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Income, aspirations and subjective well-being: International evidence☆

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ABSTRACT

Previous micro-level results from cross-sectional data from individual countries suggest that well-being brought about by higher income are at least partly offset by higher income aspirations. We conduct an encompassing analysis, covering about 30 countries at different stages of economic development. We use micro-data on Europeans' subjective well-being, income and aspirations from the year 2013 and panel data on income and aspirations. Earlier findings on the negative association of aspirations and well-being are shown to hold internationally. As suggested by the earlier results from individual countries, aspirations matter systematically more in high-income countries. These results are robust to alternative well-being measures. However, the results also suggest that, despite aspirations, higher income improves life satisfaction even in high-income countries where aspirations totally offset emotional well-being and eudaimonia improvements. Further, the panel analysis shows that aspirations increase with incomes. Taken together, our results suggest that aspirations dampen income-induced well-being improvements, especially in high-income countries.

1. Introduction

At least since (Easterlin, 1974), rising consumption norms, or material aspirations, have been considered as a possible explanation for rising incomes' failure to improve subjective well-being (SWB). In a later paper, Easterlin (2001) documents negative correlations in the United States between falling short of getting goods one thinks are part of a good life and her subjective well-being. Yet, direct empirical evidence on how income aspirations affect subjective well-being, and how this effect compares to the effect of income, is limited. To our knowledge, Stutzer (2004), using Swiss data, and Knight and Gunatilaka (2012), using data from rural China, are the only studies on the topic. These two studies also provide results of an important related phenomenon of how income affects aspirations. There has also been growing interest in aspirations among development economists whose focus is on the incentive effects of aspirations but whose theorising about the utility effects and determination of aspirations is similar to that of well-being researchers (Genicot and Ray, 2020).

Rarity of aspirations data has hindered researchers from studying these questions. We utilise an international data set which includes information on subjective well-being, income and income aspirations. The European Union Statistics on Income and Living Conditions (EU-SILC) is a data set which includes information on income aspirations over many years because one of the standard questions in the EU-SILC survey concerns minimum income needs (a measure of aspirations in earlier studies as well). In 2013, an ad-hoc module containing questions related to well-being was included in EU-SILC. Combining the 2013 information on subjective well-being with income and income aspirations information, we are able to expand on the earlier analyses by including about 30 countries. The panel nature of the income and income aspirations data allows us to control for individual and year fixed effects in modelling aspirations as a function of income.

In line with earlier findings, our results suggest that higher income aspirations are associated with lower well-being, controlling for actual income. However, there is marked heterogeneity across countries when it comes to the negative effect of aspirations offsetting the positive effect of income. We find that the two effects tend to be more similar in absolute magnitude in high-income countries whereas aspirations matter less as compared to income in low-income countries. Thus, Stutzer (2004) and Knight and Gunatilaka (2012) results that aspirations and income have similar-sized effects in Switzerland but not in rural China seem to be representative of a more general phenomenon. Namely, it is (by far) income relative to income aspirations that is associated with well-being in high-income countries whereas in low-income countries, higher aspirations do not offset the benefits of higher incomes. The results are robust to using three different measures of subjective well-being: life satisfaction, emotional well-being and eudaimonia. Some differences between the three well-being measures can be observed, however. Offsetting of income's effect by aspirations' effect in high-income countries appears not to be as predominant in the case of life satisfaction as it is for the other two well-being measures. This result is in line with that of Kahneman and Deaton (2010) who find that high-income buys life satisfaction but not emotional well-being in the United States. It can be conjectured that the differential effect of aspirations on different aspects of well-being is behind their finding.

Our results on how aspirations are associated with incomes suggest that an increase in average income in a country of 1% is followed by roughly a 0.5% increase in aspirations, on average. In the long run, the relative increase in aspirations may be close to or equal to the relative increase in average income. On average, an increase in others' average income is estimated to be associated with a much larger increase in aspirations than an increase in one's own income. Therefore, relative concerns seem to be important, though measurement error in own income may explain this finding to some extent. Taken together, our results indicate that income aspirations reduce higher income's potential to improve subjective well-being, especially in high-income countries.

2. Measures of well-being and data

Our SWB data come from the EU-SILC 2013 well-being module. The module data allows us to measure three distinct dimensions of well-being: life evaluation, emotional well-being and eudaimonia. Kahneman and Deaton (2010) argue that the two former aspects of well-being are determined differently by life circumstances. Importantly from the perspective of this study, they find that having high income is associated with high life evaluation but not high emotional well-being. A recent paper by Clark and Lee (2021) includes a review of well-being measures and suggests that eudaimonia might be a dimension of well-being not well captured by the other well-being measures. We therefore find it worthwhile to separately estimate the association of income and income aspirations on the three aspects of well-being. Further, using three alternative well-being measures allows us to assess the robustness of the results. The 2013 well-being, income and income aspirations data as well as a rich set of control variables are available for almost 320,000 individuals in 31 European countries.

As is common in the literature, our measure of life evaluation is the answer to the question about respondent's satisfaction with life:

'Overall, how satisfied are you with your life nowadays? Where nought is not at all satisfied and 10 is completely satisfied.'

The measure of emotional well-being is constructed based on five questions that measure the frequencies of experiencing different emotional states.[1] We code the two most positive answering categories as one and the remaining categories as zero.[2] The emotional well-being variable is obtained by calculating the average of the resulting five dummy variables. As compared to the emotional well-being measure in much-cited paper by Kahneman and Deaton (2010), our measure is similar in that it captures the prevalence of positive and negative emotions. The main difference is caused by the fact that Kahneman and Deaton (2010) measure concerns respondent's emotions yesterday.

The eudaimonia variable is the answer to the question:

'Overall, to what extent do you feel the things you do in your life are worthwhile? Where nought is not at all worthwhile and 10 is completely worthwhile.'

Before its use in the 2013 EU-SILC, this question was specifically designed to measure eudaimonia and appeared in the 2011 Annual Population Survey of the United Kingdom (Hicks et al., 2013).

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[1] The five emotional states are *'Being very nervous'*, *'Feeling down in the dumps'*, *'Feeling calm and peaceful'*, *'Feeling downhearted or depressed'*, and *'Being happy'*.

[2] The two most positive answering categories are *'all of the time'* and *'most of the time'* for positive emotions and *'none of the time'* and *'a little of the time'* for negative emotions, respectively.

The other key variables are the total disposable household income and income aspirations. The former variable is directly available in EU-SILC either as a survey response or taken from national registers, depending on the country.

As the latter variable we use the answer to the question:

'In your opinion, what is the very lowest net monthly income that your household would have to have in order to make ends meet, that is to pay its usual necessary expenses? Please answer in relation to the present circumstances of your household, and what you consider to be usual necessary expenses (to make ends meet).'

This is a 'minimum income question' and it belongs to the class of 'income evaluation questions' that the so-called Leyden School (an early contribution is van Praag, 1971) have long used to study poverty. Answers to a minimum income question have been used to measure income aspirations in the earlier papers similar to ours (Stutzer, 2004; Knight and Gunatilaka, 2012). Stutzer (2004) conducts his analyses using also answers to a question about income considered as 'sufficient' and the results are fairly similar. Other income evaluation questions besides the minimum income question are not available in EU-SILC, but Stutzer (2004) results suggest that minimum income measures aspirations reasonably well as compared to sufficient income. A benefit of using minimum income as the measure of aspirations is that it plays a central role in the subjective-poverty literature, as Knight and Gunatilaka (2012) mention. In a cross-section of households, reported minimum income is an increasing function of household's income, and the so-called subjective poverty line is defined as the income at which the value of that function equals the actual income. Therefore, studies such as ours produce information about whether minimum income reports' dispersion across households is relevant for well-being (or just noise). Moreover, we produce results on how minimum incomes change over time as households' incomes and the national income change.

The well-being information is only available in the 2013 module which means that, as in the earlier studies, only cross-sectional analysis of well-being determination is permitted. However, the EU-SILC longitudinal data file includes income and income aspirations information and, therefore, we can control for individual and year fixed effects, in addition to other control variables, when studying how aspirations depend on household's own income and the average income in their country. Earliest observations in our longitudinal sample are from the year 2003 and the last year of the sample is 2015. Because minimum income is the key variable in both the well-being analyses and the aspirations analyses, we carefully examined the distribution of this variable by country and year. There were some inconsistencies that led us to drop some observations. We were left with about 3.7 million observations from 29 countries for aspirations analyses.[3]

Table 1 describes our 2013 cross-sectional sample used for well-being analyses by presenting the summary statistics of the dependent variables and regressors.[4] The most striking feature of the EU-SILC data is the coverage of wide range of countries at different stages of economic development. This variety manifests itself in the large variation in our key variables, namely income and minimum income needed. Large between-country variation in the economic variables calls for modelling heterogeneous relationships between well-being, income, and income aspirations. We will next present our model of subjective well-being and the results from estimating it for the cross-sectional sample, also allowing for cross-country heterogeneity in the key associations.

