



Discussion Papers

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Discussion Paper No. 15
July 2004

ISSN 1795-0562

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Women's Hours of Market Work in Germany: The Role of Parental Leave*

Abstract

This paper investigates trends and changes in the structural composition of women's weekly market hours in former West-Germany using aggregate time-series data from German micro census from 1957 until 2001. Aggregate weekly hours per working-age woman are decomposed into hours worked per employee – the intensive margin of adjustment – and into labor force participation – the extensive margin. The decomposition is performed by women's marital status, their age, and whether or not young children are present. The main results are that labor force participation has steadily risen among female employees of all marital statuses and of consecutive cohorts. The rise in women participation has been accompanied by a strong decline in women's weekly hours worked. This decline has been the most severe among married women with young children. Unlike in many other industrialized countries where married women with very young children have drastically increased their weekly hours since WWII, this group of female employees in Germany has steadily and significantly reduced its weekly hours' involvement since 1975. The paper attributes much of this decline to institutional change in the federal legislation governing parental leave which have occurred since the mid 1980s.

JEL Classification: J13, J22.

Keywords: Female labor supply, extensive and intensive margin of adjustment, parental leave policy.

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* Prepared for presentation at the ECB/CEPR conference on "What explains the pattern of labor supply in Europe?", Frankfurt A.M., June 2003. I thank Chinhui Juhn, Guy Laroque and seminar participants at Arizona State University and IGER at Universita Bocconi for useful comments. Financial support from the German Science Foundation (*Deutsche Forschungsgemeinschaft*) is gratefully acknowledged. This project was started when I visited RUESG at the University of Helsinki. I thank Erkki Koskela and Seppo Honkapohja for their generous hospitality. Markus Demany provided able research assistance. All errors and omissions are my own.

1. INTRODUCTION

The literature on female labor supply often departs from the presumption that in most industrialized countries women's market hours worked have steadily risen since the early 1970s. A commonly quoted example is the experience of married women in the U.S. Their average hours worked have risen by over sixty percent during the last three decades (McGrattan and Rogerson 1998, 2004). For married women with children this rise has been even more extreme. The secular increase in women's hours worked has become the subject of a growing body of literature which uses dynamic economic models in an effort to explain the driving forces underlying this trend (see, e.g., Olivetti 2001, or Jones et al. 2003). Often quoted exceptions to the above-mentioned empirical observations are Germany, Italy and Spain where women's total market hours worked have remained constant at best. Given that fertility in these countries has declined over the past thirty years and reached the bottom of the distribution in Europe, the observations on Germany, Italy and Spain are considered a puzzle, because at first glance it is hard to perceive why women who have few children do not participate more actively in the labor market. At second glance, there are likely candidates that may help explain the observed differences, such as child care availability, the income tax system, parental leave policies, the legal length of the workweek, or the availability of part-time jobs.

In this paper we explore the development of women's involvement in the German labor market since the late 1950s. We pursue two goals. Firstly, we document the trends of market hours worked of different groups of women. Contrary to most of the existing literature, we not only study women's labor force participation, but also their weekly hours worked in the market. We provide compelling evidence that exclusively focusing on female labor force participation in an effort to understand women's labor market involvement can be misleading. Towards this end, we decompose women's market hours worked into hours worked per female employee—the so-called intensive margin—and the product of the employment rate and the labor force participation—the so-called extensive margin. Secondly, we investigate the link between the observed decline in women's weekly hours and three major changes in the federal regulation governing parental leave which have taken place since the late 1970s. To do so, we illustrate the changes in the actual weekly hours of married females with children below the age of ten—the group for whom average weekly hours have declined the most since the mid 1970s—and contrast them to the respective changes in the control group, i.e., married females without young children. We use micro census data from the

German Federal Statistical Office (*Statistisches Bundesamt*). At a highly aggregated level, these data are available from 1957 through 2001 for the former West-Germany. They allow us to study long-term trends of the variables of interest, and also structural changes.

Our findings suggest that the near constancy in aggregate series of hours worked per working-age woman that has been observed since the late 1950s hides a vast set of different trends in the intensive and extensive margin of women's involvement in the German labor market. Labor force participation has steadily risen among female employees of all marital statuses and of consecutive cohorts. The rise in women's participation has been the strongest for married and widowed or divorced women. The observed rise in female participation has been accompanied by a notable decline in women's weekly hours worked. We identify married women with young children as the group of female employees for whom this decline has been the most severe. Unlike in many other industrialized countries—notably the United States of America—where married women with very young children have drastically increased their weekly hours worked since WWII,—this group of female employees in Germany has steadily and significantly reduced its weekly hours' involvement since 1975. We attribute much of this decline to institutional changes in the federal legislation governing parental leave which occurred in 1986, 1992 and 2001.

The paper proceeds as follows. Section two presents the data underlying the study. Section three sets the scene for a taking a closer look at women's hours worked in the market by studying long-term trends of the aggregate series that are decomposed by gender, age and marital status. Section four takes a closer look at changes in the federal legislation governing parental leave and studies the impact of these changes on married women's labor market behavior. Section five concludes.

2. THE DATA

All data underlying our study originate from the micro census of the German Federal Statistical Office. The micro census is the official statistic of the population and the labor force in Germany; it has been available since 1957 for the former West-Germany and since 1991 for the former East-Germany.² The most recent results currently available are for 2001. In terms of data collection method applied, it is comparable to the Current Population Survey of the U.S. Data are collected by annual interviews of one percent of all households that are randomly drawn. In every year, about 370,000 households with 820,000 individuals

participate in the interviews. Out of these, about 70,000 households with 160,000 individuals primarily live in the former East-Germany. Interviews take place between April and July. They are typically staged with the head of a chosen household who is asked to respond to questions relating to the various household members. Hence, the data are gathered through a household's self-reporting. The response rate regularly reaches at least 97 percent. Responses to questions relating to labor market activities relate to an *ex ante* chosen week of the year, the so-called reference week. That particular week has varied over time – it currently is the last week of April in which there are no public holidays. A quarter of all participating households are rotated each year, so that a chosen household participates in the sample on average for four years.³ Questions relating to the number of weekly hours worked when employed cover actual as well as normal hours worked during the reference week. In case these two figures deviate from each other, the interviewees give reasons for the deviation such as overtime, vacation, illness, flexible work hours, or other reasons, including parental leave.

The micro census results that have been available since 1957 are based on individual, regional or time aggregation. Individual data are aggregated based on characteristics such as gender, age, marital status, or sector of employment. The time-series have the advantage of consistently reporting the variables of interest over forty-five years for the former West-Germany. They obviously suffer from the fact that they are not available at a degree of disaggregation that currently is of interest to many researchers.

This deficiency has led the German Federal Statistical Office to make excerpts of the original micro-level data – so-called scientific use files – available to academic institutions. A scientific use file contains randomly drawn seventy percent of those households that participate in the micro census of the respective year. In order to render compatibility with the micro census data, the relevant entries in the sub-sample are multiplied by the factor 10/7. Scientific use files are available for 1989, 1991, 1993, 1995, 1996, 1997 and 2000. The micro level data provide detailed information on an individuals' gender, age, marital status, educational attainment, whether or not children in various age categories are present, and also on individuals' labor market status. If applicable, the data also capture the economic situation of a person's partner. For those individuals who are employed, the data contain information on the actual number of weekly hours worked, and whether their job is full-time or part-time.

² The former West-Germany comprises the states Bremen, Hamburg, Schleswig-Holstein, Northrhine - Westfalia, Hessa, Lower Saxony, Rhineland-Palatine, Baden-Wuerttemberg, Bavaria, the Saarland and West-Berlin.

³ There may be a source of systematic misreporting, simply because the time of the interview often does not coincide with the point in time for which the interviewee provides the information. However, whether or not the data actually suffer from such a mistake has not yet been analyzed.

Our empirical work is based on the aggregate time-series of the micro census covering the period from 1957 through 2001. We use the aggregate time-series in order to illustrate trends in the evolution of gender-specific labor force participation rates, or weekly hours worked per employee. Most importantly, we can divide market hours worked for each of these group-specific characteristics into labor force participation (extensive margin) and hours worked per employee (intensive margin), thereby searching for empirical regularities. We restrict our analysis to individuals and households who reside in the former West-Germany, primarily because our analysis requires consistent data over a rather long time-period. Naturally, such data are more readily available for former West-Germany than for the former East.

A comment on the informational content of the aggregate time-series underlying this paper is in place. The composition of the female population in former West-Germany has undergone major changes since the official micro census was started in 1957. Those changes are mostly due to three main waves of immigration. Starting in the 1970s so-called guest-workers from southern European countries and Turkey came to Germany to work. Many of those guest-workers and their families settled there permanently. Since the mid 1980s, many German descendents from Russia have immigrated to Germany. Lastly, German unification has led to much migration from former East-Germany into the Western states. Since data on West-Germany cover all those who reside in the former west, they include migrants and immigrants.

3. TRENDS IN HOURS OF MARKET WORK

Macroeconomists commonly use the total number of hours worked in the market as measure of labor input in the production of goods and services. This measure is typically reported in relation to the working age population. In Germany, where retirement at the age of 65 is mandatory in the public sector and common practice in all other sectors, the working age population covers all individuals who are between 15 and 64 years old. Figure 1a depicts the ratio of total weekly hours worked to persons of working age together with the pendant for men and women. All three series declined markedly between 1957 and the mid 1970s. Thereafter, the measure for men continued to decline—albeit at a reduced pace—, whereas the measure for women remained constant.

Although an important measure of the economy's total labor input, the aggregate series on hours worked hide much of the dynamics associated with their underlying

components. To be specific, total hours worked per person (H/Pop) can be decomposed into total hours worked per employee (H/E)—the intensive margin—and the extensive margin, employees as a fraction of the total labor force—the so-called employment ratio (E/L)—, and labor force participation (L/Pop):

$$\left(\frac{H}{Pop}\right)_i = \left(\frac{H}{E}\right)_i \times \left(\frac{E}{L}\right)_i \times \left(\frac{L}{Pop}\right)_i \quad i \in \{w, m, s\} \quad (1)$$

where the index i represents women w , men m , or the sum of the two s . We argue that in the case of Germany, studying hours worked per employee as measure for the intensive margin of adjustment is much more informative and appropriate than simply distinguishing between part-time and full-time work. That's because the exact classification of a particular job depends on the normal hours worked, and normal hours vary by sector. For example, a person working thirty-five hours a week is classified as part-time worker in a sector where the normal work week consists of thirty-eight hours. However, that same person would be classified as full-time worker if she worked in a sector where the normal work week consist of thirty-five hours. To avoid this ambiguity, we simply look at actual weekly hours worked.

