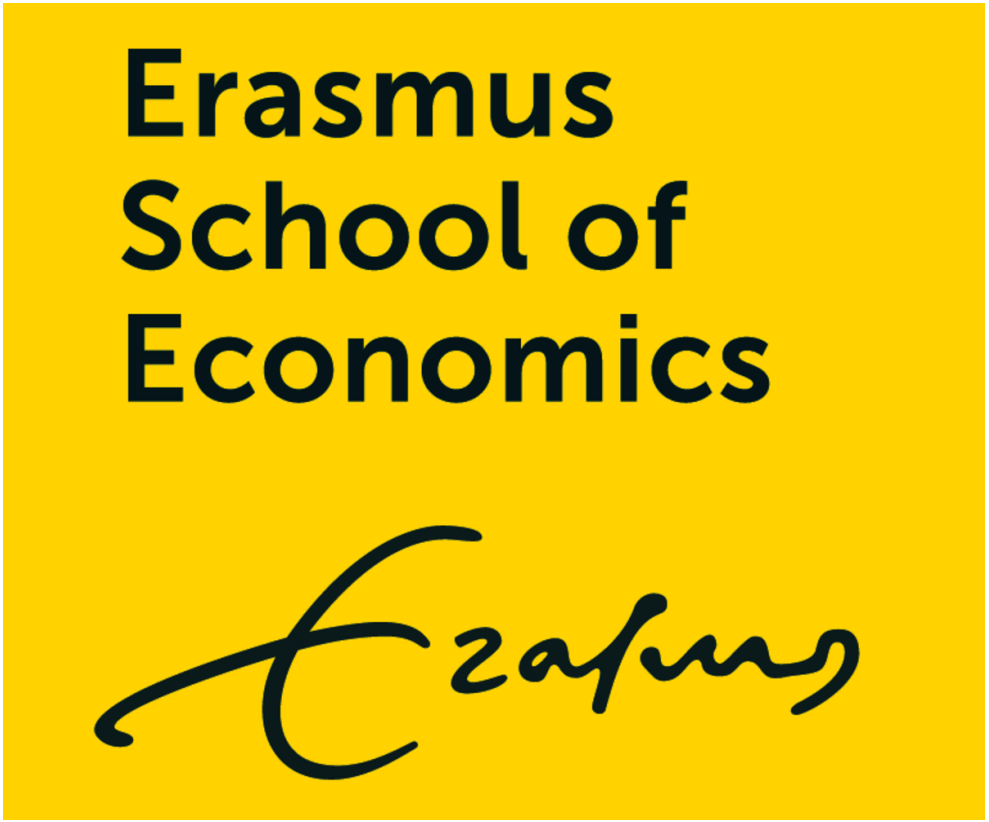

Bachelor Thesis

How does the choice of field of study among second or higher education graduates influence their decision to engage in self-employment versus traditional employment?

Author's name: Hayato Uechi

Student number: 589062

Study program: International Bachelor Economics and Business Economics

Thesis supervisor: Phan Vinh

July 28, 2024

Abstract

In this paper, I examine how the field of study among second or higher education graduates influences their employment choices between self-employment and traditional employment. Using cross-sectional data, I found that individuals who graduated from the fields such as Art and Agriculture, Forestry, and Environment are more likely to engage in self-employment compared to graduates from general or nonspecific fields. In addition, socioeconomic factors including age and educational background significantly interact with certain fields of study and influence the choice of employment type. These findings indicate the importance of considering both educational factors and socioeconomic factors to understand the relationship between the field of study and career path. This would be beneficial for educators, policymakers, and career counselors as it can help them better support graduates in navigating the evolving job market.

Table Of Contents

Introduction

Background

In the last few decades, the improvement of technology and economics changes, and the development of workforce needs have been playing an important role in changing the job market. One of the most significant trends is growing intentions toward self-employment or entrepreneurship among second or higher education graduates. This shift shows the change of society where individuals prefer more flexible and independent employment types rather than traditional employment choice. The transition from university to the workforce can be considered as a significant phase in the lives of graduates because they might face a lot of challenges and complexity concerning their career path. The growth of intentions towards self-employment and entrepreneurship has continued to increase due to the emergence of the gig economy, rise of remote work, and the expansion of digital platforms (Lemma, 2014).

It is well understood that the type of career paths offered by higher education institutions is significant. The field of study is also very relevant in this context as it determines what kind of knowledge and skills a graduate gains, and what kind of prospects and obstacles are awaiting him or her in the field of professional activity. Some fields well known to have a high propensity for self employment include technology, business, and law while some that are known to have a high tendency of having their employees in the traditional manner include fields like humanities and social sciences. For example, people who graduated in fields related to IT may use technology to build their start-ups while those who graduated in business may use their knowledge to launch their own start-ups. On the other hand, humanities graduates are likely to be best suited for careers in teaching, research and government or public services. Understanding how these educational choices impact career outcomes is essential for educators, policymakers, and graduates themselves.

