

Job Satisfaction and Comparison Income in Germany

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1. Introduction

In the last decade economists have started to pay more and more attention to the fact that agents do not just care of the absolute value of their own consumption or income, but rather evaluate what they have in comparison with what other people have. The present paper investigates in particular how job satisfaction depends on comparison income. It makes use of data for Germany and adopts the same methodology already used by Clark, Oswald (1996) with UK data, so that a direct comparison is possible. The present results are quite different from theirs. This might be either due to differences between UK and Germany, or, more probably, it calls for a better specification of the comparison income. Future research will be needed in order to reconcile the conflicting evidence and understand it more deeply.

2. Relative position, comparison income and job satisfaction

The idea that relative income matters for individual utility or happiness is indeed an old idea in many social sciences, especially in sociology and psychology. Though, if we look at standard economics textbooks, we almost find no trace of it. Cole, Mailath and Postlewaite (1992) argue that this "reluctance to include relative position in society and status in models stems in large part from a belief that if one is 'allowed' to put status into agents' utility functions, then it is possible to explain anything". Nevertheless, they also stress that this expansion of the scope of economic analysis is necessary since many economically relevant variables are not allocated through markets, but rather through different social mechanisms, which are worth of investigation. In this spirit they interpret "status as a ranking device that determines how well an agent fares with respect to the allocation of nonmarket goods".

The general point that relative position matters for economic agents has far reaching consequences for both economic theory and economic policy. To give an idea of this literature, Hirsch (1976) argues that contemporary advanced societies, after having widely satisfied primary needs, are more and more facing positional and relational needs. Moreover, he observes that positional competition brings about unavoidable aggregate dissatisfaction, since it is a zero sum game, but it induces people to work inefficiently too much. One policy implication, drawn recently by Corneo (2000), is then that progressive income taxation might have an efficient side, to the extent that it corrects this distortion and reduces the rat race. On the other side, Corneo, Jeanne (1999a) show that competition for status might have indirect positive welfare effects through the

fostering of private growth and Corneo, Jeanne (1999b) investigate more deeply the link between pecuniary emulation, inequality and growth. The focus on growth is shared by Cole, Mailath and Postlewaite (1992), who argue that differences in social organization, inducing different preferences in terms of relative position, may lead to different growth rates. Neumark, Postlewaite (1998) apply a similar kind of reasoning to the job market, showing how income comparison with the family of a woman's relatives may motivate her decision to work, through a mechanism that potentially gives rise to chain effects, much better in accordance with empirical findings than traditional neoclassical models. From a slightly different point of view Akerlof, Kranton (2000) provide a theoretical basis for models which focus on agents' identity as an engine for their economic choices and it is apparent that in such settings relative position and interpersonal comparison play a major role.

Another way of looking at how relative position and in particular relative income might matter besides absolute income is that of focusing on the comparison with an individual aspiration level rather than on interpersonal comparison. Aspirations seem to play a crucial role in determining satisfaction, as argued by Sacco, Vanin (2000) in a simulation model of network interaction. Clark (1997) explains the empirical finding that women report on average a higher job satisfaction than men with the consideration that, mainly because of historical reason, they have been used to having worse positions and therefore they have on average lower aspirations, which are more easily satisfied. If this explanation is correct, it means that the gender differential in satisfaction is just temporary and will disappear as soon as women's aspirations are adapted and revised upwards.

These two ways how relative income could matter, i.e. through interpersonal comparison with a reference group and through psychological comparison with one's own aspiration level, need not, of course, be thought as alternative. Indeed, one of the most important ways of forming own aspirations is through the comparison with others. Clark, Oswald (1996) investigate this link and provide an empirical estimation of the relevance of comparison income for job satisfaction. Using data for UK for 1991, they find that:

- "Workers' reported level of satisfaction are at best weakly correlated with absolute income alone";
- "Measures of comparison income are significantly negatively correlated with reported levels of happiness at work";
- "The higher the level of education, the lower the reported satisfaction level"

The last result is explained with the idea that higher education brings about higher aspirations, which are more difficult to be met satisfactorily.

