Is Work a Burden? The Role of the Living Standard

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ABSTRACT. Many mainstream schools of economics argue that work is a burden, while nonmainstream schools argue that this might not be entirely true. This paper aims to reconcile the differences by suggesting that individuals will balance income and leisure only after the necessary expense for their current living standard is met. Thus, whether work is a burden depends upon two criteria. (1) In terms of marginal utility, before (after) such expense is met, the marginal utility per labor hour is positive (negative), i.e., work is not (is) a burden. (2) In terms of total utility, the total utility provided by labor is positive, i.e., work is not a burden. Three applications show that the above explanation can reconcile different historical perspectives, explain various discrepancies about labor supply between neoclassical theory predictions and empirical findings, and reconcile the different interpretations about lottery winners' labor supply.

Key words: is work burden; living standard; economic history; happiness economics; labor supply
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1. Introduction

Whether work is a burden is a fundamental question in labor economics, and three different opinions exist. (1) Mainstream economics, from mercantilism to classical and neoclassical, argues that work is a burden (Spencer 2009; 2014). Neoclassical economics explicitly assumes that the marginal utility per labor hour is negative. (2) However, some nonmainstream approaches to economic analysis, such as Marxian economics, suggest that work has intrinsic value (Spencer 2009; 2014). (3) The answer from mainstream economists is that although marginal utility can be positive in the initial hours, it becomes negative at the margin (Jevons 1871; Lazear 2000). Rätzel (2012) empirically shows that the marginal utility per labor hour is first positive and then negative; however, the mechanism of the change in marginal utility remains unknown.

This paper attempts to reconcile the above opinions by proposing that individuals balance consumption (measured by income) and leisure only after the necessary expense for the current living standard (measured by minimum required income (MRI)) is met. The utility function is, for example,

$$u = (c - M)l^{\alpha}$$

where u is utility, c is consumption/income,[1] M is MRI, and l represents leisure. M comes from the consumption commitment for the current living standard (Chetty and Szeidl 2007, 2016), such as mortgage payment, which is relatively difficult to adjust. If current income is not sufficient to cover the MRI, individuals do not want leisure. Instead, they want and appreciate the opportunity to work more hours (Edin and Lein 1997).

Thus, whether work is a burden depends upon several criteria. (1) In terms of marginal utility, whether work is burden is determined by whether the MRI is met. Before (after) the MRI is met, the marginal utility per labor hour is positive (negative), i.e., work is not (is) a burden. (2) In terms of total utility, the total utility provided by labor is positive, i.e., work is not a burden.

This paper provides empirical evidence for this hypothesis using German Socio-Economic Panel (GSOEP) data and subjective well-being (SWB) as a measure of utility.

[1] This paper uses consumption and income interchangeably.

SWB is a widely used measure of utility in the research on happiness economics, which has been increasing since 1990 (Clark 2018). The empirical strategy has two steps. First, this paper demonstrates that, *ceteris paribus*, individuals' SWB is maximized if they work the desired number of hours. The greater the deviation between actual working hours and desired hours is, the lower the SWB, which is consistent with the results of a large number of studies about working hour mismatches (e.g., Bell and Blanchflower 2019). Second, this paper shows that the desired number of hours coincides well with the MRI.

Three applications are provided. First, a review shows that the above explanation is able to reconcile different perspectives about labor supply in history, including mainstream and nonmainstream economics (for simplicity, this paper regards happiness economics as mainstream). For example, both mercantilists and classical economists regards work as bad, but they have different opinions about whether higher wages increase labor supply. The living standard is likely to play an important role in this difference. By contrast, nonmainstream economists suggest that work has intrinsic value. These economists are likely to refer to the well-being provided by the living standard.

Second, the above explanation reconciles various discrepancies about labor supply between neoclassical theory predictions and empirical findings. For general populations, MRI increases with actual income and remains below income. Thus, ignoring M (i.e., assuming that individuals always balance consumption and leisure) in the utility function has an insignificant impact. However, low-income earners, such as the unemployed, have income lower than MRI. In this case, ignoring M results in discrepancies between theoretical predictions and empirical findings. For example, a theory suggesting that individuals always balance consumption and leisure predicts that unemployment is associated with positive utility gain after income is controlled for. However, happiness economics empirically shows that unemployment is associated with much lower SWB after income is controlled for (Clark 2018). Another example comes from in-work benefits recipients. The theory predicts that such benefits are likely to reduce labor supply in the intensive margin (hours worked), but little supportive evidence exists (see Chan and Moffitt 2018 for a review). The above discrepancies can be explained by the fact that

the MRI is substantial; thus, the unemployed want to work (unemployment reduces SWB), and in-work benefits recipients do not reduce labor supply.