While the employment ratio has remained roughly constant during the period of observation, the remaining two components have undergone remarkable changes.⁴ Weekly hours worked per employee have declined for both men and women. As figure 1b shows, this decline has been much more drastic for women than for men. Between the late 1950s and the mid 1960s—a time that has become known as post World War II *Wirtschaftswunder* in Germany—, male and female employees each worked well over 45 hours per week. During the following four decades, women on average reduced their weekly hours worked to less than 30, while men reduced theirs to effectively 40. The reduction in weekly hours worked was a continuous process which was accelerated in the 1980s. Two factors mainly contributed to this development. Firstly, starting in the mid 1980s, the length of the workweek was gradually reduced across most sectors. In 1985, for example, the metal industry negotiated an agreement to switch from 40 to 38.5 hours per week. In 1993, the number of weekly hours worked was further reduced to 36. Similar agreements were adopted in other sectors. The reduction in the workweek came along with the possibility for firms to negotiate longer or shorter hours per week with a small fraction of their work force. Secondly, in 1979, the

country's first law on parental leave became effective, enabling employed women who had given birth to take a leave from their job following maternity leave. This leave policy was extended and improved from the employees' perspective through various amendments which became effective in 1986, 1992 and 2001, respectively. The launch of the new policy was accompanied by a steady increase in the number of part-time jobs that have been occupied by women much more than by men. Taken together, these changes accelerated the decline in weekly hours worked per employee.

Theoretically at least the decomposition of total hours worked per person as summarized in equation (1) can be arbitrarily refined not just according to gender, but according to any other individual characteristic. In practice, the degree of refinement is limited by data availability. The aggregate series from the micro census allow us to decompose total weekly hours worked by gender and marital status, but not any further. At this level of disaggregation, the data have been available since 1975 for women and since 1990 for men. Decomposing the aggregate hours series by gender and marital status helps shed light on key differences in the labor market behavior of women and men. Data availability lets us consider an individual's marital status to be one of the following three states: single, married, widowed or divorced. A distinction between widowed or divorced is not possible at the aggregate data level.

3.1 WOMEN'S HOURS OF MARKET WORK

Figure 2a suggests that the constancy in all women's weekly hours worked per person is related to the fact that this measure has remained constant for married women, and that the decline in the measure for single women has been offset by the increase in the measure for widowed or divorced women.⁵ As far as the intensive margin of adjustment is concerned, single women have always worked more hours per week than widowed or divorced women whose weekly hours, in turn, have typically exceeded those of married women. In spite of these differences in levels, all three groups of female employees have reduced their number of hours worked per week to a comparable extent. These trends are summarized in figure 2b.

⁴ The time-variation of employment rates is driven more by business cycles than by changes in long-term trends. We therefore abstract from employment rates in our effort to link long-term developments in total weekly hours worked to the extensive and intensive margin of adjustment.

⁵ Between 1975 and 2000, the share of single women in the female population declined from 36 to 34 percent, while the share of widowed or divorced women rose from 16 to 18 percent. Nothing is known about the composition of the latter group and how it may have changed over time. But it seems sound to assume that the share of divorced women in this group has risen, given that the divorce rate in the population has drastically increased.

Married female employees with children below the age of ten have undergone the most severe reduction in weekly hours worked. As depicted by the solid line in figure 2b, this group of employees cut its weekly hours by close to forty-five percent between 1975 and 2000. The observed reduction gained momentum in the late 1970s and again around 1986 and 1992—three points in time which coincide with major modifications in the federal legislation governing parental leave. We will focus on this group in particular when trying to assess the quantitative implications that changes in the parental leave policy have had on women’s labor market involvement.

It should be emphasized that, even though the various groups of female employees have undergone different degrees of adjustment in their weekly hours worked during the time period considered, their respective fractions of total female employment remained remarkably constant. Single females constitute thirty percent of total female employment. Widowed or divorced females make up for eleven percent, and married females without children below the age of ten years make up for forty-two percent. The remaining eighteen percent are attributable to married females with young children.

The picture for changes in the labor force participation significantly differs across the three female groups considered. Single women’s participation in the labor force hardly changed between 1975 and 2000; it has remained constant at about sixty-five percent. The participation rate of married and widowed or divorced women, on the other hand, has undergone a significant increase. For married women, this rate rose from forty-four to sixty percent. The increase for widowed or divorced women was even more distinct: their participation rate rose by over twenty percentage points from forty-five to sixty-six percent. As a result, a woman’s marital status nowadays is less decisive for her participation in the labor force than for the number of hours she works per week. These trends are summarized in figure 2c.

Figure 3 illustrates the life-cycle profile of women’s labor force participation for particular cohorts in different years when women of all marital statuses are grouped together.⁶ This figure nicely illustrates how labor force participation has changed from older to younger cohorts of women. Older women cohorts tended to participate less in the labor market at every stage in their life, and they also tended to withdraw more frequently around the age when they had children. On the other hand, younger cohorts participate less at a younger and an older age, indicating an increased level of education as well as a reduced retirement age.

⁶ The data for 1950 originate from the census which was conducted on September 13, 1950. They do not cover the Saarland and West-Berlin.

The *prima facie* evidence suggests that younger cohorts' labor force participation much more closely resembles that of men than did the participation behavior of older cohorts. However, this latter statement is subject to a major caveat. Since 1992, employed women who had a child can take parental leave up to three years after the child's birth (see section 4 for details). This generous parental leave policy has become very popular among younger female employees, leading to a steadily growing fraction of them who actually take such a leave if they have a child. The official statistic treats women on parental leave as employed, even though most of them do not work in the market at all during that time. One can argue that employees should be treated as out of the work force while being on parental leave. That, of course, would imply that the life-cycle pattern of different women's cohorts effectively has not changed much over time.

The extent of the change in women's labor market involvement that has occurred since the late 1950s becomes all the more evident if it is contrasted to that of men. Men's labor market involvement has remained remarkably constant over the past 25 years. Their labor force participation has remained remarkably constant over different birth cohorts; younger cohorts have slightly reduced their participation, but their overall involvement remains high. This observation is mirrored in the development of men's labor force participation which has remained largely unchanged since 1975. Single men have increased their participation while married men have decreased theirs, leaving the average participation rate for men unaffected. A similar picture emerges when looking at weekly hours worked. This measure has only slightly decreased from 42 hours to ca. 40 hours per week since 1975, and the decrease has been born proportionately by men of different marital statuses.

4. THE ROLE OF PARENTAL LEAVE

There are several indications in the data that the introduction of parental leave has contributed to the observed decline in the number of weekly hours worked by married women with young children. We want to assess the impact that this institutional change has had on married women's engagement in the labor market. Towards this end, we first provide a brief overview of the timing and the extent of the institutional changes that occurred and then carefully study the data.

4.1 SOME INSTITUTIONAL DETAILS

Parental leave is closely tied to maternity leave. In former West-Germany, female employees who expect a child have been entitled to a total of fourteen weeks of maternity leave, six weeks of which have to be taken prior to delivery. While on maternity leave, women receive their full salary and are protected against dismissal. Starting in January 1979, female employees on maternity leave could opt to take an additional four months of leave immediately following their maternity leave. While on leave, they received a monthly income of DM 750 from the government and could not be dismissed. They also had the right to return to their employer, albeit not to their previous job. Although this leave policy can be viewed as an early form of parental leave, effectively it was nothing but an extension of maternity leave.

Starting in January 1986, the first federal law on governmental transfer payments to new parents became effective (*Bundeserziehungsgeldgesetz BerzGG*). According to this law, new parents were entitled to receive a transfer payment (*Erziehungsgeld*) from the federal government, regardless of their labor market status. The transfer equaled 600 DM for the first six months and was means-tested thereafter; the transfer was paid for at most one year; it has explicitly been aimed at providing a financial incentive for new parents to raise their children themselves at home.

The same law also regulated parental leave for the first time. Married mothers and fathers and unmarried mothers who were employed and who had an infant were entitled to a total of two years of parental leave following the mother's maternity leave. Until the end of 1991, only those parents could opt to take the leave who were entitled to receive the government's parental subsidy. Starting in 1992, those subsidies were extended to a maximum of 24 months, and eligible parents could take parental leave up to three years after the birth of their child. The possibility to take parental leave was disentangled from the eligibility to receive transfer payments for raising the child. If married, a child's parents could decide on how to split up the parental leave time between each other.

Parental leave has been compatible with part-time work. Between 1986 and the end of 1988, a mother or a father on parental leave could work up to fifteen hours per week. Between 1989 and late 2000, they could work up to nineteen hours per week.

Another modification of the BerzGG became effective in January 2001. Employed mothers and their male partners – regardless of whether or not they are married – are entitled to take parental leave up to three years after the birth of their child. In fact, up to a third of this leave can be taken until the child turns eight years old, if the employer agrees. Part-time work

of up to 30 hours per week is compatible with being on parental leave. Married parents with an annual income of at least 100,000 DM (=51,130 €) and all other parents with an annual income of at least 75,000 DM (=38,350 €) are excluded from receiving a parental subsidy; all eligible parents can choose between receiving a monthly transfer of 600 DM (=307 €) for at most two years, or 900 DM (=460 €) for at most one year.

It is important to note that following ILO convention, individuals on parental leave count as employed in the official statistics for Germany. In what follows, we document the impact that these legal changes have had on the extent to which employed females take parental leave, and hence on their market hours worked.

4.2 EMPIRICAL EVIDENCE

Assessing the quantitative importance of parental leave in former West-Germany is difficult, because direct evidence from aggregate time-series data is available for the period from 1987 through 1991 only. During that time, receiving the parental subsidy was a prerequisite for being eligible to take parental leave. The German Federal Statistical Office in its Statistical Yearbook (*Statistisches Jahrbuch*) reports the socio-economic profile of those who received the subsidy and those who subsequently took the leave. With the legal changes becoming effective in 1992, the possibility for employed new parents to take parental leave was disentangled from their entitlement to receive the parental subsidy. Therefore, the federal statistics on parental subsidies (*Bundesstatistik Erziehungsgeld*) which are maintained by the Federal Ministry of Family Affairs no longer convey reliable information on the extent of parental leave.

