Education Economics

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/cede20

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**To cite this article:** Amina Ahmed Lahsen, Alan T. Piper & Ida-Anna Thiele (2023): The role of gender inequality in the overeducation and life satisfaction relationship: an empirical analysis using panel data from Korea, Education Economics, DOI: 10.1080/09645292.2023.2178640

**To link to this article:** https://doi.org/10.1080/09645292.2023.2178640

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EDUCATION ECONOMICS
https://doi.org/10.1080/09645292.2023.2178640

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# The role of gender inequality in the overeducation and life satisfaction relationship: an empirical analysis using panel data from Korea

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**ABSTRACT**

Despite Korea's economic development, gender inequality in its society and the labour market is still prevalent. Within this context, this investigation considers the relationship between overeducation and life satisfaction by gender. Korean females are better educated than males, and they also face more discrimination in the labour market, the consequences of overeducation are likely to differ by gender. Using Korean panel data the results are consistent with females having lower aspirations despite their high levels of education, and indicate that a more female friendly labour market could address the country's currently underutilised human capital.

**ARTICLE HISTORY**
Received 10 February 2022
Accepted 2 January 2023

**KEYWORDS**
Overeducation; Life satisfaction; Korea; gender inequality

**Gender unequal Korea and the overeducation and life satisfaction relationship.**

Seungyeon always said girls don't need special treatment – they just want the same responsibilities and opportunities. Instead of choosing the lunch menu, they want to run for president. *Kim Jiyoung, Born 1982*, Cho 2020, 78

## 1. Introduction

Korea[1] is dominated by gender differences that become obvious both through official statistics, and through public reports of Korean women themselves. This extensive gender inequality has also been repeatedly noted by international organisations. Some of these gender inequalities relate to the different patterns of labour market participation of the genders, and the gender pay gap which, in Korea, is the largest within all OECD member states (OECD 2021). In Korea, 90% of legislators, senior officials and managers are men (World Economic Forum 2019). The Global Gender Gap Report 2020, published by the World Economic Forum (2019), shows that Korea has a high gender inequality in economic participation and opportunity as well as political empowerment, ranking 108th out of 153 countries in the overall Global Gender Gap Index. Additionally, in the 'environment for working women' indicator of the Glass-Ceiling-Index published by The Economist (2021), Korea has ranked bottom for nine years in a row out of around 30 developed countries. This is

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Supplemental data for this article can be accessed online at https://doi.org/10.1080/09645292.2023.2178640
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despite Korean women having consistently higher levels of educational attainment than men and as such could be regarded as a waste of economic resources and human capital (OECD 2017).

Despite these inequalities, and the related underutilisation of human capital, South Korea has experienced rapid economic growth, managing to transform itself from a developing country to a developed country in less than 50 years. This transformation has attracted the attention of many scholars who have been interested in its underlying factors (Cho 2019; Lee 2012; Lee and Lee 2019; Park 2011). According to this literature, a key factor that has contributed to Korea's economic development and growth is education (Lee 2020; Piazolo 1995). Indeed, Education has been argued to have accelerated economic growth and development through, in particular, the improvement of labour force quality and thus productivity, and heightened innovation (Bak 2018; Lee 2020). This is supported by Figure 1, which shows that the number of individuals in Korea who complete higher education has more than doubled in recent years and was, in 2018, at 69.6% of all individuals aged between 25 and 34, significantly exceeding the OECD average of 44.5% (OECD 2020).[2]

This increase in attainment within higher education is similar for males and females, although the rate has always been higher for women in Korea (75.7% in 2018) than men (64.1%), a gap similar to the OECD average in 2018 (50.4% for females compared with 38.0% for males; OECD 2020). Given this, and the oft-recorded discrimination of females in Korea and the Korean labour market, gender is clearly an important consideration for any analysis of the labour market. We briefly return to this when explicitly setting out the article's contribution towards the end of this section.

With the increase in higher education participation, one phenomenon that has gained attention is that of overeducation (Chevalier 2003; Piper 2015; Sicherman 1991). Overeducation occurs when a rapid expansion in higher education has not been met with a corresponding increase in the demand for highly educated labour (Belfield 2000; Delaney et al. 2020; Patrinos 1997; Piper 2015). In short, individuals who have more education than necessary for their employment are considered overeducated (Belfield 2000; Groot and Maassen van den Brink 2000). Empirical evidence has been found overeducation to be a significant societal problem as well as an individual one: with overeducated individuals having been found to be less innovative (Agut, Peiro, and Grau 2009; Länsisalmi, Kivimäki, and Elovainio 2004); to have lower job satisfaction as well as the companies they work for experiencing a higher turnover (Alba-Ramírez 1993; Park and Shahiri 2015; Sloane, Battu, and Seaman 1999; Tsang 1987; Tsang, Rumberger, and Levin 1991; Verhaest and Verhofstadt 2016) and a general underutilisation of human capital. Important for this investigation, being overeducated is also associated with having lower life satisfaction (Artés, Salinas-Jiménez, and Salinas-Jiménez 2014; Frank and Hou 2018; Piper 2015)