Third, the above explanation reconciles the different interpretations about lottery winners' labor supply. The heterogeneities found in the literature are so large that opposite interpretations exist about whether lottery winning reduces labor supply (Gilbert et al. 2018). Generally, the probability of reducing labor supply is significantly affected by the amount of winning and the earning potential (Arvey, Harpaz, and Liao 2004). This paper suggests that the larger the winnings, the more likely that a winner is able to cover the MRI, thus the more likely the winner is to quit their job. The lower the earning potential is, the smaller the portion that their labor income contributes to support the living standard, thus the more likely they are to quit. A salient example comes from Smith and Razzell (1975), where all winners receive a large prize and earn little through their work. In this case, all the winners quit their jobs. Moreover, those who fail to invest their money and use the investment gains to cover their living standard must return to work.

This paper proceeds as follows. Section 2 provides the theoretical background. Section 3 describes the empirical work. Sections 4 to 6 present three applications, and section 7 concludes.

2. Theoretical background

Extensive literature suggests a reference point for income/consumption in the utility function. First, in happiness economics, SWB is recognized to be affected by the gap between income and reference income, where the reference income could be comparison income (Luttmer 2005), previous income (Clark 2016), or MRI (Stutzer 2004). The advantages of MRI are that it directly measures an individual's consumption pattern and that it correlates with relative income and previous income (Stutzer 2004). Second, the concepts of habit formation and consumption commitment are used to explain various stylized facts in macroeconomics (Chetty and Szeidl 2007, 2016). Third, in behavioral economics, especially related to labor supply, the reference-dependent preference model is widely used (e.g., Allen et al. 2016).

Furthermore, numerous articles describe how individuals endeavor to meet the necessary expense of their living standard, especially low-income earners. Chetty and Szeidl (2007) show that the consumption commitment of the unemployed remains substantially high. Luo (forthcoming) demonstrates that transition to unemployment means that income becomes less than MRI (i.e., insufficient to support living standard). Therefore, the unemployed lose "savings, retirement, credit rating…" (Blau, Petrucci, and McClendon 2013, p258). Ethnographic studies show that low-income earners struggle to meet the substantial expense and spend most of their money on necessities or needs, instead of treats or wants. However, low-income earners occasionally cannot cover those expenses (Edin and Lein 1997; Halpern-Meekin et al. 2015). Thus, "back utility bills are the most common forms of outstanding debt, followed by medical bills" (Romich and Weisner 2000, p1259). Therefore, low-income earners want and appreciate the opportunity to work more hours (Edin and Lein 1997).

Based on the above considerations, this paper suggests that individuals balance consumption (measured by income) and leisure only after the MRI for current living standards is met. A simple utility function would be

$$u = (c - M)l^{\alpha} \tag{1}$$

where u is utility, c is consumption/income, M is MRI, and l represents leisure. More generally, the utility function $u(c, l) = g(c)v(l)$ has the following property:

Property 1. $(c - M)g(c) > 0$*, i.e., the sign of* $g(c)$ *is the same as that of* $c - M$

Under this utility function, the marginal utility of consumption is always positive, while the sign of the marginal utility of leisure depends on the sign of $c - M$. If $c - M < 0$ ($c - M > 0$), then the marginal utility of leisure is negative (positive), i.e., work is not (is) a burden in terms of marginal utility. In terms of total utility, work is not a burden because work provides more positive utility than does not-work. This conclusion is reached by integrating the utility or by the fact that, *ceteris paribus*, the greater the number of work hours is, the higher the labor income. The living standard, as supported mostly by labor income, is positively correlated with various measures of well-being; see the following sections for empirical evidence.

Notably, individuals balance consumption and leisure after MRI is reached, resulting in income higher than MRI and working more than the desired number of hours. This

scenario is different from the other 2 specifications. First, if individuals always balance consumption and leisure, i.e., MRI is 0 and desired working hours is zero, then the results are an income higher than 0 and working hours higher than 0. Second, if individuals have a target income and the utility function is additively separable (i.e., $u(c,l) = g(c) + v(l)$), then the income would be around the target income. See Camerer et al. (1997) for a famous example.