We therefore supplement the direct evidence by indirect evidence from the official employment statistics in order to gain insight into the quantitative importance of parental leave among female employees, and how it has evolved over time. Such evidence is available, because when reporting their actual weekly market hours worked, employees also report whether or not their actual hours deviate from their normal hours. If they deviate, employees indicate the main reason for that deviation such as illness, vacation, flexible work hours, overtime, or parental leave. We further use this detailed information in order to disentangle the general rise in part-time work of women which started in the 1980s, and business cycle movements in hours worked from parental leave.

We center our attention on married women when studying the quantitative implications of changes in parental leave policies on women's labor market involvement.

That's because married women are the only group for which the official statistics provide separate information on the labor market behavior of those who have children below the age of ten years, and those who don't. Married employees without young children can be viewed as the control group for married employees with small children who may be exposed to the treatment 'receiving a parental subsidy' or 'taking parental leave'. Moreover, it is also well known that between 1987 and 1991, over ninety-eight percent of all recipients of a parental subsidy were women. Out of these women, ca. ninety percent were married and lived together with their spouse.

Figure 4a draws a clear picture of how the real monthly parental subsidy per recipient – female and male – has developed since this transfer payment was introduced in 1986. The average subsidy drastically increased between 1987 and 1991 and dropped significantly when the legal changes became effective in 1992. In fact, there are clear signs of a structural break occurring in the early 1990s. Since then, the average subsidy received has remained rather stable.

Because the nominal monthly payment has not been adjusted since 1986, these figures suggest that during the first five years after the first law on parental subsidies became effective, eligible individuals adjusted their behavior such as to receive an increasing monthly payment. They could do so, e.g., by reducing their market hours worked, and thereby their income, prior to becoming a new parent. The observed decline in the average monthly payment which occurred in the early 1990s is due to the fact, that since 1992, the parental subsidy can be received for a maximum of two years, and that any payment after six months is means-tested. Furthermore, entitled individuals have been able to *ex ante* choose between receiving a maximum monthly amount of 900 DM (=460 €) for at most one year, or a maximum of 600 DM (=307 €) per month for at most two years. Taken together, these factors have driven down the average monthly payment per recipient.

The fraction of new mothers who receive a parental subsidy equals the number of new female recipients of a parental subsidy in a given year relative to the total number of births in that year. A careful look at this fraction reveals the following two phenomena. Firstly and not surprisingly, the fraction is significantly higher for all new mothers than for those mothers who were employed at the time of delivery. For example, in 1987 the ratio equaled ninety-six percent for the first group and eighty-two percent for the latter group. Secondly, this ratio has declined over time; it reached eighty-five percent in 2002 for all mothers and eighty percent for employed mothers in 1991. (No separate evidence on this latter group is available beyond

1991.) This drop most likely is due to the recent legal changes which allow mothers on parental leave to work up to thirty hours per week.

Finally, when restricting our attention to married female employees, between 1987 and 1991 close to seven percent of them were on parental leave and worked zero hours.⁷ These figures are the clearest direct evidence on the quantitative importance of parental leave among married female employees which we report in this paper. They are consistent with the figures which we infer from indirect evidence (see table 1).

We provide indirect evidence on the quantitative importance of parental leave among married women which we derive from the Federal Statistical Office's employment statistics. We look at the fraction of employed married females working at most twenty hours per week and compare the actual hours to the normal hours worked. We focus on female employees working at most twenty hours per week, because women on parental leave could work up to nineteen hours (fifteen hours) per week until the end of 2000 (1988). Next, we select the fraction of married female employees for whom the actual hours worked are less than their normal hours and indicate the reason for this deviation. We provide this evidence for the three years in which major changes in the law on parental support (*Bundeserziehungsgeldgesetz*) became effective, i.e., for 1986, 1992, and 2001, and also for the years preceding those legal changes. This enables us to assess the impact that the various legal changes had on the labor market behavior of married women with and without children below the age of ten.

Table 1 presents upper bounds on the incidence of parental leave without part-time work among married women with young children, illustrating how this incidence was linked to changes in the federal law regulating parental leave. All figures are based on the Federal Statistical Office's employment statistics. They illustrate that following the introduction of parental leave in 1986, married women only gradually adjusted their labor market behavior to this new opportunity of taking time off from their job while raising their children at home. Between 1986 and 1991, the fraction of married women who went on leave rose from 4.4 percent to over ten percent. With the new possibility of taking parental leave without being eligible for parental subsidies, that fraction jumped by 2.5 percentage points in 1992 and continued to rise until the turn of the century. When new parents were allowed to combine parental leave with part-time work of up to thirty hours per week in 2001, the fraction of married women with young children who took a leave without part-time work started to decline.

⁷ This figure is computed as follows. 8.7 percent of all married female employees had a child in 1987; 82 percent of them received a parental subsidy; and 96 percent of those women worked zero hours.

Table 1: Incidence of Parental Leave without Part-Time Work (Upper Bounds)

| | Married women with kids < 10 | Married women without kids < 10 |
|------|------------------------------|---------------------------------|
| 1986 | 4.4% | .67% |
| 1991 | 10.1% | .69% |
| 1992 | 12.5% | .92% |
| 2000 | 16.1% | .96% |
| 2001 | 14.7% | .95% |

Source: German Federal Statistical Office, *Bevölkerung und Erwerbstätigkeit*, Fachserie 1, Reihe 4.1.1, various issues. The entries denote the fraction of the respective group of married female employees working zero hours during the survey week for ‘other reasons, including parental leave’.

Figures 4b through 4d illustrate the distribution of married female employees’ weekly hours worked for the three points in time when changes in the law on parental support became effective; each figure shows the distribution for married women with children below the age of ten and for married women without those children. Figures 4e through 4h indicate the extent to which the actually observed weekly hours coincided with the normal hours worked. They also indicate the reason for deviations between actual and normal weekly hours.

Figure 4b suggests that the legal changes which became effective in 1986 left the hours distribution for the two groups of married female employees almost unaffected. Prior to 1986, married women with young children were more likely to work less than twenty hours per week and also less likely to work around forty hours per week than women from the control group. In 1986, both groups’ hours distribution changed in a similar fashion: weight shifted away from the tails towards the center of the respective distribution. While for married women with young children the fraction of weekly hours in the category ‘between ten and twenty’ increased by more than the fraction in the category ‘between thirty and forty’, the opposite held true for the control group. Figures 4e and 4f shed some light on the motives underlying the observed changes. On the one hand, the fraction of married employees working at most twenty hours per week for whom the actual hours are less than their normal hours declined between 1985 and 1986 to less than twenty percent, indicating that an increasing fraction of these women reduced their regular weekly hours. On the other hand, among the married women with young children for whom the observed hours were less than their normal hours, the fraction who attributed this discrepancy to parental leave significantly increased from sixty percent in 1985 to seventy-two percent in 1986. This observation clearly

shows that many eligible married women took advantage of parental leave when it was first introduced.

Figures 4c, 4g and 4h convey the respective information for 1992. By 1991, well over fifty percent of married female employees with small children worked at most twenty hours a week as opposed to only thirty percent of the women in the control group. Also, over ten percent of married women with young children worked zero hours, as opposed to only three percent of married women without young children. Figure 4g suggests that much of this observed difference in the hours distribution of the two groups was due to parental leave policy. For over twenty-five percent of married women with young children at most twenty hours per week were less than their normal hours, and eighty percent of them attributed this discrepancy to other reasons, including parental leave. According to figure 4h, with the legal changes becoming effective in 1992, the fraction rose to over thirty percent. In sum, there is compelling evidence that the legal separation between parental leave and parental subsidy together with the increase of the maximum leave period from two to three years led to an overall rise of parental leave among married women, thereby contributing to the decline in the weekly hours worked by that group.

By the year 2000, the fraction of married women with young children who worked less than twenty hours per week had risen to almost seventy percent; twenty percent worked zero hours, and over thirty-five percent worked between ten and twenty hours per week. Figure 4d supports the evidence stated in table 1 that the legal changes which became effective in 2001 successfully induced some married women with young children who took parental leave to start working part-time. Remarkably, even though individuals on parental leave were entitled to work up to thirty hours per week, the reform of 2001 reduced the fraction of married employees working between twenty and thirty hours per week and instead increased the fraction working between one and ten, or between ten and twenty hours per week.

5. CONCLUSIONS

This paper provides strong evidence that drawing a reliable picture of women's labor market involvement in Germany requires one to not only look at their labor force participation, but also at their hours worked if employed. Using aggregate time-series data from the German micro census covering the period from 1957 through 2001, the paper illustrates that labor force participation has steadily risen among female employees of all marital statuses and of

consecutive cohorts. The rise in women's participation has been the strongest for married and widowed or divorced women. Average female labor force participation in Germany has moved towards that of men in the country, and has almost reached that of women in other industrialized countries. The evidence further suggests that the observed rise in female participation has been accompanied by a notable decline in women's weekly hours worked. The paper points to married women with young children as a significant group of female employees for whom this decline has been the most severe. Unlike in many other industrialized countries—notably the United States of America—where married women with very young children have drastically increased their weekly hours worked since WWII, thereby contributing to an overall rise in aggregate hours worked—this group of female employees in Germany has steadily reduced its weekly hours' involvement by over forty percent since 1975.

In this paper we argue that institutional changes in the federal legislation governing parental leave contributed to the observed decline in married women's weekly hours worked. We provide ample evidence to support this argument. The strong increase in monthly real payments of parental subsidies to new parents which took place between 1986 and 1991 coincided with a big drop in married women's weekly hours worked and with a doubling of the fraction of married females taking parental leave without part-time work. When in 1992 the maximal length of parental leave was extended from two to three years and the possibility to take this leave was disentangled from the eligibility for a governmental transfer payment, this fraction jumped significantly. Similarly, the legal changes which enable new parents on parental leave to work a considerable number of weekly hours while on leave have caused fewer married females to take such a leave and to not work at all. In sum, even though labor force participation has steadily risen across the different groups of female employees, there is strong evidence that married females have reacted with their intensive labor market involvement to changes in incentives to work. These reactions have considerably affected the development of average hours worked by female employees in Germany.

The results presented leave several important questions unaddressed. For example, it is to be expected that changes in the parental leave policy not only affected the labor market behavior of married women, but also of single and widowed or divorced women. Have their reactions been similar to those illustrated for married women? Furthermore, the extent to which women react to parental leave policies most likely is linked to their educational level, or to the labor market status of their spouse or partner. All of these issues require further exploration in an effort to complete the picture on the impact that parental leave has had on

women's total labor market involvement in Germany. However, such an exploration requires analyzing individual data from the micro census, or from the German Socio-Economic Panel. We leave it for future research.

