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Support on the way to the top? The effect of organisational equal opportunities measures on women's promotion prospects

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Articles on labour market issues

13|2022 Support on the way to the top? The effect of organisational equal opportunities measures on women's promotion prospects

Susanne Wanger

Support on the way to the top? The effect of organisational equal opportunities measures on women's promotion prospects

Susanne Wanger (IAB)

Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

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Abstract

Even though women have been able to increase their participation in management positions to a small extent in recent years, they are still significantly underrepresented in management positions. Organisational measures to promote gender equality and work-life balance are seen as an option to reduce inequalities between men and women. However, there are relatively few firms that have formalised organisational gender equality policies. Against this background, I examine whether organisational measures may increase women's career opportunities or promote the assumption of management positions on a part-time basis. This is investigated using a German Linked-Employer-Employee dataset (LIAB) from 2012 to 2016 and logistic panel regression models.

The results show that the targeted promotion of women in particular improves their chances of promotion. However, this is not the case for mothers and their chances of achieving a part-time management position: these are lower when targeted promotion of women is practised in a firm. Measures to improve reconciliation, such as firm support for childcare or for employees with dependents in need of care, have a positive effect on advancement to management positions. The effect of family-friendly working conditions in a firm is heterogeneous: while women have lower chances of promotion, their chances of obtaining a management position with reduced working hours are higher. In contrast, a firm's membership in a family-friendly network has a negative effect on the career and promotion opportunities of women.

Zusammenfassung

Auch wenn Frauen in den letzten Jahren ihren Anteil an Führungspositionen in geringem Maße erhöhen konnten, sind sie in Führungspositionen immer noch deutlich unterrepräsentiert. Organisatorische Maßnahmen zur Förderung der Gleichstellung der Geschlechter und der Vereinbarkeit von Beruf und Familie werden als eine Möglichkeit angesehen, die Ungleichheiten zwischen Männern und Frauen zu verringern. Allerdings gibt es nur relativ wenige Betriebe, die formalisiert organisatorische Gleichstellungspolitik betreiben. Vor diesem Hintergrund untersuche ich, ob organisatorische Maßnahmen die Karrierechancen von Frauen erhöhen oder die Übernahme von Führungspositionen in Teilzeit fördern können. Dies wird mit einem deutschen Linked-Employer-Employee-Datensatz (LIAB) von 2012 bis 2016 und logistischen Panelregressionsmodellen untersucht.

Die Ergebnisse veranschaulichen, dass vor allem die gezielte Förderung von Frauen deren Aufstiegschancen verbessern. Dies zeigt sich allerdings nicht bei Müttern und deren Chancen auf eine Führungsposition in Teilzeit: diese sind niedriger, wenn Frauenförderung im Unternehmen praktiziert wird. Auch Maßnahmen zur Verbesserung der Vereinbarkeit, wie die betriebliche Unterstützung bei der Kinderbetreuung oder von Beschäftigten mit pflegebedürftigen Angehörigen haben einen positiven Effekt auf den Aufstieg in Führungspositionen. Die Wirkung familienfreundlicher Arbeitsbedingungen in einem Betrieb ist heterogen: Während Frauen in

Betrieben mit solchen Maßnahmen zwar geringere Aufstiegschancen haben, sind ihre Chancen auf eine Führungsposition mit reduzierter Arbeitszeit höher. Die Mitgliedschaft eines Betriebes in einem familienfreundlichen Unternehmensnetzwerk wirkt sich dagegen negativ auf die Karriere- und Aufstiegschancen von Frauen aus.

JEL classification

J16, J71, M12, M51

Keywords

Female managers, gender equality, Germany, leading positions, Linked-Employer-Employee Data, part-time, promotions, work-life-balance

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1 Introduction

In recent decades, the labour force participation of women and men has converged. Almost half of the employees in Germany today are women (Wanger 2020). However, this development should not obscure the fact that there is still a substantial gender gap in labour market opportunities. Empirical labour market research has long pointed to clear gender-specific discrepancies in working hours, remuneration or career opportunities for women (Wanger 2020, Ochsenfeld 2012, Busch et al. 2014, Granato 2017, Kohaut/Möller 2019, 2022, Holst/Kirsch 2015, Holst/Friedrich 2016). Women are significantly underrepresented in management positions, (Holst/Friedrich 2016, Holst/Marquardt 2018), and their share has only increased to a small extent in recent years (Kohaut/Möller 2022). This is related to the enormous expansion of part-time employment in Germany: widespread part-time work reduces career opportunities for women – especially mothers – as full-time employment is a prerequisite for many management positions (Blau/Kahn 2013, Deschacht 2017, Holst/Friedrich 2016, Holst/Marquardt 2018).

Given the low proportion of women in management positions, gender equality measures in firms could be an option to improve equal opportunities between women and men and to promote women's advancement. However, empirical analyses of the extent to which such organisational measures actually lead to better career opportunities are rare (Fehre et al. 2014). Against this background, I examine in this paper how organisational measures for equal opportunities affect the attainment of management positions – possibly also part-time. If management tasks can also be performed part-time, these positions are also more accessible to women. Moreover, in times of a shortage of skilled workers, firms may have a strong interest in retaining qualified workers for the long term and therefore comply with the desire for shorter working hours.

So far, much of the research has focused on the underrepresentation and prevalence of women in management positions (Holst/Marquardt 2018, Möller/Kohaut 2022), and the aspect of part-time management is also gaining importance, even though part-time management positions are still very rare (Kohn/Breissig 1999, Koch 2008, Gärtner et al. 2016, Schmidt 2017, Hipp/Stuth 2013). Qualitative studies in particular show that the implementation of part-time models among managers is hampered by time restrictions, expected career losses and a lack of role models (Tomlinson/Durbin 2010, Durbin/Tomlinson 2010, 2014, Formánková/Křížková 2015, Dick 2010, Gascoigne/Kelliher 2018). Little is known about whether gender equality policies of firms contribute to women's better success in advancing to management positions, and whether these policies are also beneficial when moving into part-time management positions.

Germany is an interesting case in this context because it is the ideal type of a conservative welfare regime that has long supported a traditional division of labour between men and women. Only in recent years have reforms been introduced to break up this system of the male breadwinner. In addition to reforms in parental leave (Samtleben et al. 2019) or childcare (Zoch 2020), there have been efforts to increase the share of women in management positions through women's quotas or firm agreements. In Germany, for example, the *Gesetz für die gleichberechtigte Teilhabe von Frauen und Männern an Führungspositionen* (Act for the Equal Participation of Women and Men in Leadership Positions) has been in force since 2016, which prescribes a women's quota for large firms (Kohaut/Möller 2019) and, following an amendment

in 2021, now aims in particular to increase the proportion of women on management boards (Kohaut/Möller 2022). As early as 2001, the umbrella organisations of German industry and the federal government had agreed on the voluntary introduction of organisational measures to promote women's labour market opportunities. By now, however, only relatively few firms have implemented such measures, and the gender gap remains wide. In 2020, for example, Germany was only in the bottom third in a European comparison in terms of the proportion of women in management positions (Destatis 2021a).

Thus far, the effects of specific organisational practices on holding a management position have been neglected in the existing literature in the current German context. With this investigation, I close this research gap and explore the question of the extent to which work organisation contributes to the emergence and reduction of gender inequality. The present study pursues two methodological targets: First, a large and representative Linked-Employee-Employee longitudinal data set (LIAB) from the Institute for Employment Research (IAB) is used to examine whether workplace policies have an effect on the attainment of a managerial position. Furthermore, the second question to be answered is whether the effect of these measures is merely a correlative relationship or whether the effect is actually causal, i.e. the attainment of managerial positions can also be attributed to the measures. As far as I know, this is the first study to examine this in the German context.

To answer these questions, I focus on different instruments of equal opportunity measures that are available for different groups of employees. On the one hand, there are measures to promote gender equality, here (1) the targeted promotion of women, for example through mentoring programmes or career planning. On the other hand, I examine different practices to promote the work-life balance at firm level. These include (2) family-friendly working hours and workplaces, (3) childcare support, in the form of financial support or in-company childcare, (4) support for employees with relatives in need of care and (5) membership in a network of family-friendly establishments.

2 State of research: women, part-time and management positions

2.1 Women and management positions

Although women have increased their participation in management positions in recent years (Kohaut/Möller 2022), women are still significantly underrepresented in management positions in Germany (Holst/Friedrich 2016, Holst/Marquardt 2018, Bundesagentur für Arbeit 2019, Kohaut/Möller 2019, 2022). Kohaut and Möller (2009, 2022) regularly report on gender inequalities in access to managerial positions in the German labour market. The results are sobering: although 43 per cent of employees were women, the proportion of women among

managers is only 27 per cent¹ (Kohaut/Möller 2022). The gender leadership gap – the difference between the proportion of women in all employees and the proportion of women in management positions – is thus 16 percentage points at the first management level for the year 2020. Women usually manage small and micro enterprises, where management responsibility is extremely limited due to the lack of a second management level. In large firms with more than 500 employees, the share of women in management falls to only 15 per cent, although the share of women in these firms is still 36 per cent (Kohaut/Möller 2022). Especially in eastern Germany and structurally weak regions, women are rising to management positions, while in large industrial firms these are predominantly occupied by men (Klammer/Menke 2020). The share of female managers also differs by sector: if the share of women in the overall workforce is higher, there are also more women than men in management positions, e. g. in education and teaching as well as in health and social services (Kohaut/Möller 2022).

There are fewer management positions in women's occupations than in typical men's occupations (Granato 2017, Kohaut/Möller 2022, Holst/Friedrich 2016). The opportunities for promotion in women's occupations are therefore lower from the outset (Hausmann et al. 2015). In addition, women are more often appointed to risky and precarious management positions than men (Ryan/Haslam 2005, 2007, Ryan et al. 2016), which is referred to as the so-called "glass cliff". Women are more often found in management positions in "unattractive" firms (Ellguth et al. 2017). These firms are more likely to be in the red, have higher staff turnover, pay lower wages, have lower skill levels and managers have less span of control.

A large body of literature deals with the stable underrepresentation of women in management positions in the labour market. A variety of causes are put forward to explain this, none of which can be considered comprehensive due to the complexity of the topic. In the following, I present the most important supply-side and demand-side aspects.

On the *supply side*, factors such as personality traits, different endowments of human capital, but also life-course approaches used to elucidate this inequality. Personality traits, e. g. different levels of risk-taking or tolerable behaviour, explain part of the glass ceiling, especially at the upper end of the wage distribution (Collischon 2021a). On the other hand, different endowments of human capital among younger cohorts can no longer provide a satisfactory argument for different opportunities in management positions. Especially since women are disproportionately represented in higher education (Destatis 2021b). This shows that there is definitely a large potential of women who could take up management positions. However, occupational gender segregation – i. e. the choice of occupation and field of study – clearly contributes to the explanation of the underrepresentation in management positions. The German labour market is generally characterised by strong occupational segregation (Busch 2013, Granato 2017) and women more often work in low-status occupations. This is solidified in the "sticky floor effect": women remain more often than men in low-paid jobs, i. e. in the lower ranks of the job scale, with low mobility and invisible barriers to career advancement. Empirical studies show this effect also

¹ Depending on the definition of management positions, delimitation and data set (Holst 2005, Kleinert 2006, Kleinert 2011, Kohaut/Möller 2013, Holst et al. 2015), the figures for the share of women in management positions in Germany differ. The figures for 2017 vary between 25 per cent (IAB Establishment Panel), 27 per cent (Employment Statistics Register), 30 per cent (SOEP) and 31 per cent (Labour Force Survey) (Bundesagentur für Arbeit 2019).

for Germany (Hoque/Kirkpatrick 2003, Huffman et al. 2017), so that the probability of working in the lower ranges of the wage distribution is still higher for women than for men.

In addition, women work more often in professions with few management positions and less often in professions with many management positions. However, gender-specific differences in career development can be explained in particular by a socio-political institutional framework, because the "gender gap" is primarily a "mother gap" (Ochsenfeld 2012). Family policy in Germany continues to support the traditional division of labour between women and men. Incentives to take a longer career break or to work part-time after the birth of a child (Bünning/Hipp 2022, Wanger/Zapf 2021, Boll/Schüller 2020, Vogel 2009) remain strong for women, even though policies are increasingly focusing on parents' career and family preferences for a more egalitarian division of paid and unpaid work (Bünning/Hipp 2022).