3. Empirical work

1. Data and summary statistics

The data are from the 1984-2017 GSOEP, a nationally representative panel survey of German households that has been conducted yearly since 1984 with rich information (Haisken-DeNew and Frick 2005). GSOEP is among the most frequently used datasets in happiness economics research.

This paper uses life satisfaction (LS) as a measure of utility. LS is assessed based on the following question: "How satisfied are you with your life, all things considered?" The MRI is assessed as follows: "What would you personally consider the minimum net household income you would need in your current living situation?" A limitation is that the MRI is available only in 1992, 2002, 2007, 2012, and 2017. The desired working hours are obtained from "If you could choose your own working hours, taking into account that your income would change according to the number of hours, how many hours would you want to work?" This variable is not available in 1984 or 1996.

To investigate labor supply behavior, this paper inclusively restricts the age range from 16 to 65 years and deletes those with missing values in actual working hours. Approximately 339,000 observations (57,000 individuals) are included in the whole sample. Table 1 column (1) lists the summary statistics for the whole sample. The sample has a monthly net household income of 3,293 Euro, which is sufficient to support the living standard, measured by an MRI of 2,460 Euro. All income variables are deflated using 2011 as the base year. A total of 510 observations with an income or MRI greater than 20,000 Euro are excluded. This exclusion significantly reduces the standard error of income and MRI. Moreover, income and MRI are derived from observations in which

both income and MRI are available for a direct comparison. On average, individuals in the sample work 38 hours every week, while they desire to work only 35 hours. This result provides preliminary evidence that individuals work more than their desired hours to cover the MRI. More rigorous regressions follow.

2. Empirical strategy

This paper uses a traditional ordinary least squares fixed effects (OLS-FE) regression because individual FE help to control for unobservable time-invariant individual factors, such as personality. Ferrer-i-Carbonell and Frijters (2004) demonstrate that OLS (treating LS as a cardinal variable) provides results that are similar to those using an ordered logit analysis (treating LS as an ordinal variable). The robust standard error is clustered at the individual level.

This paper uses a two-step strategy. The first step is to show that individuals' SWB reaches the maximum if the individuals can work their desired number of hours. The functional form is similar to that of Bell and Blanchflower (2019)

$$LS_{it} = \alpha_i + \beta_1\, UnderHour_{it} + \beta_2\, OverHour_{it} + \theta\, X_{it} + \varepsilon_{it}$$

where

$$UnderHour = \begin{cases} DesireHour - ActualHour, DesireHour > ActualHour \\ 0, DesireHour \leq ActualHour \end{cases}$$

$$OverHour = \begin{cases} ActualHour - DesireHour, ActualHour > DesireHour \\ 0, ActualHour \leq DesireHour \end{cases}$$

Both β_1 and β_2 are expected to be negative. In this specification, LS_{it} represents LS for individual i in year t, α_i represents the individual fixed effect, ε_{it} is the random error, and X_{it} represents control variables, including household net income in log form, marital status (5-level categorical variable), residence state (16 levels), age group (6 levels), years of education, and the survey year (34 levels). Notably, income is controlled for. If individuals always balance income and leisure, then working hours should be associated with lower well-being, i.e., β_1 should be positive.

The second step is to demonstrate that the desired hours correspond well to the MRI. The functional form is

$$HourGap_{it} = \alpha_i + \beta\, IncomeGap_{it} + \varepsilon_{it}$$

where

$$HourGap = ActualHour - DesireHour,$$

$$IncomeGap = HouseholdIncome - MRI.$$

The constant term is expected to be zero or close to zero, and β is expected to be positive, i.e., individuals desire to work until the MRI is reached, as shown in figure 1. Specifically, the FE can be written as $\alpha_i = \alpha + v_i$, where the constant term is estimated by placing the constraint $\sum_{i=1}^{N}\sum_{t=1}^{T_i} v_i = 0$.[2] This specification has no control variables except residence state and survey year because income and hours should be similarly affected by other demographic factors.

3. Results

The results of step 1 are shown in table 2. Column (1) shows the results of the baseline regression. The coefficient of log household monthly net income is 0.29 and is statistically significant. The magnitude is similar to that in the literature of happiness economics. The coefficients of other controls are not listed due to space constraints; however, they are consistent with the literature. For example, marriage increases SWB, and SWB is U-shaped in age.

