

Should Friday be the New Saturday? Hours Worked and Hours Wanted

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Motivation

- Most workers cannot freely choose their hours
- Jobs tend to come with hours requirements not at the workers' discretion
- Typical hours are shaped by laws and customs such as 5-day work week, 8-hour workday, public holidays, mandatory time off, parental leave etc.

This raises two questions:

1. Are workers on their labor supply curve? If not, are they systematically off it?
2. What is the role of caps on weekly hours worked in creating or correcting wedges between usual and desired hours worked?

Roadmap

1. Evidence of Overwork
2. Welfare loss of overwork
3. Counterfactual caps on hours
4. Feasibility of caps on hours

Evidence of Overwork

Data

- German Socio-Economic Panel (SOEP)
- Representative annual household survey since 1985
- Focus on full-time workers in 2019 for main analysis

Descriptives

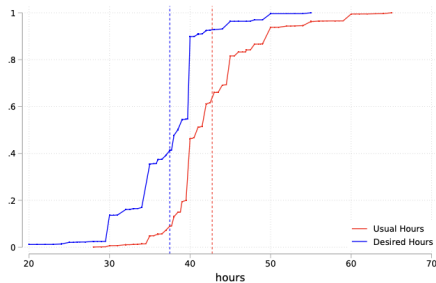
Survey Question

“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?”

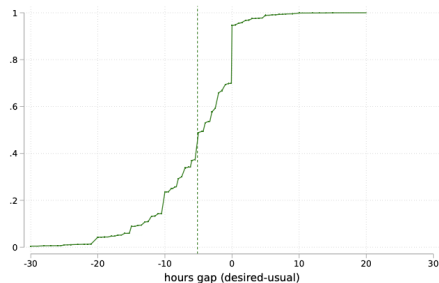
How do workers interpret this?

- Rule out “work less, make the same”
- Assume workers have a linear budget constraint in mind

Desired vs. Actual Hours Worked



(a)



(b)

Figure 1: Weekly Hours Worked and Desired in Germany

Desired vs. Actual Hours Worked Over Time

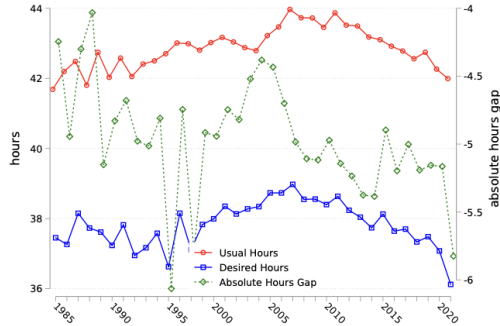


Figure 4: Actual Hours, Desired Hours, and the Hours Gap over Time

Welfare

Welfare Cost of Hours Wedges

Goal: Measure welfare cost of hours wedges

Approach:

- Translate hours wedges into dollar terms using WTP calculation
- This will capture the welfare gain of moving a worker from their usual hours to their desired hours
- Using simple static model of labor supply a la MaCurdy (1989)

Preferences:

$$U_i(c, h) = \frac{1}{1 + \eta} c^{1 + \eta} - \frac{\beta_i}{1 + \gamma} h^{1 + \gamma}$$

Desired hours:

$$h_i^* = \arg \max_h U_i(c, h) \quad \text{s.t.} \quad c = w_i h$$

Simple Model of Labor Supply

Desired hours:

$$\log h_i^* = \frac{1 + \eta}{\gamma - \eta} \log w_i - \frac{1}{\gamma - \eta} \log \beta_i$$

Define WTP, $\sigma_i(\tilde{h}_i)$, for counterfactual hours $\tilde{h}_i$:

$$U_i(w_i \tilde{h}_i - \sigma_i(\tilde{h}_i), \tilde{h}_i) = U_i(w_i h_i, h_i)$$

Average WTP for counterfactual allocation $\tilde{\mathbf{h}} = \{\tilde{h}_i\}_{i \in N}$:

$$W(\tilde{\mathbf{h}}) = \frac{1}{N} \sum_{i=1}^N \sigma_i(\tilde{h}_i)$$

Calibration

- Want to back out β_i using desired hours h_i^*
- Given β_i , can compute WTP for moving from usual hours to h_i^* each worker
- Need to set η and γ
- Set $\eta = 1$ (log preferences), as lack of time trend in usual hours and desired hours suggests IE and SE cancel
- Set $\gamma = 2$ to match estimates of Hicks elasticity from Chetty et al. 2011

