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Nadia Steiber

,How many hours would you want to work a week?'
Job quality and the omitted variables bias in labour supply models

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Abstract

'How many hours would you want to work a week?'
Job quality and the omitted variables bias in labour supply models.
A longitudinal analysis of working time preference change

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Comments very welcome*

This paper sets out to provide an understanding of how individuals form their preferences over the extent of their paid work involvement – their *working time preferences* – in different work environments and societal contexts. The main objective of the empirical analysis is to investigate how preferences of this kind are constructed at the individual level and adapted over time following changes in work- and family-related circumstances. The consideration of the Old and New Länder of Germany as cases for comparative analysis allows for a test of common factors in different contexts of economic conditions and gender relations. The empirical findings from a longitudinal analysis of the German Socio-Economic Panel (1993-2003) run counter to the predictions of neoclassical labour supply theory. This owes to a fundamental difference in terms of theoretical approach. While (most) economists tend to view paid work in instrumental terms – as something that people perform only for its monetary rewards, this study takes account of intrinsic work rewards as central determinants of work motivation. We find the qualitative experience of work to exert an independent influence on individuals' preferences over work hours, and therefore argue for the inclusion of work quality as a central factor in labour supply decisions.

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INTRODUCTION

The paper is concerned with the question of how many hours per week individual women and men would *want to* spend performing paid work – with how they form their *working time preferences*. Until recently, working time preferences remained largely unexplored. In sociology, this largely owes to the discipline's traditional focus on institutional constraints to employment in the attempt to explain variations in individuals' and in particular women's involvement with the labour market. Only of late have some scholars endorsed the neo-classical emphasis on individual choice and have begun to pay attention to what women and men want – i.e. to people's preferences (e.g. Hakim 1991; Hochschild 1997). Also among economists, there is increasing awareness that the canonical model of labour supply, which is based on the assumption that we are able to choose the number of hours we desire, has its shortcomings. Work behaviour is, inter alia, constrained by employer preferences and for this reason cannot be regarded as strict evidence for employees' preferences (Blundell et al. 2005; Manning 2003). In short, the limitations of the 'theory of revealed preferences' (Samuelson 1948) are increasingly acknowledged by the wider research community. As a consequence, there is a growing interest in measuring and studying working time preferences themselves rather than inferring them from behaviour.

Surveying the literature on working time preferences unearths a considerable body of empirical research on the frequent gaps between employees' actual and desired hours of paid work (e.g. Altonji & Paxson 1988; Bell & Freeman 2000; Bluestone & Rose 1997; Böheim & Taylor 2003; Clarkberg & Moen 2001; Dickens & Lundberg 1993; Drolet & Morissette 1997; Echtelt et al. 2006; Golden 2006; Jacobs & Gerson 2004; McDonald et al. 2006; Reynolds 2003; 2004; 2005; Reynolds & Aletraris 2006; Sousa-Poza & Henneberger 2001; Stewart & Swaffield 1997; Stier & Lewin-Epstein 2003). Studies of this kind have challenged one of the basic assumptions of microeconomic labour supply theory, namely that individuals are free to choose the number of hours they work. There is consistent evidence that in the European Union (Bielenski et al. 2002; Fagan 2002) as well as in other industrialised countries (Bell & Freeman 2000; Sousa-Poza & Henneberger 2001; Drolet & Morissette 1997; Dickens & Lundberg 1993; Reynolds & Aletraris 2006) many workers are dissatisfied with the length of their current work week. In Europe, roughly every second employee faces an 'hours mismatch'[1].The vast majority of these constrained workers are overworked, i.e. they are currently working more than they would prefer to.

A second strand of research that draws on subjective working time preference data is concerned with the predictive value of such data. A number of longitudinal studies provide empirical evidence confirming that stated desires for work time adjustments among employees are significant predictors of future changes in their actual hours worked (Böheim & Taylor 2004; Euwals 2001a; Euwals et al. 1998; Euwals 2005). Moreover, these studies suggest that constraints set by employers are a major factor in the creation of the frequent mismatches between actual and preferred hours of work. Such conclusions are based on findings that show that workers who change their employers are more likely to adjust their working hours in the preferred direction (e.g. Blundell et al. 2005; Baaijens & Schippers 2005; Euwals 2001b). The

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[1] Drawing on data from the British Household Panel Survey, Böheim and Taylor (2003) find a dissatisfaction rate with current hours of 40% (share of respondents who indicate to prefer to work fewer or more hours than at present). Holst and Schupp (2002), who draw on data from the German Socio-Economic Panel report a dissatisfaction rate of 48% (the presence of an hours mismatch was defined as working two hours more or less than desired). Fagan (2002), drawing on data from the European Foundation, reports a dissatisfaction rate of 63% for the EU plus Norway (see also Bielenski & Wagner 2004).

establishment of the predictive value of working time preferences for adjustments in hours supplied over time and especially their greater predictive power in situations that involve a change of employer gives credence to the assumption that such preferences have an intentional component (validity criterion).

Whilst there is a substantial body of research on the determinants and consequences of the frequent mismatches between preferred and actual hours of work, very few studies have directly addressed the *theoretically prior question* of how people form their working hours and have explored the factors that may determine the number of hours individuals prefer to work (e.g. Bielenski et al. 2002; Drago et al. 2006). Moreover, previous studies on individual labour supply decisions have almost exclusively modelled actual work hours and not individuals' labour supply preferences as such. In part, this may be due to the type of preference data available. In many surveys, respondents are asked whether or not they would like to adjust their hours in an upward or downward direction but they are not asked about the magnitude of their hours mismatch. In the absence of information on the number of hours by which employees would like to lengthen or shorten their current work week, such surveys do not provide information on the number of hours individuals would like to work[2]. The German Socio-Economic Panel is among the very few studies that provide a direct measure of working time preferences and is used in this paper for a dynamic analysis of preferred labour supply.

Furthermore, intrinsic job quality remains absent from the mainstream of labour supply theory as well as from most applied work in this area (Spencer 2004b).[3] Arguing that the conventional model of labour supply may for this reason (i.e. due to an omitted variables bias) lead to erroneous conclusions with regard to the determinants of individuals' labour supply preferences, the present study develops an interdisciplinary theoretical framework that combines the microeconomic model of labour supply with alternative theories of work motivation; i.e. with a motivational theory of work behaviour that also takes account of the intrinsic rewards of paid work as important factors in work motivation.

In sum, the aim of this study is to carry out an empirical analysis of individuals' labour supply decisions, that differs from the mainstream of economic research on labour supply in at least four respects: first, we look at *stated preferences* regarding the desired amount of paid work rather than at *revealed preferences* (i.e. the number of hours actually worked); second, we take account of the intrinsic quality of work as an important component of work motivation; third, we aim to account for the fact that preferences are formed in a context of structural and cultural constraints and that they may thus be 'adaptive' rather than reflecting 'ideal choices' of homo economicus; and fourth, we acknowledge that the process of preference formation may vary across socio-economic contexts. This interdisciplinary model of working time preference formation is tested against longitudinal data that was collected in Germany in the time between 1993 and 2003. Separate analyses are carried out for the Old and New Länder. This comparative approach affords us with the opportunity to assess *mediating effects* of different socio-economic and gender cultural contexts on preference formation processes. The rest of

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[2] This is, for instance, the case with the British Household Panel Study and the Swedish Level of Living Survey, which simply ask whether respondents want to work more, fewer or the same number of hours when compared to how much they work now.
[3] From the neoclassical point of view, the value of different job attributes is determined on the market as a compensating differential. For this reason, (most) economists do not tend to take a prior view on value of different job attributes for workers (Green 2006). Yet, today there are a number of economists who argue for the importance of intrinsic job quality as a determinant of economic behaviour (e.g. Lane 1991; 1992; Kaufman 1999; Altman 2001; Clark 2001; 2005; Spencer 2004a; 2004b; Green 2006).

the paper is organised as follows. The next section introduces the theoretical framework and discusses the main research hypotheses. This is followed by a presentation of the data used and the analytical methodology applied. The hypotheses are put to an empirical test using longitudinal data. After the presentation of the results, the study ends with a discussion of its principal conclusions.

THEORETICAL FRAMEWORK AND HYPOTHESES

Researchers differ with respect to how they conceptualise working time preferences. Economists tend to model stated preferences over work hours as a utility function in terms of leisure and income, based on the assumption that preferred hours were, apart from the budget constraint, not affected by any other restrictions (e.g. Euwals & van Soest 1999). Bielenski and colleagues (2002), by contrast, view working time preferences as the result of '*compromises between what is desirable and what is feasible'.* We adopt this notion of 'bounded' preferences, assuming that preferences over work hours are shaped by constraints such as economic necessities, domestic responsibilities, and, less tangibly, by social norms about how people should use their time (Fagan 2001). We thus expect that they can only partly be explained under the assumption of utility-maximizing behaviour.

In this study, *working time preferences* (henceforth interchangeably used with the among economists more commonly used term 'labour supply preferences', cf. Altonji & Paxson 1988; Böheim & Taylor 2003) are conceptualised as the outcome of an *optimal* trade-off between the financial and non-financial rewards from paid work, on the one hand, and the utility gained from time spent in non-market activities, on the other, faced by individuals who are (factually or normatively) *constrained* by their need to earn a living (minimum paid work time) and to fulfil their out-of-work responsibilities (minimum non-market time). Hence, in contrast to neoclassical microeconomic labour supply theory, labour supply preferences are not viewed as representations of individuals' *ideal* combination of income and leisure at a particular wage – as being entirely determined by wage rates and budget constraints. Instead, working time preferences are viewed as being shaped by the characteristics of individuals and their jobs, as well as by situational factors including individuals' family situation and the welfare and labour market context, in which hours decisions are mediated. Working time presences are moulded by individuals' evaluation of what is possible in their current circumstances – financially and in terms of the time available for paid work. Furthermore, since individuals' work- and home-related circumstances as well as the labour market and policy context, in which decisions over work hours are mediated, are temporally variable, working time preferences are not viewed as stable characteristics of individuals. On the contrary, they are expected to change over time.

