



Do menstrual problems explain gender gaps in absenteeism and earnings?[☆]

Evidence from the National Health Interview Survey



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HIGHLIGHTS

- We examine if menstrual problems explain gender gaps in absenteeism and earnings.
- Menstrual problems may explain some of the gender gap in absences due to illness.
- Menstrual problems explain very little of gender gaps in earnings.

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ABSTRACT

The health effects of menstruation are a controversial explanation for gender gaps in absenteeism and earnings. This paper provides the first evidence on this issue using data that combines labor market outcomes with information on health. We find that menstrual problems could account for some of the gender gap in illness-related absences, but menstrual problems are associated with other negative health conditions, suggesting that our estimates may overstate causal effects. Nevertheless, menstrual problems explain very little of the gender gap in earnings.

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1. Introduction

There is a large literature in economics examining gender gaps in labor market outcomes (see Altonji and Blank, 1999; Bertrand, 2011 for reviews). Early research on gender gaps largely focused on the roles of human capital accumulation (e.g., education, experience) and discrimination, but more recent work has paid increased attention to psychological factors, such as risk preferences and attitudes towards competition and negotiation (Bertrand, 2011). These studies have

revealed a number of important differences between men and women, and in light of these findings, a fundamental—and provocative—question is to what extent these differences might be driven by “nature” rather than by “nurture.”

Currently, there is little evidence of innate biological determinants of gender gaps. A major biological difference between the sexes is the ability to bear children, and a number of studies (e.g., Mincer and Polachek, 1974; O'Neill and Polachek, 1993) show that the career interruptions associated with child birth reduce women's wages. However, since the decisions to have and stay home with children may be endogenously determined by women's labor market prospects and social norms regarding child-rearing, child-bearing may not reflect an exogenous biological basis for gender gaps.

Seeking a source of exogenous variation, Ichino and Moretti (2009) focus on menstrual cycles, which are experienced by nearly all women

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of reproductive age. They develop a model of statistical discrimination to illustrate how menstrual-related health problems (e.g., premenstrual syndrome (PMS), premenstrual dysphoric disorder (PMDD))—which are documented in the medical literature to increase work absenteeism—could generate gender gaps in earnings.¹ In their model, employers cannot directly observe individual workers' productivity but can observe absenteeism, a signal of workers' propensity to shirk.² Because menstrual cycles make absenteeism a noisier signal of productivity for women, employers set different wage schedules for men and women as a function of absenteeism; men receive higher base pay than women but incur larger wage losses for each absence.

Ichino and Moretti's empirical support for this model, based on data from a large Italian bank, suggests a link between menstrual cycles and illness-related absenteeism at 28-day intervals.³ In a subsequent paper (Herrmann and Rockoff, 2012), we re-analyze these Italian data and show that this link is not robust to small corrections in coding or changes in specification. More importantly, we show that their approach—which relies on absence timing rather than direct information on menstruation—is confounded by the fact that five day work weeks can create large differences in absence patterns between groups at multiples of 7, including 28 days. Without an additional source of identifying variation, the timing of absences is unlikely to provide conclusive evidence for or against a role for menstrual cycles in explaining gender gaps in labor market outcomes.⁴

To our knowledge, the role of menstruation in explaining gender gaps in the labor market has not been investigated with data that contains information about menstrual health problems, absenteeism, and individual earnings. Fortunately, two waves of the National Health Interview Survey (NHIS), a nationally representative sample of adults in the U.S., contain information on all three of these variables. We use these data to estimate the relationships between menstrual health problems, illness-related absenteeism, and earnings for women. We predict the counter-factual illness-related absences and earnings that women would have if no women had menstrual problems and use these predictions to assess the extent to which menstrual problems could explain gender gaps in illness-related absences and earnings.

We find that women with menstrual problems have significantly more illness-related absences than other women; completely eliminating menstrual problems would reduce the gender gap in illness-related absences from 0.96 days to between 0.65 and 0.46 days. Our estimates may overstate the explanatory power of having menstrual problems; this condition is correlated with a number of other negative health indicators and is likely to be endogenously determined.

Despite the fact that menstrual problems could account for some of the gender gap in illness-related absences, they explain very little of the gender gap in earnings; specifications that include a standard

set of controls (i.e., demographic characteristics, full-time work, and number of months worked) suggest that menstrual problems could account for less than 1% of the gender gap in earnings. We explore a number of potential explanations for this discrepancy and find that illness-related absences explain little of the gender gap in earnings.