3. Modelling subjective well-being

3.1. Theoretical framework and empirical model

When it comes to how utility depends on income and income aspirations, early aspiration-level theories and the adaptation-level theory posit that utility is determined by the difference between the actual income and the reference level of income (aspirations or adaptation level).[5] We will call that reference level 'aspirations' from here on. Thus, we can write a simple model of utility:

$$u = \beta(lny - lnR) + \epsilon, \tag{1}$$

where u is the (unobserved) level of utility, y is the level of income, R is the (unobserved) aspirations level of income, respectively. ϵ denotes other circumstances that affect utility (possibly including a constant). In line with theory, β is assumed to be positive, meaning that the larger one's income's deviation from her aspirations, the larger is utility.[6]

In the emerging economic literature on aspirations, recently reviewed by Genicot and Ray (2020), income and aspirations influence utility in a more flexible way than in the early theories. More specifically, people derive utility both from the difference between income and aspirations and from income itself. This assumption leads us to a more general model, the

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[3] We dropped the following: Italy in 2004 because the minimum income variable was right-censored at 6000 euros a month that year. About 4500 unreasonably small values (as compared to both the actual incomes of those respondents and the country-year specific distribution) of minimum income in Bulgaria (2011), Hungary (2007), and Romania (2012–2015). Slovakia altogether because minimum income was reported in the old currency for some respondents and in euros for others in multiple years (such inconsistencies are also reported by Mysíková et al., 2019). 8750 missing observations of minimum income coded as very large values in Denmark (2010, 2011) and Norway (2007–2009, 2012–2015). More detailed information on the observed anomalies is available upon request.

[4] More information on the distributions of the key variables in the sample countries is available in the Online appendix.

[5] Stutzer (2004) and Genicot and Ray (2020) survey the early reference-dependence and aspirations theories. The key works on the adaptation-level theory are Helson (1964) and Frederick and Loewenstein (1999).

[6] Of course, any positive monotonic transformation (and no transformation) of the variables would be consistent with the theory. By taking logarithms, we impose the usual assumption of concavity in income and also in the difference between income and aspirations.

Table 1
Descriptive statistics: cross-section sample.

Variable		Mean	St. Dev.	25%	Median	75%
Life satisfaction		6.96	2.11	6	7	8
Eudaimonia		7.50	1.89	7	8	9
Emotional well-being		0.63	0.35	0	1	1
Income (€)		2514	2773	802	1741	3389
Minimum income (€)		1743	2008	795	1494	2298
Female		0.55	0.50	0	1	1
Age (0 if > 79)		46.59	19.24	34	48	62
Dummy: Age > 79		0.05	0.22	0	0	0
Education	Pre-primary	0.01	0.09	0	0	0
	Primary	0.11	0.32	0	0	0
	Lower secondary	0.19	0.39	0	0	0
	Upper secondary	0.41	0.49	0	0	1
	Post-secondary non-tertiary	0.04	0.19	0	0	0
	1st / 2nd stage of tertiary	0.25	0.43	0	0	0
General health	Very good	0.21	0.41	0	0	0
	Good	0.43	0.49	0	0	1
	Fair	0.25	0.43	0	0	1
	Bad	0.09	0.29	0	0	0
	Very bad	0.02	0.14	0	0	0
Country of birth	EU	0.03	0.17	0	0	0
	Local	0.89	0.32	1	1	1
	Other	0.08	0.28	0	0	0
Employment	Working full time	0.40	0.49	0	0	1
	Working part time	0.08	0.27	0	0	0
	Unemployed	0.08	0.26	0	0	0
	Pupil/student/training	0.06	0.23	0	0	0
	Retired	0.27	0.45	0	0	1
	Disabled	0.03	0.16	0	0	0
	Military, community service	0.00	0.03	0	0	0
	Fulfilling domestic tasks	0.07	0.26	0	0	0
	Other inactive	0.02	0.12	0	0	0
Marital status	Never married	0.25	0.43	0	0	0
	Married	0.57	0.50	0	1	1
	Separated	0.01	0.12	0	0	0
	Widowed	0.09	0.29	0	0	0
	Divorced	0.07	0.26	0	0	0
Household type	Single male, age<65	0.04	0.21	0	0	0
	Single female, age<65	0.04	0.21	0	0	0
	Single male, age>64	0.02	0.14	0	0	0
	Single female, age>64	0.06	0.23	0	0	0
	2 adults, age<65	0.15	0.36	0	0	0
	2 adults, age>64	0.16	0.37	0	0	0
	>2 adults	0.13	0.34	0	0	0
	Single, children	0.03	0.17	0	0	0
	2 adults, 1 child	0.10	0.30	0	0	0
	2 adults, 2 children	0.11	0.31	0	0	0
	2 adults, >2 children	0.04	0.20	0	0	0
	>2 adults, children	0.10	0.30	0	0	0
	Other	0.00	0.05	0	0	0
No. of adults in the household		2.31	1.04	2	2	3
No. of children in the household		0.53	0.91	0	0	1

N=318,980. Life satisfaction, eudaimonia measured on a 0–10 scale. Emotional well-being is the average of 5 dummies indicating frequent positive / non-frequent negative emotions. Income is the monthly disposable income, and minimum income is the lowest monthly income to make ends meet.

empirical counterpart of which is estimated in the earlier studies of SWB and aspirations:

$$u = \beta_y lny - \beta_R lnR + \epsilon \iff u = \beta_R(lny - lnR) + (\beta_y - \beta_R)lny + \epsilon. \tag{2}$$

In the case of $\beta_R > 0$, the model is consistent with the key assumptions about utility function made by the recent theoretical papers on income or wealth and aspirations (Dalton et al., 2016; Ray, 2016; Besley, 2017; Genicot and Ray, 2017). First, the marginal utility of aspirations is negative. Second, at a given income level, utility is higher the higher above the income level is as compared to the aspiration level. The model also implies a correspondent disappointment effect when aspirations are not met (see e.g. Genicot and Ray, 2020). Based on theory and earlier empirical results, both β_y and β_R can

be hypothesised to be positive.[7] An interesting further hypothesis is that β_R is (at least) as large as β_y, in which case the model is consistent with the earlier adaptation-level and aspiration-level theories and the effect of aspirations completely offsets the effect of income. Eq. (2) cannot, of course, be estimated as such because both u and R are unobservable. To make the equation estimable, the empirical data on minimum income can be thought of as being informative of R. Life satisfaction and emotional well-being variables such as those described in Section 2 can be, and routinely are, argued to measure utility whereas the eudaimonia variable measures a completely different dimension of well-being.

The concept of eudaimonia and hypotheses on how aspirations affect it are based on Aristotle's philosophy and later work by philosophers and psychologists. According to Ryan et al. (2008), eudaimonia is enhanced by engagement in activities that are in themselves virtuous, good, meaningful or purposeful. Intrinsic aspirations, rather than extrinsic aspirations such as income aspirations, lead one to engage in such activities. High income aspirations can thus be hypothesised to be bad for eudaimonia because they lead one to focus on wrong kind of activities at the expense of eudaimonia-enhancing ones. However, in the light of the discussion in Schwartz and Wrzesniewski (2016), even purely extrinsically motivated activities can foster eudaimonia, for instance by being meaningful. Therefore, the sign of the link between income aspirations and eudaimonia is ultimately an empirical question.[8]

Including control variables, we can now write our regression model for individual i living in country c in year t:

$$SWB_{ict} = \beta_y ln y_{ict-1} - \beta_R ln A_{ict} + \delta_c + \psi X_{ict} + e_{ict}, \tag{3}$$

where SWB_{ict} is subjective well-being, A_{ict} is the minimum income, and X_{ict} is a vector of control variables, respectively. We also include country fixed effects (δ_c) to control for country-level factors, most importantly country-specific price levels. Finally, e_{ict} is the error term. Model (3) is essentially the same regression model as the one estimated by Stutzer (2004) and Knight and Gunatilaka (2012). We use previous-year rather than current-year disposable income to measure income because the cross-sectional data set only has this information. However, previous-year income is actually also the better choice because interviews are conducted throughout the survey year and previous-year income is thus fully realised at the time of the survey whereas current-year income is not. Our set of control variables include age, age squared, an indicator for being older than 79 (exact age above 79 is not recorded), education (6 categories), gender, self-assessed general health (5 categories), area of birth (country of residence / another EU country / a country outside EU), employment status (9 categories), marital status (5 categories), household type (13 categories), the number of adults (older than 17) in the household, and the number of children (younger than 18) in the household. The latter variables related to marital status and household type and composition measure overlapping characteristics of households which makes their estimated coefficients hard to interpret.[9] On the other hand, we want to control for such factors extensively because they are likely to be associated with income, income needs and subjective well-being.

3.2. Results

The results from estimating model (3) for the three SWB variables are reported in Table 2. The coefficient of disposable monthly income is positive and statistically significant at the 1% level in all of the models. As expected based on theory and the earlier papers, the coefficient of the aspirations variable is negative (and statistically significant at the 1% level) in all of the models. However, the coefficient of the aspirations variable is not nearly as large as the coefficient of the income variable. Rather, the coefficient of aspirations is about one-sixth of the coefficient of income in the case of the life-satisfaction model, one-seventh in the case of the eudaimonia model, and two-fifths in the case of the emotional well-being model. It thus seems that the relative magnitude of the effect of income aspirations on SWB in Europe as a whole is closer to what Knight and Gunatilaka (2012) find for rural China than to what Stutzer (2004) finds for Switzerland. However, as we will see, the small coefficient of aspirations masks considerable cross-country heterogeneity.

