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The Availability of Child Care and Mothers' Employment in West Germany

by
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Berlin, December 1999

* Die Autoren waren im Juli 1999 als Gastforscher bei der SOEP-Projektgruppe im DIW tätig

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The Availability of Child Care and Mothers' Employment in West Germany

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December 1, 1999

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Abstract: There is a vast empirical literature investigating the effects of child care costs on female employment. Day care costs are usually treated as a reduction in female wages, which is supposed to negatively affect a woman's propensity to participate in the labor market. In this paper, we argue that due to peculiarities of the German day care regime, an analysis of the effects of child care on mothers' employment in Germany should rather focus on the availability than on the affordability of care. Our empirical findings cast doubt on the effectiveness of the current German day care regime with regard to enabling mothers to work in the labor market.

1. Introduction

In most industrialized countries there is considerable consensus that day care for children should be publicly subsidized. Day care subsidies are assumed to promote female employment and create equal chances for children from deprived backgrounds. Since the pioneering work by HECKMAN (1974), the effects of day care costs are usually considered as a reduction in female wages, which is supposed to negatively affect a woman's propensity to work in the market. However, by focusing primarily on cash subsidies, the question got out of sight, how access to child care affects mothers' employment.

In Germany, as in most western European countries, child care slots are provided by the local municipalities. Due to heavy regulations, high market barriers of entry, and a dominance of public providers, there are hardly any additional private providers of day care. Therefore, individual behavior might be less influenced by the *affordability* of day care, but by its *availability*.

In the first part of this paper, we review the standard neoclassic approach that relates child care subsidies to individual behavior. In part two, we discuss the German day care regime and its specific features. The peculiarities of this system render the standard neoclassic models of labor supply and child care demand less appropriate. In a logit model, we eventually estimate, how the availability of public and informal day care arrangements affect female labor supply in West Germany. As a data source, we are using the *German Socio-Economic Panel* (SOEP). Additional information is drawn from the *Statistik Regional* database (STATISTISCHES BUNDESAMT 1997).

Our major finding is that the provision of public day care in its current form has no effect on female employment. We explain this by the German child care policy, which does not set sufficient incentives for public providers to adjust to the needs of working parents.

2. Child Care Costs and Individual Behavior

Economics deal with the effect of costs and benefits on individual behavior, where costs and benefits should preferably be quantifiable in terms of money. The applicability of the neoclassic framework is straightforward: higher costs mean higher disincentives, while higher benefits mean higher incentives to undertake an action. As action is a result of the comparison of costs and benefits, an individual will not undertake a certain action if the net benefits become negative.

In the same straightforward way, child care costs are introduced into the neoclassic model. They are generally understood as costs incurred by parents who do not take care of their child themselves, but give it to a day care center or a child minder instead. The child minder or the day care center charges the parents for having their child in care. These costs are assumed to affect various 'spheres' of individual decision making. Child care costs might affect fertility, the consumption of other goods and services, labor supply, and certainly the demand for care. However, in the center of economists' attention have been the effects of child care costs on female labor supply.

Mostly the simultaneity of labor supply and the demand for care are addressed in two or three equation models (see e.g. CONELLY 1992), or using instrumental variable techniques (GELBACH 1998). In accordance with HECKMAN (1974), the costs of child care are generally viewed as a reduction in female net wages, which results into a flatter budget constraint for women with children. Although the theoretical model leaves open, whether the income or the substitution effect dominates, it is mostly believed that higher child care costs reduce female labor supply.

Government intervention comes into the model in form of child care subsidies. Child care subsidies are treated in a similar fashion as other transfer payments, i.e. they are assumed to affect the shape of the budget constraint. "If a child-care program gives a woman with a child an hourly supplement for each hour she works, (...), the supplement is equivalent to a wage change of equal magnitude (...)" (HECKMAN 1974: 137). Therefore, costs of child care can just as well be considered as a tax, reducing net wages (ERMISCH 1993), and means tested child care subsidies can be treated as proportional income taxes (ILMAKUNNUS 1996). Empirical tests that set out to investigate into the relationship between female labor supply and child care subsidies mostly found the expected negative relationship between labor supply and child care costs (e.g. BLAU / ROBINS 1988, POWELL 1998).

