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The effect of wage satisfaction on individual labour supply

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Abstract

I examine the link between wage satisfaction and weekly work hours for 124 Dutch individuals over nine years (2014-2022) with data from the LISS panel. Fixed effects panel OLS regressions reveal a statistically insignificant relationship between wage satisfaction and work hours. Including an interaction term between wage satisfaction and the natural log of monthly net wage yields a significant positive association, however. Net wages consistently influence hours worked in a backward-bending labour supply curve Desired work hours and work type satisfaction prove to be more robust descriptors of weekly hours. The study is limited by potential bias and simultaneity issues.

Key words: Wage satisfaction, individual labour supply, Fair Wage-Effort Hypothesis, backward-bending individual labour supply curves, LISS panel

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1 Introduction

In conversations with my father, I have often heard of the many curious, if not problematic, situations that occur at his place of work. Notably, some of his colleagues earn the same, if not more, than he does yet they work far fewer hours in a given week, and this has tangible negative effects on the other workers -- my father included. What's more, colleagues of his who are a pay grade lower work more than some of his other colleagues within his pay grade. Beyond the obvious discrepancies that may be attributed to differing contracts, I often wondered why that was, and still do. In essence, what makes people work the amount that they do work? This curiosity is not a novel one, nor is it unique. The discussion of pay and productivity dates back to Frederick Taylor (1911) who, in his book *The Principles of Scientific Management,* advocates for the use of performance related pay (PRP) as a mechanism through which workers could be induced to be more productive. Edward Lazear (1986) developed a lot of the theory and research on incentive structures and further emphasizes the relationship between pay and performance. However, he crucially also discusses the costly nature of monitoring performance, where he argues that in industries where implementing accurate and efficient monitoring presents overmuch costs, firms optimally use salaries and pay schemes less closely linked to individual performance (Lazear, 1986). But this reduction, or absence, of accurate monitoring leaves workers with a considerable amount of decision power in how productive they choose to be. By drawing on theories from behavioural economics, social philosophy, and labour economics, I investigate the effect wage satisfaction has on the hours an individual chooses to work per week, and less so the wage level itself. This thereby gives form to my research question: What is the effect of wage satisfaction on individual labour supply?

Other studies have principally investigated the impact of work hours on overall job satisfaction (Clark, 1996; Mohanty, 2019) however, few have explicitly look at the effect wage satisfaction has on hours worked. The majority of the work investigating this mechanism is theoretical and experimental work with notable contributions made by Akerlof (1982); Akerlof and Yellen (1990); Fehr and Gächter (2000); and Fehr and Falk (1999). I draw on the theories they develop to investigate the relationship between wage satisfaction and hours worked using data on Dutch individuals taken from the LISS panel database. I use fixed effects panel OLS regression models to do first estimate the effect of wage satisfaction on the contract hours an individual commits to; the actual average self-reported hours worked per week; and finally, a measure of hours worked relative to contract-stipulated hours which I refer to as the labour

supply discrepancy ratio (LSDR). I find no consistent statistically significant association between wage satisfaction and the afore mention dependent variables. I find that wage satisfaction only becomes statistically significant in determining both the contract-stipulated as well as actual hours worked when an interaction term between the wage satisfaction and the net wage is included, in which case my findings are consistent with the theoretical framework presented: increased wage satisfaction is associated with more hours worked both at the contract-stipulated as well as the actual average level, but, as net wage levels increase, the positive association between increased wage satisfaction and both types of hours worked diminishes. In this respect, my study is fairly novel.

The self-centered approach to understanding labour supply decisions traditionally held in economics does not necessarily consider the other, non-standard, factors that may influence this decision. Richard Thaler (2016) quotes: "[i]n recent years there has been growing interest in the mixture of psychology and economics that has come to be known as "behavioral economics."" (Thaler, 2016, p.1577). Behavioural economics thus looks to expand the descriptive ability of economics by drawing from other social sciences to better understand the economic agent. In this vein, my study therefore derives its academic and social relevance by examining how wage satisfaction influences hours worked. Hereby, more can be said about the non-standard market interactions and considerations that influence market outcomes Senik (2021).

2 Theoretical Framework

In the following section, I present the mechanisms through which wage satisfaction can influence hours worked by drawing on theories from labour economics, behavioural economics, social psychology, and organizational theory. At a microeconomic level, it seems appropriate to characterize the labour market as a principal-agent one with employers as principals, and employees (workers) as agents. These terms will be used interchangeably henceforth. Wage satisfaction is a concept that encompasses how content a worker is with their current wage.

2.1 Standard Economic Labour Supply Theory and Utility Maximization

Consider a standard, two-good, utility function $U = U(C, L)$ where an individual's utility depends positively on their consumption, C, and positively on their leisure (equivalently referred to as non-market hours), L. Furthermore, $U' > 0 \ and \ U'' < 0$. Consumption depends

in turn positively on wage, *w,* and hours worked (equivalently market hours), *h,* whereas leisure depends negatively on hours worked. This individual faces the following constraints, with *M* denoting non-labour income:

$$C = w * h + M \tag{2.1.1}$$

$$L = T - h \tag{2.1.2}$$

Equation (1) represents the budget constraint faced and equation (2.1.2) represents the time constraint where *T* is the total time endowment. Referring to equation (2.1.1), the budget constraint is kinked. That is, in the absence of market hours, an individual can still enjoy a level of consumption along with full leisure. The indifference curve that passes through this kink point therefore denotes the reservation wage of the worker – the minimum wage required for them to enter the labour market and supply market hours (labour). An economic agent therefore solves the following in their decision to work when they can choose hours freely, conditional on the wage offered being higher than the reservation wage:

$$max_{C,L} U(C, L) \; subject \; to \; C = wh + M \tag{2.1.3}$$

Standard economic theory predicts that as wages increase, one of two things happens. Either workers choose to work more or work less. The former describes the substitution effect where, as wages rise, the opportunity cost of consuming leisure increases. This therefore induces a worker to prefer more market hours -- to work more. The latter describes the income effect where, as wages increase, a worker can maintain a desired level of income by working fewer hours and therefore chooses to consume more hours of leisure, and therefore supply fewer hours of work. Hence, the substitution and income effects typically operate in opposite directions when leisure is a normal good. Combined, an increase in wage can give way to the individual backwards bending labour supply curve where, as wages initially increase, the substitution effect dominates, and more hours of work are supplied. Beyond a certain point, as wages further increase, the income effect dominates, and fewer hours of work are supplied. This relationship is illustrated below.

Figure 2.1 – Illustration of the backward-bending individual labour supply curve
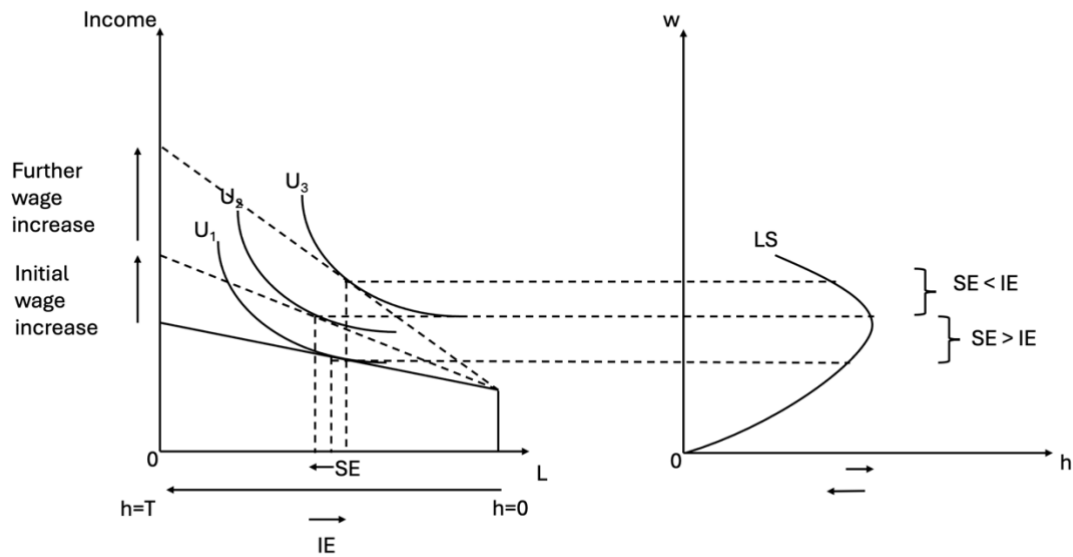
Notes: The figure above is inspired by the teaching material of professors van Ours and Marie from their course[1] titled Labour Economics taught at the Erasmus University Rotterdam, Erasmus School of Economics and is the author's own illustration.

