Explaining Occupational Gender Inequality: Hours Regulation and Statistical Discrimination

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Abstract

Women shoulder a heavier burden of family work than men in modern society, preventing them from matching male success in the external labor market. At least hypothetically, limiting working hours is a plausible way to level the playing field by creating the possibility of less gendered roles for both sexes. We find, however, the opposite has occurred: the greater the restrictions on working hours, the fewer the women who make it to the top of their professions. We explain this result with reference to statistical discrimination: As long as women are more likely than men to interrupt their careers for family considerations, firms will avoid hiring and promoting women to leadership positions that require long hours and continuous commitment. Where the absence of hours restrictions allow some women to signal their willingness to relinquish family responsibilities by working extraordinarily long hours at the office, women have a significantly higher chance of rising to managerial positions. We also note, however, that the absence of hours restrictions and other labor protections correspond with larger gender wage gaps lower on the occupational ladder because of the absence of wage compression. Moreover, the women who rise to managerial positions in liberal market economies remain outliers. The ability of outlier women to signal commitment to a long term career will not eliminate statistical discrimination itself until employers can expect the average man and woman to take equal amounts of time for family work.


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1. The Puzzle

Despite a large influx of women into mainly service sector jobs during the past four decades, women continue to be under-represented in the labor market, and they earn less on average than men. These gender differences are almost certainly linked to greater de facto responsibilities of women in child rearing and household work, but there are major and intriguing differences across rich democracies.

In relatively low productivity, low paid jobs, female labor force participation is higher in the US than in continental and southern Europe, although the gender wage gap is smaller in the latter countries. In Europe, union bargaining and wage compression put a higher floor under the lowest paid jobs where women disproportionately find themselves in every country. Scandinavia is in a class of its own because a large public sector creates the possibility of high levels of female employment in well paying government jobs.

These differences are usually attributed to the flexibility of the US labor market versus the widespread regulation of hours and wages in Europe and Japan. The ease with which American employers can hire and fire workers makes companies and workers less dependent on continuous careers than is the case in many other countries that rely more on the development of specific skills over the course of a lifetime of work. Because the American labor market is built on the expectation of worker mobility, women who interrupt their careers for family work do not set themselves apart when seeking new employment at various stages in their lives. In Europe, where labor market stability has been the norm, women (expected to spend some years caring for young children) find themselves at a distinct disadvantage compared to men who can commit to continuous careers. The cross-national pattern of gender equality is thus fairly well understood: female labor force participation is higher at two ends of a continuum—in liberal market economies and Scandinavia—than in regulated economies without big public sectors (Estevez-Abe, Iversen, and Soskice 2001; Estevez-Abe 2009; Iversen and Rosenbluth 2010; Wren 2011).

At the high end of the labor market, however, we encounter a wholly different puzzle. Female managers of large firms and university-educated professionals in the upper echelons of education, health, and law are strikingly scarce in Europe compared to a country like the US. The explanation for this cannot rest on labor market rigidities, since even in Europe, governments and unions play no or little direct role in setting hours and wages for higher-level occupations the way they do for lower-end jobs. Nor can the reason be that European women are discouraged from taking managerial and professional jobs because of long hours and inflexible schedules, since this is equally true in the US. Also of no help are theories of occupational performance that predict greater female success in jobs requiring relationship management and multitasking, since managerial jobs in the US and Europe do not differ by these criteria (Fisher 1999).

Our explanation focuses on how regulations of working time affect employers’ promotion decisions under incomplete information. To employers who can measure productivity only imperfectly, long working hours are a signal—though often a noisy one
as we discuss below—of expected productivity and therefore of suitability for many kinds of higher level managerial jobs. Labor market regulations at lower levels tend to equalize both wages and employment opportunities for men and women when productivity is linked to hours worked, but it has the unintended consequence of intensifying statistical discrimination against women in high-end jobs, even when these jobs are themselves unregulated. In labor markets as in much else, all good things do not go together; labor market regulations produce distributional tradeoffs that divide workers across both class and gender lines.

2. The Argument

We begin by distinguishing jobs along three dimensions: 1. Whether or not hours worked are positively associated with (hourly) productivity, 2. Whether there are ample opportunities for promotions based on competition rather than seniority, and 3. Whether or not working hours are regulated (restricted).

We assume that low- and middle-level jobs may or may not be regulated in terms of working hours and wages, whereas top-end jobs are always unregulated. The distribution of preferences for working hours is right-skewed for both men and women, but the mean preference is lower for women (including acquiescence in social expectations) because family responsibilities are borne disproportionately by women. The distributions are illustrated in Figure 1.