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APPENDIX

Figure 1a: Weekly Market Hours Worked per Person (age 15-64)

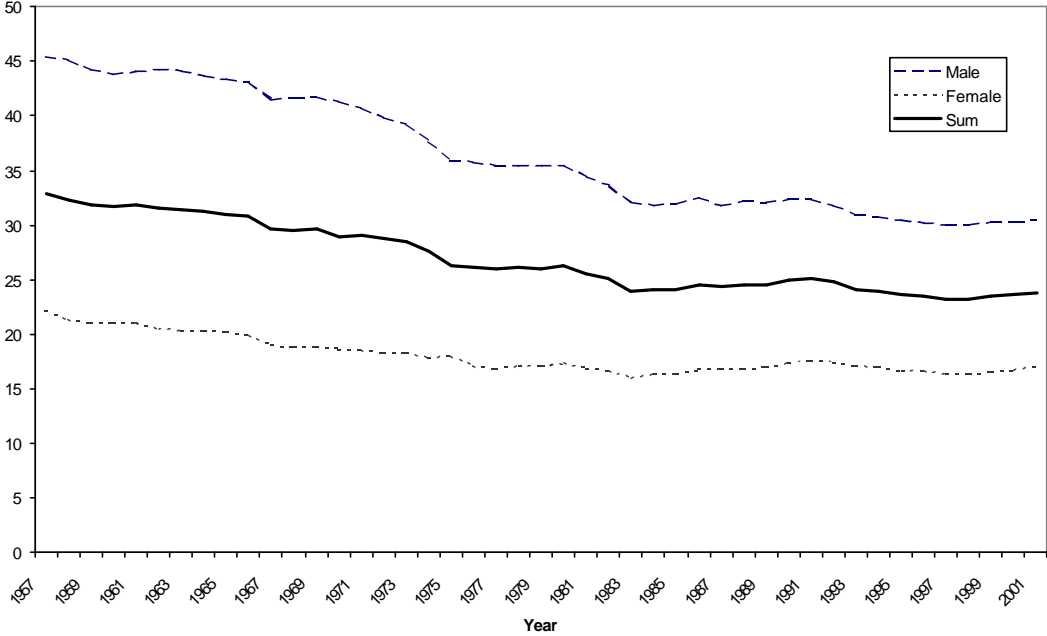


Figure 1b: Weekly Market Hours Worked per Employee (age 15-64)

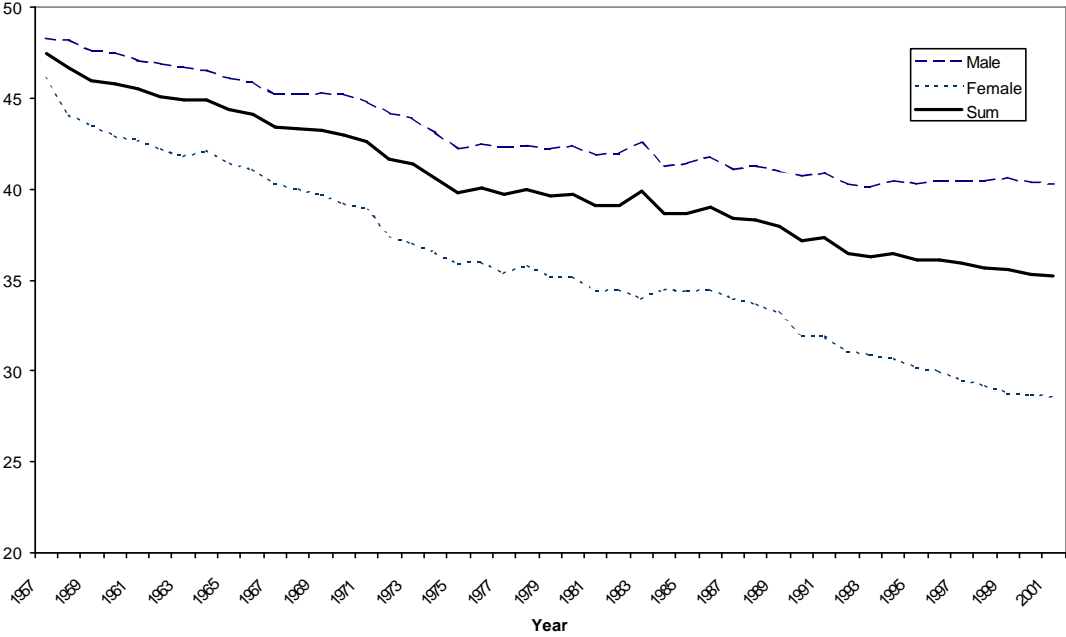
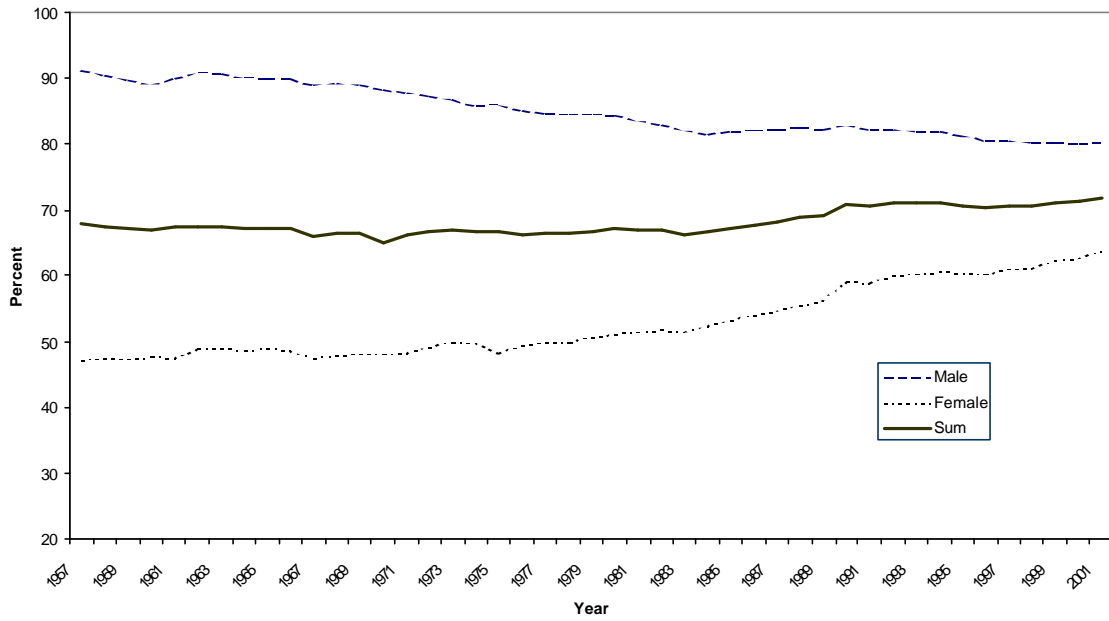


Figure 1c: Labor Force Participation (age 15-64)



Note: Underlying data originate from various publications of the German Federal Statistical Office on the micro census. Various issues. Author's own calculations.

Figure 2a: Weekly Hours Worked per Woman (age 15-64)

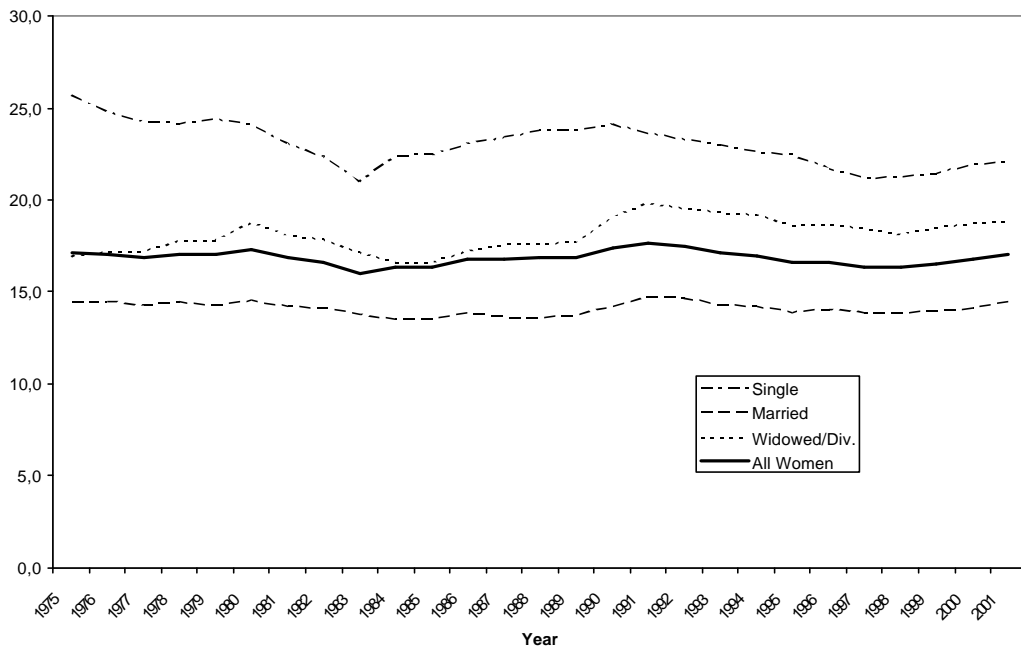


Figure 2b: Weekly Market Hours Worked per Female Employee (age 15-64)