Focusing more concretely on the worker's utility, and more broadly on utility maximization, labour supply can equivalently be examined through effort, in which case the agent's utility function takes on the form $U(w, e)$ depending positively on income and negatively on effort. This relation places the exertion of effort as a cost to the individual – a relation in line with the standard economic labour supply theory above which, from equation (2), also relates labour supply (hours worked) as a cost to the individual. In this vein, it seems appropriate to treat hours worked and the effort of supplying labour as quasi-synonymous. Jevons (1871) defines utility maximization as "satisfy[ing] our wants to the utmost with the least effort – procur[ing] the greatest amount of what is desirable at the expense of the least that is undesirable - in other words, maximiz[ing] comfort and pleasure". Notionally, this implies that workers supply labour up to the point where the marginal benefit of doing so is equal to the marginal cost of doing so. Analytically, this can take the following form. Considering the utility function outlined above, let $C(e)$ denote the cost of effort such that $C(e)' > 0$ and $C(e)'' > 0$. This assumption is a common and central one in the principal-agent examination of labour market interactions under the neo-classical, utility maximizing, economic framework (Charness et al., 2020). Therefore, it is proposed that the cost of effort be taken as $C(e) = \frac{1}{2}\theta e^2$. Income can be defined as $w * e$ therefore making the worker's utility

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[1] van Ours, J., & Marie, O., (2024). Labour Economics. (PowerPoint Presentation). Erasmus University Rotterdam, Erasmus School of Economics.

function: $U(w,e) = we - \frac{1}{2}\theta e^2$. Utility maximization dictates that the worker exerts effort[2] such that $w = \theta e \Leftrightarrow e = \frac{w}{\theta}$. To expand on this model, if a term is included to represent the effect that intrinsic motivation has on a worker's utility, the following is obtained: $U(w,e) = we + \gamma e - \frac{1}{2}\theta e^2$ where γe represents the utility a worker obtains from their joy of working. Utility maximization dictates in this case that a worker optimally exerts effort level[3] $e = \frac{w+\gamma}{\theta}$. Here, effort is increasing in intrinsic motivation, that is, the non-monetary incentives that induce a worker to supply effort. This model with intrinsic motivation draws heavily from a model developed by Delfgaauw and Dur (2007). Because intrinsic motivation is nonpecuniary in nature, and workers with higher intrinsic motivation supply more effort, this means that profit maximising employers have an incentive to employ and maintain the highly motivated workers as these are theoretically cheaper to employ.

2.2 Fair Wage-Effort Hypothesis and The Efficiency Wage Theory

Akerlof and Yellen (1990) develop a theory proposing that workers chose the level of effort they supply in consideration of what the authors present as the wage-to-fair wage ratio. That is, workers adjust their effort level in accordance with how fairly their wage matches with their self-perceived "fair wage". Akerlof and Yellen (1990) arrive at the following concise proposition: $e = \min\left(\frac{w}{w^*}, 1\right)$ where e denotes normal effort, w is the actual wage, and w^* is the fair wage. Under the above, normal effort supplied can only ever maximally reach unity, and what's more, only ever exists as the minimum of the two. Importantly, however, Akerlof and Yellen (1990) use their model to also explain unemployment as well as wage compression. It stands to reason that wage satisfaction is considerably determined by how "fair" a worker perceives their pay to be; that is, how close their actual wage is to their self-perceived fair wage. With this in mind, individuals who report being more satisfied with their wages are expected to exert more effort, and hence work more hours.

The fair wage-effort hypothesis outlined above relates very closely to the efficiency wage theory developed by Shapiro and Stiglitz (1984). In their work, they propose that employers offer wages above the market-clearing level to induce increased worker productivity and reduce on-the-job shirking. At its crux, the mechanism they outline is that higher wages present workers an increased cost of losing their job which acts as an incentive for them to be

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[2] $\frac{\partial U(w,e)}{\partial e} = 0 \Leftrightarrow w - \theta e = 0$

[3] $\frac{\partial U(w,e)}{\partial e} = 0 \Leftrightarrow w + \gamma - \theta e = 0$

productive. In this manner, fairer wages, and increased satisfaction thereof, presents itself as a way to increase the cost of a worker losing their job (through inefficient labour supply) thereby creating an incentive for workers to supply labour.

2.3 Reciprocity

Another possible mechanism through which wages, and the satisfaction thereof, might influence labour supply is through reciprocity. Akerlof (1982) looks at the labour market in the context of a gift-exchange setting. Here, he proposes that workers view wages in excess of the labor's opportunity cost as a "gift", for which the reciprocal is effort exerted above the bare minimum (Akerlof, 1982; Fehr & Gächter, 2000). Indeed, Fehr and Gächter (2000) build on the idea of labour relations between employers and employees being additionally characterized by reciprocity. The authors point out how labour market relations are often characterized by incomplete contracts. This therefore gives some margin of choice for the worker to determine their actions within their contract with their employer – for example to work above or below contract-mandated hours, or as the authors put it, the workers have a "considerable degree of discretion over effort levels" (Fehr & Gächter, 2000, p.168). In such a setting, Fehr and Gächter (2000) point out that if workers are indeed motivated by reciprocity, then employers have some degree of control over the exertion of effort in how generous compensation is. In examining this relationship, they refer to an earlier study conducted by Fehr, Gächter, and Kirschteiger (1997) where the authors simulate a labour market in the form of an experiment where the employers offered wage contracts with desired effort levels specified within. Conditional on a worker accepting an offer, the actual level of effort supplied was ultimately left up to the discretion of the worker. The employer was bound to pay the stipulated wage regardless of true effort provision by the worker. As Fehr and Gächter (2000) highlight, the crux of the experiment is that purely self-interest, economically rational, workers have no incentive to supply effort beyond the minimum. The authors sum up the purpose of the experiment in the following question: "to what extent experimental employers do appeal to workers' reciprocity by offering generous com- pensation packages and to what extent workers honor generous offers[?]" (Fehr & Gächter, 2000, p.169). Fehr, Gächter, and Kirschteiger (1997) find that many experimental employers make generous offers, and what's more, despite the presence of shirking, the experimental workers were on average willing to supply more effort than what was minimally required. In this manner, higher wage satisfaction may be indicative "generous" offers made by employers for which the reciprocal is more effort.

2.4 Congruence and Motivation

Referring to Akerlof and Yellen's (1990) fair wage-effort hypothesis, normal effort reaching unity can be thought of as representing congruence between employers and employees. In economics, and more precisely organizational theory, and under consideration of the principal-agent problem, congruence refers to the degree to which the priorities and objectives of principal and agent are aligned (Jensen & Meckling, 1976). In the context of the labour market, a profit maximizing firm will have as its objective maximizing profits. This is possible, in part, when workers are working, or supplying labour, at efficient levels. Workers in turn have, as their objective, utility maximization which is dependent on income. If we take the actual wage as a measure of the principal's value placed on the agent's contribution to them achieving their objective, and the fair wage as the agent's value placed on their contribution to the principal's objective, efficiency is reached when normal effort takes on a value of unity – the principal and agent value the agent's effort equally. When the actual wage falls short of the fair wage, this presents itself as an inefficiency as the agent would then supply a lower amount of labour (this in the form of reduced effort). If we take wage satisfaction to encompass an agent's perceived fairness of wage received (among other attributes), then a misalignment in value placed on the agent's supply of labour would lead to reduced effort (or hours of work supplied), a suboptimal outcome. Falk (2014) summarizes the issue described above in the following: "Firms want their employees to work hard and to pay them as little as possible, while employees want to maximize their pay and expend as little effort as possible" (Falk, 2014, p.2).

At its core, wage satisfaction is taken to influence (and perhaps distort) the incentives economic agents face when deciding to supply labour. Motivation plays a crucial role in deciding how much labour to supply. This therefore forms the basis of my core hypothesis: individuals who report higher wage satisfaction work more hours ceteris paribus.

3 Related Literature

My topic of research more broadly relates to the literature on industrial organisation as well as on job satisfaction and happiness.

Clark (1996) examines the relationship between job satisfaction and individual -- as well as -- job characteristics. He focuses on emphasizing the correlation between job satisfaction and labour market outcomes. To do so, he uses data from the first wave of the British Household Panel Survey (BHPS). He concludes that higher levels of job satisfaction are found for women, older workers, and lower education levels. Men, people in their thirties,

the well-educated, and those working longer hours reported having lower levels of job satisfaction. Clark (1996) additionally finds that income is strongly associated with pay satisfaction and less strongly with over all job satisfaction.

Lydon and Chevalier (2002) investigate the effect of wages on job satisfaction by exploring the hypothesis that wages are actually endogenous to job satisfaction. Using data on two cohorts of recent UK graduates of higher education institutions, 1985 and 1990 respectively, the authors find that when controlling for wage endogeneity by using the characteristics of partners/spouses as instruments, the effect of wages on job satisfaction approximately doubles. Furthermore, they identify that job expectations and aspirations present themselves as considerable determinants of job satisfaction.