This notion of preferences strongly differs from what economists and rational choice theorists from other disciplines have in mind when postulating that preferences (or 'tastes') were fixed, exogenously given, and universal characteristics of individuals (e.g. Stigler & Becker 1977). In contrast to this view, and in line with other scholars who stress the social embeddedness of choice and the endogeneity of preferences (e.g. Sen 1973; Becker 1996; Bowles 1998)[4], we consider the study of preference formation *important* and, as a precondition, *possible.* That is, in contrast to the assumption of revealed preference theory, that

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[4] Although many economists would agree that preferences are not exogenously given; the study of preference formation tends to be viewed as not being useful for economics. It should be left to be investigated by scholars from other disciplines (Friedman 1962).

preferences can *only* be read off from behaviour, we hold the view that stated preferences can be used as proxies for people's 'real' preferences, and that the information that such preferences contain will be at least as closely if not more closely related to peoples' real preferences than is observed behaviour.[5]

Individual level determinants

The study is based on the assumption that individuals work for economic but also for non-economic reasons. In the terminology of needs theory of human motivation (Maslow 1943; Alderfer 1972; Lawler 1973), people are motivated to engage in paid work in order to meet their material needs, on the one hand, and some of their higher-order needs for growth and self-development, on the other. Whether a job lends itself to the satisfaction of higher-order growth needs is argued to depend on the intrinsic rewards it provides. With the aim to relate work motivation to working time preferences, we thus focus on two work motives: monetary rewards and self-actualisation through the performance of intrinsically rewarding tasks. We expect that how many hours individuals prefer to work depends on how many hours they need or want to work for economic reasons and thus on their personal income target and hourly wage rate, and on the extent to which they experience the paid work they perform as an intrinsically rewarding activity. A more detailed account on the theoretical predictions about the impact of wages and of intrinsic job quality on preferred work hours is given in what follows.

Our predictions with regard to wage and income effects build on the micro-economic concept of 'target income behaviour (Camerer et al. 1997; Altman 2001), That is, our basic assumption is that individuals work to meet a predefined income or consumption level, or in other words, that they have a *personal target income* they aim to generate in gainful employment[i]. Given that the amount of paid work that is necessary to reach one's income target is a function of hourly wages, we thus hypothesise workers' hourly pay rate to be inversely related to the number of hours they prefer to work, *all else equal*. We hence expect workers to prefer shorter hours when offered a higher wage, while in the event that their wage falls, they are expected to prefer an increase in work hours to compensate for the lower pay rate. When high pay rates lead to a reduction in the willingness to work long hours, because relatively few hours of work secure a high total income, this is what economists call the '*income effect'*. The application of the '*target income logic'* implies that changes in the pay rate are *generally* negatively related to changes in preferred work hours (Bluestone & Rose 1998). This is in contrast to standard micro-economic labour supply theory which posits that higher wages can also have the opposite effect: the logic of opportunity costs implies that workers may be enticed to desire longer hours of work when offered a pay rise, because higher wages make the consumption of leisure more costly in terms of forgone income ('*substitution effect*'). Competitive theory holds that above a certain income the income effect will dominate the substitution effect; i.e. rising wage rates will start to reduce labour supply. This results in the theoretical prediction of a 'backward bending' labour supply curve, which is positively sloped at lower wages but negatively sloped at higher wages (Bluestone & Rose 1998; Bell 1998). However, labour supply theory does not provide predictions about the circumstances under which the income

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[5] This argument is supported by Sen: 'That behaviour is a major source of information on preference can hardly be doubted, but the belief that it is the only basis of surmising about people's preferences seems extremely questionable. (…)The idea that behaviour is the one real source of information is extremely limiting for empirical work and is not easy to justify in terms of the methodological requirements of our discipline' (1973: 257-258).

effect can be expected to outweigh substitution effects (e.g. Altman 2001). The issue of how wages and working hours are, in reality, related is left to empirical rather than theoretical work. Yet, to date, empirical research has not resolved the issue either (Blundell & MaCurdy 1999; Kimball & Shapiro 2003).

As mentioned, the application of the '*target income logic*' implies the theoretical expectation that changes in the wage rate are, in general, negatively related to changes in preferred work hours. Hence, in contrast to neoclassical labour supply theory, we do not expect preferred work hours to increase with the wage in the lower part of the wage distribution. As also argued by Spencer (2004a), it makes perfect sense in applied work not to expect such substitution effects, as it appears implausible to assume the reverse, i.e. that low-wage workers will desire a reduction in paid work hours when they face wage cuts. The intuitively more satisfying thesis, namely that workers whose real wages decline, are willing to work more hours in order to recoup some of their lost purchasing power, receives empirical support (Scacciati 2004)[ii]. In sum, based on the concept of 'target income behaviour', we expect *wage increases* to result in preferences for shorter hours; conversely, *decreasing wage rates* are expected to trigger an increase in the number of preferred hours.

H1a: An increase in their wage rate, ceteris paribus, leads workers to reduce the number of hours they prefer to allocate to paid work, and vice versa [underlying assumption: individuals set an *income target* whose attainment is faster at the higher wage rate; 'target income hypothesis'].

The target income logic also implies that preferred hours should theoretically rise with the *income target*. Individual's preferred hours are thus expected to increase with the number of financially dependent family members (e.g. non-working partner, children), and conversely, to decrease with the level of non-labour income. Given that women are less likely to act as the main breadwinner in families than their male partners, an increase in the household target income is less likely to affect women's labour supply preferences than men's. Hence, against the backdrop of traditional gender relations, we would expect the arrival of children to affect men's preferences mainly via financial considerations (increase in target income), whilst for women the presence of small children is more likely to operate as a time constraint (e.g. Charles & James 2003). Based on this reasoning, we expect the average German woman to prefer shorter hours of paid work in the presence of small children due to her role as the primary caregiver, while we expect her male partner to prefer longer hours of work upon the arrival of children, as he will often resume the main responsibility for the attainment of the household's target income. However, differences between East and West Germany in the extent to which this scenario takes place are likely to occur due to varying levels of institutional and cultural support for maternal employment and as a result of differences in economic conditions. There are various reasons for why we would expect to find a weaker negative child effect for East German women than for their West German counterparts. First, in East Germany childcare facilities are more strongly tailored to the needs of full-time working mothers (Engelbrech & Jungkunst 2001). Second, the gender cultural background tends to be more favourable towards the paid work involvement of mothers in East than in West Germany (Rosenfeld et al. 2004). And third, wages tend to the lower in the Eastern part of Germany while unemployment rates are much higher leading to a situation in which many mothers may have to work for economic reasons. In contrast, in West Germany a higher share of women may be able to afford not to work or to work reduced hours and may hence be more likely to reduce their preferred hours upon the birth of a child. Among men,

we expect the arrival of children to lead to preferences for longer hours of paid work not least because they have to compensate for the loss in family income in the event that their partners reduce their paid work involvement. Given that West German women are more likely to quit employment upon the arrival of children (Rosenfeld et al. 2004), we may thus expect the child effect on men's preferred hours to be more strongly positive in West than in East Germany.

H1b: An increase in their target income, ceteris paribus, will lead workers to increase the number of hours they prefer to work [workers' target income is assumed to rise when the number of people dependent on their income increases or when their non-labour income decreases, all else being equal].

The assumption that individuals will always prefer to work less when they can afford to do so implies that they have a preference for leisure over time spent at the workplace; i.e. that that they generally view the performance of paid work as a *disutility*. In contrast to this view, we assume that workers do not only derive utility from consumption and leisure, but that they may also derive utility from the act of labour itself, especially when it offers opportunities for personal development and initiative (Kohn & Schooler 1983). Hence, we take account of the *quality of the time spent at the workplace* as a potentially important factor in shaping peoples' labour supply preferences. There is a great deal of consensus in the literature regarding the proposition that intrinsically rewarding work tasks and certain job characteristics such as discretion and decision latitude will elicit work motivation and may thus encourage individuals to work more/harder (Hackman & Oldham 1976). Moreover, according to Alderfer's theory of work motivation (1972), intrinsically rewarding and challenging work perpetually increase people's desire for self-actualisation, personal development and advancement in their jobs. Based on the reasoning that task-related rewards such job autonomy and feelings of competency can only be 'consumed' and enhanced when working; and that professional success and the further development of skills require a high level of intensive and extensive work effort, we would thus expect workers in higher quality jobs to prefer longer hours of work than their counterparts in lower-quality jobs, whose performance is less likely to be intrinsically rewarding. From a more dynamic perspective, we thus expect workers who move from lower to higher quality jobs, and hence from less to more growth needs satisfaction, to increase their preferred number of work hours, *all else equal*. Intrinsic job quality is understood as being determined by the nature of the work tasks involved when performing a job. The level of skill, job autonomy, task discretion and the extent to which the job permits self-development and advancement are usually seen as central factors determining the quality of a job (e.g. Gallie 1997; Clark 2005; Green 2006; Rose 2003).