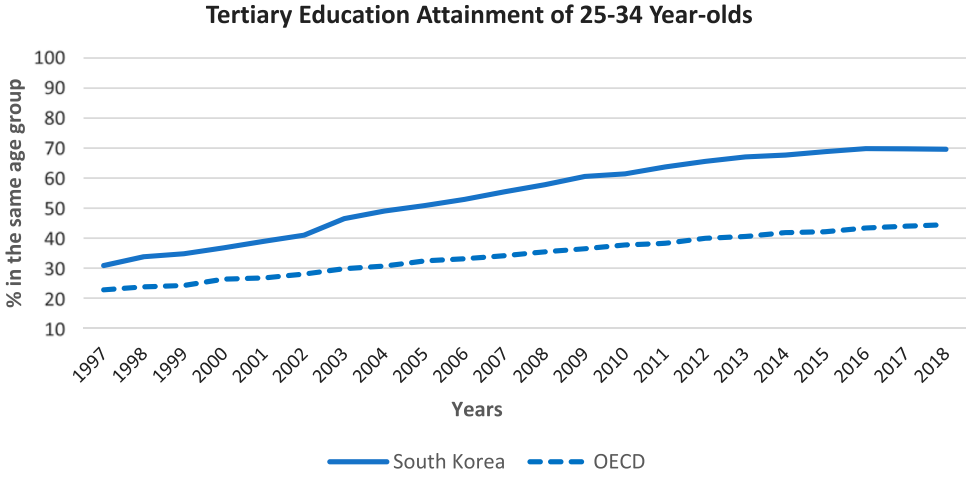


**Figure 1.** Development of Tertiary Education Attainment in Korea and the OECD between 1997 and 2018 (OECD 2020).

In the case of Korea, a high incidence of overeducation seems likely, as the number of jobs that require a high level of education has not caught up with the increasing rate of graduates (Ministry of Education 2017). This problem is intensified by the fact that the Korean economy is dominated by ten large conglomerates (including Samsung and Hyundai), which have managed to grow without creating many jobs for graduates of tertiary education (Yang and Kim 2019). They also quoted Ban Ga-woon, who stated that 'South Korea is paying the price for its overprotection of top-tier jobs and education fervor that produced a flood of people wanting only that small number of top jobs' (Yang and Kim 2019).[3]

Thus, the Korean economy is seemingly not producing appropriate employment opportunities commensurate with the substantial increases for educational participation and attainment. Like elsewhere, when Koreans fail to find a job that matches their education, they are likely to settle for a job that is below their educational level (i.e. that they are overeducated for) to avoid unemployment. A recent study by Kim, Ahn, and Kim (2016) reported that almost 20% of employed college graduates take this route, and work in jobs that do not match their level of education.[4] Overeducation and potential consequences have until now received little academic attention in the context of Korea even though there are strong reasons suggesting that overeducation might be an important phenomenon (Cho and Lee 2014).

Our contribution is to investigate the life satisfaction-overeducation relationship in the context of Korea, where the extent of gender inequality makes this both an interesting as well as worthwhile study. Usually, the overeducated have lower life satisfaction than those who have educationally matched employment. As the gap between the overeducated females and matched females is larger than that for equivalent males, we should expect that overeducated females are less happy than overeducated males in comparison with matched individuals of the same gender. However, gender inequality in Korea may instead be responsible for a finding that differs from this common expectation. As well as the statistics for discrimination overall in Korean society highlighted above, Korean women face gender discrimination in their daily (working) life, even though they are relatively more successful than males when undertaking higher education. This leads to our main hypothesis, developed below, which is that overeducated females in Korea are have a less of a gap in their life satisfaction when compared to their overeducated male compatriots. If our hypothesis is correct, the overeducation-life satisfaction relationship is different, indeed reversed, from previous findings in the context of substantial gender inequality.

The rest of the article is organised as follows: Subsection 2.1 contains a brief introduction regarding the definition and measurement of overeducation, and Subsection 2.2 reports on the academic literature regarding overeducation and life satisfaction in the context of gender inequality. Section 3 describes the data and methods used and Section 4 presents the results. Results of our investigation are discussed in section 5, along with some concluding remarks and limitations of the study.

## 2. Literature review and theoretical framework

### *2.1. Overeducation and its measurements*

Overeducation is by now a well-understood and researched phenomenon thus our introduction to its definition and measurements is brief. Also referred to as *overschooling* or *educational mismatch*, overeducation has been 'defined as the difference between a worker's attained or completed level of schooling and the level of schooling required for the job the worker holds' (Leuven and Oosterbeek 2011, 9). Overeducation has been investigated for several decades, with one of the earliest discussions was about overeducated Americans by Richard Freeman (1976). Since then, as an increasing number of people participate in higher education in many countries, the topic of overeducation has become even more relevant.

In general, the academic literature distinguishes between four different ways to measure overeducation (Verhaest and Omey 2006). Two of these are subjective measures (direct self-assessment, and

indirect self-assessment), and the other two are objective measures: job analysis, and the statistical 'realised matches' method. Verhaest and Omey (2006) is a rare exception that investigates all four measurements of overeducation using SONAR data of Flemish school leavers. They found that the effects of overeducation and the conclusions drawn depend on how it is measured. Similarly, differences were found in an earlier meta-analysis of 25 European and American studies: Groot and Maassen van den Brink (2000) found that, compared to the other measurements, the realised matches approach gives lower estimates of the incidence of educational mismatch. In the overeducation literature, most studies rely on just one of the four measures, often because of data constraints. An advantage of the Korean data we use, and therefore our study, is the ability to measure overeducation using both a subjective measure, direct self-assessment, and an objective measure, realised matches.

There is a small literature investigating overeducation in Korea. Using the 2005 Korean National Follow-up Survey of College and Graduate School Graduates on Economic Activity with data from 12,666 individuals who graduated in 2003 and the indirect self-assessment to measure worker's overeducation, Kim, Ahn, and Kim (2016) found that in Korea 70.4% of the sample worked in a job that matches their education whereas 17.4% of the workers were overqualified. Kim, Ahn, and Kim (2016) also found that both two-year Korean female college graduates and female workers with graduate degrees were more likely to be matched (and thus not overeducated) than equivalent males.[5]

Given the lack of research about overeducation in Korea, we also report about findings from neighbouring countries. For example, a study of the Japanese labour market by Kucel, Molina, and Raya (2016) using the indirect self-assessment measure could not find a significant relationship between the female gender and overeducation, and could therefore not confirm that Japanese women are more likely to be overeducated than men. These studies may have had a different finding if overeducation was measured objectively. One explanation given by Kucel, Molina, and Raya (2016) is that women tend to understate their actual job expectations, and, as a result, their overall level of overeducation. Relatedly, Kinias and Kim (2012), using a scale for injustice, showed that Hong Kong Chinese (East Asian) cultures with Confucian values (like Korea) see gender inequality as less unjustified than Western countries, which in turn may affect women's perception of overeducation and its effect on life satisfaction in Korea (Kinias and Kim 2012). The next subsection discusses overeducation and life satisfaction both generally and in the Korean context.

