THE DETERMINANTS OF THE ALLOCATION OF TIME TO PAID AND UNPAID LABOUR IN SWITZERLAND: A PRELIMINARY EMPIRICAL ANALYSIS

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1. Introduction

"It can be argued that the fundamental scarce resource in the economy is the availability of human time, and that the allocation of time to various activities will ultimately determine the relative prices of goods and services, the growth path of real output, and the distribution of income" (Juster and Stafford 1991, 471). If one accepts the fact that time qualifies as one of the most important economic resources, then analysing the determinants of the allocation of time seems like a logical point of departure for the understanding of many aspects of economic life. From a sociological point of view, knowing the way people use time tells us something about the society within which they live. How children affect the amount of time worked in the market, how income influences the amount of unpaid work done in society, how education and leisure depend on each other, and how gender differences lead to different time allocations are but a few of the interesting problems tackled by time use analysis.

In economic theory and research, paid labour time (under the heading "labour supply") has received nearly exclusive attention,[1] whereas unpaid labour has gone unnoticed and, as far as the authors of this paper can ascertain, no studies on the determining factors of the allocation of time to unpaid labour in Switzerland exist. This is to a certain extent surprising as unpaid labour is as economical a resource as any other, and one may well assume that an incorporation of unpaid labour in economic theory would enhance our understanding of, amongst others, such fields as economic growth and income distribution. In traditional microeconomic theory, individuals have the choice of spending their time working in the market or consuming (i. e., leisure). This is the traditional dichotomy of time. By maximising their utility (which is a function of market goods and leisure time) subject to a budget constraint,

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1   Numerous studies exist on this topic (see Killingsworth 1983). For Switzerland Gerfin (1990, 1991a, 1991b) and Schwendener (1991) analyse women's supply of paid labour.

individuals determine how much time they should spend working for money and how much time they should spend on leisure. The so-called New Home Economists from Chicago (inspired by the work of Becker 1965) have argued that this dichotomy of time is flawed. They reason that a further time allocation possibility should exist, namely the allocation of time to unpaid (or household) labour. Their main argument is that the dichotomy of time tacitly assumes that leisure and unpaid labour are basically the same thing (Gronau 1977). From a theoretical perspective this assumption implies that changes in socio-economic variables (such as, for example, the wage rate) should have the same effect on both leisure and unpaid labour. As quite a few studies have shown, this is not the case: changes in age, education, experience, income, etc., have different effects on leisure than on unpaid labour (see, for example, Gronau 1977 and Shelton 1992). Furthermore, the dichotomy of time implies that households' time is only productive in the market – the remaining time is only used to consume. Accordingly, time spent rearing children, doing the household, gardening, etc., is not considered productive. Yet, why should a meal produced at home be less "productive" than a meal produced at a restaurant? The New Home Economists have therefore expanded the traditional microeconomic theory by including unpaid (and productive) activities.

The aim of this study is to analyse the determining factors of the allocation of time to paid and unpaid labour for men and women in the German, French, and Italian-speaking parts of Switzerland. Due to the lack of adequate data, very little research has been done on the cross-cultural aspects of the allocation of time. Those studies which do make an attempt (e. g., Evenson 1983 and Douthitt and Zick 1988) concentrate solely on differing *levels*, and not on the *determining factors*. In Switzerland such an analysis is possible as three quite distinct cultures and one data set exist.[2] A main objective of this paper is therefore to show that numerous behavioural differences can be observed between the German, Italian, and French-speaking parts of Switzerland.

The structure of this paper is as follows: In section 2 the conceptual framework is presented. The empirical model is specified in section 3, and in section 4 the data and the empirical results are discussed. Section 5 rounds off this study with a few concluding comments and a summary of the main results.

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2   Although we must confess that our definition of "culture" is somewhat ad hoc.

2. Conceptual framework

The conceptual framework of this study is based on the household theory developed by Becker (1965) and extended, amongst others, by Gronau (1977). This theoretical framework is known as "New Home Economics". In traditional microeconomic theory, households maximise their utility by consuming a combination of market goods, and subject to a budget constraint. The New Home Economists extended and modified this traditional model in two ways (see Gronau 1986): Firstly, they argued that it was not market goods as such which render utility but, instead, household commodities (e. g., a meal). Secondly, the New Home Economists expanded the set of inputs. According to them, commodities are not only produced through the combination of market goods, but also with a certain amount of time. This implies that a household is not only restricted by a budget constraint, but also by a time constraint. Individuals therefore maximise a utility (or "commodity") function which has market goods and leisure (or consumption) time as arguments, and subject to a time and budget constraint. The result of this maximisation problem will give rise to demand functions for the parameters of the utility function and the inputs used in the production of home goods. The reduced form equation for the demand of unpaid and paid labour time can be written as follows:

$$q_k = f(W, V, Z) \qquad q_k \subseteq \{H, L\}$$

H (L) is the time spent doing unpaid (paid) work, W is the wage rate, V is non-labour income, and Z is a vector of socio-economic variables such as age, education, presence of children, etc. The comparative static properties of this model are discussed in Gronau (1977). In the next section the predicted (or expected) effects of the parameters will be analysed.

