Does Freedom of Choice cause Satisfaction?

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ABSTRACT

This paper investigates the relation between freedom of choice and individual well being, as measured by satisfaction. I look at analyse the hypothesis of a positive correlation between the two variables, controlling for other relevant covariates and unobserved heterogeneity. The results show that freedom is significantly correlated with satisfaction, a finding robust to several alternative model specifications.

INTRODUCTION

Well being has recently encountered renewed interest as a policy objective, motivating the flourishing of a new branch of economics, known as economics of happiness. Part of this literature is focused on uncovering the determinants of well being, often understood as satisfaction over one's life or feeling of happiness. By now, however, virtually no study has investigated the relatively intuitive question of whether freedom matters for individual well-being. If one understands freedom as freedom of choice[1] (FoC), the existing theory endorses a positive answer (Pattainx, Xu, 1990, Sen, 1999 and Sugden, 1998). Providing empirical evidence in support of this claim encounters a twofold problem. First, it is not yet clear how to correctly measure freedom, since there is no unique definition of it. Second, freedom is most likely to be endogenous with other measures of well being, and the relation is widely blurred by the presence of unobserved heterogeneity. Does more freedom cause higher satisfaction or is being satisfied with one's life the cause of higher self reported freedom? To what extent are unobservable ethics or value systems affecting the relationship under study?

In this paper I will mostly concentrate on the problem of unobservables. As for the theoretical part, I will be measuring FoC as Autonomy Freedom (Sugden, 1998, Bavetta and Peragine, 2006, Bavetta and Guala, 2003). Autonomy Freedom is a metric of freedom with a formal characterization (Bavetta and Peragine, 2006), maintaining that the essence of freedom is having opportunities to choose from in a conscious way. More importantly in this context, data on Autonomy Freedom are collected in a publicly available dataset[2] (for a justification, see Bavetta et al., 2008). Some preliminary research (Bavetta et al., 2008) reports that FoC is correlated with several important socio-demographic variables, as income, employment, marital status and religion. This evidence is suggestive that FoC may be relevant for social studies, further motivating the interest in how it relates to individual well being.

Well being is a broad concept with a wide array of definitions and measures. In what follows, I will measure it as satisfaction. From a philosophical perspective, in fact, being free to choose induces an individual to be "the master of one's own life" (Mill, 1859), by allowing him or her to take the choices more appropriate to his or her lifestyle. Empirically, this means that

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[^] The author thanks the Wallander/Hedelius Foundation for financial support.
[1] Where freedom of choice means the extent to which an individual has opportunities allowing him to take meaningful choices.
[2] The World Values Survey and the European Values Survey.

FoC should be expected to impact measures of individual satisfaction with one's own life, where satisfaction comes from the appraisal of one's conscious choices (Bavetta and Guala, 1998).

Guided by the above considerations, I will investigate the hypothesis that FoC relates positively with the satisfaction that an individual feels with his or her life. While I do not address the problem of endogeneity, I try to deal with the unobserved heterogeneity issue by controlling for fixed effects. The results show that there is a strong, positive correlation between the FoC and satisfaction, holding across all specifications, with and without fixed effect controls.

The remainder of the paper is organized as follows: the next section quickly reviews the previous research. After that, two sections discuss the dataset and the empirical strategy. Section 5 provides the results and the following one comments the empirical evidence. A concluding section follows.

PREVIOUS RESEARCH

The existing literature is relevant for the present work in two respects. First, they will guide the choice of the relevant variables to be included in the regression of FoC on satisfaction. Second, they will provide a benchmark against which to test the consistency of the estimates.

Almost all studies find that income increases with satisfaction (Schnys, 1998, Frey and Stutzer 2002), and a similar correlation holds for being employed, especially self-employed (Oswald, 1997), having a higher education and living in a big city. Satisfaction is also strongly positively related with being married and being male, while it is still debatable whether it increases or not with having children (Frey and Stutzer, 2006). Several works show that satisfaction is a convex function of age, with a peak down around the mid-forties. Moreover, being religious is a determinant of satisfaction (Clark and Lelkes, 2005). For a more comprehensive review of the studies, see Bjornskov et al. (2008). To my knowledge, no study includes a measure of FoC among the covariates.