The purpose of the present contribution is to check the validity of these findings in the light of data for Germany for 1993, coming from the sample released by SOEP (Sozio-oekonomisches Panel) for students. The main findings are the following:

- Male workers' satisfaction depends to a high degree (positively and significantly) upon absolute income and not upon comparison income, whereas the opposite holds for female workers;
- The coefficient of absolute and comparison income are always of opposite sign, but they appear reversed for men and women, a fact that might be interpreted through in terms of a different attitude toward distributional issues;
- The level of education is not significantly correlated with reported satisfaction.
- Before proceeding to interpret them it is necessary to look more in detail at how they are derived.

3. Estimation procedure

The dataset contains observations on 3306 persons, of whom 1362 full time workers. Table 1 shows some descriptive statistics of the sample of full time workers. Each worker was asked, among other questions, to report his or her degree of happiness with job in a scale ranging from a minimum of 0 to a maximum of 10. To assess the impact of various explanatory variables on this reported satisfaction, one has to cope with a problem of qualitative ordered choice, for which an ordered probit regression is particularly suited [see Verbeek (2000) for a general introduction and Hausman, Wise (1978) for a deeper analysis of the probit model]. Since the main purpose of the present estimation is a comparative one, I consider a small number of explanatory variables, focusing attention just on those which appear most important in Clark and Oswald's work. In particular, I analyse the effect on job satisfaction of gross monthly income, comparison income (taken as a proxy of an individual aspiration level over income), monthly hours of work, reported happiness with health, age, years of schooling, marriage, membership in a trade-union and gender. The expected coefficients, on the base of Clark and Oswald's work, are as follows: absolute income should be hardly significant; comparison income should have a significant negative effect, since it represents higher aspirations, more difficult to be met; hours of work should have a negative impact for seemingly obvious reasons; health conditions are very likely to influence satisfaction even in other spheres of life, hence they should be relevant and positive; job satisfaction seems to be monotonically positively related to age; higher education seems to bring about lower satisfaction,

perhaps because it increases aspirations more than actual results; marriage was included on the idea that there might be different reactions to similar job conditions for married and for non married workers, since they might have different needs and habits besides the work, but it was not clear what effect one should expect; trade-union membership could be associated to a more conflicting or critical way of seeing work relations, and hence might be associated with a lower satisfaction; finally, as already mentioned, men seem to report on average a lower job satisfaction than women. As we shall see, some of these intuitions are not supported by the data.

The main problem, for the scope of the present analysis, is how to construct a good proxy of the aspiration level. The strategy followed by Clark and Oswald, and followed here, consists in running a simple OLS regression of income on a number of explanatory variable, and then to use the fitted values as a proxy for aspirations. To a certain extent, it is difficult to doubt that this approximation captures some relevant elements, since it tells us how much earns on average a person of a certain age, with a certain education, who makes a certain kind of job, and so on, and it seems natural to think that aspirations and satisfaction are influenced by the average level around an individual. Nevertheless, for two reasons this measure might be inadequate. First, an individual's aspirations depend crucially on the dynamics of his or her performances, i.e., there is a temporal element which is not captured by a simple static average across the population (or its subgroups); second, as pointed out by Neumark and Postlewaite (1998), the reference group for an individual might be different from the population we are studying, for instance it might be constituted by his or her relatives or friends. Clark and Oswald try to overcome these problems using different measures of the comparison income (whereas I estimate it just in one way), but still they do not apply any dynamic definition.

Specifically, I regress gross monthly income (in logarithm) on gender, age, age squared (a proxy for experience), years of schooling, years of schooling squared (since returns to education may not be linear), seven dummies for job type and five dummies for firm size (since it may be the case that bigger firms pay more [as shown by Schmidt, Zimmermann (1991)]). The results of this OLS regression appear in Table 2.