Compared to the sociological theories underlying the division of the allocation of time within a household,[3] New Home Economics provides a framework which is parsimonious and which can be reasonably well empirically tested. Nevertheless, this framework has been criticised (especially by sociologists) on a number of grounds (see Homan 1988, 29–33 and Berk 1985, 25–30). One of the most ubiquitous criticisms is the neo-classical assumption that individuals are well-informed utility maximisers. In reality such problems as imperfect information, uncertainty, habit formation, tradition, and the rationing of labour time exist, which question the plausibility of the strict neoclassical rationality assumption. Naturally, it is possible to explicitly incorporate these imperfections

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3   To mention is the "conjugal power" school which tries to explain the allocation of time on the basis of role and authority patterns, exchange and choice, family role typologies, and family decision-making. See Berk (1985), 10 ff.

in a theoretical model, yet only at the expense of its empirical tractability. A further shortcoming of the theoretical model presented by the New Home Economists is that it cannot account for so-called "psychic production" (or "process benefits"). Hence, satisfaction, pleasure, frustration, boredom, etc. are not considered in the individual's maximisation problem (see Berk 1985, 27).

3. Empirical specification

Let the reduced-form equations for the amount of time per week spent on paid (L) and unpaid work (H_e for employed, H_{ne} for non-employed individuals) be specified by the following linear models:

$$H_e = \alpha_0 + \alpha_1 \cdot X_1 + \ldots + \alpha_1 \cdot X_1 + \varepsilon$$

$$H_{ne} = \delta_0 + \delta_1 \cdot X_1 + \ldots + \delta_m \cdot X_m + \xi$$

$$L = \beta_0 + \beta_1 \cdot X_1 + \ldots + \beta_n \cdot X_n + \nu$$

ε, ξ and ν are stochastic disturbance terms, the α_i's, δ_i's and β_i's are the coefficients to be estimated, and the X_i's are the exogenous variables. The data was segmented into three categories, namely occupational status (employed, non-employed), gender, and region (German, French, Italian). Subsets of these categories were created so that the determinants of the allocation of time could be analysed with ordinary least squares (OLS) regressions.

The exogenous variables used in the analysis of *unpaid labour* time for the non-employed group are age, household income, number of rooms, and the following dummy variables: marital status, high education, low education,[4] children aged 0 to 6, children aged 7 to 14, children aged 15 to 25, own home. For the employed group three further variables were included: logarithm of the hourly wage rate, flexible working times (dummy), and part-time employment (dummy).

Age is usually introduced as an explanatory variable in order to capture the productivity and efficiency effect in the household. It is thus used as an approximation for experience. The effect that an increase in age has on household production cannot be determined a priori, as the resulting increase in productivity

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4 Degrees from the following institutions were considered as "high education": university, technical college ("höhere Fachschule"), and high school ("Matura", "Diplommittelschule"). The following categories were considered as "low education": no degree, only compulsory schooling, and lower apprenticeship schemes ("Anlehre"). The reference category was primarily made up of apprenticeships ("Berufslehre"), and similar qualifications ("Vollzeitberufsschule", "Meisterdiplom", "Technikerschule").

and efficiency could lead to two opposing effects: on the one hand, it could reduce the price of goods produced at home, and thereby increase their demand, which could result in more time being spent on home production. On the other hand, a set of commodities could be produced in less time, thereby setting time free for other activities. The situation is further complicated by the fact that an increase in age also usually implies an increase in market productivity. The change in unpaid labour caused by an increase in age is therefore also dependent on the relative change in market productivity compared with household productivity. It should also be noted that age may effect the attitude that individuals have towards unpaid labour, and thereby not only affecting household productivity, but also household preferences. One plausible argument could be that younger people are more emancipated which could implicate that women in this cohort are more likely to participate in the market, and consequently spend less time doing unpaid work. Men in this cohort may be more willing to do household tasks.

According to the theoretical household model, a rise in unearned/household (i. e., nonlabour) income increases the amount of goods that an individual can buy (for any given time allocation). The amount of time devoted to unpaid labour will decrease or stay unchanged depending on whether the individual is employed or not. Since neither the marginal productivity of home work nor the real wage rate changes, the amount of unpaid work for employed individuals should not change. Given the pure income effect, an increase in unearned income will increase the amount of time spent on consumption (leisure time) at the expense of paid labour time (naturally, only if market work time is not fixed by institutional constraints). If the individual does not work in the market, then an increase in unearned income will call for an increase in consumption time at the expense of unpaid work (see Gronau 1977). In the empirical analysis unearned income for employed individuals was approximated by the household's income minus the individual's earned income. The household's income includes the labour income of all household members and earnings from assets (such as securities, real estate, etc.). In an individualistic time-allocation analysis the labour income of the other household members may be considered as "unearned income". If one extends the analysis to a two-person household, then it would be wrong to make such an assumption – strictly speaking, the labour income of the partner should then be treated as a separate variable (see, for example, Kiker and Ng 1990 and Homan 1988).