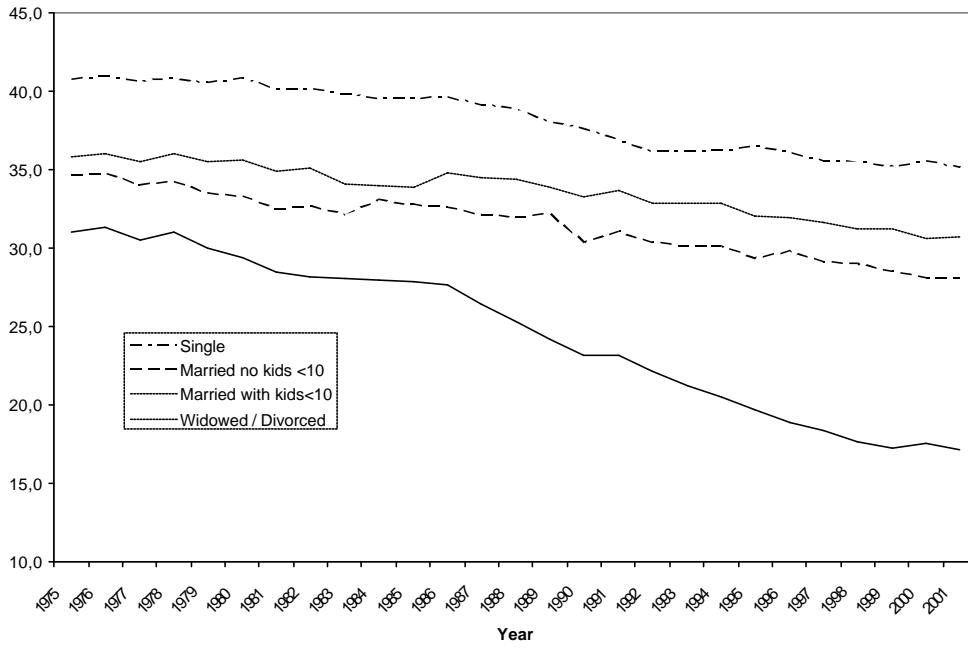
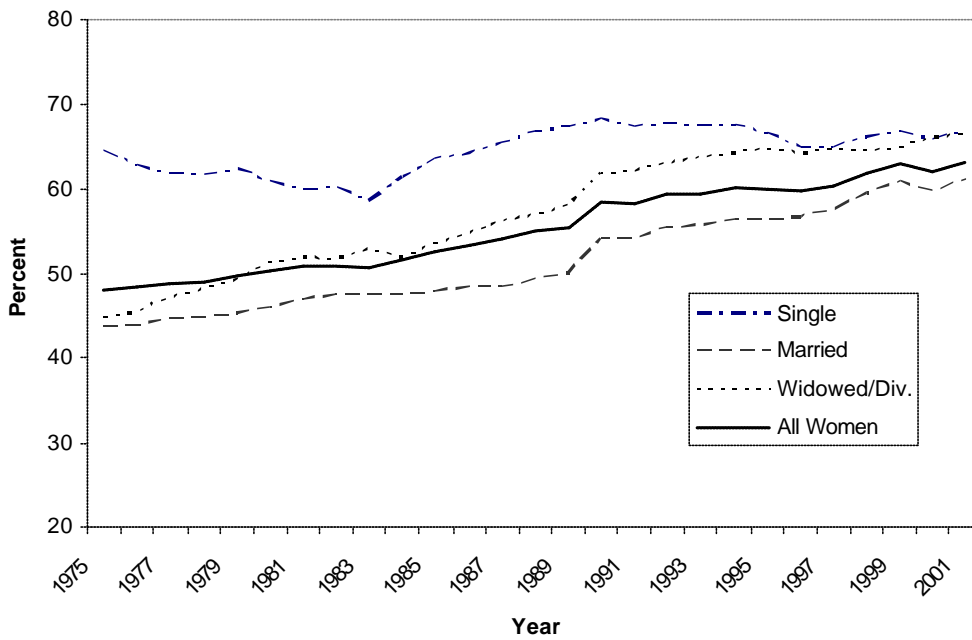
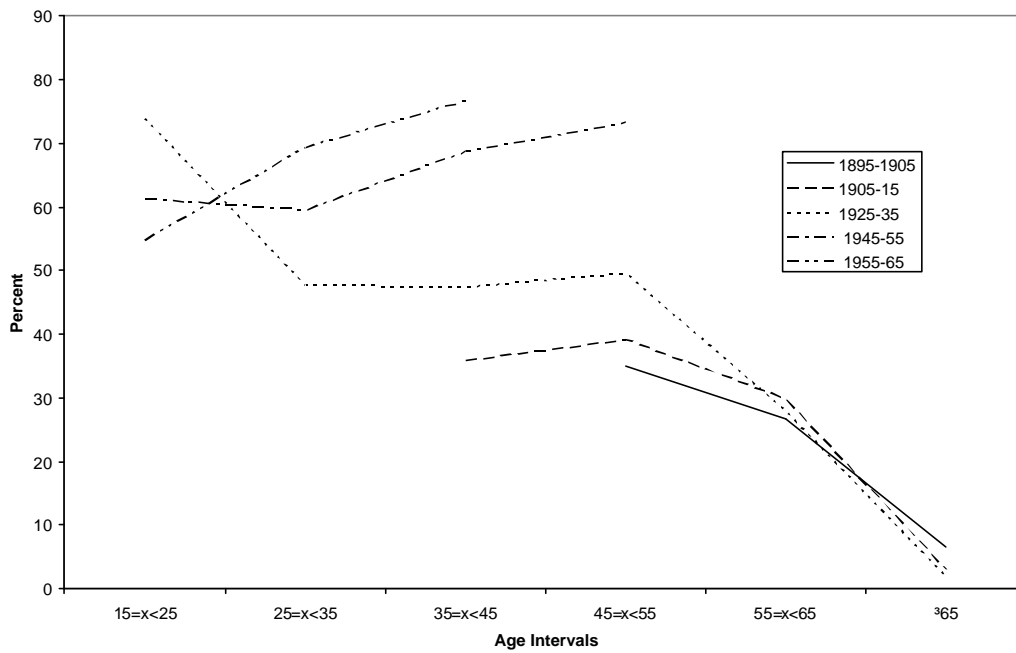


Figure 2c: Female Labor Force Participation (age 15-64)



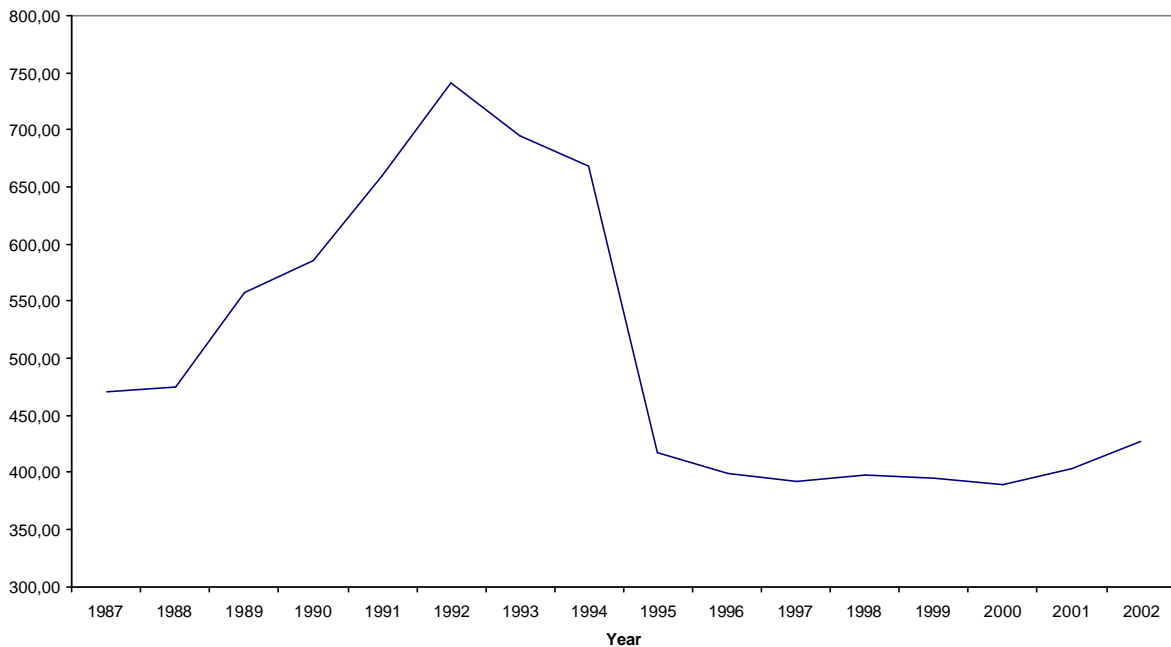
Note: See figure 1.

Figure 3: Life-Cycle Profiles of Women's Labor Force Participation for Different Birth Cohorts



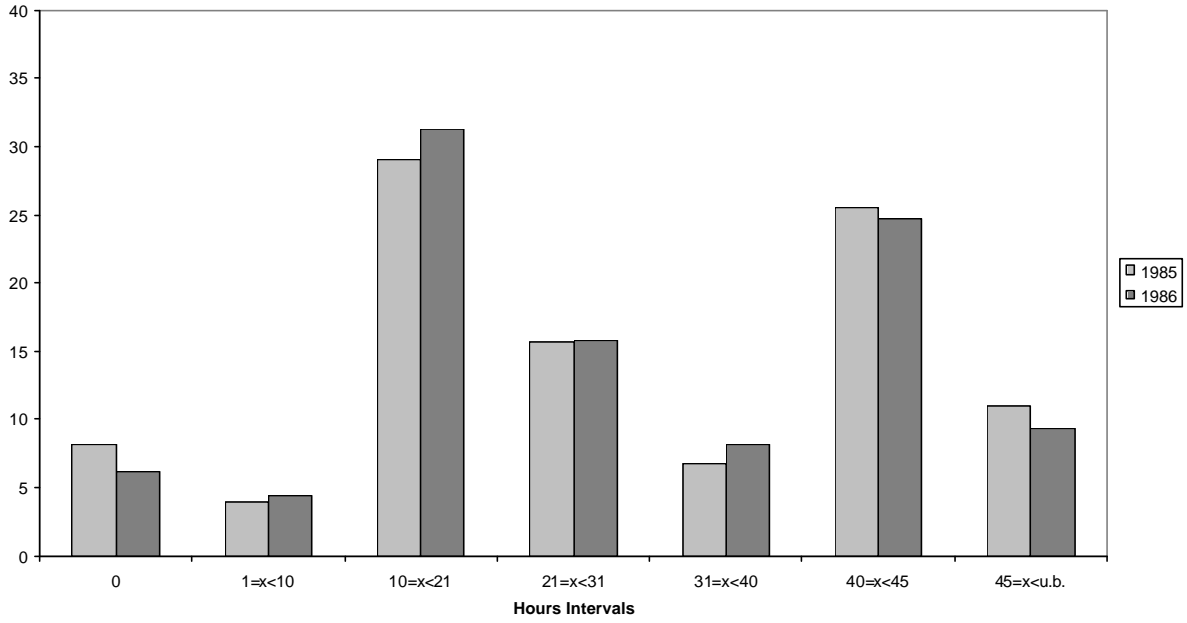
Note: See figure 1. The data for 1950 originate from the census which was held on September 13, 1950. They do not cover the states Saarland and West-Berlin.