When child care costs are included into the economic model, it is usually assumed that there is a functioning market system, where the parents' willingness to pay decides on the amount of child care they purchase. This model perfectly fits to the analysis of the child care tax credit in the US, or the child care cash rebate and the child care assistance in Australia. For Germany, this framework might fit the analysis of the child rearing benefits (*Erziehungsgeld*), or child benefits (*Kindergeld*). However, both measures cannot be understood as child care subsidies. Child rearing benefits foster parental care, but they provide no incentive for out-of-home care. In Germany, cash transfers supporting the use of (out-of-home) child care are of very limited importance only¹. Instead, the government provides public day care slots, heavily regulates non-profit providers, and sets up high market barriers of entry for private providers. In the case of a day care regime that is characterized by a high share of public provision and a rather unimportant private market, the costs of care (i.e. the question of affordability) lose some of their importance. What really matters instead, seems rather the question of availability of child care slots.

In the following, we describe the German day care regime and how it deviates from the 'ideal' of a child care market, where the price of care regulates demand and supply.

¹ It should be noted that child care costs are tax deductible in Germany (*Abzugsmöglichkeiten für Kinderbetreuungskosten*). So far, they only apply to lone parents, but the law will be revised and extended to all parents in 2000 (BUNDESVERFASSUNGSGERICHT 1999).

3. The German Day Care Regime

GUSTAFSSON and STAFFORD (1994) introduced the term 'day care regime', referring to the pioneering work of ESPING-ANDERSEN on the three worlds of welfare capitalism. Although government intervention into the child care market is only one aspect of a welfare state, GUSTAFSSON and STAFFORD (1994) point out that child care policy can significantly affect behavior and well-being of individuals living under such a regime. For the purpose of categorization, the following indicators might be useful:

- the form of child care subsidies (in-kind or cash transfers),
- the coverage level reached by public intervention, and
- the degree of quality regulation.

On the basis of this scheme, one could describe the United States as a child care regime that mostly provides cash transfers, with a low level of coverage, and a low level of quality regulation (SPIESS 1998). As a contrasting example, mostly Sweden is named, with a high coverage of public day care slots and a high regulation of day care quality. Germany's day care regime can be described best as a regime, where day care is publicly provided, and where there is a high level of quality regulation (REIDENBACH 1996). There is a medium coverage in West Germany, and a high coverage in East Germany. The distinct features of the German system which we are going to discuss in detail are

- regional variations in supply,
- child care fees,
- the organization of public supply, and
- the non-existence of a private child care market.

Regional variations in supply

Germany is a federalist state. The highest administrative level is the federal level (*Bund*), formed by the 16 states (*Bundesländer*). Usually analyses are done on the state level. It is the local communities, however, which are responsible for financing and providing public day care. In 1994 they spent about 20 billion DM (about \$ 10 billion) on the provision of day care (STATISTISCHES BUNDESAMT 1996). Therefore it does not seem appropriate to use states as the unit of analysis. In our paper we analyze *Kreise*, which is very close to the community level and the smallest regional unit for which data are available. Because reliable data for East German *Kreise* are not yet available, we do not include the eastern states in the analysis. This leaves us with 327 West German *Kreise* (not including Berlin).

One can best classify public day care centers by the age group of children they care for. This classification makes sense, as the provision levels for these age groups differ substantially. Moreover, most day care centers only serve one or the other age category. These categories are:

- day care centers for infants age 0-3 (*Krippe*),

- day care centers for pre-school children age 3-6 (*Kindergarten*), and
- day care centers for (primary) school-age children age 6-10 (*Hort*).

Regional variations in supply reflect the fact that the actual planning of the number of slots to be provided takes place on the community level. Table 1 displays the average provision rate on the Kreis level for each West German state in 1994, plus the respective coefficient of variation.