A variable indicating whether the individual owns a house or an apartment has been included. It can be argued that home ownership will induce an individual to spend more time on housing maintenance, and that such maintenance is directly proportional to the size of the home. A variable accounting for the

number of rooms has therefore also been included. As often most maintenance work is done by males, one would expect home ownership to affect primarily the behaviour of males.

The division of labour within a household is often described as a bargaining process, and one must therefore assume that the individual's marital status plays an important role in his or her allocation of time. If one considers the dominant institutional framework in western developed countries (in particular the male and female roles, and the market wage differentials between genders) then it could be expected that being married increases (decreases) the amount of time spent on unpaid work by females (males). This bargaining process was perhaps easier in the past than in the present; the outcome in the past usually being that the man specialised in market work, and the woman in household work. From an economic perspective, the two main reasons for this specialisation was that, firstly, market wages offered to men were (and, to a large degree, still are) higher than those offered to women, and, secondly, women were considered more efficient than men in doing household tasks (see Evenson 1983). With the current increase in female labour market participation in industrialised countries, these two reasons are becoming less important, and consequently the negotiation process is becoming more difficult. Although specialisation along gender lines seems less obvious nowadays, one can still expect marriage to increase the amount of time spent on unpaid labour by females, and decrease that of men.

The effect that education has on the amount of time spent on unpaid labour cannot be unambiguously determined. Since the level of education influences not only the productivity at home but also the productivity in the market, the same argument as for the "age" variable applies. The level of education most probably also affects attitudes towards unpaid labour, although predicting the relationship between these attitudes and the level of education is not a priori possible. On the one hand, a high education (especially among young married males) could be associated with the willingness to spend more time on household activities.[5] On the other hand, a high education (especially among single male and females, and elderly males) may be associated with a diminished importance given to unpaid work by an individual.

Children play an important role in the amount of time devoted to unpaid work, and as a time-intensive good one can assume that the presence of children will have a strong positive effect on the amount of time allocated to unpaid labour. The older the child, however, the less time intensive they should

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5   There is some evidence that people with higher education spend more time taking care of children. See, for example, Hill and Stafford (1985).

become. Note that treating the number of children as an exogenous variable could lead to an endogeneity problem, as the time allocation decision is usually jointly determined with the number of children that a household decides to have (see Malathy 1994).

Including an explanatory variable for the degree of market participation (namely a dummy variable indicating whether the individual works part-time or full-time) could also lead to an endogeneity problem since the allocation of time to non-market work is most probably jointly determined with that of market work, and a market-participation measure such as "part-time" can be described as a "poor proxy" for the amount of hours market work (see Jenkins and O'Leary 1995 for a discussion of this endogeneity problem in time modelling). Strictly speaking, in a life cycle model both the demand for children and a measure for the degree of market participation should be treated as endogenous variables, and hence the time allocation function should be estimated using simultaneous equations methods, instead of estimating a quasi-reduced form equation. In this paper this complication is neglected. Part-time employment can, however, be expected to increase the amount of time spent on unpaid labour.

For employed individuals, the natural logarithm of the wage rate was included as an explanatory variable. An increase in the wage rate makes home production less profitable (it lowers the price of market goods in terms of time), and the amount of time spent on unpaid labour should therefore decline.

For employed individuals, having flexible working hours should be associated with a more efficient allocation of time. Depending on whether the time "saved" working in the market (due to better efficiency) is reallocated to leisure or household work, one can expect flexible working contracts to either have no effect, or a positive effect on the amount of time spent on unpaid labour. It must, however, also be considered that flexible working contracts are usually associated with jobs that carry more responsibility, and that people in such jobs may work more hours per week than the average. In such a case time flexibility will increase the amount of time spent on the market, and thus reduce work at home or leisure.

The exogenous variables used in the analysis of *paid labour* time are age, household income, logarithm of the hourly wage rate, and the following dummy variables: marital status, high education, low education, children aged 0 to 6, children aged 7 to 14, children aged 15 to 25, own home, and flexible working times.

Age is a proxy for the experience in paid employment. Since experience and the marginal productivity of paid employment are positively correlated,

one could expect the amount of time spent on market employment to increase with age. The experience in the household, however, also increases with age, making an a priori prediction impossible. Considering the distinct male and female roles with regards to home and market work, one could expect age to have a positive effect on men and a negative effect on women.

As was discussed above, according to the theoretical household model, an increase in household (i. e., non-labour) income will (given the pure income effect) reduce the amount of time spent on paid employment.

An increase in the wage rate will raise the opportunity costs of spending time on other activities and, thus, increase the amount of time spent working in the market.

In a similar train of thought as with unpaid labour, one can expect the marital status to significantly affect the allocation of time to paid labour. More specifically, being married should increase (decrease) the amount of time spent by males (females) in paid employment. However, and as mentioned above, due to increased female market participation this specialisation trend is not as obvious as before.