Central to the research question are the coefficients of working hours. Working either under or above the desired number of hours reduces SWB, i.e., *ceteris paribus*, individuals' SWB reaches a maximum when they work the desired hours. The magnitude is substantial. If individuals work 10 fewer hours than their desired weekly hours, their SWB is predicted to decrease 0.11 points on the 11-point LS scale. The effect is larger than the transition from single to married (0.10), one of the most significant impactors of SWB (Clark 2018). Overemployment has a significant but smaller effect than underemployment, consistent with the literature (Bell and Blanchflower 2019; Wunder and Heineck 2013).

Column (2) tests the specification of Rätzel (2012), which includes actual working hours and actual working hours squared. The coefficients indicate that LS is inversely U-shaped in working hours. LS reaches the maximum point at 36 hours (0.0097/0.000133/2),

[2] See https://www.stata.com/support/faqs/statistics/intercept-in-fixed-effects-model/

which is close to the desired number of working hours of 35 (table 1 column 1). Notably, income is already controlled for. If individuals always balance income and leisure, then the utility should decrease as working hours increases after controlling for income.

Various robustness tests are performed for the specification of column (1). The effects of underemployment and overemployment are similar for males and females (not shown here). Columns (3) and (4) demonstrate that underemployment has a more negative impact for sole wage earners than for those who are not the sole wage earner in a family (however, the difference is not statistically significant). Intuitively, because the whole family is counting on the income of the sole wage earner, underemployment represents heavier financial pressure.

The results of step 2 are given in table 3. Column (1) provides the results for the whole sample. As expected, the coefficient of income gap is positive, i.e., as the gap between actual income and MRI increases, individuals feel that they are overworked. Central to this step is the coefficient of the constant term. The coefficient is 2.6 and significant at the 10% level, i.e., when income exceeds MRI, individuals do not feel that they are overworked until they work 2.6 more hours. The number is relatively large compared with the average gap between actual hours and desired hours (3 hours, calculated from table 1).

A caveat of column (1) is that the hour gap is calculated at the individual level, while the income gap is calculated at the household level. Thus, income and working behavior are unlikely to coincide unless all wage earners have the same working pattern. One solution to this issue is to consider the households with only one wage earner. Column (2) tests this hypothesis. As expected, the coefficient of the constant term reduces substantially to 0.7 and becomes statistically insignificant. Column (3) further excludes outliers by including only observations with an hour gap between -30 and 30 and an income gap between -10000 and 10000. In this case, the coefficient of the constant term decreases and remains insignificant.

A potential argument is that the hour gap and income gap may not be correlated so that the constant term is insignificant. To test this argument, column (4) replaces the hour gap by actual working hours. In this specification, the coefficient becomes very large (38) and statistically significant; thus, this argument does not hold.

4. Application I: a historical review

1. Mainstream economics

Work has been commonly regarded as toil and burden since ancient times, as shown in the works of Plato and Aristotle and in the Bible. Individuals work only because they care about the associated consumption (Anthony 2014; Weiss 2009). Mercantilism, from the 16th century to the mid-18th century, inherited this concept. As Furniss (1920) describes, mercantilists believe that laborers should be coerced to work by low wages. Thus, laborers struggle to achieve a low living standard by working hard. This idea is supported by a common phenomenon at that time that higher wages reduced labor supply.

Starting from the mid-18th century, classical economists (especially Adam Smith), though still holding the concept of work as bad, are more "liberal" to laborers. They advocate high wages and higher living standards because a low living standard makes laborers despair and hopeless and thus unwilling or unable to work (Firth 2002; Spencer 2009).

The two concepts can be explained by equation (1). Suppose $c = wh$ and $l = T - h$, where w is wage, h is working hours and T is total hours available. The optimization solution for working hours h is easy to derive. Then, we have $\frac{\partial h}{\partial w} < 0$, i.e., *ceteris paribus*, higher wages reduce labor supply, the idea of mercantilism. We also have $\frac{\partial h}{\partial M} > 0$, i.e., higher living standards increase labor supply, the idea of classical economists.

The above solution has been employed by Berg (1961) to explain why the labor supply in Africa decreases in wage in the early stages of development but increases in wage in later years (see also Sharif 2018). He suggests that in the early stage, the living standard is fixed; thus, labor supply decreases in wage. By contrast, in later years, higher wage stimulates individuals to upgrade their living standard; thus, higher wage stimulates an increase in labor supply.