To examine cross-country heterogeneity suggested by the results of the earlier papers, we re-estimate the model (3) and allow for country-specific coefficients of the income variable and the aspirations variable. The results are presented in Table 3.[10] When it comes to the difference between the absolute values of the coefficients of income and aspirations, Knight and Gunatilaka (2012) propose a pattern based on their and Stutzer's (2004) results. They hypothesise that the two coefficients are more similar in magnitude in rich countries than in poor ones because fulfilment of aspirations is

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[7] A somewhat related literature on the well-being consequences of materialism also suggests that higher income aspirations, to the extent they measure materialism, lead to lower well-being. That literature is reviewed in the recent article by Schalembier et al. (2020).

[8] Correlations recently presented by Mackenzie et al. (2018) point to a negative link.

[9] Despite the overlap, variance inflation factors suggest that these variables do not cause multicollinearity problems.

[10] Cross-country differences in data quality can be a cause of some differences in the coefficient of income. Namely, the income data come from registers in some countries and surveys in others, the latter being a source of a larger measurement error (and, thus, a larger attenuation bias). Should this be behind the results, we would see larger coefficients of income (as such or as compared to the coefficients of aspirations) for the register countries. We looked into this and found no systematic differences between the register and survey countries. The aspirations data come from surveys in all countries, and are therefore arguably subject to similar errors (instead of systematically larger errors in low-income countries). Another potential measurement issue might be caused by income from informal economic activity being excluded from the income variable but reflected in the aspirations variable. This would cause the coefficient of aspirations to partly capture the effect of income on SWB and, thus, be upward biased. We explored this issue by regressing the coefficient of aspirations on the share of shadow economy taken from Medina and Schneider (2018). No relationship was found, suggesting no bias due to informal activity.

Table 2
Determinants of well-being.

	Satisfaction		Emotional WB		Eudaimonia	
	(1)		(2)		(3)	
Income (ln)	0.49***	(0.01)	0.05***	(0.00)	0.27***	(0.01)
Minimum income (ln)	−0.08***	(0.01)	−0.02***	(0.00)	−0.04***	(0.01)
Female	0.12***	(0.01)	−0.03***	(0.00)	0.19***	(0.01)
Age	−0.07***	(0.00)	−0.01***	(0.00)	−0.02***	(0.00)
Age squared/1000	0.69***	(0.02)	0.09***	(0.00)	0.24***	(0.02)
Dummy: Age>79	−0.89***	(0.04)	−0.04***	(0.01)	−0.11**	(0.04)
Education (ref. = Pre-primary)						
Primary	0.08*	(0.04)	−0.03***	(0.01)	0.17***	(0.04)
Lower secondary	0.18***	(0.04)	−0.02**	(0.01)	0.28***	(0.04)
Upper secondary	0.28***	(0.04)	0.01	(0.01)	0.37***	(0.04)
Post-secondary non-tertiary	0.30***	(0.05)	0.01	(0.01)	0.40***	(0.05)
1st or 2nd stage of tertiary	0.41***	(0.04)	0.02***	(0.01)	0.46***	(0.04)
General health (ref. = Bad)						
Very good	2.12***	(0.02)	0.37***	(0.00)	1.49***	(0.02)
Good	1.60***	(0.01)	0.29***	(0.00)	1.10***	(0.01)
Fair	0.93***	(0.01)	0.15***	(0.00)	0.70***	(0.01)
Very bad	−0.95***	(0.03)	−0.11***	(0.00)	−0.78***	(0.04)
Country of birth (ref. = Other)						
EU	0.11***	(0.02)	0.01***	(0.00)	0.06**	(0.02)
Local	0.17***	(0.02)	0.03***	(0.00)	0.10***	(0.02)
Employment (ref. = Military, community service)						
Working full time	−0.31***	(0.10)	0.01	(0.02)	0.18	(0.12)
Working part time	−0.41***	(0.10)	0.01	(0.02)	0.15	(0.12)
Unemployed	−1.22***	(0.10)	−0.10***	(0.02)	−0.47***	(0.12)
Pupil/student/training	−0.06	(0.10)	0.04**	(0.02)	0.47***	(0.12)
Retired	−0.31***	(0.10)	0.04**	(0.02)	0.16	(0.12)
Disabled	−0.66***	(0.10)	−0.02	(0.02)	−0.23*	(0.12)
Fulfilling domestic tasks	−0.36***	(0.10)	0.02	(0.02)	0.10	(0.12)
Other inactive	−0.60***	(0.10)	−0.00	(0.02)	−0.01	(0.12)
Marital status (ref. = Separated)						
Never married	0.23***	(0.03)	0.04***	(0.01)	0.00	(0.03)
Married	0.56***	(0.03)	0.07***	(0.01)	0.33***	(0.03)
Widowed	0.10***	(0.03)	0.02***	(0.01)	0.04	(0.03)
Divorced	0.16***	(0.03)	0.03***	(0.01)	0.08***	(0.03)
Household type (ref. = Single male, age>64)						
Single male, age<65	−0.18***	(0.03)	−0.02***	(0.01)	−0.07**	(0.03)
Single female, age<65	−0.13***	(0.03)	−0.02***	(0.01)	0.04	(0.03)
Single female, age>64	0.09***	(0.03)	−0.00	(0.00)	0.07**	(0.03)
2 adults, age<65	−0.09***	(0.03)	−0.01***	(0.01)	0.04	(0.03)
2 adults, age>64	−0.09***	(0.03)	−0.02***	(0.00)	0.06**	(0.03)
>2 adults	−0.30***	(0.03)	−0.05***	(0.01)	−0.04	(0.03)
Single, children	−0.38***	(0.03)	−0.06***	(0.01)	0.09***	(0.04)
2 adults, 1 child	−0.11***	(0.03)	−0.03***	(0.01)	0.09***	(0.03)
2 adults, 2 children	−0.07**	(0.03)	−0.03***	(0.01)	0.09***	(0.04)
2 adults, >2 children	−0.07	(0.04)	−0.04***	(0.01)	0.12***	(0.04)
>2 adults, children	−0.21***	(0.04)	−0.04***	(0.01)	0.06*	(0.04)
Other	−0.27***	(0.07)	−0.07***	(0.01)	0.03	(0.07)
No. of adults	−0.09***	(0.01)	−0.00	(0.00)	−0.06***	(0.01)
No. of children	−0.04***	(0.01)	−0.00	(0.00)	0.01	(0.01)

N=318,980. Country dummies included. Robust standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

more essential in rich countries whereas people in poor countries focus on fulfilment of basic needs. To the extent that aspirations reflect others' income, the results of Caporale et al. (2009) support this claim. They find that, unlike in the rest of Europe, others' income does not have a negative effect on well-being in the relatively poor Eastern European countries. We test this hypothesis but also examine whether some other country characteristics are linked to the heterogeneity. The roles of inequality and culture have been emphasised in the aspirations literature (Genicot and Ray, 2020). Inequality may well affect the salience of aspirations and, thus, their offsetting role. Similarly, cultural traits in a society may be related to the relative importance of fulfilment of aspirations. For example, a more materialistic culture might make well-being more strongly dependent on income relative to norms such as aspirations Schalembier et al. (2020).

We calculate the sum of income's coefficient and aspirations' coefficient for each country. The larger the sum, the less of the effect of income is offset by the effect of aspirations. Table 4 presents results from bivariate regressions of this measure on various country characteristics. Because the dependent variables are estimates, we estimate the models by FGLS

Table 3
Income and aspirations as determinants of well-being by country.