One can expect people with a high education to spend more time working in the market, since the opportunity costs associated with time spent working in the household or consuming (leisure) is higher for well-educated individuals than for low-educated individuals.

The effect that the presence of children have on the allocation of time to paid work cannot be a priori determined. On the one hand, children represent a financial obligation, which could induce the parents to increase market employment. On the other hand (and as was discussed above) the presence of children increases the demand for unpaid labour time, possibly at the expense of paid labour time (child-care being a time-intensive activity). More than likely, these opposing effects are gender specific, i. e., men will increase their market employment, and females will reduce theirs.

Home ownership may increase the households costs, as often home ownership is associated with mortgage debts. As a result, one may expect more time being spent in market employment.

As was discussed above, no a priori expectations on the effect time flexibility has on the allocation of time can be made. The expected signs of the coefficients are summarised in table 1.

Table 1

Expected effects on paid and unpaid labour

	Unpaid Labour	Paid Labour
Marital status	+ females / − males	− females / + males
Age	?	?
Education high	?	+
Education low	?	−
Children aged 0–6	+	− females / + males
Children aged 7–14	+	− females / + males
Children aged 15–25	+	− females / + males
Number of rooms	+	na
Own home	+	+
Time flexibility	?	?
Part-time employment	+	na
Household income	+ or unchanged	−
Wage rate	−	+

Note: ? – cannot be determined a priori; na – not applicable

4. Data and Empirical Results

The data are taken from the 1995 "Schweizerische Arbeitskraefte-Erhebung", SAKE (Swiss Labour Force Survey), which is an annually conducted telephonic survey by the Swiss Federal Statistical Office (BFS). A total of 31827 individuals over the age of 15 were questioned to various topics including occupation, job experience, working hours, working conditions, mobility, education, income, and a range of socio-economic factors (such as child-care, living conditions, household composition, etc.).[6] For this study males between the age of 18 and 65 and females between the age of 18 and 62 were selected.

The data for the amount of hours spent doing paid and unpaid work are collected using so-called "stylised" (or "recall") questions, in which respondents must estimate the amount of time spent on paid and unpaid work in the last week. In the case of unpaid labour, individuals were asked to estimate how much time they spent per week doing household work and taking care of the

6   For further information regarding SAKE, see Bundesamt fuer Statistik (1996) and Bundesamt fuer Statistik (1992).

children.[7] For paid labour, respondents were questioned on the usual amount of time spent working in the market. Using a usual-hours instead of an actual-hours measure better reflects long-run accommodations to paid labour time (see Wolf and Soldo 1994). In comparison with data collected by the "diary" method, the quality of such estimates is poor (see Dex 1991). This is especially the case for unpaid labour time, which is subject to greater variance than paid labour time. However, for the purpose of this analysis, this inaccuracy is not too serious, as we are primarily interested in changes and not in actual levels. It is generally accepted that for the purposes of analysing changes even information collected by stylised questions lead to reasonable results (see Bittman 1996). Nevertheless, it is worthwhile mentioning the problems associated with this survey method. Firstly, a weekly recall period is generally considered to be too long, i. e., the data become too imprecise (see Juster and Stafford 1985). Secondly, there is a danger of double counting concurrent activities (e. g. child-care and cooking). Thirdly, there is a danger of systematic error as certain socio-economic groups have a tendency of exaggerating the amount of time spent on particular activities. Niemi (1993), for example, showed that activities which are considered to enhance the social standing of a specific group tend to be overstated. Finally, the data used on unpaid labour in this study is not disaggregated, i. e., only information on the *total* amount of time spent on unpaid work is available. A consequence of setting such an all-encompassing question is that individuals were forced to make their own distinction between leisure and unpaid work.[8] Thus, certain unpaid labour activities (such as gardening) may have been treated by the respondent as leisure.

4.1   Unpaid labour

Table A1 (in the appendix) depicts the results of a regression with unpaid labour (measured in hours per week) as the dependent variable. The sample is made-up of non-employed individuals (i. e., individuals not earning a market wage). Regressions were performed on five sample subgroups, which were partitioned according to region and gender. The male Italian-speaking sample has been omitted due to insufficient data. On average, women do at least twice

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7   "Unpaid labour" is the generic term for a variety of activities such as household work, child-care, gardening, community services, etc. In this study, aggregated data on only two of these activities is available, namely household work and child-care. Nevertheless, in this paper, the terms "unpaid labour" and "household work" are used interchangeably, and, unless otherwise stated, refer to both activities.