Figure 4a: Real Monthly Parental Subsidy per Recipient in DM (1991=100)



Source: German Federal Statistical Office, *Yearbook*, various issues; German Federal Ministry of Family Affairs, *Bundesstatistik Erziehungsgeld 2002*. Own calculations.

Figure 4b: Distribution of Weekly Hours by Married Women with Kids < 10 Yrs. Across Hours Intervals, 1985 vs. 1986



Distribution of Weekly Hours by Married Women Without Kids < 10 Yrs. Across Hours Intervals, 1985 vs. 1986

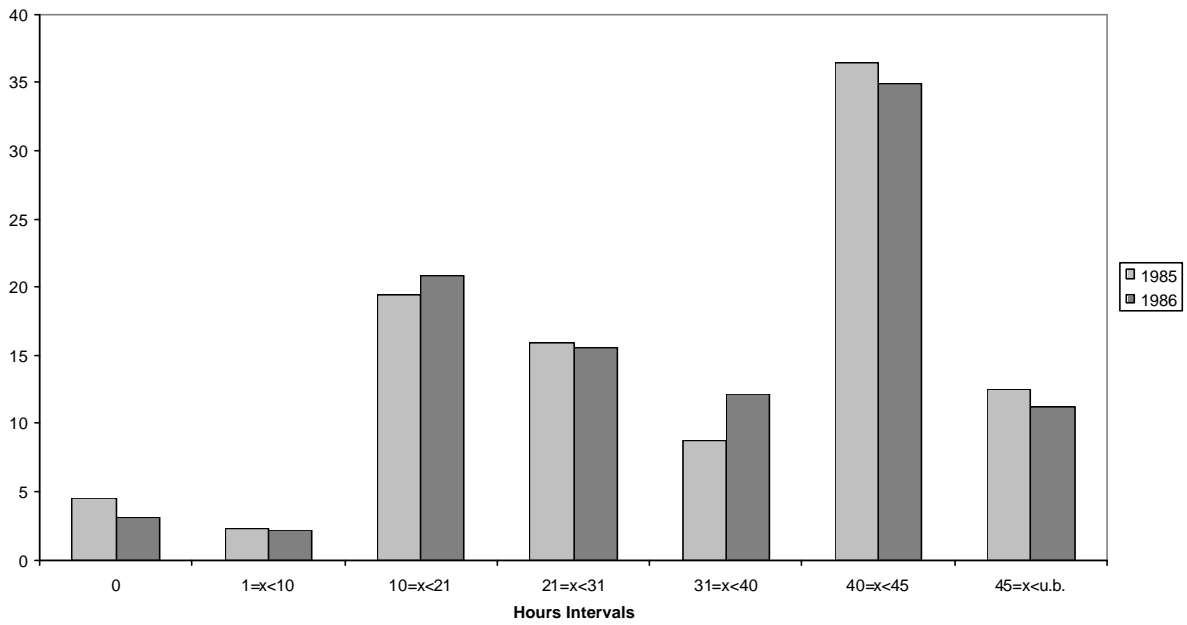
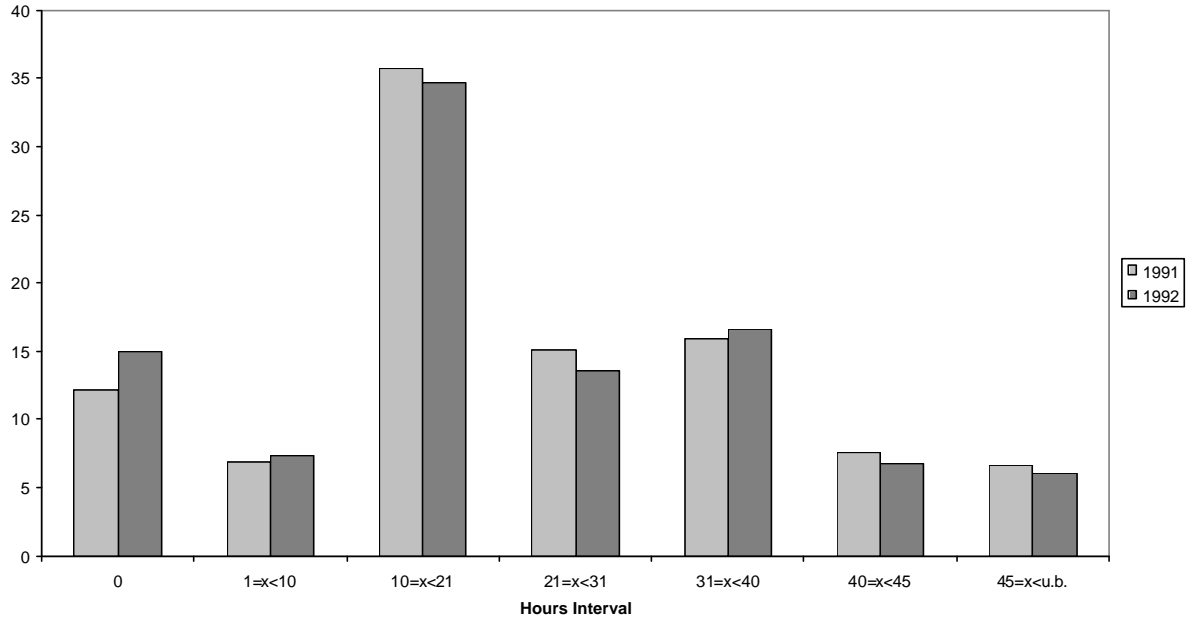


Figure 4c: Distribution of Weekly Hours by Married Women With Kids < 10 Yrs. Across Hours Intervals, 1991 vs. 1992



Distribution of Weekly Hours by Married Women Without Kids < 10 Yrs. Across Hours Intervals, 1991 vs. 1992

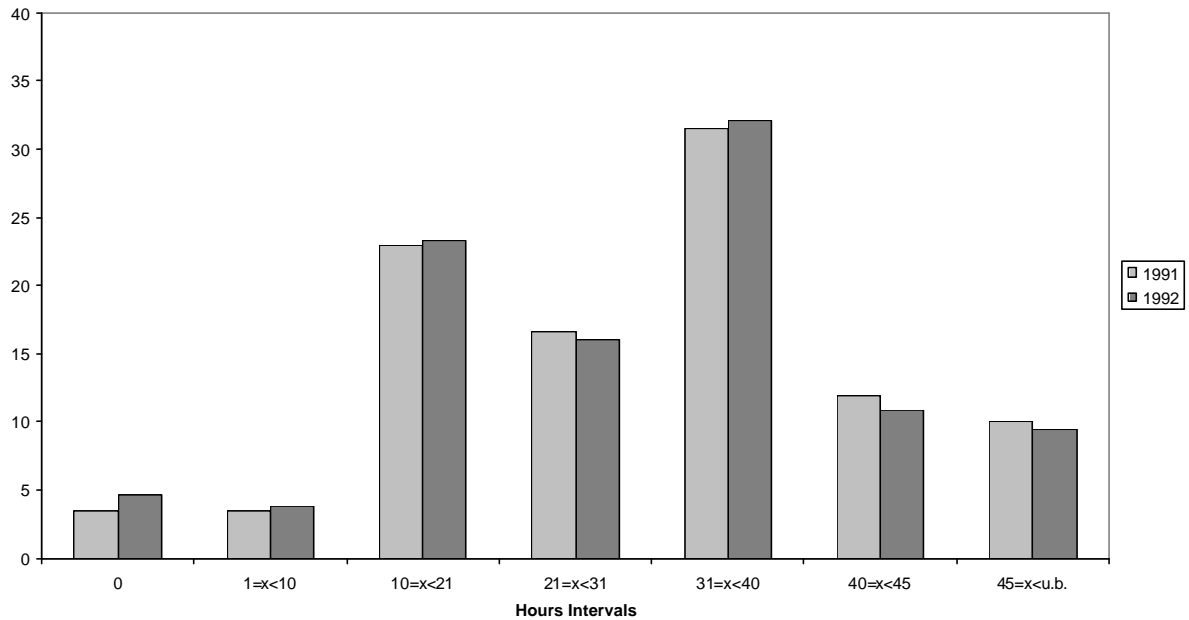
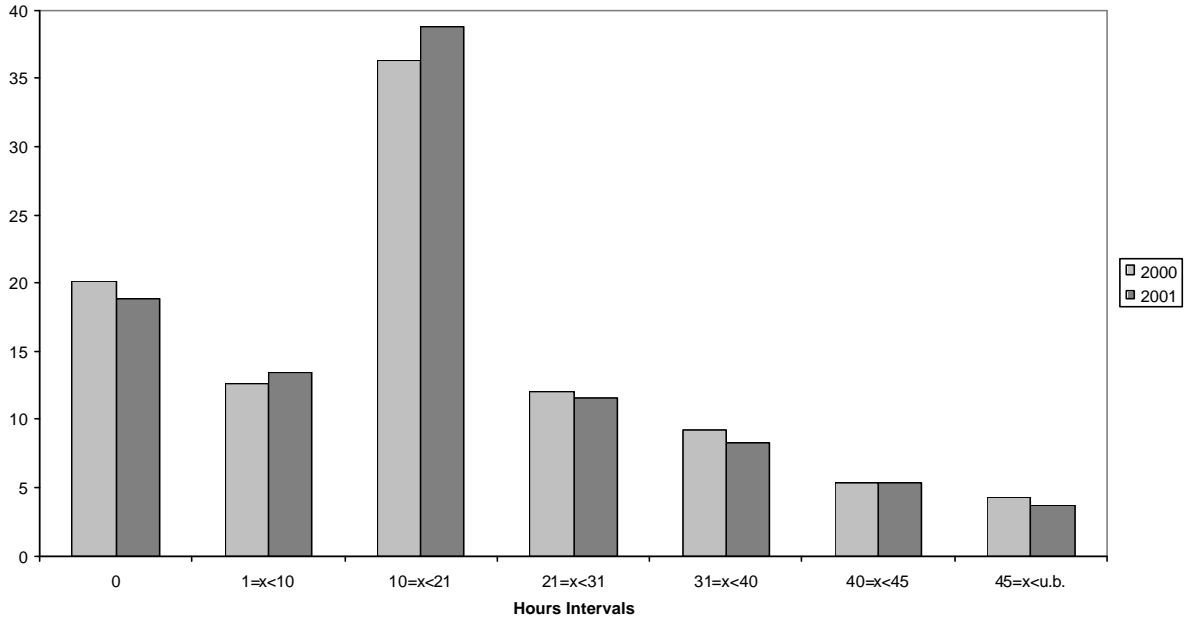