Establishing a clear axiomatic measure for FoC has been on the agenda of Social Choice theory for many years. Pattanaix and Xu (1990) suggested that FoC should be measured by the number of options available to an individual. Alternatively, Sen proposed to look at the number of options available to and preferred by the decision maker (Sen, 1991).

In this work, I will measure FoC as Autonomy Freedom, a conceptualization due to Sugden (1998) and Bavetta et al. (1997, 2003). They maintain that a metric of freedom should capture the extent to which a choice set allows the decision maker to come to choose an option x rather than to what extent it gives access to (ex post preferred) options, without any requirement on the decision process (Mill, 1898, Bavetta and Guala, 1997, 2003). There are two reasons why I favour this notion. It is an interesting policy variable because it captures the value of having opportunities, which recently has been central for many political goals[3] and it is possible to work with it empirically by using the following question from the European Value survey[4].

[3] See acceptance speech delivered by president-elect Barak Obama, http://www.marketwatch.com/news/story/text-barack-obamas-acceptance-speech/story.aspx?guid=%7B523A921D-6E5F-4103-BA81-23A1ACE29EBE%7D

[4] In the original work, the authors refer to the World Value Survey, but the question is unchanged in the more handy European Value Survey.

Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use this scale where 1 means "none at all" and 10 means "a great deal" to indicate how much freedom of choice and control you feel you have over the way your life turns out (for a justification, Bavetta et al., 2008). Moreover, preliminary work shows that this measure has some statistical significance in relation with other socio-demographic variables (Bavetta et al., 2008), but the issue of its relation with satisfaction is not studied there[5].

THE DATA

The data that I am using are taken from the worldwide integrated European Values Survey[6], a survey that gathers information on how people perceive themselves and the society around them, similar in spirit to Eurobarometer[7] and the ISSP survey[8]. The sample has a cross section dimension consisting of more than 250,000 individuals from roughly 60 countries worldwide, and a time series of four waves, 1981-1984, 1989-1992, 1994-1997, and 1999-2003.

To measure well being, I will be using data on satisfaction, as gauged by the answer to the question *All things considered, how satisfied are you with your life as a whole these days?*

Respondents provided an answer ranging from 1 to 10, with 1 meaning total dissatisfaction and 10 complete satisfaction. Apart from FoC, I will be using ten other covariates, whose descriptive statistics are displayed in Figure 1.

Covariate	Obs.	Mean	Std. Dev.	Variance	Smallest	Largest
SAT	263097	6.61	2.48	6.18	1	10
FoC	248224	6.64	2.44	5.97	1	10
INC	228938	4.67	2.47	6.13	1	11
EMPL	259689	3.18	2.15	4.64	1	8
TOWN	181216	4.88	2.51	6.32	1	9
EDU	187668	4.44	2.27	5.19	1	8
CHILD	244024	1.93	1.70	2.90	0	20
M.STATUS	263038	2.62	2.17	4.73	1	7
BIRTH	264839	1953	17.46	304.85	1881	1988
SEX	267660	1.5	.49	.24	1	2
REL_0	238328	1.3	.56	.31	1	4
REL_1	204721	56.2	12.81	164.16	1	86
POL	193531	5.56	2.26	5.13	1	10

Fig. 1. Descriptive Statistics

Most of them are self explanatory. Married is a dummy taking value 1 if single and 2 if the respondent is married. Sex is coded with 1 being 'Male' and 2 'Female'. REL_0 stands for the question *Independently of whether you go to church or not, would you say you are a religious person?,* with possible answers: 1 'A religious person', 2 'Not a religious person', 3 'A convinced

[5] The authors regress FoC on a set of covariates (sex, age, marital status, education level, income and employment status, political orientation, trust level, individual's support in market-oriented institutions; religious beliefs), but without accounting for fixed effects.
[6] http://www.europeanvalues.nl/.
[7] http://ec.europa.eu/public_opinion/.
[8] http://www.issp.org/.

atheist' and 4 'Other answer'. Finally, POL corresponds to the question: *In political matters, people talk of "the left" and "the right." How would you place your views on this scale, generally speaking?,* whose answers are coded with 1 meaning 'Left' and 10 'Right'.

THE EMPIRICAL STRATEGY

One way to estimate empirically the relation between FoC and Satisfaction is to try to control as much as possible for the large unobservable heterogeneity lying in the background. More specifically, it is likely that some of the unobservable variables are connected with the effect of being in a certain country (country effect) and being interviewed in a certain wave (time effect). Consider for instance the participants in the wave 1989-1992: the effect produced on their reported answers by the fall of the Berlin wall is per se unobservable, but it is possible to capture it by including time effects. Similarly, country effects account for those ethics or values that are specific to a certain area and affect the relation between FoC and Satisfaction in ways that are intrinsically unobservable.

