

## **The complex relationship between education and happiness. The case of highly educated individuals in Italy.**

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### **Abstract**

The present work aims to explore whether there exists a systematic frustration in terms of income expectations among those who have obtained high level of education in Italy, and if this mismatch between expected and effective incomes negatively affects their perception of happiness.

We adopt a reference-dependent preferences model combined with the concept of “illusory superiority bias” to analyse data on “happiness” in Italy, provided by the biennial survey conducted by the Bank of Italy on the Italian households’ incomes and wealth between 2004 and 2014. Our results show a positive effect produced by education on incomes. Graduated and post graduated workers have on average higher income than other people, and this difference is statistically significant controlling for working experience and other possible confounding factors. However, the disutility resulting from the frustration of expectations produces negative effects on perceived happiness. Even though highly educated people are actually able to find better job matching in comparison to less educated workers, they are also more likely to seeing their income expectations frustrated.

**Keywords:** Happiness; Education; Reference dependent preferences; Income

### **1. Introduction**

The present work aims to explore whether there exists a systematic frustration in terms of income expectations among those who have obtained high level of education in Italy, and if this mismatch between expected and effective incomes negatively affects their perception of happiness.

As reported by Cunado and De Gracia (2012), empirical studies present some inconclusive results on the connection between educational levels and subjective well-being. Indeed, some empirical works have found a positive effect of education on happiness (Di Tella et al. 2001, Stevenson and Wolvers 2008), others a not significant (Inglehart and Klingemann 2010) and in some cases even a negative effect (Clark and Oswald 1996). These contrasting results according to Clark and Oswald (1996) may be due to two factors: i) highly educated people have higher job expectations which are more difficult to fulfil; ii) the dispersion of incomes increase with education. Considering these premises, Italy seems to represent an ideal context to study the possible effect of frustrated income expectations on happiness. Indeed, according to the Istat Report (2015) only a small number of Italian Ph. Doctors (17.9% in 2008 and 15.6 2% in 2010) believe that their PhD qualifications contributed towards improving their professional conditions, especially in terms of incomes.

In addition, the Fondazione Mingrantes’s report (2016) has warned about the increasing tendency of high qualified young Italians to move abroad to find better wage and job opportunities. This has attracted increasing attention of Italian media and generated a huge public debate on the conditions of the higher educated individuals in Italy.

As better explained in the next section, we will adopt a reference-dependent preferences model (Kőszegi and Rabin 2006; Sugden 2003) combined with the concept of “illusory superiority bias” (Hoorens 1995) to understand how education might influence perceived utility. Specifically, we assume that higher levels of education might represent an obstacle to the achievement of income expectations if ability is not perfectly observable by employers. Indeed, in addition to the fact that employers would offer a wage that reflects their beliefs about the average quality of the workers, the illusion of highly educated individuals of ending up in better job matching in comparison to lower educated workers, might imply an inflation of income expectations. In turn, the systematic frustration of these expectations may negatively affect their perceived happiness.

In support to these assumptions, a study conducted by AlmaLaurea (a Consortium of Italian universities which collects information on graduate and postgraduate students) in 2015 shows how since their graduation the 74% of Italian Doctors strongly believe to have more chances to find a job abroad, and the 10% choose to work abroad mainly in relation to higher incomes, opportunities to apply their skills and to carry out research activities. Observing the highly-qualified individuals from another perspective, it is possible to identify a further discrimination in terms of gender inequality. In fact, in all cases female workers with a post-graduate qualification earn salaries that are substantially lower than their male colleagues (Istat 2015). This might be explained in relation to a tendency of women to work part-time (the 19.5% of female workers work part-time compared to 9.1% of men), but also in relation to a higher number of temporary contracts within this category (with a gap of around 10 percentage points between women and men).

This disadvantage contributes towards increasing women’s degree of dissatisfaction, in particular about both the limited possibility to make career (women attribute an average value of 5.1 in a range from 0 to 10, whereas men 5.6) and work stability (5.5 for women, whereas 6.1 for men) (Istat 2015).

Therefore, the picture drawn by all these reports describes either an under-utilisation of qualified figures or an engagement of young qualified individuals in positions which not specifically require their competences (in particular for women). Even when this part of the workforce finds a job, the labour market seems to require to these young workers to rely more on their enthusiasm rather than on stable and remunerative work contracts (see also Argentin et al. 2014).

In order to explore the relationship between income expectations and perception of happiness, the paper is structured as follows: the first section describes a theoretical model to better explain the role of income expectations on happiness and to clarify our research question; the second presents the results obtained from an empirical analysis of secondary data gathered from the SHIW for the period 2004-2014, which contains detailed individual data on level of education, income, other socio-economic characteristics and level of perceived happiness in Italy. Finally, some conclusions will be drawn.