Although more and more fathers are taking parental leave (Samtleben et al. 2019), it is still the vast majority of women who interrupt or reduce their professional activity after starting a family. Even though mothers return to work much more frequently and earlier today than the generation before them after starting a family (Bächmann et al. 2020, Vogel 2009), family-related career interruptions are often followed by part-time jobs and low-paid work. For women, starting a family often means the end of a continuous full-time career. With growing work experience, full-time employees achieve higher percentage wage increases than part-time employees (Boll 2010; Gallego-Granadas/Wrohlich 2018; Gallego-Granadas et al. 2019). Career interruptions in particular lead to significant wage losses when returning to work (Schmelzer et al. 2015). On average, women currently earn 21 per cent less than men. The gender pay gap between men and women starts to widen from the age of 30 onwards, while at the same time women significantly reduce their working hours at this age in contrast to men (Schrenker/Zucco 2020).

For most women who take parental leave and return part-time, the path to management is very difficult. In general, part-time work reduces women's career opportunities, as full-time employment is a prerequisite for many management positions (Schmidt 2017, Holst/Friedrich 2016, Granato 2017, Bürmann 2014). Especially for highly qualified women, the phase of starting a family clearly overlaps with career-intensive professional development. The birth of children thus significantly reduces women's chances of advancement (Deschacht 2017). Career and family are apparently hardly compatible for women. Women in high management positions more often live in non-marital relationships and without children in the household. And children have a particular career-inhibiting effect when long working hours are generally required, but mothers (can) only work part-time (Holst/Friedrich 2016). This reflects the professional expectations of managers, which are still oriented towards the realities of men's lives.

For managerial roles in the firm, full-time employment and thus unrestricted availability of the employee is still an important factor when it comes to recruiting and promoting managers. Deschacht (2017) shows that 40 per cent of the "promotion gap" between men and women can be explained by gender differences in contractual working hours, overtime and occasional late work. When women become mothers, the probability of being in a management position ten years after graduation is halved. For men, on the other hand, parenthood is not associated with a career interruption (Ochsenfeld 2012). Family-related career interruptions and the widespread part-time work of women thus contribute decisively to their underrepresentation in management positions.

In contrast to the reconciliation of work and family, a reconciliation of career and family is only possible to a limited extent for one parent and requires the support of others. Social support from the partner is particularly important for women to achieve a high professional position (Busch et al. 2014). Women are more likely to advance in their careers if their partner supports them in their career advancement and takes on more housework. But support at work from colleagues and especially from superiors also has an influence on career advancement. Women are more often supported by colleagues than men, but receive less support from superiors (Bürmann 2014).

Demand-side theories that explain the different promotion opportunities of men and women include, for example, homophily arguments, discrimination theories or occupational segregation. Another possible theoretical explanation is the compensation wage theory, according to which, for example, income is being "exchanged" for family-friendly working conditions. However, recent research does not support this relationship (Pailhé/Solaz 2019, Wuestenenk/Begall 2022). When analysing gender inequality in the corporate context, the focus is on the operational and organisational processes that generate social inequalities between women and men (Ochsenfeld 2012).

For the firms, the expected career decline means a potential loss of (firm-specific) human capital, which can be associated with high costs, especially in the case of highly qualified jobs. According to human capital theory, education and training determine the productivity of an employee and thus his or her value for the firm (Becker 1962, Mincer 1974). Since the risk of turnover and absenteeism is usually higher for female managers than for their male colleagues, even if they have personally decided not to have children, there is still a tendency in many firms to preferentially hire male managers. This traditional disposition is still prevalent, even though women in management positions often have fewer children than their male colleagues and usually return to work very quickly after the birth of a child, often with only slightly reduced working hours (Holst/Friedrich 2016).

Discrimination theories are also used as an explanation. The low number of women in top positions is often attributed to a so-called "glass ceiling" (Morrison et al. 1987). A major reason for such an artificially created barrier is discrimination mechanisms, according to which employers rely on stereotypical assumptions when selecting their managers (Arrow 2015, Phelps 1972). A central stereotype is that women are less productive and have a higher risk of turnover than men because of the double workload they often face. This "statistical disadvantage" also affects those women who are fully available to the labour market because they do not have to take care of children or dependents. A workplace culture characterised by employees who are available indefinitely further reinforces the discriminatory decision of human resources managers (Klenner/Lott 2016). Eagly and Carli (2007), on the other hand, consider the image of a "labyrinth" to be more appropriate than the image of the "glass ceiling", as it better illustrates the complexity and diversity of stumbling blocks women face on their way up (Carli/Eagly 2016). Women face challenges that men do not: „gender stereotypes that depict women as unsuited to management, discrimination in pay and promotion, lack of access to powerful mentors and networks and greater responsibility for childcare and other domestic responsibilities” (Carli/Eagly 2016: 514).

2.2 Part-time management positions

Part-time work is widespread in the German labour market – it now accounts for more than a third of employment in Germany. The observed increase in part-time employment in Germany is mainly due to the increased part-time employment of women: in 2019, three quarters of part-time employees were female (Wanger 2020). However, according to Keller and Kahle (2018), only 40 percent of all part-time working women had children under age 15. With part-time work, disadvantages are accepted, especially when it comes to longer-term phases in the life course ("marginalisation effects") (Hoque/Kirkpatrick 2003). Due to care work, part-time work is the most common form of employment for women almost throughout their entire working lives (Wanger 2020) – child-rearing is often followed by caring for elderly relatives (Ehrlich 2019). Care responsibilities are by no means the only explanation for women working part-time in all phases of life. Rather, structural conditions in the labour market, such as gender segregation and flexibility strategies of companies, also play an important role in part-time employment (Althaber 2018).

But despite the enormous increase in part-time employment in Germany in recent decades, only a small proportion of these part-time employees also work in a managerial position (Kleinert 2011, Kohaut/Möller 2016). About every tenth firm in the private sector has managers who work part-time; larger firms more often allow part-time management and three quarters of the managers who hold part-time management positions are women (Kohaut/Möller 2016). Even within Europe, part-time work is not widespread among managers despite a large variation – in particular, the part-time culture as well as the gender-egalitarian attitude in a country have a positive effect on the realisation of many managers' wishes for shorter working hours (Hipp/Stuth 2013). A number of other reasons for the relatively low prevalence of part-time work in managerial positions are discussed in the literature. Part-time work at management level is associated with higher coordination efforts and additional costs in the work organisation. In addition, work processes often have to be reorganised and information flows and communication within the firm are more difficult. Thus, the lower professional experience of part-time employees results in significant career disadvantages, as productivity is estimated to be lower (Kohn/Breisig 1999).

Furthermore, according to signal theory (Spence 1978), the use of part-time work signals to the firm that part-time employees have an increased family or leisure orientation. Therefore, the use of a part-time model can be interpreted by the firm as a signal of lower professional commitment and a lower level of career orientation. In the perception of managers or colleagues, employees who work flexibly for family and care purposes are not as productive or engaged in the workplace (Chung 2020). This "flexibility stigma" contributes to the fact that working time flexibility is not actively used for fear of such stigmatisation and the associated risk of career penalties in order to avoid falling into this flexibility trap (Williams et al. 2013, Gärtner et al. 2016). In addition to expected career losses, a lack of role models makes it difficult for managers to implement part-time models (Gärtner et al. 2016, Tomlinson/Durbin 2010, Durbin/Tomlinson 2014).

Managers often "buy" part-time work with a career stop, the requirement of constant availability and a massive increase in workload (Kohn/Breisig 1999, Tomlinson/Durbin 2010, Durbin/Tomlinson 2014). In addition, time restrictions also make it difficult to network, which

makes a considerable contribution to career development (Durbin/Tomlinson 2010). Part-time managers are also marginalised in terms of training opportunities and consultation in the workplace, especially women (Hoque/Kirkpatrick 2003). Thus, female part-time managers find themselves "trapped" between the needs of their family and the expectations of their employers (Formánková/Křížková 2015). In addition to the lack of internal development opportunities within the firm, the mobility opportunities of female part-time managers also differ as comparable part-time jobs are often not to be found on the external labour market (Durbin/Tomlinson 2010).

However, the implementation of part-time models even for management positions also offers advantages to firms. Kohn/Breisig (1999) cite a disproportionate willingness to perform, productivity advantages as well as an increase in attractiveness as an employer and thus the retention of highly qualified employees. When firms allow part-time management positions, this increases the presence of women in management positions (Ellguth et al. 2017) and since part-time arrangements at managerial level are rare, employees who take advantage of them feel committed to the organisation (Tomlinson/Durbin 2010). In particular, Ochsenfeld (2012) highlights the importance of the working time mechanism in advancing to management positions. Thus, time availability conflicts are also a result of work organisation, and these lie in the design area of the firms. So far, for example, job sharing models among managers are hardly to be found in German firms, but would be one of the possible levers to attract more women to management positions (Bellmann 2019).

3 Theoretical background: Organisational measures and management positions

The topic of family-friendly organisational policy is being pushed forward primarily due to demographic change and the associated shortage of skilled workers (Ahrens 2017, 2019). This is because a family- and life-phase-conscious human resources policy benefits not only the employees, but also the firm in various areas: increased loyalty, motivation and retention of employees, increased productivity, positive business effects, increased employer attractiveness and shorter vacancies (Kohaut/Möller 2009, Schein/Schneider 2017). Firms that rely on well-educated, highly qualified women and their continued employment are more likely to offer gender equality measures. This is also where the costs arising from the loss of human capital and new hires are highest (Kohaut/Möller 2009). This is confirmed by Gray and Tudball's (2003) study, which found that employers are most likely to offer family-friendly work practices to highly skilled workers or workers in whom they have invested training or other resources. They also showed that not all employees in a firm have equal access to family-friendly policies. Interestingly, there is no correlation between having dependent children and the likelihood of having access to family-friendly working conditions.

Inequalities in occupational status and pay are largely not only due to people's qualifications, but also to firms' personnel policies. Firms recruit employees, match employees with positions and structure professional career paths. In the research literature, three dimensions of the

emergence of social gender inequalities are distinguished as important structural features of firms (Huffman et al. 2017, Krell 2010, Busch-Heizmann et al. 2018). These are (1) the formalisation of employment policies, (2) gender demographics in the firm and in management positions, and (3) companies' policies on gender equality and work-life balance. It is well known that (1) formalisation of employment policy in the form of works councils and gender equality officers increases the likelihood that a firm will offer family-friendly practices which are also associated with the reduction of gender segregation (Jirjahn/Mohrenweiser 2020, Achatz et al. 2010). However, the mere existence of a works council is less important for reducing inequalities than its commitment (Achatz et al. 2010, Carstensen 2020). Moreover, gender-typical wage differentials are reduced in firms with a works council (Achatz 2005, Heinze/Wolf 2010, Busch-Heizmann/Rinke 2018). Studies on (2) gender demographics in firms and in management positions particularly address the question of whether a higher proportion of women in management positions in a firm leads to a lower gender pay gap in these firms and whether women's chances of promotion increase with the proportion of women in management. Empirical results show that an increase in the proportion of women in management significantly reduces the gender pay gap (Huffman et al. 2017, Cohen/Huffman 2007, Hirsch 2013), with the effect being more pronounced for the second management level than for the top management level (Hirsch 2013). This underlines the importance of including women in management positions as a means of reducing gender pay inequality. However, Zimmermann (2021) finds no evidence that female first-level managers reduce the gender pay gap through practices that promote equality.

With regard to the influence of women in management positions on women's opportunities for advancement, no positive "spill-over" effects of the number of female supervisory board members on the number of female board members can be identified (Fleischer 2021). But Kunze/Miller (2017) have shown that a higher proportion of female employees at the next higher rank is associated with a significantly smaller promotion gap. However, a larger number of women at the same rank leads to a lower probability of female promotion. Bossler et al. (2020) demonstrated that hiring female managers leads to the hiring of more female managers in the subsequent period.

There are smaller income differences between men and women in firms with a female quota (Peters et al. 2020). Accordingly, the proportion of women in the firm seems to weaken the social closure processes that make it difficult or impossible for women to access certain positions in the firm hierarchy. Women place a stronger focus on support and encouragement in their leadership style than men (Eagly et al. 2003). For example, a higher number of female leaders can mitigate the problem of underemployment among involuntary part-time workers and contribute to work-life balance for workers with child or elder care responsibilities (Devicienti et al. 2019, Fuwa 2021). First-level women leaders can use their organisational power to implement practices that promote gender equality (Cohen/Huffman, 2007).

