

## Discussion

# The Employment of Domestic Help and Women's Labor Force Participation in Western Germany

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### Abstract

In contrast to the large body of empirical literature on childcare and women's employment decisions, there is an almost total lack of empirical research on the demand for domestic help. This paper particularly investigates the relationship between the employment of domestic help and the labor force participation of married or cohabiting women in western Germany. The results of a bivariate probit regression indicate that the two decisions are jointly made. Both are found to depend on the minimum amount of housework that is required to maintain the private home, woman's market wage opportunities, and her non-wage income.

### Zusammenfassung

Im Gegensatz zur umfangreichen Forschungsliteratur zu Kinderbetreuung und Erwerbstätigkeit, gibt es bislang kaum empirische Untersuchungen, die sich mit der Nachfrage nach Haushaltshilfen befassen. Der Schwerpunkt des vorliegenden Beitrags liegt auf der Untersuchung des Zusammenhangs zwischen der Beschäftigung einer Haushaltshilfe und der Erwerbsbeteiligung in Partnerschaften lebender westdeutscher Frauen. Die Ergebnisse einer bivariaten Probitschätzung weisen darauf hin, dass die zwei Entscheidungen eng miteinander verknüpft sind. Beide hängen vom Mindestmaß zu erledigender notwendiger Hausarbeit, dem potenziellen Marktlohn der Frau und ihrem Nichterwerbseinkommen ab.

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## 1. Introduction

It has long been argued that deficits in the (western) German day-care system prohibit greater labor market participation of women and force mothers to stay home and take care of their children themselves (cf. Kreyenfeld and Hank (2000) for a recent analysis). The role that domestic work other than childcare<sup>1</sup> might play for female labor supply decisions has been discussed far less, though. It is the female person, however, who still fulfills the major part of household tasks, such as cleaning, washing, or cooking. While on average German women spend about 4 hours per day performing household duties, men use only 1.5 hours of their daily time to work in the house (cf. Blanke et al. 1996).

Despite the existence of a – mainly “shadow” – market for household services in Germany, the role of the private household as a place of work has long been underestimated by politicians as well as economists. Only in recent years has the German government begun to legislate tax policies designed to encourage the use of formal domestic help as a measure to stimulate employment in the household sector (cf. BMAS 1999, for example). Since the use of market-procured domestic work reduces particularly the woman’s time costs, it may have a positive impact on the female labor supply. So far, however, economists have often conceptualized (married) women’s labor force participation decision as a choice between market work and housework only. This neglects that domestic duties need not be performed by the householder herself. The use of purchased domestic services, for example, can be regarded as a readily available market substitute for self-produced home goods.<sup>2</sup>

In contrast to the large body of empirical literature on childcare and women’s employment decisions<sup>3</sup>, there is an almost total lack of empirical research on the demand for domestic help and female labor supply.<sup>4</sup> This paper contributes to filling in the gap.

The paper investigates the relationship between the employment of domestic help and the labor force participation decision of married or cohabiting women in western Germany. *Section 2* provides an introductory overview of the market for domestic work in Germany, followed by descriptive

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<sup>1</sup> Pollak and Wachter (1975), for example, clearly distinguish childcare from housework in general, since individuals are likely to attach intrinsic utility to caring for their child, whereas other domestic work does not carry any utility itself.

<sup>2</sup> Cf. Gronau (1977) for the general argument that goods and services can be produced at home, or can be bought on the market.

<sup>3</sup> Cf. Merkle (1994) for an analysis of the German situation.

<sup>4</sup> Cf. Suen (1994) for an exception. There are some studies investigating household expenditures for services from the perspective of consumer economists (e.g., Soberon-Ferrer and Dardis 1991). These studies basically remain descriptive, though.

results concerning the socio-economic structure of households employing domestic help (*Section 3*). A theoretical framework for the analysis of the household's decision to employ a domestic worker and a woman's decision to work in the market is developed in *Section 4*. Data from the German Socio-Economic Panel (SOEP) are used for an empirical examination of the hypothesis that the household's demand for domestic help and women's supply of market work are joint decisions (*Section 5*). Conclusions are presented in *Section 6*.