## **2. The complex relationship between education and perceived utility**

In this section, we will use a model of reference-dependent preferences (see Kőszegi and Rabin 2006; Sugden 2003) in combination with another concept introduced in psychology by Hoorens (1995), to the so called “illusory superiority bias” (from now ISB) to show how education, interpreted as a proxy of human capital, can influence perceived utility. A reference-dependent model is particularly suited to model situation in which the utility of individual depends on the realised outcome as much as on the the distance from the latter and a reference point. This kind of model has been, for instance, recently used by Gneezy et al. (2014) to study the relationship between customer satisfaction for a product and expected product quality. In particular, in the model proposed by Gneezy et al. consumers are uncertain about the quality of products and use prices to formulate expectations. Using field experiments, they found that when price is high and quality is relatively low,

consumers tend to evaluate it more negatively than a low-quality product with a low price. This because they suffer a disutility deriving from the frustrations of their expectations on quality, in turn, spurred by the price. Similarly, in our model the reference point is the individual expected income, which as in Clark and Oswald (1996) is alimented by education. For instance, Lehmann (2009) in his analysis of the motivations for choosing to go to University from the students coming from low income families in Canada, reported that main driver to a such expensive investment is the expected high return in terms of income.

Imagine a simple linear utility function for individual  $i$  at time  $t$ :

$$(1) \quad U_{it} = w_{it} + \theta(w_{it} - E(w_{it}))$$

Here  $w_{it}$  denotes the individual's own wage, while  $\theta = c \in (0,1]$  when  $E(w) > w$ , i.e. when expectations about income are not fulfilled and  $\theta = b \in (0,1]$  when  $w > E(w)$  with  $c > b$ , thus, as in Kahneman and Tversky (1979) losses are evaluated more than gains.

Each worker  $i$  is endowed with a human capital level (schooling) that may be high  $h_h$ , or low  $h_l$ , with obviously  $h_h > h_l$  which is assigned to each worker by nature. A fraction  $n$  ( $1-n$ , respectively) of the population of workers (normalized to unity) is endowed with high level of schooling (low level of schooling, respectively). These proportions are common knowledge in the economy. We assume that there is also a continuum of risk-neutral firms. Each firm is run by an entrepreneur endowed with a level of entrepreneurial ability  $e_j$  distributed in the population of firms as a  $U[0,1]$ . In period 1, firms make an irreversible investment decision,  $k$ , at cost  $rk$ . Workers and firms come together in the second period. The labor market is not competitive; instead, firms and workers are matched randomly, and each firm meets a worker.

If firm  $j$  meets worker  $i$  and they produce together, their output is:

$$(2) \quad (1 + e_j) k_j^\beta h_i^\delta \text{ where } \beta < 1 \text{ and } \delta \leq 1 - \beta$$

Therefore, firms managed by more talented entrepreneurs are also characterised by a larger output.

We suppose that higher educated people ( $h_i = h_h$ ) are convinced that they have more probability of being matched with entrepreneurs with higher level of ability. In other words, they suffer from an illusory superiority bias. In particular, we follow Ferrante (2009), according to whom education spurs individual expectations about available working opportunities. Thus, we assume that they believe that with a probability greater than  $\frac{1}{2}$  they will end up with an entrepreneur that is better than average, i.e. with an entrepreneur endowed with a level of ability higher than  $\frac{1}{2}$ .

For both firms and workers, it is costly to destroy a match, and wage is determined by the solution of a Nash bargaining among the parties. In particular, we assume for simplicity that a fraction  $\mu$  of the produced output goes to the worker while the remaining  $1-\mu$  goes to the firm.<sup>1</sup>

Firms maximise expected profit with respect to  $k$ :

$$(3) \quad E(\pi) = (1 - \mu)(1 + e_j) k_j^\beta E(h_i)^\delta - rk_j$$

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<sup>1</sup> We are implicitly assuming that  $\mu > 0$  since a  $\mu = 0$  will imply that workers do not receive a wage for their job.

Where  $E(h_i) = nh_h + (1-n)h_l$  is the average level of human capital in the economy. So, deriving for k and equalising the derivative to zero, we have that:

$$(4) \quad k_j = \left( \frac{\beta(1-\mu)(1+e_j)E(h_i)^\delta}{r} \right)^{1/(1-\beta)}$$

More talented entrepreneurs manage firms endowed with higher level of capital k. Moreover, the availability of a qualified workforce, as captured by the average level of human capital, induces firms to invest more. Now we have that substituting (3) in equation (1) and using the fact that wage is a share  $\mu$  of total output, the expected incomes for a worker will be:

$$(5) \quad E(w_i) = \mu \left[ (1+E(e_j))h_i^\delta \left( \beta(1-\mu)(1+E(e_j))E(h_i)^\delta \right)^{\beta/(1-\beta)} r^{-\beta/(1-\beta)} \right]$$

In order to simplify the notation, note that with  $E(e_j) = 1/2$  and let use denote  $H = E(h_i)^\delta$  so, deriving with respect to  $h_i$ , we have that:

$$(6) \quad \frac{\partial E(w)}{\partial h} = \mu\delta \left[ \left( 1 + \frac{1}{2} \right) h_i^{\delta-1} \left( \beta(1-\mu) \left( 1 + \frac{1}{2} \right) H \right)^{\beta/(1-\beta)} r^{-\beta/(1-\beta)} \right] > 0$$