Previous research on the (3) effects of organisational measures for equal opportunities and work-life balance focuses in particular on their influence on wage inequality or on career interruptions of women. With regard to earnings structures, these studies show that with bindingly formalised corporate policy practices, the average earnings of women and men increase and the gender pay gap decreases (Anderson/Tomaskovic-Devey 1995, Huffman et al. 2017, Zimmermann 2021).

However, the income disadvantages for women in firms do not vary with the availability of mentoring programmes (Peters et al. 2020). Organisational family-friendly measures can positively accelerate the return of women to the labour market after the birth of a child (Bächmann et al. 2020). In particular, childcare support or the targeted promotion of women have a binding effect and reduce the likelihood of mothers changing firms after family-related career interruptions (Bächmann/Frodermann 2020).

With regard to the different career opportunities of men and women, measures of firms to promote equal opportunities and formalised human resources processes can help to reduce this gap and break through the "glass ceiling" for women or unravel the "labyrinth" of career advancement. Firms can use human resources policies to promote equal opportunities for men and women in the workplace by counteracting stereotypes and the resulting discrimination in hiring, promotion and remuneration (Busch-Heizmann et al. 2018). Such measures aim to prevent decision-makers from acting solely on the basis of preferences and stereotypical assumptions (Reskin et al. 1999) by undermining the phenomenon that homogeneous groups – for example, male managers in larger firms – tend to reproduce (Allbright Stiftung 2017). The results on this are heterogeneous: Open job advertisements are associated with a higher proportion of women in management positions, while recruitment through informal networks increases the proportion of men (Reskin/McBrier 2000). However, female first-level managers do not influence workers by changing organisational practices (Zimmermann 2021).

There are only a few studies in the German context on the influence of organisational measures for gender equality or work-life balance on the career paths of employees (Fehre et al. 2014). With this study, I investigate which specific organisational measures may support women in their careers and help to break down barriers on the way to a management position. In doing so, I go beyond previous findings by using Linked-Employee-Employer data and also specifically considering part-time management positions. In contrast to the advancement of women, which is deliberately intended to promote women's advancement and career opportunities, the work-life balance measures examined are primarily tailored to employees with care obligations in order to enable them to better reconcile work and family life. In particular, they are intended to reduce time conflicts that result in certain phases of life from professional and private double burdens. In this way, they strengthen women's professional activity and can therefore also influence their labour market behaviour with regard to career aspirations.

3.1 Targeted promotion of female employees

Measures for the targeted promotion of women can be implemented in the firm, e.g. through career planning, mentoring programmes and/or the preferential hiring of women. These can be conducive to the spread of women in management positions, as they have a signalling effect that consciously counters existing prejudices against women in management positions. Mentoring programmes support women, especially at the beginning of their careers, in their personal and professional development by promoting exchange of experience and information as well as access to knowledge and networks through an experienced manager.

The existing literature shows that mentoring is important for women at all stages of their careers (Singh et al. 2002, Bohachova et al. 2013), including mid-career women (Durbin/Tomlinson 2014).

Mentoring supports knowledge transfer, organisational learning and interdepartmental communication; it serves as a node in an information network for informal exchange and provides access to internal information, e.g. job advertisements (Singh et al. 2002). This can reduce the isolation of disadvantaged groups in the firm (Kalev et al. 2006; Reskin/McBrier 2000).

However, previous studies have also shown that women benefit only to a small extent from mentoring programmes. Although women consider career networks to be very important for themselves, these network contacts only help a small part in their careers (Habermann-Horstmeier 2007). For example, women have more relationships with people of lower status in their professional networks (McGuire 2000). Targeted interventions to promote women can provide a starting point for building more relationships with higher status individuals, increasing the likelihood of advancement (Day/McDonald 2010). Furthermore, mentors are rarely actively involved in the career development of their mentees (Ibarra et al. 2010). However, when they are supported by their superiors, they are promoted more frequently than men (Bürmann 2014). Kalev et al. (2006) showed that diversity efforts for women's and ethnic minorities' access to management positions in the United States were particularly effective when policies were in place that established managers' responsibility for increasing diversity in the firm. Based on these considerations, in *firms that offer targeted measures to promote women, women's chances of advancement to management positions should increase* (H1a). This should also apply to disadvantaged groups such as part-time employees. Therefore, *mentoring programmes should also promote the transition to part-time management positions* (H1b).

3.2 Family-friendly working time and workplace organisation

Management positions are often associated with long working hours and high demands on availability. These working time arrangements are oriented towards the ideal worker norm, where (mostly male) workers are employed full-time and are available to the firm without time constraints due to family or private commitments. This includes regular overtime, atypical working hours, business trips and relocation (Williams 2000). Managers are seen as role models who have to exercise control and steering functions. Therefore, it can be particularly difficult for women with family responsibilities to take on a management role. Firms can accommodate women at this point by, for example, offering management positions on a part-time basis (Kohaut/Möller 2016) or allowing them to work from home. So far, however, hardly any innovative working time models have been implemented in management (Gärtner et al. 2016).

In addition, the "flexibility stigma" (Williams et al. 2013, Chung 2020) contributes to the fact that working time flexibility is hardly used for family reasons, especially in employee-oriented models. In the perception of both managers and (co)workers, employees "working flexibly for family/care purposes are not as productive or as committed to the workplace, and will effectively not contribute as much towards the firm compared to those who are not working flexibly" (Chung 2020: 526). Fearing such stigmatisation and the associated risk of career penalties, employees with career ambitions may not actively use existing flexible working models to avoid falling into this flexibility trap. Working conditions that are flexible in terms of time and location are seen by female managers as incompatible with their requirements; in part, employers expect that the offer of flexible working hours will not be taken up (Habermann-Horstmeier 2007). I therefore assume that this "flexibility stigma" and the "ideal worker norm" will continue to have

an effect and that *family-friendly working hours and workplace design therefore do not contribute to better career opportunities for women (H2a)*.

However, when moving to a part-time management position, I assume that the mode of action is different. Part-time management is more important for women than for men. Part-time jobs and job sharing at management level can be an instrument for women in particular to take on positions with leadership responsibility. Especially the possibility to work from home allows women to work longer hours as they no longer have to commute (Gärtner et al. 2016). This also allows for more interesting jobs with more development opportunities (Carstensen 2020, Arntz et al. 2019). And for women who have already reached a management position and want to reduce their working hours, the chances of doing so are likely to be greater in firms with family-friendly working conditions. Since important career steps have already been taken, the "flexibility stigma" in the form of career disadvantages is likely to lose its effect. I therefore assume that *in firms with family-friendly working hours and workplaces, it is easier for women to take on management tasks part-time (H2b)*, since the flexibility offers more opportunities to hold a managerial position in the first place.

3.3 Childcare support

Many of the family policy reforms that have been launched in Germany in recent years, such as parental leave or the legal entitlement to childcare, were aimed at promoting the employment of mothers and breaking up the classic "male breadwinner system". The availability of public childcare has a positive effect on labour force participation of mothers (Rainer et al. 2013, Zoch 2020) and the length of working hours of mothers (Büchel/Spieß 2002). Positive societal attitudes towards public childcare for children aged one to two years and towards care in day-care during parental leave, as well as a higher rate of day-care at district level, lead to more mothers going back to work (Diener/Berngruber 2018). Highly qualified women in particular use crèches and all-day care for their children (Kreyenfeld/Krapf 2016); due to their higher income, there are also fewer financial restrictions for them.

The federal funding programme *Betriebliche Kinderbetreuung* (Company Childcare) has created financial incentives for the establishment of childcare facilities in firms, not least due to the legal entitlement to a childcare place for all children from the age of two (BMFSFJ 2020a), which has been in force since 2013. However, firms do not have to create their own offers; the booking of childcare places in existing childcare facilities or the provision of places in holiday care is also eligible for funding. Firms can support parents in childcare with a variety of measures: these range from parent-child rooms, childcare options during holidays, cooperation with daycare centres, company kindergartens to financial support for the costs of childcare.

The support also pays off for firms: mothers who work in firms with childcare support are less likely to change companies after the birth of a child (Bächmann/Frodermann 2020). However, only mothers of young children showed a positive influence on the duration of the career break (Bächmann et al. 2020). Mothers with vocational training benefit more from childcare support, to a lesser extent also highly qualified women (Lauber et al. 2015, Lauber/Storck 2016).

These offers help employees to better reconcile work and family life and to reduce overload and stress situations. This is because the time available for gainful employment is often tight due to

the daily organisation of gainful employment, commuting times and time for childcare. Especially in the case of spontaneous emergencies such as illness of the children, the daily work routine often gets disrupted. In addition, taking on a management position is often associated with longer working hours and overtime (Schmidt 2017), which requires childcare hours outside of the usual times. This may also exceed childcare hours at daycare facilities. In addition to public childcare facilities, women in management positions in particular often rely on a personal network of family members or privately funded childcare facilities to cope with unforeseen situations (Kowalewska 2021). If firms can provide short-term support in challenging situations, this can make it easier for women to opt for a management position. Besides, the existence of childcare support services in firms can also send a positive signal to (still) childless, highly qualified women, making these firms attractive for them as to starting a family later on. Based on these considerations, *women's chances of advancing to a managerial position (H3a) – even part-time (H3b) – are likely to increase if a firm offers childcare support.*

3.4 Support for employees with relatives who require care

The duty of care towards relatives has only recently become the focus of politics. In 2015, for example, regulations were created with the *Pflegezeitgesetz* (Care Act) and *Familienpflegezeitgesetz* (Family Care Leave Act), which, among other things, allow for leaves of absence and reductions in working hours in order to be able to care for close relatives for a limited period of time (BMFSFJ 2020b). Due to demographic change and the aging of society, the number of persons in need of care in Germany is steadily increasing. Their number was estimated at 4.1 million in December 2019 (Destatis 2020), of whom 3.3 million were cared for at home, 70 per cent predominantly by relatives. Thus, periods of raising children are followed by periods of caring for ageing relatives, during which women are the main caregivers and are also increasingly working (Geyer/Schulz 2014). Caregiving mainly affects middle-aged and older adults, and the longer the care lasts and the greater the care required, the more likely they are to drop out of labour force (Geyer 2016). More and more firms have to reckon with employees having to combine care and work.

It is therefore becoming increasingly important for firms to offer support for employees with relatives in need of care, e.g. information services or cooperation with nursing homes and counselling centres. But also offers that overlap with other measures, such as flexible working time and place of work regulations or temporary leaves of absence, help employees with care responsibilities to better reconcile these with their jobs. I therefore expect *that in firms that support employees with dependents in need of care, women will have better chances of getting into management positions (H4a).*

The organisation of care limits the available time resources for the profession. This is because both care and paid work take time and often need to be adapted to changing needs at short notice. As a result, a reduction in professional activity may be required. Accordingly, I suspect *that women in firms that offer support around caring for relatives have a higher chance of moving into a part-time management position (H4b).*

3.5 Membership in a network of family-friendly firms

Also, against the backdrop of demographic change and the associated shortage of skilled workers, awareness of family-oriented personnel policies in firms has increased (Hammermann et al. 2019). Firms may become active in a broad mix of fields of action, e.g. working hours, work organisation, place of work, information and communication, leadership, personnel development, salary components and benefits in kind, as well as services for families. In order to promote exchange between human resources managers and provide new ideas and impetus for family-friendly personnel policies, a number of family-friendly networks and initiatives have emerged since the late 1990s, often in the form of cooperation between state and civil society actors (Ahrens 2017).

A firm's membership in a network of family-friendly firms is a clear, image-enhancing commitment to the promotion of family-friendly measures (Fehre et al. 2014). This is because membership brings the commitment and experiences of these firms more into the public eye and sensitises firms and human resources managers to the necessity and benefits of a better work-life balance and its implementation in everyday company life. However, the decisive factor for true family-friendliness is the design and implementation, because membership alone does not bring benefits for employees. Especially since firms can enter into it solely for the motive of being perceived as a socially exemplary employer without filling it with content. After all, if the reputation as an attractive employer increases, this can be of great importance with regard to increased competition for qualified workers. The proportion of highly qualified skilled workers in a firm is positively related to a family-friendly personnel policy (Konrad/Mangel 2000, Gray/Tudball 2003, Heywood et al. 2007, Bloom et al. 2011, Fakhri 2014).