Armin Falk (2014) explicitly looks at the relationship between fairness and effort, and finds that when workers are treated fairly, they are more productive. Falk (2014) references an earlier study conducted by Fehr and Falk (1999) which examined how under incomplete contracts, as is the case often in labour relations, and no explicit performance incentives, employers have an incentive to maintain generally cooperative relationships with workers. Under the conditions outlined above, the lack of enforceable, or costly, performance measures give workers a degree of discretion over the effort they supply. Fehr and Falk (1999) find that effort levels are indeed positively related to wages. These findings are obtained from an experiment they conducted which took the form of a double auction between experimental workers and employers. One interaction involved complete contracts whereas the other involved incomplete contracts offering workers discretion over effort supply. Crucially, their findings contribute to explaining why there is downward wage rigidity in labour markets; the positive relationship between wages and effort under incomplete contracts presents a cost for the employer to lower wages. Turning back to Falk (2014), he emphasizes that "[f]irms that emphasize the fair treatment of workers with regard to wages and other workplace conditions may produce better outcomes for both them and their workers." (Falk, 2014, p.1).

Mohanty (2019) investigates the relationship between job satisfaction and workers' weekly wages and hours. His approach is axed on the assumption that these three are simultaneously related and therefore estimates them as such: under a simultaneous equations framework using a two-stage procedure (Mohanty, 2019). Crucially, he finds that when assuming that the wage level, hours worked, and job satisfaction are related to one another simultaneously and correcting for this, a causal interpretation of job satisfaction hours worked, and wage level can be explored. The data used stem from three waves of the National Longitudinal Survey of Youth (NLSY79) corresponding to the years 1990, 2000, and 2010.

Ultimately, Mohanty (2019) finds that first, regardless of age, weekly wage is positively related to job satisfaction. Younger and more mature workers are found to have a positive association of hours worked and job satisfaction whereas older adults are found to have a negative one. Job satisfaction proves to be statistically significant in both estimations of wages and hours whereas both wages and hours were insignificant in estimating job satisfaction. This "recursive" relationship is therefore what leads Mohanty (2019) to infer a causal interpretation of the effect of job satisfaction on weekly wages and hours.

4 Data and Methodology

The data used for this research are taken from the Longitudinal Internet Social Survey (LISS) panel database. This is a database administered by Centerdata and the Tilburg University. The panel database uses a true probability methodology for sampling households drawn from the Dutch National Statistical Bureau (Centraal Bureau voor de Statistiek in Dutch (CBS)). This results in 5000 households constituting approximately 7500 individuals aged 16 and older. This method of sampling allows for a representative sample of the Dutch population to be analyzed. In my study, I make use of waves 7 till 15 of the Work and Schooling study were used corresponding to the years 2014 until 2022. The background variables for the respondents were merged from the Background datasets corresponding to the months of survey. The years 2014 to 2019 represent a period of relative economic stability for The Netherlands and was therefore selected. The years 2020 till 2022 were included as COVID years to evaluate the effect of relative economic instability on the variables of interest. The results in Section 5 point to COVID years not being statistically significantly different to non-COVID ones in the context of my study.

To investigate the effect of wage satisfaction on hours worked, the sample studied only focuses on wage earners. This specification further excludes working students and retired persons. As such, the individuals studied cover for the most part the prime working age. After removing missing observations and incomplete/incoherent observations, I was left with 124 unique individuals (n=124) over 9 years giving me access to 1002 individual observation points.

4.1 Variables and Control Variables

In table 4.1.1 the descriptive statistics are given for the continuous variables used in this study. The values included above the double line correspond to the descriptive statistics of continuous variables used in this study with 124 individuals. Below the double line, the descriptives are

given for a more representative sample of the Dutch population during the years studied. The LISS panel provides access to a hypothetical 7500 randomly selected individuals. The fuller sample used to assess my study's external validity makes use of 6692 of these individuals. Therefore, although not immune to selection bias, it provides a more robust point of comparison against which I can compare the descriptive statistics of my studied sample. Hence, the mean age studied in my sample is approximately 49 years old whereas that of a more representative sample of the Dutch population during the years 2014 to 2022 is closer to 45 years old – my individuals are on average older. Furthermore, my studied individuals earn a considerably higher mean net monthly wage. This is likely because my study only focuses on wage earners. To this, contract, actual, and desired mean hours are only presented for my studied sample as these 124 are the only ones who provided consistent data over the chosen time span. Therefore, not much can be said about how these 124 differ in terms of these variables.

Table 4.1.1 – Descriptive statistics for continuous variables

Variable	Mean	Std. Dev.	Min	Max	Obs.	n
Age	48.83	8.54	22	66	1002	124
NetWage	2448.39	762.64	530	7000	1002	124
Experience	15.95	10.96	0	48	1002	124
ContractHours	35.24	6.53	8	40	1002	124
ActualHours	38.06	7.84	8	75	1002	124
DesiredHours	33.48	7.33	0	70	989	124
Age	44.72	13.90	16	103	25063	6692
NetWage	1874.86	1849.22	0	133537	25063	6692

Notes: Age and experience are presented in years. Net wage is measured and presented in Euros and is the monthly wage. Contract, actual, and desired hours are measured in hours per week. The data are obtained from the LISS panel studies on Work and Schooling as well as corresponding Background Variables datasets for the years 2014-2022. Data entries with n = 124 correspond to the sample studied in this paper whereas those below the double line with n = 6692 correspond to a fuller sample closer to the representative sample of the Dutch population from 2014-2022.

Wage satisfaction is the principal variable of interest in this study. It is measured on an eleven-point Likert-scale where respondents of the LISS study indicated to what extent they were satisfied with their wage (and salary earnings writ large) with 0 indicating not being satisfied at all and 10 corresponding to being fully satisfied. The distribution of wage satisfaction can be found in figure 4.1 in Appendix 2. The majority of observation points are 8,

with 7 being a close second. This therefore indicates that the sampled individuals are already relatively satisfied with their wages.

Net wage is included as a control for fairly logical reasons. Drawing from the theory discussed, wage is expected to have a considerable degree of influence over both wage satisfaction and hours worked. Specifically, net wage is included because it presents a realer factor for workers and fits the data better. Wage distributions are often right skewed (Neal & Rosen, 2000), and so too is the one for the sample studied. Figure 4.2 in Appendix 2 illustrates this. Therefore, the natural logarithm of the net wage is taken to account for the skewedness.

Desired hours of work are included as a control variable. The hours of work an individual would ideally supply, or wants to supply, captures to some extent the intrinsic motivation they face towards their work. Relating to the model outlined above, it seems fair to consider that desired hours of work would influence how much an individual would like to be paid (and relatedly how much the actual wage faced aligns with this, and hence the wage satisfaction) and how much they would like to work correspondingly.

Colleague satisfaction is included as a control. In his work, Akerlof (1982) similarly articulates that if workers have an interest in the welfare of their colleagues, they gain some form of utility in the firm relaxing pressure on those who are hard pressed. Such workers, with an altruistic component, compensate the lessened effort exerted by colleagues by in turn working harder. Colleague satisfaction however also encompasses how fairly workers perceive their wages are in relation to that of their colleagues. In his seminal work, Easterlin (1974) proposed that happiness be derived from relative wages as opposed to absolute wages. Furthermore, Adams (1963) posits that wage inequalities may influence the productivity of workers. Similarly to wage satisfaction, colleague satisfaction is measured on an eleven-point Likert scale with 0 being not satisfied at all and 10 being fully satisfied. Figure 4.3 in Appendix 2 illustrates the distribution. The majority of observation points correspond to 8 in the sample studied. This suggests a high degree of colleague satisfaction on average.

Work type satisfaction is additionally included as a control. This variable is taken to reflect to some extent the intrinsic motivation a worker faces, much in line with the theoretical framework outlined above. Similarly to wage and colleague satisfaction, work type satisfaction is measured on an eleven-point Likert scale with 0 being not satisfied at all and 10 being fully satisfied. Figure 4.4 in Appendix 2 shows the distribution. Similarly to colleague satisfaction, there is a markedly high degree of work type satisfaction with the majority of observation points corresponding to 8.

Sector of employment is included as a control because as Krueger and Summers (1988) show, industry affiliation is related to the wage level. A considerable degree of specificity is removed in using the sector of employment as opposed to the industry per se, however there is still reason to suspect that unobserved characteristics play a role in the self-selection of workers into either the public or private sector. Roy (1951) is credited with developing the Roy model of occupational self-selection which stipulates that workers choose to work in the occupations that reward them for their skills and productivity best. To this, the public and private sectors are known to differ in remuneration structure and level (Kreuger & Summers, 1988). Hence, the sector of employment is expected to be a confounder when estimating the effect of wage satisfaction on hours worked.