Ignoring the possibility of promotions for the moment, it is not difficult to see that with these assumptions, if productivity is rising in hours worked, women are at a disadvantage (see Figure 2). If wages are regulated by collective bargaining agreements or equal pay legislation, rising productivity in hours worked implies that fewer women on average will be hired, everything else equal. If wages are not regulated so that men will be paid more on average, fewer women will enter into employment in the first place, given their preferences for work. Either way the result is that women will make up a smaller share of total employment in these types of jobs.

Regulation of hours addresses both types of inequalities, wages and employment, simultaneously. If men and women have to work the same number of hours—in Figure 2 the regulation sets hours between the mean preferences of men and women—the gender shares of employment will equalize and so will wages (all else equal). Hours regulation can thus be a powerful tool for gender equality as argued by a number of scholars (Mutari and Figart 2001; Pascall and Lewis 2004; Burgoon and Baxandall 2006; Gornick and Heron 2006).

But there is an important and largely overlooked countervailing effect if competitive promotions, our second dimension, are important. Assume that promotions are into top-level positions where hours are always unregulated. When employers recruit workers for these jobs, they cue principally off of the formal education of candidates and their willingness to work long hours without career interruptions. Because the employer has to make a large specific investment in those who are promoted (“grooming”), and because
Figure 1. The distribution of preferences for working hours by gender.

![Graph showing the distribution of preferences for working hours by gender.](image)

Figure 2. Productivity and the gender gap.

![Graph showing productivity and the gender gap.](image)
productivity is rising in individual hours worked, willingness to work long hours and forgo career interruptions are important considerations. We expect the same logic to hold, though perhaps less stringently, if we look only at managers hired from the outside rather than those promoted from the inside.

If working hours are unregulated, employers can both observe past career interruptions and hours logged. Employers are likely to draw from the recruitment pool illustrated at the high end of the preference distributions in Figure 1, assuming that these preferences are revealed in unregulated labor markets. Within the recruitment pool employers promote without regard to gender, diminishing the role of prejudice.

There are two important qualifications to this analysis. The first is about the noise in the “hours” signal used to proxy future productivity. Since employers cannot know in advance the commitment of those who are promoted to working long hours, they use current hours as proxy. Workers therefore have an incentive to increase hours beyond the point where the marginal cost in terms of leisure is equal to the marginal benefit in terms of higher income. This means that in order for the most ambitious workers to stand out—in order to produce a “separating equilibrium” in game-theoretic parlance—they work longer hours than they otherwise would (Akerlof 1976; Rebitzer and Taylor 1995; Landers, Rebitzer, and Taylor 1996; Alesina, Glaeser, and Sacerdote 2005; Glover 2011). Empirical evidence suggests that a substantial fraction of workers do in fact clock longer hours they would like. According to the 1995 Swiss Labor Force Survey, for example, approximately 70% of both male and female full time workers said they would prefer working less than they actually do (Sousa Posa and Ziegler 2003). People hang around the office at late hours just to show their commitment to the boss despite the costs in terms of family and forgone leisure. Workers who might want to limit their working hours face an insurmountable collective action problem, which is an important source of inefficiency in unregulated systems. This inefficiency may to some degree be offset by the higher levels of productivity and employment noted above. Regardless of the net efficiency gains or losses, note that this market imperfection does not affect the shares of men and women who are promoted.

The second qualification has gender implications. Being forced to signal future productivity by working long hours poses a particular problem for women, given the time consuming extra home duties that society assigns by gender (Spence 1974). To the extent that many important hiring and promotion decisions occur at a relatively young age, employers will worry that women will later leave or cut back their hours if they have children. This may delay promotions for women, and it will likely mean that they have to work even harder than men to signal their long-term commitment. Fewer women are

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1 In his classic article on “signaling,” Michael Spence (1974: 372) alludes both to the general rat race problem and to the separate differentiation problem for women: “High productivity women may have to spend more on education and have less left over to consume in order to convince the employer that they are in the high productivity group.”

2 Konrad and Cannings (1997) find that the number of children correlates positively with earnings for men and negatively for women.
willing or able to make those trade-offs, and this also means that fewer women will be promoted than in the case of complete information (Edgeworth 1922; Mincer 1968; Arrow 1971; Phelps 1972; Polachek 1975).

Many females avoid investing in careers that require longer or more rigid hours than they want to devote. Goldin and Katz (2010), for example, find that many females interested in medicine become veterinarians because of the smaller up-front investment and the flexible working schedule, despite lower wages. Females have gone from making up 10% of the graduates of veterinary school in the 1980s to nearly 80% in 2007. Many women who do become medical doctors work fewer hours than would be necessary to recoup their financial investment in education and forgone income to get where they are. Chen and Chevalier (2011) find that the median female primary-care physician does not work enough hours to amortize her up-front investment in medical school, leading to the stark conclusion that many female doctors are financially worse off than if they had become physician assistants instead.