Therefore, worker ‘i’ expectations positively depend on the level of his/her human capital  $h_i$ . However, also wage increases as h goes up. Thus, the sign of derivative of (1) with respect to h, crucially depends on how actual wage reacts to increases in level of human of the worker, which in turn depends on the realised matching with the entrepreneur j:

$$(7) \quad \frac{\partial U}{\partial h} = \underbrace{\mu\delta \left[ (1+e_j)h_i^{\delta-1} \left( \beta(1-\mu)(1+e_j)H \right)^{\beta/(1-\beta)} r^{-\beta/(1-\beta)} \right]}_{+} + \theta \left\{ \underbrace{\left[ \begin{array}{l} \mu\delta \left[ (1+e_j)h_i^{\delta-1} \left( \beta(1-\mu)(1+e_j)H \right)^{\beta/(1-\beta)} r^{-\beta/(1-\beta)} \right] \\ \mu\delta \left[ \left( 1 + \frac{1}{2} \right) h_i^{\delta-1} \left( \beta(1-\mu) \left( 1 + \frac{1}{2} \right) H \right)^{\beta/(1-\beta)} r^{-\beta/(1-\beta)} \right] \end{array} \right]}_{+-} \right\}$$

If a worker has drawn an entrepreneur with an ability level that is lower/higher than the average, the second term of the derivative is negative/positive.

Focusing on the case of “poor” matching, i.e.  $e_j < 1/2$ , the second term of the above calculated derivative is negative. Note that after some simple passages derivative (7) may be rewritten as:

$$\frac{\partial U}{\partial h} = \underbrace{\mu\delta \left[ h_i^{\delta-1} (1+e_j)^{1/(1-\beta)} \left( \beta(1-\mu)H \right)^{\beta/(1-\beta)} r^{-\beta/(1-\beta)} \right]}_{+} + \theta \left\{ \underbrace{\left[ \left( (1+e_j)^{1/(1-\beta)} - \left( 1 + \frac{1}{2} \right)^{1/(1-\beta)} \right) \mu\delta h_i^{\delta-1} \left( \beta(1-\mu)H \right)^{\beta/(1-\beta)} r^{-\beta/(1-\beta)} \right]}_{-} \right\}$$

The first term will be higher than the second term if:

$$\mu\delta \left[ h_i^{\delta-1} (1+e_j)^{\beta/(1-\beta)} (\beta(1-\mu)H)^{\beta/(1-\beta)} r^{-\beta/(1-\beta)} \right] \geq \theta \left[ \left( (1+e_j)^{1/(1-\beta)} - \left(1+\frac{1}{2}\right)^{1/(1-\beta)} \right) \mu\delta h_i^{\delta-1} (\beta(1-\mu)H)^{\beta/(1-\beta)} r^{-\beta/(1-\beta)} \right]$$

Thus when:

$$(8) \quad \theta \leq \frac{(1+e_j)^{1/(1-\beta)}}{\left( (1+e_j)^{1/(1-\beta)} - \left(1+\frac{1}{2}\right)^{1/(1-\beta)} \right)}$$

So, given the fact that  $\theta$  cannot be negative, we will have that inequality 8 is never satisfied when  $e_j < \frac{1}{2}$ .

Therefore, if  $e_j < \frac{1}{2}$ , then an increase in the level of human capital leads to a decrease in perceived utility because the second term of (7) will be always higher than the first one. It is straightforward to show that if  $e_j > \frac{1}{2}$ , then the opposite holds (i.e. an increase in education leads to an increase of perceived utility). These

results are coherent with the mixed empirical findings that econometric literature produced on the relation between education and life satisfaction. In particular, on the one hand some empirical works found a positive relation between education and life satisfaction (among the others, Cunado e De Gracia 2012; Di Tella et al. 2001); on the other hand, some studies did not find a significant relation between the two variables (Inglehart and Klingemann 2000). Finally, a negative relation was found by Clark and Oswald (1996). In particular, according to Clark and Oswald, highly educated people have higher job expectations, which are more difficult to fulfil and this may explain why they observe a negative relation between the two variables.

Therefore, following Clark and Oswald we will try to answer to the following question: do highly educated workers have more probability of ending up with their expectations unfulfilled? We may have 2 cases and related different implications: 1) the matching between workers and entrepreneurs are purely random, but highly educated individuals are affected by ISB as supposed above; 2) higher educated individuals are actually more likely to find capable entrepreneurs. In case 1, more educated individuals are convinced of having more chance of being matched with a better than average entrepreneur.

Thus, since the expectation about the job matching enters in equation 5, highly educated individuals will tend to have an upward biased expectation about their wages, implying that on average the most educated workers will end up with an actual wage that is lower than that expected. However, this does not necessarily mean that an increase in education will automatically lead to negative consequences on perceived utility, since the sign of derivative 7 depends on actual matching. On average  $n/2$  highly educated workers will end up in good matching, while the remaining  $n/2$  will be matched in a poor one. Therefore, if case 1 holds, then the contrasting empirical findings reported by Cunado and De Gracia (2012) may be due to the institutional setting of the country analysed. In countries where the matching between workers and firms is close to pure randomness, the sign of the relationship between education and happiness (assuming that happiness is a good proxy for perceived utility) is not predictable a priori.

Obviously, in case 2, higher educated individuals, being more capable to find good matching, will also have less probability of seeing their expectations frustrated. This does not mean that all highly-educated individuals are able to meet their expectations. In some cases, casual errors may lead to suffer a misalignment between reality and aspirations. However, on average we may expect that if case 2 holds, then an increase in education leads to an increase in perceived utility, since highly educated workers will have more chances to end up with an entrepreneur with  $e_j > 1/2$

Therefore, our empirical model will test the following hypotheses:

H1: Have higher educated people more probability of not fulfilling their income expectations as implied by our assumption of ISB?

