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Theory and Evidence**

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ABSTRACT

Women in the Workplace and Management Practices: Theory and Evidence*

We review recent studies on management practices and their consequences for women in the workplace. First, the High Performance Work System (HPWS) is associated with greater gender diversity in the workplace while there is little evidence that the HPWS reduces the gender pay gap. Second, work-life balance practices with limited face-to-face interactions with coworkers may hamper women's career advancement. Third, individual incentive linking pay to objective performance may enhance gender diversity while individual incentive with subjective performance may have an opposite effect. Fourth, a rat race model with working hours as a signal of the worker's commitment is a promising way to explain the gender gap in promotions. Fifth, corporate social responsibility practices may increase gender diversity. We temper the findings by identifying three major methodological challenges: (i) how to measure management practices; (ii) how to account for endogeneity of management practices; and (iii) how to minimize selection bias.

JEL Classification: J16, M5, J7, M14

Keywords: gender diversity in the labor market, gender pay gap, management practices, high performance work system, work-life balance, family-friendly practices, incentive pay, pay for performance, promotion tournament, rat races, corporate social responsibility

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Women in the Workplace and Management Practices: Theory and Evidence

1. Introduction

In mainstream labor economics, what workers do inside firms used to be considered a “black box” and was largely left to other fields to study – including human resource management, industrial relations, organizational sociology, industrial psychology, accounting and so forth. One of the most important developments in mainstream labor economics in the last few decades is to open this black box and make a rigorous economic analysis of institutional arrangements and activities inside firms an indispensable part of contemporary labor economics (Gibbons and Waldman, 1999; Lazear and Shaw, 2007; and Gibbons and Roberts, 2013).

The objective of this chapter is to review select recent studies that are at the intersection of this new economics of institutional arrangements and activities inside firms (often labeled as organizational economics and personnel economics) and economics of gender. In so doing we extract from the burgeoning literature on organizational and personnel economics new evidence and insights that are relevant to gender economics. We then identify the limitations of the current state of knowledge and point to the promising directions of future research in the field.

Specifically we focus on the intended and unintended consequences of new management practices for women in the workplace. Many firms around the world have been changing their management systems by introducing a variety of new management practices, such as the High Performance Work System (HPWS) consisting of a cluster of complementary new management practices; Work-Life Balance Practices (WLBPs); Pay for Performance (individual incentive pay), Relative Performance Pay (promotion tournament), and Corporate Social Responsibility Practices (CSRPs). The aforementioned literature in organizational economics and personnel economics has been accumulating an impressive body of evidence and insights on such

management practices (see, for instance, Bloom and van Reenen, 2011 for a recent review of the literature). Yet much of the literature thus far has focused on the effects on firm performance of such management practices and far less attention has been paid to the possible effects of these management practices on women in the workplace. There is no systematic review of the literature on economics of management practices with specific reference to their impact on gender diversity and equality in the workplace. This chapter aims to provide such a review of the literature and fill an important gap.

In studying the effects on women in the workplace of management practices, it is useful to distinguish between the price effect and the quantity effect. A central question concerning the price effect is whether a certain management practice (or set of management practices) will lead to narrower or wider gender gap in wages and benefits. Likewise a core question concerning the quantity effect is whether a certain management practice (or a certain set of management practices) will result in a higher or lower proportion of female workers in general as well as in specific occupations (most notably in managerial occupations).¹

Before embarking on a review of the literature on the price and quantity effects on women in the workplace of management practices, we provide a brief discussion on why we ought to care about management practices and their potential consequences for gender diversity in the workplace. First, while gender diversity in the workplace is an important subject in its own right, what new management practices do to gender diversity in the workplace is a deserving research question. Figure 1 shows employment rates of women (proportion of all women aged 15

¹ The quantity effect and the price effect are likely to be interrelated with each other. For instance, changes in gender gap in wages may well influence labor supply behavior of women and hence the proportion of female workers, and vice versa. Nonetheless, most prior studies address either effect but not both effects. One of our recommendations for future research is, as discussed in the concluding section, to develop a comprehensive theoretical framework to address both quantity and price effects of management practices, and design a compelling empirical strategy accordingly.

to 64 who are employed) in select OECD countries over 2000-2015. As clearly shown in the figure, a large majority of working age women are indeed employed, ranging from around 70 percent in Nordic countries to 50 to 60 percent in East Asia. Furthermore, East Asian employment rates of women have been rising over time while the U.S. has a downward trend, and in fact, in 2015 Japanese women's employment rate surpassed U.S. women's rates. In short, the vast majority of women in OECD countries are employed women, and what happens in the workplace matters for most women in these countries.

Second, in spite of the impressive entry of women into the labor market, as shown in Figure 2, women constitute still only a minority of managers (defined as International Standard Classification of Occupations Group 1) in those countries, ranging between over 40 percent in the U.S. and around 10 percent in East Asia. The low incidence of career advancement for women does not appear to be a result of the gender gap in educational attainment. As Figure 3 demonstrates, the number of college-educated women exceeds that of college-educated men in the U.K., France, Sweden, Denmark, Japan, and the U.S. Even for Germany and Korea where there are still fewer college-educated women than college-educated men, the gender gap in educational attainment is modest. The low incidence of career advancement for women despite their impressive educational attainment has been of considerable concern for scholars, practitioners, and policymakers in many OECD countries. For instance, narrowing the gender gap in the labor market has been a top policy priority for Japanese policymakers for some time.²

It is of considerable interest and importance to understand the possible consequences of management practices for gender diversity in the workplace. To demonstrate the relevance and

² For instance, see Prime Minister Abe's well-publicized ambitious policy target---to achieve a society in which the share of women occupying leadership positions in a multitude of sectors is at least 30% by 2020, from Policy Speech by Prime Minister Shinzo Abe to the 189th Session of the Diet, Thursday, February 12, 2015.

importance of such an understanding, suppose researchers obtain compelling evidence that certain management practices have an unintended consequence of hampering women's career advancement. This new knowledge will lead to more informed decision making by management as they are deciding whether to adopt such practices. In addition, policymakers may also benefit from such a new knowledge when designing their public policy to promote or discourage such practices.

It is also plausible that gender diversity in the workplace in general and in top management in particular can improve firm performance by tapping into fresh skills and perspectives of women. There is some evidence in support of this assertion (see, for instance, Hellerstein et al., 2002, Kawaguchi, 2007, Siegel, Kodama, and Halaburda, 2013). If researchers find evidence that a certain management practice, say flextime, enhances gender diversity in the workplace, given the possibility of gender diversity as a source of performance gains for the firm, management may find the adoption of flextime a win-win strategy---helping women achieve better work-life balance and advance in their careers *and* improved firm performance.

Third, as shown in Figure 4, the gross gender wage gap as a percentage of male wages is still sizable, ranging between the lowest gap of 10 percent in Denmark and the highest gap of close to 40 percent in Korea in 2014. Arguably such a persistent gender pay gap may be a reason for women not to pursue career advancement aggressively. Evidence-based policy making will be greatly facilitated by a good body of evidence on the possible consequences of management practices for the gender pay gap.

In the next section we discuss the HPWS and its relationship to both the gender pay gap and gender diversity in the workplace. We then discuss WLBP in section 3, competitive management practices, such as pay for performance and rat race tournaments (workers signal

their high productivity and commitment to the firm by working inefficiently long hours in order to get promoted to higher positions) in section 4, and CSR in section 5. Section 6 concludes.

2. Women in the High Performance Work System

One of the most important changes in the workplace in industrialized countries in the last three decades or so is the emergence of a new employment system consisting of clusters of participatory work practices.³ In contrast to the traditional work system, in the HPWS, first, workers not only produce goods and services but also engage in problem-solving activities and generate valuable local knowledge (e.g., a series of small improvements to the existing goods and services and their production process) through their collective efforts. Jones and Kato (2011) provide real-world examples of such problem-solving activities in which front-line production workers (a majority of whom were women) participated at a light manufacturing firm in the U.S. For instance, a group of production workers worked together to develop a new labeling system, which resulted in a 50-percent drop in the time required for labeling, and a less frequent incidence of the use of the wrong parts and hence the product defect rate.

Similarly, in the HPWS a team of frontline workers also deal with local shocks (such as demand shifts between different items sold in a local store of a large retail chain) often collectively in the team without waiting for detailed instructions from managers. Second, to sustain the interest and desire of workers to take full advantage of such problem-solving activities on top of their regular production activities, the firm often pays efficiency wages (high wage/benefits). Furthermore, the interest alignment between workers and the firm is fostered by (i) financial participation schemes (such as profit sharing and employee ownership) by which the

³ In the literature, HPWS is also referred to as HIWS (High Involvement Work System). By now, the literature on economics of HPWS/HIWS is vast. For a recent review of the literature, see Bloom and Van Reenen (2011).

financial wellbeing of workers is more tied to the final wellbeing of the firm; and (ii) information sharing mechanisms through which management shares important information with workers, and fosters their loyalty and commitment to the firm. Third, workers are often provided with strong job security which will enable them to take advantage of the aforementioned opportunities wholeheartedly without fearing any job loss. Finally, careful screening and training are an integral part of the HPWS. In particular, the worker's ability to engage in problem solving and work in team (e.g., communication and interactive skills) is more carefully assessed and cultivated through various training and development programs. Furthermore, the HPWS requires a team of workers to respond to local shocks autonomously, and such an autonomous and collective response to local shocks often requires workers to be multi-skilled.⁴

Naturally scholars as well as practitioners are interested in whether the introduction of the HPWS leads to improved firm performance (such as productivity) and if so, how much and through what channels. By now we have a rich body of evidence on the performance effect of the HPWS (for a recent review, see Bloom and Van Reenen, 2011). More recently the HPWS literature extends the scope of its inquiry and considers the effects on worker outcomes (such as wages and subjective satisfaction of workers).⁵ Some of such recent literature on the effect on worker outcomes focuses on the differential effect on female workers of the HPWS, and provides evidence and insight on the consequences of the HPWS for women in the workplace.