On the face of it, then, restricting working hours would seem a good way not only to slow down the rat race for workers in general but also towards greater gender equality. Perversely, however, hours regulation can make matters even worse for women. To see why, imagine that a maximum work week imposed on all, such as that indicated by the dotted line at the center of Figure 3. To the left of this line workers can reveal their true preferences by working fewer hours than the maximum, but to the right employers have no way of identifying types who are willing to work very long hours (the lack of knowledge about the distribution to the right of the maximum working week is indicated by punctuated lines). All they know are the means of the two distributions to the right of the maximum working week line (indicated by solid vertical lines). So long as society remains as currently constituted, with gendered family roles, women on average prefer to and/or are expected to work fewer hours than men. Since men and women are otherwise identical, given our simplified assumptions, the stark implication is that employers will only promote men (as long as the number of promotions is smaller than the number of promotable males – those above the black dotted line). There is no way that an employer can promote a woman and be better off in expectation, because the expectation is fully captured by the mean, which is lower for women than for men. In the absence of information about an individual worker to the contrary, employers will fall back on available information shortcuts including gender stereotypes.

In the real world there are of course other factors that matter in promotions than just gender, education, and hours of work. Employers take into account school performance, revealed competence and intelligence, personality, and so on. Workers can signal dedication and commitment to hard work in indirect ways by, for example, going to work-related social functions that are not regulated by collective agreements or legislation—and note that many of these activities tend to occur during family unfriendly times. Still, we have not found a way around the problem that strict hour regulations put women at a distinct disadvantage in competing for high-powered jobs. A paradoxical implication is that men who are promoted will on average be less willing to work long hours than their peers in unregulated systems. This is because they have not been selected
from the extreme right tail of the distribution but only from the right half of the distribution. There may be more males than females in the rat race who don’t want to be there.

**Figure 3. Preferences for working hours with a maximum working week**

![Graph showing preferences for working hours]

**Application to specific occupations**

We distinguish four occupations that vary in terms of the hours-productivity link and the role of promotions: (i) elementary, low-skilled occupations, whether manual or non-manual; (ii) manual jobs; (iii) middle-level non-manual jobs, and (iv) top-end managerial positions. We briefly discuss each in turn.

Workers in *elementary occupations* have little education and employers make few investments in their employees’ training. As a consequence, except for some supervisory functions filled “from below”, promotions are relatively infrequent, and all significant ones are into to higher-level occupations. There are thus virtually no promotions into the occupation and regulations at lower levels are therefore not an issue. This means that the effects of hours regulations depend almost entirely on the link between hours worked and productivity. For many, such as domestic cleaners and farm-hands, we would expect this link to be weak or absent; but for others, such as drivers and building caretakers, it may be significant. Whatever the exact magnitude of the link, the effect of hour regulations
should always be in the direction of improving the representation of women in the occupation.

Most manual occupations do not display a strong link between hours and productivity. While there are large productivity gains from learning by doing and experience, these gains are realized over time and do not necessitate long working hours. Indeed, physical fatigue ensures that marginal productivity will decline above a certain, fairly low threshold. Our argument implies that a weak linkage between work hours and productivity promotes gender equality, and historically women have made up a large portion of physically non-demanding manual jobs. Women who cannot commit to long hours do better when output is easy to measure and attribute to individual workers, such as piece-work or individual trades and sales (Altonji and Paxson 1988; Goldin 1990; Altonji and Blank 1999; Roth 2006).

Physical strength nevertheless still matters in many industrial jobs, which disadvantages women. Even more importantly, when employers invest in their workers’ training, the skills that workers acquire tend have a significant firm-specific component, which makes it important that workers can credibly commit to long, continuous careers with the same company. Conversely, for workers to be willing to jeopardize their outside options by acquiring specific skills, they need reassurance that they can remain with the company for a long period of time. Promotions tend to be seniority-based for this reason (Koike 1988). This has two consequences. First, since men can more easily commit to continuous careers than women, they are advantaged in getting skilled jobs. The other implication is that the relative lack of competitive promotions means that hour regulations will have little effect on the ability of women to compete for these jobs.

The story is different in many professional and semi-professional non-manual occupations. Women have a much better starting point in competing for these jobs because they do not require brawn, and because they often (though not always) rely on general education instead of firm-specific skills. The rise of services has been an important driver of female entry into labor market for these reasons, and in many social and personal services women now outnumber men.