However, the offers of family-friendly firms often focus solely on parental leave schemes or flexible working time models (Hammermann et al. 2019), while the promotion of employees who want to combine career and family is often not explicitly addressed. Only a few firms already have innovative concepts for reconciling professional management tasks and family duties (Gärtner et al. 2016, Karlshaus/Kaehler 2017). The issue of reconciling professional management tasks and family is presumably of secondary importance for network membership and therefore does not offer any advantages for career-oriented women. Especially since membership in a network can also function as a mere legitimisation façade for a firm. Therefore, I do not expect *membership in a network of family-friendly firms to increase women's chances of obtaining a management position (H5a) – not even for a transition to a part-time management position (H5b).*

4 Data, Variables and Methods

4.1 Data

To investigate the effect of gender equality policies on women's career opportunities, I analyse Linked-Employer-Employee data (LIAB_LM_9319_v1, for detailed information see Ruf et al. 2021a). For the analyses, I use the LIAB longitudinal model (Ruf et al. 2021b), which consists of the IAB Establishment Panel data (Bellmann et al. 2020). These are supplemented by individual data on the employees in these panel establishments. These individual data come from the

Employment Statistics Register of the Federal Employment Agency and are of high quality as process-produced data as part of the employer's notification to social security. Employers are obliged to report information about their employees to social security upon commencement and termination of employment or in the event of relevant changes, and there is an annual reporting obligation for each employee employed on 31 December.

On the employer side, the LIAB data set consists of the IAB Establishment Panel (Bechmann et al. 2021, Bellmann et al. 2020), an annual representative survey of almost 16,000 German establishments in western and eastern Germany that employ at least one employee subject to social security contributions. The IAB Establishment Panel contains questions on various measures to promote equal opportunities for women and men and to reconcile family and work (see also Table 4 in the Appendix). These questions are asked in the Establishment Panel every four years; I use the waves from 2012 to 2016. In addition, I restrict the analysis to establishments with 10 or more employees, since formalised measures are less frequently taken in micro-establishments due to the relatively high costs – informal agreements can be reached more easily here (Kohaut/Möller 2009, Frodermann et al. 2018, Bächmann et al. 2019). The LIAB data set is particularly well suited for my research question, which examines the influence of organisational measures on individual advancement to management positions. This is because the data collected in the IAB Establishment Panel can be linked to the relevant individual data of the employees in the respective establishment via the establishment number. The LIAB consists of extensive information on the surveyed establishments and the employment biographies of the individuals who worked in these establishments between 1993 and 2019. In addition, I enrich the LIAB data with structural information, such as the childcare rate for under-3s or the unemployment rate for women at district level, respectively.

I restrict the sample to women who were employed in one of the surveyed establishments between 2012 and 2016. The large time gap between the questionings on the promotion of equal opportunities is considered in the sample selection as follows: If employers indicate in both waves 2012 and 2016 that they have an agreement or not, the entire period is considered. If the coverage of agreement is different between 2012 and 2016 (a measure exists in one wave but not in the other wave), there is uncertainty about the exact timing of implementation or elimination within these four years. To address these data deficiencies, only changes to a managerial position during the survey years are considered for these cases, and the years between measurements are ignored. This procedure is based on Bächmann et al. (2020).

The sample includes employees who are subject to social security contributions (without special characteristics) and marginally employed persons of working age between 18 and 64 years. The data of the Employment Statistics Register of the Federal Employment Agency do not include self-employed managing directors or firm managers, senior civil servants or family workers with supervisory or managerial functions, as they are not subject to the obligation to register for social security. For the matching and preparation of the LIAB data, the references of Dauth and Eppelsheimer (2020), Müller et al. (2022), Müller and Strauch (2017) and Collischon (2021b) were used. All employees in the establishments surveyed in the IAB Establishment Panel who changed to a managerial position between 2012 and 2016 are included in the analysis.

Gray and Tudball (2003) found no correlation between having dependent children and the probability of having access to family-friendly measures. Thus, firms that offer such measures

may appear attractive to women as employers even before they become mothers, as they hope to receive support and benefits if they start a family at a later stage. For these reasons, I do not limit the analysis to mothers (what could be considered, for example, in the context of childcare support), but examine the effects of the measures for all women. However, to take into account that the situation may be different in the case of motherhood, I have additionally included interaction terms for mothers with children under the age of 16 and the organisational measures in the models.

4.2 Dependent Variables

Since I am examining the change to a management position or a part-time management position as dependent variables, the variable "management position" and the variable "part-time" must be defined. The delimitation and definition of management positions is possible on the basis of different concepts (Körner/Günther 2011, Holst et al. 2015). For the analysis in the LIAB, the occupational classification 2010 (KldB2010, cf. Bundesagentur für Arbeit 2010) can be used to identify whether persons hold a management position or not. Occupations with supervisory or managerial responsibilities are each grouped in their own occupational subgroup within the respective occupational group. These special occupational subgroups are coded with a "9" in the fourth digit in the KldB2010 system (Bundesagentur für Arbeit 2019). In addition to these occupations, I also include – following the procedure of the Federal Employment Agency – expert occupations as managers (Bundesagentur für Arbeit 2019).²

Due to the application of KldB2010 for the identification of managerial positions, a restriction to the data from 2012 onwards also makes sense for another reason: employment notifications with an end date before 30 November 2011 are reported with an old occupation code. Since the new occupation code KldB2010 is much more detailed than the old one, breaks in the reports are to be expected at this point (Schmidtlein et al. 2019). This would lead to an increase in changes in managerial positions due solely to the change in occupational code.

However, Collischon (2021b) points out that the use of KldB2010 to identify managerial roles underestimates their actual share, as the definition of managers or employees in managerial positions according to this classification is much stricter than e. g. survey data suggest. There may be several reasons for this: In practice, employers have no incentive to update the information in the notifications if a promotion occurs. This means, for example, that if an employee initially starts working in a firm without management duties and is promoted to a managerial position, it could be the case that the employee simply keeps the original KldB2010 information in the administrative data and the employer would only update the salary and contract duration information. Therefore, this person would be wrongly identified as a non-manager. Furthermore, not all employees with managerial responsibilities are necessarily classified as managers via a "9" in the KldB2010 codes, as the classification does not allow for this (as some occupations do not include this category), as Paulus and Matthes (2013) also note.

² These are the following occupational categories of the KldB2010: 52314 Pilots of planes and airliners, 52414 Deck officers/mates and ship's captains or skippers, 53244 Police officers in penal institutions, 71104 Managing directors and executive board members, 71214 Legislators, 71224 Senior officials of special interest organisations, 94134 Conductors, 94414 Occupations in managing theatre, film and television productions, 01104 Commissioned officers (Bundesagentur für Arbeit 2010).

This point of criticism is considered in the estimates by using variables for management positions according to the identification strategy proposed by Collischon (2021b) in addition to the pure KldB management variables. Collischon (2021b) uses additional survey information from the Panel Study Labour Market and Social Security (PASS) (Trappmann et al. 2019) to predict the probability of a managerial position in administrative data. The application of this procedure includes a broader definition of supervisory or managerial positions that arguably matches better with survey data and identifies more individuals as managers than based only on the KldB2010 codes. Collischon (2021b) considers this procedure of enriching information in administrative data to be more appropriate for collecting information on the proportion of individuals in management roles than using administrative data alone.

In the following models I use the KldB2010 information enriched with the PASS data, namely the variant in which the model, including the 3-digit KldB, predicts a more than 70 per cent chance of being a manager (hereinafter also referred to as the "PASS" model). Further details on the identification of the key variables for management according to Collischon (2021b) can be found in Table 5 in the Appendix. Whether and how the results on organisational measures may differ due to different identification of management positions is addressed in the robustness analyses (see Section 5.3).

In addition to the information on the occupation code, the Employment Statistics Register also contains information on “working time”, which is distinguished between full-time and part-time employees, but does not provide any information on working hours. The decisive factor here is the relationship between the individually agreed working hours and the working hours normally worked in the firm. Employees are considered part-time employees if their working hours are less than the collectively agreed or normal working hours of the firm. In the case of the part-time variable, there is also the possibility that employers do not update the information in the administrative data when working hours are reduced. For example, during the modernisation of the notification procedure to social security in 2011, it became apparent that employers had not always recorded and reported the change of an employee from full-time to part-time in a timely manner (Fitzenberger/Seidlitz 2020). Frodermann et al. (2013) suggest to correct employment post motherhood, which is recorded as full-time, to part-time if the daily wage was at least 10 per cent lower than in the last employment spell before motherhood recorded as full-time by the same employer. In addition, I correct a full-time job to a part-time job if the daily wage has decreased by more than 40 per cent compared to the median full-time daily wage with the same employer (this is the ratio of the average part-time daily wage to the full-time daily wage).

The dependent variable "managerial position" takes the value 1 if a managerial position as defined above is held and indicates promotions during the career. The dependent variable “part-time manager” is a combination of the variables manager and part-time and takes the value 1 if both conditions are met. In addition to promotion from regular employment, this position can also be achieved by reducing working hours in a managerial position already attained. Due to the small number of cases, a separate consideration of promotion versus reduction is not appropriate.

4.3 Independent Variables

The key independent variables in the analyses were formed from the various dummy variables (yes/no) of the organisational measures for gender equality and work-life balance. I use five practices: (1) the targeted promotion of women in the firm, (2) particular consideration of the needs of employees with care responsibilities when organising working hours, (3) childcare support and (4) support for employees with relatives in need of care; and (5) membership in a network of family-friendly firms. Descriptions of the questions on organisational measures in the IAB Establishment Panel can be found in the Appendix (see Table 4).

Table 1 shows the prevalence of these measures in 2012 and 2016. The targeted promotion of women in German firms remains a marginal phenomenon and even declined during the reporting period. Considering the needs of employees with care responsibilities in the organisation of working hours and workplace is only formalised in a few German firms. In contrast, childcare support is more widespread in German firms. The most widespread measures are for employees with dependents in need of care. This is especially true for firms with 10 or more employees. In addition, more and more firms are members of a family-friendly network. Overall, organisational measures, with the exception of the promotion of women, have gained in importance in firms between 2012 and 2016.

Table 1: Prevalence of organisational equal opportunity policies, 2012 and 2016

Shares in per cent

	All Establishments		Establishments with 10 or more employees	
	2012	2016	2012	2016
Gender equality				
Targeted promotion of female employees	2.5	2.2	5.8	5.2
Work-life-balance				
Family-friendly working time and workplace organisation	1.1	1.5	3.5	3.9
Childcare support	6.3	7.9	12.6	17.0
Support for employees with relatives in need of care	23.9	29.2	42.6	50.7
Membership in a network of family-friendly firms	4.1	5.8	8.9	12.7
Number of firms	15,556	15,341	8,910	8,604

Source: Own calculations using IAB Establishment Panel IAB BP 9319 v1, establishments with valid information, weighted.

4.4 Control Variables

A number of other control variables are included in the analyses, which correspond to the current state of research (Bächmann/Frodermann 2020, Zimmermann 2021, Bächmann et al. 2020, Huffman et al. 2017).

In order to control differences in women's previous career steps and possible differences in commitment and attachment to the employer, I consider employment histories using the following variables: tenure in months and experience in the establishment in years. Empirical studies show that prospects for managerial roles increase with the level of educational resources

and work experience (Granato 2017). Tenure also enters the model in quadratic form, as the chance of a managerial position should decrease again with increasing work experience. In addition, I include daily gross income as a relevant aspect. Daily wages can only be observed up to the amount of the pension insurance contribution assessment limit valid in the respective year of observation. Above this limit, income is reported at the level of the contribution assessment limit, which is why this variable is right-censored. And as employment progresses, the share of right-censored daily earnings increases significantly due to dynamic development: the salary increases associated with promotion lead to a growing share of managers being above the contribution assessment ceiling. This problem is countered by wage imputation in the preparation of the data. For this purpose, the method explained in Dauth and Eppelsheimer (2020) is used, which is based on previous procedures (Dustmann et al. 2009, Card et al. 2013, Gartner 2005).