H2: Workers who move from lower to higher quality jobs with greater intrinsic rewards, ceteris paribus, will increase the number of hours they prefer to work, and vice versa.

Theoretical predictions about the *relative importance* of different factors as determinants of labour supply preferences can be made based on needs theories of human motivation[iii]. One of the best-known of these theories is Maslow's hierarchy of needs (1943), which posits that human needs can be arranged hierarchically, with individuals being motivated to satisfy them one step at a time beginning with their material needs. Based on this logic, the expectation would be that before the goal of securing material needs is achieved; other factors such as whether individuals enjoy performing their jobs play a minor role

(cf. Sen 2000; Stewart 2006). Therefore, we would expect those who struggle to obtain an income that allows for a decent standard of living, to mainly focus on the material rewards of work. They are thus expected to mainly work for monetary reasons and therefore to form their labour supply preferences according to the *target income logic*. Upon the attainment of their material needs, workers are held to *progress* to higher-order needs. According to Alderfer's version of needs hierarchy theory (1972), however, workers can also move in a downward direction ('frustration regression'). Based on this reasoning, workers who are able to satisfy their material needs but do *not* have the opportunity to satisfy their higher-order growth needs at work are expected to 'regress' to the *target income logic,* i.e. the monetary rewards of work remain their primary motivation to work. Those who have attained material security *and* whose jobs allow growth needs to be gratified, by contrast, are expected to be motivated by the non-economic rewards of their jobs (performance of intrinsically rewarding tasks).

An implication of this reasoning is that we would expect the strength of the 'income effect' deriving from the 'target income logic' to vary across workers, depending on their position in the hierarchy of needs. In particular, we would expect the strength of the 'income effect' to decline with the extent that one's job is conducive to higher-order growth needs satisfaction. In other words, workers in high-quality jobs are expected to be less prone to desires for work hour reductions when their wages rise. Moreover, those in higher-quality jobs should be more likely to increase their preferred hours when the quality of their jobs improves than their counterparts whose jobs are less rewarding in intrinsic terms. This prediction derives from Alderfer's contention that the intrinsic rewards of work increase in importance as sources of work motivation with the opportunity to satisfy them ('the more one gets, the more one wants').

H3a: *Material security* decreases the likelihood that workers form their preferences according to the *target income logic* (c.f. H1a) but increases the likelihood that they form their preferences with view to non-economic factors and in particular to the quality of their jobs (c.f. H2).

H3b: The likelihood that workers form their preferences according to the *target income logic* (c.f. H1a) declines with their opportunities to satisfy their growth needs at work, i.e. with the intrinsic quality of their jobs.

H3c: The likelihood that workers form their preferences with view to the quality of their jobs (c.f. H2) increases with their opportunities to satisfy their growth needs at work, i.e. with the intrinsic quality of their jobs.

Furthermore, in contrast to the view that we can classify jobs into high- and low-quality jobs with the former not only involving work tasks of higher intrinsic quality and better working conditions, but also higher pay than the latter, we acknowledge that wage increases may often but do not necessarily always come along with increases in intrinsic job quality. As suggested by the theory of compensating differentials, pay rises may even accompany deteriorations in job quality, when workers who switch to jobs with poorer working conditions or task quality are compensated for their 'job disamenities' with higher pay (Rosen 1974; 1986). Against this backdrop, we expect the effect of wage changes on workers' preferred hours to be mediated by the respective developments in terms of job quality. Employees who experience upward mobility in terms of an increase in hourly wages *and* in terms of job quality are expected to be less likely to reduce the number of hours they prefer to work following the pay rise than their counterparts who get a pay rise without experiencing an increase in job quality.

Finally, while most economists assume labour supply decisions to have the same dynamics across countries, motivational theory implies that we may find important regional variations in the ways employees form their working time preferences. In particular, we argue that the target income logic should be more salient where low-wage work is more prevalent and where the gratification of material needs is more precarious, or in other words, where workers tend to be lower on the hierarchy of needs (e.g. in the present context, in the Eastern part of Germany, where wages tend to be lower and where workers face a greater risk of jobs loss and especially long-term unemployment than in the Western part of Germany). Conversely, we expect job quality to be of greater determining importance where a higher share of workers can securely gratify their material needs by working a moderate amount of hours (i.e. greater prevalence of intrinsic work motivation in the more affluent Western part of Germany).

THE EMPIRICAL ANALYSIS

Data and population sample

We use data from eleven waves of the German Socio-Economic Panel (GSOEP 1993-2003). The GSOEP is a representative panel study of German households, which have been surveyed annually since 1984, when about 12,000 people aged 16 and older participated. After German reunification, the survey was extended by about 4,500 persons from the New Länder (Haisken-DeNew & Frick 2003). The GSOEP contains a continuous measure of working time preferences. The relevant question, which is asked of all those in employment, reads: *If you could choose your own number of working hours, taking into account that your income would change according to the number of hours: How many hours would you want to work a week?* Owing to the fact that only those who have been in paid work at the time of interview have been asked about their working time preferences, the focus of our analyses is on the working population. Excluded from our sample are the self-employed, those working in the agricultural sector and those holding a second job.[iv] Moreover, the analyses are restricted to the German population of '*core working age*'. We exclude those younger than 25 and those older than 60 from the analyses, because the preferences of people outside the 25-60 age group are likely to be co-determined by factors that are not dealt with in the present study (e.g. the organisation of the education and retirement system).

Analysis of preference change

The average number of working hours that Germany employees prefer to supply to the market shows little variation over time[6]. A look at the individual level, however, reveals that between 2002 and 2003 about 30% of male and about 35% of female workers increased or decreased their preferences by at least five hours (see Annex Table 1 for transition matrix). Decomposing the variation in preferred hours over the period under study into the variation across individuals and the variation 'within' individuals over time, we find the second component to be substantial and indeed stronger than the cross-sectional variation among male workers and East German women (see Annex Table 2). In sum, a first descriptive analysis suggests that although little temporal variation in working time preferences is discernible at the

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[6] Looking at dependent employees aged between 25 and 60, excluding those holding second jobs or working in agriculture, between 1993 and 2003, the average number of preferred work hours (weekly) ranged from 37 to 39 among West German men, from 38 to 40 among East German men, from 28 to 30 among West German women and between 34 and 36 hours among East German women. In none of these groups can a straightforward pattern of increase or decline in aggregate preferences over time be detected.

aggregate level, there seems to be a great deal of change over time at the individual level. The question is: *what makes individuals change their preferences over time?* The following analysis of preference change focuses on the potential effects of family-cycle transitions, on the one hand, and on the effects of occupational mobility, on the other. Performing separate analyses for West and East Germany, we also attempt to assess a potential mediating effect of the socio-economic context in which working time preferences are formed. Moreover, as women's preferences are hypothesised to be differently determined than men's, we estimate separate models for women and men.

Analyzing the effect of wages on preferred hours, there is the potential problem that wages might be endogenous due to the omission of variables that affect both wages and working time preferences. For instance, those who have preferences for longer hours than others may at the same time be more likely to have higher earnings due unobserved motivation or ability. This would lead to an upward bias in the estimated effect of hourly wages on preferred hours. In a similar vein, a positive impact of job quality on preferred hours may partly stem from self-selection of those with preferences for longer hours into higher-quality jobs. In cross-sectional analyses, we cannot be sure whether employees are in higher-quality jobs because they (prefer to) work longer hours or whether it is indeed the other way around. If self-selection biases our results in this way, we may overestimate the positive effect of job quality on preferred hours. Given that we have the opportunity to draw on panel data, we can use repeated observations in the time dimension to deal with the *omitted variables problem*, i.e. to eliminate some of the potential bias that is due to unobserved heterogeneity. If we assume unobserved characteristics of individuals such as their general work and career commitment or the importance they attach to leisure to be time-invariant, representing permanent properties of individuals, at least during the observation window, panel data analysis allows us to control for the possibility that more work-oriented employees prefer longer hours of work and at the same have better jobs and/or earn higher incomes rather than job quality and hourly wages having a 'causal' effect on preferred hours. In the analyses, we use fixed effects estimators, which exploit variation over time as a means to purge such time-invariant *unobserved heterogeneity*.