Given the panel nature of the dataset that I am using, which tracks a cross section of countries across time, the natural technique to employ is to estimate a model with fixed effects. I will investigate the partial effect of the observable independent variables described in Figure (1) on Satisfaction assuming the following model

$$E[SAT \mid \mathbf{x}, \mathbf{c}]$$
$$SAT_{it} = \mathbf{x}_{it}\beta + \mathbf{c}_i + u_{it} \qquad (1)$$

where x_{it} is a vector containing the observable covariates[9], c_i a vector of unobservable random variables and u_{it} a idiosyncratic error term, where i refers to the country and t to the wave.

According to the theory, to consistently estimate models like (1), the explanatory variables x_{it} need to be uncorrelated with the error term, although only once the c_i's are accounted for[10]. Moreover, since the panel data I am using is unbalanced, in the sense that some countries drop off the cross section in some periods, consistency requires also the x_{it} to be uncorrelated with the drop-off pattern.

Formally, the strict exogeneity assumption reads

$$E(u_{it} \mid \mathbf{x}_i, \mathbf{s}_i, c_i) = 0 \Leftrightarrow E(s_{it}, \mathbf{x}_{is}' u_{it}) = 0 \quad s,t = 1,2...,T \qquad (2)$$

where s_{it} is selection indicator vector $\mathbf{s}_i \equiv (s_{i1}, s_{i2}, ..., s_{iT})'$, such that $s_{it}=1$ if $(SAT_{it}, \mathbf{x}_{it})$ obtained, zero otherwise.

Intuitively, this assumption is likely to be satisfied. The independence of the covariates with the error term should be sufficiently warranted by the conditioning on the fixed effects, and the correlation with the attrition pattern should be zero, given that drop-offs in the dataset are intrinsically random, being due to technical constraints in the survey design.

I will estimate model (1) by running four different regressions, whose results are displayed in the next section. First, I will estimate a baseline regression, which captures the relation between Satisfaction and FoC without accounting for unobservable heterogeneity:

[9] FoC, Income, Size of Town, Education, Employment, Marital status, number of Children, Religious personor not, Politcal self positioning, Sex, Year of Birth.
[10] strict exogeneity assumption (see Wooldridge, p. 579).

$$SAT_{it}=\beta_{0it}+FoC\beta_F+\mathbf{x}_{it}\boldsymbol{\beta}_x+du_{it} \quad (3)$$

Then I will add a country fixed effect dC_i

$$SAT_{it}=\beta_{0it}+FoC\beta_F+\mathbf{x}_{it}\boldsymbol{\beta}_x+\mathbf{dC}_i\boldsymbol{\beta}_C+du_{it} \quad (4)$$

where $\mathbf{dC}_i$ is a vector of country dummies, so that $\mathbf{dC}_i$=1 if i=C and zero otherwise. The third model specification accounts for time effects $\mathbf{dT}_t$ in a similar way

$$SAT_{it}=\beta_{0it}+FoC\beta_F+\mathbf{x}_{it}\boldsymbol{\beta}_x+\mathbf{dT}_t\boldsymbol{\beta}_t+du_{it} \quad (5)$$

where $\mathbf{dT}_t$ is a vector of time dummies such that ds_t=1 if t=T and t=1,2,3,4 and zero otherwise. Finally, I have a complete specification including country fixed effects, time fixed effects and country specific time effects, where the latter captures all the unobservables related with being in a certain country in a certain wave

$$SAT_{it}=\beta_{0it}+FoC\beta_F+\mathbf{x}_{it}\boldsymbol{\beta}_x+\mathbf{dC}_i\boldsymbol{\beta}_C+\mathbf{dT}_t\boldsymbol{\beta}_t+\mathbf{d}(\mathbf{C}_i*\mathbf{T}_t)\boldsymbol{\beta}_{it}+du_{it} \quad (6)$$

where obviously $\mathbf{d}(\mathbf{C}_i*\mathbf{T}_t)$ is a dummy such that $\mathbf{d}(\mathbf{C}_i*\mathbf{T}_t)$=1 if i=C and t=T and zero otherwise.