Distribution of WTP

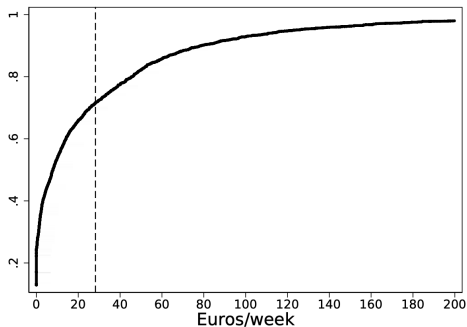


Figure 6: Distribution of WTP to Work Desired Instead of Usual Hours

Mean WTP = 28.5 Euros/Week (Mean weekly income is 510 Euros in 2019) Heterogeneity

Counterfactuals

Counterfactuals

Goal: evaluate effect of tighter cap on weekly hours compared to current cap at 48h

Two steps:

1. Construct counterfactual hours allocation $\tilde{h}$ for different hours caps
 $\bar{h} \in \{47, 46, \dots, 30\}$
2. Compute average WTP for new allocation $\tilde{\mathbf{h}}_{\bar{h}}$

Constructing Counterfactual Hours

Question: Suppose we impose a cap on weekly hours, $\bar{h}$. How would workers' actual hours change, i.e. what is $\tilde{h}_{\bar{h}}$?

Categorize workers:

- $h_i < \bar{h}$
- $h_i \in [\bar{h}, 48]$
- $h_i > 48$

Three ways of constructing $\tilde{h}_{\bar{h}}$:

Case 1

All workers with $h_i > \bar{h}$ work exactly $\tilde{h}_i = \bar{h}$

Case 2

Workers above 48 h reduce hours by $(48 - \bar{h})$, i.e. $\tilde{h}_i = h_i - (48 - \bar{h})$ They drop "Friday afternoon" but still work weekends.

Case 3

Those not bound by prior cap stay unchanged: $\tilde{h}_i = h_i$

Effects of Caps on Hours

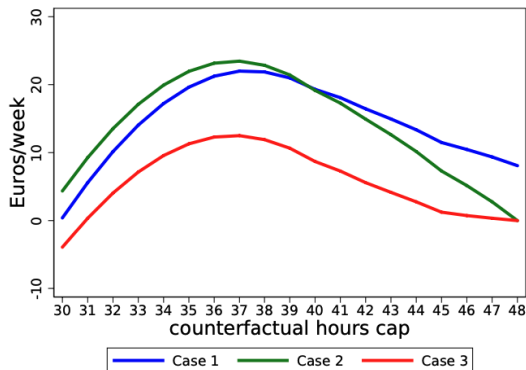


Figure 8: Average Willingness to Pay for A Shorter Workweek

Mean WTP for optimal hours cap ranges from 12.5 to 23.5 Euros/week (recall that optimal hours allocation has mean WTP = 28.2 Euros/week)

Feasibility

Feasibility

Two Concerns with results so far:

1. Analysis assumes that firms are willing to employ workers at the counterfactual hours at the same wage
2. Analysis ignores that aggregate fall in hours reduces capital income and transfers funded by taxes

Hours and Wages

Concern 1:

Firms might not want to employ workers at lower hours for the same wage

Solution:

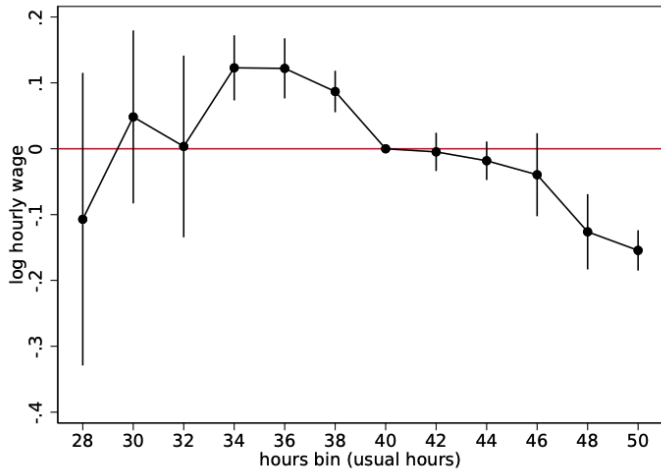
Estimate empirical relationship between hours worked and wages.