In reviewing prior studies on women in the HPWS, it is imperative to be cognizant that studies differ considerably in which specific practices they focus on. Especially, as shown below, individual incentive pay which links pay to individual performance (as opposed to group

⁴ What is considered the HPWS/HIWS varies somewhat among scholars. Our description of the HPWS is close to Kochan and Osterman (1994), Ichniowski, Shaw and Prennusi (1997), Appelbaum, et. al. (2000), and Kato (2014).

⁵ See, for instance, Bockerman, Bryson, Ilmakunnas (2013) and Bryson, Forth, and Stokes (2014).

incentive pay which links pay to group performance) has distinctly different implications for women in the workplace. Teamwork, the hallmark of the HPWS, is clearly consistent with the use of group incentive pay, and the HPWS literature is almost unanimous about group incentive pay as a key element of the HPWS. In contrast, the role of individual incentive pay in the HPWS is largely unexplored. It is not immediately obvious that individual incentive pay is congruous to teamwork. Suppose an individual worker allocates her time and effort between two activities, individual production activities and team activities (e.g., participating in quality control circles). Individual incentive pay incentivizes her to allocate her time and effort to her own production activities rather than team activities. Even if the firm mandates her to participate in team activities for a fixed amount of time, say one hour a day, the worker can still allocate her discretionary effort away from team activities toward her own production. In our view, individual incentive pay is at best of secondary importance for the HPWS. To this end, we discuss individual incentive pay separately in the next section, along with promotion tournament (another practice making the workplace more competitive).

2.1 Theory: How does HPWS affect women's outcomes

Theoretically there are a number of different channels through which the HPWS affects women in the workplace differently from their male counterparts.

Cooperative workplace

When it switches its management system from the traditional top-down system to the HPWS, as discussed above, the firm places more emphasis on hiring, retaining, and promoting workers who can thrive in team settings. Furthermore, the HPWS decentralizes the firm's decision making to

local organizations and encourages a team of workers to respond to local shocks autonomously and collectively.

There is a growing body of experimental evidence suggesting that women shy away from competitive work environment while men embrace it (see, for example, Niederle and Vesterlund, 2007; Booth and Nolen, 2012; Datta Gupta et al., 2013; Garratt et al., 2013; and Sutter and Rutzler, 2015). Moreover, some experimental evidence suggests that in such competitive environments, women tend to perform worse than men (see, for instance, Gneezy et al., 2003; Gneezy and Rustichini, 2004). Perhaps most importantly a recent experimental study by Kuhn and Villeval (2015) provided evidence pointing to women's preference for jobs in cooperative team environment over jobs in non-cooperative competitive environment.

At the core of the HPWS is teamwork which produces valuable local knowledge and effective local response to shocks. Women, being more attracted to a cooperative team work environment, are more likely to be attracted to the HPWS, and hence enter and stay in such HPWS firms. Since more women enter and remain in such firms with the HPWS, there will be more women in the firm not only at the entry level but also at the higher managerial levels. In sum, the HPWS transforms the nature of jobs and making workplace more cooperative, which women find more attractive and hence more women enter and stay in such HPWS firms---the positive quantity effect of the HPWS.

To understand the direction of the price effect of the HPWS through this cooperative workplace channel, consider a conventional firm with the persistent gender pay gap due to some form of gender discrimination, say statistical discrimination based on a statistical fact that women are on average more likely to quit for men. Suppose the firm introduces the HPWS. If women thrive and outperform men in such a cooperative work environment promoted by the

HPWS and are rewarded for their improved performance, the existing gender gap will be reduced (positive price effect). While there is strong evidence suggesting that men outperform women in a competitive environment (Gneezy et al., 2003; and Gneezy and Rustichini, 2004), we are void of conclusive evidence on whether women outperform men in a cooperative environment. In fact, Kuhn and Villeval (2015) provided experimental evidence pointing to the lack of significant difference in performance between men and women. However, they also found that the adverse sorting of workers under cooperative work environment (low-ability workers self-select into cooperative work environment in order to free ride on high-ability teammates) is stronger among men than among women. As a result if teams are formed on a voluntary basis, female teams are less subject to the adverse sorting effect than male teams, and hence female teams outperform male teams. It follows that if teams are formed on a voluntary basis, women in teams may end up earning more than men since one of the three pillars of the HPWS is group incentive pay that links individual worker pay to group performance, resulting in the narrower gender pay gap.

Second, however, the theory of compensating wage differentials predicts the opposite direction for the price effect of the HPWS through this channel. Women prefer the HPWS more than men because of its creation of more cooperative work environments. The market adjusts female wages (vis a vis male wages) downward to compensate for a greater appreciation of the cooperative nature of the HPWS by women than by men---this is the negative price effect of the HPWS (Datta Gupta and Eriksson, 2012).

“Soft skills” and multi-skilling

Communication, interactive, and people skills are more highly valued in the HPWS than in the traditional system, for collaboration and teamwork are at the core of the HPWS. Women tend to

be more endowed with such “soft skills” than men (Datta Gupta and Eriksson, 2012 and Bacolod and Blum, 2010).⁶ These endowment differences, combined with rising value of such skills which are caused by the transition from the conventional management system to the HPWS, will result in narrowing gender gap in wage and more women in the workplace (positive quantity effect).

The HPWS also taps into the ability of workers in teams to respond promptly and effectively to local shocks. Such decentralized local responses to shocks often require workers in the same team to be multi-skilled---through job rotation, each individual worker in the team will become capable of performing not only her own job but also her colleagues’ jobs. Drawing upon his long and extensive field research at various workplaces, Koike (2002) provided real-world examples of an indispensable role that multi-skilled workers play in the local organization’s effective response to shocks. The essence of Koike (2002)’s argument is that a team of workers are the first to become aware of shocks, and therefore the firm can avoid wasting time by allowing a team of workers to respond to such shocks immediately without waiting for an instruction from the top. Such an autonomous and organic response of a team often requires a flexible task reassignment, which can be carried out smoothly by multi-skilled workers. If women are more endowed with a set of skills than men that are indispensable for multi-skilling, we can make the same argument for multi-skilling as in the case of communication, interactive and people skills. The key premise that women are more endowed with a set of skills required for successful multiskilling appears plausible. Yet we are not aware of any existing rigorous study to

⁶ If the gender difference in the “soft skill” endowment comes from expectations placed on women rather than genetics, men may respond to the rising price of such skills by increasing their investment in soft skills, resulting in the narrowing gender difference in the soft skill endowment in the long run.

explore this channel. As such, we view an examination of the possible positive price effect of the HPWS through multi-skilling as a promising area of future research.

Job redesign

In introducing the HPWS, the firm often engages in job redesign to facilitate team production of local knowledge and team responses to local shocks. For instance, old jobs are replaced with newly-designed jobs with more problem solving and more collaboration. In principle, such restructuring of jobs and occupational categories will present an opportunity for women to overcome the barrier of “occupational segregation” and enter into new and better-paying jobs and occupational categories (Datta Gupta and Eriksson, 2012 and Davies, McNabb, and Whitfield. 2015). As such, the HPWS may result in narrowing the gender pay gap---positive price effect of the HPWS, which may encourage women to join HPWS firms---positive quantity effect of the HPWS.

Gender discrimination in the HPWS

The HPWS changes the nature of jobs, requiring workers to not only produce but also engage in problem solving in teams. Evaluating worker performance in a team environment is apt to be more subjective than evaluating worker performance in production (especially if it is not team production). As such, there may be more room for supervisor discretion in performance evaluation and hence potentially greater gender discrimination in the workplace may result (Jirjahn and Gesine, 2004 and Datta Gupta and Eriksson, 2012). Such increased gender discrimination will result in widened gender pay gap (negative price effect), and diminished propensity of women to enter HPWS firms due to their fear of intensified gender discrimination at HPWS firms (negative quantity effect).

The HPWS as a high-commitment work system

The HPWS relies on a team of workers who are strongly committed to the firm (and each other), stay in the firm for many years, and accumulate firm-specific human capital that is indispensable for the production of valuable local knowledge and effective responses to local shocks. Due to social norms concerning the gendered division of household production, women may find it difficult to thrive in the HPWS due to its emphasis on commitment. In addition, the firm may engage in statistical discrimination against women, based on the statistically higher odds of female workers' turnover (Davies, McNabb, and Whitfield, 2015). It follows that the HPWS may have a negative quantity effect on the proportion of female workers in general as well as in specific occupations (most notably in managerial occupations) through this channel.

2.2. Evidence

As shown above, theoretically the direction of the price and quantity effects on women in the workplace of the HPWS is ambiguous. Thus, it is an empirical question whether or not the HPWS is a gender-equalizer. Unfortunately in spite of the vast literature on the HPWS in general, only a few rigorous econometric attempts have been made to investigate the consequences of the HPWS for the gender pay gap and the proportion of women in the workplace.

Drolet (2002) carried out one of the first empirical studies on the subject. Specifically she used Canada's Workplace and Employee Survey (WES), which is similar to a more well-known Workplace and Employee Relations Surveys (WERS) of the U.K., and estimated standard Mincerian wage equations augmented by two variables capturing two elements of the HPWS, the frequency of participation in self-directed teams and the receipt of performance-based pay. Both

self-directed teams and performance-based pay are found to contribute to an increase in the gender pay gap yet the magnitude of the price effect of the HPWS is found to be rather modest.