In order to reduce multicollinearity problems, instead of the fitted values of this regression, I use their exponential as a measure of comparison income in the ordered probit regressions, whereas I keep measuring actual income in logs. This does not allow any more to speculate about the difference between actual and desired income. Nevertheless, while this interpretation would have been somewhat problematic in any case, we should be still able to detect a monotonic negative effect of higher comparison income on satisfaction, if present. The results of the ordered probit regressions are listed in Tables 3 to 8.

4. Empirical results

The most striking result from the present estimations is that male and female workers exhibit sharp differences in the way they evaluate their job satisfaction, and not only in the sense that women report on average a higher degree of happiness for their work - an element, indeed, that does not appear to be very strong in our sample -, but rather in the sense that the determinants of their satisfaction appear to be different. In order to give adequate relevance to this aspect, the tables show two series of three regressions. The first series does not include comparative income and is meant to assess the impact of absolute income taken alone, the second includes comparative income. Each time, I show the basic regression for the whole sample and then, disentangled, the two regressions that hold for men and for women.

The first regressions show that absolute income, taken alone, has a positive and significant impact for men, but not for women, for whom the coefficient is insignificantly different from zero. So it seems that women's job satisfaction is substantially independent from their income. Rather, it depends to a high degree (negatively) on the number of hours of work, which appear in turn to be insignificant for men (even if the coefficient is still negative, as expected). Age is highly positively correlated with job satisfaction for both, as well as it seems to be general that older workers are more content with their job than younger people. The negative effect of schooling on satisfaction found by Clark and Oswald is here present only for men, whereas no significant effect is present for women. Contrary to the possible expectation, both marriage and union membership are not significant.

If we now introduce comparison income, the picture changes in the following way. First, as anticipated, both for male and for female workers the signs of the coefficients of absolute and comparison income are opposite, but while men make their job satisfaction largely depend (positively) upon their absolute income (comparison income is not significant), women do exactly the opposite: for them only the comparison income appears to be significant, the absolute income not. Although significant for women, the effect of comparison income on satisfaction is very low for them as well as for men, contrary to the findings of Clark and Oswald. Moreover, it is really surprising that a woman's job satisfaction be negatively (although not significantly) correlated with her income! This point deserves some comments: a possible explanation could be that in our sample women care about distribution of income, and hence about relative income, in a way opposite to men: while male workers tend to fight on the job to gain a position higher than the average, female workers care more about distributive fairness. This is just a possible explanation,

but other ones could be more appropriate. A possible alternative, for instance, would be to think that the specification of the comparison income has to be changed. What seems indeed clear is that, to really understand these results, more research efforts are needed. Moreover, even the sharp difference in the results from Clark and Oswald's ones could be due either to an insufficiently accurate specification or to real differences between Germany and the UK, which then would require an explanation. Finally, as far as the other explanatory variables are concerned, the introduction of comparative income changes a bit our previous results. Hours of work are still significant for women but not for men, as well as health remains relevant and significant in any case, but now the significance of age turns out to be lower than before, while that of education, with the sign predicted by Clark and Oswald, is now higher. Marriage and union participation remain always statistically negligible. These changes in the results are relatively minor ones and do not alter any of the basic previous findings.

5. Conclusion

This paper provides an estimation of job satisfaction focusing in particular on the role of comparison income and of aspirations. The methodology follows closely Clark and Oswald (1996), but while they use data for the UK, the present data for Germany lead to different results. In particular, comparison income appears to be less relevant than they found and seems to have opposite effects on job satisfaction for male and female workers. The present investigation is not sufficient to fully explain these differences. A possible interpretation goes in the direction of the difference between men and women's way of caring of distributional issues; similarly, Germany and the UK could differ in the way in which workers attribute value to positional issues. Another possible interpretation is that the measure of comparison income used is not sophisticated enough, and hence brings just to partial results. In particular, dynamic considerations would be necessary to capture adequately the role of aspirations. Finally, while Clark and Oswald find a strong negative correlation between education and job satisfaction, this does not appear from the present sample. What instead appears quite clearly is that women pay much more attention than men to the number of hours of work and, in general, much less to income (either absolute or relative).