Studying and understanding the factors that have an impact on the choice of employment type has become important since freelance, self-employment, and entrepreneurship are becoming common as mentioned earlier. This understanding is crucial for several reasons: First, the insight which can be obtained through this paper is able to contribute to the improvements of educational policies or systems. These policies and systems could help students to better prepare for a lot of career opportunities including self-employment. Secondly, understanding the factors that facilitate the intention of self-employment will be valuable for policy makers when they try to plan favorable

policies for individuals who are self-employed and start-ups which could lead to economic growth and creation of new employment. Lastly, this research can assist career counselors and academic advisors in giving proper counseling to the students to choose their field of study in line with their career preferences. These points emphasize the importance of this research in terms of guiding educational and economic policies to respond to the evolving modern job market.

The research question of this study is: “How does the choice of field of study among second or higher education graduates influence their decision to engage in self-employment versus traditional employment?" To analyze the relationship, I set the following objectives. The first is to examine the relationship between field of study and employment status to determine which fields are more likely to lead to self-employment and which to traditional employment. To do this, I use the logistic regression analysis to identify the strength and type of relationship. The second objective is associated with analyzing the role of socio-demographic factors. For instance, I analyze how age and educational background interact with the field of study to influence the type of employment. I expect these demographic factors play a complementary role in better understanding employment choices.

In order to bring out a clear understanding of this research, this paper is divided into the following sections. The Introduction elaborates on the background of the study, its purposes, the research question formulated for it, and the objectives. The Literature Review focuses on studies concerning higher education, various employment types, and impact of the studied field on career choice. The Theoretical Framework introduces key theories relevant to understanding the relationship between field of study and employment choice. Based on the literature review and theoretical framework, hypotheses are formulated. The Methodology section gives an outline of the research methodology that was employed in the study. The Results section discusses descriptive analysis and elaborates on the results of the logistic regression analysis that measures the association of the field of study or demographics and employment type. The Discussion provides an understanding of the findings in the context of the research question, a comparison with the findings from the literature review, and the consideration of the theoretical, practical, and policy implications of the findings. It also acknowledges the research limitations. The Conclusion restates the main findings, addresses the research questions, hypotheses and gives recommendations for future research, policy, and practice.

Literature Review

The paper by Bennion and Locke (2010) focuses on understanding the patterns of employee mobility and its effects in relation to the initial employment in the higher education field. Their study reveals significant variations in how individuals transition from doctoral training to employment across various national contexts. For example, in countries such as the United States of America and Canada, there is very strong representation of the employee with a PhD indicating that these countries have well developed and strong higher education systems where academic job calls for the highest academic qualifications. In contrast, emerging systems such as those in Mexico and Argentina show lower proportions of PhD holders among academics, indicating different pathways and possibly more opportunities for self-employment due to less rigid academic structures.

One of the most significant implications of the research is that students' mobility, both internally and internationally, has a crucial impact on employment choices. Individuals who earn their doctoral degrees abroad often bring diverse perspectives and networks back to their home countries, which can affect their likelihood of pursuing self-employment. For instance, in countries like Malaysia, Hong Kong where many of the academics have received their doctorate overseas, there are increased chances that such persons will engage in entrepreneurial activities upon their return. This pattern shows that international exposure for graduates is important in developing an entrepreneurial mind.

The factor that also has been identified as having a huge influence on the employment decision of graduates is the socioeconomic environment. Bennion and Locke (2010) pointed out that employment protection including contractual status and income securities differ across different countries. Employees laying in well established higher education systems with strong supporting structures stand to benefit from better working conditions and job security thus leading to an incline towards traditional employment. On the other hand, in systems where employment is less secure and more flexible, there is a greater inclination towards self-employment. The field of study plays a massive role in influencing employment opportunities among the graduates. Their research also reveals that individual's study areas have a positive attitude toward self-employment. Areas of specialization that are more attached to the use of knowledge and requirements set by the market, including engineering, information technology, and business are likely to have high rates of self-employment among the graduates. This is because these fields give the skills and information that can be used for entrepreneurship operations directly.

They employ analysis on datasets encompassing higher education systems in 17 countries and the relationship between national policies and structures and employment. For traditional employment, they seem more frequently in the countries focused on the development of the R&D sector like Finland and Germany because of availability of institutional support and funds. These environments contribute to preparation of graduates to take academic and research related careers in institutions. On the other hand, there is a higher tendency of self-employment in countries where their academic system is still in the process of evolving or in a state of transition such as Malaysia and China. Lack of proper institutional support combined with rigid career structures in these regions forces the graduates to look for other means of employment, for example, engaging in entrepreneurship.

