

Relative Income and Hours Worked: Empirical Evidence from the US

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Abstract

The so called “happiness paradox”, i.e. the non increasing long-term trends of the subjective well-being, has been explained by theories based on social comparisons. If such explanations are taken seriously, we have to further check whether they are consistent with the observed trends in hours worked in Western countries. Available evidence suggests that leisure time is only weakly increasing, especially if compared with output growth so that it remains to investigate to what extent this is compatible with the social comparison hypothesis. Indeed, the presence of both a non-increasing long-term trend of subjective well-being and a weakly decreasing trend of the hours worked in the last decades is paradoxical: why do people strive so much for money if money does not buy happiness?

In this paper, we empirically investigate whether the amount of hours worked by US citizens during the period 1972-2004 is affected by their relative standing in terms of income. We find evidence that reference income is positively correlated with the amount of hours worked. In particular, we find that an increase in one's reference income of 10000 dollars of yearly income goes with an increase of hours worked per week which ranges from 0.2 to 3, depending on the reference group considered. We also find evidence that the amount of hours worked by non-white people is not correlated with reference income, independently of reference income being constructed conditional on race or not. This may

suggest that whites are more inclined to make social comparisons than non-whites, or alternatively that their reference group is different from the ones which we identified. Furthermore, women seem to be less sensible to reference income than men, especially when reference income is constructed unconditionally on age. Finally, we find that job participation is not significantly correlated with reference income.

Empirical Strategy

Our basic strategy is to regress hours worked per week on reference income and a set of social, economic and demographic controls. Since there is no straightforward way to build reference income we investigate several alternatives based on different combinations of region of residence, age and race. We also investigate sub-populations such as men, women, whites, black, other non-whites. In order to control for the offered wage (which we do not observe) we include a set of control variables which predict one's wage such as regional unemployment, education, price differentials across regions and non-personal income in the household.

Principal dataset

US General Social Survey for the period 1972-2004. See the appendix for a list of the variables used and their summary statistics.

Related Literature

Brown et al. (2007), Clark et al. (2007), Clark et al. (2008), Clark and Oswald (1998), Neumark and Postlewaite (1998), Bowles and Park (2005).

The Impact of Household Reference Income on Hours Worked per Week, 1972-2004

	All	Men	Women	Black	White	Other Race
1. Reference Group Yearly Income: household average income	.003 (0.04)	.016 (0.16)	.016 (0.20)	.115 (0.57)	-.012 (0.17)	.046 (0.11)
2. Reference Group Yearly Income: household average income by census region	.098*** (3.44)	.155*** (3.54)	0.51 (1.39)	.106 (1.30)	.094*** (3.04)	.118 (0.57)
3. Reference Group Yearly Income: household average income by race and census region	.053* (1.87)	.101** (2.34)	.018 (0.51)	.056 (0.70)	.050* (1.65)	.003 (0.02)
4. Reference Group Yearly Income: household average income by race and 5-years age category	.275*** (11.27)	.261*** (6.59)	.260*** (8.70)	.074 (1.14)	.338*** (13.10)	-.137 (1.60)
5. As above but restricting the sample to people whose reference group consists of at least of 50 households	.137*** (5.05)	.115*** (2.67)	.128*** (3.79)	-.109 (1.46)	.181*** (6.13)	-.086 (0.56)
6. Reference Group Yearly Income: household average income by census region and 5-years age category	.070*** (5.68)	.076*** (3.95)	.061*** (3.83)	-.003 (0.09)	.085*** (6.38)	-.039 (0.55)
7. As above but restricting the sample to people whose reference group consists of at least of 25 households	.067*** (2.83)	.082** (2.81)	.0430 (1.43)	-.062 (0.93)	.097*** (3.73)	-.101 (0.81)
8. Reference Group Yearly Income: household average income by census region, 5-years age category and race	.069*** (5.58)	.071*** (3.75)	.061*** (3.85)	.002 (0.07)	.084*** (6.36)	-.062 (0.98)
9. As above but restricting the sample to people whose reference group consists of at least of 25 households	.065*** (2.75)	.080** (2.17)	.042 (1.28)	-.063 (0.95)	.095*** (3.64)	-.106 (0.86)
Number of obs (1,2,3,4,6)	34813	15452	19356	4729	28698	1381
Number of obs (5)	33042	14766	18276	4505	27204	1333
Number of obs (7,9)	17760	7974	9786	2766	14163	831

*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level, OLS estimation, robust standard errors. Reference group income is expressed in yearly earnings measured by thousands of dollars of the year 2000. Other included variables which are not reported in the table are female, age, age square, black, other non-white, % diff. regional price index, non-personal household income/1000, regional unemployment, household size, years of education, years of education square.