- Partition weekly hours into bins $h \in H$ and define hour-dummies $\mathbb{1}_{ih} = 1$ if individual i 's usual hours lie in bin h .
- Run regression à la Bick et al. (2019):

$$\log w_i = \alpha + \sum_{h \in H} \zeta_h \mathbb{1}_{ih} + \eta X_i + \varepsilon_i$$

- ζ_h captures average log wage within hour bin.
- X includes age, education, marital status, sector and union membership

The Wage-Hours Schedule



Feasibility

- Denote the estimated wage-hours schedule $w(h)$
- Compute how much firm is willing to pay at counterfactual hours, $w(\tilde{h}_{\bar{h}})\tilde{h}_{\bar{h}}$
- Compare this with what workers think they would get paid, $w_i\tilde{h}_{\bar{h}}$
- Summing this across all workers give a measure of surplus from $\tilde{\mathbf{h}}_{\bar{\mathbf{h}}}$:

$$S(\tilde{\mathbf{h}}) = \sum_i \tilde{h}_i (w(\tilde{h}_i) - w(h_i)) \approx \sum_i \tilde{h}_i w_i [\log w(\tilde{h}_i) - \log w(h_i)] \quad (1)$$

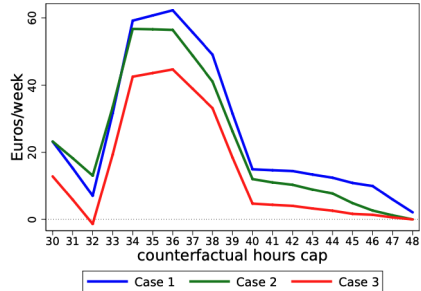


Figure 12: Surplus/Shortfall when Applying Empirical Wage–Hours Schedule

Macro Losses

Concern 2:

Workers don't internalize entire fall in aggregate income due to lowering their hours

- Capital income falls, if K and L are complements
- Lower tax revenue

Solution:

Do back-of-the-envelope calculation of the macro losses

1. Compute aggregate output loss due to hours cap $\bar{h}$
2. Subtract from this number the change in net-income, which the workers internalize
3. Add this to workers WTP

Simple Model of the Economy

Aggregate output:

$$Y = (\alpha K^\rho + (1 - \alpha)L^\rho)^{\frac{1}{\rho}} \quad (2)$$

Computing fall in aggregate output:

- Change hours from $h_i(\bar{h})$ to $\tilde{h}_i(\bar{h})$
- K is fixed, so we just need to compute the change in effective labor, s_L :

$$s_L \equiv \frac{\tilde{L}}{L} = \frac{\sum_i \tilde{w}_i(\tilde{h}_i(\bar{h})) \tilde{h}_i(\bar{h})}{\sum_i w_i h_i}$$

- By doing some algebra we get $\frac{\Delta Y}{Y}$ as a function of the change in effective labor, s_L and the capital share α_K :

$$\frac{\Delta Y}{Y} = (s_L^\rho + \alpha_K[1 - s_L^\rho])^{\frac{1}{\rho}} - 1 \quad (10)$$

Simple Model of the Economy Ctd.

Fall in net income internalized by workers

- The workers internalize the fall in their net income Ω :

$$\Delta\Omega = (1 - \hat{s})\Omega, \hat{s}_L = \frac{\sum_i w_i \tilde{h}_i(\bar{h})}{\sum_i w_i h_i(\bar{h})} \quad (3)$$

- As a share of GDP:

$$\frac{\Delta\Omega}{Y} = (1 - \hat{s}_L)(1 - \tau)\alpha_L \quad (4)$$

- α_L is the labor share of gross income and τ is the tax rate

Macro Losses: Computation

Computing the model objects:

- Percentage change in effective labor, s_L , and percentage change in net income, $\hat{s}_L$, can be computed using survey responses (hours and wages) and the empirical wage-hours schedule $w(h)$
- $\alpha_k = 1/3$
- $\rho = -1$
- $\tau = .4$ (Overall “tax wedge” reported by OECD)

Macro Losses: Results

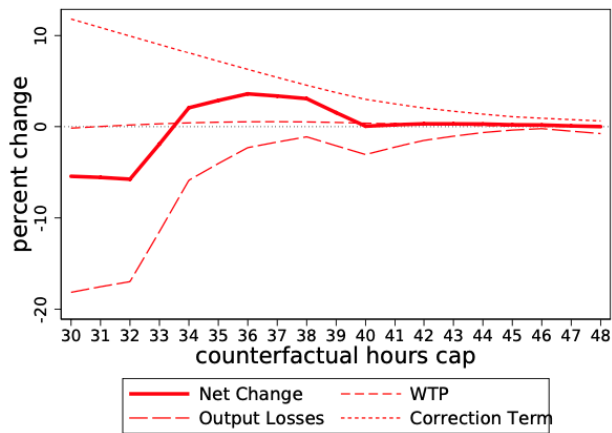


Figure 13: Net Change in Welfare (Case 3)