Premand et al. (2012) did an experimental study to evaluate the effect of a new entrepreneurship program that was introduced in the universities in Tunisia. This program provides business training and individual tutorials with final year students, and they submit their own business plan instead of thesis to graduate from the university. The results show that students who participated in the program got more intention and were more likely to become self-employed. More specifically, one year after graduation, the students who completed the program had a 46 to 87% higher possibility to become self-employed compared to those who completed the standard program. This increase indicates the effectiveness of the entrepreneurship program for promoting entrepreneurial activities among university graduates. Their research shows that entrepreneurship training programs can have a significant impact on employment outcomes of graduates. This kind of program may lower the barrier to be self-employed and give students opportunities to think about their career path as self-employment or entrepreneurs by offering support and necessary skills. This is important in the environment where there is a high unemployment rate for younger individuals and limited job opportunities in the job market.

Premand et al. (2012) also examines the socioeconomic factors that influence the decision of being self-employed. Their study found that the individuals who participated in the entrepreneurship program improve their practical business skills and network. Additionally, they also increase the interactions with bankers and employment agents. These improved networks promote participants toward self-employment by providing better access to resources and support. When comparing the findings of their research with others, it is highlighted that targeted or tailored entrepreneurship programs play an important role for increase of intention. Conventional education system or program focuses on theoretical knowledge. However, practical business training can address the specific

needs of those who try to start a business. This is especially effective in areas where unemployment is high and gives opportunities to become self-employed instead of ordinary employment. Overall, authors suggest to policymakers the importance of encouraging entrepreneurship education as one of the higher education programs. Through Integrating business training and personal tutorials with university programs, educational institutions can help students prepare to meet the demands of the job market. This approach could improve entrepreneurship and enhance innovation, which may contribute to economic development eventually.

About the entrepreneurship education programmes, Huber et al. (2014) explain that the early entrepreneurship education has an impact in the development of the non-cognitive dispositions, entrepreneurial traits. This study employed a randomized field experiment through the BizWorld program in the verification of the study and discovered that such education programs can improve the skills, including risk-taking propensity, creativity and self-efficacy of students in the primary school. This is an important conclusion as it indicates that non-cognitive skills, which are important for entrepreneurial activity, can be improved through improvement of academic personal and social skills in the early age of childhood (Huber et al., 2014). They argue that their study is different from past reviews of entrepreneurial education because such reviews mostly concerned adolescents and yielded rather ambiguous outcomes. For example, Peterman and Kennedy (2003) and Souitaris et al. (2007) detected positive outcomes concerning the subsequent intentions of secondary school students, whereas Oosterbeek et al. (2010) did not observe significant enhancement of the mini-company program concerning the development of entrepreneurial skills. Huber et al. (2014) attribute their more positive findings to the early age of the participants, aligning with Cunha and Heckman's (2007) model that emphasizes the effectiveness of early investments in skill development.

Salas-Velasco (2023) analyzed the occupational choice made by recent university graduates in Spain. Author used a binomial logit model to estimate probabilities to be self-employed. The findings show that likelihood of self-employment is varied across the field of study and indicate that individual sociodemographic factors have an impact on the decision of occupational choice. More specifically, the analysis shows that graduates from the field of study such as Odontology, Physiotherapy, Architecture, Law, Fine Arts, Pharmacy, and Psychology are more likely to be self-employed compared to those who majored in other fields. These fields often contain practical skills and knowledge that can be used for entrepreneurship. Therefore, self-employment is considered as one of the possible career paths. In contrast, graduates with degrees in Economics, Business, and Finance are less likely

to become self-employed even though they have relatively higher financial literacy. This is because such fields have more attractive job opportunities in the traditional employment sector. Author also examined the impact of socioeconomic factors on the occupational choice among graduates and found that it plays an important role in the decision of employment choice. For example, the findings highlight that age, family background, and gender have a significant impact on the decision. Women are less likely to become self-employed compared to men. This result aligns with the empirical results which show the gender differences in entrepreneurial activities. Additionally, graduates whose mother has a university degree tend to be self-employed, indicating the importance of family background and social capital in increasing entrepreneurial intention. The analysis of likelihood of self-employment among graduates with different fields of study can provide an important insight with policymakers. The findings show that graduates with degrees in the fields which are associated with professional autonomy and specialized skills have a higher rate to be self-employed. This trend suggests that targeted support towards such fields could further enhance the entrepreneurial outcomes. Furthermore, by addressing the gender gap for entrepreneurial activities and providing financial support and resources to young entrepreneurs, it can create a creative favorable environment for self-employment.

Theoretical framework

The theoretical framework for this research is based on several key theories that could play a role in explaining the relationship between the field of study and employment type.

Human capital theory

Human capital theory proposed by Becker (1964) explains that an individual's economic outcome is significantly influenced by education, skills, and experiences. According to this theory, education provides necessary skills and knowledge to individuals and it increases their productivity and future earnings. Graduates from fields which require a high level of creativity such as art or design may have unique and special skills for entrepreneurship. These creative skills might lead to innovative business ideas and increase in ability to work independently, which results in higher likelihood of self-employment. Based on this, I formulated the following hypothesis:

Hypothesis 1

Graduates from fields requiring high levels of creativity, such as Art and Design, are more likely to engage in self-employment compared to graduates from fields which do not need so much creativity.