NOTES:

- Reference group incomes for individual “x” are calculate excluding the household income reported by individual “x”
- 10,000 dollars of greater reference income implies from 0.2 to almost 3 extra hours worked per week.

ISSUES:

- Reference group incomes are calculated using the household income reported by the respondent. In other words, reference group incomes are households income. On the contrary, both age and race are individual level characteristics so their use for constructing reference groups is, at least, problematic. Our solution is to assume that household characteristics are correlated with the respondent characteristics (as in Ferrer-i-Carbonell, 2004; Vendrik and Woltjer, 2007).
- Household income is not income per capita. In particular, it depends on the household size. We therefore provide a new set of regressions using “Size-Weighted Household Reference Income”

GENERAL ROBUSTNESS CHECKS

- Results holds when we also control for reported health; however, we omit this variable in the baseline estimations because it is available for only about two-thirds of the observations.
- In the baseline estimations we always control for differential life costs (price differentials of one family house).

The Impact of Size-Weighted Household Reference Income on Hours Worked per Week, 1972-2004

	All	Men	Women	Black	White	Other Race
1. Reference Group Yearly Income: household average income	.003 (0.04)	.024 (0.16)	0.25 (0.20)	.392 (1.25)	-.005 (0.17)	.071 (0.11)
2. Reference Group Yearly Income: household average income by census region	.145*** (2.79)	.232*** (2.91)	.092 (1.38)	.201 (1.40)	.130** (2.28)	.090 (0.26)
3. Reference Group Yearly Income: household average income by race and census region	0.53 (1.03)	.116 (1.48)	0.26 (0.40)	.088 (0.62)	.044 (0.79)	-.157 (0.53)
4. Reference Group Yearly Income: household average income by race and 5-years age category	.409*** (8.89)	.417*** (5.69)	.371*** (6.46)	.027 (0.22)	.526*** (10.68)	-.152 (1.09)
5. As above but restricting the sample to people whose reference group consists of at least of 50 households	.244*** (4.77)	.250*** (3.08)	.211*** (3.29)	-.297** (2.07)	.333*** (5.97)	.002 (0.01)
6. Reference Group Yearly Income: household average income by census region and 5-years age category	.096*** (4.46)	.116*** (3.50)	.087*** (3.12)	-.030 (0.45)	.119*** (5.16)	-.066 (0.51)
7. As above but restricting the sample to people whose reference group consists of at least of 25 households	.108*** (2.64)	.125** (1.96)	.075 (1.44)	-.112 (0.97)	.150*** (3.32)	-.011 (0.06)
8. Reference Group Yearly Income: household average income by census region, 5-years age category and race	.094*** (4.42)	.111*** (3.41)	.086*** (3.09)	-.019 (0.30)	.119*** (5.19)	-.100 (0.96)
9. As above but restricting the sample to people whose reference group consists of at least of 25 households	.110*** (273)	.138** (2.20)	.0622 (1.22)	-.080 (0.71)	.151*** (3.39)	-.039 (0.22)
Number of obs (1,2,3,4,6)	34813	15452	19356	4729	28698	1381
Number of obs (5)	33042	14766	18276	4505	27204	1333
Number of obs (7,9)	17760	7974	9786	2766	14163	831

*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level, OLS estimation, robust standard errors. Reference group income is expressed in yearly earnings measured by thousands of dollars of the year 2000. Other included variables which are not reported in the table are female, age, age square, black, other non-white, % diff. regional price index, non-personal household income/1000, regional unemployment, household size, years of education, years of education square.