Job experience is included as a control. Akerlof (1982) highlights that contracts between employers and employees are sometimes implicit in that "workers need not be currently rewarded for their current performance but may earn chances for promotion with higher pay in the future in return for good performance in their current jobs" (Akerlof, 1982, p.545). As workers progress in their jobs and careers, it is expected that their pay increases as well as their productivity. For these reasons, it is expected that experience would be a confounder in examining the effect of wage satisfaction on hours worked. The squared term is included to account for non-linearities.

4.2 Estimation Specifications and Strategy

To estimate the relationship between wage satisfaction and hours worked, I employ a fixed effects OLS panel regression. A fixed effects regression is preferred to a random effects one following the results of a Durbin-Wu-Hausman test where the null hypothesis (which states that a random effects model is preferred) is rejected. The fixed effects model is therefore more efficient and hence, the following regressions are employed. The first, most general regressions I estimate are the following models for both contract and actual hours:

$$lnContractHours_{i,t} = \alpha_i + \beta_1 * WageSat_{i,t} + X_{i,t} + \gamma_{i,t} + \varepsilon_{i,t} \qquad (4.2.1)$$

and

$$lnActualHours_{i,t} = \alpha_i + \beta_1 * WageSat_{i,t} + X_{i,t} + \gamma_{i,t} + \varepsilon_{i,t} \qquad (4.2.2)$$

where the dependent variable is given by the natural logarithm of the weekly work hours stipulated in an employment contract for individual i at time t under (4.2.1) and the actual self-reported hours worked on average in a week for individual i at time t under (4.2.2). The first term, α_i, represents the constant for individual i. β_1 is the coefficient for wage satisfaction for individual i at time t, and $X_{i,t}$ denotes a vector of personal controls. $\gamma_{i,t}$ represents the time

fixed effects for individual i at time t. Finally, $\varepsilon_{i,t}$ is the error term for individual i at time t. Including further control variables yields the complete models given by:

$$lnContractHours_{i,t} \tag{4.2.3}$$
$$= \alpha_i + \beta_1 WageSat_{i,t}$$
$$+ \beta_2 lnAvgNetWage_{i,t} + \beta_3 lnAvgNetWage_{i,t}^2 + \beta_4 lnDesiredHours_{i,t}$$
$$+ \beta_5 SectorEmployment_{i,t} + \beta_6 Experience_{i,t} + \beta_7 Experience_{i,t}^2$$
$$+ X_{i,t} + \gamma_{i,t} + \varepsilon_{i,t}$$

and

$$lnActualHours_{i,t} \tag{4.2.4}$$
$$= \alpha_i + \beta_1 WageSat_{i,t}$$
$$+ \beta_2 lnAvgNetWage_{i,t} + \beta_3 lnAvgNetWage_{i,t}^2 + \beta_4 lnDesiredHours_{i,t}$$
$$+ \beta_5 SectorEmployment_{i,t} + \beta_6 Experience_{i,t} + \beta_7 Experience_{i,t}^2$$
$$+ X_{i,t} + \gamma_{i,t} + \varepsilon_{i,t}$$

where the crucial difference is that the first equation uses contract-mandated hours whereas the second one uses the self-reported actual hours worked per week on average. The former is used to capture the effect wage satisfaction has on the hours of work workers commit to working and are expected to work (in the same spirit as the experiment conducted by Fehr, Gächter, and Kirschteiger (1997)). The latter, using actual hours, is used to capture the effect wage satisfaction has on the hours of work a worker -- in some sense -- chooses to supply which, crucially, can deviate from the contract-stipulated weekly hours of work. These both include the occupational controls discussed in section 4.1.

I further construct a labour supply discrepancy ratio (LSDR) variable inspired by Wang and Weststar (2015) who define work hour congruence as when a worker works the same hours as they would ideally work. I define the LSDR as:

$$LSDR = \frac{(ActualHours - DesiredHours)}{ContractHours}. \tag{4.2.5}$$

By measuring the difference in actual and desired work hours and standardizing it by the contract hours, I obtain a proxy for how labour supply and demand preferences match between employers and employees. This metric is valuable because it serves as a measure of employee preference satisfaction in a labour supply context. Both actual and desired hours are choice variables whereas contract hours less so -- they represent the hours expected of the employee by the employer. Hence, when $LSDR > 0$ this means an employee is working more hours than they would ideally work relative to their contract hours. Similarly, when $LSDR <$

0, this implies that an employee is working fewer hours than they ideally would be relative to their contract hours. $LSDR$ can only ever equal 0 when $ActualHours - DesiredHours = 0$, or when the actual hours they choose to work are equal to their ideally preferred working hours. When relative to their contract hours, this proves to be interesting as this indicates that employees are maximising their work preferences, which in line with economic theory, would be an efficient outcome for workers. To investigate the effect of wage satisfaction on LSDR, the following regression is employed:

$$LSDR_{i,t} = \alpha_i + \beta_1 WageSat_{i,t} + \beta_2 lnAvgNetWage_{i,t} + \qquad\qquad (4.2.6)$$
$$\beta_3 lnAvgNetWage_{i,t}{}^2 + \beta_4 SectorEmployment_{i,t} + \beta_5 Experience_{i,t} +$$
$$\beta_6 Experience_{i,t}{}^2 + X_{i,t} + \gamma_{i,t} + \varepsilon_{i,t}.$$

To check the robustness of my results, I estimate both complete models on contract and actual hours and the LSDR with the inclusion of an interaction term between wage satisfaction and the net wage itself. This gives me the following models estimated in table 5.2 in the ensuing section:

$$lnContractHours_{i,t} = \alpha_i + \beta_1 WageSat_{i,t} + \beta_2 lnAvgNetWage_{i,t} + \qquad\qquad (4.2.7)$$
$$\beta_3 lnAvgNetWage_{i,t}{}^2 + \beta_4 WageSat_{i,t} * lnNetWage_{i,t} + \beta_5 lnDesiredHours_{i,t} +$$
$$\beta_6 SectorEmployment_{i,t} + \beta_7 Experience_{i,t} + \beta_8 Experience_{i,t}{}^2 + X_{i,t} + \gamma_{i,t} + \varepsilon_{i,t}.$$

$$lnActualHours_{i,t} = \alpha_i + \beta_1 WageSat_{i,t} + \beta_2 lnAvgNetWage_{i,t} + \qquad\qquad (4.2.8)$$
$$\beta_3 lnAvgNetWage_{i,t}{}^2 + \beta_4 WageSat_{i,t} * lnNetWage_{i,t} + \beta_5 lnDesiredHours_{i,t} +$$
$$\beta_6 SectorEmployment_{i,t} + \beta_7 Experience_{i,t} + \beta_8 Experience_{i,t}{}^2 + X_{i,t} + \gamma_{i,t} + \varepsilon_{i,t}.$$

$$LSDR_{i,t} = \alpha_i + \beta_1 WageSat_{i,t} + \beta_2 lnAvgNetWage_{i,t} + \beta_3 lnAvgNetWage_{i,t}{}^2 + \qquad (4.2.9)$$
$$\beta_4 WageSat_{i,t} * lnNetWage_{i,t} + \beta_5 SectorEmployment_{i,t} + \beta_6 Experience_{i,t} +$$
$$\beta_7 Experience_{i,t}{}^2 + X_{i,t} + \gamma_{i,t} + \varepsilon_{i,t}.$$

5 Results

5.1 Preliminary Results

The preliminary results obtained from equations 4.2.1 until 4.2.6 are presented in table 5.1.1 in Appendix 3. Equations (1) and (2) in table regress wage satisfaction on the natural logarithm

of contract hours; equations (3) and (4) on the natural logarithm of actual hours worked; and finally, (5) estimates the effect of wage satisfaction on the labour supply discrepancy ratio (LSDR). Equations (2), (4), and (5) include the occupational controls. From table 5.1, it is apparent that wage satisfaction is infrequently a statistically significant determinant of hours worked. Only in equation (1) does it take on statistical significance at the 1% level when associated with contract-stipulated work hours. The lack of consistent statistical significance with the addition of occupational controls both when regressing on contract-stipulated and actual hours points to wage satisfaction alone not being a robust descriptor of labour supply decisions as modelled in my study. In all models, the natural logarithm of the net monthly wage and its square are consistently statistically significant: in equations (1) to (4) at the 1% level and at the 5% level in equation (5). This suggests that a considerable determinant of hours worked, both at the contract and actual level is the net wage itself. A further discussion of net wages is presented in section 6.1 below.