8   Unpaid labour is usually distinguished from leisure on the bases of whether or not a certain activity could purposefully be done by a market substitute. This is the so-called "third person" criteria.

as much unpaid work as men, and individuals residing in the Italian part of Switzerland do more unpaid work than those in the French and German parts.[9]

Table 2

Cultural and gender differences for unpaid labour
(non-employed individuals)

	Males	Females
Marital status	0/0	+/+/+
Age	+/+	0/+/+
Education high	0/0	0/0/0
Education low	0/0	0/0/0
Children aged 0–6	0/+	+/+/0
Children aged 7–14	0/0	+/+/+
Children aged 15–25	0/0	+/+/0
Number of rooms	0/0	+/0/0
Own home	0/0	0/0/0
Household income	0/0	0/0/0

Note: The first, second and third entry in each cell represents the sign of the specific coefficient for the German, French and Italian-speaking parts respectively. "0" implies that the coefficient is not significant at the 10% level. The sample size for the Italian-speaking male population was too small, and has been ignored here.

As with most other time-use studies, the R^2 values for male subgroups are relatively small (0.04 and 0.09 for the German and French-speaking parts respectively), indicating that the male allocation of time depends on other factors. According to Jenkins and O'Leary (1995), "the smaller extent of unexplained variation in domestic work time amongst females than amongst males might be explained by greater perpetuation of traditional home-making roles amongst women ('new men' increase the variance)" (Jenkins and O'Leary 1995, 274). The female sub-samples give rise to R^2 values of 0.31, 0.25, and 0.10 for the German, French, and Italian-speaking parts respectively, which can be considered as relatively high in comparison with other studies.

In table 2, the cultural and gender differences by the allocation of time to unpaid work for non-employed individuals are depicted. Each cell contains the signs of the estimated coefficients for the German, French and Italian-

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9   An ANOVA-test revealed that individuals in the French part of Switzerland do significantly less unpaid work than those in the German part. This is a first indication that a clear distinction between Germanic and Latin cultures is often stereotyped.

speaking samples respectively. "0" implies that the coefficient is not significant at the 10% level.

In all three regions the marital status plays a significant role in explaining the allocation of time for unpaid work done by women; a change in status from "single" to "married" increases the amount of time spent on work at home. Men are not affected by changes in marital status, indicating that married females are primarily responsible for household work. In the French and German-speaking parts, an increase in age leads to an increase in women's time spent on unpaid labour. For non-employed individuals the level of education does not play a significant role. With the exception of the Italian-speaking part, the presence of children significantly increases the amount of time devoted to unpaid labour by women. As can be seen in table A1, this effort diminishes with the age of the children. This result can be seen very well with the German-speaking female sample: the presence of a child aged between 0 and 6 leads to an increase of 19 hours per week in unpaid work, whereas a child aged 7 to 14 leads to an increase of about 9 and a half hours, and a child aged 15 to 25 only increases unpaid work by about 6 hours. It is interesting to note that these results also apply to the French part, yet not to the Italian part.[10] With the exception of the French-speaking part, non-employed males are not affected by the presence of children. Child-care remains primarily a woman's responsibility. In the German-speaking part, women's time devoted to unpaid labour is positively associated with the number of rooms in the house. For all other groups the results are not significant. Home ownership and household income do not have an effect on any of the groups.

The results of the regressions for the employed subgroup (i. e., for those individuals that receive a market wage) are presented in table A2 in the appendix. Table 3 depicts the gender and cultural differences for this group. Three additional explanatory variables were introduced, namely time flexibility, part-time employment, and the hourly wage rate. The household's income was also considered, yet the individual's personal income was subtracted from the household's income, in order to attain a proxy for "unearned income". As was the case above, the fit for the male subgroup is poor, with adjusted R^2 values of 0.06, 0.01, and 0.06 for the German, French, and Italian-speaking parts respectively. The explanatory power of the model is quite good for the female samples with adjusted R^2 values of 0.43, 0.27, and 0.25 for the German, French and Italian-speaking parts respectively.

Marital status is significantly positive for all female subgroups. The magnitude of the marital status coefficients are, however, smaller compared to

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10   For a more detailed analysis of the effects of children, see Gronau (1976, 1977).

Table 3

Cultural and gender differences for unpaid labour (employed individuals)

	Males	Females
Marital status	0/0/0	+/+/+
Age	+/+/0	+/+/0
Education high	0/0/0	–/–/–
Education low	0/0/0	+/0/0
Children aged 0–6	+/+/0	+/+/0
Children aged 7–14	+/0/0	+/+/+
Children aged 15–25	+/0/0	+/+/0
Number of rooms	0/0/0	+/0/0
Own home	+/0/0	0/0/0
Time flexibility	0/0/0	0/0/0
Part-time employment	0/0/0	+/+/+
Household income	0/0/0	0/0/0
Hourly wage rate (ln)	0/0/–	–/–/0

Note: The first, second and third entry in each cell represents the sign of the specific coefficient for the German, French and Italian-speaking parts respectively. "0" implies that the coefficient is not significant at the 10% level.