## 2. A brief overview of the market for domestic work in Germany

The market for domestic work in Germany is characterized by a predominance of marginal employment.<sup>5</sup> According to research conducted by the *Institut für Sozialforschung und Gesellschaftspolitik* (ISG) in 1992, more than 25% of all working persons who were not subject to social security contributions (about 760,000 persons) worked in private households. An additional 285,000 persons worked there, having a marginal second job, which is 20% of all marginal second job holders (see ISG 1993). Results of a survey conducted by the ISG in 1997 underline this dominant position of domestic work in the informal labor market (cf. Daniels 1998).

In comparison, the number of domestic helpers who do pay social security contributions is negligible (e.g., Emmerich 1997a,b). Since the official figures are likely to be underreported and illicit work is assumed to play a substantial role (e.g., Muntz 1996), reliable data concerning the total number of domestic employees and the job potential in private households are hard to come by. Estimates range from 1.4 up to 2.4 million domestic helpers in Germany (cf. Weinkopf 1997).

An attempt to set incentives for private households to create regular jobs which are subject to social insurance is found in the 1997 federal tax law. Up to 18,000 DM of the costs for a domestic helper can be deducted from the household's income subject to income taxation (for legal details, cf. BMAS 1999).<sup>6</sup> Parallel to such monetary incentives, so called "household checks" were introduced in the same year. They are aimed at the integration of already existing domestic help jobs into the German social security system

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<sup>5</sup> Neither the worker nor the employer pays social security contributions, if the job is regarded as marginal, i.e. less than 15 hours per week with a monthly wage below 630 DM (see BMAS 2000).

<sup>6</sup> Alternatively, the trade union responsible for domestic workers suggested a deduction from the tax due (cf. Klenner and Stolz-Willig 1996). The Social Democratic Party, on the other hand, developed a concept favoring direct transfers in form of vouchers (cf. Handelsblatt 1996).

(cf. BMAS 1999 for practical details) by simplifying the bureaucracy involved with the regular employment of a domestic helper in the household.

However, the advantages of illicit work or marginal employment still seem to outweigh the utility that could be drawn from regular employment (e.g., Klenner and Stolz-Willig 1996). Thus, the actual labor market effect of the above mentioned policies is extremely weak. Until mid-1999, not more than 9,000 private households (out of 30 millions) had made use of the “household check” to employ domestic workers (cf. Bittner and Weinkopf 2000).

Although the work hours of German domestic helpers differ widely, most of the jobs are marginal, that is about 5 hours per week with an hourly wage of ca. 15 DM (see Emmerich 1997a, Weinkopf 1997). Hatzold (1986) finds that not more than 6% of all households employing a domestic worker have a full-time help, and only 30% of the part-time jobs are more than 6 hours per week. This structure would support an increasing use of so called “service pools” (cf. Bittner and Weinkopf (2000) for a recent review). Service pools bundle several small engagements of only a couple of work hours each to a full- or part-time job subject to social security contributions. In case of the domestic sector, it would be the agency and not the household anymore, which is the employer of the domestic worker.

### **3. The socio-economic structure of households employing domestic help**

#### **3.1 Data source**

The data used in this paper were made available by the German Socio-Economic Panel Study (SOEP).<sup>7</sup> This longitudinal micro-database covers socio-economic information on currently more than 7,000 households (including an oversample of foreign-headed households) and 14,000 individuals. The survey was started in 1984 in the western states of Germany, with the latest available wave being collected in 1998. The GSOEP was supplemented by a sample of households and individuals from eastern Germany in 1990, and further extended by a sample of recent immigrants in 1994 / 95.

Each interview contains a household questionnaire, which collects information on the residence, the number of persons living in the household, the household’s income, etc. Additionally, all household members over age 16 report individual information on standard demographic characteristics, labor market activity, sources of income, time spend for various activities, and so on.

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<sup>7</sup> For a detailed description of the dataset, which is provided by the DIW Berlin, see Wagner, Burkhauser and Behringer (1993) and SOEP Group (2001).

In 1994, respondents were asked whether they regularly or occasionally have someone come in to help with household tasks.<sup>8</sup> Unfortunately, there is no information on how many hours the domestic helper works, what types of tasks she/he performs and whether more than one person (if any) works in the household. Thus, the demand for domestic help is treated here as a discrete binary choice.