Turning to the occupational controls, in models (2) and (4), a consistently significant association is found between desired work hours and both contract and actual hours worked respectively: a one percent increase in desired hour of work is associated with 0.052% and 0.075% increase in contract and actual hours worked respectively. Colleague satisfaction is only weakly significant at the 10% level in equation (2) suggesting that a one-point increase in colleague satisfaction is associated with a 0.5% reduction in contract-stipulated work hours. Conversely, work type satisfaction is positively statistically significantly associated with actual hours worked: a one-point increase in work type satisfaction is associated with working 0.9% more actual hours on average. Individuals employed in the private sector are statistically significantly associated with working more hours on average as compared to those employed in the public/semi-public sector corresponding to a 10% and 10.5% increase in contract and actual hours worked respectively. Experience (and its squared term) are for the most part negligibly statistically significant.

Looking at the personal controls, the highest level of education obtained is rarely significant. The only cases occur when estimating the actual hours worked in which case having maximally obtained a higher secondary education degree is associated with working fewer hours on average relative to having only completed a secondary education degree which drops from 16.1% to 15.2% with the inclusion of occupational controls at the 10% level. The number of children someone has is only statistically significantly associated with contract-stipulated hours and not the actual hours worked dropping from 1.3% at the 10% level to 1.2% at the 5% level for every additional child an individual has with the inclusion of occupational controls.

The position an individual is within the household proves to be statistically significant across models (1) to (4) only when they are an unwedded partner as opposed to the household head (the reference category). To this, in all four models, being the unwedded partner of the household head is associated with a reduction in both contract-stipulated as well as actual hours worked. Referring to the full models (2) and (4) this presents itself as a 6.4% and 8.3% reduction in contract and actual hours worked respectively at the 5% level.

Turning to model (5), the only significant variables are the natural logarithm of the net wage, its squared term, experience, and its squared term. Wage satisfaction does not present itself as a statistically significant descriptor of the LSDR. The net wage and experience share a positive correlation with the LSDR respectively, whereas their squared terms share a negative association, all significant at the 5% level. A more extensive interpretation is presented in the ensuing section.

5.2 Addition of Further Specifications

The table below shows the results obtained when the most complete models estimated above are checked with the inclusion of an interaction effect between wage satisfaction and the net wage itself.

Table 5.2.2 – Regression results for standard models with the inclusion of interaction effects

	Regressions		
Variables	(6)	(7)	(8)
	lnContractHours	lnActualHours	LSDR
Wage satisfaction	0.167**	0.208**	0.159
	(0.055)	(0.073)	(0.136)
lnNetWage	5.042***	2.416***	2.638**
	(0.368)	(0.492)	(0.914)
lnNetWage^2	-0.291***	-0.129***	-0.160**
	(0.025)	(0.033)	(0.062)
Wage satisfaction X	-0.021**	-0.027**	-0.021
lnNetWage	(0.007)	(0.010)	(0.018)
Occupational Controls			
lnDesiredHours	0.052**	0.076***	-
	(0.016)	(0.021)	
Colleague satisfaction	-0.005**	-0.005	-0.004
	(0.003)	(0.003)	(0.006)

Work type satisfaction	0.003	0.009**	0.005
	(0.003)	(0.004)	(0.007)
Sector of employment			
Private	0.100**	0.105**	-0.009
	(0.035)	(0.046)	(0.087)
Experience	0.002	0.005**	0.010**
	(0.001)	(0.002)	(0.004)
Experience^2	-0.000**	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)
Personal Controls			
Highest educational attainment			
havo/vwo	0.015	-0.153*	-0.225
(higher	(0.058)	(0.078)	(0.146)
secondary			
education)			
mbo	-0.014	-0.141*	-0.223
(intermediate	(0.063)	(0.085)	(0.159)
vocational			
education)			
hbo (higher	0.004	-0.094	-0.010
vocational	(0.058)	(0.077)	(0.145)
education)			
wo	0.051	0.003	-0.033
(university)	(0.089)	(0.120)	(0.225)
Number of children	0.012**	0.002	0.009
	(0.005)	(0.007)	(0.013)
Age	-0.007	0.036	-0.065
	(0.019)	(0.025)	(0.046)
Age^2	0.000**	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Position in household			
Wedded	0.021	0.035	0.055
partner	(0.023)	(0.030)	(0.057)

Unwedded	-0.067**	-0.086**	-0.127
partner	(0.031)	(0.042)	(0.078)
Child living at	0.023	0.046	-0.061
home	(0.037)	(0.050)	(0.094)
Period Controls			
2015	-0.010	-0.022	0.071
	(0.020)	(0.027)	(0.050)
2016	-0.019	-0.071	0.091
	(0.037)	(0.050)	(0.091)
2017	-0.036	-0.087	0.159
	(0.055)	(0.073)	(0.134)
2018	-0.048	-0.119	0.211
	(0.072)	(0.097)	(0.177)
2019	-0.064	-0.154	0.244
	(0.088)	(0.117)	(0.214)
2020	-0.073	-0.183	0.316
	(0.108)	(0.144)	(0.264)
2021	-0.090	-0.213	0.361
	(0.125)	(0.168)	(0.307)
2022	-0.097	-0.249	0.420
	(0.143)	(0.191)	(0.351)
Constant	-18.201***	-8.899***	-8.102**
	(1.626)	(2.175)	(4.057)
N	983	983	989
R^2	0.46	0.10	0.01
F-Stat	23.35***	6.57***	1.49*

Notes: *** corresponds to $p < 0.001$; ** to $p < 0.05$; and * to $p < 0.1$. Standard errors presented in parentheses. The reference category for the sector of employment is the public/semi-private sector. The reference category for the categorical education variable is only having completed secondary education. The reference category for the household position is the household head. The reference year for the year fixed effects is 2014. The data are obtained from the LISS panel studies on Work and Schooling as well as corresponding Background Variables datasets for the years 2014-2022.

Interestingly, when the interaction effect of wage satisfaction and net wages is included, both complete models estimating the effect of wage satisfaction on contract and actual hours respectively display wage satisfaction as a considerably significant estimator at the 5% level. Here, a one-point increase in wage satisfaction is significantly associated with a 16.7% and 20.8% increase in contract and actual hours worked respectively on average. The natural

logarithm of the net wage and its squared term remain highly statistically significant at the 1% level akin to the results found in equations (2) and (4) – similarly, a deeper examination thereon is presented in section 6.1. What's more, the interaction effect itself is considerably significant. The ensuing section will provide a more extensive discussion of the mechanisms likely at play.

Turning to occupational controls, similar relationships are found as in table 5.1. Briefly, contract and actual hours worked are associated with increasing by 0.052% and 0.076% on average with a 1% increase in desired hours of work. A one-point increase in colleague satisfaction is associated with a 0.5% reduction in contract hours only. Conversely, a one-point increase in work type satisfaction is associated with a 0.9% increase in actual hours worked on average only. Working in the private sector is on average associated with a 10% and 10.5% increase in contract and actual hours worked relative to those in the public/semi-public sector respectively. An additional year of experience with an employer is associated with a 0.5% increase in actual hours worked only, however this increase negligibly statistically significantly diminishes at higher years of experience with a current employer for both contract and actual hours worked.

Regarding personal controls, for contract hours, an additional child is associated with a 1.2% increase in contract hours on average. At higher age levels, there is a negligibly statistically significant positive association with contract hours. The unwedded partners of the household head are associate with working 6.7% fewer contract hours on average. Relating to actual hours, having completed either HAVO or MBO is significantly associated with working 15.3% and 14.1% fewer hours on average relative to only having completed secondary education in both cases at the 10% level. Furthermore, unwedded partners to household heads are associated with working 8.6% fewer actual hours on average.

Similarly to the section above, equation (8) shares the same relationships as equation (5) from table 5.1 with the statistically significant variables included. That is, the logarithm of the net wage and its squared term, and experience and its squared term are the only positive associations, all at the 5% level with the squared terms taking on negative values whereas the non-squared terms positive values.

6 Discussion and Conclusion

The results presented in the section above are for the most part in line with the theoretical framework presented above. Preliminary examination of the results in table 5.1 indicates that although statistically insignificant, wage satisfaction is associated with reducing the LSDR.