As in the case of most pioneering work, Drolet (2002)'s study has a number of limitations. First, the HPWS is measured by only two specific practices. One of the key insights from the large literature on the HPWS is complementarities among its various practices.⁷ To address complementarities, a more comprehensive list of work practices comprising the HPWS will need to be considered. Second, in investigating the effects of the HPWS, it is difficult to infer causality from cross-sectional studies such as Drolet (2002) for two specific reasons: (i) endogeneity of the HPWS; and (ii) selection. For example, if the firm with progressive and innovative corporate culture (which is an unobserved variable in all economic analyses of the HPWS) is more likely to adopt the HPWS, we cannot estimate the effect of the HPWS *per se* separately from the effects of the progressive and innovative corporate culture. The current practice in the literature to address this type of endogeneity is to use panel data and estimate fixed-effect models. Note that the fixed-effect solution is not viable if the culprit for endogeneity varies over time.

The selection bias arises from the possibility of nonrandom assignment. In the case of Drolet (2002), all workers are assumed to be assigned to HPWS firms and non-HPWS firms randomly. This assumption will be violated if the worker with higher ability (which is also an unobserved variable) is more apt to join an HPWS firm *and* such a worker sorting effect is stronger for women than for men. The gender difference in the sorting effect of HPWS implies that HPWS firms end up having relatively more high-ability women, making the average gender

⁷ See, for instance, Milgrom and Roberts (1995), Kato and Morishima (2002), and Boning, Ichniowski, and Shaw (2005).

gap in HPWS firms shrink without HPWS inducing any behavioral changes in the incumbent workers.

Davies, McNabb, and Whitfield (2015) used the WERS for 2004 and 2011, and refined the Drolet (2002) study by measuring the HPWS more comprehensively and considering complementarities as well as accounting for gender segregation. Overall, Davies, McNabb, and Whitfield (2015) confirmed an earlier finding by Drolet (2002) for Canada that there is no evidence for the positive price effect of the HPWS (reducing the gender pay gap) and if any, the effect on the gender pay gap of the HPWS is positive. Though improved over Drolet (2002), Davies, McNabb, and Whitfield (2015) are still subject to the issue of endogeneity of the HPWS and the nonrandom assignment.

Datta Gupta and Eriksson (2012) used unique registry-based data created by Statistics Denmark, and estimated the effect on the gender pay gap of the HPWS. Their survey provides a comprehensive list of work practices of the HPWS, and thus allows them to take into consideration possible complementarities among work practices as well as examine the effect of each element of the HPWS individually. Unlike Drolet (2002) with the individual worker as the unit of observation, Datta Gupta and Eriksson (2012) chose the individual firm as the unit of observation and estimated the effect on the gender pay gap within the firm of its use of the HPWS. Most importantly they addressed the endogeneity of the HPWS by taking advantage of the panel nature of their data and provided the fixed-effect estimates on the effect on the gender pay gap of the HPWS. The selection bias caused by the possible nonrandom assignment of firms to the treatment was also accounted for by using Rosenbaum (1987)'s weighted propensity-score method. Finally Datta Gupta and Eriksson (2012) allowed for the heterogeneous effect of the

HPWS for hourly workers and salaried workers by estimating the HPWS effect separately for hourly and salaried workers.

Datta Gupta and Eriksson (2012) found that the HPWS caused the gender pay gap to rise for salaried workers yet fall for hourly workers. The magnitude of the effect is modest yet not economically meaningful. For instance, for hourly workers the introduction of one work practice of the HPWS will result in an increase in female wage by one percent and no change in male wage. In contrast, for salaried workers, the introduction of one work practice will lead to an increase in male wage by 1 percent and a decrease in female wage by 0.7 percent. Some evidence on complementarities was also found for hourly workers----as the firm adds more practices, the gender pay gap for hourly workers will narrow at an increasing rate.

Regarding the impact of specific practices, the gender pay gap for hourly workers was found to shrink the most by the introduction of quality circles (small groups of frontline workers at the workplace level who voluntarily set plans and goals concerning operations and work together toward accomplishing these plans and goals), whereas the gender pay gap for salaried workers was found to widen the most by the introduction of teams. Perhaps the most important message from Datta Gupta and Eriksson (2012) is that the effects of the HPWS may be highly heterogeneous---in their case of Danish firms, the HPWS is found to help hourly-paid women yet hurt salaried women. The diametrically opposite result for hourly and salaried workers begs an obvious question---why the HPWS helps hourly paid women but harms salaried women. They speculated that the HPWS may create more room for gender discrimination for salaried workers than for hourly workers. We urge researchers to follow up on this study and explore further why the HPWS helps hourly-paid women while hurting salaried women.

The first rigorous econometric evidence on the quantity effect of the HPWS was provided by Davies, McNabb, and Whitfield (2015). Using the WERS for 2004 and 2011, they estimated an ordered probit model of the odds of working in the firm with varying levels of the HPWS as a function of gender. Note that as in the case of Datta Gupta and Eriksson (2012), Davies, McNabb, and Whitfield (2015) measured the HPWS by using a comprehensive list of work practices. They conducted the same analysis for 2004 and 2011 separately, in part to explore if the effect of the HPWS differs significantly before and after the Great Recession following the financial meltdown of 2008. For the pre-Great Recession year of 2004, they found that women are significantly more apt to work in the firm with the HPWS than men, conditional on both individual and job characteristics.

When they estimated the same model for individual elements of the HPWS, Davies, McNabb, and Whitfield (2015) found that “flexible work” (consisting of team work, functional flexibility, quality circles, suggestion schemes, team briefings) and “skill acquisition” (consisting of new employee orientation programs, communication/team work training, provision of information on financial, investment and staffing, non-managerial appraisal scheme) attracts women more than men. In short, Davies, McNabb, and Whitfield (2015) provided the first reliable evidence on the positive quantity effect of the HPWS. Interestingly for the post-Great Recession year of 2011, they found no significant quantity effect of the HPWS, pointing to the possibility of a structural change in the labor market and employment system in the U.K. after the Great Recession. However, to confirm that the 2011 result represents a permanent structural shift in the labor market and the employment system, we will need to repeat the same analysis using the next wave of the WERS.

Finally, on our reading of the literature, no attempt has been made to test rigorously the relative validity of the proposed channels or mechanisms behind the price and quantity effects on women in the workplace of the HPWS. In addition to accumulating further evidence on the price and quantity effects on women in the workplace of the HPWS, we recommend exploring the specific channels through which such effects arise as an extremely important and fruitful direction of future research.

3. Women in the Work-Life Balance Workplace

Work-Life Balance Practices (WLBP_s), which employers offer to alleviate their employees' work and family conflicts, have been attracting both scholars' and practitioners' attention around the world (Drago and Hyatt, 2003; Kato and Kodama, 2016). Though what is considered a WLBP differs slightly among scholars, a typical set of WLBP_s include three categories of practices: (i) flexible scheduling policies/programs such as flextime; telecommuting; and satellite office; (ii) temporary transitional part-time work (e.g., female employees return to work after maternity leave as a temporary transitional part-time worker for a fixed period of time); and (iii) company child care assistance (including onsite day care centers and a reimbursement program for those who use government-run daycare centers).

The literature on WLBP_s has identified two major channels through which WLBP_s yield positive outcomes for employees in general and female employees in particular (Drago and Hyatt, 2003). First, WLBP_s address specific work and family conflicts, thereby improving employees' ability to control work and family responsibilities (e.g., Berg, Kalleberg, and Appelbaum, 2003). Second, WLBP_s function as a signal to employees that the firm cares about employees, boosting employee commitment to their firms (e.g., Yanadori and Kato, 2009).

Starting with a pioneering work by Batt and Valcour (2003), a number of attempts have been made to explore whether the effects of WLBP differ between women and men and if so, in what way and how much. As discussed in the last section, it is plausible that women are more attracted to firms with WLBP. First, the use of WLBP may be viewed as a signal to women that the workplace is more cooperative, resulting in an increase in the proportion of women in the workplace. Second, due to unequal and traditional division of labor in household production, women value WLBP more than men, and hence are more attracted to firms with WLBP. Third, WLBP help women focus on their work and improve their performance on the job while they are less relevant to men. In other words, WLBP may reduce the gender pay gap by raising female performance more than male performance. However, as in the case of the HPWS, the theory of compensating wage differentials also predict an offsetting effect, because women value WLBP more than men and the market adjusts female wage downward relative to male wage.

Table 1 summarizes select prior studies on the price and quantity effects of WLBP on women in the workplace. Gariety and Shaffer (2001) used U.S. CPS for 1989 and found evidence on the positive price effect of one specific WLBP, Flextime, on women in the workplace in the U.S.. However, they failed to find similar evidence on the positive price effect for 1997. For the U.K., Chatterji, Mumford, and Smith (2011) analyzed the 2004 WERS and found evidence on the positive price effect on women in the workplace in the public sector of WLBP measured by a summary index of Paternity leave, Maternity leave, Home working, Job sharing, Child care, Paid leave. In contrast, Winder (2009) used the same data and found evidence on the negative price effect on women in the workplace of one specific WLBP--- Start/End Time Discretion or flexible hours. Despite use of the same data, Winder (2009) drew completely opposite conclusions about the price effect of WLBP. To reconcile the two studies,

we will need to augment the model estimated by Chatterji, Mumford, and Smith (2011) with the flexible hour variable used by Winder (2009) and re-estimate the augmented model for the public sector and the private sector separately.

Though not addressing the gender wage gap directly, Glass (2004) conducted a unique 7-year longitudinal study of 195 female employees who gave birth between December 1991 and September 1992 in the Midwestern region of the U.S. Her analysis yielded some intriguing and compelling evidence on the long-term effect on wages of the use of WLBP by mothers. Specifically she considered four WLBP (flexible scheduling, telecommuting, reduced hours, and child care assistance) and found that mothers who used each WLBP experienced significantly lower wage growth over the 7-year time period than mothers who did not use it.