Table 1: Regional variation of slots in day care centers per 1000 children of different age groups – West Germany 1994* (Mean of provision rates on Kreis level. Coefficients of variation in parentheses.)

| Federal State | Krippe (Age 0-3) | Kindergarten (Age 3-6) | Hort (Age 6-10) |
|-------------------------------|---------------------|---------------------------|--------------------|
| Schleswig-Holstein | 13.0 (0.80) | 757.5 (0.09) | 45.2 (0.92) |
| Hamburg** | 119.0 | 593.0 | 212.0 |
| Niedersachsen | 15.9 (0.97) | 747.4 (0.10) | 30.0 (1.02) |
| Bremen | 45.0 (0.97) | 709.5 (0.18) | 128.5 (0.53) |
| Nordrhein-Westfalen | 14.6 (0.63) | 736.7 (0.08) | 36.4 (0.92) |
| Hessen | 19.4 (1.03) | 904.1 (0.10) | 61.0 (1.23) |
| Rheinland-Pfalz / Saarland | 12.1 (0.94) | 1044.3 (0.08) | 31.5 (1.11) |
| Baden-Württemberg | 14.7 (1.13) | 1077.8 (0.07) | 30.6 (1.24) |
| Bayern | 13.2 (0.93) | 898.8 (0.13) | 45.7 (1.09) |

Note: The mean provision rates are calculated on the basis of the Kreise. They are not standardized and therefore do not reflect the actual provision rate in the state.

* Not including West Berlin.

** No coefficient of variation is displayed, as Hamburg consists of one Kreis only.

Source: BAUEREISS / BAYER / BIEN 1997, authors' calculations

With the upswing of the (West) German educational reform (*Bildungsexpansion*), day care for preschoolers became established in the 1970s (COLBERG-SCHRADER 1993).

Since 1996, the local communities are required by law to offer day care for all children between 3 and school age for half of the day. Therefore, we find a high provision rate for pre-school children. But although the relatively low coefficients of variation indicate a rather homogenous distribution of child care slots within the federal states, we still find substantial differences across states. While in Nordrhein-Westfalen there are only 737 slots available for 1000 children of the respective age group, supply seems to exceed the number of children in Baden-Württemberg, where 1078 slots are provided for 1000 children. However, this provision relates in the first place to care in the morning hours, mostly not even including lunch time².

While half-day care for pre-school children is established, there are still hardly any day care slots available for infants (age 0-3). Here, too, variation across states is high, especially if one compares the city states of Hamburg and Bremen (with the highest provision rates) to the other West German states. Similar applies to school-age children. This is of major importance in Germany, as schools are open only in the morning hours and do not start or end the same time every day. Moreover, the rather high coefficients of variation show that there are substantial differences in the provision with slots for infants and school-age children between Kreise within the states.

In a representative survey, TIETZE, ROSSBACH and ROITSCH (1993) interview local youth organizations in West Germany about the supply of day care in their region. They find significant variations in the provision of day care for infants and school age children in rural and urban areas. They conclude that rural areas are discriminated in the provision of day care. In Table 2, we display the provision rate on the Kreis level by population density. Similar to the study by TIETZE, ROSSBACH and ROITSCH (1993), we find that West German Kreise with a population density of 500 or less inhabitants per square kilometer provide less than half as much day care slots per 1000 infants age 0-3 as those Kreise with a higher population density. On average, the latter provide even four times more slots for school-age children. The observed discrimination of less populated areas, however, does not hold true for the provision with kindergarten slots.

Most profound are still the differences between East and West Germany. In East Germany, as an inheritance from socialist GDR, there is still a high coverage of day care slots (WAGNER / HANK / TILLMANN 1995). The provision of children's day care has been cut down significantly since unification, though. Nevertheless, provision rates for infants and school-age children in East Germany are more than ten times as high as in West Germany (see Table 3). The severest difference, however, is in the opening hours of the provided day care. In West Germany, day care for children in pre-school age is in general for half of the day only, not including lunch. Only 17 percent of the day care centers offer all-day-care. In East Germany, on the other hand, almost all day care centers for pre-school children (97 %) offer universal care.

² Unfortunately we are not able to distinguish day care slots by opening hours on the regional level.