### 2.2. Overeducation and life satisfaction

In the last few years there has been increasing interest in the relationship between overeducation and life satisfaction, with a main pathway through which overeducation affects life satisfaction argued to be relative comparisons (Piper 2015; Yin 2015). Based on this logic, if individuals compare themselves to others who have a lower level of education, but work in similar employment positions, they are likely to be dissatisfied. When investing time and money into the attainment of a degree, individuals expect that this will bring about benefits in the future. However, when these hoped-for benefits are not obtained, it could lead to disappointment over the lack of returns for their investment in increasing their own human capital. This disappointment should be seen in lower life satisfaction.

Using the indirect self-assessment method and two waves of the European Social Survey (ESS), Artés, Salinas-Jiménez, and Salinas-Jiménez (2014) found a significant negative effect of overeducation on life satisfaction by comparing the overeducated with individuals that have a similar educational level and are not overeducated. An argument presented for this finding is that education raises expectations regarding labour market participation, which, for the overeducated, are not met in comparison to the non-overeducated. Similarly, using the realised matches objective method and several waves of British panel data, Piper (2015) found a negative relationship between overeducation and life satisfaction which became less pronounced for later cohorts. As overeducation became more prevalent in the UK (due mainly to the expansion of participation in higher education), being overeducated became less damaging to life satisfaction; a result potentially attributable to changing comparison effects and social norms.[6] Salinas-Jiménez, Artés, and Salinas-

Jiménez (2016) also find a similar negative relationship, and Bracke, Pattyn, and von dem Knesebeck (2013) demonstrate that overeducated workers show higher levels of depressive symptoms than educationally matched workers. All of these studies use European data.

While we are, to the best of our knowledge, the first to investigate overeducation and life satisfaction in the Korean context – our work is seemingly the first – there is a related literature on Korean adolescents who are undertaking education. Park and Huebner (2005), for example, found that Korean students are less satisfied with life than US students, and that the contribution of the school satisfaction domain to overall life satisfaction is higher for Korean adolescents. Since education is an important determinant of Korean individuals' life satisfaction, it is expected that overeducated Korean graduates, who recently finished their education, are likely to be less happy because they cannot adequately use the education for which they have invested a significant amount of time, finance and effort. For these reasons, and those mentioned above, we expect overeducated Koreans to be less satisfied with life than the non-overeducated: a result common in the existing literature.

However, given cultural expectations, social norms, and other trends in labour market participation we expect overeducation to be more distressing to men. Confucian cultures such as the Korean one are known for male dominance, which gives Korean men greater privileges and opportunities.[7] This has been suggested as a reason why Korean men report higher life satisfaction than women (Park and Huebner 2005). In the context of overeducation, however, this could mean that working in a job that does not allow them to make use of their educational level might make them even less happy than women in similar positions. A further argument in support of this can be built on social comparison theory, which proposes that as men usually dominate higher job positions in Korea, they are also likely to compare themselves to those working in higher job positions (Lee 2017). Differences by gender in Korea are expected. Finally, given that Korea has a large gender pay gap, it is conceivable that income may play a different role in the relationship between overeducation and subjective well-being penalty by gender. Our empirical analysis, to which we now turn, takes this likelihood into consideration, by running estimations with and without income as a confounding variable.

## 3. Data and methods used

The data for our investigation come from the Korean Labour and Income Panel Study (KLIPS). Commencing in 1998, KLIPS is an annual, nationally representative, longitudinal study covering approximately 10,000 individuals in each wave.[8] In nearly all waves individuals are asked about their education, employment situation, income, life satisfaction, and many socio-economic factors, meaning the dataset is fruitful for many quantitative investigations. For our investigation one major advantage is that the data enables measurement of overeducation in both a subjective and an objective way. As the literature review briefly demonstrates, how overeducation is measured can affect the incidence of overeducation and thus subsequent associations with important factors like income and life satisfaction.

As is common in the literature, for the subjective overeducation measure we make use of a question where individuals are directly asked 'Do you think that your job is appropriately matched with your educational level?', answering on a five point scale covering (very) low, well-matched, or (very) high on a five-point scale. In our analysis, everyone who reports their level of work as low or very low perceives themselves as overeducated. Our objective overeducation measure relies on the 'realised matches' way of measuring education. We use information from KLIPS about an individual's highest qualification, and attach a years of ISCED schooling value to this using the method that UNESCO recommends.[9] Following this, and in line with the literature (e.g. Sloane 2003), we use the mode and standard deviation of years of schooling for each combination of occupation, industry and survey year. This additional inclusion of the survey year in the creation of the realised matches method of deciding who is overeducated is rare, but important given the increase in participation within higher education over time. Individuals are then classed as overeducated if they have more than

one standard deviation of education above the mode for their employment group (i.e. their particular occupation-industry-survey year combination).[10] Though the undereducated are not of direct interest, we include them in the analysis to distinguish them from the matched. They are captured, subjectively and objectively, in the opposite way to the overeducated. Of note is that we consider workers who are employed and self-employed together.

Life Satisfaction is measured on a 5 point scale with respondents stating whether they are very satisfied (recoded as 5), satisfied (4), neither satisfied nor dissatisfied (3), dissatisfied (2) or very dissatisfied (1) with life. Income is individual after tax income deflated by the Consumer Price Index, though if pre-tax income is considered instead, or household income, the results presented below are almost identical. In the present analysis, we only consider individuals who are thirty-five years old or younger (however the results below are substantially the same without this restriction) for the following reasons[11]: the rise in participation in the higher education sector in Korea is a recent phenomenon thus affecting younger people more; the age restriction also makes the comparison group more realistic – for example, a thirty year old is unlikely to compare their employment and education situation to a fifty year old; and we avoid the problem of studies which consider the whole of working life, use the realised matches approach, and often conflate individuals changing their job with a change regarding whether they become overeducated or stop being overeducated. Regarding the latter point, after a certain age, individuals rarely increase their level of formal education and thus changes in the realised matches overeducation measure capture changes of industry and occupation category. This conflation issue is particularly a problem when studies rely on fixed effects estimation, with its focus on changes for each individual.[12] This partly explains our methodological choice stated below. Table 1 presents descriptive statistics.