### 3.2 Descriptive results

In 1994 as many as 11% of all German private households employed a domestic helper, which amounts to almost 4 million households. Since the fraction of households hiring domestic help in eastern Germany is negligible, the subsequent analysis focuses on the western part of the country. This increases the share of households purchasing domestic services to 14% (see *Table 1*).<sup>9</sup>

In 24.3% of the survey households with a monthly net income of 5,000 DM or more, at least some of the housework is done by a professional. At the same time, the demand for waged domestic labor in households with a relatively low income (up to 2,000 DM) turns out to be unexpectedly high. With 13.1%, the share of employing households in this category is about as high as the average.

A large fraction of single households<sup>10</sup> purchases domestic services as well. A domestic helper is reported by 18.7% of these households (see *Table 1*). Most single households have a monthly net income below 3,500 DM, but still about 14% of these households buy domestic labor. While only 11.4% of working singles employ someone to help in the home, as many as 29.6% of retirees<sup>11</sup> demand waged domestic labor.<sup>12</sup>

The fraction of two-person-households hiring domestic help is 12.2%. This share decreases even further in households with three or more members. Only 7.9% of households that report having children employ domestic

<sup>8</sup> The actual question asked in the SOEP is: “Beschäftigen Sie in Ihrem Haushalt regelmäßig oder gelegentlich eine Putz- oder Haushaltshilfe?” This formulation excludes childcare and is appropriate with regard to the main duties generally performed by domestic helpers in Germany. According to Hatzold (1986), for example, these are cleaning (64%) and washing (25%).

<sup>9</sup> Results are based on the weighted samples. In comparison, estimates of the share of US households hiring professional housekeepers range from 9% to 17% (cf. Dortch 1996).

<sup>10</sup> Single households are defined here as households inhabited by one person or a single parent with her/his child(ren).

<sup>11</sup> A person is defined here as retired if s/he reports not to be employed, not to be registered as unemployed, and is over age 60.

<sup>12</sup> Cf. Stoller and Cutler (1993) for an analysis of the use of paid help among older people in the US.

help, indicating a traditional intra-household division of labor, where one adult works in the market, while the other one (usually the female partner) stays home and takes care of the household and the children. Households with young children are also typically headed by younger, lower-paid workers, who might not be able to afford paying someone to clean the place (e.g., Dortch 1996).

Considering partner households<sup>13</sup> only, it turns out that the fraction of those purchasing domestic services decreases to 10.1% (see *Table 1*). Most of these households have a monthly net income of more than 3,500 DM. Equally high shares of households hiring domestic help can be found where no household member works (11.5%), and where both partners perform market work (11.1%).

*Table 1*  
**Employment of domestic help by different subgroups**

	Fraction of households employing domestic help	Number of households employing domestic help (million)
All households <sup>a)</sup> ( <i>n</i> = 6,055)	11.1%	3.7
– regularly	7.0%	2.3
– occasionally	4.1%	1.4
All western German households <sup>b)</sup> ( <i>n</i> = 3,226)	13.9%	3.4
Western German single Households <sup>c)</sup> ( <i>n</i> = 1,067)	18.7%	2.1
Western German partner Households <sup>d)</sup> ( <i>n</i> = 2,032)	10.1%	1.3
Western German partner Households, woman 25 – 55 years old ( <i>n</i> = 1,386)	8.9%	0.7

Note:

<sup>a)</sup> Information on both household and individuals required.

<sup>b)</sup> Only Sample A of the SOEP is used. Foreigners (Sample B) and eastern Germans (Sample C) are not included.

<sup>c)</sup> Includes single parents and their child(ren).

<sup>d)</sup> This does not include households with more than one adult couple, such as multigenerational households.

Source: German Socio-Economic Panel, wave 11 (1994), weighted by KHHRF, author's calculations.

<sup>13</sup> Married or cohabiting partners. This category excludes households with more than one adult couple, e.g. multigenerational households.

If the analysis is restricted to those partner households in which the woman is in the prime age for labor force participation (age 25 to 55), the fraction of households employing domestic help drops to 8.9% (see *Table 1*). Dual career households use professional help the most.<sup>14</sup> In this group, 11.8% of households purchase domestic services. Only 7.0% of households in which the woman spends more than 3 hours per day on housework employ a domestic helper. On the other hand, as many as 17.7% of households where the woman's weekly hours of market work exceed 40 hours use market-procured domestic labor.