This procedure recovers the partial effect of FoC on the dependent variable, and the estimates will be consistent as long as the exogeneity assumption is satisfied.

RESULTS

The results from regression (3)-(6) are displayed in the following Tables. As the theoretical research on FoC suggests, the estimates imply a large, positive and statistically significant association between FoC and Satisfaction. For each specification, the estimated coefficient varies a little in size according to the estimation technique used (OLS, Probit, Probit with survey option). However, for each technique, estimates do not vary across the different specifications, remaining significant, of the same sign and of about the same size.

Estimation results for (3) are shown in Table (1). As mentioned above, the magnitude of the relative effect of FoC drops from 0.34 to 0.2 when (3) is estimated with a multinomial probit estimation technique rather than with pooled OLS. This was expected, since OLS treats the regressors as if they were continuous variables, which inflates the resulting estimates.

	POOLED OLS	PROBIT	PROBIT SVY
FoC	0.340**	0.200**	0.198**
	(73.93)	(80.88)	(15.59)
INC	0.122**	0.059**	0.060**
	(31.39)	(31.36)	(5.94)
EMPL	-0.007	-0.006**	-0.007
	(1.66)	(2.90)	(1.38)
TOWN	0.002	0.011**	0.012
	(0.45)	(6.05)	(1.19)
EDU	0.034**	0.005*	0.006
	(7.68)	(2.38)	(0.72)
CHILD	-0.005	0.021**	0.020
	(0.69)	(6.50)	(1.71)

M.STATUS	-0.047**	-0.007**	-0.008
	(10.00)	(3.10)	(1.31)
BIRTH	-0.000	-0.001**	-0.001
	(0.43)	(4.37)	(0.79)
SEX	0.108**	0.056**	0.057**
	(6.37)	(6.52)	(2.93)
REL_0	-0.211**	-0.049**	-0.045
	(10.44)	(5.16)	(1.54)
REL_1	-0.004**	0.012**	0.011**
	(3.42)	(28.28)	(3.43)
POL	0.066**	0.041**	0.040**
	(15.56)	(19.39)	(6.20)
CONS	4.290**		
	(3.41)		
Obs	59898	59898	59898
# country	62		
Robust z			
* sign.5%; ** sign. 1%			

Table 1. Baseline regression

Table 2 displays results from model (4). Adding country fixed effects does not alter the estimates that I found in the baseline model. The relation between FoC and Satisfaction remains present, with the same positive sign and basically the same magnitude, with the estimated coefficient varying between 0.17 and 0.34. The coefficients on the country dummies are not all zero and some are significant at 5%, but the standard errors are quite large, suggesting evidence of multicollinearity and warning of overemphasizing the results.

	OLS POOLED	PROBIT	PROBIT SVY
FoC	0.338**	0.175**	0.174**
	(18.22)	(14.86)	(15.06)
INC	0.121**	0.058**	0.056**
	(9.34)	(9.72)	(9.19)
EMPL	-0.007	-0.000	0.000
	(0.85)	(0.03)	(0.06)
TOWN	0.002	-0.001	0.000
	(0.21)	(0.24)	(0.02)
EDU	0.034**	0.014**	0.013*
	(3.79)	(2.81)	(2.61)
CHILD	-0.005	-0.002	-0.003
	(0.53)	(0.53)	(0.57)
M.STATUS	-0.048**	-0.025**	-0.026**
	(6.02)	(5.89)	(6.05)
BIRTH	-0.000	-0.001	-0.001
	(0.13)	(1.21)	(0.85)

SEX	0.107**	0.057**	0.058**
	(3.89)	(4.33)	(4.64)
REL_0	-0.213**	-0.116**	-0.113**
	(4.52)	(5.28)	(5.16)
REL_1	-0.005*	-0.003*	-0.002*
	(2.19)	(2.21)	(2.23)
POL	0.066**	0.035**	0.033**
	(5.85)	(6.27)	(5.82)
Constant	4.082		
	(1.68)		
Obs	59898	59898	59898
# country	62		
R-squared	0.168		
t stat **sign.1%, *sign. 5%			

Table 2. Country Fixed Effects

The same considerations follow by looking at the results obtained accounting for time effects rather than country effects, as can be seen from Table 3. Again, the association between FoC and Satisfaction remains positive and significant, between 0.19 and 0.4. Dummies for wave 1 and 3 are automatically dropped for collinearity reasons, and the results show that only the second wave has had a significant positive impact on Satisfaction. This may be explained by the fact that the second wave is the one carried out right after the fall of the Berlin wall. However, standard errors are large, so the interpretation is not clear.