A comparison between those who consider themselves overeducated and those that do not (i.e. the first three columns) reveals that the subjectively overeducated are, on average, less satisfied with life. They also earn considerably less money, and are less likely to be married. Both groups have a very similar average amount of schooling. In contrast, the objectively overeducated are slightly more satisfied with life, on average, than the non-objectively overeducated (columns 4, 5 and 6). This is in contrast to the discussion in Section 2.3, however the objectively overeducated also, on average, receive considerably more income: a potential reason for the finding of higher average life satisfaction. The objectively overeducated – expected given how it is measured – have, on average, more years of schooling. Gender, age, and marital status reveal no noteworthy differences between the two groups.[13] Comparing the subjectively overeducated and objectively overeducated reveals that the subjectively overeducated report less life satisfaction and receive less income. Once again indicating that income will be an important control variable for the overeducation-life satisfaction relationship. Table A1 in the Appendix provides the same figures by gender. The big difference is with income, to which we now turn to in a little more detail.

**Table 1.** Descriptive statistics for the overeducated and non-overeducated. KLIPS data 1998–2015.

| | (1. Subjective measure) | | | (2. Objective measure) | | |
|---|---|---|---|---|---|---|
| | Overeducated | Matched | Undereducated | Overeducated | Matched | Undereducated |
| **Life Satisfaction (1-5)** | 3.22 | 3.45 | 3.51 | 3.46 | 3.39 | 3.41 |
| **Years of Schooling (ISECD)** | 13.83 | 13.92 | 14.02 | 16.54 | 13.93 | 12.39 |
| **Real Disposable Income** | 2036.19 | 2591.15 | 2571.61 | 2788.65 | 2565.58 | 2236.33 |
| **Female** | 35.7% | 41.9% | 38.6% | 29.9% | 37.8% | 54.8% |
| **Male** | 64.3% | 58.1% | 61.4% | 70.1% | 62.2% | 45.2% |
| **Age** | 28.5 | 29.6 | 29.0 | 29.6 | 29.4 | 29.0 |
| **Single** | 62.8% | 53.6% | 55.7% | 55.1% | 55.2% | 56.6% |
| **Married** | 35.7% | 45.3% | 42.9% | 44.4% | 43.7% | 41.8% |
| **Separated** | 0.4% | 0.2% | 0 | 0.02% | 0.2% | 0.2% |
| **Divorced** | 0.9% | 0.8% | 1.3% | 0.4% | 0.8% | 1.3% |
| **Widowed** | 0.07% | 0.04% | 0 | 0% | 0.06% | 0.03% |

Note: Life satisfaction is positively coded; real disposable income is annual and measured in units of 10,000 Won (which is about 7.5 euros); years of schooling is the standard ISECD measure; the rest are binary variables.

Table 2 provides averages for after tax real income by gender separately and also for the whole sample. The differences in income for the genders are striking and, furthermore, the averages in our sample reflect official statistics for the average incomes of females and males in Korea.

Table 2 shows that, in all six categories, females receive substantially less real income after tax than males.[14] Our discussion above suggests that, controlling for income (and other commonly control variables in life satisfaction estimations), the expected negative association of being overeducated with life satisfaction will be lower for females. However, not controlling for income may change this picture given the much lower average wages females earn. Table 2 also shows that the average income for subjectively (objectively) overeducated people are lower (higher) than those who are not. Thus, it is conceivable that individuals deciding that they have too much education for their job might be responding to what they consider to be their low pay; certainly, as Table 1 shows, the subjectively overeducated and not subjectively overeducated (matched and undereducated) have, on average, only a negligible difference with their actual years of schooling (despite the large pay differentials). Also noteworthy is the finding that the objectively overeducated, on average, receive more income than the objectively not overeducated, and also on average receive more than the subjectively overeducated. These substantial income differences highlight the importance of not just relying on subjective measures of overeducation and of carefully considering the role of income in any investigation of overeducation.

Ideally, for our estimation technique we would exploit the longitudinal nature of the dataset. However, with one exception we are unable to. With the realised matches measure of overeducation individuals rarely move from not being overeducated to being appropriately educated or back, thus problematic for fixed effects estimation.[15] One solution to a lack of within variation is to employ dynamic panel estimation techniques like System General Method of Moments (GMM). The obtained coefficients from this estimator fully support the results presented below, though the diagnostic testing of the models indicate that much caution is necessary if this technique used for this investigation.[16] As a consequence, for all of the estimates for objective overeducation we use ordered probit analysis taking account of the ordinal nature of the dependent variable, even if we cannot take into account individual unobserved heterogeneity (for reasons just given). We present the coefficients obtained by the estimations and the key marginal effects calculated post-estimation. For comparison purposes, we employ the same method for the subjective measure of overeducation too. Given that there is sufficient 'within' variation with the subjective measure, we first assess this via fixed effects analysis, and then proceed to the ordered probit estimations of both measures of overeducation. Given the importance of income (see Table 2), we undertake – for each measure of overeducation – two estimations: one that controls for income and one that does not.[17]

## 4. Results

Table 3 presents the results from fixed effects estimation for the subjective measure of overeducation. There are two columns for each group: all, female and male. The first column for each group does not control for individual income, whereas the second does. To recap, our subjective

**Table 2.** Mean (and standard deviation) of annual real after tax income, 10,000 South Korean Won. KLIPS data 1998–2015.

| | (1. Females) Real after tax income | (2. Males) Real after tax income | (3. All) Real after tax income |
|---|---|---|---|
| **Subjectively overeducated** | 1695.76 (1167.76) | 2207.46 (1303.04) | 2036.19 (1282.17) |
| **Subjectively matched** | 2090.07 (1182.76) | 2935.84 (1635.98) | 2591.15 (1525.91) |
| **Subjectively undereducated** | 2138.50 (1293.27) | 2827.13 (1736.08) | 2571.61 (1619.09) |
| **Objectively overeducated** | 2266.05 (1332.25) | 2960.92 (1619.03) | 2788.65 (1656.87) |
| **Objectively matched** | 2067.59 (1246.70) | 2781.88 (1604.11) | 2565.58 (1577.60) |
| **Objectively undereducated** | 1882.30 (968.99) | 2646.05 (1322.68) | 2236.33 (1200.13) |