Note:

- Size-weights are constructed calculating the mean of the income of reference households each weighted by $1/(1 + \ln(\text{household size}))$

Marginal Effects of Household Reference Income on the Probability of Labor Participation, 1972-2004

	All	Men	Women	Black	White	Other Race
1. Reference Group Yearly Income: household average income	-.003* (1.71)	-.001 (0.39)	-.004* (1.65)	-.0003 (0.06)	-.003 (1.63)	-.003** (2.00)
2. Reference Group Yearly Income: household average income by census region	.003*** (7.63)	.003*** (5.92)	.002*** (4.29)	.0005 (0.53)	.003*** (7.93)	.002 (0.88)
3. Reference Group Yearly Income: household average income by race and census region	.002*** (2.82)	.003*** (2.63)	.002 (1.46)	.002 (0.71)	.002*** (2.72)	-.002 (0.16)
4. Reference Group Yearly Income: household average income by race and 5-years age category	.002*** (2.57)	.002** (2.44)	.001 (0.83)	-.004** (2.40)	.003*** (3.87)	.001 (0.41)
5. Reference Group Yearly Income: household average income by census region and 5-years age category	.0005 (1.27)	.0006 (1.14)	.0001 (0.29)	-.001 (1.24)	.0008* (1.89)	-.0004 (0.30)
6. Reference Group Yearly Income: household average income by census region, 5-years age category and race	.0004 (1.30)	.0005 (1.09)	.0002 (0.36)	-.001 (1.02)	.0008* (1.92)	-.001 (0.70)
Number of obs (1,2,3,4,5,6)	34813	15452	19356	4729	28698	1381

*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level, Robust standard errors. Reference group income is expressed in yearly earnings measured by thousands of dollars of the year 2000. Other included variables which are not reported in the table are female, age, age square, black, other non-white, % diff. regional price index, non-personal household income/1000, regional unemployment, household size, years of education, years of education square.

Note:

- The impact of reference income on the probability of labor participation is small. Even in the most significant cases (regressions 2,3,4), a one hundred thousands dollars increase in reference income generates only a 2-3% greater probability of having a job.
- Whites seem to be the more sensitive to reference income.

Appendix

Definition and Source of Variables

The U.S. General Social Survey (dataset 1972-2004)

Hours worked per week: reported hours worked last week (GG source variable: *hhtot*)

Female: 1 if subject is female (GSS source variable: *sex*)

Age: number of years since born (GSS source variable: *age*)

Age square: age to the power of 2 (GSS source variable: *age*)

Black: 1 if respondent defines himself afro-American (GSS source variable: *race*)

Other non-white: 1 if respondent neither defines himself as white nor afro-American (GSS source variable: *race*)

Years of education: number of years the respondent declared to have attended school (GSS source variable: *educ*)

Working: 1 if respondent declares to have a job (GSS source variable: *wrkstat*)

Household income: reported household income as provided in the GSS (variable name: *coninc*) divided by 1000 (dollars 2000) (GSS source variable: *coninc*)

Household size: number of reported household members (GSS source variable: *hompop*)

Number of Children: reported number of children (GSS source variable: *childs*)

Married: 1 if respondent reports to be currently married (GSS source variable: *marstat*)

2nd+ Marriage: 1 if respondent reports to be married but not for the first time (GSS source variable: *marnum*)

Separated: 1 if respondent reports to be currently separated (GSS source variable: *marstat*)

Divorced: 1 if respondent reports to be currently divorced (GSS source variable: *marstat*)

Widowed: 1 if respondent reports to be currently widowed (GSS source variable: *marstat*)

Self-rated health: (range 1-4, dummies) (GSS source variable: *hlthsat*)

US Dept. of Commerce, Bureau of Economic Analysis

Regional unemployment: average regional unemployment provided by the US Dept of Commerce (dollars 2000)

The Office of Federal Housing Enterprise Oversight's

% Diff. Regional price index: percentage of variation between average national house values for single-family detached homes on which at least two mortgages were originated or subsequently purchased or securitized and average regional values (calculated using the Repeat Sales House Price Index).

Variable	Obs	Mean	Std. Dev.	Min	Max
Hours worked per week	44893	24.61493	23.00587	0	98
Female	46510	.5606106	.4963181	0	1
Age	46344	45.26474	17.48464	18	89
Black	46510	.1375833	.3444658	0	1
Other non-white	46510	.0350677	.183953	0	1
Years of education	46369	12.60765	3.166813	0	20
Real Household Income (dollars 2000)	42021	30951.27	27581.64	294	162607
% Diff. Regional price index	40372	.0116351	.1855122	-.4092308	.8303686
Regional unemployment	38882	.0632316	.018056	.028	.125
Household size	46504	2.730346	1.539986	1	16
Married	46502	.555417	.4969248	0	1
2 nd marriage	46502	.1054148	.3070905	0	1
Separated	46502	.1161025	.3203513	0	1
Divorced	46502	.0349447	.1836418	0	1
Widowed	46502	.1003398	.3004557	0	1
children	46351	1.964316	1.812595	0	8

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