	POOLED OLS	PROBIT	PROBIT_SVY
FoC	0.419**	0.200**	0.198**
	(92.08)	(15.51)	(15.71)
INC	0.142**	0.061**	0.062**
	(36.19)	(6.57)	(6.58)
EMPL	-0.018**	-0.005	-0.006
	(4.06)	(1.13)	(1.30)
TOWN	0.022**	0.009	0.010
	(5.84)	(0.92)	(1.03)
EDU	0.012**	0.004	0.005
	(2.72)	(0.48)	(0.61)
CHILD	0.034**	0.018	0.017
	(5.11)	(1.48)	(1.43)
M.STATUS	-0.009	-0.005	-0.005
	(1.76)	(0.84)	(0.95)
BIRTH	-0.001*	-0.001	-0.001
	(2.07)	(0.65)	(0.62)
SEX	0.119**	0.058**	0.060**
	(6.54)	(2.79)	(3.04)
REL_0	-0.064**	-0.043	-0.038
	(3.10)	(1.46)	(1.27)

REL_1	0.028**	0.013**	0.013**
	(31.58)	(4.63)	(4.55)
POL	0.086**	0.042**	0.041**
	(19.59)	(6.31)	(6.00)
Constant	3.449**		
	(2.74)		
Obs	59898	59898	59898
Number of wave	3		
R-squared	0.237		
Rob t stat * sign 5%; ** sign 1%			

Table 3. Time Fixed Effects

Finally, model specification (6) does not give rise to significant alterations of the estimation results found in the baseline model. Here the marginal effect of FoC ranges between 0.17 and 0.33.

	POOLED OLS	PROBIT	PR SVY (W)	PR SVY (C)
FoC	0.336**	0.174**	0.173**	0.173**
	(18.07)	(14.76)	(14.96)	(14.96)
INC	0.127**	0.060**	0.059**	0.059**
	(9.66)	(9.98)	(9.42)	(9.42)
EMPL	-0.004	0.001	0.001	0.001
	(0.60)	(0.24)	(0.32)	(0.32)
TOWN	-0.006	-0.004	-0.003	-0.003
	(0.82)	(1.32)	(0.95)	(0.95)
EDU	0.031**	0.012**	0.012*	0.012*
	(3.59)	(2.63)	(2.53)	(2.53)
CHILD	-0.005	-0.002	-0.003	-0.003
	(0.54)	(0.52)	(0.60)	(0.60)
M.STATUS	-0.048**	-0.025**	-0.026**	-0.026**
	(6.00)	(5.84)	(6.04)	(6.04)
BIRTH	0.000	-0.001	-0.000	-0.000
	(0.15)	(1.03)	(0.75)	(0.75)
SEX	0.100**	0.054**	0.056**	0.056**
	(3.55)	(3.97)	(4.33)	(4.33)
REL_0	-0.217**	-0.117**	-0.114**	-0.114**
	(5.12)	(6.04)	(5.88)	(5.88)
REL_1	-0.004	-0.002*	-0.002*	-0.002*
	(1.92)	(2.00)	(2.04)	(2.04)
POL	0.065**	0.034**	0.033**	0.033**
	(5.85)	(6.22)	(5.73)	(5.73)
Cons	3.304			
	(1.52)			
Obs	59898	59898	59898	59898

# country	62
R-squared	0.174
Robust t * sign at 5%; ** sign at 1%	

Table 4. Complete

With regard to the other covariates, the estimated partial effects are in line with the rest of the literature. Income is always significant and positively related to satisfaction. Employment status displays a positive correlation as well[11]. The coefficients on education, marital status, religion and sex are significant and positive across all specifications, as one would have expected. I do not find any effect for the number of children but this covariate is generally considered controversial. I cannot find a significant correlation for age, but this may not be surprising given that I impose a linear specification. Surprisingly, political orientation is highly significant across all specifications, with a positive correlation between being right-winged and being satisfied with one's life.

DISCUSSION

This section discusses some critical issues that may have arisen with the empirical methodology, the data and the interpretation of the results.