		Satisfaction		Emotional WB		Eudaimonia	
		(1)		(2)		(3)	
Austria	Income (ln)	0.29***	(0.03)	0.03***	(0.00)	0.13***	(0.03)
	Minimum income (ln)	0.05	(0.04)	0.01	(0.01)	0.10**	(0.04)
Belgium	Income (ln)	0.39***	(0.03)	0.09***	(0.01)	0.30***	(0.04)
	Minimum income (ln)	−0.14***	(0.04)	−0.09***	(0.01)	−0.17***	(0.05)
Bulgaria	Income (ln)	0.98***	(0.04)	0.09***	(0.01)	0.77***	(0.05)
	Minimum income (ln)	−0.29***	(0.06)	−0.03***	(0.01)	−0.17***	(0.07)
Cyprus	Income (ln)	0.67***	(0.05)	0.07***	(0.01)	0.33***	(0.04)
	Minimum income (ln)	−0.37***	(0.07)	−0.07***	(0.01)	−0.03	(0.05)
Croatia	Income (ln)	0.59***	(0.06)	0.07***	(0.01)	0.46***	(0.05)
	Minimum income (ln)	−0.08	(0.08)	−0.03***	(0.01)	−0.14*	(0.08)
Czech	Income (ln)	0.68***	(0.05)	0.08***	(0.01)	0.53***	(0.04)
	Minimum income (ln)	−0.32***	(0.06)	−0.05***	(0.01)	−0.30***	(0.06)
Denmark	Income (ln)	0.44***	(0.05)	0.05***	(0.01)	0.15***	(0.05)
	Minimum income (ln)	−0.30***	(0.05)	−0.02**	(0.01)	−0.12***	(0.04)
Estonia	Income (ln)	0.64***	(0.04)	0.05***	(0.01)	0.20***	(0.03)
	Minimum income (ln)	−0.17***	(0.04)	−0.00	(0.01)	0.22***	(0.04)
Finland	Income (ln)	0.29***	(0.03)	0.05***	(0.01)	0.05**	(0.02)
	Minimum income (ln)	−0.08***	(0.03)	−0.02***	(0.01)	−0.04	(0.03)
France	Income (ln)	0.59***	(0.03)	0.06***	(0.01)	0.14***	(0.03)
	Minimum income (ln)	−0.11***	(0.04)	−0.04***	(0.01)	−0.10**	(0.04)
Germany	Income (ln)	0.61***	(0.03)	0.06***	(0.01)	0.33***	(0.03)
	Minimum income (ln)	−0.13***	(0.04)	−0.04***	(0.01)	−0.14***	(0.04)
Greece	Income (ln)	0.39***	(0.03)	0.05***	(0.00)	0.33***	(0.03)
	Minimum income (ln)	−0.02	(0.05)	−0.06***	(0.01)	−0.08*	(0.05)
Hungary	Income (ln)	0.85***	(0.03)	0.08***	(0.01)	0.57***	(0.03)
	Minimum income (ln)	−0.19***	(0.04)	0.02**	(0.01)	−0.09**	(0.04)
Iceland	Income (ln)	0.45***	(0.06)	0.05***	(0.01)	0.07	(0.06)
	Minimum income (ln)	−0.25***	(0.07)	0.01	(0.01)	−0.16**	(0.07)
Ireland	Income (ln)	0.29***	(0.04)	0.04***	(0.01)	0.13***	(0.03)
	Minimum income (ln)	−0.37***	(0.05)	−0.04***	(0.01)	−0.24***	(0.04)
Italy	Income (ln)	0.47***	(0.02)	0.06***	(0.00)	0.32***	(0.02)
	Minimum income (ln)	−0.10***	(0.03)	−0.03***	(0.01)	−0.06**	(0.03)
Latvia	Income (ln)	0.54***	(0.03)	0.06***	(0.00)	0.33***	(0.03)
	Minimum income (ln)	0.01	(0.04)	−0.02***	(0.01)	0.14***	(0.04)
Lithuania	Income (ln)	0.48***	(0.04)	0.03***	(0.01)	0.42***	(0.03)
	Minimum income (ln)	−0.04	(0.05)	0.03***	(0.01)	0.02	(0.05)
Luxembourg	Income (ln)	0.56***	(0.05)	0.04***	(0.01)	0.08*	(0.04)
	Minimum income (ln)	−0.24***	(0.05)	−0.05***	(0.01)	−0.19***	(0.05)
Malta	Income (ln)	0.34***	(0.04)	0.03***	(0.01)	0.04	(0.03)
	Minimum income (ln)	0.06	(0.05)	−0.02***	(0.01)	0.19***	(0.04)
Netherlands	Income (ln)	0.37***	(0.03)	0.09***	(0.01)	0.03	(0.03)
	Minimum income (ln)	−0.18***	(0.04)	−0.02***	(0.01)	−0.11***	(0.04)
Norway	Income (ln)	0.40***	(0.05)	0.05***	(0.01)	0.22***	(0.05)
	Minimum income (ln)	−0.19***	(0.05)	−0.02***	(0.01)	−0.11**	(0.05)
Poland	Income (ln)	0.42***	(0.03)	0.04***	(0.00)	0.24***	(0.03)
	Minimum income (ln)	0.10***	(0.04)	−0.02***	(0.01)	0.07**	(0.04)
Portugal	Income (ln)	0.63***	(0.04)	0.07***	(0.01)	0.22***	(0.03)
	Minimum income (ln)	−0.12**	(0.05)	−0.01	(0.01)	−0.05	(0.04)
Romania	Income (ln)	0.41***	(0.02)	0.04***	(0.00)	0.32***	(0.02)
	Minimum income (ln)	0.01	(0.03)	−0.02***	(0.01)	−0.12***	(0.03)
Serbia	Income (ln)	0.73***	(0.03)	0.04***	(0.00)	0.45***	(0.03)
	Minimum income (ln)	0.09**	(0.04)	−0.00	(0.01)	−0.06	(0.05)
Slovenia	Income (ln)	0.62***	(0.04)	0.04***	(0.01)	0.31***	(0.04)
	Minimum income (ln)	−0.03	(0.05)	0.01	(0.01)	0.15***	(0.05)
Spain	Income (ln)	0.34***	(0.02)	0.04***	(0.00)	0.10***	(0.02)
	Minimum income (ln)	−0.00	(0.03)	−0.01**	(0.01)	0.01	(0.03)
Sweden	Income (ln)	0.32***	(0.04)	0.06***	(0.01)	0.17***	(0.05)
	Minimum income (ln)	−0.07	(0.05)	−0.01	(0.01)	−0.03	(0.06)
Switzerland	Income (ln)	0.30***	(0.03)	0.05***	(0.01)	0.07**	(0.03)
	Minimum income (ln)	−0.15***	(0.04)	−0.04***	(0.01)	−0.09**	(0.04)
United Kingdom	Income (ln)	0.46***	(0.03)	0.05***	(0.01)	0.22***	(0.03)
	Minimum income (ln)	−0.14***	(0.04)	−0.01**	(0.01)	−0.10***	(0.03)

N=318,980. Well-being regressed on income variables interacted with country dummies (control variables as in Table 2). Robust st. errors in parentheses. ***, **, * denote significance at the 1%, 5%, 10% levels, respectively.

Table 4

Univariate cross-country regressions of the SWB offsetting effect.

Macro variable	Satisfaction			Emotional Well-being			Eudaimonia		
	β	SE	R^2	β	SE	R^2	β	SE	R^2
Stage of development									
Mean income[a]	−0.011***	(0.002)	0.446	−0.001**	(0.000)	0.157	−0.012***	(0.002)	0.506
Mean income (ln)	−0.281***	(0.057)	0.455	−0.019*	(0.009)	0.123	−0.295***	(0.058)	0.473
Real GDP trend[b]	−0.008***	(0.002)	0.451	−0.001**	(0.000)	0.145	−0.009***	(0.001)	0.566
Real GDP trend (ln)	−0.329***	(0.051)	0.594	−0.019*	(0.010)	0.119	−0.340***	(0.052)	0.598
National culture									
Mean trust[c]	−0.125***	(0.028)	0.412	0.001	(0.005)	0.001	−0.099***	(0.032)	0.244
Mean trust (ln)	−0.753***	(0.164)	0.421	0.002	(0.028)	0.000	−0.593***	(0.192)	0.247
Mean materialism[d]	0.139	(0.100)	0.084	0.022*	(0.013)	0.129	0.278***	(0.094)	0.295
Mean materialism (ln)	0.395	(0.306)	0.074	0.064	(0.039)	0.114	0.839***	(0.285)	0.292
Inequality									
Gini coefficient[e]	0.024***	(0.007)	0.266	-3.6×10^{-4}	(0.001)	0.004	0.021**	(0.008)	0.206
Gini coefficient (ln)	0.675***	(0.217)	0.250	−0.014	(0.033)	0.006	0.611**	(0.232)	0.194

N=31. The SWB effect of a one unit rise in both ln(income) and ln(aspirations) from Table 3 regressed on a macro variable and a constant term using FGLS. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. [a] Mean disposable household income in 2020 EU-27 prices divided by 1000. Source: EU-SILC (income), Eurostat (prices), authors' calculations. [b] Trend component of real GDP per capita at Purchasing Power Parities in US dollars divided by 1000. Source: Penn World Table version 9.1, authors' calculations. [c] Mean of trust in others (measured on a scale from 0 to 10). Source: EU-SILC, authors' calculations. [d] Mean of individuals' evaluations of whether it is important for them to be rich and have expensive things (measured on a scale from 1 to 6). Note: Results for materialism variables are calculated using only 23 countries. Source: European Social Survey Round 6, authors' calculations. [e] Gini coefficient calculated using net income. Source: World Income Inequality Database (WIID).

as proposed by Lewis and Linzer (2005).[11] The real average disposable income and the trend component of per capita GDP are the alternative measures of the stage of economic development.[12] Inequality is measured by the Gini coefficient, and culture is characterised by measures of generalised trust and materialism.[13] To allow for nonlinearities, regressions on logarithmic transformations of the variables are also run.

The R-squared values in Table 4 suggest that the stage of economic development is the best predictor of offsetting: the effect of aspirations clearly offsets more of the effect of income in high-income countries. This result is robust across different SWB measures. Although the results also suggest that offsetting is more significant in societies characterised by income equality, trust in others and less materialism, these findings are less robust. We also ran multivariate models and only the results on the stage of economic development were robust to controlling for the other characteristics. It thus seems that the Swiss result by Stutzer (2004) and Chinese result by Knight and Gunatilaka (2012) are representative of a more general pattern in which aspirations are relatively more important for well-being in high-income countries whereas in low-income countries, actual income is more important.