**Table 3.** Fixed effect coefficients from Korean Panel data. KLIPS data 2002–2016.

| | (1. All) Life Satisfaction | (2. All) Life Satisfaction | (3. Females) Life Satisfaction | (4. Females) Life Satisfaction | (5. Males) Life Satisfaction | (6. Males) Life Satisfaction |
|---|---|---|---|---|---|---|
| **Subjectively overeducated** | −0.086*** | −0.071*** | −0.065*** | −0.024 | −0.099*** | −0.095*** |
| | (0.010) | (0.011) | (0.015) | (0.019) | (0.012) | (0.014) |
| **Subjectively undereducated** | 0.049** (0.025) | 0.033 | 0.059 | 0.065 (0.048) | 0.039 (0.032) | 0.013 (0.036) |
| | | (0.029) | (0.040) | | | |
| **Years of Schooling** | 0.019 | 0.005 | 0.021 | 0.005 | 0.017 | 0.006 |
| | (0.007) | (0.009) | (0.010) | (0.013) | (0.011) | (0.013) |
| **Real Pre-tax Income** | – | 0.00004*** | – | 0.003*** | – | 0.004*** |
| | – | (0.000) | – | (0.000) | – | (0.000) |
| **Age** | 0.077*** | 0.078*** | 0.077** | 0.078** | 0.075** | 0.068** |
| | (0.022) | (0.025) | (0.033) | (0.038) | (0.029) | (0.034) |
| **Age$^2$** | −0.001*** | −0.001*** | −0.001*** | −0.001*** | −0.001*** | −0.001** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| **Married** | 0.168*** | 0.177*** | 0.177*** | 0.189*** | 0.162*** | 0.167*** |
| | (0.013) | (0.016) | (0.022) | (0.025) | (0.017) | (0.020) |
| **Separated** | −0.067 | −0.016 | 0.055 | 0.257* | −0.243* | −0.369** |
| | (0.084) | (0.100) | (0.110) | (0.133) | (0.132) | (0.153) |
| **Divorced** | −0.133*** | −0.082 | −0.115* | −0.019 | −0.142* | −0.126 |
| | (0.049) | (0.060) | (0.066) | (0.083) | (0.074) | (0.086) |
| **Widowed** | −0.556 | −0.488 | −0.504 | −0.483 | −0.649 | – |
| | (0.310) | (0.366) | (0.373) | (0.366) | (0.551) | – |
| **Constant** | 1.872*** | 1.693*** | 1.895*** | 1.095*** | 1.925*** | 1.856* |
| | (0.750) | (0.803) | (1.126) | (1.318) | (1.008) | (1.050) |
| **Observations** | 31,960 | 23,445 | 12,958 | 9,217 | 19,002 | 14,228 |
| **Individuals** | 7,425 | 5,904 | 3,235 | 2,509 | 4,190 | 3,395 |
| **$R^2$** | 0.043 | 0.037 | 0.053 | 0.044 | 0.039 | 0.037 |

Note: Robust standard errors in parentheses, ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Income unit is 1,000,000 Won (about 750 euros). Reference category: single. Region and year controls included.

overeducation variable captures changes of how an individual perceives their level of work compared to the education they have: individuals are subjectively overeducated if they rate the level of work in comparison to their education as low or very low.

For everyone together and males separately, subjective overeducation is associated with lower life satisfaction. However, for females the situation is less clear cut and supports the speculation based on the descriptive statistics in Table 2. That is, the dissatisfaction that females report with the level of their job compared to their education level may reflect their relatively low salary, at least in part. When real disposable income is not controlled for (column 3), subjectively overeducated females are less happy than females who do not report being overeducated for their jobs. However, this difference is no longer significant when income is controlled for (column 4).[18] Thus income does seem to play a role in the judgement of Korean females regarding the requirement of their job compared to their education level. For males, even though Table 2 shows us that the subjectively overeducated have substantially less income than the subjectively not-overeducated, income does not modify the overeducation life satisfaction relationship. Thus, for subjective overeducation in Korea we uncover a substantial gender difference.[19]

Given that these coefficients are obtained by fixed effects analysis, subjective overeducation (and undereducation) in Table 3 are identified by changes for the same individuals between one year and another. These changes are most likely either about job change or changes in job tasks rather than education level (given that such changes are less common for individuals in employment, post formal education).[20] Years of schooling is controlled for in the analysis, however (and perhaps unsurprisingly), not taking it into account barely changes the obtained coefficients. Furthermore, while the job tasks information in the KLIPS dataset does not permit further analysis, it is possible to additionally control for whether a worker has started a new job. Doing so also results in negligible change for the overeducation and undereducation coefficients. In contrast, pooling the data and using standard OLS regression results in coefficient sizes for overeducation which are approximately double those of Table 3. This increase in size might, in part, reflect previously controlled for potential time invariant characteristics like personality traits which may lead to individuals being particularly likely to be overeducated or undereducated or at least more likely to report being so.

We now turn to the objective realised matches variable, which only has a low positive correlation with this subjective measure (approximately 0.1). This may be, partly, a result of occupational crowding, gender discrimination and resulting societal norms. Table 4 presents ordered probit analysis regarding life satisfaction and investigates objective overeducation. The columns follow the same pattern as Table 3, and given the higher level of income of the objectively overeducated we are looking at two things: are the overeducated less satisfied with life than those not overeducated; and does the higher income compensate for any life satisfaction penalty due to being overeducated (if such a penalty is found).[21]

Ceteris paribus, Table 4 reveals that the more years of schooling a Korean individual has, the more satisfied with their life they are. However, controlling for this, if they are overeducated they are less satisfied than those who are 'matched' with respect to their education and job. With and without the income control, based on the size and confidence intervals of the coefficients obtained for objective overeducation, males, as expected, suffer a greater happiness penalty than females. Thus the higher income of the objectively overeducated (see Table 2) does not seem to offer much compensation in terms of life satisfaction. For comparison purposes, Table A2 in the Appendix shows the same table for the subjective measure of overeducation. Here we simply note no substantial difference for the main variables of interest.