Yet, the ability of a woman to compete effectively across-the-board in non-manual labor markets depends substantially on her working hours. On the one hand, regulations tend to equalize opportunities where productivity is increasing in hours. This is because many services depend on networks where the presence of one worker raises the productivity of others. The issue can in part be addressed by coordinating working time to ensure periods of overlap among group members. Job sharing arrangements in the Netherlands allow two or more people share a job, and doctors in a group medical practice may share responsibility for their patients. But even in these cases, it is often easy for individuals to establish themselves as more important to the network by being available more of the time than others. Many women choose to be part time doctors, lawyers, and accountants in the Netherlands, where law requires pro-rated benefits for part time workers. But it is no surprise that relatively few Dutch men choose the slower track to advancement (Cousins and Tang 2004; Gornick and Heron 2006).
In *top-end managerial jobs* such network effects tend to be strong because managers are complements to most others in the organization, including other managers. This is surely one reason that top-end jobs are not regulated, even in otherwise regulated systems. But it puts women—all but outlier women who can commit to long hours—at a disadvantage compared to men. *How much* of a disadvantage depends on hours and related regulations at lower levels. If women cannot reveal their types through hard work and long hours, promotions will, as we have argued, go disproportionately to men. So unlike lower levels in the organization, hours regulations unambiguously hurt women in top-end jobs.

When do the positive effects of regulation on gender equality outweigh the negative? It clearly depends on how far down the occupational hierarchy we travel because at lower levels the importance of promotions from below declines. At some point the balance shifts so that regulations will have a positive effect on women’s representation in the workforce. It is an empirical question exactly where this point is, and we try to address it below.

### 3. The Politics of Hours Regulation

We have explained why employers use gender (along with other identity markers) as an information shortcut to predict productivity and therefore as a guide to personnel decisions. Because societal expectations to be good mothers, wives, and daughters come with a wage penalty, women share a collective interest to socialize the costs of family work. Women would benefit as a group if they could 1. Get the government to reduce the number of working hours for everyone, men and women, to a degree that would make it possible to balance family and work, and/or 2. Shift more of the burden of family work onto men so as to reduce the mommy tax on wages and opportunities for promotion. But women have failed on both counts.

True, by Fogel’s (2000) reckoning, working hours per day fell by over a third for an average American male head of household, from 65 hours a week in 1890 to around 40 hours a week in 1985 (before it began creeping up again). Leisure time more than tripled over that period, from 1.8 to 5.8 hours a day (Whaples 2010). The numbers for Europe are more striking still, with the average working hours falling and staying below 40 hours a week. Vacation time has also increased more in Europe than in the US. But no one contends that that men’s work week has been reduced either to allow men to help more at home, or to make work available for women. Although advocates of shorter hours have often couched their arguments in equity terms (“work less, work all”), the labor unions that bargain for reduced hours have backed off when their own job security has come into question (Hinrichs, Roche and Wiesenthal 1985). Rather, the world wide trend in the past one hundred and fifty years towards fewer working hours is the result of increased labor productivity, followed by political fights (largely excluding women—not because they are women but because they are disproportionately outside the workforce) over how productivity gains or losses should be distributed.
Starting in the 1970s, unions in Germany and other European countries pressed for reductions in standard working hours on an industry-by-industry basis, on grounds that fewer hours per worker would allow firms to hire more workers, boosting employment (Thelen 1993). Although scholars are careful to point out the complexities affecting productivity and employment, most studies suggest that the hours-cutting arrangements reached between unions and employers put more focus on holding wages steady than on boosting total employment (Hunt and Katz 1988; Hunt 1999; Bosch and Lehndorff 2001; Alesina, Glaeser, and Sacerdote 2005). In Germany, women’s employment measured in hours has not increased over the past twenty years, even though more women work, because women tend to work in part time jobs (Shire). Almost invariably, hours regulations were designed to cater to “insider interests” of skilled, mostly male, industrial workers. Such reductions were linked to employment protection legislation that complemented the power of union in collective bargaining. Employers went along, up to a point, by requiring that reduced hours would be organized more flexibly over time.

Meanwhile, both because of the substitution of technology for labor and because of trade competition from low wage countries, the bargaining position of semi-skilled labor in rich industrialized countries has worsened in recent decades (Western 1995). Countries with proportional electoral (PR) systems, where unions form the nationwide constituency for a strong labor-promoting party, have maintained many labor market protections including hours restrictions favored by union membership, although even there workers in import-competing sectors have begun to work somewhat longer hours (Burgoon and Raess 2010). Worker protections are weaker still in single member district (SMD) countries, where majority-seeking parties must forge middle-class coalitions than are not conducive to the representation of union interests. In the US, UK, Canada, and Australia, hours worked per employee have turned more dramatically upwards after decades of secular decline (OECD 2010).

In the Nordic countries, where parties on the left have typically been in power for longer stretches than in continental and southern Europe, the large number of secure public sector jobs forms a basis for a durable coalition between the (male) private sector unions and (female) public sector workers. The highly unionized female workforce has resisted moves towards job-sharing, part time working arrangements such as those undertaken in the Netherlands, to avoid ghettoizing women in the long run (Burgoon and Baxandall 2006). More than in other parts of Europe, Scandinavian women work full time (40% of Swedish women work 40 hours a week, compared with 11% in the Netherlands and 12% in the UK). But women may pay another kind of cost: 33% of Swedish mothers, compared to 16% of Dutch mothers and 17% of English mothers say they wish they could work fewer hours (Cousins and Tang 2004: 534-536).