Table 2: Provision of slots in day care centers per 1000 children of different age groups by regional population density – West Germany 1994 (Mean values. Coefficients of variation in parentheses.)

| Population density of Kreis | Krippe (Age 0-3) | Kindergarten (Age 3-6) | Hort (Age 6-10) |
|---|---------------------|---------------------------|--------------------|
| <= 150 inhabitants per square kilometer | 9.05 (0.49) | 869.84 (0.17) | 17.93 (0.82) |
| <= 500 inhabitants per square kilometer | 10.50 (0.72) | 923.50 (0.17) | 22.63 (0.93) |
| > 500 inhabitants per square kilometer | 25.95 (0.83) | 857.71 (0.17) | 83.50 (0.69) |

Source: BAUEREISS / BAYER / BIEN, 1997, STATISITK REGIONAL 1997, authors' calculations

Table 3: Child care provision rates in East and West Germany 1994

| | East Germany | West Germany |
|---|--------------|--------------|
| Krippe (0-3) | 41.3 % | 2.2 % |
| Kindergarten (3 – 6) | 116.8 % | 85.2 % |
| Kindergarten (3 – 6), all day including lunch | 97.0 % | 17.0 % |
| Hort (6-10) | 59.7 % | 5.1 % |

Source: DEUTSCHES JUGENDINSTITUT 1998

Child care fees

If parents have a child in day care, they have to pay a fee. The actual amount is usually specified by the federal state or the local community. Child care fees are supposed to take into account the parents' income. If this was the case, working parents would face higher child care costs than parents who do not work. However, hardly any correlation is found between household income and child care fees charged (KREYENFELD / TILLMANN / WAGNER 2000). Generally, child care fees should cover between 10 to 20 percent of the operating costs (FLEHMIG / BINDER / WAGNER 1995). Data from the German Socio-Economic Panel suggest that in 1996 the monthly fee for a pre-schooler in care for all day is 150 DM (about \$ 80). The respective average monthly amount paid for child care by US parents is \$ 240, i.e. about three times as high (ANDERSON / LEVINE 1999). This

suggests that, even if there is an effect of child care fees on mothers' employment in Germany, it can be treated as rather negligible³. Out of this reason, we believe it is more important to focus on the provision, i.e. the availability of public day care, and its regional variations.

Organization of public supply

The provision of public day care is financed and planned on the community level. However, Germany has a long tradition of the so called „subsidiarity principle“ (*Subsidiaritätsprinzip*). In line with this principle, social services should preferably be provided by non-profit organizations (*Verbände*). Since the beginning of institutional day care in the early 20th century, church organizations particularly engaged in the provision of children's day care (ERNING 1987). Because local governments are still requested to follow the subsidiarity principle, the government either provides own day care slots, or allocates money to NPOs, which in turn provide day care. These subsidies generally cover up to 90 percent of the operating costs (FLEHMIG / BINDER / WAGNER 1995). While in West Germany about half of all slots in day care centers are supplied by subsidized NPOs, these are of minor importance for the supply of day care in East Germany (RAUSCHENBACH 1995). Day care provided by NPOs is not public day care in the narrowest sense. However, we will also refer to day care provided by NPOs as public day care, as it is mainly funded by the tax payer. Moreover, admission policy and fees do not differ significantly between public day care centers and those run by NPOs.

On the community level it is decided, which providers receive subsidies, and if the community itself should provide public day care centers. This planning process is supposed to take into account the needs of the parents. It can be doubted, however, that this is the case, because the information transfer works in one direction only. While the local representatives get informed about an excess supply of slots, there is no mechanism informing them about an excess demand. It is quite common, for instance, that the number of slots provided in the previous year is simply extrapolated, correcting for population growth (COLBERG-SCHRADER / ZEHNBauer 1996). Apart from population growth, local municipalities hardly take into account any other indicators of possible changes in the demand for day care. However, if there is an excess supply, i.e. if slots are not used, they will be cut down in the consecutive planning process. This could be observed in East Germany, for example. In the years following unification, female unemployment and women's use of three years of maternity leave have negatively affected the demand for out-of-home care. With a certain time lag, public supply has consequently been cut down. It is rather doubtful, whether it will be extended again, if in the future the demand for child care slots is increasing again.

On these grounds, one can argue that parents have to take the provision of day care as exogenous to their employment decision. Interviews conducted by the

³ MERKLE (1994) imputes missing child care costs on basis of a tobit model, and uses the imputed costs to estimate their effect on the probability of a mother to be engaged in market work. However, she finds no significant effect of child care costs on female employment in Germany.

DEUTSCHES JUGENDINSTITUT (1998) support this line of argumentation. They conclude that the parents' demand for day care develops in reference to the slots they assume to be publicly provided in the area they live in, and not necessarily with regard to their actual needs.