Career development theory

Career development theory introduced by Super (1990) proposes that career choices and development are influenced by personal experiences, maturity, and life stages. According to this theory, people go through life stages of growth, exploration, independence, maintenance, and decline. Older people are in the stage of independence or maintenance and likely to have more resources, skills, and experiences compared to younger ones. With this theory, I focus on certain fields such as Art and Agriculture for this hypothesis. Career maturity is important for self-employment. In practical and creative fields like agriculture and art, developing hands-on skills and creativity takes time and it is helped by experience and maturity. Older graduates in these fields have gained practical skills and built networks, making them better at self-employment. This is especially true in agriculture, where managing a farm or business requires technical know-how and experience with market fluctuations, weather, and long-term planning. Similarly, in art, experienced artists often understand their market, have more refined skills, and have a stronger personal brand, which are critical for successful self-employment.

Hypothesis 2

Graduates from practical and creative fields, such as Agriculture and Art, are more likely to engage in self-employment as they age, compared to graduates from less practical fields.

Social cognitive career theory

Social cognitive career theory developed by Lent, Brown, and Hackett (1994) explains the role of self-efficacy, outcome expectations, and goals in terms of career development. This theory suggests that individuals with high self-efficacy and high outcome expectations are more likely to make an effort to achieve challenging goals. This includes self-employment. Higher education is expected to increase self-efficacy and expectations and result in an increase of self-employment. Graduates with higher education levels may have confidence and skills to survive as self-employed.

Hypothesis 3

Graduates with higher levels of education are more likely to engage in self-employment compared to graduates with lower levels of education in the same fields.

Cumulative advantage theory

Cumulative advantage theory proposes that initial advantages that individuals have could lead to further advantages over time and result in increasing differences between individuals. This mechanism explains how those who start with certain advantages, such as higher education and working experiences, accumulate more benefits throughout their careers (DiPrete and Eirich, 2006).

Hypothesis 4

The combined effect of age and education significantly influences self-employment likelihood. Older graduates with higher levels of education are more likely to engage in self-employment compared to younger graduates with lower levels of education.

Methodology

Research Design

In this paper, I utilize logistic regression analysis to investigate the relationship between the field of study and the employment outcome. Logistic regression allows me to understand the impact of the field of study on graduate's likelihood of being self-employed.

Data Source

The population sample selected for this study is extracted from the Longitudinal Internet Studies for the Social Sciences (LISS) panel dataset. The LISS panel is a high-quality, well-organized survey that has a large number of questions concerning employment status, education, and other demographic characteristics. The panel is based upon a true-probability sample of households selected from the Dutch population register by Statistics Netherlands. The data is collected from self-administered

web-surveys which are filled out each month by the panel members and the members. The cross-sectional data has been active since October 2007, thus collecting longitudinal data for analysis over the years.

Variables and Measurements

The dependent variable is the employment status, which is a binary variable where 0 is equal to traditional employment, and 1 is equal to self-employment status. The independent variable is the field of study. The field of study is defined in detail for a given specialization and classified as humanities, technology, economics, etc., and is thereby coded. As control variables, I utilized age and highest level of education attained. Age is measured in terms of years and education level is the highest level of education acquired by the respondent and is directly assessed.

Control varibales

Age can be a good control variable since it can affect both the field of study and employment choice, but is not affected by either of them. In general, younger graduates are more likely to take risks and start their own firm or be self-employed. Meanwhile, older individuals may have more skills and experiences compared to younger ones to start their own firms.

The level of higher education attained could affect the field of study because it often reflects the field of study due to some requirements for specific jobs. For example, those who want to become a medical doctor need to obtain MD. Meanwhile, career paths such as law or academics require JD and phD respectively. In addition, higher education provides a wide range of fields and some specializations with students and it could affect the choice of field of study. For instance, a student who wants to obtain a master's or doctoral degree might have more opportunities to know niche areas within a broader field, compared to one with only a bachelor's degree. The level of higher education attained also affects the employment type. In general, individuals with higher levels of education have better occupational opportunities and better wages. This might make self-employment choice less attractive for those individuals because the opportunity cost of alternatives are high. However, it also can be said that individuals with higher education have more advanced skills and knowledge, which might help them prepare to start their own firm or be self-employed. In fact, according to the study by O'Brien, Folta, & Johnson (2003), individuals who have a higher level of education have less irreversibility of decision to be self-employed because the skills and knowledge obtained through education can be more adaptable to other sectors. As a result, the negative impact of uncertainty on the decision to be self-employed becomes weaker.

While I included the level of higher education as control variables, it is important to acknowledge that they can be theoretically bad control variables as either employment type or the field of study might affect them. This could lead to interdependence and need to be considered when interpreting results.