Furthermore, the size of the negative wage effect of the use of WLBP was found to be significantly larger for telecommuting and reduced hours than for flexible scheduling and child care assistance. One of the key differences between telecommuting/reduced hours and flexible scheduling/child care assistance is their impact on face-to-face interactions with coworkers. Such face-to-face interactions with coworkers help workers accumulate valuable firm-specific human capital such as the formation of meaningful human network, which is often vitally important for career advancement. Telecommuting and reduced hours will reduce face-to-face interactions with coworkers, while child-care assistance will not (in fact it may help female workers increase such coworker interactions by allowing them to be at work more often and consistently). Flexible scheduling may reduce face-to-face interactions with coworkers somewhat by decreasing the frequency of interactions with the same coworkers but certainly not to the extent to which telecommuting and reduced hours will do. In addition, the size of the negative wage effect of

WLBP was found to be greater for managerial and professional occupations than for other occupations.

Finally, making good use of the registry data from Denmark, Nielsen, Simonsen, and Verner (2004) estimated an endogenous switching model and found evidence that women taking birth-related leaves will face a substantial wage penalty in the private sector while no such motherhood penalty exists in the public sector with generous WLBP. As a result, women who would be affected by this motherhood penalty will self-select into the public sector with generous WLBP. Their finding can be interpreted as evidence on the positive price effect on women in the workplace of WLBP as well as the positive quantity effect of WLBP.

Turning to the quantity effect of WLBP, Batt and Valcour (2003) used the 1998 Cornell Couples and Careers Study of dual-earner couples, and estimated ordered probit models of quit intentions as a function of WLBP. They found evidence of two opposing quantity effects. Supervisor support regarding work-life balance (an informal WLBP) reduced quit intentions for women yet not for men. In contrast, only male workers' quit intentions were found to be curtailed by flexible policies (formal WLBP measured by an index gauging whether employees have access to five types of benefits relating to the flexible use of work time: paid family leave, personal/dependent care time (small increments of time off during work hours to attend to personal or family needs), flextime, telecommuting, and time off for volunteering).

Not all quit intentions result in actual quits. Yanadori and Kato (2009) used Toyo Keizai's *Shushoku Shikiho Joshiban* which provides information on the use of WLBP by Japanese firms in 2004 and estimated firm-level Tobit models of actual turnover rates (as opposed to turnover intentions) for women and men as a function of WLBP and various firm characteristics. They found that flextime, childcare leave, and nursing care leave (mostly for

taking care of elderly parents) lower turnover rates for women yet not for men, pointing to the positive quantity effect on women of WLBP in Japan---WLBP help female workers remain in the firm while there is no such significant quantity effect on their male counterparts.

Finally Kato and Kodama (2016) compiled unique longitudinal data on the use of WLBP (flextime; telecommuting; satellite office; temporary transitional part-time work; daycare service assistance) by 4,697 publicly-traded firms in Japan over the period 2003-2011. They estimated fixed-effect models of the proportion of women in the firm (at different levels of hierarchy) as a function of WLBP along with other covariates (most importantly firm fixed effects, FE) and found that not all WLBP are equally beneficial for women in the workplace. Specifically daycare service assistance was found to have a gradual yet significant positive effect on the proportion of female workers in general as well as the proportion of women at the higher (management) levels. On the other hand, transitional part-time work arrangements resulted in a decrease in the proportion of women at higher management levels.

In sum, thus far the literature on the effects on women in the workplace of WLBP has provided mixed evidence. No definitive conclusion can be drawn on the efficacy of WLBP as a means to reduce the gender pay gap and promote gender diversity in the workplace (including gender diversity in management). Nonetheless a common theme appears to be emerging---different WLBP affect women very differently, and researchers, policymakers and management ought to pay detailed attention to specific features of WLBP rather than bunching all WLBP together. Methodologically the literature on WLBP faces the same challenges as the literature on the HPWS. In searching for compelling causal evidence, endogeneity of WLBP and selection will need to be addressed. To this end, further collection of panel data on the use of

WLBP by firms (including not only the adoption of WLBP but also the intensity of their use⁸) is urgently needed. Such data will allow for fixed-effect estimates as in the case of Kato and Kodama (2016), which can account for all unobserved time-invariant firm characteristics. In addition, reverse causality is particularly plausible in the context of WLBP---the firm with greater presence of women in the workplace is more likely to adopt WLBP which benefit women more than men.⁹ Finally, though FE estimates move us toward more compelling causal evidence, we will still need to overcome the difficult challenge of selection. To this end, Nielsen, Simonsen, and Verner (2004)'s endogenous switching model approach presents a promising direction for future research.

4. Women in the Competitive Workplace: Individual Incentive Pay and Rat Race

Compensation systems have been shifting away from fixed-wage contractual payments around the world (Ben-Ner and Jones, 1995). Particularly prominent is the explosion in the use and interest in Performance Related Pay (PRP) (see, for instance, Bryson, et al., 2012 and Lemieux, MacLeod and Parent, 2009). There are two types of PRP: (i) group incentive schemes which link the financial well-being of workers to group performance such as firm performance; and (ii) individual incentive pay which links pay to individual performance. As discussed earlier in this section, we focus on individual incentive pay which tends to make the workplace more competitive. The use of promotion tournaments is another competitive management practice (Lazear and Rosen, 1981). Being a relative performance incentive mechanism, promotion

⁸ Jones, et al. (2017) argue with evidence that the effects of work practices may need to be estimated on the intensive margin (varying intensity of the existing practices rather than on the extensive margins (the incidence of work practices) especially in the FE model framework.

⁹ Evidence on such reverse causality has been provided by Poelmans, Chinchilla, and Cardona (2003), and Heywood and Jirjahn (2009).

tournaments clearly generates between-worker competition.¹⁰ In this section we explore the consequences of such competitive management practices for women in the workplace.

The theoretical prediction about price and quantity effects of competitive management practices on women in the workplace is more straightforward than the HPWS. There is near-consensus in the experimental literature that men are more attracted to competitive workplaces than women, and recent experimental evidence provided by Kuhn and Villeval (2015) points to the preference of women for a cooperative team environment. It is plausible that women are less attracted to a workplace with competitive management practices, resulting in a negative quantity effect of individual incentive pay and tournaments on women. Regarding the price effect, as discussed in section 2, the experimental literature provides evidence that women tend to be outperformed by their male counterparts in competitive environments, suggesting that competitive practices may exacerbate the gender pay gap.

4.1 Individual Incentive Pay

The panel labeled “the Price Effect on Women in the Workplace of Individual Incentive Pay” of Table 2 summarizes recent studies on the price effect of individual incentive pay on women in the workplace. All studies but one estimated the effect of individual incentive pay on the gender pay gap. The exception, by Xiu and Gunderson (2013), estimated the size of the gender pay gap for different types of pay including individual incentive pay.

Evidence is again mixed. On the one hand, Manning and Saidi (2010) estimated the standard wage equation with and without a variable indicating whether the worker is on a performance pay contract, using the U.K.’s WERS 1998 and 2004. They found no substantive

¹⁰ Kato and Shu (2016) provide evidence from an econometric case study of a Chinese textile factory that relative performance incentive generates extra discretionary effort from workers.

difference in the gender pay gap between the specification with and without the performance pay variable, pointing to the absence of a significant and economically meaningful effect of individual incentive pay on the gender pay gap.

Castilla (2012) conducted a careful econometric case study of a large private employer in the U.S., and uncovered that while performance ratings are on average higher for women than for men, women's higher performance ratings do not translate into higher pay despite the use of individual performance pay because of the subjective nature of the process of converting performance ratings to actual pay increases. As such, his case study evidence is largely consistent with the overall conclusion of Manning and Saidi (2010)---a negligible price effect of individual incentive pay. Moreover, complementary evidence was provided by Kangasniemi, and Kauhanen (2013) who used Finnish LEED (Linked Employer-Employee Data) and found that bonuses lead to an increase in earnings almost equally for men and women (however, they did find evidence that piece rates and reward rates tend to result in an increase in the gender pay gap).

On the other hand, by applying the empirical strategy used by Manning and Saidi (2010) to different datasets (the NLSY79 and NLSY97 of the U.S.), McGee, McGee, and Pan (2015) found that whether the worker receives commissions and/or bonuses accounts for a significant and economically meaningful portion of the gender pay gap, and the contribution of such compensation schemes to the gender pay gap increased from 1998 to 2004. In addition, Chiang and Ohtake (2014), Xiu and Gunderson (2013), and Kangasniemi, and Kauhanen (2013) provided evidence which is consistent with the finding from McGee, McGee, and Pan (2015).

Precisely what causes the diverging results among studies is unknown, for studies differ in a number of different dimensions---countries, time periods, and the nature of the data. Perhaps

most importantly studies differ in the construction of their key explanatory variable. As discussed earlier, bonuses can be either individual incentive pay or group incentive pay or both. To make matters worse, the concept of bonuses may vary significantly across countries and firms. To this end, there is an urgent need for research that focuses on a scheme which is clearly individual incentive pay) *and* a scheme (which is undoubtedly group incentive pay), and contrast the price effect between individual incentive pay and group incentive pay.

Turning to the quantity effect, all but one study used individual worker-level data to estimate the odds of having individual incentive pay as a function of gender, and identified whether women are more or less likely to work on individual incentive pay contracts. The most recent study, Kato and Kodama (2016) adopted a different approach---using individual firm-level panel data to estimate the effect on the proportion of female workers and female managers at different job levels of individual incentive pay.

The direction of the quantity effect of individual incentive pay was found to differ dramatically, depending on whether traditional objective piece rates or other more subjective individual incentive pay schemes are considered. On the one hand, Geddes and Heywood (2003) and Jirjahn and Gesine (2004) found that women are *more* likely to work under piece rates even after controlling for a variety of covariates, in particular detailed occupation categories. On the other hand, the opposite quantity effect was found for other forms of individual incentive pay, some of which are more subjective than piece rates (Geddes and Heywood, 2003 for the U.S., Manning and Saidi, 2010 for the U.K., and McGee, McGee, and Pan, 2015 for the U.S. in more recent years). Xiu and Gunderson (2013) used data from the 1996 Life Histories and Social Change in Contemporary China and found a similar negative quantity effect but the effect

disappeared once occupations, ranks, and ownership types are controlled for, suggesting that gender segregation may be stronger in China than in the U.S. and the U.K.