At the company level, I control for firm size (less than 200 employees, 200 to 1000 employees and 1000 and more employees) and the proportion of part-time employees, women and skilled employees in the firm. I also include the share of women at the first management level, the existence of a second management level and – if available – the share of women at the second management level of the firm to examine the extent to which different power structures of women in the workplace explain some of the limited access of women to management positions. In addition, I include the existence of a works council or staff council as a dummy variable, as this is a firm institution that can influence working conditions in many ways and is an essential part of the corporate culture (Ellguth et al. 2017). I also consider whether the firm is covered by collective agreements (industry-level collective agreement, firm-level collective agreement or individual agreements) and its industry affiliation.³

Finally, the structural context is considered by controlling for the childcare rate for children under 3 and the regional unemployment rate for women at district level based on the women's place of residence. With these variables, temporary regional fluctuations in the labour market and thus different macroeconomic opportunities for women can be taken into account.

Information on births is not directly available in the administrative data of the Federal Employment Agency. However, other information indirectly helps to identify births. For example, a notification reason is given in the employment notification, which is used to calculate a woman's expected date of childbirth. This date can be calculated on the basis of the reasons for termination or interruption of employment given in the employment notification. This procedure is explained in Müller et al. (2022). A dummy variable for children under the age of 16 is derived from the birth dates of the children generated in this way. In addition, a distinction is made according to the age of the youngest child (up to two years, three to five years, six to ten years, over ten years). It should be noted, however, that this delimitation of births cannot be complete, since a woman must have entered the labour market before the first childbirth in order to identify a birth (Müller et al. 2022).

³ Classification of sectors according to NACE Rev. 2 / classifications of economic activities, 2008 edition (European Commission 2008): 1 Agriculture, manufacturing, construction (Sections A to F); 2 Trade, accommodation and other private services (Sections G, I, R to T); 3 Transportation and Business Services (Sections H, J to N); 4 Public administration, defence, education (Sections O, P and U); 5 Human health and social work activities (Section Q).

In the robustness analyses (see Section 5.3 and Appendix) I also include the following variables with little or no variability for the alternative hybrid estimator. On the individual side, I control for the highest educational attainment (no vocational training, vocational training and university degree), for women's nationality with a dummy variable for German nationality and for women's age (up to 35 years, 36 to 50 years, 51 years and older). In addition, I model the place of residence separately for West and East Germany to account for the different cultural expectations of women's roles due to their different histories. Table 8 in the Appendix shows the descriptive statistics for all variables.

4.5 Methods

Linking the data from 2012 to 2016 opens up the possibility of a longitudinal analysis. Since the dependent variables are coded as binary variables, logistic panel regression models based on the individual data can be used to estimate the effect of organisational measures on attaining a managerial position (Wooldridge 2010, Torres-Reyna 2007, Allison 2009). Thus, fixed effects estimates are also available for non-linear models: for binary dependent variables, a consistent fixed effects estimate can be made using the conditional maximum likelihood method (Chamberlain 1980). For my study, I estimate fixed effects⁴ and control for unobserved heterogeneity at the person level. The main advantage of estimating fixed effects is that causal effects can be identified from the observations. Since the fixed effects estimator eliminates all group-specific constants from the estimation equation, a correct calculation of the fixed effects and thus also of the marginal effects is not possible with logistic panel models (King 2001). Instead, the coefficient estimates should be used for analysis and interpretation (Crisman-Cox 2021).

Because of this drawback, some researchers prefer pooled logit models that can be used to estimate marginal effects. However, Crisman-Cox (2021: 532) assesses „this trend is alarming, as it frequently leads scholars to embrace less robust estimators that may not fully account for the unobserved heterogeneity common to panel data, in order to produce substantive results of interest“. This is because fixed effects estimators compare the same person over time and therefore rely solely on intra-individual changes. In this way, stable characteristics or traits that do not change over time – these may be measured or unobserved – can be controlled for, even if they are not included in the model. This applies, for example, to characteristics such as personality, intelligence or ambition. Consequently, the estimated coefficients cannot be biased by omitted time-invariant differences, as fixed effects models can deal with unobserved heterogeneity. The fixed effects estimate is based only on those individuals for whom a change in status was observed. All individuals who held a leading position in either none (“all zeros”) or in every observed spell (“all ones”) are excluded from the estimation. It is therefore important that there are enough observations in which a change in status can be demonstrated at the individual level and in organisational measures. This is the case, otherwise regression with fixed effects would be problematic (Allison 2009). Variables with little or no variation are therefore not included in the fixed effects model, such as education or nationality.

⁴ In the models, the F-test (with probability > F = 0.000) rejects the null hypothesis of zero individual-specific unobserved heterogeneity. This indicates that fixed effects is the preferred specification over random effects.

Note that for logistic and other nonlinear regression models, the coefficients should not be compared between different models. If additional independent variables are added to a logistic regression model, the effects of the variables already included in the model change – even if the additional independent variables are uncorrelated with the previous ones (Mood 2010). In the robustness analyses (see Section 5.3 and Appendix) I check the results of the fixed effects models with another estimation model for non-linear regression models, the hybrid model, with regard to the agreement of the sign and the statistical significance of the estimated coefficients.

5 Results

5.1 Descriptive Results

Table 2 shows evaluations from the Employment Statistics Register of the Federal Employment Agency and from the LIAB sample to get a first impression of how leading positions in Germany are distributed by gender and part-time work. The Employment Statistics Register is the basic population from which the employment biographies of the person data in LIAB can be generated. Since civil servants, the self-employed and family workers are not included in the data, the Employment Statistics Register represent around 80 per cent of the employed population in Germany.

Table 2: Employment, part-time and managerial positions, as of 31 December 2016

Absolute figures and percentages

	Employment Statistics Register		LIAB Establishments with 10 or more employees	
	Women	Men	Women	Men
Total employment (employees subject to social security contributions and marginal employees)	18,979,764	19,846,894	223,733	364,234
Thereof part-time	11,190,100	4,706,951	105,475	27,654
Management positions	511,311	1,389,258	13,826	87,580
Part-time management positions	147,064	120,821	2,606	1,657
Part-time quota	59.0	23.7	47.1	7.6
Percentage of management positions at total employment	2.7	7.0	6.2	24.0
Percentage of part-time management positions at part-time employment at total employment	1.3	2.6	2.5	6.0
Part-time quota for management positions	28.8	8.7	18.8	1.9
Share of women in total employment	48.9		38.1	
Share of women in management positions	26.9		13.6	
Share of women in part-time management positions	54.9		61.1	
Gender Leadership Gap	22.0		24.4	

Source: Own calculations using Employment Statistics Register of the Federal Employment Agency and LIAB_LM_9319_v1, employees with valid information.

According to Employment Statistics Register, about 3 per cent of female and 7 per cent of male employees were in managerial positions on 31 December 2016. The share of part-time managerial positions is significantly lower for men (9 %) than for women (29 %). Overall, the share of women in all managerial positions was 27 per cent, and the share of women in all part-time managerial positions was 55 per cent. In the LIAB sub-sample in firms with 10 or more employees, on which my analysis is based, the share of women in managerial positions was significantly lower (14 %) than in the employment statistics (27 %). This is due to the fact that small firms employ far more women, including in managerial positions, than larger firms, and the proportion of women decreases when small firms are excluded.

In addition, we can use the LIAB to distinguish how a management position was achieved. Table 3 shows the different career paths of women and men in firms with 10 or more employees. For men, (full-time) management positions are obtained almost exclusively through promotion from full-time employment (92 %). Although such a classic promotion also is predominant among women in about three out of four cases, the change to a part-time management position plays a significantly greater role than among men. If one differentiates how a part-time management position was achieved, the reduction in working hours in an already achieved management position accounts for the largest share for women and men. Only 20 per cent of women's promotions are involve mothers with children under 16. About half of them worked

part-time before the promotion. When moving to a part-time management position, the share of mothers is 50 per cent.

Table 3: Promotions to management positions and transitions to part-time management positions by gender and different management variables, 2012 to 2016

Shares in per cent

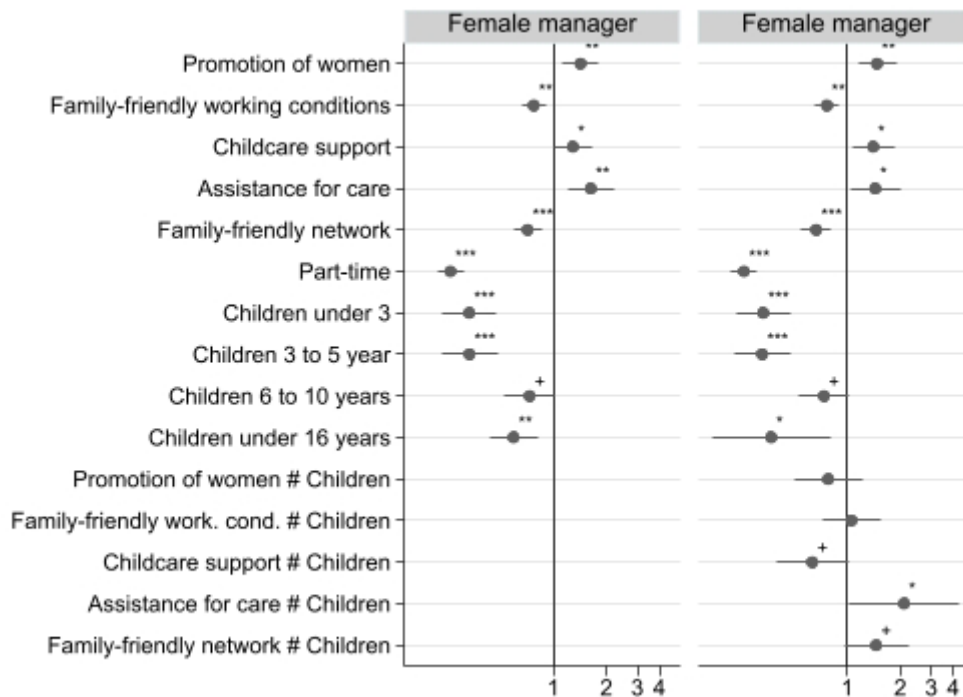
	Men	Women	Among them: Mothers	Mothers as a percentage of all women
Promotions to management positions				
Number of promotions	N = 38,822	N = 7,146	N = 1,394	19.5
Full-time => Part-time management position	0.3	1.5	3.1	40.2
Full-time => Full-time management position	91.9	77.1	44.5	11.3
Part-time => Part-time management position	2.1	12.9	32.4	48.9
Part-time => Full-time management position	5.7	8.5	20.0	46.2
	100	100	100	
Transitions to part-time management positions				
Number of transitions	N = 3,315	N = 2,720	N = 1,360	50.0
Working time reduction in management Full-time => Part-time	72.6	62.1	63.6	51.2
Promotion: Part-time => Part-time management position	24.2	34.0	33.2	48.9
Promotion: Full-time => Part-time management position	3.2	3.9	3.2	40.2
	100	100	100	

Source: Own calculations using LIAB_LM_9319_v1, employees in firms with 10 and more employees with valid information.

5.2 Multivariate Results

The hypotheses presented in Section 3 (H1 to H5) are examined below, considering the control variables, and using the logistic panel regressions described above. The figures show the odds ratios of the different model estimates. These indicate the strength of a relationship between two characteristics: how high is the chance of promotion if one is employed in a firm with organisational measures relative to the chance of not being employed in such a firm. Figure 1 and Figure 2 graphically depict the effects of relevance: positive coefficients indicate an increased chance of being in a managerial position; negative effects indicate that the chances of promotion are lower for this group. It must be emphasised again that in logistic panel regressions, coefficients should not be compared across different models (Mood 2010) and that the representation of marginal effects in logistic fixed effects models is not possible (King 2001). The detailed regression results of the models can be found in Table 9 in the Appendix.

Figure 1: Fixed effects estimates (odds ratios): women's chances of advancing to management positions and interactions between organisational measures and mothers with children under the age of 16



+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Note: Results of logistic fixed effects regression models, these also control for part-time employment, age of youngest child, tenure (in months), tenure (squared), experience in establishment (in years), daily gross wage (imputed), share of female first-level managers, existence of second management level, share of female second-level managers, existence of a work council, share of part-time work, women and qualified workers in the establishment, firm size, collective bargaining coverage, branch of industry, childcare rate and female unemployment rate at district level

Source: Own calculations using LIAB_LM_9319_v1 („Female manager“: 17,936 observations of 5,682 women).