In the last decades of the 19th century, the so-called "marginalist revolution" provides the foundations of neoclassical economics. This marginalism framework has high explanatory power, so it quickly becomes mainstream (Spencer 2009). Under the

marginalism framework, the labor supply is pushed negative at the margin, although labor supply could be positive initially (Jevons 1871; Lazear 2000). This concept is simplified as the notion that individuals always balance consumption and leisure. If income is larger than MRI, ignoring M in the utility function still generates consistent predictions (because the marginal utility of work is negative). However, if $c < M$, then the predictions may be inconsistent (because the marginal utility of work is positive). More details are provided in a later section.

2. Nonmainstream economics

The instrument view of work is challenged by nonmainstream economists. In the late eighteenth and nineteenth centuries, some writers criticize classical economists. For example, Charles Fourier, one of the founders of utopian socialism, suggests that work has intrinsic value and is a means of self-expression and self-realization. He proposes to make work attractive by means of various actions, such as improving the quality of work. He also proposes Basic Income Guarantee (BIG), a topic to be discussed in a later section. After individuals are able to meet the living standard, they are freed from the necessity to work but can look for work as a pleasure (Fourier 1971).

Karl Marx (1818-1883), influenced by the utopian socialists, also suggests that work has intrinsic value, which is, however, prevented from being realized by "alienation". Alienation essentially comes from the inability of laborers to control their work. Marx thus suggests reducing work time (which is used to produce material needs of the society) and increasing free time (which is used for activities that the workers choose) for the purpose of self-realization (Marx 1894).

Institutional economists continue to argue that work could be good. For example, Veblen (1898) suggests that work helps to express the "instinct of workmanship" and to gain social status. Outside of economics, some scholars in psychology and sociology also suggest that work is rewarding (Halpern-Meekin et al. 2015; Jahoda 1979). For example, Jahoda (1979) proposes 5 latent benefits of work: time structure, social capital, purpose of life, social identity or status, and regular activity.

This paper makes two comments on the above concepts. First, in terms of marginal utility, work is bad in the margin; however, there are two potential exceptions: (1) when

individuals' working hours are less than desired, such as for the unemployed (discussed later); and (2) if individuals are able to choose work activity that they enjoy. For example, Steiner and Schneider (2013) find that job satisfaction increases in working hours for artists (work is good) but decreases for non-artists (work is bad). This result implies that most people do not truly enjoy their work and that they work to support their consumption and living standard. This finding is analogous to that of Buckingham and Clifton (2001) that only 20% of individuals have the opportunity to do what they do best (though "do best" may not mean "enjoy").

Second, in terms of total utility, work is good. The total utility is positive by calculation. Moreover, work should be correlated with various indicators of well-being because living standards are mostly supported by labor income. Table 4 shows some simple regression results. The variables are chosen to represent Maslow's (1943) 5 levels of human needs. The variables are weekly food expenditure at home (representing physiological needs), crime in the neighborhood (safety), feeling of loneliness (love), and positive attitude toward self (esteem and self-actualization). These variables are available for only limited years, so OLS is used. The small within-person variation in the small sample makes the coefficients of OLS-FE insignificant. Column (1) shows that working hours has insignificant effects on food expenditure at home. Perhaps those with high working hours tend to eat outside of the home. However, as expected, higher working hours is associated with a lower crime rate in the neighborhood (column 2), feeling less lonely (column 3), and a positive attitude toward the self (column 4).

5. Application II: labor supply of low-income earners

As previously suggested, when $c < M$, assuming that individuals always balance consumption and leisure generates inconsistent predictions. Two groups of low-income earners are likely to have income lower than MRI: the unemployed and in-work benefits recipients. This section discusses these individuals in turn.

1. Unemployment and SWB

Happiness economics inherits the concepts of neoclassical economics but uses SWB survey data as a measure of utility. The consensus in the literature is that unemployment reduces SWB even after income is controlled for (Clark 2018). This consensus is a violation of the notion that individuals always balance consumption and leisure. Thus, various nonpecuniary explanations, such as psychological effects, are proposed (see Winkelmann 2014 for a survey). However, why some rich people do not work even though they are considered happier (Smith and Razzell 1975) is unclear.

The proposal of this paper provides a pecuniary-based answer to the violation. As shown in table 1 column (2), the unemployed have incomes lower than MRI. Thus, they want to work to support their living standard. When actual working hours is zero, the marginal utility of work hours is positive, i.e., the coefficient of unemployment is negative. Only a few articles, such as Bayer and Juessen (2015) and Luo (2018a), suggest a pecuniary root cause; this explanation is consistent with such studies.