H2: Does the inability to meet income expectations imply negative effects on perceived utility? If not, then our reference dependent preferences model is not valid and the explanation of the contrasting findings obtained on the empirical ground must be searched using other approaches.

H3: After having controlled for actual incomes and for the possible effect of the misalignment between the latter and aspirations, does an increase in education lead to either an increase or a decrease of perceived utility?

### **3. An empirical analysis of the relation between education, expectations and happiness: data and empirical strategy**

The proposed analysis is based on data provided by the biennial survey conducted by the Bank of Italy on the Italian households' incomes and wealth between 2004 and 2014. In addition to information such as age, sex, educational qualifications, professional status, incomes and financial investments of Italian families, since 2004 this survey has been collecting data on perceived happiness. In fact, it includes the following question: "Considering the overall aspects of your life, how much do you feel happy in a range from 1 (extremely unhappy) and 10 (extremely happy)?"<sup>2</sup>. This variable (from now on "happiness") justifies our choice to consider the period 2004-2014<sup>2</sup>. Recently, this survey has included about 8.000 families (around 24.000 individuals)<sup>3</sup>.

One of the main limits of this data source is the impossibility to examine each category of post-graduates individually. This implies that different qualifications, such as PhD, school of medical specialisation, master degree, are all included in the same classification. In all the presented analyses, we decided to pool the data of each survey and not to use the panel component of the Survey. We were forced to do this because in the period from 2004 to 2008 the question regarding the "happiness" was randomly proposed only to half of the sample and, following these individuals over in time, obviously enormously reduced the number of post-docs to include in the empirical analysis.

Table 1 shows some descriptive statistics about the average level of income and of declared happiness broken by the level of education and by gender. These statistics shows that those who have at least a university degree seem to have some benefits, in terms of income and happiness compared to lower educated individuals. See also the appendix for other descriptive statistics on the characteristics of the sample.

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<sup>2</sup> The discussion about an appropriate measure of well-being goes behind the scope of this paper. As observed by Stevenson and Wolvers (2008), even though happiness and life satisfaction may be considered as two different concepts, much of the economics literature assessing subjective well-being used the measures of "life satisfaction" and "happiness" interchangeably. Indeed, these alternative measures of well-being are highly correlated and have similar covariates. See also Frey and Stutzer (2002) for a discussion of the reason why question about subjective happiness may be a good proxy for perceived utility. Unfortunately, in Bank of Italy's survey a question on job satisfaction was introduced only in two waves (2006-2008) and asked only to half of the occupied respondents implying thus a modest sample size (around 2000 individuals). This has prevented us to test if the effect of frustrated expectations on happiness passes only through a possible relation with job satisfaction.

<sup>3</sup> For more information on the sampling techniques used by the Bank of Italy, see the Supplements to the Statistical Bulletin: [http://www.bancaditalia.it/statistiche/indcamp/bilfait/boll\\_stat](http://www.bancaditalia.it/statistiche/indcamp/bilfait/boll_stat).

Table. 1. Average annual incomes and happiness in relation to educational qualification and gender, years 2004-2014.

	Education level	Income			Happiness		
		N. of obs.	Mean	Standard dev	N. of obs.	Mean	Standard dev
Male	No title	826	11694.30	6011.38	665	6.15	2.03
	Elementary	5620	17773.31	11034.65	4673	6.68	1.86
	Middle School Diploma	9816	20668.50	20201.98	7627	7.00	1.82
	Vocational School Diploma	2396	21593.32	12233.17	1893	7.15	1.72
	High School Diploma	8238	26956.85	21094.57	6609	7.36	1.56
	First Level Degree (3 years of university)	258	23408.17	16420.07	221	7.43	1.52
	Second level degree (3+2 years of university)	2696	42241.90	39656.07	2183	7.57	1.45
	Post-graduate qualification	271	47080.74	33026.35	220	7.65	1.32
	Total	30121	23867.67	22259.69	24091	7.09	1.75
Female	No title	1735	10544.68	5485.14	1472	5.95	1.98
	Elementary	6566	12143.26	7794.20	5424	6.41	1.92
	Middle School Diploma	6084	12853.60	11028.53	4860	6.83	1.85
	Vocational School Diploma	1688	15799.40	9640.53	1338	7.15	1.67
	High School Diploma	6896	18085.25	11525.42	5402	7.27	1.64
	First Level Degree (3 years of university)	395	19138.34	15145.42	315	7.37	1.69
	Second level degree (3+2 years of university)	2901	24410.08	18088.18	2249	7.49	1.51
	Post-graduate qualification	151	26737.63	15945.84	123	7.56	1.30
	Total	26416	15521.84	11995.53	21183	6.88	1.84
Male + Female	No title	2561	10915.47	5684.51	2137	6.01	2.00
	Elementary	12186	14739.76	9836.56	10097	6.53	1.90
	Middle School Diploma	15900	17678.19	17689.26	12487	6.93	1.83
	Vocational School Diploma	4084	19198.58	11589.84	3231	7.15	1.70
	High School Diploma	15134	22914.39	17951.39	12011	7.32	1.60
	First Level Degree (3 years of university)	653	20825.35	15787.82	536	7.40	1.62
	Second level degree (3+2 years of university)	5597	32999.43	31722.43	4432	7.53	1.48
	Post-graduate qualification	422	39801.57	29756.34	343	7.62	1.31
	Total	56537	19968.21	18669.42	45274	6.99	1.79

To compare incomes expressed in current euro all the data are reported in 2015 values using the Istat currency revaluation coefficients.