Models and estimation methods

Our sample consists of individuals aged between 25 and 60, who were observed at one or more of the eleven waves of the GSOEP between 1993 and 2003 to be dependently employed and to report working time preferences. Excluded from the sample are agricultural workers and second job holders. We adopt a typical specification of labour supply where preferred hours of work are related to the wage rate, other sources of income and a set of control variables. In addition, however, we include a measure of intrinsic job quality. We use the following model, where i indexes individuals and t indexes time periods. P_{it} is the weekly number of hours of paid work preferred by individual i in year t. W_{it} are hourly wages, Q_{it} is a measure of job quality, X_{it} is a vector of time-varying regressors including respondents' age, the length of job tenure with the current employer, health status, the presence of a cohabiting partner, the number of children of different ages and non-labour income. To control for aggregate effects (e.g. business cycle), we include year dummies in all models (α_t). Finally, we include a time-invariant individual-specific error component (μ_i) and the classical time-varying idiosyncratic error term (ε_{it}).

$$P_{it} = W_{it}\beta_1 + Q_{it}\beta_2 + X_{it}\beta_3 + \alpha_t + \mu_i + \varepsilon_{it} \qquad i=1, 2 \dots N \quad t=1, 2 \dots T \qquad (1)$$

The restriction of our sample to those currently employed will lead to biased estimates should there be a selection process driving the decision to participate or not in the labour market. To account for the potential impact of sample selection bias deriving from the fact that we only observe preferred hours for those who are working more than zero hours at the time of interview, we model the selection into employment. In the selection equation, the dependent variable is a dummy indicating whether the individual was working at time t ($s_{it}=1$) or not ($s_{it}=0$). The predictors are a set of time-varying ($X2_{it}$) regressors[7] some of which are common to those contained in X_{it} in the equation of interest (1). In detail, we include the number of children in different age groups, the presence of a cohabiting partner, the level of non-labour income, age in linear and quadratic form and subjective health status. Furthermore, to aid identification, we add predictors that are specific to the selection equation, namely a summary measure of the years spent in schooling and training and a dummy variable representing the employment status of the individual in the year prior to the study wave (working or not working). This approach is consistent only under the assumption that unobserved individual heterogeneity is uncorrelated with the explanatory variables in the selection equation. To overcome this assumption, which is unlikely to hold especially regarding individuals' employment status in the previous year, we use a Mundlak-type approach and include the within-groups mean of each of the explanatory variables on the right hand side of the selection equation. In other words, to allow the unobserved effects in the selection equation v_i to be correlated with the time-varying predictors ($X2_{it}$), we parameterise vi assuming it is a linear combination of the time averages of $X2_i$ while the remaining part of the unobserved effect (c_i) is independent of $X2_i$ (Mundlak 1978). Probit estimation is then performed for each t on the equation obtained from inserting (3) into (2).

$$S_{it}=X2_{it}\beta_1 + v_i + \varepsilon_{it} \qquad\qquad i=1, 2 ...N \quad t=1, 2...T \qquad\qquad (2)$$

$$vi= \pi_0 + X2_i'\pi + c_i \qquad\qquad X2i'=\text{time averages of X2i} \qquad\qquad (3)$$

Tests for sample selection bias are achieved using a method proposed by Wooldridge (2002: 581f). To test whether the sample for whom $s_{it}=1$ differs systematically from those for whom $s_{it}=0$, we compute inverse Mills ratios (IMRs[8]) from a probit estimation of the selection equation for each time period t. The wave-specific IMRs are then stacked by i and t to form an additional regressor in the equation of interest (1). The test for selection bias then consists of a fixed effects estimation of the resulting model and a test of the restriction that the coefficient on the IMR is equal to zero[9].

The estimation strategy is as follows: In a first step, we estimate the model of interest (1) by pooled OLS. Estimates will only be unbiased if all of the regressors are exogenous and if there is no sample selection bias. Second, under the assumption of 'no sample selection bias', we estimate a fixed effects model. The within-groups estimator is unbiased and consistent even if μ_i is correlated with the regressors. Hence, the use of fixed effects models allows us to account for the potential endogenous nature of hourly wages and job quality that is due to time-invariant unobserved heterogeneity. However, in the event that selection

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[7] The fixed effects estimator cannot determine the effect of time-constant factors. However, time-constant regressors such as sex or residence in West or East Germany can be omitted, because the analyses are performed separately for these groups.

[8] The inverse Mills ratio is the ratio of the probability density function over the cumulative density function of a distribution. It reflects the effects of all unmeasured characteristics related to the employment decision. In the model of interest, it catches the part of the effect of these characteristics which is related to preferred hours. The test for sample selection is the Wald test.

[9] In addition to the IMR, we add interactions of the IMR with time dummies to allow for different correlations between the idiosyncratic errors in the selection equation and the equation of interest. Then, we test for the joint significance of these terms.

into employment is systematically related to the idiosyncratic errors in the model (1), our fixed effects estimates may still suffer from sample selection bias. For this reason, in a third step, we explicitly test for sample selection bias using the method proposed by Wooldridge (2002) and outlined above. As is well-established in the literature, especially in female labour supply models, sample selection bias is likely to be a problem. Hence, testing for its presence is important. It is important to remember, though, that selection correction procedures only promise to produce consistent estimates provided that certain assumptions are satisfied and since some of these assumptions are likely to be violated in applied work, such procedures tend to reduce the precision of parameter estimates (Semykina & Wooldridge 2005). A drawback is the need for exclusion restrictions for the sample selection, i.e. the difficulty in finding variables that affect the selection process but do not affect the outcome of interest. Against this backdrop, in the event that tests suggest that selection plays a role, we produce sample selection bias corrected estimates. These are mainly used to get an idea of the ways in which sample selection may bias our results but are otherwise interpreted with the necessary caution.

Variable specification

A continuous measure of working time preferences is available for each wave between 1993 and 2003 except for the year 1996 when this variable has for some reason not been measured (for details on item wording, see above). Our measure of hourly wages is constructed by dividing the usual net monthly pay by usual monthly hours worked (including overtime). The former is deflated by the retail price index. This method of computing hourly wages may suffer from measurement error as any error either in the measurement of hours or pay will be transmitted to the construction of hourly wages. To mitigate this problem, cases with hourly wage estimates that are at the very high or low end of the earnings distribution (i.e. the first and last percentile) have been excluded, thus arriving at a wage estimate that ranges from four to fifteen Euros per hour. Yet, efforts to delete outliers in the wage distribution are no remedy for the potential endogenous nature of wages, which may, in addition to unobserved heterogeneity that we can control for, also stem from measurement error. In the econometrics literature wage endogeneity is usually dealt with by using two-stage least squares estimation. However, this poses the difficulty of finding proper instruments for hourly wages, i.e. finding predictors of wages that do neither affect selection into employment nor working time preferences. Owing to these difficulties, we test for the potential endogeneity of hourly wages and discuss the direction of bias that such endogeneity may produce but do not aim to present estimates that actually correct for potential biases.

As direct measures of *task quality* are not available for all waves, we need to draw on proxy measures. Candidates include an occupational prestige scale[10] and a measure of occupational autonomy. To determine which of the two measures available is more suitable as a proxy for job quality, we made use of the measures of task quality provided in the 2001 wave. In detail, we constructed a simple summative index focusing on the dimensions of task variety, task discretion and opportunities for personal development[11]. Given that the measure of occupational autonomy correlates more strongly with the constructed index of task quality ($r=0.5$; $p<0.001$) than the occupational prestige scale ($r=0.3$;

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[10] This is a continuous index that offers an instrument for measuring hierarchical occupational status.
[11] Workers are asked whether it applies completely, partly or not at all that a) their job is varied, b) that they decide themselves how to complete the tasks involved in their work, and c) that they learn something new on the job, something that is relevant for their career.

p<0.05), it was decided to use the former as a proxy measure of intrinsic job quality. This measure differentiates the categories civil servant, employee and worker, each of which is further differentiated according to the characteristics of work tasks. Civil servants are divided into those in lower, medium or higher civil service jobs, depending on the autonomy they enjoy in performing their jobs. Employees are sub-divided according to their level of responsibility into the following four groups: simple tasks, autonomous performance of difficult tasks under general supervision, autonomous performance of responsible tasks or limited responsibility for the tasks performed by others, and managerial tasks with decision-making power. Finally, workers are differentiated according to their education and training. They are divided into unskilled, semi-skilled and skilled workers and foremen. The final classification of job in terms of occupational autonomy is five-fold: 1) manual work with low autonomy, 2) employees in the production and services sector with little specialisation, 3) employees performing tasks that require a secondary level degree but involve limited responsibility, 4) employees performing tasks that require a tertiary degree but have low prestige, and 5) top managerial tasks and professionals with tertiary degrees and high prestige. This measure of occupational autonomy provided in the data increases with higher job quality in terms of variety, decision latitude and opportunities for further learning. The advantages of using this measure to capture changes in job quality instead of focusing on changes in the wage rate, as frequently done in the literature, are evident. An increase in hourly wages may but does not necessarily reflect a transition towards a job of higher intrinsic quality (e.g. Rosen 1986).

To control for 'non-labour income', we include the net household income not earned by the respondent (Mincer 1962), alongside a dummy indicating partnership status (1=married/unmarried cohabitation). Moreover, we create a set of variables to capture the number and age distribution of children in the household (number of children a) aged up to one year, b) 2-4 years of age and c) aged 5-15).To account for sectoral differences in working time regulations,[12] we include a dummy indicating employment in the private or public sector. We also control for job tenure, i.e. the number of years that respondents have been working for the current employer. Conditional on age, this variable should capture the effect of work experience and specific on-the-job training. As health problems may also have a bearing on workers' preferences, we control for respondent's subjectively evaluated health status (1-bad health to 5-very good health). Finally, for the selection equation that models the participation decision (1=working; 0=not working) we draw on a continuous measure of qualifications, provided in the data[13]. Furthermore, we model workers' current employment status as a function of their respective status at time t_{-1}.

Results

Table 1 presents the estimated effects of hourly wages, job quality and household composition on the number of work hours preferred by male and female employees in East and West Germany. For each of the groups analysed, the first column of results reports pooled OLS estimates (POLS), the second and third columns report fixed effects results for two different models (FE-1 and FE-2) and the final column presents estimates derived from a fixed effects regression including a test for sample selection

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[12] It was attempted to also control for the type of contract. However, this measure was not provided in all sample waves.
[13] This measure captures the sum of years of schooling and secondary occupational education. It counts the years of education and training that are institutionally assigned to the type of qualification obtained rather than the years actually spent in education.