The descriptive results indicate that, apart from households where no household member participates in the labor market, households in which the female partner is engaged in market work have the highest demand for domestic help. In this paper, the focus is on the latter, i.e. the relation between the woman's allocation of time and the household's demand for domestic labor. In the following, a theoretical framework for an analysis of this connection will be developed (*Section 4*) and empirically tested afterwards (*Section 5*).

#### 4. Theoretical framework

The core of the theoretical framework proposed in this paper is in the tradition of the "Theory of the Allocation of Time" models of Becker and Gronau (cf. Becker 1965, Gronau 1977), although it is extended to allow for the hiring of domestic help.

In neoclassical models, labor supply decisions are the result of utility maximization subject to budget and time constraints.<sup>15</sup> An individual's utility is assumed to depend on the amount of market goods and services (purchased with labor earnings and non-labor income), and hours of leisure that are consumed per period. According to the approach of Becker (1965), however, goods and time do not yield utility themselves, but are better regarded as inputs to the production of various commodities. These commodities, which are produced via household production functions are ultimately consumed and the direct source of utility. Thus, in contrast to the simple labor-leisure-model, non-market time cannot be regarded as leisure only, but as a different kind of work, performed at home rather than for an employer (three-way allocation of time).<sup>16</sup>

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<sup>14</sup> For a detailed sociological discussion of the influence of waged domestic labor on the domestic division of labor within dual career households, see Gregson and Lowe (1994). The authors analyze qualitative data from Great Britain.

<sup>15</sup> For a more detailed discussion of the simple static model of labor supply as it is given here, see Killingsworth 1983, Chapter 1, Ehrenberg and Smith 1996, Chapter 6, for example.

The production of home goods or services, however, is characterized by decreasing returns to effort (see Gronau 1977): additional hours of home work increase the amount of home goods produced, but at a diminishing rate, as home production changes towards activities that have a cheaper market substitute. Adopting the assumption that there is only one consumption good  $X$ <sup>17</sup>, one can roughly distinguish the following situations: For low desired values of  $X$ , household production alone is sufficient and the individual does not participate in the paid labor market. At some point, home production becomes inefficient in the sense that an hour devoted to work at home produces less  $X$  than could be purchased with the income from one hour's work in the market. Given sufficient demand for  $X$ , the individual decides to allocate some time to home production and the remainder of work time to the market, where a constant hourly wage is paid.

Following the "male chauvinist model" of labor supply of family members<sup>18</sup>, it is assumed here that the husband decides on his labor supply without reference to his wife's labor supply decision, i.e. solely on the basis of his own wage and the family's actual property income. Therefore, the husband's allocation of time as well as his earnings can be regarded as fixed parameters of the wife's labor supply decision.

To be more specific, at this point two new features are added to the model: a minimum amount of housework that has to be done to maintain the private home ( $X_{\min}$ ), and the availability of market-purchased labor to perform this duty.

$X_{\min}$  depends on household characteristics, such as the size of the household, size of the dwelling, age and number of children, for example. It can be produced by the male or female partner or it can be bought on the market (by employing domestic help). If the husband's labor supply for the market is regarded as fixed, the same can be assumed for his share of work in the household sector. Therefore, the remaining time needed for the production of  $X_{\min}$  has to be contributed either by the wife, or by hired domestic help.<sup>19</sup> This makes the availability of market-procured domestic labor an explicit

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<sup>16</sup> Gronau (1997) summarizes recent work on the theory of home production and provides an extensive bibliography.

<sup>17</sup> If necessary, the model can be easily extended to the case of two commodities (see Gronau, 1977).

<sup>18</sup> For details on this and other models of the relation between household membership and labor supply, see Killingsworth 1983, Chapter 2, Ehrenberg and Smith 1996, Chapter 7, for example.

<sup>19</sup> Suen (1994) develops a model, in which all housework is done by a domestic helper (if a servant is hired at all). This model ignores, however, that home production is the most efficient way of producing  $X$ , as long as the marginal productivity in the household sector exceeds the productivity of the individual in the market.



component of the female's time constraint, which is relevant for her labor supply decision.