In the following, we present an econometric analysis, which also includes individual characteristics of postgraduates (such as e.g. work seniority, marital status, etc.), in order to better investigate the relationship between happiness and education.

Our empirical strategy follows three steps. Firstly, a modified mincer equation will be estimated, in which the logarithm of annual incomes will be regressed on the level of education (using a dummy measure for each level instead of the most common measure based on the number of years of training), on the years of working experience (in the quadratic form), on some control variables such as sex, type of employment, marital status, number of household members, geographical area of origin (North, Central, South), and on survey period<sup>4</sup>.

Following Ferrante (2009), the results of this estimation will be interpreted as an “expected income” in relation to personal and contextual characteristics. Hence, we assume that individuals’ income expectations are developed in relation to both context (how the labor market usually works) and personal characteristics (how individual characteristics can be applied in the labour market). This represents the crucial assumption of our empirical strategy. We are aware that our estimation of the mincerian equation is subject to the ability bias, i.e.

<sup>4</sup> We are aware that the use of annual income (instead of income per hour) causes some distortions due to tendency of the more qualified workers to work a greater number of hours (see Patrinos 2016 for a comprehensive discussion of the pros and cons of using Mincer equation). However, given the unavailability of data on incomes per hour, we preferred to limit further distortions related to arbitrary assumptions on the average number of hours per level of education.

we may expect that individual ability is correlated with education, but since we cannot directly measure ability we have that educational levels will be positively correlated with the error term in the equation. In turn, this leads to an upward bias in the estimation of the returns of education. However, it should be noted that we are not interested in running this econometric exercise to have a precise estimation of the educational returns in Italy, instead to proxy individual income expectations. Therefore, if one is willing to accept the idea that people form expectations by observing what is happening around them (see Evans and Kelley 2004), thus our bias in educational returns is probably closer to their expectations than the real rate of returns.

Secondly, a dummy variable will be developed, named FrustratedExpectation (FE from now on) as follows:

$$FE = \begin{cases} 1 & \text{if (Realized Income - Expected Income) < 0} \\ 0 & \text{otherwise} \end{cases}$$

The FE variable will be used as a dependent variable in a multivariate logistic regression to test whether a frustration of income expectations exists among both graduates and postgraduates (H1).

Finally, the third phase provides an ordinal logistic regression analysis to explore the relationship between happiness, education and FE variables (H2 & H3). The results of this approach will be presented in the next section.

Note that since the variable FE is defined using the residuals from the mincerian equation estimation, one may argue that it must be orthogonal to each explanatory variable in the second step logistic regression. This would be confirmed, if individuals were not affected by the illusory superiority bias, since the probability of ending up in a situation of frustrated expectations should not depend on education. Instead, when the above depicted case 1 holds, we expect a positive relationship between education and probability of ending up with frustrated expectations. Indeed, if education spurs income ambitions, but better educated people are not able to draw jobs from a better distribution, then this will cause a systematic bias in their formulation of income expectations. Therefore, if we find a relation between FE and education, this should be caused by this systematic bias of highly educated people. Instead, when the above depicted case 2 holds, since highly educated individuals are characterized by higher probability of obtaining better paid jobs, the misalignment between reality and aspirations should be purely random. Hence, we expect a not significant relationship between education and probability of ending up with frustrated income expectations if case is valid.

#### 4. Empirical results

Table 2 shows the resulting estimations from the mincerian equation, based on the data from 2004 to 2014 provided by the Bank of Italy. The labels used for the variables are mainly self-explanatory, however further clarifications are provided when necessary. First of all, the results associated with the control variables will be discussed in order to furnish an idea of the reasonableness of the entire model. Indeed, if the latter results turn out to be totally unexpected, this may cast doubts on the validity of the estimated model. We want to better clarify that this estimation is not carried out to assess the educational wage premium in Italy, instead to have an empirical estimation of equation 5. Obviously, the underlying (maybe strong) assumption is that people formulate expectation by observing what is happening around them. The results reported in table 2 confirm the existence of a significant gender gap in Italy. In fact, they show how women's incomes are lower than 40% in comparison to men. Such a negative result might be partially explained by the fact that women are more often employed in part-time jobs due to a number of difficulties in combining family and work commitment. Following the research conducted by Ferrante (2009), who only focused on the wave 2004 (in which a question

on the number of weekly working hours was included), the wage gap (also controlling for the number of worked hours) was about 20%. This result is a further confirmation of the disparity already highlighted in the introduction to this work.