First, the probability of promotion for women is estimated depending on the organisational measures for equal opportunities and work-life balance (Figure 1). Only a relatively small share of women's advancement is accounted for by mothers with children under 16 (see Table 3). To find out whether the measures have a differential impact on the upward mobility of women with children, I include additional interaction terms in the model. These results can also be seen in Figure 1.

The results confirm Hypothesis H1a: women in firms with targeted promotion of women have higher chances of obtaining a management position than in firms without. The effect is statistically significant⁵ (p < 0.01). A p-value above the significance level of 0.01 means that the null hypothesis that the organisational measures have no influence on the probability of

⁵ In science, increasing attention is being drawn to the misinterpretation of the p-value in many publications (Hirschauer et al. 2016, 2017, Wasserstein/Lazar 2016, Ioannidis 2019). A significant result is often erroneously attributed the adjective "stronger" or "more" than a non-significant result. If a variable X has a statistically significant influence (effect) on a variable Y, it does not mean that it is a large or important one. Rather, it means that there is a small probability that the observed result would appear to be a random result if there were no effect. "Significant" means that there is a low probability of finding the effect in the data if it is not present at all (Hirschauer et al. 2016).

promotion cannot be rejected with the usually required significance level 0.01 at the most. Even if the data do not provide information on the exact design of the career or mentoring programmes studied here, their existence noticeably promotes women's chances of advancement according to the results. This is consistent with previous literature pointing in this direction (Singh et al. 2002, Bohachova et al. 2013).

Hypothesis H2a is also verified by the results: family-friendly working conditions have a negative effect on women's promotion probability (at a statistically significant level, $p < 0.01$). Women in firms with flexible, family-friendly working conditions thus even have a lower chance of promotion to management positions than in firms without. Family-friendly working conditions, i.e. considering the needs of employees with care responsibilities when organising working hours, whether through flexible working hours, working time accounts, working from home or family-friendly part-time models, do not initially prove to be beneficial for women's careers. While they may improve the work-life balance, they cannot prevent role conflicts in more highly qualified professions. The "ideal worker norm" (Williams 2000) still prevails in firms and women are also subject to the "flexibility stigma", i.e. they have career disadvantages in the form of lower promotion prospects if they use flexibility.

With regard to Hypothesis H3a, I assumed that childcare support would increase women's chances of advancement. Indeed, my results show that this organisational measure has a positive effect. Women are more likely to move into a management position if this measure is offered in a firm. Thus, H3a can be confirmed; however, only at a $p < 0.05$. Uncertainties in the estimation results could also be attributed to the data. For example, no statements can be made about the exact structure of the respective firm support for childcare, i.e. whether purely financial support or own childcare facilities are provided.

In accordance with Hypothesis H4a, the results show that women have better promotion prospects in firms that have introduced measures for employees with dependents in need of care. If a firm offers such support for employees, women have a higher chance of advancing to a managerial position, at a statistically significant level ($p < 0.01$).

For the organisational measure of membership in a family-friendly network, it was assumed that this had a negative effect on women's chances of advancement. Hypothesis H5a is confirmed, the membership has a negative and statistically significant effect ($p < 0.001$) on the probability of advancing into a management position. Thus, membership says little about what measures membership entails and how these are specifically designed, i.e. whether the firm also fills it with content. A membership can just as well only serve as a façade of legitimacy and thus even lead to lower chances of women moving into a management position.

It should also be emphasised that the results regarding women working part-time confirm previous studies (Deschacht 2017, Holst/Friedrich 2016, Holst/Marquard 2018). Women who work part-time have significantly lower chances of advancement to a management position. Furthermore, it is also clearly evident, that the chances of promotion decrease with motherhood, as indicated by the "child"-variables. As shown in previous studies (Ochsenfeld 2012, Deschacht 2017), having children reduces women's chances of advancement. And the chances of promotion vary with the age of the youngest child: mothers with children under the age of 6 have the lowest chances of promotion.

Since many of the organisational measures considered explicitly target the work-life balance of women, I also investigate whether the results on promotion opportunities change when I take into account that women become mothers. The interaction effects indicate whether the effect of motherhood on promotion depends on the organisational measures of the firm. Compared to the models without interaction effects (Figure 1), there are hardly any deviations in the main effects, and their direction, strength and statistical significance are robust. For the child variable, the standard errors become larger due to the smaller number of cases and thus the statistical significance decreases. Uncertainties in the estimation results could also be attributed to the data. For example, the identification of births in the LIAB is possibly under-reported (Müller et al. 2022).

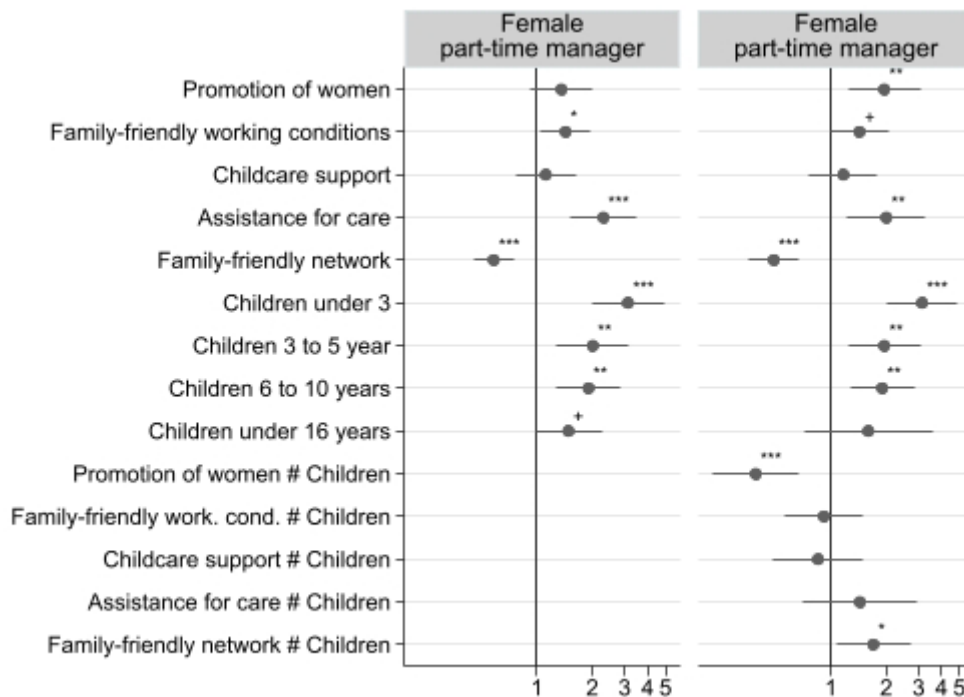
The chances of advancement for women with children do not vary depending on the organisational measures of promotion of women and family-friendly working conditions. The interaction effects are statistically insignificant. The correlation between these organisational measures and the chances of promotion is therefore independent of motherhood.

For childcare support the estimates show a negative correlation, but only statistically significant at the 0.1 confidence level. Due to the limited number of cases, the confidence intervals are wide and varying the age limit of the youngest child in the interaction terms (e.g. under 2 years, under 6 years or under 10 years) does not show significantly different effects for mothers with children of this age.

For the measures assistance for employees with dependents in need of care and membership in a family-friendly network, however, positive interaction effects on promotion prospects can be identified for women with children. Both are statistically significant at the 0.05 and 0.1 confidence level, respectively.

In a next step, I examine whether organisational measures influence women's chances of achieving management positions on a part-time basis. As already highlighted, this can be a promotion, but also a reduction in working hours on an already achieved leadership position. Figure 2 shows the corresponding effects. Again, I include additional interaction terms between organisational measures and the child variable in order to investigate whether and how women's chances of attaining a part-time leadership position change if the relationship between motherhood and organisational measures is considered.

Figure 2: Fixed effects estimates (odds ratios): women's chances of moving into part-time management positions and interaction between organisational measures and mothers with children under the age of 16



+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Note: Results of logistic fixed effects regression models, these also control for part-time employment, age of youngest child, tenure (in months), tenure (squared), experience in establishment (in years), daily gross wage (imputed), share of female first-level managers, existence of second management level, share of female second-level managers, existence of a work council, share of part-time work, women and qualified workers in the establishment, firm size, collective bargaining coverage, branch of industry, childcare rate and female unemployment rate at district level

Source: Own calculations using LIAB_LM_9319_v1 („Female part-time manager“: 5,631 observations of 1,816 women).

According to Hypothesis H1b, it can be seen that the targeted promotion of women also increases the chance of part-time management. However, the p-value is above the significance level of 0.05, i.e. the null hypothesis that the measure has no effect on the probability of promotion to a part-time management position cannot be rejected with the usually required significance level of maximum 0.05.

Also, in line with H2b, family-friendly working conditions increase women's chances of advancing to part-time management positions ($p < 0.05$). Family-friendly working conditions are often limited to part-time work (Hammermann et al. 2019), but other flexible and innovative forms of work such as working from home or job sharing could also be offered in these firms. These make it easier to hold management positions also on a part-time basis.

For the childcare support measure, I find - contrary to my expectations (H3b) - no effect that women who move to a firm that offers childcare support have higher chances of changing to a part-time managerial position. Existing barriers in the area of childcare may already have been overcome by shorter working hours, so that this measure does not further increase the woman's opportunities.

Hypothesis H4b is also confirmed by the results: If a firm offers support for employees with dependents in need of care, women have a significantly higher chance of moving to a part-time managerial position, at a statistically significant level ($p < 0.001$). Employees who care for relatives face great challenges in organising their daily lives. If women work in firms that offer support in this regard, their chances of getting a part-time management position increase. This also reflects the fact that, according to the *Care Leave Act*, full or partial leave from work must be made possible by the company under certain conditions.

As indicated in Hypothesis H5b, belonging to a network of family-friendly firms does not increase women's chances of part-time management positions. Rather, the results show that women in these firms have a lower probability of attaining a part-time management position, and this at a statistically significant level ($p < 0.001$). Even if women in these firms receive better offers to reconcile family and work, e.g. through part-time work (Ahrens 2019), the focus of these networks is usually not on career advancement.

Another result worth mentioning is that as the proportion of part-time workers in the company increases, so does the chance for women to get a part-time management position (see Table 9 in the Appendix). Motherhood has a positive influence on transitions to a part-time management position. The lower the age of the youngest child, the higher the chance of a part-time managerial position. I also add interaction terms between the organisational measures and motherhood to identify divergent effects: Among the main effects, the one that changes in particular is the effect for women's advancement, which now has a positive effect on the change to a part-time management position with a statistically significant level of $p < 0.01$. The positive child effect, on the other hand, loses significance and slips above the 0.1 limit of the confidence interval. Two statistically relevant differences can be found in the interaction effects. On the one hand, the chance of a part-time management position is significantly reduced for mothers in firms that promote women ($p < 0.01$). On the other hand, "belonging to a family-friendly network" increases the chance of a part-time management position in the case of motherhood. For the other measures, the interaction terms show no correlation; the effect of organisational measures on the chances of promotion seems to be independent of motherhood.

However, it must also be mentioned that the interaction results regarding organisational measures and motherhood are still based on relatively few cases. As the number of cases increases, the results of the estimates should become more precise and reliable.

5.3 Robustness Analyses

The results presented show that firms can use targeted measures to promote and support women's opportunities for advancement or a move to part-time management positions. I conducted a series of sensitivity analyses to test the models for the robustness of their results, in particular for directional stability, strength and statistical significance in the presence of changes in model specifications or estimation methods.

In order to first examine the extent to which men and women benefit differently from the organisational measures, a fixed effects model was estimated for all employees and additionally extended by an interaction effect "gender" (Figure 3 in the Appendix). The interaction variable indicates whether and how the relationship between promotion to a managerial position and the

different organisational measures varies, when gender is taken into account. Although effects of time-constant variables cannot be estimated in fixed effects models, interaction effects between time-varying and time-constant variables can be modelled (Allison 2009). Surprisingly, women do not benefit more than men when women's advancement is introduced in the firm or when they move to a firm with such measures. Companies can also subsume trainee and career programmes for junior staff under the promotion of women, from which both genders benefit. Regardless of gender, the negative effect of the family-friendly working conditions measure illustrates the effect of flexibility stigma on career opportunities. However, there is a positive interaction effect for women, which means that the flexibility stigma has a significantly smaller effect on women than on men.