No hiring and no change in the allocation of time to household and market work occurs, if the minimum amount of necessary production is less than the efficient amount. This means that at any given point in the production of  $X_{\min}$ , the marginal productivity at home is higher than the woman's wage rate. If  $X_{\min}$  increases and the wage of the hired worker is greater than the householder's wage, the householder will devote more of her time to home production and less time to the market. Finally, if  $X_{\min}$  exceeds the efficient amount produced at home and the householder's wage is greater than the wage of a domestic worker, hiring occurs. The householder's hours of home work remain unchanged, since her efficiency in this type of production has not been altered. The extent to which the woman devotes the time she has gained by hiring a domestic worker to the paid labor market or to leisure cannot be predicted.

Thus, the householder has to decide on her allocation of time and whether to hire a domestic worker. This set of decisions depends on the minimum amount of housework to be done, the woman's market wage opportunities, her non-wage income, the cost of hiring a domestic worker, and the efficiency of the householder in home production.

## 5. Empirical procedure

### 5.1 Method and variable description

The household's hiring decision and the female partner's labor supply decision are treated here as discrete choices with binary dependent variables. Therefore a probit model is used for the regression (see Greene 1993, for example). In a first step, separate equations for each decision are estimated. In the first equation, the dependent variable equals 1, if the household reports on *employing domestic help* either regularly or occasionally, 0 otherwise. If the female partner reports on *participating in the labor market*<sup>20</sup>, the dependent variable of the second equation equals 1, 0 otherwise.

To control for a possible interdependence between the hiring and the labor supply decision, a bivariate system of equations is estimated in a second step. Along with the simultaneously estimated coefficients for both equations, the correlation among their error terms is calculated. In a bivariate

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<sup>20</sup> Labor force participation is defined here as being either full-time or part-time employed, in vocational training or marginally employed, and not being registered as unemployed.

probit regression, these correlations can indicate the interdependence of the two decisions, holding other factors fixed (see Greene 1993).<sup>21</sup>

The decisions to hire domestic help and to participate in the labor market are assumed to depend on the minimum amount of housework to be done, the woman's market wage opportunities, her non-wage income, the cost of hiring a domestic worker, and the efficiency of the householder in home production.<sup>22</sup> These factors differ substantially from each other with regard to the degree by which they can be observed empirically (see *Table 2* for a description of the variables and descriptive sample statistics).

*Table 2*  
**Description of variables and unweighted descriptive sample statistics (western German partner households, woman 25 – 55 years old)**

Variable	Mean	Standard deviation <sup>a)</sup>
Employment of domestic help	.08	–
Female partner participates in labor market	.62	–
University degree	.09	–
Vocational degree	.71	–
“Mittlere Reife” or “Abitur” <sup>b)</sup> , no vocational degree	.05	–
Female partner's age	39.01	8.75
Female partner's age squared	1598.37	702.33
No. of rooms bigger than 6 m <sup>2</sup>	4.16	1.50
No. of children between age 0 and 3	.20	.45
No. of children between age 4 and 6	.19	.45
No. of children between age 7 and 12	.33	.63
No. of children between age 13 and 16	.22	.48
No. of children older than age 16	1.26	1.07
Person needing long-term care in household (yes / no)	.01	–
Owner of residence	.55	–
Monthly household net income, woman's wage excluded, divided by 100	38.83	19.94

Note:

<sup>a)</sup> Standard deviations are not displayed for binary variables.

<sup>b)</sup> “Mittlere Reife” usually takes 10 years of schooling, “Abitur” takes 13 years.

Source: German Socio-Economic Panel, wave 11 (1994), author's calculations.

<sup>21</sup> This empirical strategy has also been applied in studies similar to the one presented here. Merkle (1994), for example, estimates a bivariate probit when analyzing the relationship between a woman's labor market participation and the use of non-familial day-care for children in Germany. Suen (1994) uses a bivariate probit model for the analysis of the demand for domestic servants, and female labor supply in Hong Kong.

<sup>22</sup> Suen (1994) considers the woman's market wage rate, her non-wage income, age, and the number of children only.

- *Minimum amount of housework*

The minimum amount of housework necessary to maintain the household ( $X_{\min}$ ) is not directly observable. Since prime household duties are cleaning, washing, and cooking,  $X_{\min}$  is assumed to be determined in a major part by the size of the residence, the number of children in the family (and their respective age)<sup>23</sup>, and whether a person needing long term care lives in the household.