Table 2. Estimation of the Mincer equation, Italy 2004-2014

Dependent Variable: log of the net annual income		
	$\beta$	s.e.
Working_exp	0.009***	(0.001)
Working_expsq	-0.000***	(0.000)
Education: reference category: High school diploma		
1.No title	-0.674***	(0.020)
2.Elementary school	-0.494***	(0.015)
3.Middle school Diploma	-0.240***	(0.013)
4.Vocational school Diploma	-0.128***	(0.017)
6.First level degree (3 years)	0.096***	(0.030)
7.Degree (3+2 years)	0.239***	(0.013)
8.Post-graduate qualification	0.295***	(0.041)
Women	-0.400***	(0.008)
N of family components	-0.052***	(0.004)
Civil Status: reference category: married people		
2.Single	-0.151***	(0.013)
3.Separated/Divorced	-0.007	(0.021)
4.Widower	0.255***	(0.013)
Working Status: reference category: blue collar		
2.Office worker	0.129***	(0.012)
3.Manager	0.435***	(0.018)
4.Entrepreneur	0.226***	(0.022)
5.Freelance	0.047***	(0.018)
6.Retired	-0.174***	(0.015)
7.Unemployed	-1.169***	(0.042)
Geographic Area: reference category: North		
2.Centre	-0.015	(0.010)
3.South	-0.196***	(0.009)
Year: reference category: 2004		
2006	0.016	(0.014)
2008	-0.030**	(0.014)
2010	-0.051***	(0.017)
2012	-0.114***	(0.013)
2014	-0.130***	(0.013)
_subseq	10.546***	(0.023)
N	47746	
adj. R <sup>2</sup>	0.41	

Heteroskedastic robust Standard errors in parentheses.

Survey's author weights adopted were used in the regression in order to ensure the representativeness of the population.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The concavity of the relationship between years of working experience (working-exp is defined as respondents' current age minus their age of first entering the labor market) and income, already observed in previous empirical works on Italy (see Fiaschi and Gabbriellini 2013), seems to be confirmed by our analysis. This might

be explained by the fact that when the income growth reaches its maximum peak, then it starts to decrease, probably in relation to a reduction in terms of productivity of the worker<sup>5</sup>.

The results associated with the variables related to both marital and employment status, seem very reasonable. In fact, singles tend to receive lower incomes than married people, probably also because they do not receive family allowances. Moreover, widowers earn more than married people probably thanks to survivor's pension benefits. Considering the type of work, only retired and unemployed people from working class earn less than blue collars, whereas managers earn more than the other categories.

Workers from southern Italy seem to earn less than those from the North, and this confirms Fiaschi and Gabbriellini (2013) findings, which already highlighted a significant income disparity between the North and the South. One explanation might be found in the limited availability of higher qualified positions in the South of Italy. The effects produced by the economic crisis are captured by the dummy "Year". In fact, since 2008, the  $\beta$  coefficient has become negative and statistically significant.

Focusing on the education, incomes seem to be related to the degree of qualification: those who have graduate or postgraduate qualifications earn more than those who have a secondary school diploma. In turn, the latter earn more than those who have a lower qualification.

Specifically, postgraduates and graduates respectively earn about 30% and 24% more than those with a high school diploma. Our empirical analysis seems to support the hypothesis that the market is inclined to reward highly qualified individuals (at least in terms of incomes). Note that the total sample size reported in Table 2 differs from that reported in Table 1 because of missing observations for control variables.

Therefore, here the question is: is the market able to satisfy people's aspirations? Table 3 replies to this question by reporting results obtained from a logit regression that uses the FE (see previous section) as dependent variable, and the qualification and the control variables (of table 2) as explanatory variables.

Table 3. Education and Probability of seeing people's expectations frustrated

	Dependent Variable: FE	
	B	Se
Education: reference category: High school diploma		
1.No title	0.106	(0.083)
2.Elementary school	-0.076*	(0.046)
3.Middle school Diploma	-0.169***	(0.038)
4.Vocational school Diploma	-0.158***	(0.055)
6.First level degree (3 years)	0.012	(0.120)
7.Degree (3+2 years)	0.106**	(0.047)
8.Post-graduate qualification	-0.052	(0.145)
<i>N</i>	47746	
<i>Chi</i> <sup>2</sup> ( <i>p</i> value)	276.71(0.000)	

Controlling for Geographic area, years of work, experience, calendar year, type of job, civil status, sex.

Heteroskedastic robust Standard errors in parentheses.

Survey's author weights adopted were used in the regression in order to ensure the representativeness of the population

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

<sup>5</sup> For each individual, we demeaned the variable years of experience by subtracting the sample mean. Hence, the demeaned variable and its square were used in the model, instead of the original one. This operation was necessary to reduce the obvious collinearity that exists between the original variable and its square.

Table 3 shows how those who have lower qualifications are less likely to see their income expectations disappointed in comparison to those who have a secondary school diploma (reference category). By contrast, those who have a university degree are the most likely to be frustrated in terms of incomes. However, we find a not significant difference between postgraduates and people holding a secondary school diploma. This seems to suggest that post-graduates are actually more accurate in formulating their expectations, so on average they are not likely to experience a hindrance in the realisation of their income expectations<sup>6</sup>.