(FE+SS). The test for the significance of fixed effects (F-Test of $\mu_i = 0$) suggests that person-specific time-constant unobserved heterogeneity plays a role in all analyses. Hence, OLS estimates are likely to be biased[14]. This has some important and non-negligible consequences for some of our estimates:

The estimated effects for the household variables are as expected. Married or cohabiting women tend to prefer fewer hours of work than single women, while partnered men tend to prefer longer hours than single men. In East Germany, only the OLS but not the FE-estimates of the partnership effect are significant, suggesting that partnered workers have some unobserved characteristics that are related to preferred hours (e.g. higher success in the marriage market for career-oriented men). There is a clear gradient across the effect of children on women's preferences. Mothers tend to prefer fewer hours than childless women, with mothers of smaller children preferring fewer hours than mothers of older children. Moreover, in line with expectations, we find stronger negative effects of the presence of children for West than for East German women. Conversely, West (but not East) German men tend to prefer longer hours when they have children. Hence, our theoretical prediction that in West Germany, women (prefer to) reduce their paid work involvement to a stronger degree than in East Germany, while men have to compensate for the resulting reduction in household income by increasing the number of hours they prefer to work, receives empirical support. Non-labour income (in €100) is, as expected, negatively related to preferred hours, this effect being strongest for West German women.

The second row of Table 1 reports the estimated effects of hourly wages. The pooled OLS estimates are negative and significant for all groups except for West German women. As outline above, in the event that the unobserved individual specific effect is positively correlated with preferred hours, we can expect the OLS estimates of wage effects to be biased upwards, however. Controlling for unobserved heterogeneity (FE estimator) does not greatly change our estimates for men. For women, however, the OLS estimator seems to underestimate negative wage effects, suggesting that female employees, who possess characteristics which typically come along with higher wages, also tend to prefer longer hours of paid work. As a consequence negative wage effects are underplayed, or in the case of West German women, totally masked unless such unobserved characteristics are controlled for[15].

Looking at the effect of job quality in terms of occupational autonomy, the OLS estimates suggest that those in higher-quality jobs tend to prefer longer hours of work. In the FE model, however, the job quality effects are estimated to be smaller and even turn out insignificant in the case of East German workers. This suggests that occupational autonomy is positively related with some unobserved factor that also comes along with preferences for a longer work week. In sum, for East German workers the results suggest that job autonomy has no effect on preferred hours. For their West German counterparts, by contrast, positive effects of autonomy are estimated to be smaller in the FE than in the OLS specification but nevertheless remain highly significant (both for our male and female sample).

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[14] The fixed rather than the random effects specification was chosen due to the fact that the Hausman test rejected the hypothesis that individual effects are not correlated with the regressors (not shown).
[15] For West German men, we find significant effects of squared hourly wages. Their inclusion in the model does not change the coefficients for occupational autonomy, however. For all other groups, the coefficient for squared hourly wages is insignificant.

In a next step, we test interaction effects between job quality and hourly wages to test whether workers who experience upward mobility in terms of an increase in wages *and* in occupational autonomy, are indeed less likely to reduce the number of hours they prefer to work following the pay rise than their counterparts who get a pay rise without experiencing an increase in job quality, as hypothesised. We find this prediction to hold in West but not in East Germany (FE-2, Table 1). The stronger the increase in occupational autonomy that occurs concurrently with an increase in wages, the weaker the negative wage effect on West German employees' preferred hours is estimated to be.

The last model in Table 1 presents estimates derived from a FE regression including a test for sample selection (FE+SS). To conserve space, the wave-specific cross-sectional selection equations are not reported. As indicated by the Wald test, which tests for the joint significance of the wave-specific inverse Mills ratios and their interactions with time dummies, sample selection bias is likely to be present for all but East German women[16]. However, correcting for the indicated bias has a modest impact on the estimated coefficients of the explanatory variables of interest (comparing FE-1 and FE+SS). In particular, the impact on the wage and job quality coefficients is rather small[17].

After this analysis that related to average effects across the population, we test our hypotheses about potential divergences across the work force in the ways that labour supply preferences are shaped by wages and job quality. To this end, we split our sample into two segments on the basis of whether or not workers enjoy occupational autonomy. Then, we estimate the basic FE model shown in Table 1 (FE-1) once for workers who enjoy a high level of autonomy and once for workers who do not[18]. As can be seen from Table 2, in line with our predictions, we generally find negative wage effects to be more strongly pronounced in our 'low-autonomy sample' (i.e. those in lower-quality jobs). Conversely, *only* those in higher-quality jobs seem to respond to changes in job quality. Running the same model once for workers who earn less than the average hourly wage (either in East or West Germany) and once for their counterparts in the upper half of the wage distribution (for details see footnotes below Table 2), we generally find negative wage effects to be less pronounced among workers in better paid jobs. Moreover, among West German workers we find the better-paid half of the workforce to respond with preferences for longer hours when the quality of their job improves, while this is not the case among their lower-paid counterparts. Overall, the findings suggest that the strength of negative wage effects generally decreases in strength with the level of job quality as well as with the level of pay. Conversely, job quality effects turn out to be stronger among those already in possession of 'better jobs' (in terms of job quality in both parts of Germany as well as in terms of pay in West Germany). These findings are in line with our theory that holds that those in higher quality jobs form their preferences more with view to job quality than their counterparts in lower quality jobs. Therefore, they are less likely to prefer work hours reductions when their wages increase but more likely to increase the number of preferred hours when the quality of their

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[16] The inverse Mills ratio (IMR), which reflects the effects of all unmeasured characteristics related to the employment decision, is shown to be a significant predictor of preferred hours. The IMR catches the part of the effect which is related to preferred hours.

[17] The wage estimates for men do not change. For women, the wage estimates seem to be downward biased, when we do not take account of selection effects. This suggests that non-active women may be willing to take up employment at higher potential wages, i.e. they would increase their preferred hours with wages rather than decrease it. Moreover, the model suggests that among West German women job quality effects may be somewhat overestimated. Unless this is due to scaling effects, this upward bias may stem from unobserved characteristics of non-working women that make them less responsive to job quality (e.g. home-centred women).

[18] The low-autonomy group includes manual workers with low autonomy and employees in the production and services sector with little specialisation (values 1 and 2 on the autonomy scale). The high-autonomy group includes workers performing tasks that require a secondary level or tertiary degree, professionals and top managers (values 3 to 5 on the autonomy scale).

jobs increases. Conversely, those in lower quality jobs were expected to form their preferences primarily according to the simple target income logic, while being less likely to take account of job quality. Based on this reasoning, they should be more prone to reduce their preferred hours when their wages increase.

In sum, our results suggest that changes in hourly wages are generally negatively related to changes in preferred hours. This holds for both sexes in both parts of Germany and tends to be more strongly pronounced among employees in lower quality jobs (in terms of occupational autonomy). Improvements in terms of job quality (occupational autonomy) tend to result in preferences for longer hours, especially among employees who are already in higher quality jobs. Yet, positive job quality effects are only found for West German workers and here especially among women, while the *average* East German worker does not seem to respond with preferences for longer hours when the quality of his or her job improves. This confirms our theoretical predictions about the mediating effect of the socio-economic context on preference formation processes. As argued, the average East German worker may be lower on the hierarchy of human needs than his or her West German counterpart due to an economic situation in the less affluent Eastern part of Germany, in which low levels of real wages necessitate the majority of employees to work rather long hours. Due to the fact that East German workers are hence less likely to have their material needs securely gratified, they should be less likely to progress to desires for higher-order needs satisfaction at work as the main source of work motivation. However, while the average East German worker may be too low on the hierarchy of needs to consider the intrinsic quality of their jobs when forming his or her working time preferences, this is not the case for the advantaged segments of the East German labour force. Both in West and in East Germany, significant job quality effects can be discerned among workers enjoying a relatively high level of occupational autonomy (Table 2).

Preference data is looked upon with a certain amount of scepticism by labour economists, who tend to build their work on the assumption that labour market behaviour can be taken as an expression of preferences ('revealed preferences assumption', e.g. Stigler & Becker 1977). This instance encouraged us to replicate the investigation with actual hours worked as our dependent variable (see Tables 3 & 4). To preclude that differences in findings are due to differences in the samples investigated, we exclude those cases for which information on working time preferences is missing. Comparing the estimates for actual with those for preferred hours of work shows some interesting variations. Most centrally, while we failed to find job quality effects on East German workers' preferences, we find their actual hours to significantly and substantially increase with the level of occupational autonomy they enjoy. This suggests that individuals extend or reduce their working hours, in part, in response to external factors that have no effect on their preferences. For instance, a high level of job autonomy often comes along with the necessity to work longer hours. However, it seems that employees who are climbing up the career ladder to take jobs with increased autonomy would prefer to increase their work hours to a lesser extent than is suggested by their behaviour. Moreover, preferred hours seem to be differently determined than actual hours. In this analysis, health status turns out as a variable that helps to explain preferred but not actual hours[19]. There is reason to believe that there are other factors that have this property, i.e. have a stronger effect on preferences than on behaviour, but are as yet overlooked in labour supply research.

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[19] This is not to preclude the possibility that health affects actual labour supply under certain conditions or for certain sub-groups of the working population such as older workers or those experiencing strong health problems.