Childcare support measures increase the chances of promotion, but I cannot detect any gender-specific effect. In contrast, measures such as assistance for employees with dependents in need of care or membership in a family-friendly network have only gender-specific differences in the effects with regard to advancement opportunities. Assistance with care increases the chances of promotion only for women more and in the case of membership in a family-friendly network the result indicates only for women negative opportunities compared to men. When the results are considered with regard to a change to a part-time management position, the measures family-friendly working conditions, assistance for care and network membership show higher effects for women compared to men. The other measures do not show different opportunities for women compared to men when they take a part-time leadership position. It is worth mentioning that the child variables cannot be controlled for in this model. While information on children and births in the Employment Statistics Register can be derived from different reporting reasons and interruption periods for women according to the approach developed by Müller et al. (2022), there is no corresponding option for men.

In a next step, I examine whether the effects found also hold up against alternative models. For this purpose, on the one hand, further management variables are tested and, on the other hand, further estimation procedures are modelled. In addition to the PASS variable used in the models, Collischon (2021b) suggests further variants for identifying management variables (see also Table 5 in the Appendix). These management variables were also tested for their sensitivity to organisational measures as well as the pure KldB-variable. Table 6 and Table 7 in the Appendix compare the results of these different management variables. Overall, the direction of the effect of organisational measures on management status remains stable regardless of the variable used – with differences in significance levels.

To check whether the results are also valid with alternative estimators, I have also modelled all logistic panel models as hybrid models (Allison 2009, Krishnakumar 2006, Mundlak 1978, Wooldridge 2010, Schunck/Perales 2017). Hybrid models allow the analysis of group differences (e.g. of individuals in firms with and without equality measures), but also of status transitions of individuals (change to a firm with equality measures). Thus, the advantages of fixed effects can be combined with those of random effects regression models, whereby the estimators are based on a logistic random effects regression model in which a within-between decomposition of the effect estimators is carried out (Schunck 2013, Giesselmann/Windzio 2012).

Even variables that change little or not at all over time can be included in these models. A limitation of nonlinear hybrid models is that the estimates of the within-effects are not identical

to those of standard fixed effects models – as used in Section 5.2 –, which can lead to biases (Brumback et al. 2010). Schunck and Perales (2017) therefore recommend comparing the estimated within-cluster effects from hybrid models and standard fixed effects models. The inclusion of non-linear dependencies in the hybrid model can provide information on whether the assumption of correlated random effects is violated (Allison 2014, Schunck/Perales 2017). To reduce possible bias, I therefore included non-linear functions in the hybrid model and I restricted the sample to women who held a management position or moved into a management position during the observation period. The results of the between estimators confirm that the assumption of correlated random effects is violated in the hybrid model. Moreover, the included cubic dependencies show significant results, and that these estimates are preferred in the Hausman test to those without this modelling. However, as the results of the hybrid models in the Appendix (see Figure 4) show, these are similar to the standard fixed effects models and the direction of effect is largely consistent, the significance levels are partly different.

6 Conclusions

Women continue to be significantly underrepresented in management positions. Whether specific equal opportunity measures in firms can increase women's chances of advancing to management positions has not yet been investigated in the current German context. I have filled the existing research gap by using Linked-Employer-Employee data and logistic panel regression models to include various organisational equal opportunity and work-life-balance practices as key explanatory variables for advancement to management positions as well as for moving into management positions with reduced working hours.

Specifically, I have examined the targeted advancement of women, family-friendly working hours and workplace design, support for childcare or for employees with dependents in need of care, and membership in a network of family-friendly firms. I have investigated the question of whether women who work in organisations that introduce these measures or move to firms where these measures already exist have better career opportunities. In addition to the organisational measures, the estimation models also consider various personal, occupational and firm characteristics, which are intended to cover the explanatory approaches for a transition to a management position.

As the empirical analyses show, equal opportunities measures do have the potential to exert a concrete influence on women's chances of advancement. In particular, the targeted promotion of women through mentoring programmes shows positive effects on women's chances of advancement - in the case of part-time managerial positions, however, only for women without children.

Though, the results also confirm that measures that consider care obligations in terms of working hours have so far not given women any advantages on their way to a management position; on the contrary, they even reduce the chance of a management position. The "ideal worker norm" (Williams 2000) is still widespread and women are also subject to a flexibility stigma (Williams et al. 2013, Chung 2020), which means that deviations from the full-time norm

still entail career disadvantages. The situation is different when the transition to a part-time management position is examined. Here, the family-friendly working hours have a positive effect on the change to a part-time management position – the chances for women to get a management position increase. Reasons for this may be that, on the one hand, such a change may involve a reduction in working hours on top of a management position already attained, and the "flexibility stigma" in the form of career disadvantages loses its effect. On the other hand, innovative working models – especially the option to work from home – offer women the opportunity to work more hours or to hold management positions. (Gärtner et al. 2016).

For the measure childcare support, the results depend on whether it is a promotion to a managerial position or a change to a part-time managerial position. Depending on this, the measure is reflected in higher chances of promotion versus virtually no different chances in a part-time management position. Women seem to be more willing to take on a management position if the firm supports them with daily work organization and childcare. However, motherhood reduces this effect. In the case of a part-time management position, existing barriers in the area of childcare may already have been overcome by shorter working hours, so that this measure does not further increase the woman's opportunities. Organisational support for employed women with relatives who are in need of care increases also women's career opportunities – even somewhat more pronounced in the case of motherhood. The chance of moving into a part-time management position is higher for women in firms with such measures. Women in older age groups in particular are more frequently confronted with the task of caring for close relatives. Since these age groups have often already reached a management position, organisational offers in this area – such as temporary part-time work – increase the chances of obtaining a part-time management position.

I could not detect any advantages of the employer's membership in a network of family-friendly firms with regard to career and promotion opportunities for women or even changing to a part-time management position; on the contrary, this measure even reduces the chance of a management position. Thus, the focus of such networks seems to be on other topics, especially the reconciliation of family and work – but not in terms of reconciliation of family and career. However, when a woman becomes a mother, this negative effect on promotion chances is lower.

In this context, the Corona pandemic has fundamentally changed the working conditions and demands placed on employees and managers. This can also be an opportunity for women in management positions or on their way there. During the Corona crisis, the intensive use of working from home led to a flexibilisation of work location and working hours (Kohaut/Möller 2022) and to the experience that performance was not significantly affected by this. The otherwise common orientation of work processes to the reality of men's lives with constant accessibility and excessively long presence times was thereby weakened (Gulden/Thomsen 2021). Further research on this as well as on innovative and successful approaches would be helpful to analyse when measures can have their full effect. For example, job-sharing models could help women take on leadership roles in the long term by providing better opportunities to reconcile career and family.

Further promotion of measures for equal opportunities and for the reconciling family and work, as well as a customised design and implementation in the firms, could be promising for all involved and hold potential for increasing the proportion of women in management positions. As

the results make clear, the organisation of a firm can have a concrete influence on the career and promotion opportunities of women by offering measures for women that are as tailored and targeted as possible. In this context, the design of the measures is likely to be of particular importance, since the effectiveness of the measures depends on the corporate culture. This also includes firms questioning traditional gender images and making that corporate cultures more egalitarian. Only if the measures also fit the values of the firm, i. e. if they go hand in hand with an "egalitarian" firm culture and are also filled with content, they seem to be able to unfold their effect, whereas otherwise they tend to function more as a legitimisation façade and can, for example, promote a "flexibility stigma" (Busch-Heizmann et al. 2018).

In this context, both women and men should be enabled to reconcile family and career in management positions. It is important to actually provide flexibility and time sovereignty and not to penalise their use. This is becoming more and more important for firms to recruit and retain qualified professionals, as the work-life balance is becoming more important, especially for younger generations. Professional autonomy and the assumption of management responsibility are being put aside in favour of a higher degree of working time sovereignty (Hammermann et al. 2015). Thus, the desire to have more free time, e. g. for leisure activities, further education or social engagement, is becoming increasingly important. Employees are thus also responding to the trade-off between the possibility of spending a lot of time on family and private matters and the time commitment required to qualify for positions with management responsibility.

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Appendix

A1 Questionnaire

Table 4: IAB Establishment Panel questions on equal opportunity measures, for the years 2012 and 2016

Under the keyword "Equal Opportunities", the IAB Establishment Panel asks whether the establishment offers measures to reconcile work and family life and to promote equal opportunities for women and men:

Keyword:	Research Questions 2012 and 2016
	This list contains different measures aimed at improving the compatibility of family and work and promoting the equal opportunities of women and men. Please indicate which measures are provided in your establishment/office.
Childcare support	A) Support with childcare (e.g. company childcare facility, cooperation with childcare facilities, childcare during school holidays) or financial contributions towards childcare.
Assistance for care	B) Support for employees with relatives who require care (e.g. cooperation with care homes, advisory facilities, provision of information)
Family-friendly working time and workplace organisation	C) Particular consideration of the needs of employees with care responsibilities when organising working hours (e.g. flexible working hours, working-time accounts telework, home office, family-friendly, part-time-jobs).
Targeted promotion of women	E) Targeted promotion of women (e.g. mentoring schemes, plans for the promotion of women, special further training, target agreement to increase the proportion of women).
Family-friendly establishment	F) Member of a network of family-friendly firms

Source: Bellmann et al. 2020

A2 Robustness check: Further management variables

Table 5: Procedure for identifying the various management variables based on the PASS survey data

The approach of Collischon (2021b) is used to identify the various management variables. It uses information from the panel study Labor Market and Social Security (PASS, Trappmann et al. 2019), linked to administrative files (PASS-ADIAB) (Antoni/Bethmann 2019). Since 2011, people in the PASS have been asked whether they supervise other employees or are authorised to give instructions. Collischon (2021b) uses this questionnaire item to predict the status of supervisors or executives in administrative data.

This is accomplished by regressing management status as reported in the survey on a number of variables from the administrative data, and then using the coefficients from this regression to estimate the propensity to be a leader in the administrative data. Covariates are daily wage (cubic polynomial), labour market experience and tenure (both using squared polynomials), gender, education dummies, and age and survey year (dummies). The model is estimated for robustness using logit and probit regression. In a next step, it uses the predicted probabilities from this regression to predict a binary variable of management status in the PASS data; he appreciates different variants:

- 1) binary indicator prediction predicts more than 80 per cent chance of being a manager (i.e. predicted probability in logit estimation is greater than or equal to 0.8)
- 2) the prediction from the model including the 3-digit KldB predicts a more than 80 per cent chance of becoming a manager
- 3) the prediction from the model including the 4-digit KldB predicts a more than 80 per cent chance of becoming a manager
- 4) the prediction from the model including the 3-digit KldB predicts a more than 70 per cent chance of becoming a manager.

Overall, the predictions based on the PASS identify more executives in the data than simply using the original KldB2010 occupational classification.

Source: Collischon (2021b)

Table 6: Women's chances of advancing to management positions: results of the different management variables

	Hypothesis	KldB	Prediction w/ 3-digit- KldB, 70% threshold	Prediction w/ simple indicator	Prediction w/ 4-digit- KldB	Prediction w/ 3-digit- KldB
Promotion of women	+	++	++	+	+++	++
Family-friendly working conditions	/		—		—	-
Childcare support	+	+	+	+	+	+
Assistance for care	+	+	++	+	+	+
Family-friendly network	/	—	—	—	—	—
Number of observations		6,494	17,936	7,076	10,877	9,006

+ / - p < 0.05, ++ / -- p < 0.01, +++ / --- p < 0.001

Note: Results of logistic fixed effects regression models, these also control for part-time employment, children under 16 and age of youngest child, tenure (in months), tenure (squared), experience in establishment (in years), daily gross wage (imputed), share of female first-level managers, existence of second management level, share of female second-level managers, existence of a work council, share of part-time work, women and qualified workers in the establishment, firm size, collective bargaining coverage, branch of industry, childcare rate and female unemployment rate at district level.

Source: Own calculations using LIAB_LM_9319_v1 and Collischon (2021b).