Working hours have declined from a hundred years ago due to no particular concern for female employment. Neither have the number of employment hours declined by enough to even the playing field between sexes unequally burdened with family work. Labor protections in primarily European countries boost the wages of women who get into lower level jobs that are subject to union bargaining and wage compression, but statistical
discrimination based on average female work commitment ensures that fewer women than men get promoted to managerial status.

With more women in the labor force the politics of labor market regulation is increasingly incorporating issues of gender equality and family welfare. But as our discussion has revealed, women do not share a common interest. Hours regulations can be a source of equality for women at the lower half of the distribution, but many highly educated career-oriented women may see such regulations as an impediment, at least as long as social norms attribute a disproportionate responsibility for family welfare to women. The result is that labor market regulations remain a largely left-right issue where countries with strong unions and frequent center-left governments are more likely to sustain regulations that promote gender equality at the middle and low end, but undermine equality at the high end.

4. Empirics

The model and data

In any labor market, individuals make decisions about the kind of careers they want to pursue and employers make decisions about the kind of workers they want to hire. The distribution of individuals across occupations is therefore the net result of both types of decisions. Gender plays an important role in this equation because women on average have preferences for occupations which allow for shorter and more (individually) flexible hours, and because of the information asymmetries discussed above. In this paper we are particularly interested in comparing the ability of women to compete effectively for high-powered management-level jobs compared to other occupations, given the regulatory context.

We explore the argument using a multinomial probit model where the probability of being in a particular occupation depends on individual-level traits, especially gender, as well as national-level regulations of work, especially restrictions on hours. Specifically, we estimate the following equation:

\[
Pr(\text{occupation} = n) = \Phi \left[ a + \beta_1 \cdot \text{female} \cdot (1 + \beta_2 \cdot \text{lm regulations}) + \beta_3 \cdot \text{education} + 
\beta_4 \cdot \text{age} + \beta_5 \cdot \text{female labor force participation} + \epsilon \right],
\]

where \( \Phi(z) \) is the standard normal density function, and \( n \) is the set of occupational choices.

The equation says that the probability that an individual will work in a particular occupation, \( n \), is a function of gender, education, and age at the individual level. In addition, we allow for the possibility that the effect of gender is contingent on national restrictions on working hours, union power, and related labor market regulations. An important implication of our argument is that hours restrictions help women compete for low and mid-level positions, but undermine the ability of ambitious women to compete for high-powered careers. The level of individual ambition obviously varies, but we have no way of capturing this directly in the data. Instead we assume that ambition is randomly distributed and absorbed into the error term. Since observations in each country cannot be assumed to be independent of each other – they all have the same score on
the regulation variable, for example -- we correct for this correlation using robust standard errors. The regression is estimated using maximum-likelihood.

Education is the most important non-gender variable in explaining career choice, and we use a set of dummies to capture different levels of education. The dummies are based on national classifications of education, consolidated into five different levels: 1. primary; 2. lower secondary (including vocational training); 3. upper secondary (or similar level technical training); 4. lower level university or equivalent; and 5. post-graduate degrees.3

We also add age as a control because higher-level jobs cannot be reached until after considerable buildup of experience. Workers may also tend to leave different occupations at different ages.

Finally, we include nationally specific intercepts – equivalent to including a full set of country dummies. This is to eliminate the effect of any national-level factors, such as level of development or differences in outsourcing, which may affect the distribution of workers across occupations. It also helps ensure that the effect of educational level is not the result of differences between national educational systems and how individual educations are classified.

The dependent occupational variable is divided into six groups:

1. managers,
2. professionals,
3. lower and mid-level non-manuals,
4. manuals
5. elementary/unskilled
6. people outside the labor market.

The grouping broadly corresponds to the theoretical discussion, except that we have included not working as a choice, and divided the middle-level non-manual class into two sub-groups: professionals and lower-level non-manuals. The reason is that competitive promotions should play a greater role among professionals than among lower-level non-manuals, and that should have an effect on whether the equalizing or inequalizing gender effects of labor market regulations dominate. The equalizing effects should be greater in lower-level occupations.

The grouping is based on ILO’s standard classification of occupations, ISCO-88, at the 1-digit level. We have data coded directly into ISCO-88 for 13 OECD countries (Austria, Belgium, Denmark, Finland, Germany, Greece, Ireland, Netherlands, Switzerland, and United Kingdom), and for another four countries (Australia, Canada, France, and United

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3 In a few cases where it is not possible to differentiate graduate and post-graduate degrees we assign a value of 4.
States) we have national classifications that can be roughly converted into ISCO-88.\footnote{We can do so most reliably in the US case because we have highly disaggregated data that correspond to the ISCO-88 codes at the 4-digit level. In the other two cases the classification is either at the 2-digit or 1-digit level, and therefore less accurate.} In one case that is included in the Luxembourg Income Study, Sweden, the occupational classification is so different from the ISCO-88 standard that we had to omit it.