Kato and Kodama (2016) used panel data on the incidence of individual performance pay by 684 publicly-traded firms in Japan over 2003-2011, and estimated the effects on the proportion of female employees at the different job levels of the introduction of individual performance pay. An advantage of panel data estimates with FE is their ability to account for unobserved firm heterogeneity such as progressive corporate culture that can be correlated with the adoption of individual incentive pay as well as with gender diversity in the firm. For instance, it is plausible that the firm with a progressive corporate culture (which is unobservable) is more likely to change its payment system from the traditional seniority wage toward a more modern individual incentive pay. At the same time, it is also conceivable that such a firm with progressive corporate culture is more likely to promote gender diversity in the firm. Therefore, standard cross-sectional analysis does not allow researchers to estimate the effect on the proportion of female workers in the firm of individual incentive pay separately from the effect of progressive corporate culture. By using panel data and estimating FE models, the quantity effect of individual incentive pay can be identified separately from the quantity effect of progressive corporate culture, to the extent that corporate culture does not change from year to year.

Kato and Kodama (2016) found that the introduction of individual performance pay results in a decrease in the proportion of female directors (amplifying gender inequality in management); that such a negative quantity effect of individual incentive pay is mediated fully by having a more objective performance evaluation system, a more transparent decision making process and a more systematic, explicit and formal training program.

4.2 Promotion tournament and rat races

Since the experimental literature on women in tournaments/relative performance incentives in general is large and growing, and is reviewed elsewhere in the Handbook, here we focus on one particular promotion practice, rat races, and their impact on women's career advancement. The gender gap in promotion rates was documented by a number of studies (e.g., Cabral, Ferber, and Green 1981, Cannings 1988, Cobb-Clark 2001, Paulin and Mellor 1996, Pekkarinen and Vartianinen, 2006). Recently Blau and DeVaro (2007), using the Multi-City Study of Urban Inequality, found that the gender gap in promotion rates still remain even after controlling for job performance, occupations, and detailed firm characteristics. Their finding points to the plausibility of some form of discrimination behind the gender differences in promotion. Similar results were also obtained by McCue (1996); and Cobb-Clark, et al. (2001). Most recently Smith, Smith, and Verner (2013) made use of detailed and reliable registry data from Denmark and confirmed that the significant gender gap in promotion to top management still remains in Denmark and that such a gender gap cannot be fully accounted for by a variety of individual and firm characteristics.

In accounting for the pervasive gender gap in promotion rates, researchers often resort to either one of the two traditional theories of gender gap in the labor market. The first theory focuses on unobserved gender differences in individual productivity and/or preferences for varying job characteristics as main culprits for the gender gap in career advancement. Such differences are often attributed to gender-biased division of labor in the household production (Becker 1985). More recent variants include behavioral theory of the gender gap in promotion rates which stresses the importance of the gender differences in preferences for competition and

risk (see, for example, Niederle and Vesterlund, 2007; Booth and Nolen, 2012; Datta Gupta et al., 2013; Garratt et al., 2013; and Sutter and Rutzler, 2015).

The second theory emphasizes taste-based discrimination or statistical discrimination (Becker 1957, Phelps 1972, Arrow 1985, Lazear and Rosen 1990). The original theory was later extended by Booth, Francesconi, and Frank (2003) who turned their attention to the limited outside job opportunities for female managers who face gender-biased division of labor in the household production. Most recent studies explored a statistical discrimination model in a dynamic setting, and drew somewhat more mixed conclusions regarding the gender gap in promotion (Fryer, 2007 and Bjerck, 2008).

Recently the literature on the gender pay gap is focused on the gender difference in working hours as a key driver of the gender pay gap. For instance, Bertrand, Goldin and Katz (2010), using a panel of MBAs from the University of Chicago, found that much of the gender pay gap can be explained by career interruptions due to parenting and reduced working hours. Goldin (2014) further demonstrated that the gender pay gap is larger in occupations with higher returns to long working hours, pointing to the nonlinear relationship between pay and hours as the remaining main driver of the gender pay gap. Gicheva (2013) also found that the relationship between hours and wage growth is non-linear. She further provided the first evidence that the relationship between hours and the odds of promotion is also nonlinear.

Building on Gicheva (2013), Kato, Ogawa, and Owan (2016) developed a rat race model of the gender gap in promotion, and provided supporting evidence from their econometric case study of a large manufacturing firm in Japan. The model's key feature is the coexistence of two different sources of asymmetric information: (i) the worker's cost of long working hours: and (ii) the worker's OJT ability (the worker's ability to accumulate valuable human capital on the job

through learning by doing). The worker's cost of working long hours is known only to the worker, while the worker's OJT ability is accurately assessed only by the firm observing him/her on the job. Long working hours signal the worker's commitment to the firm, which determines the surplus produced when the worker is promoted. Thus, the firm provides the worker with managerial training only after observing the employee's hours worked and hence his/her commitment to the firm or lack thereof. The firm's decision to provide training also depends on its private information about the worker's OJT ability, which in turn affects the second period productivity when the worker gets promoted. Upon completion of training, the firm then promotes the worker. They showed that the model yields a testable prediction that the positive relationship between working hours and the odds of subsequent promotion is stronger for women than for men. Supporting evidence was then obtained from their econometric analysis of longitudinal personnel data from a large Japanese manufacturing firm.

5. Corporate Social Responsibility Practices and Gender Diversity in the Workplace

Corporate Social Responsibility Practices (CSRPs) have been attracting growing attention from scholars and policymakers as well as management (Brammer, Jackson, and Matten, 2012, Jackson and Apostolakou, 2010). As a result, the literature on CSRPs has been expanding rapidly and by now there is an impressive body of studies from diverse disciplines on the subject.¹¹ Yet research on CSRPs in the context of economics of gender is surprisingly limited. In this section, we review recent attempts to fill this important gap in the literature, and point to CSRPs and gender diversity as a promising direction for future research.

Table 3 presents a summary of select recent studies. All studies but one (Kato and

¹¹A number of excellent literature review articles have been already written (see, for instance, Garriga and Melé, 2004; Aguinis and Glavas, 2012; and Orlitzky, Schmidt, and Rynes, 2003).

Kodama, 2017) investigated gender diversity at the highest level of corporate organization (members of board of directors) as a predictor of CSRPs. In essence, all six studies used individual firms as the unit of analysis, and estimated CSRPs as a function of gender diversity in top management, conditional on observable firm characteristics. All studies point to the same conclusion---the firm with more female board members are more likely to have stronger CSRPs. Bear, Rahman, and Post (2010) further showed that the resultant stronger CSRPs lead to better corporate reputation---CSRPs function as a significant mediator for the impact on corporate reputation of gender diversity in top management. The consistent findings among all studies notwithstanding, we ought not to treat the consensus evidence as definitive causal evidence on the effect on CSRPs of gender diversity in top management. All evidence obtained thus far is cross-sectional. As such, it is subject to the usual problem of unobserved firm heterogeneity. For instance, the observed cross-sectional correlation between gender diversity in top management and CSRPs can be spurious, reflecting unobserved firm heterogeneity (varying levels of progressiveness of corporate culture) influencing both CSRPs and gender diversity in top management. A standard practice to account for unobserved firm heterogeneity is to collect panel data and estimate FE models. Even if such FE estimates confirm the robustness of the key result as in the case of Mallin and Michelon (2011), however, there may be still time-variant confounders that affect both gender diversity in top management and CSRPs.

Most prior studies on CSRPs from the perspective of “instrumental theories” (Garriga and Melé, 2004) are interested in the effects of CSRPs on corporate performance and other pertinent outcomes. For example, Pelozo (2009) conducted a meta-analysis of 128 studies and found that a majority of studies report evidence pointing to a significant positive linkage between CSRPs and financial performance, while recognizing a number of potentially serious limitations

in the papers they reviewed. Other scholars focus on outcomes other than financial performance, such as productivity (Sánchez and Benito-Hernández, 2015); better recruitment outcomes (Greening and Turban, 2000); and investment by institutional investors (Graves and Waddock, 1994). On our reading of the literature, Kato and Kodama (2017) is the only quantitative study to estimate the quantity effect on women in the workplace (including female managers and directors) of CSRPs.¹² Kato and Kodama (2017) used firm-level panel data from Japan and obtained the FE estimates on the quantity effect of CSRPs. For those firms that adhere closely to the traditional Japanese participatory management model, they found evidence of a positive quantity effect of CSRPs that is statistically significant and economically meaningful. Furthermore, the quantity effect of CSRPs was found to be robust to the inclusion of WLBP as a control, suggesting that CSRPs have direct impact on the proportion of women in the workplace rather than through the mediating effect of WLBP.

6. Conclusions

We have reviewed recent studies on the consequences of management practices for women in the workplace and other related issues. First, the HPWS tends to attract women and hence increase gender diversity in HPWS firms yet it does not reduce the gender pay gap. Second, different WLBP affect women differently, and that researchers, policymakers and management ought to pay detailed attention to the specificity of WLBP rather than bundling all WLBP together. Third, prior studies on the price effect of individual incentive pay produced highly divergent evidence. Unfortunately the causes of the divergence among studies are

¹² There are, however, a few theoretical and qualitative studies on the effects on gender diversity and equality of CSRPs (Grosser and Moon, 2005, Schultz, 2007 and Stropnik, 2010). The qualitative literature describes the potentially important role that CSRPs may play in enhancing gender diversity; elucidates a number of key challenges that need to be overcome in order for CSRPs to yield positive outcomes in gender diversity/equality; and proposes some solutions to those challenges.

unknown. In contrast, the literature on the quantity effect of individual incentive pay appears to point to a clearer verdict--positive when objective performance is used and negative when subjective performance is used. Fourth, the literature on promotion tournament has demonstrated the value of bringing working hours to the center of discussions on the remaining gender gap in the labor market. Last we have reviewed the growing literature on CSRPs that is relevant to the gender issues in the workplace, and have found evidence on a positive quantity effect.