Endogeneity of wages due to measurement error

Wage effect estimates from empirical labour supply models, which assume exogenous wages, are often negative. Once researchers try to account for the potentially endogenous nature of hourly wages within a two-stage least squares framework, negative wage effects often disappear or even change the sign. This cannot be ignored here. What statistical procedures attempting to control for wage endogeneity basically do is to include predicted wages as a regressor instead of the potentially biased estimates obtained from dividing income by hours worked. However, the problem with such procedures is that they require valid and sensible instruments that are neither easy to obtain nor justify. The availability of panel data enables us to use lagged wages, which are typically argued to satisfy the criteria for valid instruments, for this purpose. Exchanging predicted for estimated hourly wages in the preferred labour supply model does away with any significant wage effects (not shown). This may arguably suggest that originally observed negative wage effects are an artefact of the data generated through an overestimation of hourly wages for those working short hours, and vice versa. Or less severe, it suggests that we may overestimate the magnitude of negative wage effects[v]. Yet, we are reluctant to ascribe greater credibility to the findings produced by statistical procedures that aim to control for the potential measurement error in wages by predicting these on the basis of past wages and the other covariates in the model. As a matter of fact, the issue of how to correctly estimate wage elasticities is still unresolved, owing to the mentioned difficulties in finding suitable and theoretically justified instruments. At all events, the established job quality effects in this study are unaffected by potential problems of measurement error with regard to wages. Irrespective of the true direction of causation regarding wages, our central thesis that labour supply preferences are positively affected by the quality of work, receives empirical support. Moreover, when using predicted wages as covariates in our preferred labour supply models, we still find comparably stronger effects of transitions towards jobs with greater autonomy among West German women than among their male counterparts as well as stronger effects among those enjoying a higher level of autonomy already. Furthermore, even when we do not control for wages at all, we find positive effects of upward mobility in terms of occupational autonomy on preferred hours in West Germany (Annex Table 5). This is unlikely to be due to wage increases, as these have been found to be either negative or non-significant. Hence, the established effects of job autonomy can plausibly be interpreted as job quality effects.

SUMMARY AND CONCLUSIONS

The economic literature tends to support the view that empirical analyses of labour supply decisions and its determinants should be based on *realised behaviour* rather than on subjective preference data. This is built on the belief that it is only through actual behaviour that individuals will 'reveal' their true preferences. However, as suggested by studies that draw on preference data to investigate the extent that these diverge from actual behaviour, working hours are co-determined by employer preferences and therefore cannot be strictly interpreted as '*revealed preferences'*. There is thus good reason for examining the role of stated preferences for explaining the actual patterning of working hours, and hence this study has been concerned with employees' preferences over work hours and how these are shaped.

The main results regarding the effects of family life-cycle transitions can be summarised as follows: It is well-established in the literature that the presence of small children negatively affects women's labour force activities (Uunk et al. 2005; Haas et al. 2006). Our analysis supports such observations and shows that the reduction in women's paid work involvement following the arrival of children tends to be reflected in their preferences. Moreover, due to the fact that West German women are more likely to reduce their contribution to the household income upon the arrival of children than their East German counterparts, West German men were expected and indeed found to increase their preferred hours with the number of children, while this is not the case among their East German counterparts.

With regard to out findings on the effects of occupational mobility, the results of this study suggest that it is not just the monetary rewards of work which determine the choice between work and non-market time; the quality of work exerts an independent influence on working time preferences. Moreover, it seems that on account of varying levels of 'material security' obtained by workers the salience of intrinsic work rewards as motivational determinants of preferred hours varies across different groups of workers. We found negative wage effects to be more pronounced for workers in lower-quality jobs than for their counterparts in higher quality jobs (proxied by level of occupational autonomy). Conversely, we found those already in high-quality jobs to increase their preferred hours when intrinsic job quality further improves, while those in low-quality jobs do not seem to respond with preferences for longer hours when they experience upward mobility to jobs with greater autonomy. In this context, we also expected to find regional differences. Owing to the fact that in the New Länder workers tend to have substantially lower wages than in the Old Länder, we expected fewer East than West German workers to be high enough on the hierarchy of needs as to be motivated to work by the intrinsic rewards of their jobs. In line with these predictions about the mediating effect of the socio-economic context on preference formation processes, our results suggest that increases in job quality tend to trigger an increase in employees' preferred hours in West Germany, while this is not the case in the East. Hence, job quality indeed seems to be of greater importance as a determinant of labour supply preferences where a higher share of workers can securely gratify their material needs by working a moderate amount of hours[vi].

The argument that the quality of the time individuals spend at the workplace is an important determinant of their motivation to work, and that thus the basis idea that the utility of leisure also depends on the quality of work time, has already been put forward by Jevons (1871) in the late 19th century. This early attempt to illuminate the importance of non-economic aspects of work is in stark contrast to latter-day models of labour supply, in which the qualitative content of paid work is blinded out. As outlined by Spencer (2004b), it was the success of the notion of opportunity costs that contributed to the neglect of work quality in mainstream labour economics. In contrast to Jevons and others, the *Austrian School* of economics (e.g. Böhm-Bawerk 1891; von Wieser 1892) decided not to assign theoretical relevance to the fact that workers may derive utility or disutility from the act of labour. Instead, they re-defined the cost of labour in terms of the loss of leisure time rather than in terms of the direct disutility or pleasure of work activities. The disutility of labour has thus come to be conflated with the utility of leisure. The theoretical implication of such a view is that workers are assumed to consider only the monetary rewards of work while being entirely indifferent toward its qualitative content. However, counter to the view that work is an instrumental activity people perform only to earn an income; it is well-established in the literature that the material rewards from work are not workers'

sole inducement to supply labour. Workers do not work just in order to meet their consumption needs; they also retain interests in the quality of their work activities (e.g. Jahoda 1982; Gallie et al. 1998; Nordenmark 1999; Hult & Svallfors 2002; Green & Tsitsianis 2005). Indeed, there is evidence that the majority of people would stay in the labour market even if this was not necessary for economic reasons (e.g. Warr 1982; Gallie et al. 1998; Svallfors et al. 2001). This suggests that employment offers a range of non-economic, on top of financial rewards. Especially when it offers scope for personal initiative and creativity, employment provides an important arena for self-fulfilment and personal development (Kohn & Schooler 1983; Lane 1991).

We would therefore argue that there may be merits to re-including the quality of the time spent at the workplace as an independent factor in individual labour supply decisions. In a similar spirit as other commentators (e.g. Spencer 2004a; 2004b; 2006; Steedman 2000; Kaufman 1999; Altman 2001), we would like to argue that research on labour supply may profit from a more holistic view of work motivation. Including work quality as a central aspect in the labour supply decision would have an important theoretical consequence: the taste for leisure would depend on the quality of work time.

Finally, the analyses suggest that actual and preferred hours of paid work are differently determined, which supports the view that work behaviour does not reflect 'revealed preferences' and hence that investigating working time preference formation processes can provide valuable insights into the mechanisms underlying observed labour supply outcomes. Most centrally, it seems that employees, who experience upward mobility, moving to jobs with increased autonomy, would prefer to increase their work hours to a lesser extent than what is suggested by their actual behaviour. This conclusion corroborates findings from research, which suggests that it is the highly-skilled employees who are the most likely to work longer hours than they prefer (e.g. Stier & Lewin-Epstein 2003; Echtelt et al. 2006). Furthermore, preferred hours seem to be shaped by factors that have no or a different effect on behaviour. Health status is one factor that this study found to help explain preferences but not actual hours and there is good reason to believe that there may be other factors that have this property. Factors that affect preferences but not actual behaviour may, for instance, include individual differences in the utility of leisure. Leisure may not be a normal good for all workers, i.e. increases in income may not always lead to a desire for additional leisure. First, what the study aimed to take into account is that the relative utility of leisure and work time is likely to depend on the quality of the time spent at the workplace. Workers' subjective evaluation of the latter may be shaped by the quality of the job tasks they perform and the possibilities for further development provided but it may also depend on the quality of social relations at the workplace. Second, how much importance workers put on having leisure time may in addition to the quality of the time spent at the workplace also depend on the quality of their non-market time (e.g. satisfaction with family life, interest in leisure activities, quality of social network, etc.). A well-known example for this reasoning is the central thesis in Hochschild's (1997) *The Time Bind*: some workers may experience the time spent at home as psychologically more strenuous than the time they spend at work and for this reason may be less willing to substitute work for leisure. Workers, who are dissatisfied with their out-of work-life, may be willing to give up an hour of their leisure time more readily than others.

Table 1: Pooled OLS and fixed effects estimates – the effects of German employees' work and household situation on their working time preferences, 1993-2003