Figure 4d: Distribution of Weekly Hours by Married Women with Kids < 10 Yrs. Across Hours Intervals, 2000 vs. 2001



Distribution of Weekly Hours by Married Women Without Kids < 10 Yrs. Across Hours Intervals, 2000 vs. 2001

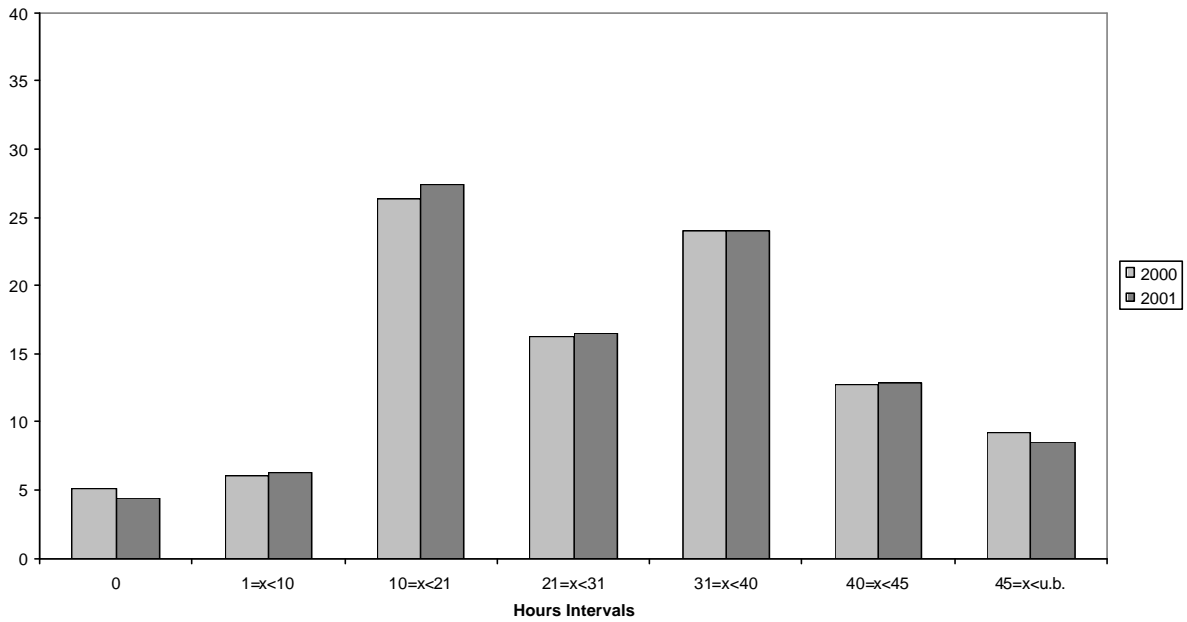
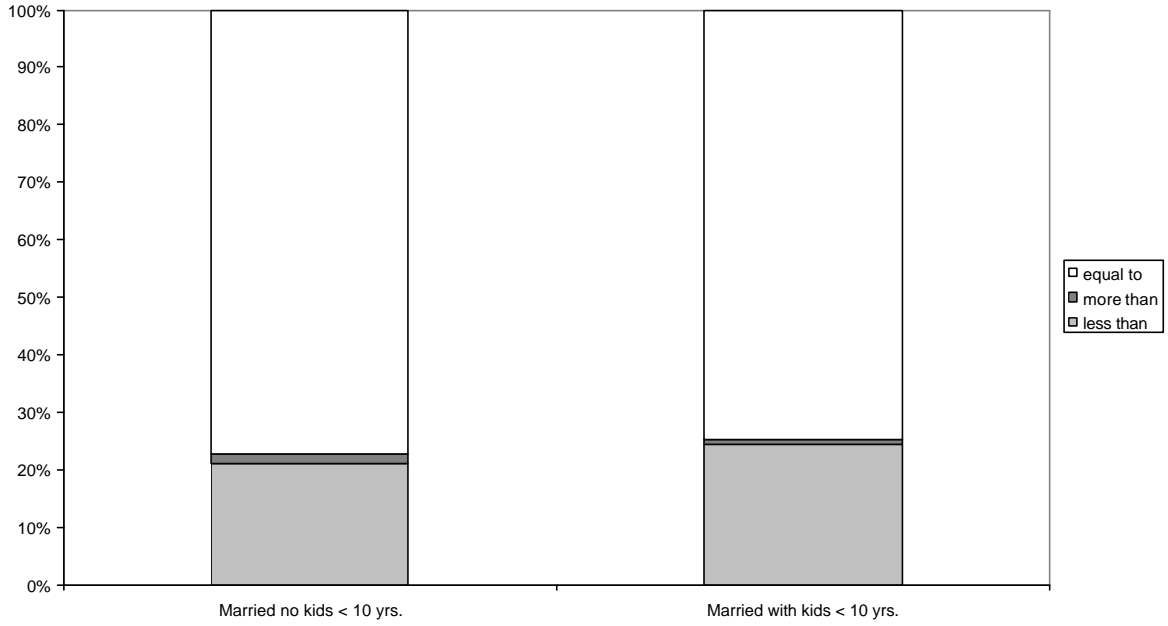


Figure 4e: Fraction of Married Women Working at Most 20 hrs./week for Whom Actual Hours are ... Normal Hours, 1985



Fraction of Those Women For Whom at Most 20 hrs./week are Less Than Their Normal Hours, Where Deviation is Due To ..., 1985

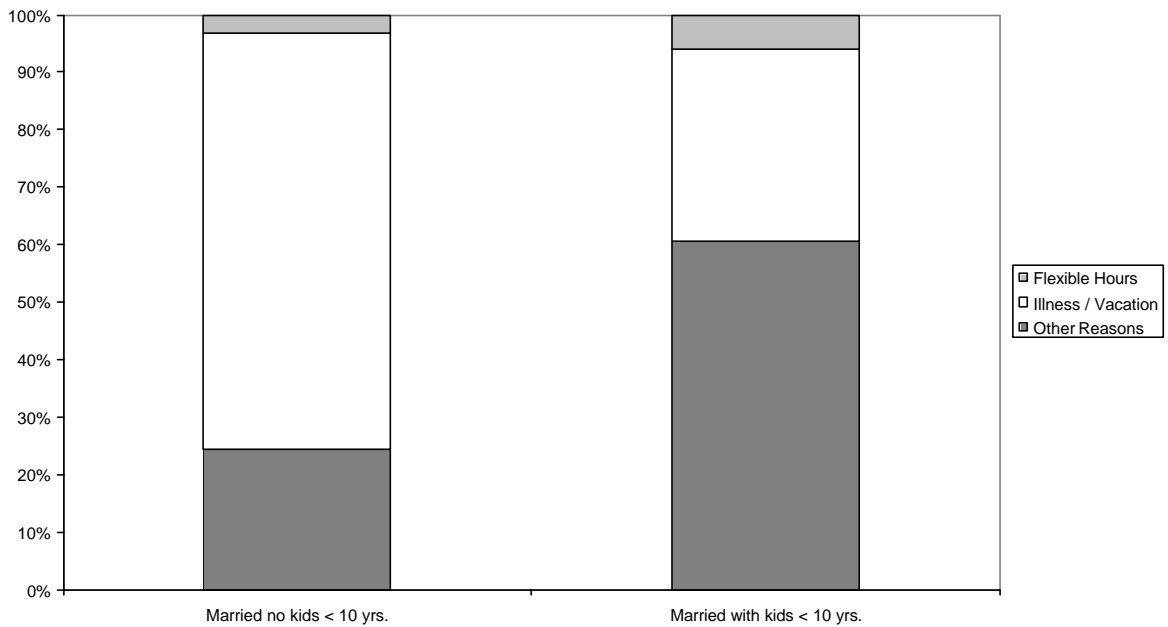
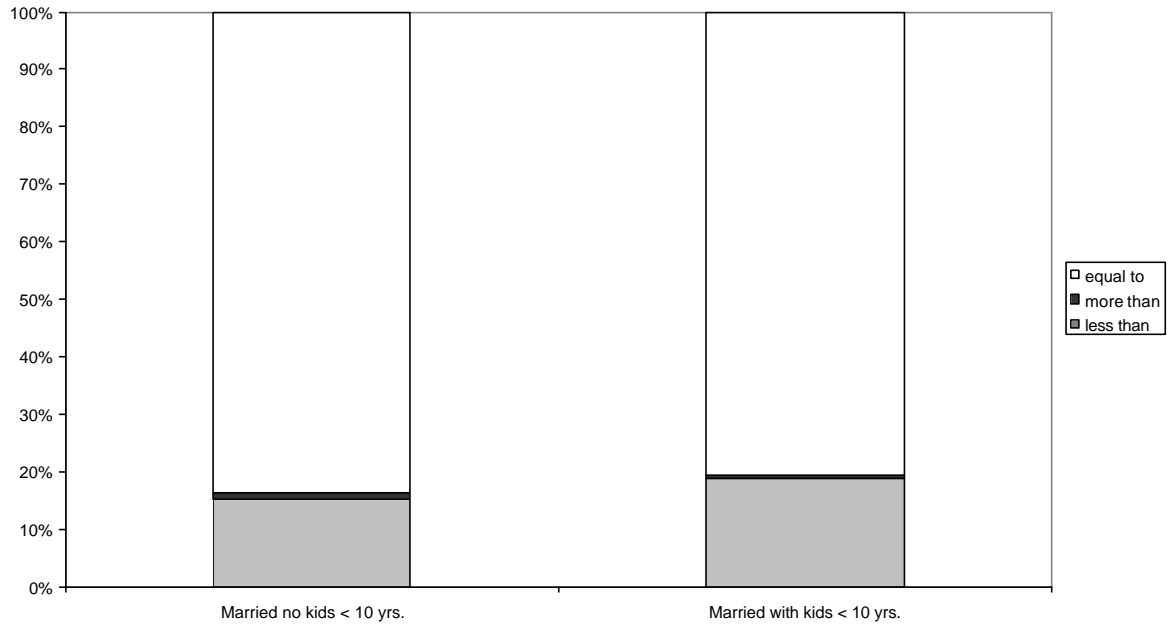