All individual-level data are from the Luxembourg Income Study, and are based on national labor force surveys. We combined these surveys into a single dataset, choosing survey years that were as close as possible to each other in time while also differentiating on occupation. The survey years range from 2000 to 2004 with the majority conducted in 2004. In total we have more than 650,000 individual observations distributed across the 17 countries.

We matched the micro-level data with macro-level data on regulation from a variety of sources. In principle we would have preferred to use a measure of regulatory restrictions on working hours. The World Bank has devised such a measure, but unfortunately it is available for less than half of our 17 countries. Another option is to look at total average hours worked in the reasonable expectation that regulations will reduce this number (so the effects of hours should be the inverse of regulation). These data are available from the OECD. The limitation is that actual hours worked do not necessarily capture restrictions on working above the norm, which could be high in relatively less developed countries. In Greece, which has by far the lowest GDP per capita, average working hours are notably higher, even though hours regulations are known to be pervasive. Because Greece is such an outlier on working hours we had to exclude it from the regression when using that measure.

In addition, we have argued that the extent of restrictions on the organization of work and hours is closely related to the strength of unions and company insiders. We measure the former by the share of workers who are unionized, and the latter by OECD’s measure of employment protection. Employer protection is widely regarded as an indicator of insider power. The two measures are not strongly related (r=.12) and it is sensible to think of unions and insider power as substitutes when it comes to restricting working hours. We therefore combine the two measures into an index of labor market regulation (after both have been standardized to vary between 0 and 1). The unionization data are available from OECD.stat except in the case of Israel, where we rely on a national survey done in 2000 (Cohen et al. 2003).

Results

The complete set of statistical results is listed in Table A1 of the appendix for each regulatory variable. Here we focus on the interpretation of the results based on the regression for the composite measure.

Our strategy is to estimate the probability of women working in a particular occupation compared to men, depending on the regulatory context. All other variables are kept...
constant at their means. If we then divide the probabilities for women by the sum of the probabilities of both men and women, it is equal to the predicted share of women in a particular occupation. For example, in a strong regulatory environment, measured by our index of employment protection and unionization, the probability of a randomly chosen woman being in top-level management is .51 percent. For a randomly chosen man the probability is 4.02 percent. The share .51/(.51 + 4.02) = 11 percent is then the predicted proportion of female managers.5

The predicted proportion of female managers for regulated systems is shown as the far-left bar in Figure 4. If we compare it to the predicted proportion for deregulated labor markets we see that regulations appear to notably undermine the chances of women becoming managers. While women are underrepresented everywhere, the predicted proportion of women in management in deregulated systems is nearly four times that in regulated systems. This is a large effect, but it must be kept in mind that this category of occupations only makes up about eight percent of total employment (using our definitions).6

In professional and semi-professional occupations women have reached parity with men, and the relationship between gender shares and occupation vanishes. This makes good sense because regulations have opposing effects in this group that will tend to offset each other. On the one hand equity is promoted by restricting any advantage men have because of hours worked is linked to higher productivity. On the other hand women will find it more difficult to signal their commitment to employers seeking to fill higher-level positions.

As we move to lower- and mid-level non-manual occupations the former effect tends to dominate. There are relatively few to be promoted from below, while productivity is likely linked to hours in at least some activities. The same is true in elementary occupations. In both types of jobs regulations significantly raise the share of women. The effects are smaller than in management – the female shares are predicted to be 8 and 14 percent higher in regulated than in unregulated systems, compared to 30 percent lower in management – but because total employment in these occupations is much higher, about 50 percent more women are positively affected by regulations than negatively affected.

As expected, in manual occupations there are no statistically significant differences between regulated and unregulated systems.

Figure 4. Predicted shares of women in different occupations

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5 Strictly speaking, this assumes that the shares of men and women in the working age population are equal, which is very nearly true.

6 Remember that the probabilities include non-working individuals.
Notes: Results are based on estimated probabilities the nominal probit regression reported in Table A1 c) in the appendix. “Unregulated” refers to the lowest observed score (out of 17) on the regulation index; “regulated” refers to the highest observed score.

The results presented above—based on probabilities from probit regressions—are not very illuminating in terms of describing the key cross-national patterns of interest in the data. In order to better do capture these, we first calculated the share of women in management and in professional occupations in each country, and then used the ratio of the former to the latter as a measure of how effectively women are being recruited into management positions.  