	West Germany								East Germany							
	men				women				men				women			
	POLS	FE-1	FE-2	FE+SS	POLS	FE-1	FE-2	FE+SS	POLS	FE-1	FE-2	FE+SS	POLS	FE-1	FE-2	FE+SS
Age	-.01	.02	.02	.03	-.18***	-0.3	-.03	-.16***	-.05**	.00	.00	.05	-.03	.10	.11*	.20**
Hourly wage	-.35***	-.26***	-.45***	-.26***	-.09	-.43***	-.69***	-.38***	-.32***	-.36***	-.29	-.36***	-.29**	-.46***	-.94**	-.36***
Occ. autonomy	.75***	.31***	.31	.26*	.95***	.55***	-.20	.38*	.52***	.29	.47	.13	.87***	.31	-.73	.33
Autonomy*wage			.07**				.10**				-.03				.15	
Tenure	-.01	.01	.01	.02	.11***	.03	.03	.05	-.01	.00	.00	-.01	.00	-.06*	-.05	-.08*
Public	-.76***	-.63*	-.63**	-.49	-.41	.00	-.01	-.20	-.56*	.09	.09	.05	-.34	.53	.52	.51
Nr of kids 0-1	-.02	.05	.04	.17	-6.27***	-5.59***	-5.64***	-5.07***	.67	.37	.36	.56	-5.16*	-4.65**	-4.60**	-5.50*
Nr of kids 2-4	.22	.30*	.30*	.20	-6.25***	-4.48***	-4.50***	-3.77***	.00	.18	.17	.30	-3.29***	-3.29***	-3.28***	-3.25***
Nr of kids 5-15	.44***	.25**	.25**	.26*	-3.05***	-2.11***	-2.11***	-1.85***	.23	.18	.17	.21	-.85***	-1.04***	-1.03***	-.86***
Partner	.92***	.58*	.59*	.33	-1.65***	-1.67***	-1.66***	-1.49***	.88*	.84	.84	.30	-.88*	-.57	-.57	-.70
Non-labour inc.	-.06***	-.04***	-.04***	-.03*	-.19***	-.09***	-.09***	-.08***	-.05*	-.03	-.03	-.03	-.09***	-.05*	-.05**	-.04
Health	.18*	.22**	.23***	.21**	.22	.44***	.44***	.33**	-.04	.24	.24	.37*	.20	.41*	.41*	.53**
Constant	40.67***	39.47***	41.32***	40.91***	41.10***	37.20***	39.14***	42.41***	43.18***	42.25***	41.71***	41.04***	39.46***	35.96***	39.09***	32.18***
Observations	20951	20951	20951	15691	14606	14606	14606	10519	6435	6435	6435	5580	4967	4967	4967	4161
Respondents	6082	6082	6082	4766	4884	4884	4884	3729	1749	1749	1749	1524	1432	1432	1432	1231
R-squared	.03	.01	.01	.01	.23	.07	.07	.06	.03	.02	.02	.03	.05	.03	.04	.04
F-Test		3.46***	3.44***	3.69***		4.74***	4.72***	4.76***		3.23***	3.22***	3.14***		3.17***	3.18***	2.96***
Wald Test				sign				sign				sign				n.s.

Year dummy variables are included in each procedure but not reported. 'POLS' refers to pooled ordinary least squares regression with robust standard errors. FE refers to fixed effects estimation. 'FE+SS' refers to fixed effects estimation with correction for sample bias. The selection equation is not reported. The F-Test tests the significance of time-constant individual specific effects (unobserved heterogeneity). The Wald Test tests the joint significance of the inverse mills ratios and their interaction with time dummies. ***p <.001 ** p<.01 *p<.05

Table 2: Fixed effects estimates – the effects of German employees' work situation on their working time preferences, by level of occupational autonomy, 1993-2003

	West Germany								East Germany							
	men				women				men				women			
	high-A [a]	low-A	high-W [b]	low-W	high-A [a]	low-A	high-W [b]	low-W	high-A [a]	low-A	high-W [b]	low-W	high-A [a]	low-A	high-W [b]	low-W
Hourly wage	-.23***	-.32***	-.20***	-.47***	-.27***	-.57***	-.35***	-.53***	-.50***	-.55**	-.33*	-.56*	-.41***	-.73***	-.33**	-.34*
Occ. autonomy	.60**	-.12	.30*	.12	.55**	.49	.54*	.03	1.04**	-.22	.43	.19	1.03*	.33	.38	-.17
Observations	9803	11148	10561	10390	8354	6252	7179	7427	2932	2609	3183	3252	3497	1470	2586	2381
Respondents	3348	3452	3799	3959	3012	2450	2879	3193	908	933	1082	1169	1040	631	833	950
R-squared	.01	.01	.01	.01	.10	.03	.06	.04	.03	.02	.02	.02	.05	.02	.03	.04
F-Test	3.83***	2.84***	3.80***	2.48***	4.42***	4.00***	4.73***	3.96***	3.79***	2.40***	3.14***	2.51***	2.95***	2.72***	3.22***	2.44***

Year dummy variables are included in each procedure but not reported. Controls: all those contained in Table 36 except for health status. The F-Test tests the significance of time-constant individual specific effects (unobserved heterogeneity).
(a) The sample includes professionals, managers and workers performing tasks that require at least a secondary degree (values 3-5 on the scale of occupational autonomy, while those with values 1 or 2 are in the low-autonomy group).
(b) In each model, the sample was divided into two segments based on hourly wages. High-wage earners are defined as workers who earn the average wage level or more among each of the groups of employees considered.
***p <.001 ** p<.01 *p<.05

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Table 3: Pooled OLS and fixed effects estimates – the effects of German employees' work and household situation on their actual working hours, 1993-2003

	West Germany								East Germany							
	men				women				men				women			
	POLS	FE-1	FE-2	FE+SS	POLS	FE-1	FE-2	FE+SS	POLS	FE-1	FE-2	FE+SS	POLS	FE-1	FE-2	FE+SS
Age	.07***	.13***	.13***	.20***	-.22***	-.10***	-.10***	-.06*	-.02	.09**	.09**	.08*	-.04	.02	.01	.06
Hourly wage	-1.10***	-1.48***	-1.67***	-1.50***	-.43***	-1.40***	-1.57***	-1.46***	-.95***	-1.88***	-2.55***	-1.89***	-.92**	-1.94***	-1.72***	-2.02***
Occ. autonomy	2.95***	1.34***	.72***	1.13***	3.43***	1.52***	1.03***	1.28***	2.52***	1.04***	-.50	1.00***	3.95***	1.13***	1.60***	1.01***
Autonomy*wage			.07***				.06				.22***				-.07	
Tenure	-.02*	.01	.01	.01	.20***	.07***	.07***	.04	-.05**	.03*	.03*	.03*	.03	.02	.02	.00
Public	-1.51***	-1.24***	-1.24***	-1.07***	-.73*	-.60*	-.60*	-.88***	-1.85***	-.73*	-.71*	-.84*	-.44	-.11	-.11	.14
Nr of kids 0-1	.28	.81***	.80***	.79***	-7.88***	-7.38***	-7.42***	-5.60***	.27	-.06	-.01	.13	-7.27**	-.58	-.60	.18
Nr of kids 2-4	.47**	.81***	.80***	.82***	-9.35***	-7.10***	-7.11***	-6.21***	.09	.65*	.70*	.64*	-4.70***	-3.23***	-3.23***	-2.53***
Nr of kids 5-15	.62***	.68***	.68***	.62***	-4.21***	-2.87***	-2.88***	-2.65***	.22	.38*	.41**	.40*	-.94***	-.87***	-.88***	-.74***
Partner	1.95***	.88****	.89***	.72**	-.87*	-.71***	-.70**	-.50	1.99***	.45	.45	.17	-.27	.32	-.32	-.13
Non-labour inc.	-.07***	-.08***	-.08***	-.05***	-.23***	-.13***	-.13***	-.12***	-.03	-.08***	-.09***	-.07***	-.07**	-.07***	-.07***	-.03
Health	.09	.07	.07	-.03	-.25	.00	.00	-.01	.23	.08	.08	.13	-.21	.05	.05	.09
Constant	42.36***	47.80***	49.52***	45.06***	41.67***	47.76***	39.14***	47.25***	45.76***	51.98***	56.58***	52.84***	37.15***	50.48***	39.09***	49.50***
Observations	20951	20951	20951	15691	14606	14606	14606	10519	6435	6435	6435	5580	4967	4967	4967	4161
Respondents	6082	6082	6082	4766	4884	4884	4884	3729	1749	1749	1749	1524	1432	1432	1432	1231
R-squared	.17	.18	.18	.19	.35	.24	.24	.25	.13	.20	.20	.21	.17	.21	.21	.23
F-Test		7.56***	7.46***	8.10***		10.50***	10.39***	10.99***		8..52***	8.45***	8.36***		10.05***	10.05***	8.78***
Wald Test				sign				sign				sign				sign

Year dummy variables are included in each procedure but not reported. 'POLS' refers to pooled ordinary least squares regression with robust standard errors. FE refers to fixed effects estimation. 'FE+SS' refers to fixed effects estimation with correction for sample bias. The selection equation is not reported. The F-Test tests the significance of time-constant individual specific effects (unobserved heterogeneity). The Wald Test tests the joint significance of the inverse mills ratios and their interaction with time dummies. ***p <.001 ** p<.01 *p<.05

Table 4: Fixed effects estimates – the effects of German employees' work situation on their actual working hours, by level of occupational autonomy, 1993-2003

	West Germany								East Germany							
	men				women				men				women			
	high-A [a]	low-A	high-W [b]	low-W	high-A [a]	low-A	high-W [b]	low-W	high-A [a]	low-A	high-W [b]	low-W	high-A [a]	low-A	high-W [b]	low-W
Hourly wage	-1.42***	-1.61***	-1.12***	-2.48***	-1.29***	-1.52***	-1.34***	-1.91***	-1.84***	-3.30***	-1.52***	-3.87***	-1.97***	-1.73***	-1.81***	-2.74***
Occ. autonomy	1.74***	.64***	.92***	1.33***	1.72**	1.72***	1.14***	1.35***	2.02***	.50	1.29***	.76***	1.05***	.73	.83***	1.50***
Observations	9803	11148	10561	3959	8354	6252	7179	7427	2932	2609	3183	3252	3497	1470	2586	2381
Respondents	3348	3452	3799	10390	3012	2450	2879	3193	908	933	1082	1169	1040	631	833	950
R-squared	.19	.19	.14	.19	.27	.18	.24	.17	.24	.21	.18	.22	.25	.15	.22	.14
F-Test	6.81***	7.77***	8.07***	6.22***	8.08***	11.75***	10.86***	9.51***	8.73***	7.09***	9.12***	7.78***	9.43***	8.76***	10.05***	8.60***