Our review of the literature has made it amply clear that we will need many more studies that apply a unified framework to diverse data. We conclude the chapter by proposing a number of building blocks for the construction of such a unified framework for future work. First, theoretically there are two interrelated yet different effects on women in the workplace of management practices: (i) the price effect---the effect on the gender pay gap of management practices; and (ii) the quantity effect---the effect on the proportion of female workers at the firm (including the proportion of female managers, directors, and board members). Second, all management practices can be divided into two broad categories: (i) competitive management practices such as individual incentive pay and promotion tournament; and (ii) other practices which often make between-worker competition less intense, and create a more cooperative and family-friendly workplace environment. The experimental literature suggests that women shy away from the competitive management practices, while embracing the other practices. Moreover, women tend to perform worse under the competitive practices than men, while outperforming men under the other non-competitive practices.

Third, there are at least three major methodological challenges: (i) how to measure management practices; (ii) how to account for possible endogeneity of management practices; and (iii) how to minimize selection bias. The measurement challenge is demonstrated by the

following questions. Should we consider individual practices separately or construct some summary indices?¹³ If we construct some summary indices, should we let theory guide us or let the data dictate?¹⁴ Should we measure management practices on the extensive margin (whether or not a certain practice exists) or on the intensive margin (how widely and strongly the existing practice is used)?¹⁵

The most relevant form of the endogeneity challenge in the context of this chapter stems from unobserved heterogeneity of firms that can be correlated with both management practices and the key dependent variables such as the gender pay gap and the proportion of female workers. To the extent to which the suspected unobserved heterogeneity of firms is time-invariant, we can overcome the endogeneity challenge by using panel data and estimating FE models. A few studies we have reviewed in this chapter have done so successfully. We expect many future works to follow suit. Nonetheless, the panel data/FE strategy often creates its own challenge---insufficient within-firm variations in the key management practice over time and exacerbated measurement errors. This problem is particularly acute when estimating the effect of management practices on the extensive margin (Jones, et al., 2017). Furthermore, FE models are still subject to time-variant unobserved shocks that are firm-specific.

Correcting the selection bias is perhaps the most challenging. For studies with individual workers as the unit of analysis, self-selection of individual workers into firms with a certain management practice makes it difficult to interpret the estimated coefficient on the management

¹³ Including multiple individual practices that may be correlated with each other often yields imprecise estimates, especially when interaction terms involving different practices are added to test complementarity.

¹⁴ For examples of the construction of summary indices to avoid efficiency loss due to multicollinearity, see, for instance, Ichniowski, Shaw, and Prennushi (1997) and Kato and Morishima (2002).

¹⁵ For the issue of whether management practices are to be measured on the intensive margin or on the extensive margin, see Jones, et al. (2017).

practice. For example, suppose we estimated the woman's odds of earning a top management appointment as a function of whether or not her firm has a temporary transitional part time work policy for women with a young child, and found the estimated coefficient on the transitional part time work policy to be negative and statistically significant. It is tempting to conclude that this particular type of WLBP is detrimental for women's career advancement. However, it is plausible that workers with high cost of working long hours (perhaps due to the gender-biased division of labor in the household production) self-select into firms with such transitional part time work policy. The estimated coefficient on the policy may end up picking up the effect of this kind of worker sorting. In short, it is *a priori* difficult to determine whether the estimated coefficient on the transitional part time work policy is capturing the behavioral effect of the policy (women's career advancement is hampered because of the reduced face-to-face interactions with coworkers resulting from the part time work arrangement) or the sorting effect of the policy (women with high cost of working long hours and hence limited career aspiration self-select into firms with such a policy). A promising strategy is making good use of long longitudinal Linked Employer-Employee Data (LEED) such as Denmark's IDA. Since the registry-based LEED cover all workers and all firms in the country, we can obtain individual FE estimates for all individual workers in the country from the wage regressions, and use the FE estimates as proxy for unobserved ability and test the validity of worker sorting theory.¹⁶

¹⁶ For an example of this approach, see Frederiksen and Kato (2017).

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Table 1 The Effects on Women in the Workplace of WLBP

Study	Data Sources	Main dependent variables	Main independent variables	Key findings
The Price Effect on Women in the Workplace of WLBP				
Gariety and Shaffer (2001)	US, Current Population Survey / 1989, and 1997	wage	flextime	Flextime was found to increase wage for women but not for men in 1989. But in 1997 flextime was found to raise wage for both women and men.
Glass (2004)	7-year longitudinal panel of 195 mothers in 1990s.	wage growth	Flexible scheduling, telecommuting, reduced hours, and child care assistance	Negative price effect of all WLBP and the size of the motherhood penalty is larger for telecommuting and reduced hours.
Nielsen, Simonsen, and Verner (2004)	Denmark, several registers by Statistics Denmark / 1997	wage	family-friendly / non-family-friendly sector	Significant and considerable wage penalty for birth-related leave for women in the private sector but not in the public sector with WLBP.
Winder (2009)	UK, Workplace Employment Relations Survey / 2004	wage	Flexible scheduling	Female wage rises with flexible scheduling by 3.4% whereas male wage rises with flexibility by 8.5%
Chatterji, Mumford, and Smith (2011)	UK, British Workplace Employee Relations Survey 2004 (WERS04) / 2004	wage	Family-friendly index, paternity leave, maternity leave, home working, job sharing, child care, paid leave, discretion over work	Increased provision of WLBP in the public sector is associated with higher relative earnings for women.
The Quantity Effect on Women in the Workplace of WLBP				
Batt and Valcour (2003)	the 1998 Cornell Couples and Careers Study of dual-earner couples.	Quit intension	Dependent care, Flexible policies, Supervisor support	Supervisor support lowers quit intention for women, while flexible policies reduce quite intention for men
Yanadori and Kato (2009)	Toyo Keizai's <i>Shushoku Shikiho Joshiban</i> (SSJ, hereafter) 2004.	turnover	flextime, maternity leave, child care leave, and nursing care leave	There are statistically significant associations between WLBP and female employee turnover in Japan but no such linkage for men.
Kato and Kodama (2016)	(i) the Intangible Assets Interview Survey; (ii) CSR Data compiled by Toyo Keizai; and (iii) Corporate Proxy Statement Data.	Proportion of women in the firm at different levels of corporate hierarchy	flextime; telecommuting; satellite office; temporary transitional part-time work; daycare service assistance	Daycare service assistance has a positive effect on the share of women in the firm's core labor force and the proportion of female directors. However, transition period part-time work has a negative effect on the proportion of female directors.