Non-existence of a private child care market

The most interesting feature of the German child care regime is that no private day care market has ever really evolved. In other countries, e.g. in Great Britain, private child minders or private day care centers have evolved, meeting the demand, which is not satisfied by public providers. In contrast to this experience, hardly anything like that has happened in Germany. There are even too few private day care centers for the German census to mention them in the official statistics. Child minders are also still of minor importance. The Institute for Employment Research (IAB) conducted a survey on female labor supply and child care in 1995 (ENGELBRECH / JUNGKUNST 1998). They find that the use of child minders varies between 4 and 10 percent for employed mothers, depending on the age of the child and the region of residence. The use of child minders is found to be highest for children under the age of 4 in West Germany. There is practically no use of child minders in East Germany.

Table 4: The use of care arrangements of employed mothers by age of the child – East and West Germany 1995 (Multiple answers allowed.)

| | West Germany | | East Germany | |
|----------------|--------------|---------|--------------|---------|
| | Age 0-4 | Age 4-6 | Age 0-4 | Age 4-6 |
| Mother | 84 % | 69 % | 36 % | 37 % |
| Spouse | 34 % | 31 % | 9 % | 16 % |
| Grandparent | 45 % | 33 % | 30 % | 21 % |
| Other relative | 10 % | 8 % | 9 % | 2 % |
| Child minders | 10 % | 7 % | 3 % | 2 % |
| Day care | 5 % | 57 % | 21 % | 74 % |

Source: ENGELBRECH / JUNGKUNST 1998

One can basically take four positions to explain the lack of a private day care market in Germany. First, it could be argued that informal care arrangements (e.g., grandparents) meet most child care needs of parents. Second, one could argue that market failure prohibits the evolution of a market system. Third, it could be argued that there is simply

no demand, or rather that women are not willing to pay the market price of child care. And fourth, one could argue that high market barriers of entry and heavy regulations keep out private day care providers.

Almost half of all West German women rely on informal child care arrangements (see Table 4). This could be a consequence of a lack of public and private supply. There is, however, doubt that this is due to market failure. SPIESS (1998) shows that there is little evidence for child care being so different from other goods and services which are regularly provided by the market system. Moreover, other countries show that a market system can function to provide day care. Therefore it is believed that the dominance of public providers and heavy regulations keep out private day care providers (MONOPLKOMMISSION 1996/97). Additionally, some evidence is found that there is only a medium willingness to pay the market price for day care. The IAB survey points to the fact that not more than 11 percent of all working mothers in West Germany, and 17 percent in East Germany are willing to pay more than 400 DM per month for day care (see Table 5). One could speculate that parents who are used to pay only small fees for day care, subjectively evaluate charges of private providers as too high.

Table 5: Willingness of working mothers to pay for child care – East and West Germany 1995

| Age of the child | West Germany | | East Germany | |
|------------------|--------------|---------|--------------|---------|
| | Age 0-3 | Age 4-6 | Age 0-3 | Age 4-5 |
| 0 DM | 16 % | 20 % | 8 % | 6 % |
| Up to 200 DM | 45 % | 54 % | 39 % | 54 % |
| 200 to 400 DM | 28 % | 34 % | 36 % | 34 % |
| 400 DM or more | 11 % | 6 % | 17 % | 6 % |

Source: ENGELBRECH / JUNGKUNST 1998

In the absence of a private day care market and a largely exogenous public supply of day care, it becomes rather dubious to study the effect of child care costs on female labor force participation. Especially in the German context, it might therefore be more appropriate to emphasize the question of availability, rather than affordability, when analyzing the impact of child care subsidies on individual decision making.

4. The Availability of Day Care and Mother's Labor Force Participation in West Germany

Method

We estimate a logistic model on the effects of the availability of day care on mother's employment in West Germany. By availability of care, we understand access to public day care and informal child care arrangements. The mother's employment status is modeled as a binary variable⁴.