The methodology that I am using boils down to investigating the effect of FoC on Satisfaction controlling for how much heterogeneity as possible. This impinges on the implicit assumption that satisfaction levels are interpersonally comparable[12]. While this may be in principle questionable, the assumption is commonly accepted in the economics of happiness literature (Bjornskov et alii, 2008), and even has some psycho-neurological foundations.

With regard to the data, it is important to warrant that there are no systematically missing observations, arising from the respondents' inability or unwillingness to answer some questionnaire items. If missing observations follow a pattern related to some unobservable variable, then the regression estimates will be biased and inconsistent. However, by looking at the dataset the problem does not seem a pervasive one: less than 5,000 respondents did not report an answer to the question on satisfaction, over more than 250,000 interviewed.

The choice of fixed effects as a modelling technique is rather natural to deal with part of the heterogeneity problem. However, it can be the case that the fixed effect dummies will take up part of the effect on satisfaction that instead is to be attributed to other covariates, most importantly to FoC. Unfortunately, there is no way to solve this issue, which loses relevance considering that the estimated coefficient for FoC is always sizeable and significant.

For fixed effects models, the consistency of the results depends crucially on the exogeneity of the covariates with respect to the error term, although allowing positive correlation between the explanatory variables and unobservables. As mentioned in Section 4, assumption (2) is quite likely to hold if we look contemporaneously at the covariates and the error term, being this random in a given time period. Zero correlation between lagged errors and covariates may be trickier to defend: some respondents may systematically report lower FoC in t in face of a negative shock in t-1. However, strict exogeneity requires zero correlation once the c_i's have been accounted for: controlling for the unobservables is likely to wash out this kind of feedbacks and make assumption (2) likely to be met.

[11] Employment is coded such that higher values correspond to increasing levels of unemployment.
[12] Note that this does not imply any assumption about cardinality of the categories.

Considering the actual estimates, there are few general comments to be made. First, it may be difficult to extend the results to samples with different characteristics. The fixed effects control for unobservables but these remain a sort of black box. Also, the effects of the long term levels of the observed variables will no longer be captured in the results, which will rather provide an estimate of the effects of variations in the observed variables.

Looking at the output, the standard errors more than double in the specifications including the country dummies, (4) and (6). This evidence is suggestive that there is multicollinearity among the country dummies. To control for this possibility, I compute the Variance Inflation Factor (VIF) of the variables entering specification (2) and (4)[13]. The VIF shows for each variable how much its variance is inflated by multicollinearity: as long as the VIF is less than 10 there is no need to worry about the growing standard errors. Although it is possible to compute the VIF only for the OLS estimations, the results clearly show that when adding the country dummies the average VIF raises sharply from 1.15 to more than 7. Standard errors, however, take overall reasonable values; thus the pattern discovered above, although calling for caution, does not weaken the main results.

Finally, it is important to point out that while this analysis is suggestive of a causal relation running from FoC to Satisfaction, it is by no means evidence for it. The empirical intuition in favour of causality comes from the robustness of the estimates through the different specification (3)-(6). The preliminary evidence on a positive and significant effect of FoC on Satisfaction comes from the baseline regression, which does not control for any unobservable effect. Adding the fixed effects does not affect the estimates of the coefficient, which keep having the same sign and significance. To further test the robustness of this result, for each model specification I run a pooled OLS estimation, a multinomial probit and a multinomial probit that accounts for the survey-nature of data. While the results again remain unchanged, the causality interpretation again remains only a possibility. Reverse causality from Satisfaction to FoC is an objection difficult to counter at this stage, and I cannot rule out the hypothesis of an external, unaccounted variable that drives both dependent and independent variables. Yet, if one accepts these caveats, the results support the notion that FoC matters for well being, suggesting that further research in this area may be worth pursuing.

CONCLUSIONS

This paper assesses the importance of the relationship between freedom of choice and individual satisfaction, as a measure of well being. I investigate the hypothesis that Freedom of Choice has a positive impact on satisfaction, as it is implied by theoretical studies in the Social Choice literature. The results show that freedom indeed correlates positively with satisfaction, although given the few caveats discussed above. What the results do not show is the direction of causality in the relationship under study, which remains an open issue for future research.

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[13] VIF is the reciprocal of the tolerance of a variable, which is the proportion of the variance for the variable in question that is not due to other explanatory variables: a tolerance close to 0 indicates risk of multicollinearity.

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