References

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Table 1 - Descriptive statistics of the variables employed

Variable	Obs	Mean	Std. Dev.	Min	Max
health	1373	6.98252	2.046753	0	10
jobsat	1368	7.114766	1.986233	0	10
jp0803	881	1	0	1	1
jp15	1373	1	0	1	1
wage	1373	4653.945	2824.552	1000	55000
jp10001	1373	1.29716	.4571739	1	2
jp10002	1373	954.185	11.26894	922	974
jp101	1368	1.853801	1.131694	1	5
jiscoh	1369	4.34843	2.33001	1	8
betr93	1371	3.695113	1.272551	1	6
school	1362	11.7232	2.481844	7	18
jtatzeit	1299	43.10092	8.06755	9.5	80
logwage	1373	8.343903	.4224449	6.907755	10.91509
hours	1299	186.7707	34.95938	41.16667	346.6667
sex	1373	.7028405	.4571739	0	1
age	1373	38.815	11.26894	19	71
agesq	1373	1633.501	915.6549	361	5041
schoolsq	1362	143.5885	67.2385	49	324
marry	1373	.6081573	.4883397	0	1
union	1373	.6416606	.4796873	0	1
job1	1373	.1806264	.3848485	0	1
job2	1373	.0386016	.1927137	0	1
job3	1373	.2425346	.428772	0	1
job4	1373	.0772032	.2670109	0	1
job5	1373	.0844865	.2782174	0	1
job6	1373	.01748	.131099	0	1
job7	1373	.3350328	.4721739	0	1
size1	1373	.0611799	.2397473	0	1
size2	1373	.1238165	.3294921	0	1
size3	1373	.2396213	.4270079	0	1
size4	1373	.2359796	.4247642	0	1
size5	1373	.3095412	.4624729	0	1

jobsat: satisfaction with job

health: satisfaction with health

wage: gross income last month

logwage=ln(wage)

hours: actual hours per month on the job

sex: dummy =1 when male, =0 when female

age: age

agesq=age*age

school: number of years of schooling

schoolsq=school*school

marry: dummy =1 when married, =0 when separated, single, divorced or widowed

union: dummy =1 when trade union member, =0 when not

job1: dummy for scientist

job2: dummy for manager

job3: dummy for office worker
 job4: dummy for business job
 job5: dummy for service sector job
 job6: dummy for agriculture job
 job7: dummy for production job
 the residual category is composed by "other" or "does not apply"
 size1: dummy for firms with employees<5
 size2: dummy for firms with 5=<employees<20
 size3: dummy for firms with 10=<employees<200
 size4: dummy for firms with 200=<employees<2000
 size5: dummy for firms with 2000=<employees
 the residual category is composed by the self-employed with no employees

Table 2 - OLS estimation of comparison income (log gross monthly wage)

Source	SS	df	MS	Number of obs =	1362
Model	109.457213	17	6.43865958	F(17, 1344) =	64.59
Residual	133.977345	1344	.099685525	Prob > F	= 0.0000
				R-squared	= 0.4496
				Adj R-squared	= 0.4427
Total	243.434558	1361	.178864481	Root MSE	= .31573