Table 2 The Effects on Women in the Workplace of Individual Incentive Pay

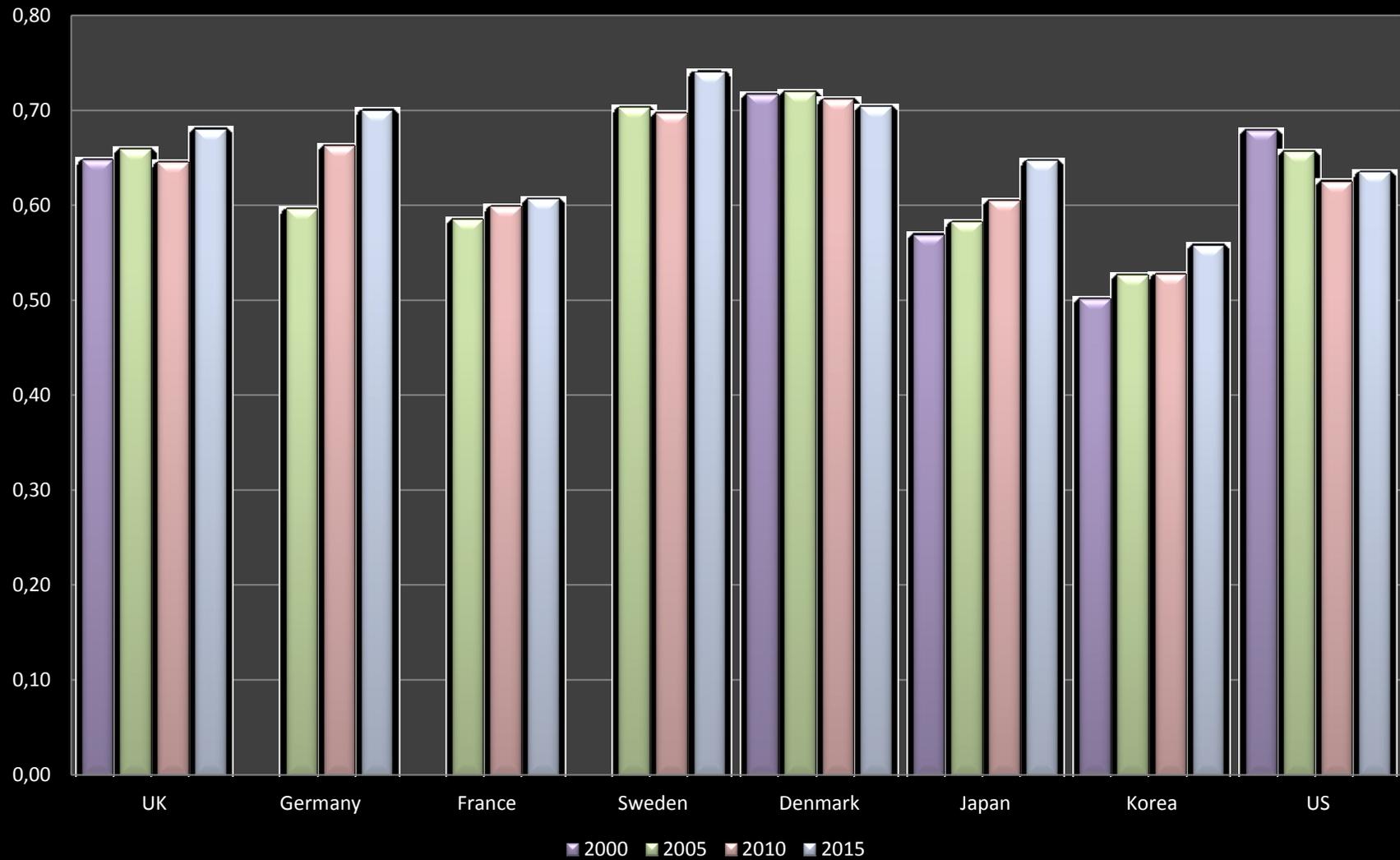
Study	Data Sources	Main dependent variables	Main independent variables	Key findings
The Price Effect on Women in the Workplace of Individual Incentive Pay				
Manning and Saidi (2010)	WERS 1998 and 2004	Log-hourly wage	Performance Pay encompassing a wide range of incentive Schemes	The effect of performance pay on earnings is modest and does not differ markedly by gender. The results change little even if focusing on specific scheme.
Castilla (2012)	Personnel data from a large private employer in 2003. A service sector organization with several facilities located in a large city in North America	Salary growth	Gender and performance evaluation	Women's higher performance ratings do not translate into higher pay despite the use of individual performance pay because of the subjective nature of the process of converting performance ratings to actual pay increases.
Kangasniemi, and Kauhanen (2013)	the Confederation of Finnish Industries over 1998-2007. There are 590,809 unique persons (414,601 men and 176,208 women) and 3,768 unique firms.	Log-hourly wage	Bonus pay, Piece rate	Bonuses increase earnings quite similarly for both men and women. Piece rates, however, tend to increase gender wage differentials
Xiu and Gunderson (2013)	1996 Life Histories and Social Change in Contemporary China 1,790 observations, with 966 men and 824 women	Log-performance pay	gender	Men earn about 30 per cent more than women, with the gender gap in performance pay (35 per cent) and in 'other' forms of pay (28 per cent), both being greater than the gap in base pay (25.5 per cent). But the unexplained or potentially discriminatory component is smaller for performance pay and 'other' forms of pay compared to base pay.
Chiang and Ohtake (2014)	the Survey of Living Preferences and Satisfaction' (SLPS) a total sample of 2,745 observations (1950 for male workers and 795 for female workers)	Log-hourly wage	Performance Pay (individual incentive pay)	A glass ceiling effect is observed for white collar workers who do not receive performance-based pay but not for white-collar workers with performance pay.
McGee, McGee, and Pan (2015)	the NLSY79 and NLSY97 33,828 and 29,943 for the NLSY79 and NLSY97	Log-hourly wage	Commissions and bonuses	The receipt of commissions and/or bonuses explains 3.6 percent of the gender wage gap for the 79 cohort and 13.8 percent of the gender wage gap for the 97 cohort.

The Quantity Effect on Women in the Workplace of Individual Incentive Pay				
Geddes and Heywood (2003)	The NLSY 88-90 5581 individuals	Piece rate, bonus and commission	gender	Women are more likely to be paid piece rates and less likely to be paid commissions and bonuses than their male counterparts.
Jirjahn and Gesine (2004)	German Official Statistics, the Lower Saxonian Salary and Wage Structure Survey for the year 1995 around 22,000 employees from 850 firms.	The odds of working under piece rates vis-à-vis time rate.	gender	Women are more likely to work under piece rates vis-à-vis time rate even after controlling for tenure and the presence of children, pointing to the possibility of gender discrimination as a primary culprit for women's preference for piece rates.
Manning and Saidi (2010)	WERS 1998 and 2004	The odds of receiving performance pay encompassing a wide range of incentive Schemes	gender	Women are less likely to have performance pay contracts than their male counterparts.
Xiu and Gunderson (2013).	1996 Life Histories and Social Change in Contemporary China 1,790 observations, with 966 men and 824 women	The odds of receiving year-end bonuses, merit pay and individual bonuses	gender	Women are less likely to receive year-end bonuses, merit pay and individual bonuses than their male counterparts but the gender gap in the odds of receiving performance pay disappears once occupations, ranks and ownership types are controlled for.
McGee, McGee, and Pan (2015)	the NLSY79 and NLSY97 33,828 and 29,943 for the NLSY79 and NLSY97	The odds of receiving Commissions and bonuses	gender	Women in the 79 cohort (the 97 cohort) are 1.5 (1.6) and 3.7 (1.8) percentage points less likely to be receiving compensation through commissions and bonuses, respectively, than their male counterparts.
Kato and Kodama (2016)	(i) the Intangible Assets Interview Survey in Japan; (ii) CSR Data compiled by Toyo Keizai; and (iii) Corporate Proxy Statement Data	Proportion of women in the firm at different levels of corporate hierarchy	Individual incentive pay	The introduction of individual incentive pay will result in a decrease in the proportion of female directors. The adverse effect on gender equality is mediated fully by having a more objective performance evaluation system, a more transparent decision making process and a more systematic, explicit and formal training program

Table 3 CSRPs and Gender Diversity in the Workplace

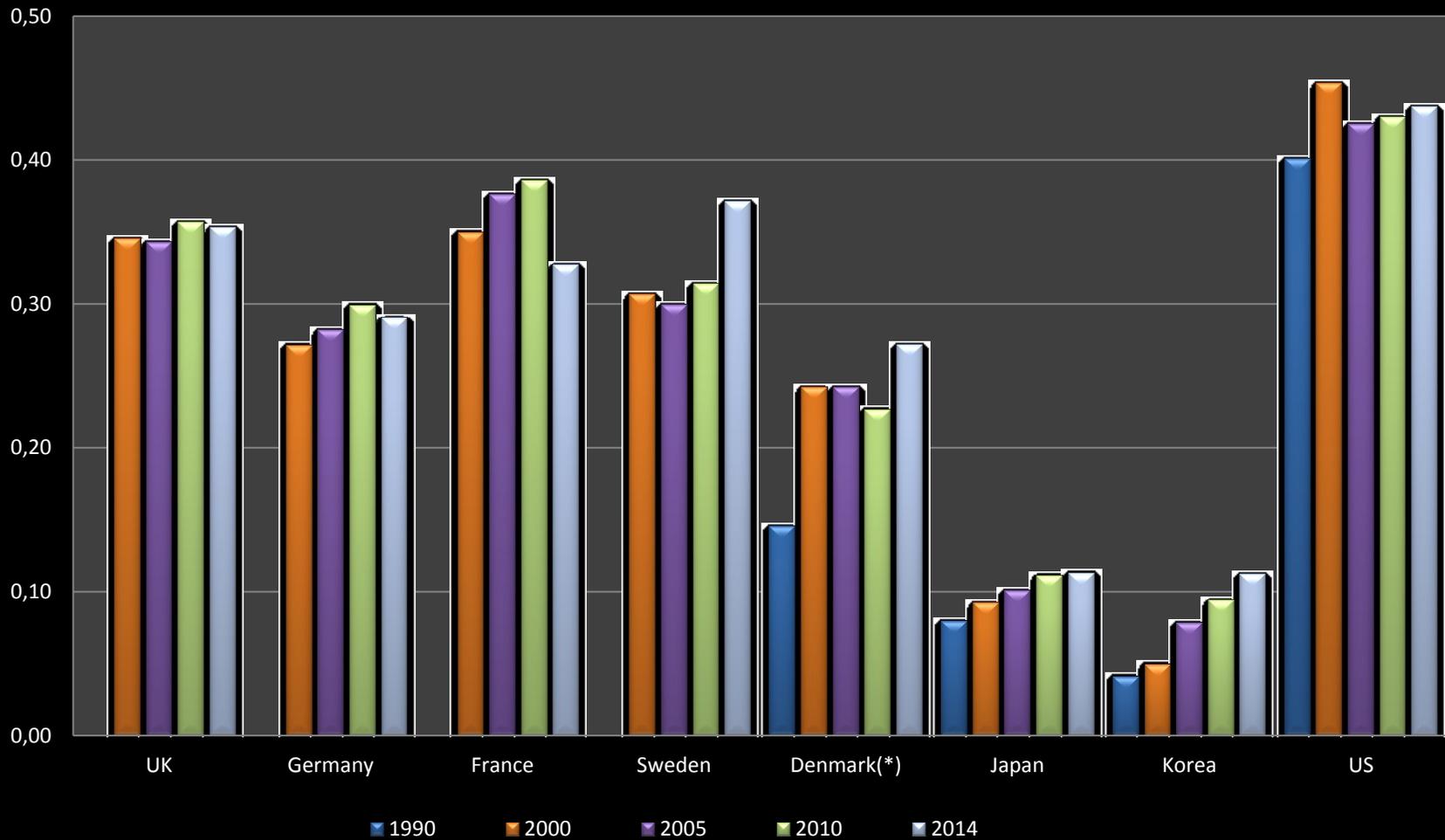
Study	Data Sources	Main dependent variables	Main independent variables	Key findings
Gender Diversity in Management as a Predictor of CSRPs				
Bear, Rahman, and Post (2010)	The Fortune 2009 World's Most Admired Companies List, matched with Kinder, Lydenberg, Domini and Co., Inc. (KLD) database.	KLD ratings for Corporate Social Responsibility (CSR)	diversity of director resources and the number of women on the board	The percentage of women on the board is positively associated with corporate reputation. The positive reputation effect is mediated by CSRPs
Mallin and Michelon,(2011)	100 companies listed in the Business Ethics 100 Best Corporate Citizens for the years 2005, 2006 and 2007, matched with KLD database	KLD ratings for CSR	proportion of women on the board	There is a significant and positive relationship between the proportion of women on the board and the social performance ratings
Post, Rahman, and Rubow (2011)	disclosed company data and the natural environment ratings data from KLD database for 78 Fortune 1000 companies	KLD ratings for environmental corporate social responsibility	proportion of women on the board	A higher proportion of outside board directors is associated with more favorable environmental corporate social responsibility and higher KLD strengths scores.
Hafsi and Turgut (2013)	The Investor Responsibility Research Center database; Board Analyst database; COMPUSTAT; and KLD database	CSR index	Gender diversity index of the board	Positive correlation between gender diversity index of the board and CSR index.
Zhang, Zhu, and Ding (2013)	The Investor Responsibility Research Center database; COMPUSTAT; FORTUNE magazine's America's Most Admired Corporations (FAMA)	The odds of being ranked by FAMA in the top half of the focal firm's peers in the industry in the dimension of CSR performance	Proportion of female directors	Positive correlation between the proportion of female directors and higher odds of being ranked in the top half of the firm's peers in the same industry.
The Quantity Effect on Women in the Workplace of CSRPs				
Kato and Kodama (2017)	(i) CSR Data compiled by Toyo Keizai; and (ii) Corporate Proxy Statement Data	The number of female college graduate hires; female managers; and female directors	CSR score	For those firms that adhere closely to the participatory model, one standard deviation increase in CSR score, after three years, will result in 0.8 more female college graduate hires from its mean of 17.5; 1.7 more female managers from its mean of 26.2; and 0.16 more female directors from its mean of 1.69.