Interaction Effect

I included interaction terms in the analysis to test hypotheses and how the relationship between field of study and the likelihood of self-employment is influenced by other factors such as age and level of higher education. Specifically, analysis with interaction terms between field of study and age examines how age changes the impact of field of study on employment type. For instance, as an individual ages, he or she obtains more skills, experiences, and network community. This might make self-employment more attractive for them in certain fields. This interaction effect tells us that how intention toward self-employment is increased or decreased over time in certain fields.

Interaction between field of study and level of higher education attained test how the relationship between field of study and likelihood of self-employment changes with level of education completed. Individuals with a higher level of education attainment might gain skills and confidence which make self-employment a feasible option for them in some fields. For example, having a higher level of education in the business or technology sector might end up with increasing necessary skills and resources and push individuals towards self-employment.

Analysis with interaction terms between age and education level investigates if these combined factors influence the intention to self-employment. Older individuals with a higher education level may be more likely to choose to be self-employed due to accumulated skills and experiences obtained over time. This analysis is beneficial to understand the combined effect of age and level of higher education. Including these three interaction terms into the analysis allows me to conduct a more comprehensive analysis about factors which influence the likelihood of self-employment among graduates from different fields of study.

Data Preparation

The process of data cleaning and preparation could be summarized to several steps to prepare it for analysis. To handle the missing values, data with missing values were omitted from the analysis. All the categorical data, especially the field of study, were then transformed into dummy variables for

the analysis. This involved binary conversion of each of the categories in the field of study to form different binary variables.

Statistical analysis

In statistical analysis for this research, the data analysis includes both descriptive and inferential analysis. Descriptive statistics were used to summarize the main characteristics of the data, including mean, number of observations, minimum and maximum for some of the important variables. By using these descriptive statistics, the demographic and educational backgrounds of the sample are displayed with information on the distribution of central tendencies of the variables of interest. Analytical statistics, particularly the use of logistic regression tests, were used in the analysis of the relationship between the variables. Logistic regression was chosen since it is suitable for modeling binary outcome variables and enables estimation of the odds ratios for various predictors. This methodology allows for determining which factors are important in influencing self-employment and to assess their specific contributions regarding the choice between self-employment and other forms of employment.

The logistic regression model is built using the dependent variable – employment type and the independent variables – field of study, age and highest education level completed. Interaction terms were used in the analysis in order to examine the presence of interaction effects with the field of study. During the analysis, it was observed that including multiple interaction terms could lead to collinearity issues. To overcome this, a set of single logistic regression for each interaction model was separately run in order to check to which extent severe multicollinearity problems exist. The interaction terms for field of study with centered age, field of study with centered education, and centered age with centered education all passed the collinearity diagnostics as none of them reached severe collinearity when tested independently of the other interactions.

Data

Data Collection Method

LISS panel gathers data through monthly online questionnaires. Every household member answers the questionnaire on many different topics. For those who do not have access to the internet, necessary tools and the connection of the internet are provided, thus everyone is eligible to take the questionnaires. The participation is based on the invitation, which could prevent self-selection bias and increase the reliability of the data. There is a monetary incentive for the participants, leading a high rate of response and maintaining the quality of data.

This study adheres to ethical standards to ensure the confidentiality and privacy of the participants' data. The LISS panel data is collected and stored in compliance with Dutch data protection laws and guidelines. Participants provided informed consent, and their anonymity was maintained throughout the research process.

Results

Descriptive statistics

The dataset for this study has 2319 observations of graduates from higher education. The dependent variable, employment type is a binary variable showing 0 for traditional employment and 1 for self-employment. The mean for this variable is 0.093. It indicates that 9.3% of individuals in the sample are self-employed.

Table 1: Descriptive Statistics of Employment Type

Variable	Obs	Mean	Min	Max
Employment Type	2319	0.093	0	1

Notes: This table presents the descriptive statistics for the variable employment type.

The independent variable, the field of study is classified into 17 major disciplines. Throughout this research, I use the field of study which is considered general or no specific field as a reference category. All remaining fields and their proportion to the total are summarized in table 2. It shows the most common field of study is economics, management, business administration, accountancy with a proportion of 17% followed by Medical, health services, nursing, etc. and Technology.

Table 2: Descriptive Statistics of field of study

Field	Proportion (%)
General or no specific field (Reference category)	7.33
Teacher training or education	6.64
Art	1.29
Humanities	1.64
Social and behavioral studies	7.07
Economics, management, business administration, accountancy	17.16
Law, public administration	3.28
Mathematics, physics, IT	5.05
Technology	11.47
Agriculture, forestry, environment	2.50
Medical, health services, nursing, etc.	13.28
Personal care services	2.89
Catering, recreation	2.85
Transport, logistics	3.45
Telecommunication	3.15
Public order and safety	1.55
Other area	11.56
Total	100%

Notes: This table presents the descriptive statistics for the variable field of study.

The variable for highest education completed is divided into 24 levels. The lowest level of education is lower and continued special education and the highest level is doctor's degree. The remaining categories and their proportion are summarized in table 3. The most common highest education completed among the sample individuals is HBO with nearly 30%.