Since the NHIS is a cross-sectional dataset, we cannot use a number of empirical strategies that would provide further supporting evidence. Ideally, if panel data were available, we would try to exploit the coincident timing of menstrual-related health problems and work absences or control for other aspects of individual heterogeneity. Nevertheless, given the lack of evidence on the effect of menstrual problems on labor market outcomes for women (and gender gaps), an observational analysis with rich cross-sectional data provides an important first step in addressing this question.

This paper continues as follows: Section 2 provides background evidence from various related literatures, Section 3 describes the data, and Section 4 presents our econometric strategy. Section 5 presents the results, and Section 6 concludes.

2. Background

It is well-known that women have higher rates of work absenteeism than men, both due to women taking responsibility for child care and having higher rates of absences for own illness (e.g., Paringer, 1983; Leigh, 1983; Johansson and Palme, 1996; Hansen, 2000). For a small fraction of women, symptoms related to menstrual cycles (e.g., fatigue, bloating, bothersome cramping, or heavy bleeding) may be severe enough to interfere with social or occupational functioning and result in increased absences from work. Around 3 to 8% of women of reproductive age are estimated to suffer from a severe form of PMS known as PMDD, and about 15 to 20% of women meet criteria for sub-threshold PMDD (Pearlstein, 2007). Dean and Borenstein (2004) and Heinemann et al. (2010) follow women over one or two menstrual cycles and find that women with PMS or PMDD are significantly more likely to be absent from work than other women. Over a one year interval, Hylan et al. (1999) find that 14% of U.S. women report missing 1–7 days of work due to PMS symptoms, 1% report missing 8–14 days, and 1% report missing more than 14 days.⁵

Several theoretical models predict that absences due to menstrual symptoms—and absences in general—should reduce wages. For example, Allen (1981) models absences as aspects of non-pecuniary compensation in a hedonic framework, and Barmby et al. (1994) develop an efficiency wage model in which absenteeism is a form of shirking. These models suggest that employers can influence absenteeism through their compensation offers, and it is reasonable to think that workers will self-select into jobs based on their preferences for absenteeism. These channels suggest that women with menstrual problems could receive lower wages because their absences result in wage penalties (e.g., Ichino and Moretti, 2009) or because their propensity for absence causes them to select into occupations that pay lower base wages but have lower costs of absence.

Unfortunately, there is no consensus in the empirical literature about the expected magnitude of wage losses due to absence. In fact, the empirical evidence about the relationship between wages and absenteeism is largely mixed due to endogeneity issues (e.g., Brown and Sessions, 1996). A common challenge in this work has been that absenteeism and wages are equilibrium outcomes of labor supply and demand. When workers' contracted hours are inflexible, they may satisfy their

¹ PMS refers to a set of physical, behavioral, or emotional symptoms that typically occur for several days to 2 weeks before and remit during menses. These symptoms can include: abdominal bloating, breast tenderness, constipation or diarrhea, food cravings, headache, difficulty concentrating, fatigue, feelings of sadness or hopelessness, anxiety, tension, irritability, mood swings, and sleep problems (A.D.A.M. Medical Encyclopedia, 2011b). PMDD is a condition in which a woman has severe depression symptoms, irritability, and tension before menstruation (A.D.A.M. Medical Encyclopedia, 2011a). For medical studies on the relationship between PMS/PMDD and absenteeism, see Dean and Borenstein (2004), Hylan et al. (1999), and Heinemann et al. (2010).

² Although absenteeism is simply a signal in their model, Ichino and Moretti note that the model could be extended to allow for absenteeism to have a direct effect on productivity.

³ Ichino and Moretti show that the hazard rate of the next absence spell for young women, relative to young men, spikes 28 days after the start of a previous absence spell—the same number of days as the average menstrual cycle. Reweighting the female distribution of 28-day absence spells to match the male distribution, they estimate that menstrual cycles could explain one third of the gender gap in illness-related absenteeism and 14% of the gender gap in earnings.

⁴ This parallels a problem in the development literature, where researchers lacked appropriate data to address how menstruation affects girls' school absenteeism. Oster and Thornton (2011), who use data on both girls' menstruation and absenteeism, conclude that this biological mechanism explains a tiny fraction of girls' school absences.

⁵ Hylan et al. (1999) only report absenteeism in the last year for the 21% of women who have ever reported missing work due to PMS symptoms, and these percentages are reported by the ranges of days above. The unconditional percentages above were calculated by multiplying the conditional percentages reported for each range of days by 0.21. Unfortunately, Hylan et al. do not report the average number of days missed. In contrast to the medical studies, an economic study of absence in Norway—where sick pay is generous—finds that menstrual pain accounts for less than 1% of women's minor disease absences that have been certified by a physician (Markussen et al., 2011).

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