the corresponding subgroups without employment discussed above (see tables A1 and A2). Males are unaffected by marriage. In the French and German-speaking parts, age has a significant and positive effect on the amount of time spent on household work. A high education has a negative effect for all female samples. A low education has a positive effect only for German-speaking women. Men remain unaffected by the level of education. As one would expect, levels of education play a more important role for employed than for non-employed women. For men and women in the German-speaking part, and for women in the French-speaking part, the presence of children is positively associated to the amount of time spent on unpaid labour. Furthermore, the older the child, the less time intensive the corresponding unpaid labour is. With the exception of young children (i. e., those between 0 and 6) French-speaking males remain unaffected by the presence of children. The results for the Italian-speaking part are not significant (with the exception of children between the ages of 7 and 14 for the female sample). This could be partly due to the relatively small sample sizes. The amount of time German-speaking women spend on unpaid labour is positively related to the number of rooms. For all other population groups the results are not significant. Home ownership only positively affects the amount of time German-speaking men spent doing

unpaid work. Time flexibility is not significant for all groups. A surprising result is that men are unaffected by being in part-time (instead of full-time) employment. The coefficients for the "part-time employment" variable are all very significant and negative for the female groups. One can thus postulate that the market participation decision for women is jointly determined with the allocation of time to unpaid labour. This does not seem to be the case for men. A change in the household's income does not lead to a change in the amount of work done in the household, which also agrees with the theoretical predictions made above. With the exception of females in the French-speaking part, the "wage rate" coefficient is, as one would expect, significantly negative.

4.2   Paid labour

The results of the linear regressions, in which the dependent variable is the amount of hours spent in paid labour per week, are shown in table A3 in the appendix. The adjusted R^2 for the male subgroups are once again relatively small. The female subgroups have adjusted R^2 values of 0.33, 0.16, and 0.18 for the German, French, and Italian-speaking parts respectively. On average, males work somewhat more than forty two hours per week, and females around thirty hours per week. It is interesting to note that employed women in the German part of Switzerland work less hours per week than their Italian-Swiss and French-Swiss counterparts.[11] Table 4 depicts the cultural and gender differences.

Marital status significantly reduces the amount of time women spent on paid labour, whereas men increase it. Combined with the results attained in the analysis of unpaid labour, i. e., that being married increases the amount of time spent on unpaid labour by women, one can conclude that women are more responsible for the non-financial maintenance of the family. French-speaking males increase the amount of time spent on paid labour, whereas German and French-speaking females tend to reduce their paid labour time with age. An interesting observation is that men with a high education reduce the amount of time they spend working in the market. According to the SAKE 1995 data, people with a high education are more likely to be in part-time employment (i. e., work less than 100%) than individuals with a "normal" education. One possible reason for this result is that high school graduates (so-called "Maturanden") were considered as having a high education, and a large portion

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11 The results are significant. No significant difference exists, however, between the employed women working in the French and Italian-speaking parts. Nor does a significant regional difference exist between the corresponding male samples. At least in Switzerland, one can therefore conclude that the notion of "the hard working Germanic" must be relativised.

Table 4

Cultural and gender differences for paid labour

	Males	Females
Marital status	0/0/0	–/–/–
Age	0/+/0	–/–/0
Education high	–/–/0	0/0/0
Education low	–/0/0	–/0/0
Children aged 0–6	+/+/+	–/–/–
Children aged 7–14	+/+/0	–/–/0
Children aged 15–25	0/+/+	–/0/0
Own home	+/+/0	–/–/–
Time flexibility	+/+/0	0/0/0
Household income	0/0/0	0/0/0
Hourly wage rate (ln)	–/–/–	–/0/–

Note: The first, second and third entry in each cell represents the sign of the specific coefficient for the German, French and Italian-speaking parts respectively. "0" implies that the coefficient is not significant at the 10% level.

of this group was still studying when questioned. The coefficient becomes not significant when the "Maturanden" are removed from the group with a high education. A low education reduces the amount of time spent on paid labour by German-speaking males and females. The presence of children in a household also has opposite effects for men and for women: whereas women reduce their paid employment (the reduction declining as the children get older), men tend to increase the amount of hours spent on paid work. This result also indicates that married women are more responsible for the non-financial maintenance, while married men are more responsible for the financial maintenance. It is worthwhile noting that, for the female samples, the magnitude of the coefficients are largest in the German-speaking part (see table A3). Possessing an own home increases the amount of time spent on paid work by men (with the exception of the Italian-speaking part) and reduces that of women. An interesting result is the fact that in the German and French-speaking parts, time flexibility increases the amount of work in the market done by employed males. Household income does not affect the allocation of time to paid labour. With the exception of French-speaking women, an increase in the wage rate reduces the amount of time allocated to market work.

5. Summary and Conclusions

The aim of this study was to analyse the determining factors of the allocation of time to paid and unpaid labour in a cross-gender and cross-cultural setting. The gender differences attained in this study correspond well with results of similar studies. Cross-cultural aspects of the determining factors of the allocation of time have not been widely analysed – yet, as the results in this study indicate, numerous behavioural differences exist.