This suggests that a one-point increase in wage satisfaction is associated with bringing actual hours worked closer to the desired hours worked (or vice versa) relative to the contract-stipulated work hours. However, not much can be inferred from this. In table 5.2 there is a positive association, although also statistically insignificant. Turning to the statistically significant relationships, only those of table 5.2 will be examined as these are very much similar to the interpretations to be drawn from table 5.1. If we begin from a point in which a worker is working fewer hours than they would ideally work relative to their contract hours (or when $LSDR < 0$), a 1% increase in net wage is associated with an approximate 0.026-point increase in the LSDR. This suggests that increasing wages can initially be a tool to bring labour supply decisions more in line with labour demanded. The negative association at higher levels suggests that eventually the income effect does still manifest itself in the studied sample suggesting that for really high net wage levels, the increase in wages will not be fruitful in bringing employee and employer objectives closer in line. Conversely, starting from a point where a worker is working more hours than they would like to relative to their contract (or when $LSDR > 0$), an initial wage increase is associated with exacerbating this. That is, a 1% increase in net wage is associated with a 0.026-point increase in the LSDR as before thereby further misaligning the preferences of employees and employers. Similarly, at higher wage levels this increase in net wages is associated with a reduction in the LSDR, here an approximate 0.002-point reduction. A similar interpretation can be drawn for experience, only the corresponding associated increase in the LSDR (and thereafter reduction in the LSDR for higher years of experience) are negligible following a 1-year increase with a current employer.

6.1 Labour Supply Curves

In the all the equations above, coefficients β_2 and β_3 can be thought of as representing the wage elasticity of labour supply. These are, however, to be interpreted very loosely as estimating wage elasticities of labour supply in the presence of a progressive tax system (as is the case in The Netherlands) presents considerable complications. Saez (2010) discusses issues regarding bunching at the kink points where the marginal tax rate an individual faces is endogenous, presenting a heavily biased estimate when not accounting for this. Furthermore, the nature of the sample composition and limited observations make it very difficult to reliably determine accurate wage elasticities of labour supply. Nevertheless, what proves to be tacit is the sign of the coefficients and not so much the magnitude, and much less the values. Jointly, $\beta_2 > 0$ and $\beta_3 < 0$ indicate the presence of a backward bending labour supply curve as discussed above, and illustrated in section 2.1. This is described by the consistently positive

wage elasticity of labour supply given by β_2 and the consistently negative elasticity of labour supply given by β_3 at higher wage levels. The positive relationship between wages and hours worked suggests the dominance of the substitution effect for lower wage levels. The negative relationship identified between higher wage levels and hours worked suggests the dominance of the income effect at higher wage levels. Furthermore, the consistently higher magnitude of β_2 in all regression models estimated with wages present suggest that for the sample studied, the substitution effect is stronger than the income effect suggesting that for the most part, the individuals studied prefer giving up leisure in exchange for more income when wages increase. Finally, the consistent significance of net wage and its squared term suggest that wages remain the strongest descriptors of what motivates workers to supply labour – an economically expected and reassuring finding.

6.2 Wage Satisfaction and Wages

From the further specified models, it can be seen that not only does wage satisfaction become significant in determining both contract-stipulated as well as actual hours worked, but the interaction effect also appears to be significant. Interpreting to interaction effect is as follows. β_1 is positive indicating that as wage satisfaction goes up by one-point, actual (contract) hours worked are associated with increasing. Furthermore, β_2 is positive indicating that with initial wage increases, actual (contract) hours worked are associated with increasing. β_4 is negative which is suggests that as net wage increases, the positive effect of a one-point increase in wage satisfaction on actual (contract) hours worked diminishes. Referring to the theoretical framework outlined above, this finding can be rationalized as follows. As wages earned by workers approach their self-perceived fair wages, they correspondingly supply more effort. Additionally, the further a wage is from a worker's self-perceived fair wage, the more generous the "gift" of a wage increase is warranting a reciprocated increase in effort. However, as exertion of effort presents a marginal cost to the worker and assuming $C(e)'' > 0$, the extent to which workers reciprocate wage increases decreases as it grows increasingly costly to do so. These findings are consistent with those of Falk (2014) who identifies that as wages increase, work effort (in his case voluntary cooperation) increases before decreasing at the end of the wage-increase distribution. These results are further in line with those of Cohn et al. (2013) who, in an experimental setting, found that workers who felt more adequately paid (or even overpaid) did not adjust their effort supply following wage increases while those who felt less adequately paid increased effort as wages increased.

6.3 Work Type Satisfaction and Actual Hours Worked

What proves to be additionally interesting from my results section above is that when predicting the effect of wage satisfaction on actual hours worked, the satisfaction derived from the type of work an individual performs proves to be significant in both equations (4) and (8) where the latter is estimated with the inclusion of an interaction effect between wage satisfaction and net wages. Indeed, work type satisfaction proves to be robust to the addition of additional terms in the estimated model of wage satisfaction on actual hours worked. This result can be rationalized by more explicitly considering motivation, and more specifically intrinsic motivation. A one-point increase in satisfaction with the type of work performed is associated with a 0.9% increase in actual hours worked. This, in combination with the robust statistical significance of the effect of desired work hours, suggests that a considerable determinant associated with labour supplied is the extent to which workers feel intrinsically motivated to do so. This finding is very interesting in the context of the broader literature surrounding industrial organization and behavioural economics and furthermore speaks to the social, human, aspect of economics.

6.4 Limitations

The principal limitation my study faces is a lack of data. The data used likely heavily suffers from biases given that while ensuring complete data, many missing observations were removed. This proves to be a considerable limitation to the external validity of my study. I refer to table 4.1.1 above and to table 4.1.2 from Appendix 1 to conclude the following: my sample studied is on average, older; earns more per month net of taxes, and is more male, and household head, dominant than a more representative sample of the Dutch population. Furthermore, non-native respondents are underrepresented in my study. Finally, both the number of children had, and the sector of employment sample proportions are similar to the more representative sample of the Dutch population during the years 2014 to 2022. My studied sample is therefore fairly representative of a more representative sample of the Dutch population with respect to the number of children had and the proportion working in either the public or private sector. This considered, I suspect my study to over-estimate the associated effect of wage satisfaction on hours worked. The principal reason for this is the considerably higher net monthly wages. As I demonstrate that the natural logarithm of the net wage (and its squared term) is a consistently statistically significant confounder in the relationship between wage satisfaction and hours worked, I suspect that a considerably different association between

wage satisfaction and hours worked would be obtained with a more representative sample of the Dutch population.

Additionally, much in the way of causality and in line with Lydon and Chevalier (2002) and Mohanty (2019), it is suspected that there is an element of simultaneity in wage satisfaction and hours worked. Therefore, my estimates for the effect of wage satisfaction on hours worked are very likely to suffer simultaneity bias. To address this, further research can look to employ more econometrically rigorous methods to estimate wage satisfaction on hours worked through, for example, a simultaneous regressions approach, or to adopt a two sage instrumental variables approach. Such methods would likely capture a more causal relationship between wage satisfaction and hours worked.

6.5 Policy Recommendations

Nevertheless, my investigation of wage satisfaction on hours of work remains interesting in the context of industrial organisation and economics writ large. Because my findings, and the theory discussed, is to an extent contingent on the idea of self-perceived fair wages, it is evident that information asymmetries present themselves as inefficiencies. Many interview procedures, and wage negotiations, include the interviewer asking the interviewee what their envisioned wage is. This aspect within the interview process can prove to be very effective in reducing information asymmetries between prospective employers and employees. By indicating what the worker in essence views their "fair wage" as, employers can better gain an idea of how to, and by how much, align incentives and objectives.

The statistically significant relationship between wage levels and the LSDR suggests that wages can, in some cases, be used to better align the incentives of workers and employers. However, considering the statistical robustness of desired work hours in relation to both contract-stipulated and actual hours worked along with work type satisfaction in relation to actual hours worked, employers have an incentive to further successfully screen motivated from unmotivated workers during the hiring process, and what's more, perhaps further invest in employee well-being such that a more considerable portion of a worker's supplied effort stems from nonpecuniary sources. Profit maximizing employers stand to benefit from hiring and maintaining intrinsically motivated workers in part from motivational rent extraction, but also from reduced information asymmetries and misaligned objectives.

6.6 Conclusion

In sum, my study looks at examining the effect of wage satisfaction on hours worked. Hours worked are explored through contract-stipulated hours and the actual hours worked on average.

Using panel data from the Work and Schooling study of the LISS database, I estimate fixed effects panel OLS regressions of wage satisfaction on both contract and actual hours worked. I additionally look at the relationship between wage satisfaction and the labour supply discrepancy ratio (the ratio between actual minus desired work hours standardized by contract hours, (LSDR)). In most of my estimates I do not find a statistically significant relationship between wage satisfaction and hours worked nor with the LSDR. Statistically significant results are however obtained when I include an interaction effect between wage satisfaction and the wage level itself. These indicate a positive association between wage satisfaction and both contract and actual hours worked. To this, as net wages increase, the positive effect of a one-point increase in wage satisfaction on actual (contract) hours worked diminishes. These results are in line with the economic theory outlined, principally axed on the fair wage-effort hypothesis developed by Akerlof and Yellen (1990). I consequently also find that the more statistically significant and robust determinants of hours worked are net wages and the desired hours of work.