As the regional provision with child care places certain restrictions on the individual actor's behavior, we have to consider micro and macro level data. It has to be taken into account that observations on the micro level are not completely independent from each other, but that people share same regional contexts and therefore partly face similar constraints. Using a simple logistic regression, for example, neglects the nested structure of such data. This leads to biased estimated standard errors of the coefficients, because the random disturbances in the regression are correlated (e.g., MOULTON 1990). The robust Huber-White estimator of variance, however, allows relaxing the assumption of independence of the observations. Its formula considers clustering of individuals in regional units, thereby producing correct standard errors (in the measurement sense), even if the observations are correlated (STATA CORP. 1999).

Using the Huber-White estimator in our logistic model, we estimate the probability of a West German mother with at least one child under age 12 to participate in the labor market. We restrict our analysis to West Germany, because only western Kreise can be properly linked with the SOEP data⁵, and reliable Kreis level information on the provision of day care in East Germany is not yet available.

We estimate separate regressions for women where the youngest child is less than three years old, between age three and school age, and where the youngest child is of school age. This seems appropriate with respect to the huge differences in the availability of care for children at different ages (see Table 1). Furthermore, there are special regulations, such as the eligibility to child rearing benefits or maternity leave, which are likely to reduce a mother's propensity to engage in market work early after the birth of her child. This should be considered when the coefficients of our model for mother's with infants are interpreted.

⁴ We also estimated a model for the probability to work part-time or full-time, respectively. As these results did not differ much from those with a binary dependent variable, we only describe the results for the probability to be employed in general.

⁵ Of these 327 Kreise (not including Berlin), 54 are dropped out of our sample, because none of the individuals in the sample lives there. This leaves us with 273 Kreise for the analysis. – For a description of the SOEP, see PROJEKTGRUPPE PANEL 1995.

Table 6: Description of variables

| | |
|-------------------------------------|--|
| Child care characteristics | |
| Child care provision rate | Number of publicly provided day care slots per 1000 children in the Kreis in 1994. Depending on the age of the child, slots are provided in a Krippe, a Kindergarten, or a Hort. |
| More than one child in household | Binary variable that equals one if there is more than one child under age 12 in the household. |
| Social network | Binary variable that equals one if the child's grandparents live in the same town. |
| Individual characteristics | |
| Mother's education | Three binary variables, indicating the highest educational degree of the mother. We distinguish between no degree (reference category), vocational degree, and college degree. |
| Lone mother | Binary variable that equals one for lone mothers whose partner does not live in the same household. |
| Foreign mother | Binary variable that equals one if the mother's nationality is not German. |
| Partner's wage | Partner's monthly net wage, divided by 1000. The variable is set to zero, if the mother does not have a partner. |
| Labor market characteristics | |
| Mother employed | Mother participates either part-time or full-time in the labor force. |
| Unemployment rate | Average unemployment rate in the Kreis in 1996 (in %). |

Discussion of the independent variables

Availability of care. Our main variable of interest is the availability of day care. The availability of care for infants, pre-school and school-age children is measured by the ratio of day care slots to 1000 children of the respective age group in the Kreis. Arguing that arranging child care for the youngest child is most difficult, we consider the child care arrangements for this child only. However, if there is more than one child in the household, the transaction costs involved with organizing child care increase, because it becomes more difficult for the family to find an arrangement that solely relies on institutional care. To account for this effect, we insert a dummy variable indicating the presence of more than one child under age 12 in the household.

Social network. Apart from public provision of day care, access to informal child care arrangements might affect a mother's labor market decision. We control for the access to informal child care arrangements by a dummy variable that indicates, if the grandparents of the child(ren) are living in the same town.

*Human capital characteristics*⁶. Women with higher educational degrees are largely expected to be more likely to work. From the economist's perspective, it is mostly put forward that a higher educated person can expect higher labor market wages. Therefore higher educated women are more likely to work than others, as they expect higher earnings. Sociologists mostly believe that education is correlated with attitudes towards gender roles (BLOSSFELD / HUININK 1989). From this perspective, higher educated women are more likely to work, because they have different attitudes towards employment. In our model we use three dummy variables, where we distinguish between no degree (reference category), vocational degree, and college degree.

Lone mother. We control for being a lone mother using a dummy variable. By lone mothers we understand women with at least one child, who are not married or cohabiting with a partner. We assume that their labor market behavior differs from those women who live in a partnership. Being a lone mother might have an ambiguous effect. On the one hand, lone mothers could be more likely to work, as they have no second income to rely on. On the other hand, lone mothers could be less likely to work than married mothers, as they are more likely to receive means tested social security benefits. Furthermore, a lone mother has one care option less, because there is no spouse to help taking care of the child.