logwage	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sex	.3052877	.0205637	14.846	0.000	.2649473	.3456282
age	.0564367	.0058377	9.668	0.000	.0449847	.0678887
agesq	-.0006037	.0000716	-8.433	0.000	-.0007442	-.0004633
school	.0912537	.0338702	2.694	0.007	.0248096	.1576979
schoolsq	-.0020803	.0012518	-1.662	0.097	-.0045359	.0003753
job1	.1981751	.0609152	3.253	0.001	.0786759	.3176743
job2	.4899409	.0712834	6.873	0.000	.3501022	.6297797
job3	.1101745	.0582301	1.892	0.059	-.0040574	.2244063
job4	.1254755	.0637068	1.970	0.049	.0005	.2504511
job5	-.1271335	.0629056	-2.021	0.043	-.2505374	-.0037296
job6	-.3712945	.0908453	-4.087	0.000	-.5495084	-.1930805
job7	-.0145506	.057774	-0.252	0.801	-.1278877	.0987865
size1	.1373937	.0635373	2.162	0.031	.0127507	.2620367
size2	.0461239	.0589932	0.782	0.434	-.0696048	.1618527
size3	.0588796	.056955	1.034	0.301	-.0528507	.17061
size4	.0892771	.0570148	1.566	0.118	-.0225706	.2011249
size5	.1319475	.0566088	2.331	0.020	.0208963	.2429988
_cons	5.994744	.2567564	23.348	0.000	5.491057	6.498431

			(Ancillary parameters)
_cut1		1.97586	.7771146
_cut2		2.155232	.7722519
_cut3		2.453978	.7683031
_cut4		3.059588	.765985
_cut5		3.430661	.7663896
_cut6		3.942348	.7677102
_cut7		4.282014	.7689561
_cut8		4.840842	.7721052
_cut9		5.795856	.7765569
_cut10		6.431323	.7781327

Table 5 - Job satisfaction for female workers

Ordered probit estimates	Number of obs	=	381
	LR chi2(7)	=	81.30
	Prob > chi2	=	0.0000
Log likelihood = -720.39359	Pseudo R2	=	0.0534

jobsat		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
logwage		.086189	.1725599	0.499	0.617	-.2520222 .4244001
hours		-.0049353	.0020432	-2.416	0.016	-.0089399 -.0009308
health		.2163822	.0258279	8.378	0.000	.1657605 .2670039
age		.0084892	.0051669	1.643	0.100	-.0016378 .0186162
school		.0060489	.0252813	0.239	0.811	-.0435014 .0555993
marry		.0636346	.1095409	0.581	0.561	-.1510616 .2783307
union		-.0092146	.1176503	-0.078	0.938	-.239805 .2213758
_cut1		-1.089382	1.335318			
_cut2		-.6938251	1.32563			
_cut3		-.3305655	1.323307			
_cut4		.0228749	1.322062			
_cut5		.2270929	1.320831			
_cut6		.851073	1.322414			
_cut7		1.11894	1.324069			
_cut8		1.620217	1.326498			
_cut9		2.413007	1.327656			
_cut10		3.127357	1.326692			

			(Ancillary parameters)
_cut1		2.215548	.8598465
_cut2		2.394346	.8551036
_cut3		2.692713	.8512977
_cut4		3.298124	.8490789
_cut5		3.669597	.8497105
_cut6		4.181951	.8513475
_cut7		4.521821	.8526064
_cut8		5.080537	.8553713
_cut9		6.035477	.8593629
_cut10		6.671348	.8610569

Table 8 - Female job satisfaction with comparison income

Ordered probit estimates	Number of obs	=	381
	LR chi2(8)	=	89.51
	Prob > chi2	=	0.0000
Log likelihood = -716.28589	Pseudo R2	=	0.0588

jobsat		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
logwage		-.2088151	.2009864	-1.039	0.299	-.6027412 .185111
refwage		.0003437	.0001199	2.865	0.004	.0001086 .0005787
hours		-.0044596	.0020505	-2.175	0.030	-.0084786 -.0004406
health		.2225733	.025946	8.578	0.000	.1717202 .2734265
age		.0020171	.0056324	0.358	0.720	-.0090222 .0130565
school		-.0504674	.0320572	-1.574	0.115	-.1132984 .0123636
marry		.0402011	.1098868	0.366	0.714	-.1751731 .2555753
union		.0239708	.1182659	0.203	0.839	-.2078262 .2557677