Conclusion

- Provided evidence that most workers in Germany are overworked
- Find substantial welfare gains from lower cap on weekly hours
- Shown that results are robust to letting wages vary with hours worked and accounting for macro losses due to lower aggregate hours

Thoughts

- Workers' in Germany clearly value having lower hours
- But macro loss calculation misses important channels:
- Lower accumulation of human capital leads to lower output in the future
- Do workers account for lower knowledge flows with their coworkers?
- Assume that workers operate the same capital

Appendix

Descriptive Statistics

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	Full-time and Part-time		Full-time Only	
	(1)	(2)	(3)	(4)
	2019	Pooled Sample	2019	Pooled Sample
male	0.53	0.57	0.66	0.68
age	43.67	41.66	43.32	41.21
married	0.52	0.57	0.48	0.55
child in household	0.41	0.56	0.36	0.55
german citizen	0.88	0.82	0.89	0.81
has college degree	0.13	0.08	0.14	0.08
has vocational degree	0.68	0.74	0.70	0.75
blue-collar	0.19	0.21	0.21	0.23
civil servant	0.07	0.08	0.08	0.09
white-collar	0.73	0.71	0.70	0.68
salaried	0.69	0.69	0.71	0.71
public sector	0.27	0.28	0.26	0.27
part-time	0.26	0.19	0.00	0.00
multiple jobs	.	0.04	.	0.03
net monthly labor income	1928.86	1769.63	2200.27	1967.10
hourly wage	11.45	10.50	11.93	10.83
Observations	11942	284372	8334	220614

Table 1: Summary Statistics: German SOEP

Desired vs. Actual Hours Worked

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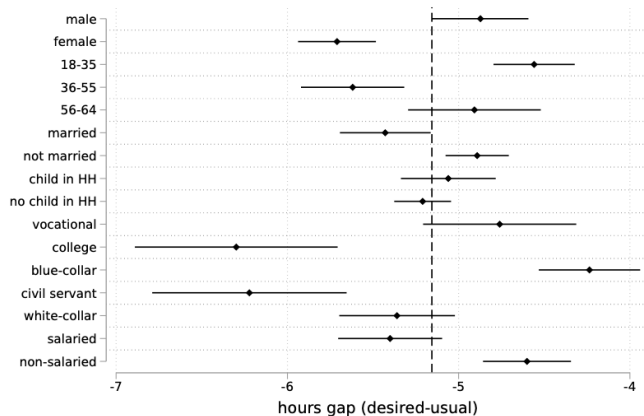
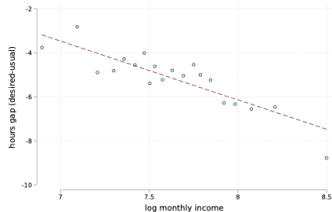
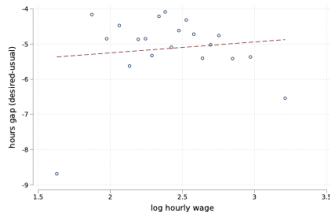


Figure 2: Average Hours Gaps for Different Demographic Groups

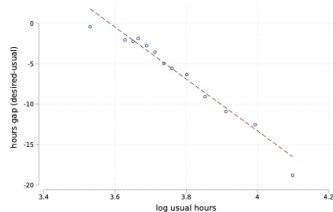
Desired vs. Actual Hours Worked



(a)



(b)



(c)