Finally, through an ordinal logistic regression we tested if once we have controlled for other influencing factors, the fact of not meeting income expectations negatively affects the level of “happiness” of the individuals. We use the variable FE as an explanatory variable in an ordered probit, in which *happiness* is used as dependent variable. We also included in the model an interaction variable between “having at least a degree qualification” (named *interaction\_FE\_qualified*) and the FE variable. This means that a negative sign of the coefficient associated with this interaction variable, would indicate that having a degree qualification produces a further negative effect on happiness.

In this case, instead of using the working experience variable, we included the age and its square to capture potential factors deriving from the life cycle (which can influence the level of happiness)<sup>7</sup>. We also used the logarithm of earned incomes as one of the explanatory variables in order to test if, once controlled for the actual incomes, negative/positive effects are related to expectations.

The results of the analysis reported in Table 4 show that, on the one hand, those who have a degree are happier than others with lower qualifications; on the other, postgraduates do not appear happier in comparison to the reference category (high school diploma qualification)<sup>8</sup>.

The frustration deriving from unfulfilled expectations produces negative effects on the happiness as assumed in the model presented in section 2. On the contrary, the higher the income, the higher the happiness. This confirms previous empirical evidences that highlighted how at the micro-level the Easterlin paradox is not confirmed (Stevenson and Wolfers 2008).

Moreover, this study supports the results obtained by Ferrante (2009) regarding the convex relationship between age and happiness in Italy. Following the interpretation of the author, individuals tend to adapt their expectations over the time. This means that their levels of happiness start again to increase only after they are 40-45 years old. The interaction between the qualification and the FE variable is not statistically significant, thus suggesting that there is not a further negative effect for this category.

It is also significant to underline that being married or having a large family positively influences the degree of happiness, whilst being unemployed is connected to lower degrees of happiness. Entrepreneurs seem to be the happiest professional category after white collars. This confirms evidences often reported by the economic literature on entrepreneurship: entrepreneurs attribute more importance to their independence than their incomes. This explains the reason why they report the highest levels of happiness despite their lower income in comparison to other workers’ average incomes (Benz and Frey 2003).

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<sup>6</sup>A possible criticism to this interpretation may be that the not significance of the post-graduated dummy is due to problem of limited sample size for this category (see Table 1). However, it should be noted that the same limited sample size is sufficient to find a significant income difference in Table 2.

<sup>7</sup> Also in this case we used the demeaned age and its square to avoid collinearity problems.

<sup>8</sup> Note that the sample size differs in this case from that reported in Table 3, because of missing observations for the dependent variable.

Table 4. Happiness determinants: ordinal logistic regression of happiness

Dependent variable: happiness		
	B	s.e.
FE	-0.215***	(0.031)
Log_income	0.120***	(0.023)
Age	-0.010***	(0.001)
Age_square	0.000***	(0.000)
Education: reference category: High school diploma		
1.No title	-0.816***	(0.070)
2.Elementary school	-0.392***	(0.044)
3.Middle school Diploma	-0.223***	(0.037)
4.Vocational school Diploma	-0.010	(0.050)
6.First level degree (3 years)	0.166*	(0.090)
7.Degree (3+2 years)	0.119**	(0.057)
8.Post-graduate qualification	0.151	(0.141)
Women	0.035	(0.028)
N of family components	0.042***	(0.013)
Civil Status: reference category: married people		
2.Single	-0.864***	(0.040)
3.Separated/Divorced	-0.966***	(0.057)
4.Widower	-0.936***	(0.045)
Working Status: reference category: working class		
2.Office worker	0.305***	(0.045)
3.Manager	0.253***	(0.064)
4.Enterprenuer	0.286***	(0.065)
5.Freelance	0.106*	(0.059)
6.Retired	0.130***	(0.050)
7.Unemployed	-0.183***	(0.067)
Geographic Area: reference category: North		
2.Centre	-0.279***	(0.033)
3.South	-0.484***	(0.029)
Year: reference category: 2004		
2006	-0.200***	(0.045)
2008	0.002	(0.049)
2010	0.336***	(0.086)
2012	0.370***	(0.040)
2014	0.173***	(0.038)
Interaction FE_qualified	0.090	(0.075)
N	42710	
pseudo R <sup>2</sup>	0.039	

White robust Standard errors in parentheses.

Survey's author weights adopted were used in the regression in order to ensure the representativeness of the population

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 5. Conclusions

The relationship between education and happiness/life satisfaction has been widely studied by empirical literature. Despite of this substantial amount of attention, mixed results have been found. Some scholars reported a positive relationship between the variables, others a not significant relation or even a negative signed one. This paper tries to give a possible theoretical and empirical explanation of this empirical ambiguity.

In particular, in the second section of this work, we develop a theoretical model in which the perceived utility of an individual depends on both the realised income and the distance between the latter and income aspirations.

The main conclusion of our theoretical model is that education spurs both wage and aspirations. This implies that when the latter cannot be satisfied by the labour market, the positive effect that education may produce on happiness, thanks to the increase in the realised income, may be offset by the disutility associated with the frustration of expectations. In the second section, we argued also that if highly educated people are affected by the so called illusory superiority bias, i.e. they are wrongly convinced that they have more chances of ending up in a good-job matching, then it is very likely that they will experience a misalignment between realised income and income expectations. In turn, this may cancel out the positive effect of education on individual happiness. The biennial survey conducted by the Bank of Italy on the Italian households' incomes for the period 2004-2014 provided data to empirically investigate this issue. The main lessons learned from our econometric exercise might be synthesised as follows.