The ratio is plotted against our composite measure of labor market regulation in Figure 5. Note that the correlation is very strong (r=-0.94), with countries distributed more or less evenly across both variables. Unsurprisingly, the US is simultaneously the country with the highest ratio of women in management and the weakest unions and employment

\footnote{In order to avoid giving an exaggerated impression of the success of such recruitment we omitted technical professions, such are engineering, where women are under-represented for the same reasons they are in many manual jobs. These are not the usual breeding grounds for managers. For countries where we only had ISCO-88 occupational data at the 1-digit level, we reduced the share of women in professional occupations by a factor that is equal to the share of women in non-technical occupations to their share in all professional occupations – using the data from countries where we had ISCO-88 data at the 2-digit level or better.}
regulations. More generally there is a fairly clear separation between liberal market economies (LMEs) and coordinated market economies (CMEs), with the exception of Switzerland, which is usually considered a CME. Unlike other CMEs, Switzerland has weak unions, and it also has a collective executive that makes it difficult for the left to pursue distributive goals. For this reason it is theoretically reassuring that Switzerland has the second highest ratio of female managers in the sample.

**Figure 5. Composite index of unionization and strictness of employment protection and the share of female managers as a ratio of the share of female non-technical professionals**

![Graph showing relationship between labor market regulation and ratio of management to professionals in various countries.]

**A culture against women in power?**

An alternative explanation for the difficulty of women to break into positions of economic power is that they face a culture of discrimination rising out of traditional gender stereotypes. Undoubtedly there is some truth to this, and Jette Knudsen’s comparison of promotion decisions by American and Danish firms operating in Denmark suggests that differences in corporate culture do matter (Knudsen 2010).

Yet, we find it implausible that a cultural interpretation could account for the general pattern we have uncovered. Women do poorly at the top of the occupational pyramid in countries with strong left parties and a long-standing commitment to gender equality.
(notably in Scandinavia). Indeed, this commitment is clearly on display in substantial female representation in the national legislature and in government. In Spain, for example, the socialist government has pursued a policy of virtual gender parity in both the parliament and the executive, yet women have made few inroads into corporate boardrooms.

Indeed, representation of women in the political elite is negatively related to representation of women in the economic elite, as illustrated in Figure 6. Excluding the three outliers—Belgium, France, and Greece—there is an almost perfect negative correlation of .96. This is particularly surprising because over time there is a strong positive relationship between female labor force participation and representation in the national legislature in every country, a relationship that almost certainly also applies to the share of females in management (see Iversen and Rosenbluth 2010, p. 143). One would expect that women who acquire experience and competences in the labor market, and form strong independent political views in the process, expand the pool of candidates for national elected office (Kenworthy and Malami 1999). Why, then, is there a strong negative cross-national relationship between the share of women in management and in the legislature?
Figure 6. Female representation in the political and economic elite in 16 OECD countries
Our explanation goes back to the general model that we outlined in Iversen and Rosenbluth (2010). For reasons spelled out in Cusack et al (2007 and 2010), regulated markets and Proportional Representation electoral systems co-evolved in the early 20th century. Regulation, associated with both strong insiders and skilled unions, and PR, which produces more center-left government in favor of such regulation, both help explain why it is hard for women to break into the highest positions in business.

At the same time, the electoral system powerfully shapes the incentives and opportunities for women to enter politics. Unlike single member district systems, PR electoral systems do not require politicians to commit to uninterrupted careers in order to cultivate close relations with their constituencies and in order to build up bargaining power within the legislature. In closed list systems, PR instead produces strong parties where commitment to the party label is more important than building up personal political capital (which is looked at with suspicion by party leaders). Party-centered systems make it far easier for women to have political careers, compared to candidate-centered ones, and it gives party leaders no (rational) reason to discriminate against women when promoting them through the party organization.

As noted there are a few outliers in Figure 6. France has a SMD run-off system, which is expected to militate against representation of women in politics, but unlike other majoritarian systems the French labor market is dominated by insiders and is heavily regulated. The roots of this system are found in very large companies with workers on long-term contracts and with heavy investments in firm-specific skills. Such a system is well-suited to a candidate-centered SMD system where the interests of large companies in each district will be attended to. But the combination is ill-suited to ensure gender equality in the economic and political elite.

Greece is an outlier for a different reason. While the electoral system is PR, it uses open lists in small districts, and this makes candidate-based resources more important than in the typical closed list PR systems. Again, this disadvantages women, and combined with a heavily regulated labor market, at least before the recent reforms, Greek women find it difficult to enter either the political or economic elite. We are not sure what explains the Belgian case.