Foreign mother. The differences between native and foreign women in Germany with regard to their engagement in market work, and the structure of the families they live in, are well known and need not be discussed here. We account for this by inserting a dummy variable in the regression, controlling for the mother's nationality.

Income unrelated to mother's work status. Taxes and transfers are usually considered as a key variable to explain labor supply in economic models. In Germany, most transfer payments are means tested. This suggests that the partner's income should have a negative effect on labor supply. The negative effect of the partner's income on a

⁶ We are aware that women who are employed may have acquired more human capital than those who do not, because they initially planned to perform market work. However, we clearly cannot address possible endogeneity problems in this context.

woman's labor supply is supported by the German tax system, which allows tax splitting for married couples (WAGNER 1989). To control for this effect in a very simple way, we use information on the partner's net wage as an indicator for the mother's income unrelated to her own employment. For lone mothers and women with unemployed partners, the partner's wage is set to zero.

Regional unemployment rate. Labor supply certainly not only depends on the willingness of women to participate in the labor market, but also on demand factors. As an indicator for these, we insert the average 1996 unemployment rate on the Kreis level. *Interaction with social network and education*⁷. Lone mothers may depend more on the availability of social networks than those, who have a spouse as an additional care giver. Furthermore, child care networks could be of greater interest for women who feel attached to the labor market. We therefore interact the social network indicator with the human capital variables, and with the dummy variable for lone mothers.

⁷ The interaction terms are not included in the model for mothers with infants, because the number of cases in this category is too small.

Table 7: Descriptive sample statistics - mean and standard deviation *

| | Age of youngest child | | |
|-----------------------------------|------------------------------|------------------|------------------|
| | 0-3 | 3-6 | 6-11 |
| Dependent variable | | | |
| Employed | 0.17 | 0.46 | 0.51 |
| Child care characteristics | | | |
| Child care provision rate | 0.02 (0.02) | 0.86 (0.15) | 0.05 (0.06) |
| More than one child in household | 0.50 | 0.56 | 0.17 |
| Social network | 0.56 | 0.53 | 0.50 |
| Individual characteristics | | | |
| Vocational degree | 0.61 | 0.57 | 0.60 |
| College degree | 0.07 | 0.10 | 0.08 |
| Lone mother | 0.05 | 0.09 | 0.10 |
| Foreign mother | 0.28 | 0.25 | 0.19 |
| Partner's wage | 4,016 (2,867) | 4,020 (4,413) | 3,796 (3,314) |
| Unemployment rate | | | |
| | 0.35 (0.48) | 0.43 (0.50) | 0.40 (0.50) |
| N | 506 | 378 | 338 |

* Standard deviation in parentheses. No standard deviation is displayed for binary variables.

Source: SOEP 1996, STATISTIK REGIONAL 1997, authors' calculations

Regression results

The outcome of the coefficients for the individual characteristics very roughly points to a standard neoclassic interpretation of female employment. It has to be considered, however, that the women analyzed here are a selective sample, as all of them have at least one child. Although the human capital coefficients in the models for mothers having a pre-school or school-age child are not significant, they mostly have the expected positive sign. If the partner's income increases, mothers of children age 3 or older are significantly less likely to be employed. The same is true, if they are Non-German. The regional unemployment rate turns out to have a significant and negative effect on the employment of mothers of school-age children only.

In our data, we find no evidence that the regional provision with day care slots has any significant influence on a mother's decision to participate in market work. We explain this result by the inadequacies of the West German day care regime. Although the quantitative provision with kindergarten slots is almost sufficient, this is not true if qualitative aspects are considered. Due to extremely limited opening hours, a mother cannot even work part-time. And even if this was so, the lack of slots for school-age children would possibly end her employment career once the child has left kindergarten. Because there are no regular school hours in Germany, a mother cannot rely on the school as being a place, where somebody takes care of her child, while she is working.