Table 3: Descriptive Statistics of highest level of education completed

Level of education	Proportion (%)
lower and continued special education	0.22
vglo	0.13
lbo	1.71
lower technical school, household school	2.46
mulo, ulo, mavo	4.43
vmbo vocational training program	2.24
vmbo theoretical or combined program	1.45
mms	0.09
hbs	0.18
havo	5.7
vwo	1.62
gymnasium, atheneum, lyceum	1.05
kmbo, vhbo	0.83
mbo professional training program (bol)	13.95
mbo professional training program (bbl)	6.63
mbo-plus to access hbo, short hbo education	5.88
hbo, institutes of higher education, new style	29.97
teacher training school	0.66
conservatory and art academy	0.39
academic education bachelor	0.75
academic education master	2.68

academic education, bachelor	1.74
academic education, master	13.34
doctor's degree (Ph.D, including doctoral research program to obtain Ph.D)	1.62
Total	100%

Notes: This table presents the descriptive statistics for the variable highest level of education completed

Basic Logistic Regression Model

Table 4 shows the regression results to estimate the impact of the field of study on the employment outcome. Model 1 introduces basic logistic regression with control variables of age and highest education completed to see the relationship and test hypothesis 1. The result shows that graduates from the field of Art are significantly more likely to become self-employed compared to those from the general fields. The coefficient is 1.159 and it is significant at 5%. When looking at the field of Transport and Logistics, it has a negative coefficient of -1.335 and it is significant at 10%. This negative significant effect indicates that graduates from such fields are less likely to engage in self-employment compared to graduates from general fields. If we assume that the field of Transport and logistics is a field that does not require much creativity, the results from Art and Transport field support hypothesis 1 which states Graduates from fields requiring high levels of creativity, such as Art and Design, are more likely to engage in self-employment compared to graduates from fields which do not need so much creativity. This is quite interesting because it shows that creativity plays an important role in influencing the outcome of employment. The positive coefficient for the art field indicates that graduates who gain creativity skills through art education tend to become self-employed. This might be the characteristics of creative industries, which often value independent work and provide many entrepreneurship opportunities. Artistic field requires unique skills and personal expression which match the independence and flexibility seen in self-employment.

Another interesting result can be seen in the field of Agriculture, Forestry, Environment. It shows a positive coefficient of 0.968 and it is significant at 5%. It suggests that graduates with a degree in such a field are more likely to engage in self-employment when compared to graduates from general or no specific field. One of the possible explanations for this result is the increase of market opportunities. The market for sustainable products or services or the more sustainable greening

process is growing. This trend could create a lot of opportunities for individuals to be self-employed to tackle unmet environmental issues. Graduates from the field of Agriculture, forestry, environment are supposed to have skills and knowledge that can help them to stop environmental degradation. Therefore, it might be easier for them to prepare or make a decision to be self-employed.

Remaining fields show insignificant effects on whether graduates choose self-employment over traditional employment. This insignificant impact may indicate that the skills and knowledge obtained in those fields can be applicable to both self-employment and traditional employment and provide a flexible career path to graduates. For example, graduates from the field of Economics, Management, Business Administration, and Accountancy gain a variety of skills and knowledge that could be beneficial in a lot of employment scenarios.

Age is another significant factor that impacts the employment outcome. Age has a coefficient of 0.036 and it influences employment type positivity. The positive and significant effect of age indicates that older graduates have a higher propensity for self-employment. This could be because older individuals tend to have more resources, skills, network, and experiences that are essential for starting new firms or being self-employed. The coefficient for highest education level is not significant, indicating that there is no significant difference in likelihood of self-employment for graduates with higher and lower education level. Having a high level of degree such as a doctoral degree does not necessarily increase the propensity for self-employment compared to having lower education degrees.

Interaction Effects

To gain a deeper understanding of how the relationship between the field of study and the likelihood of self-employment is influenced by other variables and to test hypothesis 2, 3, and 4, interaction terms were included in the logistic regression models. Model 2 in table 4 introduces an interaction term between Field of Study x Centered Age to test hypothesis 2. Model 3 contains an interaction term between Field of Study x Centered Education to test hypothesis 3. Model 4, regression with an interaction term between Centered Age x Centered Education tests hypothesis 4. These interactions help identify whether the effects of a field of study on self-employment vary depending on age and education level.

Field of Study x Centered Age

The model 2 with interaction term between Field of Study and Centered Age examines whether the impact of different fields of study on the likelihood of self-employment varies with age. The regression reveals several interesting results. Interaction term for Art and age shows a positive coefficient of 0.006 but it is not significant. However, the main effect of the field of study in Art remains to be positive and significant in this model. These results imply that the decision to be self-employed among graduates from the art field is not influenced by their age. Both younger and older graduates likely have the same level of intention toward being self-employed. Creative skills and entrepreneurship intentions obtained through education of art may consistently support self-employment across different age groups.