Fig. 1 plots the sum of the two coefficients (and tests its statistical significance) in the countries against their stage of economic development as measured by the log of the trend component of per capita GDP. An interesting difference between the three aspects of well-being is highlighted. In line with Stutzer (2004) result of aspirations' coefficient being about 80% of the coefficient of income in the life satisfaction equation, we find that complete offsetting of income's effect by aspirations' effect on life satisfaction is rare even in the highest-income countries. But the results on the other two aspects of well-being suggest that this result is specific to life evaluation. Namely, aspirations seem to have more potential to hinder higher incomes from making positive emotions more and negative emotions less frequent (emotional well-being) and making things in life feel more worthwhile (eudaimonia). These results correspond to Kahneman and Deaton (2010) result that high incomes are associated with more positive life evaluation but not with higher emotional well-being in the United States. Our results on high-income countries suggest that adaptation through higher aspirations may be the mechanism behind their findings.

Let us next comment on the association of the control variables and the three aspects of well-being based on the results shown in Table 2. However, as we are not focused on the determinants of SWB in general, we will not go into details. We find that the relationship between age and all three aspects of well-being is U-shaped. Unlike life satisfaction, emotional well-being and especially eudaimonia are higher for older people than for the young. Eudaimonia starts to improve at the age of 35, emotional well-being at 39 and, roughly in line with many earlier studies, life satisfaction at 47, respectively. Higher education is generally associated with higher well-being, the only exception being that those (few) with just pre-

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[11] Because the sample sizes are large and, thus, uncertainty about the values of the dependent variables is small, the FGLS results are virtually the same as those obtained by OLS.

[12] Linear trend extraction from long-term (series begin in 1970 for many countries but later for some; all series end in 2017) GDP data is used for its simplicity, transparency and because it has been shown to make the most relevant distinction from the perspective of Europeans' well-being (Hovi and Laamanen, 2016). We also tried explaining offset by the estimated cycle component, but that did not yield statistically significant results.

[13] Notice here that the materialism variable is available only for 23 countries. We ran all regressions in Table 4 for this group of countries also and the conclusions did not change.
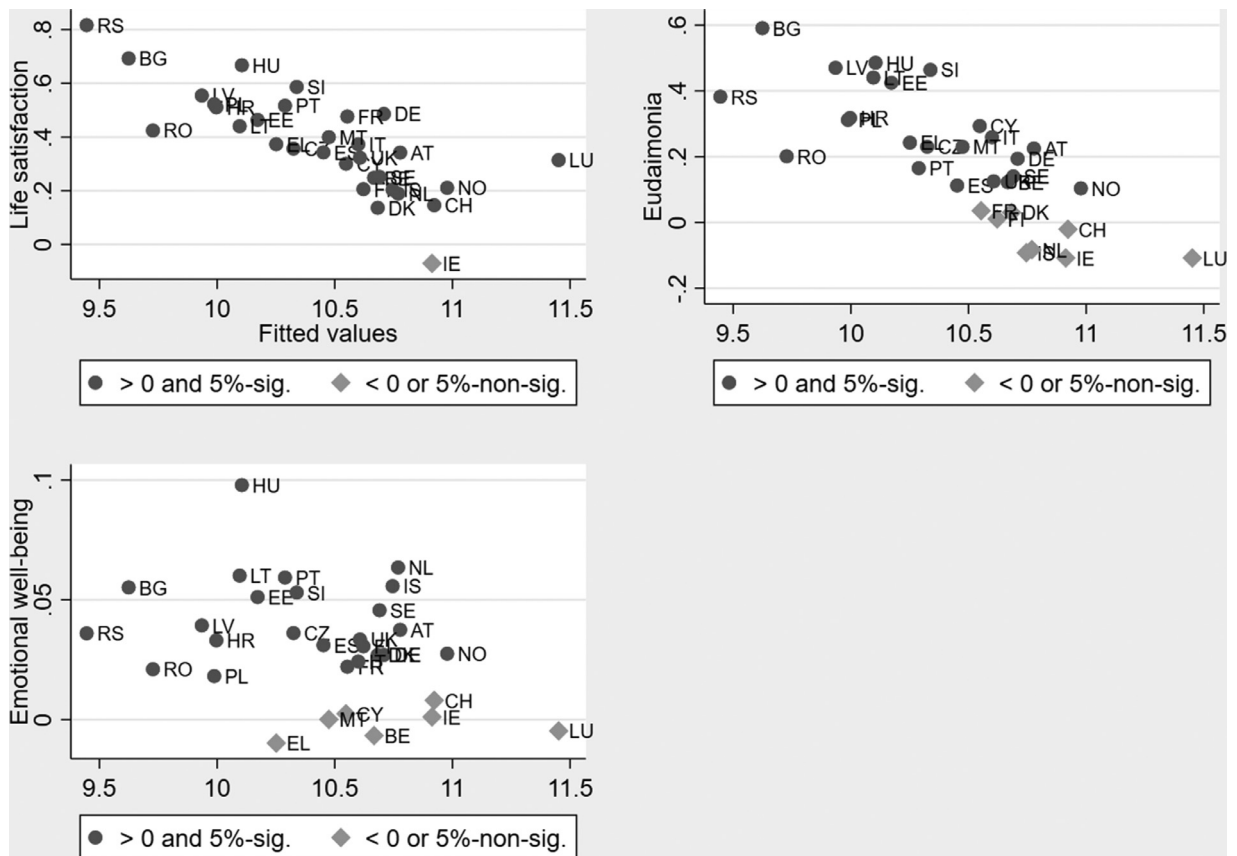
Fig. 1. Estimated life-satisfaction, eudaimonia, and emotional well-being effect of a one-unit rise in both ln(income) and ln(aspirations) by country's trend component of GDP per capita (logarithmic; PPP corrected 2011 US dollars; source: Penn World Tables, authors' calculations).

primary education have about the same level of emotional well-being as those with upper secondary education. Women are more satisfied with life and more eudaimonic than men but their emotional well-being is lower. Better self-assessed health is positively associated with all three aspects of well-being. All aspects of well-being are lower for immigrants, especially those from outside the EU. The overall picture when it comes to labour market status is that pupils, students and those in training score highest in all aspects of well-being whereas the unemployed score lowest. Those who work are relatively satisfied with life and have high eudaimonia, but being retired is better than working for emotional well-being.[14]

Before turning to estimations of how actual income and aspirations are associated, threats to identification of the causal effects of aspirations in the above analysis should be discussed. Because both the SWB variables and aspirations are survey responses, they might be correlated due to what is commonly known as common method bias. The most obvious source of common method bias is respondents' mood at the time of the survey. Although it is clear that more positive mood leads one to answer more positively to the SWB questions, it is unclear how mood impacts answers to the aspirations question. On one hand, more positive mood may be related to more optimistic assessments of one's ability to make ends meet and, thus, lower aspirations. On the other hand, positivity may make one feel more deserving of money and, therefore, report higher aspirations. Whatever the sing of the spurious correlation, it could also be caused, in a similar fashion, by differences in the personality traits of the respondents. Controlling for various individual and household characteristics may somewhat alleviate the latter bias but not the former. We also ran the models by leaving out all control variables (except the country dummies). The resulting coefficients on the aspirations variable were larger than those reported in Table 2. This indicates that leaving these controls out leads to a positive omitted variable bias. Unless the unobserved factors are, as a group, different in this respect, their exclusion does cause our coefficient estimates on aspiration to be biased upwards.

To assess the importance of the possible bias arising from time-of-the-survey mood differences, we re-estimated the life satisfaction model with alternative satisfaction variables available for the whole sample in EU-SILC. These analyses are based on the idea that mood should have a roughly equal effect on satisfaction to different things. The coefficient on the aspirations variable was larger (-0.29) for financial satisfaction than for life satisfaction (-0.08), which we think supports

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[14] Because of the obvious overlap between the control variables measuring household type and composition, we refrain from trying to interpret their coefficients. Notice that, for the same reason, caution should be exercised when interpreting the coefficients of e.g. gender and the old-age dummy.

the hypothesis that aspirations matter. The estimated effects on personal-relationship satisfaction and satisfaction of nearby recreational / green areas were smaller, yet statistically significant (-0.04 and -0.06, respectively). Although these effects may be attributed to a mood bias, there may be theoretical reasons for the effects. Higher income aspirations may harm personal relationships in the similar way we discussed they harm eudaimonia. Recreational/green-area satisfaction may be negatively linked to aspirations if people locate based not on income but on the income-aspirations gap. Interestingly, aspirations were not associated with how satisfied people are with the quality of their living environment (from the point-of-view of available services). This result suggests that there is no common method bias, although among multiple models, a single deviating result may be a coincidence. Finally, people with higher income aspirations were found to be more satisfied (+0.05) with their accommodation. Although possibly another coincidence, and more satisfying accommodation may be more expensive and, thus, cause higher income needs, this result is another one that does not support the idea of a large common method bias. Further, when it comes to endogeneity more generally, the observed cross-country heterogeneity, and especially its relation to the stage of economic development, indicates that a large part of the results on the effect of aspirations is not caused by an endogeneity bias because such bias would probably be similar across countries and not related to the stage of economic development.