Figure 4f: Fraction of Married Women Working at Most 20 Hrs./Week for Whom Actual Hours Are ... Normal Hours, 1986



Fraction of Those Women for Whom at Most 20 hrs./week are Less Than Their Normal Hours, Where Deviation is Due To ..., 1986

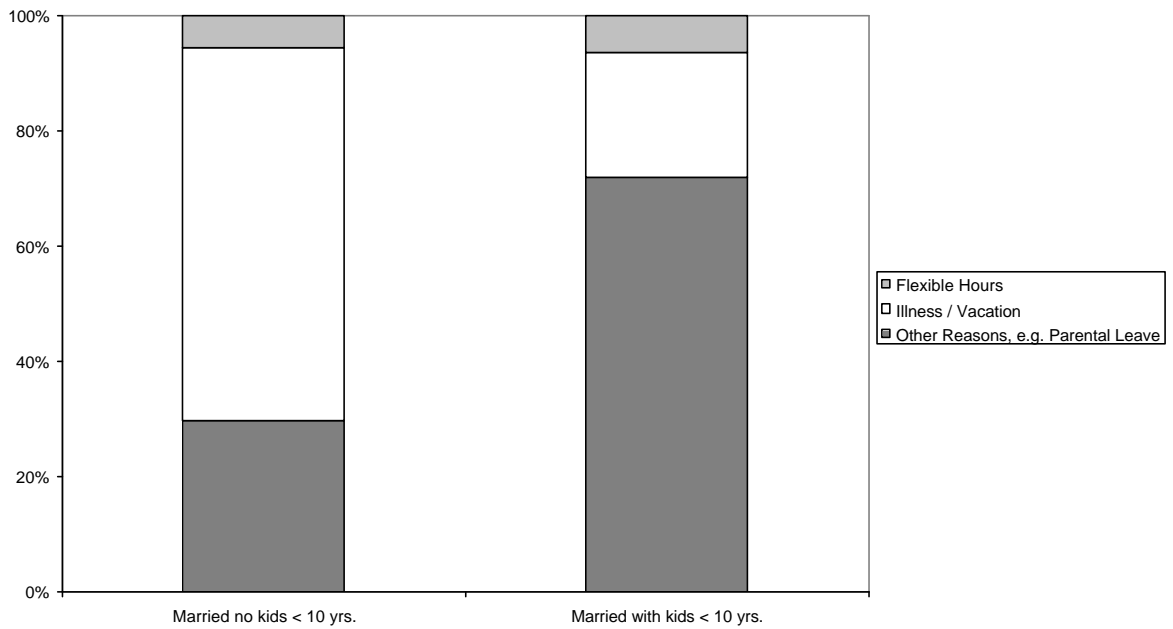
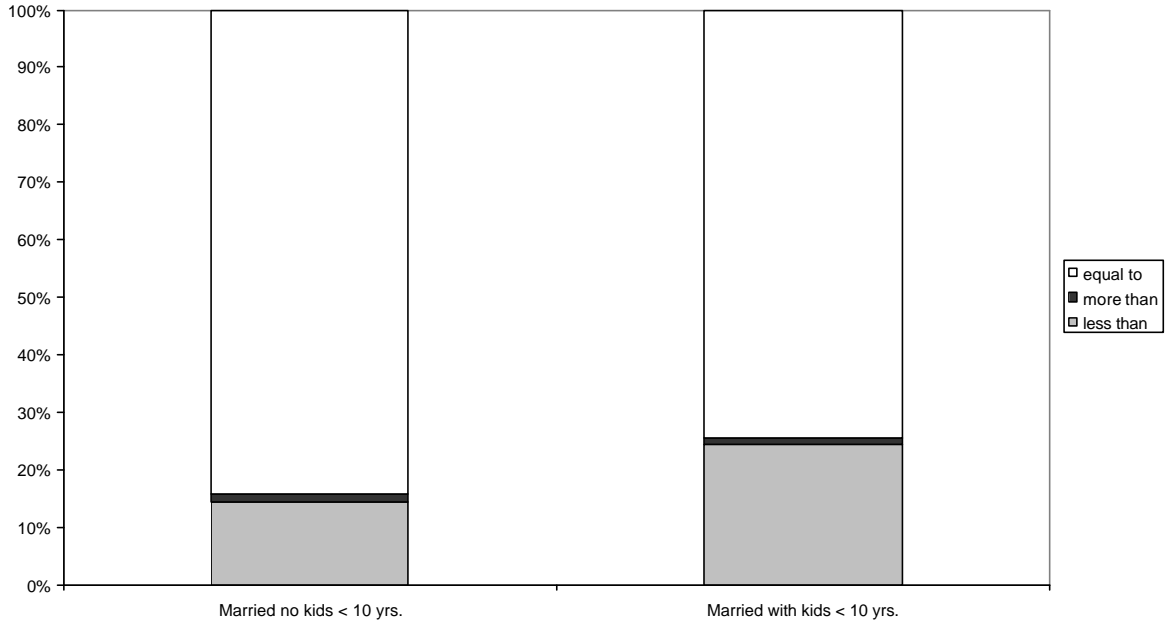


Figure 4g: Fraction of Married Women Working at Most 20 hrs./week for Whom Actual Hours are ... Normal Hours, 1991



Fraction of Those Women For Whom at Most 20 hrs./week are Less Than Their Normal Hours, Where Deviation is Due To ..., 1991

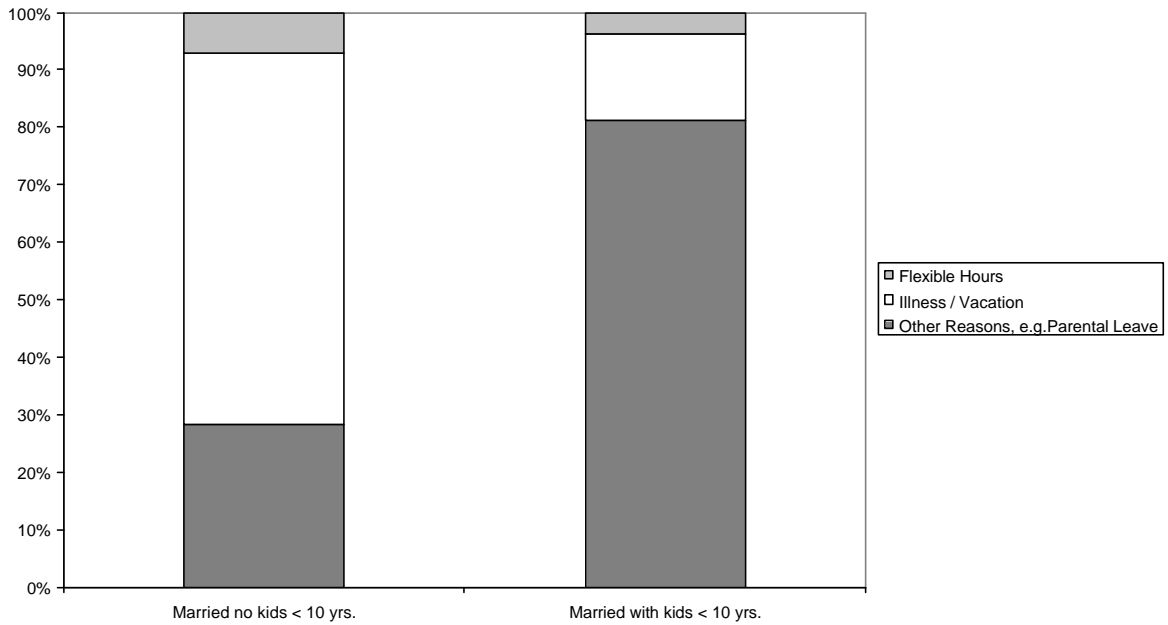
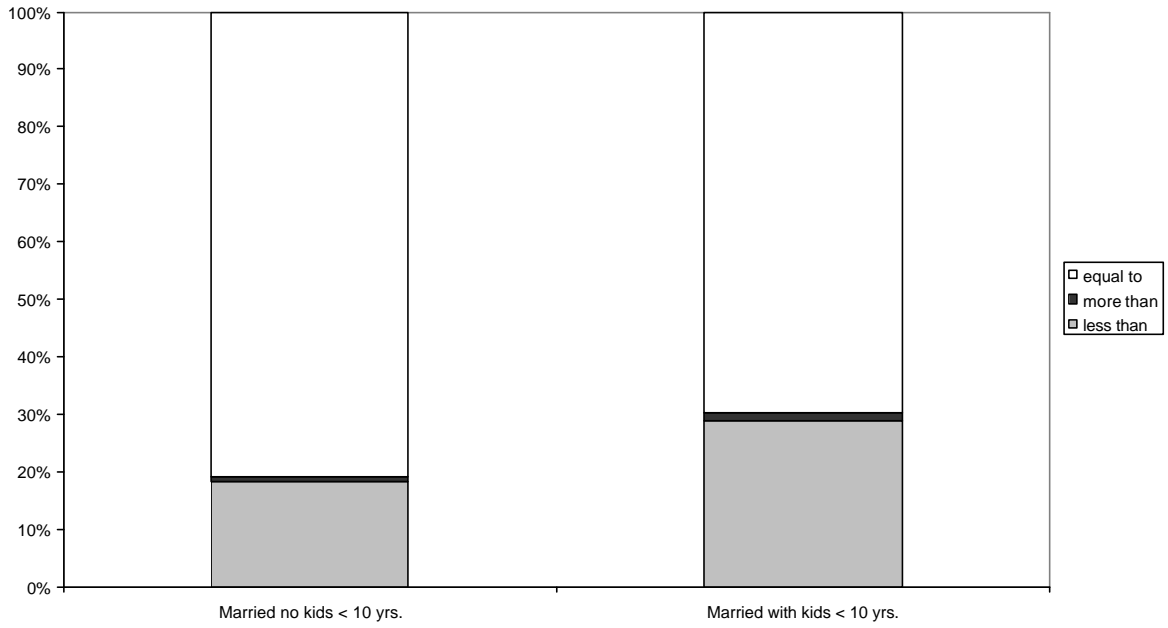


Figure 4h: Fraction of Married Women Working at Most 20 hrs./week For Whom Actual Hours are ... Normal Hours, 1992



Fraction of Those Women for Whom at Most 20 hrs./week are Less Than Their Normal Hours, Where Deviation is Due To ..., 1992