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Appendices

Appendix 1 – Sample Comparison of Proportions

Table 4.2.2 – Comparison of percentages for categorical variables between studied and fuller samples of the Dutch population for the years 2014-2022

Variable	Overall Percentage		Within Percentage	
	Studied Sample	Fuller Sample	Studied Sample	Fuller Sample
	(n=124)	(n=6692)	(n=124)	(n=6692)
Gender				
Male	67.76	46.33	100.00	100.00
Female	32.24	53.67	100.00	99.98
Position				
Household Head	81.34	60.42	95.78	94.60
Wedded Partner	13.27	23.05	84.09	90.65
Unwedded Partner	3.89	7.33	68.85	81.51
Child Living at Home	1.50	8.28	59.79	90.27
Parent (in law)	0	0.04	100.00	63.49
Housemate	0	0.58	100.00	71.84
Family member	0	0.29	100.00	84.13
Number of Children				
None	46.01	51.29	80.53	91.76
One	19.66	16.12	57.92	73.65
Two	22.85	22.18	70.80	83.84
Three	8.98	8.50	70.72	81.79
Four	0.70	1.34	18.37	75.83
Five	0.90	0.48	37.90	79.45
Six	0.90	0.09	100.00	77.00
More Than Six	0	>0.00	100.00	25.00
Origin				

Dutch	93.11	82.98	100.00	100.00
First generation foreign, Western	0.90	3.43	100.00	99.40
First generation foreign, non-Western	1.80	4.73	100.00	99.60
Second generation foreign, Western	2.40	5.17	100.00	100.00
Second generation foreign, non-Western	1.80	3.69	100.00	100.00
Sector of Employment				
Public, semi-private	33.23	36.88	98.19	90.41
Private	66.77	63.12	98.53	94.70

Notes: the figure above presents the descriptive statistics for two samples drawn from the Background Variables of the LISS panel during the years 2014 until 2022. The first sample is the one used in this study whereas the second is taken to be a closer representation of the Dutch population. The purposes of this table are to assess the external validity and selection bias in my study. The overall percentage column represents the percentage of observations that take on a given value over the studied years. The within percentage column represents the parentage of the time a variable takes on a value conditional on it being that value (e.g. conditional on an induvial reporting being a male, they are a male for 100% of the observations over the examined period of time).
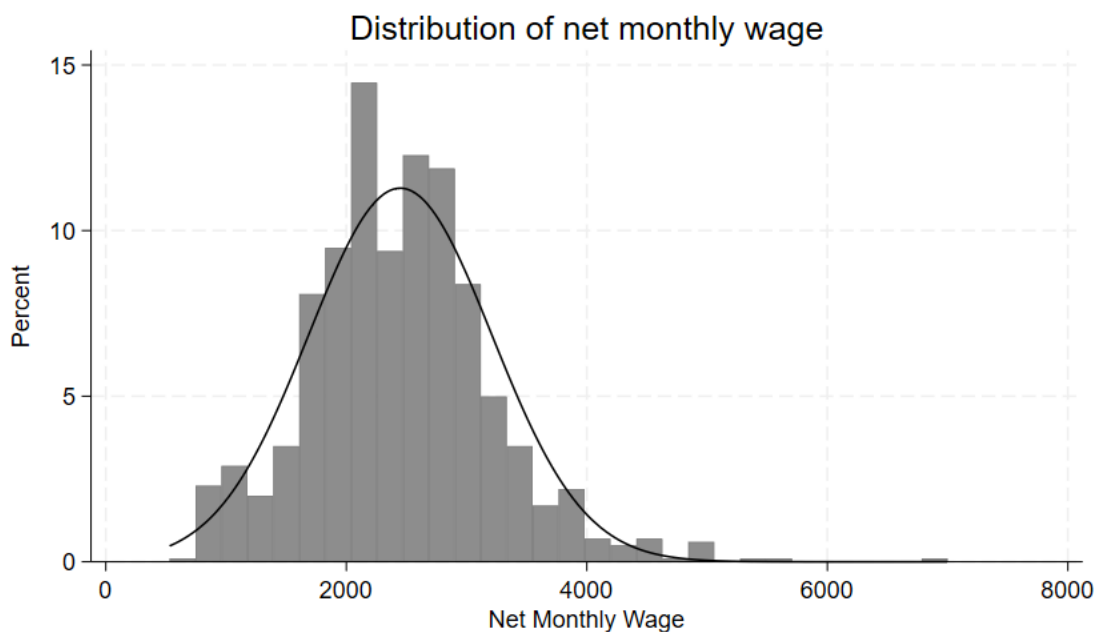
Appendix 2 – Distributions of Net Wage and Satisfaction Variables

Figure 4.1 – Histogram showing the distribution of wage satisfaction and frequency expressed in percentages
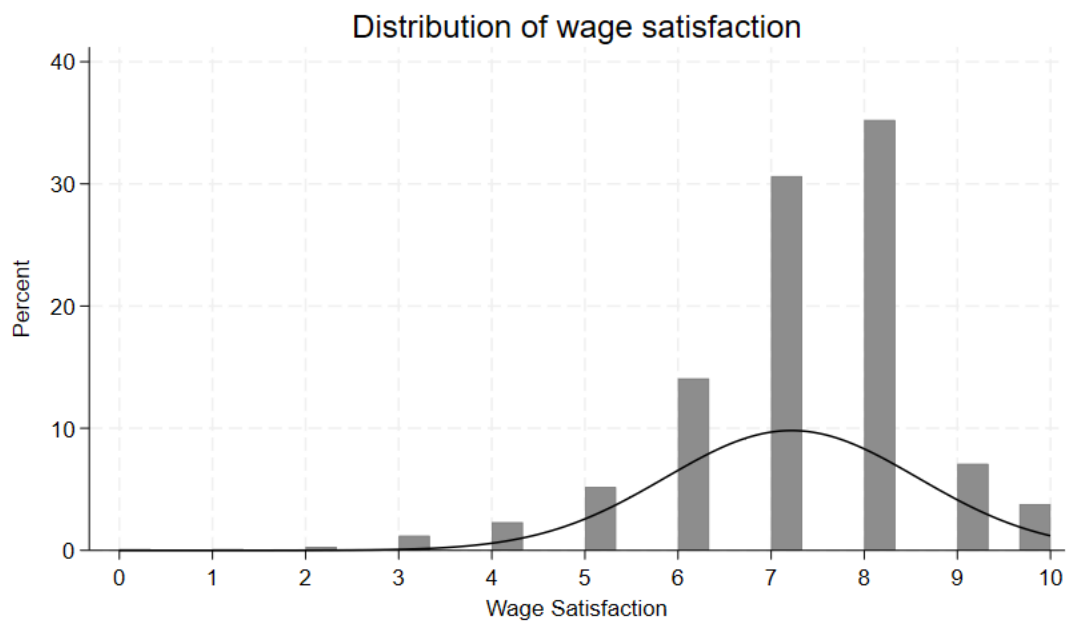
Notes: the figure above was made using data from the LISS panel study on Work and Schooling and corresponds to the years 2014 till 2022. The sample used consists of 124 individuals. There is a clear left skew to the distribution of wage satisfaction among the sampled individuals.

Figure 4.2 – Histogram showing the distribution of net wage and frequency expressed in percentages

Notes: the figure above was constructed using data from the LISS panel using data from the Background Variables corresponding to the months of collection for the Work and Schooling study. The data covers the years 2014 till 2022. There is a clear right skew to the distribution among the 124 sampled individuals.