Year dummy variables are included in each procedure but not reported. Controls: all those contained in Table 38 except for health status. The F-Test tests the significance of time-constant individual specific effects (unobserved heterogeneity).
(a) The sample includes professionals, managers and workers performing tasks that require at least a secondary degree (values 3-5 on the scale of occupational autonomy, while those with values 1 or 2 are in the low-autonomy group).
(b) In each model, the sample was divided into two segments based on hourly wages. High-wage earners are defined as workers who earn the average wage level or more among each of the groups of employees considered.
***p <.001 ** p<.01 *p<.05

Annex

Annex Table 1: Working Time Preferences, Transition Matrix 2002 to 2003

West German men N=5738 (Measure of working time preferences in both waves)					
	Part-time	Short Full-time	Standard FT	Long FT	Total
Part-time	**43**	33	21	3	100
Short Full-time	3	**56**	37	4	100
Standard Full-time	1	13	**73**	13	100
Long Full-time	1	6	37	**56**	100
Distribution	*3*	*22*	*57*	*18*	*100*

East German men N=1580 (Measure of working time preferences in both waves)					
	Part-time	Short Full-time	Standard FT	Long FT	Total
Part-time	**20**	33	27	20	100
Short Full-time	4	**52**	41	3	100
Standard Full-time	1	10	**78**	11	100
Long Full-time	1	4	38	**57**	100
Distribution	*2*	*18*	*63*	*17*	*100*

West German women N=4194 (Measure of working time preferences in both waves)					
	Part-time	Short Full-time	Standard FT	Long FT	Total
Part-time	**84**	11	5	0	100
Short Full-time	18	**61**	19	2	100
Standard Full-time	7	21	**67**	5	100
Long Full-time	5	14	40	**41**	100
Distribution	*43*	*28*	*26*	*3*	*100*

East German women N=1354 (Measure of working time preferences in both waves)					
	Part-time	Short Full-time	Standard FT	Long FT	Total
Part-time	**63**	29	8	0	100
Short Full-time	7	**69**	24	1	100
Standard Full-time	1	24	**71**	4	100
Long Full-time	4	7	56	**33**	100
Distribution	*11*	*44*	*42*	*3*	*100*

Sample: employees age 20-60; part-time: preferences for less than 30 hours per week; short full-time: preferences for between 30 and less than 37 hour per week; standard full-time: preferences for between 37 and 40 hours per week, and long full-time: preferences for more than 40 hours per week.

Annex Table 2: Working Time Preferences 1993 to 2003 (measure of WTP in at least five waves)

	Mean	Standard Deviation			N	
		Overall	Between	Within	observations	N
WG men	38.4	6.2	4.4	4.6	14,820	2,002
EG men	39.7	7.0	4.6	5.3	5,307	730
WG women	29.5	9.6	7.8	5.7	8,434	1,194
EG women	34.6	7.6	4.9	5.8	4,099	552

Sample: employees age 20-60

Annex Table 3: Pooled OLS and Mundlak-type random effects estimates – interaction effects of wages and job quality with sex, West and East Germany, 1993-2003

	West Germany		East Germany	
	POLS	Mundlak	POLS	Mundlak
Female	**-11.47***	**-10.14***	**-5.71***	**-5.45***
Hourly wage	**-.24***	**-.26***	**-.31***	**-.35***
Mean hourly wage (time average)		**.13**		.05
Female*hourly wage	.11	**-.12**	.01	-.03
Occupational autonomy	**.57***	**.15**[a]	**.51***	.21
Mean occupational autonomy (time average)		**.63***	**.35**	**.45***
Female* occupational autonomy	**.87***	**1.03***		.33
Observations	35557	35557	11402	11402
Respondents	10966	10966	3181	3181
R-squared	.31	.31	.12	.12
Test for significance of mean shares		sig.		sig.

***p<0.001; **p< 0.01; *p<0.05; [a] p< 0.07 / Controls: age, sector of activity (public or private), time with same employer (job tenure in years), presence of partner, number and age distribution of children (as in Table 36), household income not earned by the respondent (non-labour wage income) and health status and the mean shares of these variables (time-average for each worker)

Annex Table 4: Pooled OLS and Mundlak-type random effects estimates – interaction effects of wages and job quality with residence in either East or West Germany, by sex, 1993-2003

	male		female	
	POLS	Mundlak	POLS	Mundlak
East Germany	.82	**1.01***	**6.49*****	**6.37*****
Hourly wage	**-.34*****	**-.28*****	-.08	**-.41*****
Mean hourly wage (time average)		-.09		**.29*****
East Germany*hourly wage	.01	-.03	**-.18[a]**	-.06
Occupational autonomy	**.73*****	**.34*****	**1.03*****	**.71*****
Mean occupational autonomy (time average)		**.58*****		**.70*****
East Germany*occupational autonomy	-.22	-.19	-.12	**-.42***
Observations	27386	27386	19573	19573
Respondents	7763	7763	6281	6281
R-squared	.03	.03	.24	.25
Test for significance of mean shares		sig.		sig.

***p<0.001; **p< 0.01; *p<0.05; [a] p< 0.07 / Controls: age, sector of activity (public or private), time with same employer (job tenure in years), presence of partner, number and age distribution of children (as in Table 36), household income not earned by the respondent (non-labour wage income) and health status and the mean shares of these variables (time-average for each worker)

Annex Table 5: Fixed effects estimates – the effects of German employees' occupational status on their working time preferences (without controlling for earnings power in terms of hourly wages), 1993-2003

	West Germany				East Germany			
	men		women		men		men	
	preferred	actual	preferred	actual	preferred	actual	preferred	actual
Occupational autonomy	.32***	1.09***	.75***	1.70***	.27	1.00***	.22	1.35***
Observations	24381	24035	16528	16190	7125	7025	5813	5726
Respondents	6831	6777	5245	5195	1869	1855	1592	1590
R-squared	.01	.01	.06	.12	.01	.01	.03	.03
F-Test	3.63***	6.02***	4.75***	7.60***	3.29***	5.61***	3.21***	6.73***

Year dummy variables are included in each procedure but not reported. Further covariates include age, job tenure, sector of activity (pubic versus private), number and age distribution of children, non-labour income and health status. / ***p <.001 ** p<.01 *p<.05

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[i] Acknowledging that households are important decision making units, however, we view this trade-off in the context of household strategies. From this point of view, households have a target income that their members aim to generate in gainful employment. Personal target incomes of men and women in coupled households and their unpaid work loads operating as time constraints to employment are then a function of the gender division of breadwinning roles practised.

[ii] Empirical evidence for an upward-sloping labour supply curve in the region of lower wages, is typically argued to reflect utility-maximising behaviour in response to wage increases ('substitution effect'). In contrast to this reasoning, we argue that a positive relation between wage changes and working hours is plausibly due to hours constraints set by employers in the sense that workers who face a wage cut plausibly also face a reduction in demand (e.g. their opportunities to perform paid overtime work may diminish).

[iii] There are many arguments that can be raised against needs hierarchy theory, including the claim that it is rather difficult to test because of conceptual ambiguities and difficulties with operationalising its central concepts (Gibson & Teasley 1973; Wicker et al. 1993; Haslam et al. 2000). However, in spite of the conceptual criticisms of the theory, need hierarchy theory is commonly referred to in applied research, as it has proven to be very useful in generating ideas and in explaining diverse research findings. The rationale for choosing need hierarchy theory as part of our theoretical framework to explore which factors people take into consideration when forming their working time preferences is simple: given that we aim to explore employees' reactions to the core dimensions of their jobs an obvious choice would be Hackman and Oldham's (1976; 1980) job characteristics model of work motivation. However, while his model can be used to predict that certain job characteristics will elicit work motivation, it does not specify the conditions under which this will be the case. Need hierarchy theory, by contrast, is a dynamic theory of motivation that provides us with theoretical predictions about the conditions under which one need is likely to prevail over another in driving work-related behaviour. Therefore, it is chosen as a logical framework and source of inspiration in the attempt to combine economic theories of labour supply with the claim that *under certain circumstances* (e.g. absence of income deprivation) other factors than wages and income, such as the strive for personal growth, may become the main sources of work motivation.

[iv] The self-employed are excluded, because their working times are not monitored or legally regulated. Those working in the agricultural sector are excluded because farm workers often have variable schedules.

[v] There is an important caveat to the target income hypothesis: the target income that individuals aim to generate in employment may not be fixed but increase over time due to ever increasing levels of aspirations (Altman 2001). Hence, in the event that people's target income tends to increase with their earnings power, wage increases may have a weak if any effect on preferred hours. At all events, even if this should be that case, *wage decreases* can still be assumed to trigger reductions in preferred work hours, especially among low-paid workers who face a strong pressure to maintain their current level of total income. Indeed, under the assumption of loss aversion (e.g. Götte et al. 2004), wage decreases can generally be assumed to have a stronger effect on preferred hours than wage increases.

[vi] When pooling the sample of East and West German workers in order to test for the statistical significance of regional differences in the strength of job quality effects, while controlling for hourly wages, the difference between East and West Germany turned out to be significant among female but not male employees (Mundlak-type model). This suggests that the difference between West and East German men with regard to the effect of job quality on preferred hours is due to compositional effects (i.e. a higher share of low-wage workers in East Germany), while this is not the case among women. Indeed, irrespective of wage levels, West German women turned out to most strongly respond to improvements in terms of job quality, when compared to their male but also when compared to their East German counterparts, see Annex Tables 3 and 4).