Thus, mothers who want to work in the market have to find other (at least supplementary) care arrangements for their children. Although our social network variable turns out to be insignificant in all models, the outcome of the respective interaction terms indicate that the existence of an informal child care network plays a significant role for the labor supply of lone mothers, whose youngest child is between 3 and 6 years old. On the other hand, lone mothers of children in this age category who solely have to rely on public day care, are significantly less likely to perform market work. Mothers of children in kindergarten age who can fall back on a social network, and have a vocational or college degree, are also more likely to be employed than others.

Unsurprisingly, a mother's labor force participation decision is negatively attached to the existence of more than one child under age 12 in the household. Although the coefficient is significant only in the model for mothers with infants, one might argue that this is due to a stronger general orientation of multiple mothers towards staying home and taking care of their children. As our sample consists of mothers only, we assume, however, that all of these women place a certain value to family life, children, etc.. Thus, we interpret our findings in the sense that it is nearly impossible for a mother to organize care (formal or informal) for more than one child, plus a job on the market.

Table 8: Regression results (Dependent variable: Employed)

| | Child age 0-3 | | Child age 3-6 | | Child age 6-11 | |
|-----------------------------------|----------------------|-----------|----------------------|-----------|-----------------------|----------|
| | Beta (b) | t | Beta (b) | t | Beta (b) | t |
| Intercept | -1.70 | -4.39 *** | 0.89 | 0.97 | 0.68 | 1.54 |
| Child care characteristics | | | | | | |
| Child care provision rate | -12.40 | -0.10 | 0.16 | 0.20 | -0.79 | -0.33 |
| More than one child in household | -0.69 | -2.72 *** | -0.32 | -1.42 | -0.29 | -1.00 |
| Social network (NET) | 0.06 | 0.24 | -0.62 | -1.48 | 0.13 | 0.30 |
| Individual characteristics | | | | | | |
| Vocational degree | 0.60 | 2.02 ** | -0.10 | -0.22 | 0.23 | 0.58 |
| College degree | 1.32 | 2.64 *** | 0.08 | 0.12 | 0.30 | 0.43 |
| Lone mother | -0.37 | -0.57 | -1.48 | -2.06 ** | 0.01 | 0.01 |
| Foreign mother | -0.21 | -0.65 | -0.68 | -2.29 ** | -0.86 | -2.52 ** |
| Partner's wage | 0.01 | 0.21 | -0.19 | -3.09 *** | -0.09 | -2.13 ** |
| Unemployment rate | 0.33 | 1.48 | 0.46 | 1.08 | -1.02 | -2.30 ** |
| Interaction with NET | | | | | | |
| Vocational degree | -- | | 1.43 | 1.75 * | 0.03 | 0.03 |
| College degree | -- | | 0.85 | 1.65 * | -0.27 | -0.50 |
| Lone mother | -- | | 1.77 | 2.32 ** | 0.14 | 0.15 |
| Pseudo R ² | 0.05 | | 0.07 | | 0.07 | |

Note: Method: Logistic regression, Huber-White estimator of variance
Significance: *** p<.01; ** p<.05; * p<.10

Source: SOEP 1996, STATISTIK REGIONAL 1997, authors' calculations

5. Conclusions

There is a vast theoretical and empirical literature on the effects of child care subsidies on female employment. Day care costs are largely considered as a reduction in female wages and therefore assumed to negatively affect the labor market participation of mothers. Such an approach relies on the assumption of a functioning market system, where parents have the opportunity to purchase the child care they require. In this paper, we argue that at least for Germany, a functioning day care market cannot be taken for granted. Child care is publicly provided by the local municipalities, and hardly any additional private providers exist. Thus, we argue that for the analysis of the effects of child care on female employment, one should rather focus on the *availability* than on the *affordability* of care. In our empirical model, we estimate the impact of having access to public day care or informal care arrangements on the mother's employment status. There is some positive effect of the availability of social networks on the probability of lone mothers and better educated mothers to be employed, if their youngest child is of kindergarten age. However, we find no significant effect of the regional provision rate of public day care on female labor supply in Germany. This result casts doubt on the effectiveness of the German day care regime with regard to enabling mothers to work on the labor market. Since the 1960s, West German day care policies particularly aim at providing high quality day care with a focus on educating children. However, local representatives have still not realized the necessity to adjust the quantitative and qualitative supply of slots to the needs of working parents.

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