The material deprivation-based explanation has another advantage in explaining the extended questions about unemployment and SWB. First, large heterogeneity is observed: approximately one-half of the unemployed maintain the same level of SWB or even experience an increase in SWB. If the unemployed are separated into different groups, each group generally still experiences a negative change in SWB (Gielen and Van Ours 2014). However, Luo (forthcoming) shows that unemployed individuals who do not suffer from material deprivation may not experience a LS decrease and may even experience a LS increase. Second, although SWB adapts to various life events, the adaptation to unemployment or poverty, if any, is limited (Clark, D'Ambrosio, and Ghislandi 2016; Clark and Georgellis 2013). Luo (2019) explains this finding by showing that the unemployed generally have income lower than MRI, even in the long run; thus, both financial satisfaction and LS have limited adaptation. Moreover, those unemployed who do not suffer from material deprivation may not experience a decrease in SWB.

An extended topic, namely, whether any job is better than no job, can also be addressed. Chadi (2012) finds that individuals in low-quality jobs are happier than when they are unemployed. This puzzle can be explained by two factors. First, those who are not in serious need of money may not accept a low-quality job (self-selection). Second,

for those who are unemployed and in need of money (i.e., $c < M$ and utility is negative), being employed makes the utility positive or less negative. These factors also explain the anecdotal evidence that in an economic downturn, some, but not all, are willing to work for food.

2. In-work benefits, labor supply and taxation

Various developed countries are expanding in-work benefits (Chan and Moffitt 2018). This subsection focuses on its labor supply in the intensive margin (hours worked). A typical example is the Earned Income Tax Credit (EITC) in the US. The EITC has a trapezoidal structure, where the benefits increase in wage income in the "phase-in" region, reach the maximum and remain the same in the "constant" region, and decrease in wage income in the "phase-out" region. If individuals always balance income and leisure, then individuals in the constant or phase-out regions are predicted to decrease labor hours, while the effects for those in the phase-in region are ambiguous. Overall, the benefits are predicted to reduce labor hours because most recipients are located in the constant and phase-out regions. However, little supportive empirical evidence exists (Chan and Moffitt 2018; Nichols and Rothstein 2016).

The proposal that individuals will not balance income and leisure until they met the MRI can explain the above discrepancy. EITC recipients are low-income earners (there is an income threshold for eligibility). Recipients spend most of their money on necessities or needs, instead of treats or wants. However, necessary expenses are substantial, and recipients occasionally struggle to cover such expenses (Edin and Lein 1997; Halpern-Meekin et al. 2015). Thus, "back utility bills are the most common forms of outstanding debt, followed by medical bills" (Romich and Weisner 2000, p1259). Therefore, these individuals want and appreciate the opportunity to work more hours. They also say that they are not interested in taking advantage of EITC by working/earning less (Edin and Lein 1997).

A related question is taxation. In the utilitarian approach of optimal labor income taxation, a social welfare function is maximized, subject to government budget constraints and taking into consideration individuals' labor supply responses (Piketty and Saez 2013). Considering only the intensive margin response, the EITC-like schedule is

not part of the optimal taxation (Mirrlees 1971). However, as Luo (2018b, chapter 3) notes, compared with traditional welfare, in-work benefits should be part of the optimal taxation because such benefits satisfy the 3 criteria proposed in Blundell (2002, p477): "raising the living standards of those on low incomes; encouraging work and economic self-sufficiency; and keeping government costs low". Moreover, Mirrlees (1971) proves that the optimal marginal tax rate (MTR) is nonnegative if $\frac{\partial V}{\partial h} > 0$, where $V(c,h) = -h\frac{u_h}{u_c}$ and h is working hours. However, assume $u(c,h) = g(c)(T-h)^{\alpha}$; then, $\frac{\partial V}{\partial h} = \frac{\alpha g(c)T}{g'(c)(T-h)^2}$. According to the proposed property 1, that $g(c) < 0$ if $c < M$, then $\frac{\partial V}{\partial h} < 0$, i.e., nonnegative MTR does not hold. By contrast, frequently used utility functions have $g(c) > 0$ and so $\frac{\partial V}{\partial h} > 0$.

This paper makes several additional remarks. First, the statement that EITC is better than traditional welfare is based on the assumptions that labor demand is sufficient and that individuals are able to work (e.g., not disabled). If either of the assumptions fails, individuals may be worse off. For example, Edin and Shaefer (2015) show that more individuals are falling into extreme poverty as traditional welfare vanishes because of the above two reasons. Second, MRI also plays an important role in the transition between traditional welfare and EITC. Edin and Lein (1997) find that single mothers appreciate the value of work. However, work means not only a higher income but also a much higher necessary expenses, for example, commuting and child care. Thus, some single mothers have to leave work and return to welfare. Third, EITC is predicted to increase fertility because the amount of EITC depends on the number of dependent children (Nichols and Rothstein 2016). However, the empirical evidence shows the opposite result (Baughman and Dickert-Conlin 2009) because the necessary expense of raising a child is much higher than the additional EITC (Halpern-Meekin et al. 2015).

