenu/Ameristat/Topics1/2000Census1/Going _to_Work__Americans_Commuting_Patterns_in_2000.htm

FIGURE 10

Geography and Hours of Work
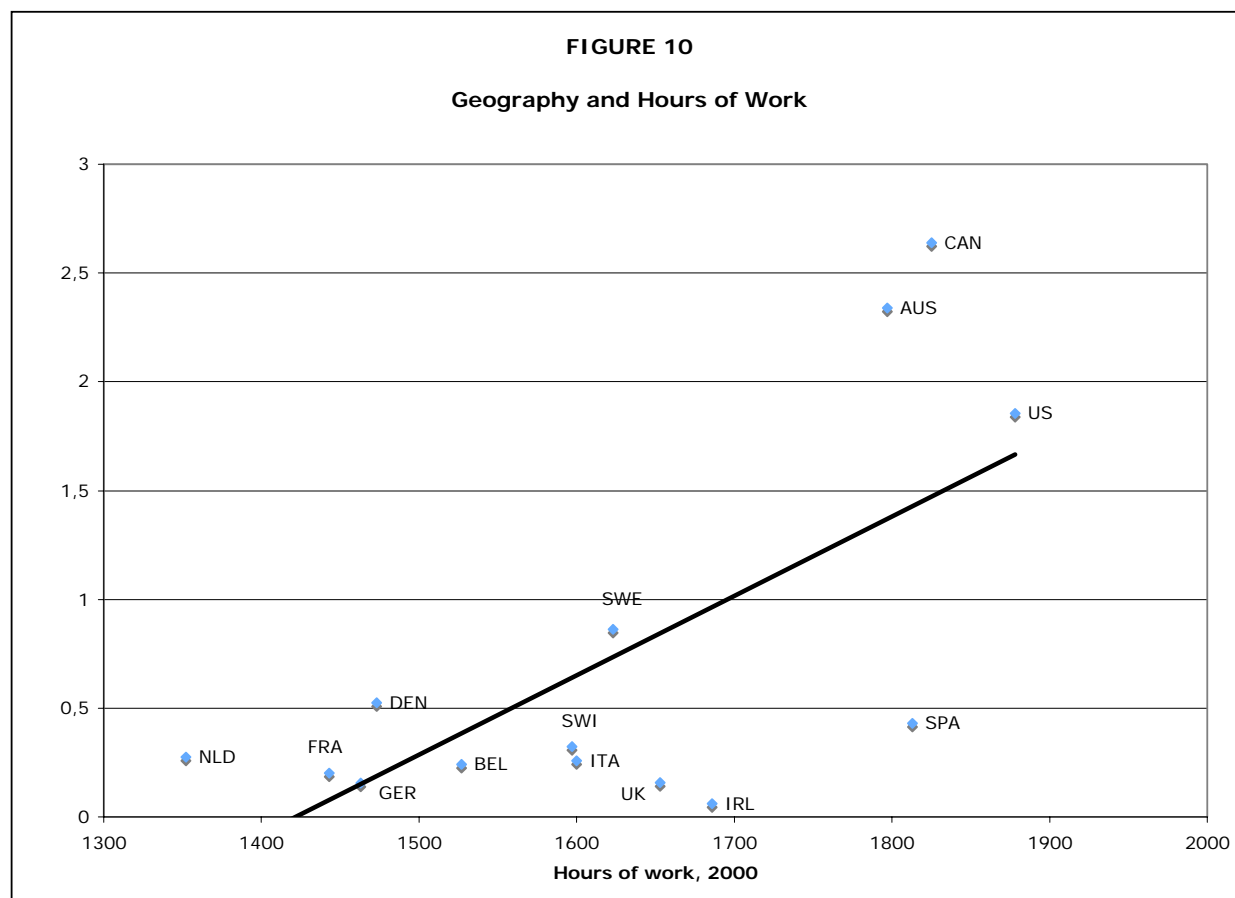
Notes and sources: The vertical axis is urban area per capita in 1870 (x100). Values for area and urban extent are for 2000. See Figure 9.