Table 5 presents the marginal effects associated with overeducation. The main findings are that (objectively and subjectively) overeducated individuals are less likely to be satisfied with life and more likely to be neither satisfied nor dissatisfied with life than matched individuals. This is the case for both genders and whether income is controlled for or not. For individuals who are either

**Table 4.** Life satisfaction and objective overeducation. Ordered probit analysis results. KLIPS data 2002–2016.

| | (1. All) Life Satisfaction | (2. All) Life Satisfaction | (3. Females) Life Satisfaction | (4. Females) Life Satisfaction | (5. Males) Life Satisfaction | (6. Males) Life Satisfaction |
|---|---|---|---|---|---|---|
| **Objectively overeducated** | −0.336*** | −0.324*** | −0.199*** | −0.152*** | −0.358*** | −0.345*** |
| | (0.039) | (0.046) | (0.051) | (0.063) | (0.048) | (0.056) |
| **Objectively undereducated** | 0.275*** | 0.269*** | 0.174*** (0.035) | 0.139*** (0.040) | 0.249*** (0.033) | 0.228*** (0.036) |
| | (0.024) | (0.027) | | | | |
| **Years of Schooling** | 0.182*** | 0.160*** | 0.159*** | 0.128*** | 0.178*** | 0.152*** |
| | (0.008) | (0.010) | (0.012) | (0.015) | (0.010) | (0.011) |
| **Real Income** | - | 0.000*** | - | 0.000*** | - | 0.000*** |
| | - | (0.000) | - | (0.000) | - | (0.000) |
| **Constant Cut1** | −0.069 | −0.420 | 0.996 | −0.429 | −0.147 | −0.272 |
| | (0.440) | (0.571) | (0.677) | (0.934) | (0.644) | (0.785) |
| **Constant Cut2** | 1.263*** | 0.921 | 2.297*** | 1.006 | 1.203* | 1.058 |
| | (0.438) | (0.567) | (0.674) | (0.925) | (0.641) | (0.781) |
| **Constant Cut3** | 3.351*** | 3.041*** | 4.349*** | 3.077*** | 3.330*** | 3.211*** |
| | (0.439) | (0.567) | (0.674) | (0.925) | (0.641) | (0.782) |
| **Constant Cut4** | 5.943*** | 5.761*** | 6.965*** | 5.816*** | 5.932*** | 5.929*** |
| | (0.440) | (0.568) | (0.713) | (0.927) | (0.642) | (0.783) |
| **Observations** | 32,159 | 23,488 | 13,079 | 9,246 | 19,080 | 14,242 |

Note: Robust standard errors, clustered at the individual level, in parentheses, ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Controls as Table 3. See Table 3 note.

**Table 5.** Marginal effects post ordered probit estimation. KLIPS data 2002–2016.

| | (1. All) No income control | (2. All) Income control | (3. Females) No income control | (4. Females) Income control | (5. Males) No income control | (6. Males) Income control |
|---|---|---|---|---|---|---|
| **Subjectively overeducated** | | | | | | |
| Very Satisfied | −0.004*** | −0.004*** | −0.004*** | −0.003*** | −0.004*** | −0.004*** |
| Satisfied | −0.161*** | −0.147*** | −0.134*** | −0.091*** | −0.169*** | −0.164*** |
| Neither | 0.141*** | 0.135*** | 0.119*** | 0.084*** | 0.147*** | 0.150*** |
| Dissatisfied | 0.023*** | 0.015*** | 0.019*** | 0.009*** | 0.025*** | 0.014*** |
| Very Dissatisfied | 0.000*** | 0.000*** | 0.001*** | 0.000** | 0.001*** | 0.000*** |
| **Subjectively undereducated** | | | | | | |
| Very Satisfied | −0.001** | 0.003 | −0.001* | 0.002 | 0.001 | 0.000 |
| Satisfied | 0.046** | 0.032 | 0.055* | 0.062 | 0.042* | 0.017 |
| Neither | −0.041** | −0.030 | −0.049* | −0.057 | −0.037* | −0.016 |
| Dissatisfied | −0.007** | −0.003 | −0.008* | −0.006 | −0.006* | −0.002 |
| Very Dissatisfied | −0.001** | −0.000 | −0.000 | −0.000 | −0.000 | −0.000 |
| **Objectively overeducated** | | | | | | |
| Very Satisfied | −0.003*** | −0.003*** | −0.002*** | −0.002*** | −0.003*** | −0.003*** |
| Satisfied | −0.130*** | −0.126*** | −0.077*** | −0.059*** | −0.137*** | −0.135*** |
| Neither | 0.113*** | 0.116*** | 0.064*** | 0.050*** | 0.119*** | 0.123*** |
| Dissatisfied | 0.019*** | 0.013*** | 0.011*** | 0.006*** | 0.021*** | 0.014*** |
| Very Dissatisfied | 0.001*** | 0.000*** | 0.000*** | 0.000* | 0.001*** | 0.000*** |
| **Objectively undereducated** | | | | | | |
| Very Satisfied | 0.003*** | 0.003*** | 0.002*** | 0.002*** | 0.002*** | 0.002*** |
| Satisfied | 0.106*** | 0.105*** | 0.067*** | 0.054*** | 0.096*** | 0.089*** |
| Neither | −0.092*** | −0.096*** | −0.059*** | −0.054*** | −0.083*** | −0.081*** |
| Dissatisfied | −0.016*** | −0.011*** | −0.010*** | −0.006*** | −0.015*** | −0.009*** |
| Very Dissatisfied | −0.001*** | −0.000*** | −0.000*** | −0.000* | −0.000*** | −0.000*** |

Note: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. See previous tables for controls.

very satisfied or very dissatisfied with life, there is negligible change with respect to being overeducated rather than being matched. This result supports the similar finding that there is little movement at the extremes of the well-being distribution found by Salinas-Jiménez, Artés, and Salinas-Jiménez (2016).