Table 7: Women's chances of moving into part-time management positions: results of the different management variables

	Hypothesis	KldB	Prediction w/ 3-digit- KldB, 70% threshold	Prediction w/ simple indicator	Prediction w/ 4-digit- KldB	Prediction w/ 3-digit- KldB
Promotion of women	+	+	+	+	+	+
Family-friendly working conditions	+	+	+	+	+	
Childcare support	+	+		+		+
Assistance for care	+	++	+++	+++	+++	++
Family-friendly network	/	—	—	—	—	—
Number of observations		3,757	5,631	3,898	5,242	4,384

+ / - $p < 0.05$, ++ / -- $p < 0.01$, +++ / --- $p < 0.001$

Note: Results of logistic fixed effects regression models, these also control for children under 16 and age of youngest child, tenure (in months), tenure (squared), experience in establishment (in years), daily gross wage (imputed), share of female first-level managers, existence of second management level, share of female second-level managers, existence of a work council, share of part-time work, women and qualified workers in the establishment, firm size, collective bargaining coverage, branch of industry, childcare rate and female unemployment rate at district level.

Source: Own calculations using LIAB_LM_9319_v1 and Collischon (2021b).

A3 Summary statistics

Table 8: Summary statistics, 2012 – 2016 pooled for women

Variables	Mean	Standard derivation
Independent Variables		
Management position (according to KldB2010)	0.03	0.18
Management position (according to PASS-identification)	0.06	0.24
Part-time managerial position (according to KldB2010)	0.01	0.09
Part-time managerial position (according to PASS-identification)	0.01	0.11
Promotion of equal opportunities		
Targeted promotion of women	0.35	0.48
Family-friendly working time and workplace organisation	0.28	0.45
Childcare support	0.47	0.50
Assistance for care	0.83	0.38
Membership family-friendly network	0.42	0.49
Women characteristics		
Part-time	0.48	0.50
Children up to 16 years	0.22	0.41
Age youngest child		
Up to 2 years	0.06	0.23
3 to 5 years	0.04	0.20
6 to 10 years	0.06	0.23
Age group		
Up to 35 years	0.32	0.47
36 to 50 years	0.38	0.48
From 51 years onwards	0.30	0.46
Citizenship: German	0.93	0.25
East Germany	0.30	0.46
Highest educational attainment		
No vocational training	0.14	0.35
Vocational training	0.68	0.47
College/university degree	0.19	0.39
Tenure (in months)	191.86	117.43
Experience in establishment (in years)	10.06	9.11
Gross wage (daily, in Euro)	88.11	66.29
Employer characteristics		
Share of female first-level managers	19.03	31.10

Variables	Mean	Standard derivation
Existence of second management level	0.92	0.28
Share of female second-level managers	29.68	29.60
Existence of a work council	0.80	0.40
Share part-time workers	31.69	25.63
Share females	54.86	24.92
Share high-skilled	18.75	20.54
Firm size		
10-199 employees	0.33	0.47
200-1.000 employees	0.31	0.46
1,000 and more employees	0.36	0.48
Collective bargaining coverage		
No collective agreement (individual contracts)	0.18	0.39
Collective agreement at the firm level	0.19	0.39
Collective agreement at the sector level	0.63	0.48
Branch of industry		
Agriculture, manufacturing, construction	0.28	0.45
Trade, hotels, other private services	0.11	0.31
Transport and business services	0.20	0.40
Public services, education	0.23	0.42
Health and social services	0.19	0.39
Structural information		
Childcare rate at the district level	34.19	13.46
Female unemployment rate on district level	6.77	2.88
Observations		
Number of observations	648,240	
Number of women	325,425	
Number of firms	6,627	

Source: Own calculations using LIAB_LM_9319_v1. "PASS" identification of the management variables.

Table 9: Fixed effects estimates (odds ratios): results of the different management variables for women's chances of advancing to management positions / moving into part-time management positions

Dependent variable:	Model: Female manager	Model: Female part-time manager
Promotion of equal opportunities		
Targeted promotion of women	1.424** (0.171)	1.356 (0.269)
Family-friendly working time and workplace organisation	0.775** (0.063)	1.430* (0.224)
Childcare support	1.294* (0.167)	1.119 (0.210)
Assistance for care	1.633** (0.256)	2.294*** (0.479)
Membership family-friendly network	0.715*** (0.067)	0.583*** (0.078)
Women Characteristics		
Part-time	0.260*** (0.023)	
Children up to 16 years	0.594** (0.095)	1.480 (0.314)
Children up to 2 years	0.332*** (0.058)	3.136*** (0.705)
Children 3-5 years	0.334*** (0.062)	2.012** (0.460)
Children 6-10 years	0.734 (0.123)	1.905** (0.385)
Tenure (in months)	1.028*** (0.003)	1.004 (0.005)
Quad. tenure (in months)	1.000*** (0.000)	1.000* (0.000)
Experience in establishment (in years)	1.177*** (0.023)	1.113** (0.038)
Gross wage (daily, in Euro)	1.007*** (0.000)	0.995*** (0.001)
Employer characteristics		
Share of female first-level managers	0.996* (0.002)	0.994** (0.002)
Existence of second management level	1.101 (0.182)	1.851* (0.529)
Share of female second-level managers	1.005* (0.002)	0.998 (0.003)

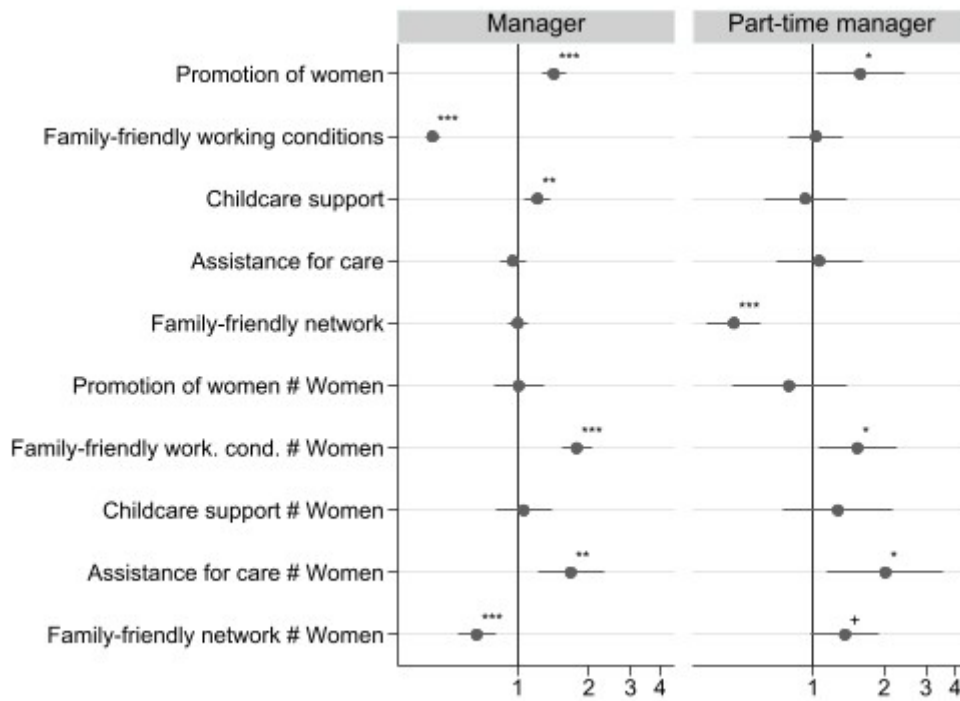
Dependent variable:	Model: Female manager	Model: Female part-time manager
Existence of a work council	0.783 (0.160)	0.795 (0.303)
Share part-time workers	1.004 (0.004)	1.020** (0.006)
Share females	0.986** (0.005)	0.970*** (0.008)
Share high-skilled	1.006 (0.004)	1.006 (0.006)
Firm size up 1000 employee and more (Reference group)		
10 to 199 employees	0.798 (0.212)	0.681 (0.231)
200 to 1999 employees	0.725 (0.126)	0.561* (0.151)
Collective bargaining coverage: No collective agreement (Reference group)		
Collective agreement at firm level	1.116 (0.250)	0.991 (0.346)
Collective agreement at sector level	0.941 (0.228)	1.154 (0.411)
Branch of industry Health and social services (Reference group)		
Agriculture, manufacturing, construction	0.407 (0.221)	0.010*** (0.010)
Trade, hotels, other private services	3.307* (1.654)	0.097* (0.089)
Transport and business services	0.690 (0.350)	0.014*** (0.015)
Public services, education	1.407 (0.625)	0.019*** (0.017)
Structural information		
Childcare rate at district level	0.995 (0.007)	0.975 (0.013)
Female unemployment rate on district level	1.064* (0.030)	0.979 (0.050)
Number of observations	17,936	5,631
Number of women	5,682	1,816

Notes: Robust standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001

Source: Own calculations using LIAB_LM_9319_v1.

A5 Robustness check: Gender interaction

Figure 3: Fixed effects estimates (odds ratios): chances to advance to management positions / moving into part-time management positions, all employees with gender interaction

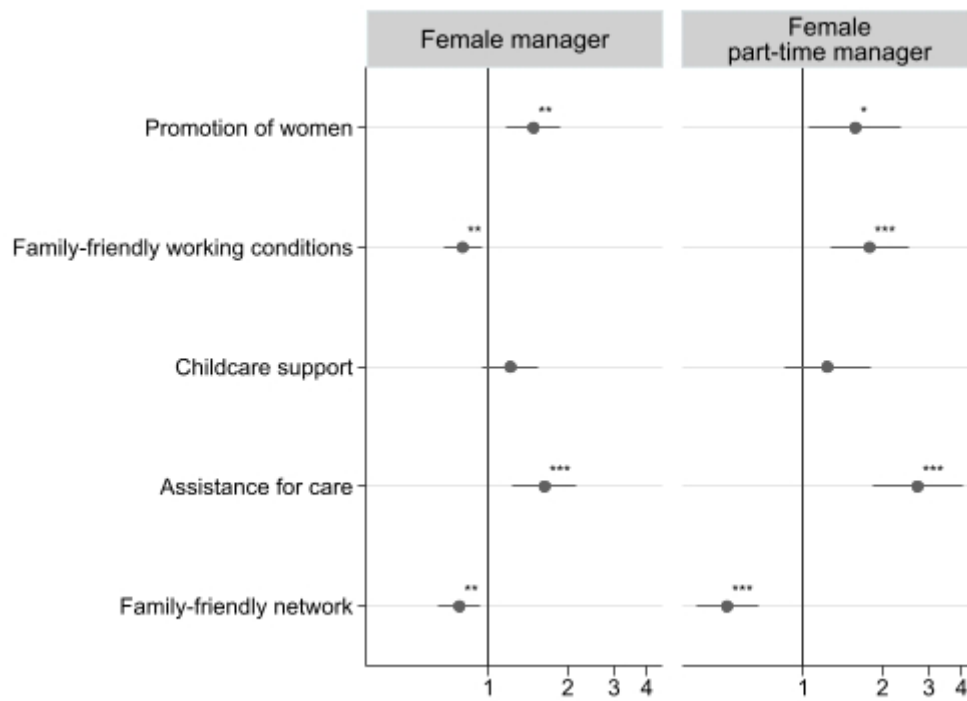


+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Results of logistic fixed effects regression models, these also control for part-time employment (only in the model "Manager"), tenure (in months), tenure (squared), experience in establishment (in years), daily gross wage (imputed), share of female first-level managers, existence of second management level, share of female second-level managers, existence of a work council, share of part-time work, women and qualified workers in the establishment, firm size, collective bargaining coverage, branch of industry, childcare rate and female unemployment rate at district level

Source: Own calculations using LIAB_LM_9319_v1 („Manager“: 105,188 observations of 33,220 employees, „Part-time manager“: 12,732 observations of 3,968 employees). “PASS” identification of the management variables.

Figure 4: Hybrid panel regressions (odds ratios of within-estimates): women's chances of advancing to management positions / moving into part-time management positions



+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Note: Results of hybrid regression models (within-effects) restricted to female employees with managerial experience in the observation period, these also control for part-time employment (only in the model "Female part-time manager"), children under 16 and age of youngest child, tenure (in months), tenure (squared), experience in establishment (in years), daily gross wage (imputed), share of female first-level managers, existence of second management level, share of female second-level managers, existence of a work council, share of part-time work, women and qualified workers in the establishment, firm size, collective bargaining coverage, branch of industry, childcare rate and female unemployment rate at district level, also for the additional time-invariant variables age, nationality, highest educational attainment and place of residence; to check whether the assumption of correlated random effects is violated, cubic dependencies were added to the between estimators.

Source: Own calculations using LIAB_LM_9319_v1 („Female manager PASS“: 48,530 observations of 20,928 employees; „Female part-time manager PASS“: 10,991 observations of 4,687 employees).

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