Although the above checks do not suggest that our results on the effect of aspirations are caused by endogeneity, we would like to remind the reader that the results should be interpreted with caution. However, we think that it is safe to conclude that aspirations affect well-being negatively in Europe in the way the results from the earlier research suggest, although the effect may not be very large.

4. Modelling income aspirations

4.1. Theoretical framework and empirical model

Let us next turn to the analysis of how income aspirations are associated with actual incomes. It is worth noting that this link is an important one because, ultimately, higher income's ability to bring about well-being is dampened by aspirations only if aspirations rise as income rises. In turn, if aspirations are determined by things not correlated with incomes, higher income increases the difference between income and aspirations and, therefore, well-being. In a seminal well-being paper, Easterlin (1974) hypothesised that aspirations rise approximately in correspondence with national income but that aspirations within a society at a point in time are correlated with actual incomes but not as dispersed as them. The recent theories about aspirations emphasise that they are socially determined, and that economic development is an important determinant, although individual income and other factors matter as well (for a review, see Genicot and Ray, 2020). We will focus on the importance of individual and national income as determinants of aspirations. Individual adaptation to income and social comparisons have been proposed as explanations to the zero long-run relationship between economic growth and SWB, originally presented by Easterlin (1974). Clark et al. (2008) discuss how one's comparison income, or income aspirations, can be influenced by own income, causing adaptation to income, or by others' income, giving rise to social comparison effects. Therefore, we produce direct evidence on the mechanisms of the two phenomena. From the perspective of the aspirations literature, information of the determinants of aspirations is much needed because any impactful policy aimed at influencing people's aspirations is based on such information. Based on Genicot and Ray (2020) review of the literature, there is only little empirical knowledge of aspirations formation. As discussed above, the key hypothesis to be explored concerns the absolute and relative importance of own income and national income in aspirations formation. Some aspirations papers, such as Genicot and Ray (2017), stress the importance of social determination of aspirations. In our judgement, the most credible micro analysis on adaptation and social comparisons is Kaiser (2020). That paper challenges adaptation but finds strong evidence for social comparison effects, indirectly suggesting that aspirations are determined by the social environment rather than by individual outcomes.

Various earlier papers have modelled aspirations as a function of income either as the sole purpose of research (van Praag, 1971; van Praag and Kapteyn, 1973; van Praag et al., 1982; Frijters and van Praag, 1995)[15] or as a part of a study such as ours that examines the links between income, aspirations and SWB (Stutzer, 2004; Knight and Gunatilaka, 2012). Authors have measured aspirations either based on a minimum income question such as the one found in EU-SILC, or based on some other income evaluation question. The standard approach has been simply to regress an aspirations variable on an actual-income variable and a set of control variables. Stutzer (2004) has also included measures of the average income of residents of the same region to allow for aspirations being driven by interpersonal comparisons. Cross-sectional data are routinely used in the earlier studies and we are not aware of any analyses to have identified parameters from within-individual instead of between-individual variation. As EU-SILC is a panel data set, we are able to control for possible time-invariant characteristics of individuals linked to both income and aspirations (Stutzer, 2004 also mentions the possibility of such individual traits). For example, individuals' aspirations may be inherently different e.g. due to upbringing (Besley, 2017). A person whose aspirations are inherently higher may have permanently higher incomes because it is, and has been, optimal for her to put more effort into earning more. Such an incentive effect of aspirations is at the heart of the emerging aspirations literature reviewed by Genicot and Ray (2020). Our model of aspirations is similar to what earlier studies have

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[15] van Praag et al. (1999) also mention 1983 and 1988 contributions by van Praag and van Weeren.

estimated but adding individual and year fixed effets:

$$lnA_{ict} = \alpha_0 lny_{ict-1} + \alpha_1 ln\bar{y}_{ct-1} + \theta_i + \pi_t + \omega X_{ict} + v_{ict}, \tag{4}$$

where aspirations, income and control variables are the same as in the model (3) but excluding the time-invariant ones, $\bar{y}_{ct-1}$ is the previous-year average income of others (i.e. excluding one's own income) in country c, θ_i is an individual fixed effect and π_t is a year fixed effect, and v_{ict} is the error term, respectively.[16] We, again, use previous-year rather than current-year income for various reasons. First, previous-year income is fully realised at the time of the survey. Second, as Stutzer (2004) points out, current income may lead to (more severe) endogeneity.[17] Finally, the current-year income information is linked to the next year's sample in EU-SILC which means that using it would lead to losing observations of those respondents who leave the sample after the current year.[18] Summary information on our longitudinal sample is presented in Table 5.[19]

Although controlling for individual fixed effects goes some way in addressing endogeneity, a reverse-causality issue may remain. Namely, a change in aspirations in time may cause a change in income due to the aforementioned incentive effect. This would bias the coefficient estimate of own income. However, there are theoretical and empirical reasons for which the reverse-causality issue may be alleviated in the case of our analysis. First, the individual time series are quite short (2.7 years, on average). Arguably, whereas aspirations may rapidly and, thus, within the time frame of our data, adjust to income changes, it takes time for people to adjust their income as a reaction to changing aspirations. For example, it takes some time to increase savings, to get more education or even to increase working hours, and the income gains due to such changes do sometimes materialise with a substantial lag. Therefore, the short-run relationship estimable using our data is likely to reflect more the effects of income on aspirations than vice versa. Using previous-year rather than current income further supports this notion because incomes are very unlikely to change proactively. Second, own income's effect on aspirations is in all likelihood a positive one whereas aspirations may affect income either positively or negatively, depending on the size of the gap between the two, as is made clear by Genicot and Ray (2017). To the extent that the positive and negative effects cancel each other out, the reverse causality issue is alleviated. Third, we control for a set of variables that are likely to be linked to changes in both aspirations and income. Because the (average) sign of the reverse effect (from aspirations to income) is not known, the sign of the possible bias in the coefficient estimate on own income is not known. In the case of an average inspiring/frustrating (Genicot and Ray, 2020) effect of aspirations on income, the bias is upward/downward.

4.2. Results

Table 6 presents the results from estimating Eq. (4) with those data. A look at the results on the control variables reveals that income aspirations rise as one's health deteriorates and those who work have higher aspirations than those who do not. Younger age and a larger household seem to be associated with higher aspirations, though due to overlap between the measures, it is difficult to draw reliable conclusions based on individual coefficients. Turning to our key regressors, both own income and average income enter positively, as expected, and with p-values well below 1%. The coefficient of the own-income variable (0.081) is considerably smaller than what Stutzer (2004) has obtained for Switzerland (about 0.4) and also what Knight and Gunatilaka (2012) have obtained for rural China (about 0.2). There are at least two potential reasons for this. First is that we control for individual fixed effects, possibly leading us to better tackle certain type of endogeneity, as discussed above. Second, attenuation bias due to errors in income measurement might be large, and larger than in earlier studies, for some of our sample countries.[20]

Let us next discuss the result on others' income. The estimated coefficient is 0.410, which is more than twice the corresponding baseline estimate of 0.188 obtained by Stutzer (2004) for Switzerland.[21] It can be argued that, in addition to different geographical coverage of the data, the results may be different because of measurement issues: Stutzer (2004) average income data are from a much earlier year than his aspirations data. Our estimate for the coefficient of average income is also much larger than what we got for the coefficient of own income. This might be because average incomes (in general) may suffer less from measurement error than micro-level incomes. This is especially the case if errors are symmetrically distributed with the actual income as the mean because then the positive and negative errors cancel each other out and the average income variable is an unbiased measure of the actual average income. In this case, measurement issues cause our average-income variable's coefficient to capture much of the effect of own income as well. Another possible measurement issue is related to the dependent variable. As can be seen in Table 5, the standard deviation of minimum income is

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[16] The country-level average income is used because EU-SILC includes information on sub-national place-of-residence for some countries only. It should be noted that an advantage of calculating the others' income for large regions (such as countries) instead of smaller localities is that the risk of spillover effects from outside the region is smaller.

[17] In the case of a within-individual estimation, this would be the case should the simultaneous shocks to income and aspirations be correlated.

[18] The amount of data lost would be significant because the longitudinal EU-SILC is a rotating panel in many countries.

[19] More descriptive information on the key variables is available in the Online appendix.

[20] Notice also that a more accurate measure of income might in fact lead to larger errors in the measurement of the relevant income concept. Namely, people might put more emphasis on their permanent income items (such as salaries, pensions etc.) than to the temporary ones (such as capital gains) when thinking of their minimum income needs. In this case, more accurate measures might actually perform worse in measuring the income that determines aspirations.

[21] Knight and Gunatilaka (2012) do not include an average income variable.

Table 5
Descriptive statistics: longitudinal sample.