Figure 3: Hours Gap in Germany by Hourly Wage and Hours per Week

Desired vs. Actual Hours Worked

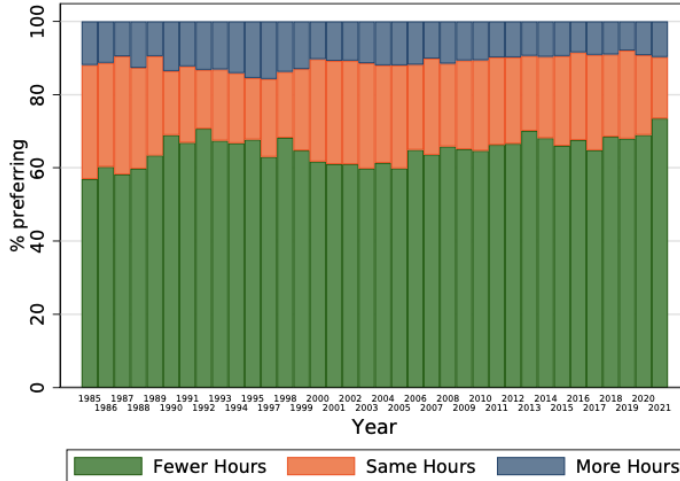
	2019		Pooled Sample	
	(1) Overworked	(2) Inverted Hours Gap	(3) Overworked	(4) Inverted Hours Gap
Male	-0.115*** (-7.57)	-1.712*** (-10.94)	-0.0907*** (-11.98)	-1.540*** (-17.35)
36-55	0.0190 (1.19)	0.615*** (3.75)	0.0152 (1.90)	0.361*** (3.84)
56-64	-0.00362 (-0.17)	0.507* (2.36)	0.00107 (0.10)	0.454*** (3.73)
Married	-0.00876 (-0.58)	0.224 (1.44)	0.0276*** (3.65)	0.545*** (6.14)
Child in HH	0.0132 (0.86)	-0.172 (-1.08)	-0.0221** (-2.88)	-0.237** (-2.62)
Vocational Degree	0.0923*** (4.98)	0.509** (2.65)	0.117*** (12.44)	0.744*** (6.76)
College Degree	0.127*** (4.81)	0.982*** (3.62)	0.122*** (9.42)	0.886*** (5.82)
Civil Servant	-0.0429 (-1.20)	-1.085** (-2.95)	0.0171 (0.97)	0.294 (1.42)
White-collar	0.0218 (1.27)	0.133 (0.75)	0.0546*** (6.30)	0.506*** (4.98)
Salaried	-0.0301 (-1.94)	-0.0683 (-0.43)	-0.00201 (-0.26)	0.167 (1.82)
Log Hourly Wage	0.0993*** (4.75)	0.633** (2.94)	0.0805*** (8.36)	0.350** (3.10)
Log Usual Hours	1.373*** (23.98)	33.49*** (55.79)	0.984*** (43.40)	27.12*** (101.57)
N	4547	4489	17316	17128

† statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Overwork and Hours Gaps Regressions

Desired vs. Actual Hours Worked Over Time



Mean WTP Across Groups

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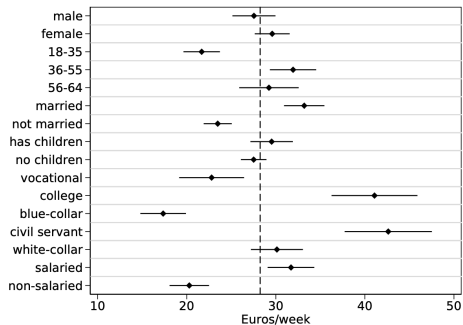


Figure 7: WTP to Work Desired Instead of Usual Hours by Observables

Effects of Caps on Hours by Group

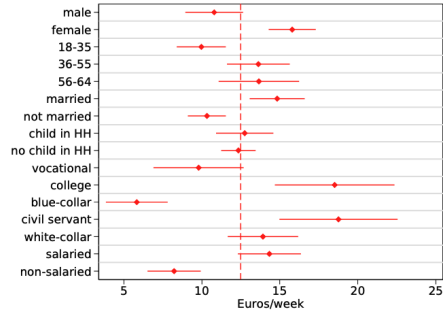
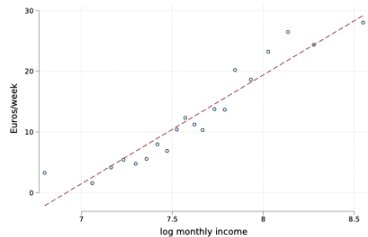
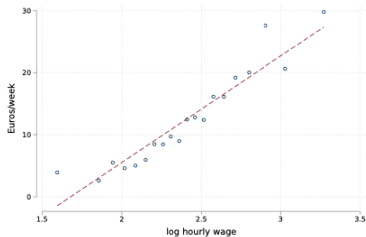


Figure 9: Willingness to Pay for A Shorter Workweek at Optimum (Case 3)

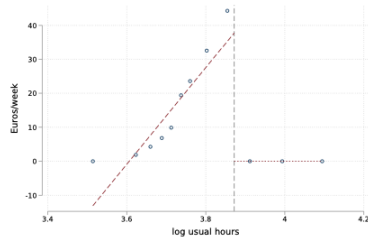
Effects of Caps on Hours by Income



(a)



(b)



(c)

Figure 10: WTP Heterogeneity by Income, Wage, and Hours (Case 3)