Figure 1 Employment Rates of Women: Select OECD Countries over 2000-2015



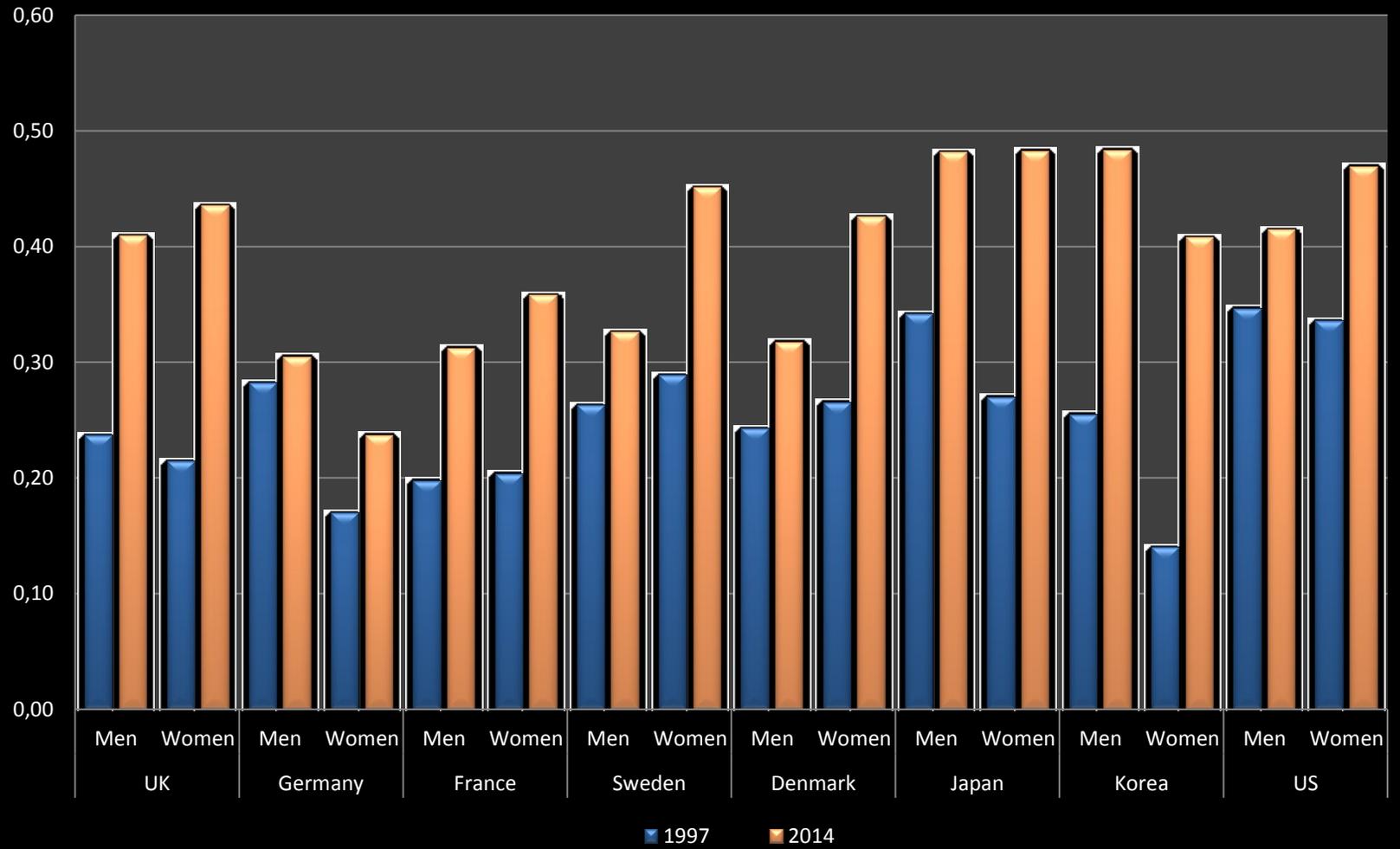
Source: OECD (2016)

Figure 2 Proportion of Female Managers: Select OECD Countries over 1990-2014



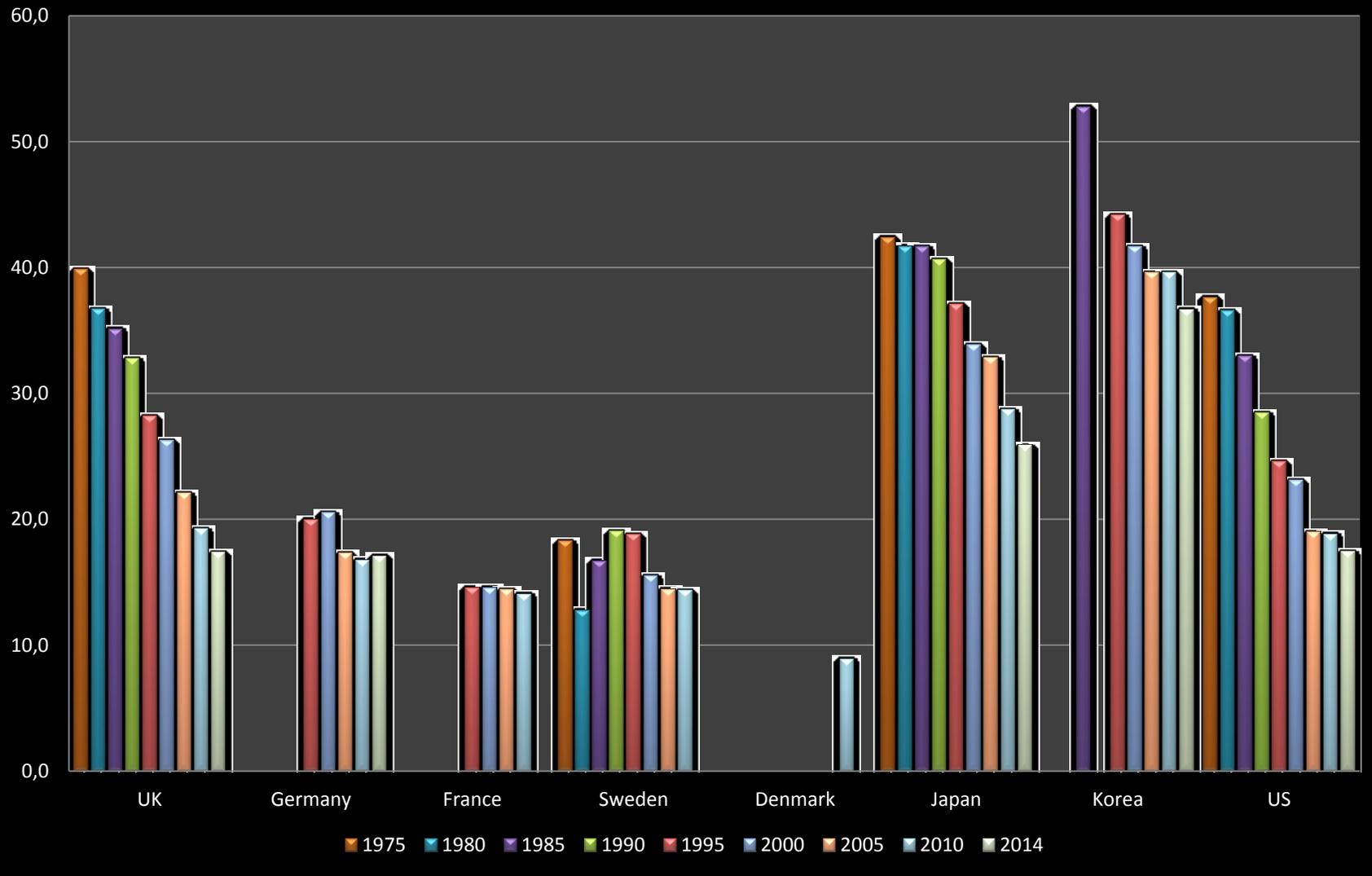
Source: JILPT (2016)
Note: (*) 2013 instead of 2014.

Figure 3 Proportion of College-educated 25-64 year-olds: Select OECD Countries , 1997 & 2014



Source: OECD (2016)

Figure 4 The Gender Wage Gap as Percent of Male Wage: Select OECD Countries over 1975-2014



Source: OECD (2016)