The marginal effects of Table 5 also highlight that Korean males are more affected by overeducation than females. This is in line with the arguments advanced in Section 2: males, in a male dominated society with more opportunities and better pay than females, suffer more when their investments in education are not sufficiently rewarded in a (favourable) labour market; overeducated females are also affected, though the percentage changes are lower. For both genders, controlling for income moderates the overall findings: given the considerably lower average incomes earned by females, controlling for income has a bigger impact on the marginal effects for being overeducated than it does for males. A claim made based on a comparison of the changes between the third and fourth column (i.e. females) and fifth and sixth column (males).

The results above indicate that the previously found and hence expected overall (i.e. both genders together) relationship between overeducation and life satisfaction is found. In all tables we see evidence that those who are overeducated are less satisfied with life than those who are matched or undereducated. Above we put forward the possibility that this relationship might differ by gender: that females may suffer less than males from overeducation because they are used to the gender inequality in Korea and thus have lower aspirations. The tables suggest that this is so, though a more direct check can be made by interacting overeducation with female and seeing if there is a statistically significant effect for the interaction term. Table 6 presents the key

**Table 6.** Overeducation and life satisfaction, with gender interaction terms. KLIPS data 1998–2016.

| | 1<br>No income control | 2<br>Income control |
|---|---|---|
| **Objectively overeducated** | | |
| Overeducated | −0.377*** | −0.384*** |
| | (0.043) | (0.050) |
| Overeducated*female | 0.145*** | 0.243*** |
| | (0.050) | (0.069) |
| Undereducated | 0.232*** | 0.188*** |
| | (0.032) | (0.035) |
| Undereducated*female | 0.068** | 0.145*** |
| | (0.038) | (0.042) |

Note: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Controls as Table 3.

results for a rerun of our basic realised matches estimate (i.e. Table 4, columns 1 and 2) with the addition of this interaction term.

Table 6 clearly indicates support for our proposition. The overeducated are less satisfied with life than those in a job appropriate to their education level (and the undereducated). The interaction term means that overeducated females are more satisfied with life than males. This is the same whether income is controlled for or not. Furthermore, we note that when income is controlled for, i.e. not allowed to influence life satisfaction, the ordered probit coefficient for overeducated females is larger. This is unsurprising, and a further indication of gender inequality. The differences in expectations between the genders can be tested in a further way.

In line with the notion that the negative association with overeducation might fade over time as more peers are also overeducated, we investigated overeducation at two different points in time (similar to Piper 2015, which found this with British panel data). The two points in time are 2002–2006, the first five years of available data, and 2012–2016, the last five years of available data, at the time of writing. In most cases, the results are largely in line with those of Table 5. An exception is found in the later period for females, and the marginal effects (for both periods) are presented in Table 7 and subsequently.[22]

The key difference here is that in the more recent period there is no statistically significant difference in life satisfaction between overeducated and matched females in terms of life satisfaction.[23] This possibly reflects both the social comparison effect and the lower expectations of success in the labour market given gender inequality and social norm expectations about motherhood. Females engage in higher education even though they do not necessarily expect this to be rewarded in the labour market, Furthermore, in the later period, they are less alone with their overeducation status, given the increases in participation and completion of tertiary education courses (see Figure 1). This could be an important explanation for the found lack of statistical significance (last two columns of Table 7). In contrast, overeducated males remain less satisfied with life in both periods of time. Again, a result indicative of gender inequality in the Korean society.

**Table 7.** Overeducation and life satisfaction (females only), marginal effects at the mean, 2002–2006; 2012–2016. KLIPS data 1998–2016.

| | (1. 2002–2006)<br>No income control | (2. 2002–2006)<br>Income control | (3. 2012–2016)<br>No income control | (4. 2012–2016)<br>Income control |
|---|---|---|---|---|
| **Objectively overeducated** | | | | |
| Very Satisfied | −0.003*** | −0.004*** | −0.001 | −0.000 |
| Satisfied | −0.119*** | −0.128*** | −0.045 | −0.029 |
| Neither | 0.093*** | 0.110*** | 0.043 | 0.028 |
| Dissatisfied | 0.029*** | 0.022*** | 0.003 | 0.002 |
| Very Dissatisfied | 0.001*** | 0.000 | 0.000 | 0.000 |

Note: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Controls as in Table 3.

## 5. Concluding discussion

> The world had changed a great deal, but the little rules, contracts and customs had not, which meant the world hadn't actually changed at all. […] Do laws and institutions change values, or do values drive laws and institutions? *Kim Jiyoung, Born 1982*, Cho 2020, 119–120

Overeducated Koreans are less satisfied with life than those not overeducated, and this lower life satisfaction association is stronger for males than females. Such a result is consistent with males having higher expectations from the labour market than females, expectations presumably borne out of experience. Despite females being better educated, in general, they suffer from labour market (and other) discrimination as recorded by organisations including the OECD and the World Economic Forum. This gender difference finding is a robust one, being consistent regardless of (objective) overeducation being calculated in different ways, considering combinations of occupation, industry, year and gender, and held whether the sample was restricted to younger individuals or not. How income was treated (individual pre-tax, individual post-tax, household), whether subjective health status or whether they live in a household with children were controlled for or not did not affected the key findings.

In line with other researchers, we find a substantial size difference between different ways of measuring overeducation. Those who feel themselves to be subjectively overeducated have a larger negative association with life satisfaction than those who are classified as objectively overeducated (in comparison to the respective not overeducated categories). In our study, the role of income provides a further example of the danger in relying on just one method (particularly if it is subjective) of measuring overeducation. For females, their much lower average income appears to explain somewhat the (subjective) self-reporting that the demands of their job are too low for the education they have. For males, taking income into consideration makes at most negligible difference. In contrast, those overeducated according to the various (objective) realised matches measures are paid considerably more than the not objectively overeducated (see Table 2),and are only slightly compensated (in terms of well-being) by this larger salary regardless of gender. In general, and in line with the discussion of Sections 1 and 2, we find that males have, ceteris paribus and on average, a larger negative association with being overeducated than females, a result concomitant with lower expectations of females induced by discrimination, despite the higher average level of education.