_cut1		-3.093829	1.508817			(Ancillary parameters)
_cut2		-2.69131	1.498763			
_cut3		-2.324819	1.496171			
_cut4		-1.966678	1.494293			
_cut5		-1.758848	1.492583			
_cut6		-1.123935	1.492083			
_cut7		-.8515747	1.492871			
_cut8		-.3420153	1.493754			
_cut9		.4614128	1.492956			
_cut10		1.177364	1.491894			

Appendix - Stata Do-File

```
set memory 32000
clear
log using "H:\Paolo\Stata\Relative Income\Jobsat.txt", replace

* Merging data

use "H:\Paolo\Stata\Data\Jpgen.dta", clear
sort persnr
save "H:\Paolo\Stata\Data\Jpgen.dta", replace
use "H:\Paolo\Stata\Data\Jp.dta", clear
sort persnr
merge persnr using "H:\Paolo\Stata\Data\Jpgen.dta"
save "H:\Paolo\Stata\Data\Merged93.dta", replace

* Select variables

keep betr93 jbilzeit jiscoh jp0101 jp0102 jp0803 jp15 jp5401 jp10001 jp10002
jp101 jtatzeit

* Keep just full time workers (with a reasonable income)

keep if jp15==1
drop if jp5401<1000

* Recode -3 (Answer improbable), -2 (Not applicable) and -1 (No answer) to "."

mvdecode _all, mv(-1)
mvdecode _all, mv(-2)
mvdecode _all, mv(-3)

* Generate variables

rename jp0102 jobsat
* satisfaction with job
rename jp0101 health
* satisfaction with health

rename jp5401 wage
* wage = gross income last month
```

```

gen logwage=ln(wage)

gen hours=(jstatzeit*52)/12
* actual hours per month on the job

gen sex=jp10001==1
* sex=1 when male; sex=0 when female
gen age=(993-jp10002)
gen agesq=age*age
rename jbilzeit school
* school is the number of years of schooling
gen schoolsq=school*school
gen marry=jp101==1
* marry=1 when married, =0 when separated, single, divorced or widowed

gen union=jp0803==1
* union=1 when trade union member, =0 when not

gen job1=jiscoh==1
* dummy for scientist
gen job2=jiscoh==2
* dummy for manager
gen job3=jiscoh==3
* dummy for office worker
gen job4=jiscoh==4
* dummy for business job
gen job5=jiscoh==5
* dummy for service sector job
gen job6=jiscoh==6
* dummy for agriculture job
gen job7=jiscoh==7
* dummy for production job
* the residual category is composed by "other" or "does not apply"

gen size1=betr93==1
* size1 is a dummy for firms with employees<5
gen size2=betr93==2
* size2 is a dummy for firms with 5=<employees<20
gen size3=betr93==3
* size3 is a dummy for firms with 10=<employees<200
gen size4=betr93==4
* size4 is a dummy for firms with 200=<employees<2000

```

```

gen size5=betr93==5
* size5 is a dummy for firms with 2000=<employees
* the residual category is composed by the self-employed with no employees

sum

* Estimating expected wage

regress logwage sex age agesq school schoolsq job1 job2 job3 job4 job5 job6 job7
size1 size2 size3 size4 size5
predict reflwage
gen refwage=exp(reflwage)

* Estimating job satisfaction

oprobit jobsat logwage hours health age school marry union
oprobit jobsat logwage hours health age school marry union if sex==1
oprobit jobsat logwage hours health age school marry union if sex==0
oprobit jobsat logwage refwage hours health age school marry union
oprobit jobsat logwage refwage hours health age school marry union if sex==1
oprobit jobsat logwage refwage hours health age school marry union if sex==0

log close

```