With regards to the allocation of time to unpaid work one gets the impression that non-employed individuals, in general, do not react very sensitively to changes in socio-economic variables. This is especially the case for males. The male samples are also characterised by the fact that only a few cross-cultural differences exist: (i) the allocation of time to unpaid labour for German-speaking females does not appear to depend on age, (ii) women in the Italian-speaking part of Switzerland are less sensitive than their German and French-speaking counterparts to the presence of children, (iii) the presence of young children has a positive effect on French-speaking, but not on German-speaking males.

In comparison to the non-employed individuals, employed individuals' allocation of time to unpaid work seems to react more sensitively to changes in socio-economic variables. This is especially the case for German-speaking females. The main cross-cultural differences are: (i) German-speaking women are affected by the level of education, (ii) in the Italian and French-speaking parts the presence of "elder" children (i. e., those older then 6 years) does not seem to affect men's devotion of time to child-care, (iii) home ownership has a positive effect on the German-speaking male's allocation of time to unpaid work, (iv) German-speaking women are positively affected by the number of rooms in the home, (v) Italian-speaking males are negatively affected by the wage rate, and (vi) the wage rate has no effect on Italian-speaking females.

The main cultural differences in the allocation of time to paid labour are: (i) a low education only significantly reduces the amount of time spent on paid work in the German-speaking part, (ii) the Italian-speaking part appears to be less affected by the level of education,[12] and (iii) French-speaking women have a very low wage rate elasticity.

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12 In general, the coefficients for the Italian-speaking part are less significant than for the other two regions. This observation also applies to the coefficients attained in the "unpaid labour" regressions. One might conclude that this is a result of the relative small sample size for the Italian-speaking Swiss.

This paper represents an initial attempt at analysing cross-cultural aspects of the allocation of time. Future research in this field should primarily concentrate on explaining the cross-cultural differences (from a sociological perspective), and extending the empirical model in order to capture the joint-decision problems associated with the allocation of time. Finally, with the current time-use survey being conducted by the Statistical Office of the European Communities (EUROSTAT), one can expect this field of research to flourish in the near future.

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Appendix

Table A1
OLS regressions for unpaid labour by region and gender
(non-employed individuals)

	German		French		Italian	
	Males	Females	Males	Females	Males	Females
Constant	5.57	13.36	3.93	−0.84	−	−7.19
	(1.65)	(3.98)	(1.38)	(−0.23)		(−0.48)
Marital status	−0.72	9.72	0.18	8.77	−	15.95
	(−0.35)	(6.80)	(0.10)	(4.97)		(3.69)
Age	0.16	0.005	0.01	0.26	−	0.54
	(2.74)	(1.03)	(1.94)	(4.29)		(2.15)
Education high	−0.90	−2.05	−0.27	0.73	−	−1.30
	(−0.48)	(−1.34)	(−0.16)	(0.40)		(−0.28)
Education low	0.22	1.18	−0.31	1.92	−	−1.13
	(0.11)	(0.94)	(−0.19)	(1.22)		(−0.26)
Children aged 0–6	7.97	19.06	13.07	19.16	−	9.23
	(1.57)	(12.48)	(3.46)	(9.70)		(1.56)
Children aged 7–14	5.80	9.40	3.13	3.39	−	8.38
	(1.17)	(7.45)	(0.82)	(1.92)		(1.81)
Children aged 15–25	3.88	6.14	−1.54	6.22	−	6.59
	(1.02)	(3.30)	(−0.58)	(2.67)		(1.35)
Number of rooms	−0.03	0.80	0.003	0.80	−	−0.24
	(−0.07)	(1.91)	(0.07)	(1.39)		(−0.19)
Own home	−0.44	1.30	−0.67	1.69	−	−2.21
	(−0.24)	(1.06)	(−0.44)	(1.00)		(−0.59)
Household income	−6.5E−05	8.5E−06	−8.3E−05	−4.1E−05	−	3.2E−04
	(−1.03)	(0.17)	(−0.91)	(−0.43)		(0.87)
Adjusted R^2	0.04	0.31	0.09	0.25	−	0.10
No. observations	274	1285	179	717	−	117
Mean of dependent variable (hours/week)	12.56	37.80	8.13	29.10	−	35.32

t-ratios in parentheses

Table A2

OLS regressions for unpaid labour by region
and gender (employed individuals)