Similar results are found for Agriculture, Forestry, Environment field. The main effect stays positive and significant at 5%, but the interaction term for age and Agriculture, forestry, environment shows insignificant positive effect on employment type. This indicates that graduates from Agriculture, Forestry, and Environment fields have a consistently higher likelihood of engaging in self-employment regardless of their age. As I mentioned earlier, this could be due to growing market opportunities for environmental sustainability. Graduates of all age groups may have opportunities where they can utilize their skills and knowledge to address environmental issues. While age positively influences the likelihood of self-employment across all fields, the insignificant interaction terms for Art and Agriculture, Forestry, Environment indicate that the increase in self-employment likelihood with age does not significantly differ between graduates from these fields and graduates from general or no specific fields.

Based on the above results of two interaction terms, it can be said that hypothesis 2 which is that graduates from practical and creative fields, such as Agriculture and Art, are more likely to engage in self-employment as they age, compared to graduates from less practical fields is rejected. The propensity for being self-employed does not change with age.

Apart from the implications for hypothesis, several new results appear in this model. For example, the main effect of the field of technology which could not be found in model 1 shows up in model 2. It has a significant negative effect on the decision of employment type. Like the interaction terms for age and Art and Agriculture fields, the interaction term between age and field of technology does not show a significant effect. Additionally, the interaction terms age and field of Catering, Recreation,

and field of Transport, Logistics show the significant positive effect even though the direct effects of such fields are not significant.

Field of Study x Centered Education

Model 3 in table 4 introduces an interaction term for field of study and level of highest education completed to examine how the relationship between field of study and self-employment is moderated by the highest level of education completed. This model aims to test hypothesis 3: Graduates with higher levels of education are more likely to engage in self-employment compared to graduates with lower levels of education in the same fields.

The results show that all interaction terms except for the field of Medical, Health services, Nursing have an insignificant effect on the likelihood of self-employment. The interaction term for Medical, Health services, Nursing, ect. shows a coefficient of 0.206 and it is significant at 5%. This indicates that having a higher education level in this area increases the likelihood of self-employment among graduates and its effect is stronger compared to having higher education in general or nonspecific fields. Based on these findings, it can be concluded that hypothesis 3 is rejected since almost all interaction terms show insignificant effect. This means that there is no significant difference in the likelihood of self-employment between graduates with higher levels of education and those with lower levels of education in the same fields. However, hypothesis 3 is partially supported, especially in the field of Medical, Health services, Nursing. Graduates with higher education levels in this sector might be more confident and better prepared to start private businesses and entrepreneurial ventures. Interestingly, the main effect of the field of Medical, Health Services, and Nursing is not significant. This indicates that on average, there is not a significant difference in likelihood of self-employment between the graduates from this field and graduates from the general field. However, the significant interaction effect for the level of education and the field of Medical, Health Services, and Nursing suggests that the relationship between education level and likelihood of self-employment is different for graduates from this field compared to from other fields.

Another finding is that the main effects of fields of Art, Agriculture, and Social and Behavioral studies are all positive and significant even though interaction effects for such fields are insignificant.

Centered Age x Centered Education

The model 4 contains the interaction term between age and level of highest education completed. This model investigates whether the combined effect of age and education level influences the likelihood of self-employment and test hypothesis 4.

The findings from this model regression shows that the main effect of centered age is significant and positive but it is not significant for centered education level. In addition, the interaction term between centered age and centered education is not significant, suggesting that the combined effect of age and education level does not significantly influence the likelihood of self-employment. This result indicates that while age affects self-employment decisions, their combined effect does not introduce additional complexity beyond their main effects and interactions with the field of study. Given those results, hypothesis 4 is rejected.

Table 4: Factors influencing the employment type

Model	(1)	(2)	(3)	(4)
Variables	Employment type	Employment type	Employment type	Employment type
General or no specific field (Reference category)				
Teacher training or education	-0.208 (0.415)	-0.248 (0.456)	0.347 (0.655)	
Art	1.159** (0.517)	1.108** (0.546)	1.933** (0.773)	
Humanities	0.503 (0.558)	0.42 (0.597)	0.158 (1.719)	
Social and behavioral studies	0.183 (0.408)	0.093 (0.433)	1.036 (0.685)	
Economics, management, business administration, accountancy	-0.068 (0.34)	-0.27 (0.385)	0.296 (0.588)	
Law, public administration	-0.295 (0.529)	-0.652 (0.673)	-0.647 (1.068)	
Mathematics, physics, IT	-0.184 (0.479)	-0.276 (0.501)	0.384 (0.679)	