First of all, as expected, there exists a positive effect produced by education on incomes. This means that investing in education produces economic benefits for those who choose to continue their studies. Graduated and post graduated workers have on average higher income than other people, and this difference is statistically significant controlling for working experience and other possible confounding factors.

The second result of our analysis is directly connected to the first one in terms of discrepancy between expectations and goals effectively achieved. Graduated people are indeed more likely to fall into the category of individuals with unfulfilled income expectations. According to our theoretical model, this may be caused by a sort of upward bias in the income expectations which is alimented by education. However, fortunately, this effect seems to not affect those who reach a post graduation degree.

The third highlight is strongly connected to the second one. Indeed, the disutility resulting from the frustration of expectations produces negative effects on perceived happiness. This confirms that the reference-dependent model may be a good instrument to investigate the complex relationship between education and happiness. Even though the frustration of expectations produces negative impacts on happiness, at least graduated people appear to be happier than other workers. In the theoretical model presented in section 2 we referred to two extreme situations, one in which job matching is purely random, but highly educated workers are affected by the illusory superiority bias of being able to influence the probability of ending up in a good job-match; and one in which highly educated are actually able to influence job matching. In the real world, it is likely that the truth lies somewhere in between these extremes. Perhaps, highly educated people are able to find better matching but not always as good as they believe, and this implies that they are more likely to seeing their income expectations frustrated. However, on average there is a positive effect of education on happiness. As alternative explanations, it may be argued that highly educated people also give importance to non-pecuniary aspects of their job. In other words, they are willing to bear a disutility given by not-fulfilling their income expectations in exchange of some other immaterial job characteristics (let us call this a trade-off effect); or that they are on average happier because they are healthier than other workers (see Cutler and Lleras-Muney 2006). However, the latter explanations seem to contrast with our findings for post-graduated workers. If gains, in terms of better health or better non-pecuniary job characteristics are able to compensate the negative effect of frustrated expectations, why is this effect not present for post-graduated workers? Even in this case two possible answers can be provided: 1) this might be seen as indication of the dissatisfaction of post graduated workers, deriving from the impossibility to apply their skills, especially in the case of women, as resulted from the Istat Report 2015 on Italian PhDs. In other words, for post graduated workers there is not a trade-off effect; 2) post graduated workers are very different from a very peculiar category as ph. Doctors in terms of employability and probability of finding a qualified job. In particular, it may be surmised that they more likely occupy apical job positions and consequently they could be subjected to more work-related stress because they have more responsibilities. This

may cancel out both the trade-off effect and possibly the gains in term of health. Unfortunately, the Bank of Italy's data do not allow to test this hypothesis because of data unavailability. However, if the first answer was true, this, in the long run, would contribute towards increasing the tendency to move abroad in order to find a more valuable job. As a consequence, a vicious cycle might result from this situation, in which there is a steady waste of human/social/economic resources. In fact, the public investments in education would become ineffective if the qualification of these figures was not recognised (in professional and economic terms) and the so called "brain drain" was not limited or compensated by the access of specialised figures from the outside. If the second answer was true, then a question, that we intentionally leave open, would emerge: why do people acquire post-graduate education in Italy? They are indeed richer but not happier than other working categories.

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## Appendix

Table 5. Other descriptive statistics

<b>Type of occupation</b>			
	N	%	Cum.
Blu collar	11,319	20.02	20.02
Office worker	10,113	17.89	37.91
Manager	1,890	3.34	41.25
Entrepreneur	2,406	4.26	45.51
FreeLance	3,260	5.77	51.27
Retired	22,286	39.42	90.69
Unemployed	5,263	9.31	100
<b>Gender</b>			
Male	30,121	53.28	53.28
Female	26,416	46.72	100
<b>Geographical Area</b>			
North	25,224	44.62	44.62
Center	12,385	21.91	66.52
South	18,928	33.48	100
<b>Civil Status</b>			
Married	35,436	62.68	62.68
Single	11,220	19.85	82.52
Separated/Divorced	2,936	5.19	87.72
Widow	6,945	12.28	100
<b>Age composition</b>			
≤30	3,253	11.08	11.08
> 30 - ≤ 40	4,352	14.82	25.9
>40 - ≤ 50	5,865	19.98	45.88
>50 - ≤ 65	7,900	26.91	72.79
> 65	7,990	27.21	100
<b>Happiness by sex</b>			
	Male	Female	Total
1	268	333	601
% on column total	1	1.57	1.33
2	241	267	508
% on column total	1	1.26	1.12
3	428	509	937
% on column total	1.78	2.4	2.07
4	749	845	1,594
% on column total	3.11	3.99	3.52
5	2,141	2,190	4,331
% on column total	8.89	10.34	9.57
6	3,657	3,486	7,143
% on column total	15.18	16.46	15.78
7	5,820	4,950	10,770
% on column total	24.16	23.37	23.79

8	6,610	5,370	11,980
% on column total	27.44	25.35	26.46
9	2,328	1,895	4,223
% on column total	9.66	8.95	9.33
10	1,849	1,338	3,187
% on column total	7.68	6.32	7.04