There are some limitations (and therefore suggestions for future research if possible to undertake) of this work as some issues could not be addressed with the KLIPS dataset. For instance, it is difficult to know if individuals who perceive themselves to be overeducated see it as their own fault or the fault of Korean society. Given Korea's vast gender inequality, these two possibilities may show systematic differences for the negative relationship between being overeducated and life satisfaction. Similarly, we cannot ascertain if individuals choose to be overeducated on purpose, perhaps as insurance in the labour market, or because they were previously studying their passion rather than anything that they expected to help them secure a good job. Again, these may have different consequences for the well-being of the overeducated. In general, the overeducated are likely to be heterogeneous and we rely on average effects for our results. Future research might endeavour to learn who the overeducated compare themselves with and explore the well-being associations with respect to different comparison groups. A qualitative study where the overeducated are interviewed may supplement this research and find nuance that we might miss.

Also given the dataset, we were also unable to address the possibility that individuals with a migration background may find it harder to secure work which suits their education, perhaps due to labour market discrimination or unrecognised qualifications (Wen and Maani 2018; Bijedić and Piper 2019). The overeducated may be pushed into self-employment, or may even leave Korea to take up more fitting employment abroad.[24] Information about children is seemingly complex in the KLIPS dataset, though none of the results are any different with the additional inclusion of a

control for children in the household. Motherhood thus also remains an interesting issue for future research to address, particularly in the context of Korea.

Overall, the issue of overeducation in Korea is a serious one that cannot be solved well without addressing the presence of significant gender inequalities in the country. One clear message is that by addressing gender inequality, both females *and* males should benefit. A more level playing field between males and females may attenuate the reduction in life satisfaction felt by males (due to tempered expectations and pressure related to obtaining a good job and being the breadwinner) and help the Korean economy and society by better utilising the human capital of the well-educated female population.

## Notes

1. In common with much of the academic literature, in the remainder of this article we will refer to South Korea as Korea.
2. Statistics also show that participation and completion at levels of education lower than tertiary have also increased over the same time period (World Bank 2020a, 2020b).
3. In an attempt to tackle this imbalance, a continual effort to generate better opportunities for 'jobless graduates' has been underway. As just one well-known example, the former president (2013–2017) of South Korea, Geunhye Park, has designed the 'K-Move' programme, which aims to support thousands of graduates in seeking a job abroad, offering training and aid for overseas business start-ups (Kim 2018). Recent statistics presented in a news report by Yang and Kim (2019) indicate that, as of 2018, around 6,000 Korean graduates work overseas with such government help.
4. This figure is broadly similar to that in many other countries though, as the next section explains, the incidence of overeducation depends upon how it is measured.
5. These Koreans graduated from a college with two years. The study also looked at graduates from four-year colleges and earners of graduate degrees.
6. This possibility is similar to the finding of Clark (2003) regarding comparison effects for the unemployed: unemployed individuals who live in areas of high unemployment suffer less than unemployed individuals who live in areas with low unemployment.
7. Traditional Confucianism sees education as a key variable for success and this can result in high educational pressure on Korean students.
8. Please see https://www.kli.re.kr/klips_eng/index.do for more information and access to the data.
9. Details are here: http://uis.unesco.org/en/isced-mappings.
10. If any of these groups has more than one mode, we use the highest in our calculations.
11. The youngest worker in our sample is 15, though only 0.05% of our sample is under 18 years old.
12. Furthermore, as Chadi and Hetschko (2021) show, there is often a honeymoon effect with new jobs that can result in higher life satisfaction. Dependent upon whether a change in job categorises someone as moving from being overeducated to matched or vice versa, the honeymoon effect can bias the result.
13. The descriptive statistics indicate that there is also no difference between the overeducated and not overeducated for health status, however health status is only available in many waves of the dataset as a subjective measure and is not included in our analysis. This lack of difference is unsurprising, given the nature of the sample (no older than 35, almost all in full-time employment). Some scholars claim that subjective health, in a subjective well-being context, falls into the category of a bad control (Angrist and Pischke 2008). All results presented, however, are robust to the inclusion or exclusion of subjective health status.
14. Information about whether an individual works full or part-time only appears in a few of the later waves so this is not included in our analysis. The vast majority of workers interviewed as part of this survey are full-time.
15. Random effects estimation is rarely supported in a life satisfaction context, and this investigation is no exception.
16. The obtained coefficients reveal that 'realized matches' overeducation is negative and statistically significant (for the main model the coefficient is −0.138, with the z statistic being −8.41), but the diagnostic testing of the models is not supportive of its use for this investigation.
17. We also undertake all of the objective overeducation estimations again, narrowing down the comparator group to members of the same sex (as well as occupation-industry-year combination) though, as Table 5 shows, this does not make much difference to the results obtained.
18. Caution is necessary with this conclusion however, because when ordered probit estimation is used – see Table A2 in the Appendix – subjectively overeducated female Koreans are still less satisfied with life, when income is taken into account, than those who do not consider themselves overeducated. Furthermore, pooled OLS supports this ordered probit conclusion.

19. The changes between the columns for the constant term may be indicative of the gender inequalities discussed in Sections 1 and 2 and support the gender based findings and arguments of Park and Huebner (2005).
20. The changes could also reflect a change in any subjective reporting function or any measuring error.
21. Additionally, controlling for mother and father's education has almost no impact on the results presented here (and in the previous table).
22. For both genders together, and makes, the results are similar to those found in table 5 for the whole period in both time periods.
23. The *p*-values for these particular marginal effects are approximately 0.16.
24. This seems to be happening: as mentioned in the Introduction, thousands of Koreans take part in the 'K-Move' programme which helps the young graduates to find a job abroad (Kim 2018).

## Acknowledgements

We are grateful for useful comments and suggestions from Nick Adnett, Tobias Halfpaap, Antje Jantsch and SeEun Jung, two anonymous reviewers, and the editor, Colin Green. We also thank participants of the inaugural Berlin Well-Being Research Network held at the Freie Universität Berlin (October 2019) and the STATEC Well-Being Conference 2022 for useful comments and kind words about the presentations. We are grateful for the collectors and maintainers of the data we use, the Korean Labour and Income Panel Survey. We also acknowledge the recent novel *Kim Jiyoung, Born 1982* written by Nam-Joo Cho, which is concerned with some of the issues we discuss.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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