		Mean	St. Dev.	25%	Median	75%
Income (€)		2563	2821	845	1818	3517
Minimum income (€)		1858	36937	806	1493	2372
Average income (€)		2563	1553	989	2777	3579
Age (0 if >79)		44.56	19.37	31	46	60
Dummy: Age>79		0.05	0.21	0	0	0
Education	Pre-primary	0.02	0.12	0	0	0
	Primary	0.14	0.35	0	0	0
	Lower secondary	0.20	0.40	0	0	0
	Upper secondary	0.40	0.49	0	0	1
	Post-secondary non tertiary	0.03	0.18	0	0	0
	First or second stage of tertiary	0.20	0.40	0	0	0
General health	Very good	0.22	0.41	0	0	0
	Good	0.43	0.49	0	0	1
	Fair	0.24	0.43	0	0	0
	Bad	0.09	0.29	0	0	0
	Very bad	0.02	0.15	0	0	0
Employment	Working full time	0.42	0.49	0	0	1
	Working part time	0.07	0.25	0	0	0
	Unemployed	0.07	0.25	0	0	0
	Pupil/student/training	0.08	0.26	0	0	0
	Retired	0.25	0.43	0	0	0
	Disabled	0.03	0.17	0	0	0
	Military, community service	0.00	0.03	0	0	0
	Fulfilling domestic tasks	0.07	0.26	0	0	0
	Other inactive person	0.02	0.14	0	0	0
Marital status	Never married	0.28	0.45	0	0	1
	Married	0.56	0.50	0	1	1
	Separated	0.01	0.11	0	0	0
	Widowed	0.09	0.29	0	0	0
	Divorced	0.06	0.24	0	0	0
Household type	Single male, age<65	0.03	0.18	0	0	0
	Single female, age<65	0.03	0.18	0	0	0
	Single male, age>64	0.01	0.12	0	0	0
	Single female, age>64	0.05	0.21	0	0	0
	2 adults, age<65	0.14	0.34	0	0	0
	2 adults, age>64	0.14	0.35	0	0	0
	>2 adults	0.15	0.36	0	0	0
	Single person, children	0.03	0.16	0	0	0
	2 adults, one child	0.10	0.30	0	0	0
	2 adults, two children	0.12	0.32	0	0	0
	2 adults, >2 children	0.05	0.21	0	0	0
	>2 adults, children	0.13	0.34	0	0	0
	Other	0.02	0.14	0	0	0
No. of adults in the household		2.48	1.09	2	2	3
No. of children in the household		0.58	0.94	0	0	1
Year		2009.87	3.15	2007	2010	2013

N=3,675,814. Income is the real monthly disposable income of the household. Minimum income is the lowest monthly real income needed for the household to make ends meet. Average income is the mean of real household income in respondent's country-year cell (respondent's household income excluded).

suspiciously large, even after removal of observations described in Section 2. A closer look at the data reveals that this is due to some very large values in certain country-years. We tried excluding observations with minimum incomes that were larger than k times the median of minimum income in that country-year, with $k = 10, \ldots, 2$. At most, 8.3% of the observations were dropped. Dropping observations resulted in samples with more reasonable standard deviations of the minimum income variable, but the changes in the regression results were negligible.

Whereas cross-study comparisons of own income's coefficient on one hand, and average income's coefficient on the other might not be very fruitful for the above reasons, comparing the association between incomes of all (own plus average) and aspirations could make more sense. Our results predict that as log incomes of all in a country increase by 1 unit, aspirations increase by 0.081+0.410=0.491 units. Based on the tests in Table 6, that number is statistically significantly larger than zero but smaller than one. Stutzer (2004) results predict an increase of similar magnitude (0.591). It thus seems that as a country's income increases by 1%, aspirations increase by roughly 0.5%.

Our individual time-series are, on average, short (2.7 years). This means that the above results concern the short-run. It is possible that how aspirations absorb income changes may be different in the short-run and in the long-run. One way to make the short-run/long-run distinction would be to explain aspirations by the short-run and long-run components of the income variables. EU-SILC data do not permit reliably decomposing the household income variable to permanent and

Table 6

Determinants of minimum income.

	Minimum Income (ln)		$\alpha_0 + \alpha_1$		$(\alpha_0 + \alpha_1) - 1$	
	(1)		(2)		(3)	
Household income (ln) (α_0)	0.081***	(0.009)	0.491***	(0.077)	−0.509***	(0.077)
Average income (ln) (α_1)	0.410***	(0.078)				
Age	0.001	(0.005)				
Age squared/1000	−0.031	(0.025)				
Dummy: Age>79	−0.067	(0.300)				
Education (ref. = Pre-primary)						
Primary	−0.003	(0.005)				
Lower secondary	−0.003	(0.008)				
Upper secondary	−0.002	(0.009)				
Post-secondary non tertiary	0.001	(0.009)				
First or second stage of tertiary	−0.005	(0.010)				
General health (ref. = Bad)						
Very good	−0.009***	(0.003)				
Good	−0.006**	(0.003)				
Fair	−0.005**	(0.002)				
Very bad	0.009***	(0.002)				
Employment (ref. = Military, community service)						
Working full time	0.021	(0.023)				
Working part time	−0.002	(0.023)				
Unemployed	−0.030	(0.022)				
Pupil/student/training	−0.009	(0.026)				
Retired	−0.018	(0.022)				
Disabled	−0.018	(0.022)				
Fulfilling domestic tasks	−0.023	(0.022)				
Other inactive person	−0.019	(0.022)				
Marital status (ref. = Separated)						
Never married	0.014	(0.009)				
Married	0.049***	(0.009)				
Widowed	−0.037***	(0.011)				
Divorced	−0.004	(0.008)				
Household type (ref. = Single male, age>64)						
Single male, age<65	−0.006	(0.010)				
Single female, age<65	−0.056***	(0.009)				
Single female, age>64	−0.037***	(0.007)				
2 adults, age<65	0.104***	(0.010)				
2 adults, age>64	0.096***	(0.010)				
>2 adults	0.101***	(0.013)				
Single person, children	0.071***	(0.010)				
2 adults, one child	0.123***	(0.013)				
2 adults, two children	0.116***	(0.014)				
2 adults, >2 children	0.110***	(0.015)				
>2 adults, children	0.099***	(0.012)				
Other	−0.011	(0.012)				
No. of adults	0.080***	(0.006)				
No. of children	0.072***	(0.004)				

N=3,675,814. Individual and year fixed effects included. Country-clustered standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

transitory components. However, we can replace the average income variable with a GDP variable and decompose that variable to get measures of short-run fluctuations (business cycle) and long-run trend growth.[22] Re-estimating the model in Table 6 with the log of GDP per capita as the average income variable yields comparable results but the explanatory power of the model is slightly lower. Including the linear trend component and the business cycle component as separate variables reveals that there, indeed, is a difference between the estimated effects of the two components. The coefficient of the trend component is 0.90 and statistically significant whereas the coefficient of the cyclical component is 0.28 and not significant. We cannot reject the hypothesis that the effect of trend growth equals 1 and neither can we reject the hypothesis that the sum of the own-income coefficient (0.09) and that of trend growth equals 1. Therefore, assuming that the effect of own income on aspirations is not smaller in the long-run than it is in the short-run, these results indicate that increases of incomes of all are fully absorbed into income aspirations. Taken together, our results on the determinants of aspirations supports the hypothesis that income aspirations are largely socially determined. Individual incomes have a significant, yet much smaller, role.

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[22] It has been demonstrated in the GDP-SWB studies that regressing SWB on a linear trend growth component and a corresponding business cycle component yields correct results on the long-run relationship between the variables (Hovi and Laamanen, 2021).

Table 7

Income and average income as determinants of minimum income by country.