An obvious question raised by this analysis is why women do not help institute reforms of the labor market in systems where they are well-represented in politics but not in the corridors of the business elite. Although we leave a thorough explanation for future work, we hinted the likely answer above. Most women are in fact in favor of labor market regulations because it helps them balance family and career. But for those women who put their career ahead of their family, like the typical male, such regulations are a double edged sword. Women with low- or mid-level jobs are protected from long hours, but ambitious women are largely shut out of corporate boardrooms. This splits the female vote and hampers efforts to present a unified women-friendly policy agenda.
5. Conclusion

Hours regulation may serve as a coordinating device allowing workers to slow down the rat race, as Alesina, Glaeser, and Sacerdote (2005) suggest. The problem for women is that even the slower European work week stretches conventional expectations of motherhood to their limit, and corporate leadership requires more still. Given the gender wage inequality that results from unequal availability to work, it is hard to dispense with the existing family bargain in which the partner making less money (still, in most cases, the wife) shoulders more of the family work in order to free the husband to earn more money—the basis for gains from trade within a marriage. Society is caught in a self-reinforcing sexist equilibrium.

Some women, of course, do benefit from the shortened work week. Restrictions on working hours narrow the gender wage gap in lower level occupations, but they do so at the cost of shrinking the percentage of women who make it up the ladder. Grasping the net welfare benefits of hours regulation would require more information than we have about selection effects and constrained preferences. But our analysis demonstrates, at a minimum, that the decision of whether or not to regulate hours entails substantial distributional consequences across different groups of women. Women who are willing to forgo a family life have a substantially greater chance of career success in an unregulated market than in a system that muffles signals of outlier-levels of ambition. However imperfect as a signal of productivity and ability, working long hours (one could as well write “rat” across one’s forehead) replaces gender as a signal in countries without hours regulation.

Until the average woman is able or willing to spend as much time on her career as the average man, a firm would have to pay a wage premium to get gender equality in its upper management. Imaginative public policy could subsidize that premium by providing tax credits or procurement priority to firms that meet desirable targets, thereby socializing the costs of family time now borne by underpaid or nonworking mothers. But any action involving legislation requires widespread political support and the absence of a blocking coalition—a difficult proposition when women’s own preferences about family and work are so distributed widely.

European women not satisfied with a smaller wage gap in the lower rungs are pressing for government-mandated quotas for women on corporate board, and several European countries have mustered the legislative coalitions to pass the requisite laws. European women dream of leapfrogging the US, where 40% of managers, 15% of high ranking managers, and only a handful of Fortune 500 CEOs are female compared to Europe’s even smaller numbers. Early experiments with quotas on boards in Norway generated a backlash in some quarters, by the men who feel unfairly passed over and by women who had to bear the burden of proof that they reached the top on merit. But Iceland, France, Spain, and the Netherlands are forging ahead with quota laws, and Belgium, Germany, and Sweden are considering similar legislation (Clark 2010).
However constructive the quota debate may prove to be in Europe, it is a nonstarter in the current American legal environment. 8 Perhaps firms themselves will be motivated by the 2007 McKinsey study (Desvaux, Devillard-Hoellinger, and Baumgarten 2007) which shows that European firms with at least three women on their executive committees outperformed their rivals both in average return on equity and operating profits. Although naysayers are quick to argue that only profitable firms could afford the luxury of appointing unqualified females in the first place, the study points out, plausibly enough, that women in leadership positions are likely to be important interpreters of female spending and investment patterns in an era of growing female spending power.

We already know that the gender wage gap is smaller in jobs where output is easier to measure than by the short hand of hours, and perhaps technological or organizational advances in productivity measurement will hasten the trend. Some studies find smaller gender wage gaps in more competitive market niches, and we expect to find, in future research, that the premium employers are willing to pay for long hours shrinks in hard economic times, reducing the gender wage gap. But whatever the current situation, it is a sure bet that firms will not draw more deeply from the pool of female talent until it is profitable to do so, or policy interventions make it so.

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8 Hans Bader of the Competitive Enterprise Institute writes, in a letter to the editor of The Economist, August 6th 2011, “In America such quotas would be struck down because they disregard the right of male directors to equal treatment. …American courts have struck down quotas and sex-balance requirements for boards and commissions in cases such as Back v Carter. They have allowed companies to challenge quotas on behalf of their male or white employees in cases such as Lutheran Church Missouri Synod v FCC. And they overturned government-mandated preferences for female business owners in the Lamprecht case.” Whatever the merits of the argument, Bader’s view appears to be the dominant one on the Roberts Court.
References


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Schultz, Paul T. *Investing in Women’s Capital*.


Wren, Anne. 2011.
Appendix:

Regression results


a) Labor market regulation variable: OECD’s measure of average total annual hours worked

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b) Labor market regulation variable: OECD’s measure of employment protection.

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c) Labor market regulation variable: Composite measure of unionization and employment protection

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Notes: The regression included a full set of country dummies that are not shown. Standard errors correct for dependencies among observations within countries.