6. Application III: labor supply of lottery winners

Lottery winning provides an exogenous income shock; thus, winners' labor supply behavior attracts scholars interested in welfare and labor supply. However, large heterogeneity is observed in the labor supply response, so both opponents and proponents of a Basic Income Guarantee (BIG) cite the literature to support their opinion (Gilbert et al. 2018).

This paper attempts to explain the heterogeneity. The most salient predictor of the probability of quitting a job is the amount of the winnings. For example, Arvey, Harpaz, and Liao (2004) find that winning less than $4 million is associated with a less than 10% probability of quitting. The probability increases to approximately 70% for $32 m. This paper suggests that if the winners are able to cover the MRI, then they are likely to quit their jobs. This characteristic also explains the finding of Gilbert et al. (2018), who review the BIG studies in multiple countries and find no meaningful impact on labor supply: the BIG is not sufficiently large to cover the MRI or to make a meaningful impact.

Another salient predictor is earning potential. (1) Those with high earning potentials are likely to continue to work (Arvey, Harpaz, and Liao 2004) because they are likely to have a relatively higher living standard compared with not working. (2) For those with low earning potential, if they win a large amount, then they are likely to quit forever (Smith and Razzell 1975) because the winnings can cover the lifetime MRI and their wages are unlikely to substantially improve their living standard. Those with low earning potential who win a relatively small amount are likely to quit but return to work after obtaining more education and training (Kaplan 1987) because the winnings cover only the short-term MRI and not lifetime MRI. In addition, education/training will increase their earning potential.[3]

[3] On the contrary, Edin and Lein (1997) show that most low-income single mothers want to return to school to increase their earning potential but generally do not have sufficient support to cover their necessary living expenses while in school.

The ethnographic study of Smith and Razzell (1975) provides supportive evidence. All the winners in their study win large amounts and have relatively low earning potentials. All the winners quit immediately because both they and the people around them believe that rich people should not work. In subsequent years, they normally rely on capital returns generated from investment to maintain their living standard. The winners do not suffer from job loss and are considered to be happier than other workers. Moreover, those who fail to invest and thus do not have sufficient money to maintain their living standard after years of spending have to return to work.

7. Conclusion

This paper suggests that individuals will balance income/consumption and leisure only after the minimum required income (MRI) for their current living standard is met. Thus, whether work is a burden depends upon two criteria. (1) In terms of marginal utility, before (after) MRI is met, the marginal utility per labor hour is positive (negative), i.e., work is not (is) a burden. (2) In terms of total utility, the total utility provided by labor is positive, i.e., work is not a burden. Theoretical considerations and empirical evidence are provided to support this proposal.

Based on the proposal, three applications are provided. First, a history review is presented for the concept of work: the proposal can reconcile different historical perspectives. Second, the neoclassical notion that individuals always balance income/consumption and leisure generates inconsistent predictions of labor supply behavior for low-income earners: the proposal can explain these discrepancies. Third, the proposal also reconciles the different interpretations of lottery winners' labor supply.

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Figure 1. Working hours and income gap