		Min. income (ln)		$\alpha_0 + \alpha_1$		$\alpha_0 + \alpha_1 - 1$	
		(1)		(2)		(3)	
Austria	Income (ln) (α_0)	0.084***	(0.002)	0.137	(0.205)	−0.863***	(0.205)
	Average income (ln) (α_1)	0.053	(0.206)				
Belgium	Income (ln) (α_0)	0.078***	(0.003)	0.177	(0.198)	−0.823***	(0.198)
	Average income (ln) (α_1)	0.099	(0.199)				
Bulgaria	Income (ln) (α_0)	0.099***	(0.002)	0.525***	(0.067)	−0.475***	(0.067)
	Average income (ln) (α_1)	0.426***	(0.067)				
Croatia	Income (ln) (α_0)	0.078***	(0.002)	0.150*	(0.084)	−0.850***	(0.084)
	Average income (ln) (α_1)	0.072	(0.083)				
Cyprus	Income (ln) (α_0)	0.144***	(0.003)	0.676***	(0.057)	−0.324***	(0.057)
	Average income (ln) (α_1)	0.532***	(0.057)				
Czech	Income (ln) (α_0)	0.109***	(0.004)	0.774***	(0.097)	−0.226**	(0.097)
	Average income (ln) (α_1)	0.665***	(0.097)				
Denmark	Income (ln) (α_0)	0.139***	(0.006)	0.254**	(0.106)	−0.746***	(0.106)
	Average income (ln) (α_1)	0.115	(0.105)				
Estonia	Income (ln) (α_0)	0.134***	(0.003)	0.368***	(0.054)	−0.632***	(0.054)
	Average income (ln) (α_1)	0.234***	(0.053)				
Finland	Income (ln) (α_0)	0.231***	(0.004)	0.066	(0.198)	−0.934***	(0.198)
	Average income (ln) (α_1)	−0.165	(0.197)				
France	Income (ln) (α_0)	0.133***	(0.004)	0.027	(0.163)	−0.973***	(0.163)
	Average income (ln) (α_1)	−0.106	(0.163)				
Greece	Income (ln) (α_0)	0.045***	(0.001)	0.268***	(0.070)	−0.732***	(0.070)
	Average income (ln) (α_1)	0.223***	(0.070)				
Hungary	Income (ln) (α_0)	0.125***	(0.003)	0.724***	(0.078)	−0.276***	(0.078)
	Average income (ln) (α_1)	0.598***	(0.078)				
Iceland	Income (ln) (α_0)	0.117***	(0.006)	0.898***	(0.023)	−0.102***	(0.023)
	Average income (ln) (α_1)	0.781***	(0.025)				
Ireland	Income (ln) (α_0)	0.028***	(0.002)	0.335*	(0.173)	−0.665***	(0.173)
	Average income (ln) (α_1)	0.307*	(0.173)				
Italy	Income (ln) (α_0)	0.041***	(0.002)	0.827***	(0.273)	−0.173	(0.273)
	Average income (ln) (α_1)	0.786***	(0.273)				
Latvia	Income (ln) (α_0)	0.119***	(0.002)	0.279***	(0.053)	−0.721***	(0.053)
	Average income (ln) (α_1)	0.160***	(0.053)				
Lithuania	Income (ln) (α_0)	0.058***	(0.002)	0.205***	(0.053)	−0.795***	(0.053)
	Average income (ln) (α_1)	0.147**	(0.053)				
Luxembourg	Income (ln) (α_0)	0.047***	(0.004)	−0.154	(0.310)	−1.154***	(0.310)
	Average income (ln) (α_1)	−0.201	(0.308)				
Malta	Income (ln) (α_0)	0.053***	(0.002)	−1.154***	(0.148)	−2.154***	(0.148)
	Average income (ln) (α_1)	−1.207***	(0.148)				
Netherlands	Income (ln) (α_0)	0.129***	(0.003)	0.077	(0.187)	−0.923***	(0.187)
	Average income (ln) (α_1)	−0.052	(0.186)				
Norway	Income (ln) (α_0)	0.175***	(0.006)	0.657***	(0.072)	−0.343***	(0.072)
	Average income (ln) (α_1)	0.482***	(0.070)				
Poland	Income (ln) (α_0)	0.092***	(0.002)	0.496***	(0.059)	−0.504***	(0.059)
	Average income (ln) (α_1)	0.404***	(0.059)				
Portugal	Income (ln) (α_0)	0.074***	(0.003)	1.185***	(0.144)	0.185	(0.144)
	Average income (ln) (α_1)	1.111***	(0.144)				
Romania	Income (ln) (α_0)	0.043***	(0.002)	0.829***	(0.087)	−0.171*	(0.087)
	Average income (ln) (α_1)	0.786***	(0.086)				
Serbia	Income (ln) (α_0)	0.063***	(0.001)	−2.434***	(0.164)	−3.434***	(0.164)
	Average income (ln) (α_1)	−2.497***	(0.164)				
Slovenia	Income (ln) (α_0)	0.116***	(0.006)	0.186**	(0.086)	−0.814***	(0.086)
	Average income (ln) (α_1)	0.070	(0.086)				
Spain	Income (ln) (α_0)	0.031***	(0.001)	0.420**	(0.159)	−0.580***	(0.159)
	Average income (ln) (α_1)	0.388**	(0.158)				
Sweden	Income (ln) (α_0)	0.100***	(0.005)	0.754***	(0.148)	−0.246	(0.148)
	Average income (ln) (α_1)	0.654***	(0.149)				
United Kingdom	Income (ln) (α_0)	0.051***	(0.002)	0.830***	(0.078)	−0.170**	(0.078)
	Average income (ln) (α_1)	0.779***	(0.078)				

N=3,675,814. Individual fixed effects included. Minimum income regressed on income and average income, both interacted with country dummies (control variables as in Table 6). Country-clustered standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Next, we allow for heterogeneous associations between incomes and aspirations across countries. Results are presented in Table 7. As was the case with SWB modelling, the estimated parameters are diverse. When it comes to the sum of the coefficients of own income and average income, it is statistically significantly (at 10% level) larger than zero for 21 out of 29 countries. With the exception of Italy, Portugal and Sweden, it is also statistically significantly smaller than one. We looked into it, but found no apparent reason for the exceptionally large average-income coefficient of Portugal or for the negative average-income coefficients of some countries. We should note that the country time-series, in general, are short and Serbia's large negative coefficient is probably explained by only three years of data in the sample for that country i.e. effectively identifying the parameter from just three different levels of average income. Any clear pattern in the overall effect of income related to countries' income levels cannot be recognised. In turn, we found out that countries with large own-income coefficient tend to have small average-income coefficient and *vice versa*. This finding is consistent with the above discussion on poorly measured own income leading to attenuation bias in its coefficient estimate and the coefficient of average income capturing at least part of the own income's effect. This interpretation is further reinforced by the observation that many of the countries providing EU-SILC with register-based income data (e.g. the Nordic countries) are typically countries with own-income coefficient relatively large compared to the average-income coefficient. To quantify these differences, we estimated a model in which heterogeneity between the two groups of countries — the register countries and the non-register countries, as classified by Lohmann (2011) — is allowed for. The coefficients (all of them statistically significant) were 0.148 and 0.330 for the register countries and 0.071 and 0.429 for the non-register countries, respectively. Although the difference between the country groups in the average-income coefficient is not statistically significant, the differences are of similar absolute magnitude and in the direction expected were the differences due to accuracy of measurement. However, notice that the own-income coefficient is quite small and clearly smaller than the average-income coefficient even for the countries where measurement is based on register information. This result is in line with aspirations being socially rather than individually determined. We think that due to possible undetected data problems and relatively little data (i.e. short time series) on average incomes for some countries, one cannot draw very firm conclusions about the income-aspirations nexus in individual countries based on our analysis. Rather, it seems safe to conclude that, in the European countries on average, about 50% of the income rises can be expected to be absorbed into income aspirations in the short-run. In the long-run, the percentage might be about 100%.

5. Conclusions

Using data from European countries, earlier findings on the negative association between income aspirations and subjective well-being are shown to hold internationally. This result holds for the three major aspects of well-being, namely life evaluation, eudaimonia, and emotional well-being. Aspirations are more impactful in offsetting income-rise induced well-being improvements in high-income countries. Offsetting is complete or close to complete in many high-income countries when it comes to eudaimonia and emotional well-being. Higher incomes, however, have some potential to improve life evaluations in high-income countries, as has been found earlier (Kahneman and Deaton, 2010). Aspirations prevent actualised income increases from improving well-being only if aspirations increase with incomes. We show that earlier results on such a link hold once individual fixed effects are controlled for. In the European countries on average, incomes of all rising by 1% in a country is associated with an approximate rise of 0.5% in aspirations. Further, our results indicate that the rise in aspirations could be the whole 1% in the long run.

Our results are relevant both for policies addressing income inequality and policies aimed at influencing aspirations in the developing world to foster growth and reduce poverty. The results suggest that despite income aspirations offset some of the differences, income inequality translates into well-being differences, more so in the low-income countries. This stems from the relatively small well-being effects of aspirations and from aspirations failing to fully absorb individual incomes. Therefore, conventional income inequality measures can effectively guide policies aimed at influencing well-being inequality, especially in the low-income countries. The implications of the results for policies aimed at aspirations policies are clear. Income aspirations of nations can be supported by improving average incomes whereas improving individuals' incomes seem to have, on average, more limited effects on aspirations of those individuals. Aspirations policies are based on the idea that fulfilment of aspirations can motivate people to improve their economic circumstances. In the light of our results, such effects may not be very large and especially the developing world may suffer not only from low aspirations but also from a failure of aspirations to actually motivate people.

Our analysis is the first international look at income, aspirations and subjective well-being. Due to the international perspective and the attempt to utilise the whole EU-SILC data, we produced a broad picture, partly at the expense of rigour. Future studies could easily improve by, say, focussing on individual countries, countries with longer time-series, countries with high-quality data, detailed modelling of the relationships and estimating dynamic effects. Also other, maybe more relevant than the minimum income that we used, measures of aspirations should be studied. The EU-SILC longitudinal data allowed us to make an improvement as compared to the earlier literature by controlling for individual fixed effects when modelling aspirations. Future studies on aspirations and well-being should try to find better ways to identify causal effects, both in modelling aspirations and modelling their effects on well-being. Because of our focus on well-being, we did not model the behavioural effects of income aspirations. Such effects are the cornerstone of the emerging literature on aspirations and future studies could use the EU-SILC data to look at them. Our result that the effects of aspirations on subjective well-being, measuring experienced utility, are small does not necessarily mean that the effects on decision utility

and, hence, on incentives are small as well. The theoretical literature on aspirations has mostly focussed on the level of aspirations as the key factor in economic development. However, our results suggests that aspirations can fail to motivate not only because aspirations are too low or too high but also because the marginal utility of meeting one's aspiration is too low.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.jebo.2021.02.030.

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