	German		French		Italian	
	Males	Females	Males	Females	Males	Females
Constant	6.48	8.71	3.98	8.87	16.33	12.37
	(6.06)	(7.44)	(3.54)	(5.71)	(3.40)	(1.79)
Marital status	0.46	5.39	0.12	3.58	2.12	5.09
	(0.92)	(10.29)	(0.23)	(5.50)	(1.06)	(2.10)
Age	6.7E–02	0.12	4.0E–02	0.13	−1.3E–02	0.18
	(3.37)	(5.75)	(1.95)	(4.60)	(−0.16)	(1.43)
Education high	−0.13	−1.34	0.43	−1.97	1.87	−5.72
	(−0.31)	(−2.52)	(0.95)	(−3.02)	(1.09)	(−2.29)
Education low	−0.41	1.60	−0.51	0.36	−1.25	0.30
	(−0.57)	(2.66)	(−0.81)	(0.49)	(−0.51)	(0.10)
Children aged 0–6	6.53	14.33	2.48	7.42	−1.28	3.19
	(12.16)	(20.83)	(4.63)	(9.20)	(−0.64)	(0.97)
Children aged 7–14	3.11	8.07	0.26	4.32	1.30	6.11
	(6.23)	(13.40)	(0.53)	(6.15)	(0.69)	(2.09)
Children aged 15–25	1.83	4.90	2.4E–02	3.18	−2.33	4.65
	(2.85)	(6.98)	(0.04)	(3.60)	(−1.03)	(1.52)
Number of rooms	−0.14	0.36	−6.9E–02	0.26	0.19	−0.68
	(−1.11)	(2.01)	(−0.46)	(1.10)	(0.33)	(−0.57)
Own home	1.32	0.72	0.36	1.16	−1.80	−1.27
	(2.95)	(1.28)	(0.73)	(1.55)	(−1.04)	(−0.41)
Time flexibility	0.34	−0.45	−0.16	0.62	−1.68	−1.4E–02
	(0.91)	(−1.06)	(−0.42)	(1.13)	(−1.05)	(−0.01)
Part-time employment	1.02	6.52	−0.15	4.89	−2.38	7.26
	(1.11)	(12.42)	(−0.16)	(7.85)	(−0.32)	(2.84)
Household income[a]	−9.0E–06	8.4E–06	−1.1E–05	−5.3E–05	5.1E–05	−1.3E–04
	(−0.83)	(0.48)	(−0.68)	(−1.60)	(0.80)	(−0.90)
Hourly wage rate (ln)	−0.23	−1.61	0.23	−1.87	−2.83	−1.23
	(−1.01)	(−7.04)	(1.00)	(−6.22)	(−2.41)	(−1.07)
Adjusted R^2	0.06	0.43	0.01	0.27	0.06	0.25
No. observations	4980	3691	2209	1822	209	134
Mean of dependent variable (hours/week)	10.89	19.71	6.92	15.26	7.68	17.87

t-ratios in parentheses
a   Excluding income earned by individual

Table A3

OLS regressions for paid labour by region and gender

	German		French		Italian	
	Males	Females	Males	Females	Males	Females
Constant	48.11	50.67	46.68	43.17	46.56	51.05
	(68.55)	(48.79)	(44.39)	(28.73)	(17.64)	(9.40)
Marital status	0.56	−7.36	0.51	−5.12	−0.46	−5.24
	(1.60)	(−15.33)	(1.01)	(−7.92)	(−0.40)	(−2.30)
Age	1.8E−02	−0.27	0.004	−0.18	−6.2E−03	−0.14
	(1.33)	(−13.36)	(2.01)	(−6.34)	(−0.14)	(−1.14)
Education high	−0.60	0.47	−2.00	0.92	1.22	2.39
	(−2.02)	(0.91)	(−4.57)	(1.37)	(1.25)	(0.98)
Education low	−1.23	−1.01	−0.004	0.88	−0.84	0.56
	(−2.48)	(−1.87)	(−0.07)	(1.14)	(−0.61)	(0.18)
Children aged 0–6	1.15	−11.28	1.67	−7.00	2.14	−9.28
	(3.10)	(−17.74)	(3.19)	(−8.64)	(1.87)	(−2.95)
Children aged 7–14	1.75	−8.42	1.59	−3.48	1.29	−2.12
	(5.08)	(−15.21)	(3.30)	(−4.86)	(1.20)	(−0.75)
Children aged 15–25	0.76	−2.67	2.05	−1.15	2.24	−1.43
	(1.71)	(−3.97)	(3.38)	(−1.29)	(1.75)	(−0.51)
Own home	1.45	−1.90	0.97	−1.83	0.19	−4.90
	(5.18)	(−3.93)	(2.31)	(−2.69)	(0.21)	(−1.91)
Time flexibility	0.46	−0.12	1.04	0.68	0.97	−1.50
	(1.78)	(−0.29)	(2.74)	(1.20)	(1.10)	(−0.70)
Household income[a]	3.3E−05	1.9E−05	1.9E−05	2.3E−05	3.3E−05	−1.8E−05
	(1.36)	(1.15)	(1.23)	(0.66)	(0.90)	(−0.13)
Hourly wage rate (ln)	−2.33	−1.02	−2.40	−0.12	−1.62	−2.06
	(−14.60)	(−4.64)	(−10.69)	(−0.39)	(−2.43)	(−1.83)
Adjusted R^2	0.06	0.33	0.09	0.16	0.02	0.18
No. observations	4980	3691	2209	1822	209	134
Mean of dependent variable (hours/week)	42.73	29.48	42.17	31.42	42.53	33.66

t-ratios in parentheses

a Excluding income earned by individual

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