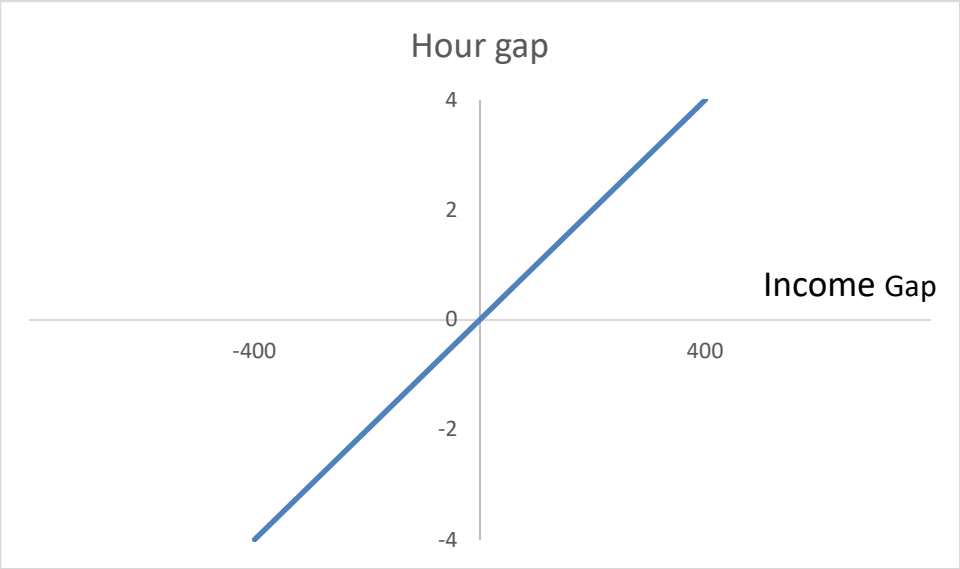

Table 1. Summary statistics

Group	(1) All	(2) Unemployed
Household Monthly Net Income (Euro)	3,293	1,714
	(1,776)	(997)
Minimum Required Income (Euro)	2,460	1,777
	(1,208)	(837)
Weekly working hours	38	0
	(13)	(0)
Desired working hours	35	35
	(10)	(9)
Life Satisfaction (11-point scale)	7.2	5.9
	(1.6)	(2.2)
Age	41	42
	(12)	(13)
Education (Years)	12	11
	(3)	(2)
Married (%)	62	51
	(49)	(50)
Male (%)	54	49
	(50)	(50)
Health status (5-point scale)	3.6	3.2
	(0.9)	(1.1)
Observations	339,078	32,387

GSOEP. Age 16 to 65 years, inclusive. Standard errors are shown in parentheses. The higher the score is, the more satisfied and healthier the individual is.

Table 2. Desired working hours

Dependent Variable: Life Satisfaction

	All	All	Sole earner	Not sole earner
	(1)	(2)	(3)	(4)
Number of under hours	-0.0106***		-0.0107***	-0.00925***
	(0.000799)		(0.00145)	(0.000982)
Number of over hours	-0.00837***		-0.00793***	-0.00787***
	(0.000532)		(0.000946)	(0.000656)
Actual work hours		0.00970***		
		(0.00116)		
Square of actual hours		-0.000133***		
		(1.48e-05)		
Log Household Income	0.293***	0.285***	0.350***	0.309***
	(0.0123)	(0.0119)	(0.0236)	(0.0177)
Demographic Controls	Yes	Yes	Yes	Yes
Observations	271,628	308,316	94,046	177,582
R-square	0.024	0.021	0.020	0.023

Robust standard errors clustered at the individual level are shown in parentheses (*** p<0.01, ** p<0.05, * p<0.1). All regressions are individual fixed effects models and include the following demographic and other control variables: years of education, marital status (5-level categorical variable), age group (6-level scale), survey year (34-level scale), and residential state (16-level scale).

Table 3. Working hours and income gaps

	All	Sole earner	No outliers	No outliers
	(1)	(2)	(3)	(4)
Dependent variable	Working hours gap	Working hours gap	Working hours gap	Actual working hours
Income Gap	0.000316***	0.000493***	0.000365***	0.000995***
	(6.09e-05)	(0.000167)	(0.000124)	(0.000194)
Constant	2.604*	0.723	-0.0111	38.05***
	(1.475)	(2.874)	(2.867)	(0.0950)
Demographic Controls	No	No	No	No
Observations	43,181	15,807	15,405	15,405
R-square	0.008	0.013	0.010	0.012

Robust standard errors clustered at the individual level are shown in parentheses (*** p<0.01, ** p<0.05, * p<0.1). All regressions are individual fixed effects models and include the following control variables: survey year (34 levels) and residential state (16 levels).

Table 4. Various levels of human needs

Dependent variable	Food expense	Neighbor crime	Feel lonely	Positive toward myself
	(1)	(2)	(3)	(4)
	OLS	OLS	OLS	OLS
Working Hours	-0.0106	-0.000814***	-0.00211***	0.00551***
	(0.0277)	(0.000227)	(0.000355)	(0.000632)
Demographic Controls	No	No	No	No
Observations	65,849	37,753	54,042	24,733
R-square	0.029	0.052	0.007	0.006

Robust standard errors clustered at the individual level are shown in parentheses (*** p<0.01, ** p<0.05, * p<0.1). All regressions include the following control variables: survey year (34 levels) and residential state (16 levels).