- *Market wage opportunities of the female partner*

For women who choose not to work, the market wage rate is unobservable. The woman's wage opportunities, however, can be regarded as a function of her education and age. Thus, it would be possible to use a selectivity-bias corrected regression to construct a predicted wage (see Heckman 1979). Findings by Suen (1994), however, suggest that education variables can be substituted directly into the probit regression without remarkable changes in the outcome of the other variables' coefficients. Instead of entering years of education into the regression, a set of dummy variables is used here to measure the householder's endowment with human capital, represented by the highest schooling or vocational degree she received. This accounts for the fact that the German labor market rewards formal qualifications in particular (see Konietzka 1999, for example). The reference category is having little or no schooling or a vocational degree. Since a non-linear effect of age is assumed, the female partner's age and age squared are included in the equation, representing a further standard determinant of her market wage opportunities.

- *Woman's income unrelated to market work*

The household's monthly net income minus the female partner's own labor earnings is regarded as income unrelated to her employment status. Additionally, information on whether the couple is owner of its residence is included in the model, serving as an indicator for asset income or mortgage payment commitments. Thus there is no expected sign of the coefficient.

- *Cost of hiring a domestic worker*

Unfortunately the data do not provide this information.<sup>24</sup> However, Suen (1994) argues that if price information in the market for domestic helpers is

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<sup>23</sup> Particularly the age of the youngest child is regarded as an important determinant of a woman's propensity to seek a job in the labor market (e.g., Kreyenfeld and Hank 2000).

<sup>24</sup> Studies investigating the use of childcare often face similar problems and have to rely on estimated costs (cf. Merkle 1994, for example). The attempt to measure the cost of domestic helpers by calculating the hourly wage of marginally employed women in western Germany on basis of the SOEP data did not produce any reliable estimates, though.

assumed to be reasonably good, there only will be one price, and one can treat the price of domestics as a constant in a cross sectional analysis.

- *The efficiency of the householder in home production* is empirically not observable and can therefore not be entered into the model, although its relevance is theoretically acknowledged (cf. Gronau (1977) on the evaluation of household sector output and the housewife's productivity at home).

## 5.2 Regression results

Only western German partner households, where the female partner is between 25 and 55 years old, are considered. The age restriction is due to the particular interest in the hiring decision in connection with the woman's labor supply decision. The regression results are displayed in *Table 3*.

*Table 3*

**Western German partner households (woman 25 – 55 years old) – Probit estimates for hiring of domestic help and woman's labor force participation decision**

Variable	PROBITS probit coefficient (standard error) <i>marginal effect</i> <sup>a)</sup>		BIVARIATE PROBIT probit coefficient (standard error) –	
	<i>hiring</i>	<i>participate</i>	<i>hiring</i>	<i>participate</i>
University degree	1.114 *** (.215) .213	.714 *** (.168) .230	1.112 *** (.215)	.715 *** (.169)
Vocational degree	.129 (.184) .012	.285 *** (.105) .109	.127 (.183)	.274 *** (.105)
“Mittlere Reife” or “Abitur”	–.043 (.373) –.004	.103 (.192) .038	–.051 (.373)	.100 (.192)
Age	.121 (.083) .012	.137 *** (.050) .052	.111 (.082)	.138 *** (.049)
Age squared	–.001 (.001) –.0001	–.002 *** (.001) –.001	–.001 (.001)	–.002 *** (.001)
No. of rooms	.143 *** (.040) .014	.068 ** (.030) .026	.144 *** (.040)	.070 ** (.030)
No. of children 0 – 3	.458 *** (.167) .044	–1.329 *** (.117) –.500	.421 *** (.166)	–1.323 *** (.116)
No. of children 4 – 7	.449 *** (.151) .043	–.488 *** (.105) –.184	.436 *** (.150)	–.484 *** (.105)

*continued next page*

Table 3 (continued)

Variable	PROBITS probit coefficient (standard error) marginal effect <sup>a)</sup>		BIVARIATE PROBIT probit coefficient (standard error) -	
	hiring	participate	hiring	participate
No. of children 7 – 12	.321 *** (.122) .031	-.440 *** (.085) -.166	.301 ** (.122)	-.441 *** (.085)
No. of children 13 – 16	.301 ** (.138) .029	-.244 ** (.098) -.092	.293 ** (.137)	-.243 ** (.098)
No. of children older than 16	-.361 *** (.095) -.035	.027 (.066) .010	-.345 *** (.094) .024 (.066)	
Person needing care in household	.227 (.444) .026	-.723 ** (.307) -.282	.224 (.435)	-.710 ** (.302)
Owner of residence	.150 (.134) .014	.062 (.086) .023	.156 (.134)	.060 (.086)
Monthly income	.011 *** (.002) .001	-.010 *** (.002) -.004	.010 *** (.002)	-.010 *** (.002)
$\rho$	-	-	.299 *** (.077)	
N	1386	1386	1386	
P(Sample)	.081 (.273)	.618 (.486)		-

Note:

<sup>a)</sup> The marginal effects were calculated at the mean of the independent variables. STATA does not provide marginal effects for bivariate probit regressions.