Figure 4.3 – Histogram showing the distribution of colleague satisfaction and frequency expressed in percentages
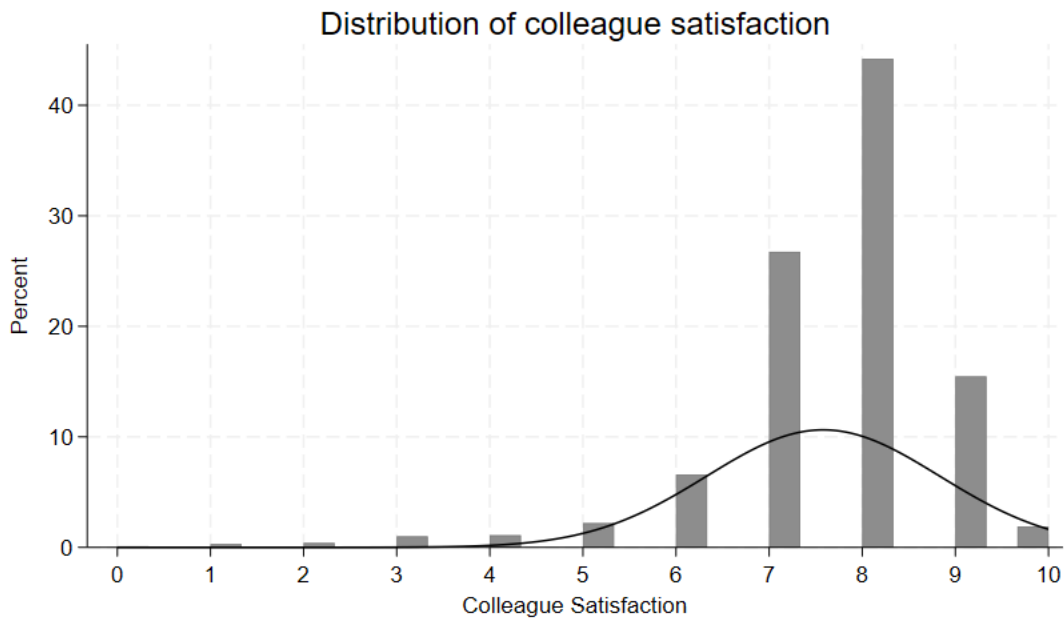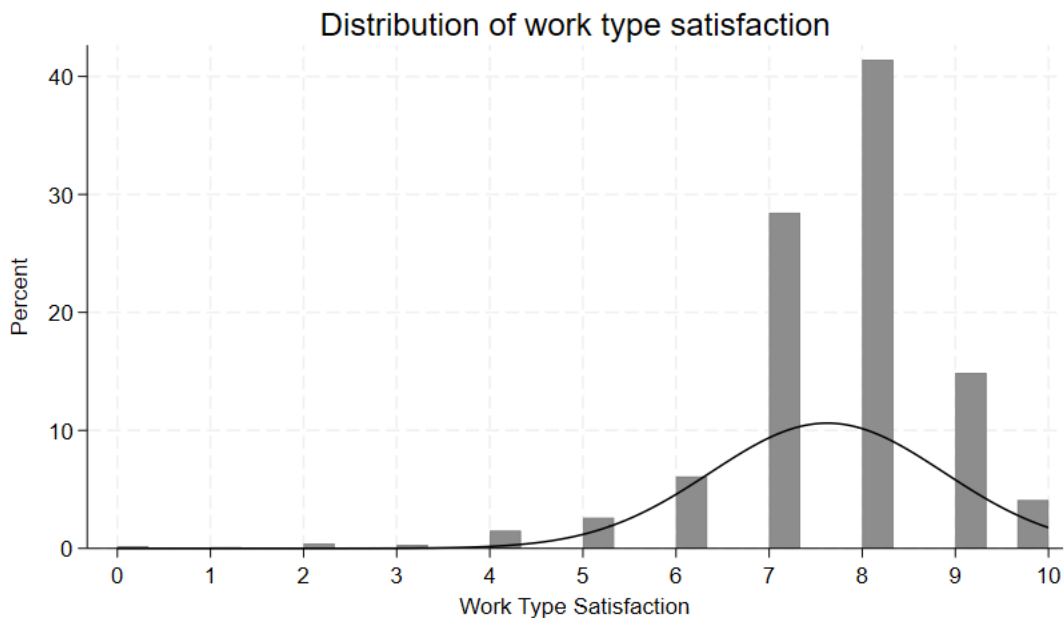

Distribution of colleague satisfaction

Notes: the figure above was made using data from the LISS panel study on Work and Schooling and corresponds to the years 2014 till 2022. The sample used consists of 124 individuals. There is a clear left skew to the distribution of colleague satisfaction among the sampled individuals.

Figure 4.4 – Histogram showing the distribution of work type satisfaction and frequency expressed in percentages

Distribution of work type satisfaction

Notes: the figure above was made using data from the LISS panel study on Work and Schooling and corresponds to the years 2014 till 2022. The sample used consists of 124 individuals. There is a clear left skew to the distribution of work type satisfaction among the sampled individuals.

Appendix 3 – Regression Results Without Interaction Terms

Table 5.1 – Regression results for models without interaction terms

	Regressions				
Variables	(1)	(2)	(3)	(4)	(5)
	lnContractHours	lnContractHours	lnActualHours	lnActualHours	LSDR
Wage satisfaction	0.012***	0.003	0.004	-0.002	-0.004
	(0.003)	(0.003)	(0.004)	(0.004)	(0.007)
lnNetWage	-	5.255***	-	2.688***	2.893**
		(0.362)		(0.485)	(0.899)
$lnNetWage^2$	-	-0.315***	-	-0.160***	-0.183**
		(0.024)		(0.032)	(-0.059)
Occupational Controls					
lnDesiredHours	-	0.052**	-	0.075***	-
		(0.016)		(0.021)	
Colleague satisfaction	-	-0.005*	-	-0.005	-0.004
		(0.003)		(0.003)	(0.006)
Work type satisfaction	-	0.002	-	0.009**	0.005
		(0.003)		(0.004)	(0.007)
Sector of employment					
Private	-	0.100**	-	0.105**	-0.009
		(0.035)		(0.046)	(0.087)
Experience	-	0.002	-	0.005**	0.010**
		(0.001)		(0.002)	(0.004)
$Experience^2$	-	-0.000**	-	-0.000**	-0.000**
		(0.000)		(0.000)	(0.000)
Personal Controls					
Highest educational attainment					
havo/vwo (higher secondary education)	0.014	0.015	-0.161*	-0.152*	-0.225
	(0.076)	(0.058)	(0.083)	(0.078)	(0.146)
mbo (intermediate	-0.001	-0.013	-0.132	-0.141*	-0.223
	(0.080)	(0.064)	(0.088)	(0.085)	(0.159)

vocational education)					
hbo (higher	-0.012	0.006	-0.093	-0.093	-0.098
vocational	(0.075)	(0.058)	(0.083)	(0.078)	(0.145)
education)					
wo (university)	-0.034	0.052	-0.026	0.005	-0.032
	(0.118)	(0.090)	(0.130)	(0.120)	(0.225)
Number of children	0.013*	0.012**	0.002	0.002	0.009
	(0.007)	(0.005)	(0.008)	(0.007)	(0.013)
Age	-0.003	-0.006	0.045*	0.037	-0.063
	(0.024)	(0.019)	(0.027)	(0.025)	(0.046)
Age^2	-0.000	0.000*	-0.000***	-0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Position in household					
Wedded	-0.018	0.023	0.019	0.037	0.057
partner	(0.030)	(0.023)	(0.033)	(0.030)	(0.057)
Unwedded	-0.080**	-0.064**	-0.130**	-0.083**	-0.125
partner	(0.039)	(0.031)	(0.043)	(0.042)	(0.078)
Child	0.028	0.025	0.063	0.048	-0.060
living at	(0.048)	(0.038)	(0.053)	(0.050)	(0.094)
home					
Period Controls					
Year					
2015	0.025	-0.011	-0.011	-0.024	0.069
	(0.027)	(0.020)	(0.029)	(0.027)	(0.050)
2016	0.046	-0.021	-0.049	-0.073	0.087
	(0.048)	(0.037)	(0.053)	(0.050)	(0.091)
2017	0.059	-0.038	-0.049	-0.090	0.155
	(0.071)	(0.055)	(0.078)	(0.073	(0.134)
2018	0.072	-0.051	-0.068	-0.123	0.204
	(0.094)	(0.073)	(0.103)	(0.097)	(0.177)
2019	0.078	-0.067	-0.099	-0.159	0.236
	(0.114)	(0.088)	(0.125)	(0.118)	(0.214)
2020	0.096	-0.078	-0.126	-0.189	0.307
	(0.140)	(0.108)	(0.153)	(0.145)	(0.264)
2021	0.104	-0.094	-0.144	-0.219	0.352

	(0.163)	(0.126)	(0.179)	(0.168)	(0.307)
2022	0.128	-0.101	-0.168	-0.254	0.410
	(0.186)	(0.144)	(0.204)	(0.192)	(0.351)
Constant	3.778***	-18.461***	2.233*	-9.233***	-8.363**
	(1.053)	(1.632)	(1.156)	(2.182)	(4.052)
N	1002	983	1002	983	989
R^2	0.07	0.45	0.00	0.10	0.01
F-Stat	1.64**	23.65***	2.63**	6.45***	1.49*

Notes: *** corresponds to $p < 0.001$; ** to $p < 0.05$; and * to $p < 0.1$. Standard errors presented in parentheses. The reference category for the sector of employment is the public/semi-private sector. The reference category for the categorical education variable is only having completed secondary education. The reference category for the household position is the household head. The reference year for the year fixed effects is 2014. The data are obtained from the LISS panel studies on Work and Schooling as well as corresponding Background Variables datasets for the years 2014-2022.