Significance: \*  $p \leq 10$  \*\*  $p \leq .05$  \*\*\*  $p \leq .01$

Source: German Socio-Economic Panel, wave 11 (1994), author's calculations.

In the hiring equation as well as in the labor force participation equation, the coefficients of the human capital variables show the expected signs. Having a university degree has a particularly strong and highly significant positive impact on both decisions. The probability of employing a domestic helper, or participating in the labor force, respectively, is more than 20 percentage points higher, for female partners with a university degree, than for women having low or no schooling or a vocational degree. While having a vocational degree has a positive and significant effect on the woman's labor supply decision, educational degrees other than a university degree turn out to have no significant effect on the hiring decision, compared to the reference group.

Being older raises the probability of hiring domestic help by about 1.2 percentage points for each additional year. The age function has a concave

shape, where the maximum probability to employ help would be reached, if the female partner was 60 years old. The peak age for joining the labor force is 34 years.

Most of the variables used to estimate the minimum amount of necessary housework come out with the expected signs in both equations and are statistically significant. The number of rooms as well as the existence of young children in the household positively affects the household's hiring decision. Additional children up to the age of 16 each raise the probability of employing help by 3 to 4 percentage points. As the children become older, however, the coefficients get a negative sign: each child in the household older than 16 years lowers the probability of hiring by about 3.5 percentage points. In the labor force participation equation, the negative influence of children on the female partner's labor force participation decreases continuously as the children age.

The outcome of the variable indicating whether a person needing care lives in the household turns out to be insignificant for the hiring decision, but shows a strong and negative impact on the female's labor supply. Being owner of the residence is insignificant for the decision to hire domestic help as well as for the female partner's labor force participation decision.

The woman's non-labor income shows the expected signs in both equations, although the effects are very small. For a 1 percentage point increase in the probability to hire, the monthly net income unrelated to the female partner's employment status would have to increase by 1,000 DM. The effect on the female's labor supply is stronger, but still small: an income growth of 250 DM lowers the probability to join the labor force by 1 percentage point.

Turning to the bivariate probit regression, we find that a simultaneous estimation of the household's hiring decision and the woman's labor force participation decision barely changes the coefficients discussed above. However, the outcome of the variable  $\rho$ , denoting the correlation coefficient between the error terms of the bivariate probit regression, is positive and statistically significant. This indicates a complementary relationship between the household's demand for domestic labor and the female partner's labor force participation decision.<sup>25</sup>

## 6. Concluding remarks

The descriptive analysis in *Section 3* has shown that in a large share of western German households which employ domestic help no member participates in market work at all. Almost every third retired single hires a

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<sup>25</sup> Cf. Suen (1994), who gets a similar result when analyzing data from Hong Kong.

housekeeper, and the share of partner households employing a helper is equally high, regardless of whether none or both of the partners work (about 11.5% in both cases). This causes not only doubts on whether the current tax policies are designed appropriately regarding their explicit aim to facilitate employment in private households. One might also question if the decision to hire domestic help and the female labor supply decision are as closely related as is suggested by the theoretical model developed in *Section 4*. While about 50% of married western German women participate in the labor force (see Statistisches Bundesamt 2000), only a relatively small fraction of about 8% of partner households with the woman in her prime age for labor force participation employs a domestic worker.

For a sample of households and women, a bivariate probit regression model has been estimated to investigate in a multivariate analysis whether the decision to hire a domestic helper and the woman's participation in market work are joint decisions, holding other factors fixed. The statistically significant correlation between the error terms of the two equations indicates that the decisions are interrelated. Both are found to depend on the minimum amount of housework that is necessary to maintain the household, the woman's market wage opportunities, and her non-wage income.

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