Technology	-0.693* (0.391)	-0.759* (0.451)	-0.294 (0.625)	
Agriculture, forestry, environment	0.968** (0.43)	0.934** (0.457)	1.228* (0.663)	
Medical, health services, nursing, etc.	-0.024 (0.349)	-0.06 (0.378)	0.124 (0.601)	
Personal care services	0.559 (0.438)	0.479 (0.489)	0.844 (0.713)	
Catering, recreation	0.082 (0.513)	-0.562 (0.73)	0.418 (0.728)	
Transport, logistics	-1.335* (0.765)	-12.655 (6.119)	-3.583 (3.824)	
Telecommunication	0.17 (0.802)	-2.868 (2.779)	0.561 (0.839)	
Public order and safety	-1.371 (1.055)	-3.145 (2.855)	-61.647 (3470.238)	
Other area	0.329 (0.334)	0.216 (0.375)	0.702 (0.589)	
Age	0.036*** (0.006)		0.037*** (0.006)	
Centerted age		0.023 (0.023)		0.034*** (0.006)
Centered education			-0.036 (0.067)	0.017 (0.015)
Highest education Completed	0.02 (0.016)	0.018 (0.016)		
Interaction terms (Model 2 and 3)				
Teacher training or education		0.006 (0.032)	-0.054 (0.152)	
Art		0.006 (0.039)	-0.103 (0.167)	
Humanities		-0.015 (0.042)	0.174 (0.252)	
Social and behavioral studies		-0.004 (0.031)	-0.057 (1.056)	

Economics, management, business administration, accountancy		0.036 (0.028)	0.077 (1.164)	
Law, public administration		0.051 (0.046)	0.213 (0.165)	
Mathematics, physics, IT		0.008 (0.037)	-0.021 (0.098)	
Technology		0.02 (0.033)	0.128 (0.086)	
Agriculture, forestry, environment		0.021 (0.036)	-0.018 (0.184)	
Medical, health services, nursing, etc.		0.008 (0.028)	0.206** (0.083)	
Personal care services		0.092 (0.049)	0.03 (0.092)	
Catering, recreation		0.018* (0.036)	0.027 (1.037)	
Transport, logistics		-0.731* (0.444)	-0.271 (0.282)	
Telecommunication		0.217 (1.162)	0.018 (0.15)	
Public order and safety		0.163 (1.819)	6.799 (367.489)	
Other area		0.018 (0.027)	0.033 (0.074)	
Centered age x centered education				0.001 (0.001)
Cons	-4.393*** (0.473)	-2.612*** (0.362)	-4.452*** (0.636)	-2.347*** (0.078)

*Note: This table presents the results of logistic regression models examining the likelihood of being self-employed among second or higher education graduates. Model 1 includes the main effects of various fields of study and control variables such as age and highest education completed. Model 2 adds interaction terms between the field of study and age, and Model 3 includes interaction terms between the field of study and highest education completed. Model 4 includes interaction terms between centered age and centered level of education. The coefficients represent the log-odds of self-employment for each predictor, with standard errors in parentheses. Significant levels are indicated as follows: *p<0.10, **p<0.05, ***p<0.01.*

Discussion

Interpretation of the results

The regression analysis with model 1 indicates that graduates in the fields of Art and Agriculture, Forestry, and Environment show a higher propensity for self-employment compared to those who are from basic fields. Regarding the field of Art, this result is in line with the theoretical assumption that fields which require a higher level of creativity such as Art or Design provide students with unique skills and knowledge through education. These unique skills may play an important role for self-employment or entrepreneurial activities and help graduates proceed to such career paths. The graduates from Agriculture, Forestry, and Environment likely have necessary skills and knowledge to address environment degradation problems. There are a lot of opportunities for such graduates to enter the market as sustainable entrepreneurs or self-employment to provide innovative and sustainable solutions to market inefficiencies which causes environmental degradation such as waste of resources, flawed pricing mechanisms, and asymmetry information.

The results also show that age is a significant factor that influences the employment decision. Older graduates have a higher likelihood of being self-employed. This result can be interpreted in several ways. First is accumulated experiences and skills. Older individuals tend to have more resources, skills, network, and experiences which are accumulated over time and beneficial to start their own firm or be self-employed. Secondly, as individuals age, they often gain financial resources and financial stability. Older graduates may have savings and better access to financial resources which younger graduates do not have and this makes it easier for older individuals to become self-employed. However, it also should be mentioned that financial stability might work negatively for the intention towards self-employment. Opportunity cost of being self-employed is high if individuals consider financial stability important, which results in not being self-employed. Unlike age, education level is not a significant factor driving self-employment. The likelihood of self-employment is not significantly different between graduates with a high level of education and graduates with a low level of education in all fields of study.

While age has a direct significant effect on employment decisions, an interaction term for age and field of study shows insignificant effects across all fields except Catering, Recreation and Transport and Logistics. For most of the fields of study, the effect of the field of study on the employment outcome does not change with age. Regarding the interaction term for level of education and field of

study, it shows significant positive effect for interaction with the field of Medical, Health Services, and Nursing. Higher level of education in this area might provide the necessary qualifications, confidence, and networks to start private practices or engage in entrepreneurial activities. This finding supports the Social cognitive career theory, which posits that higher education enhances self-efficacy and outcome expectations. However, since most of the interaction terms for education level and fields show insignificant effects, Social cognitive career theory may not be applied in most fields.

Comparison with findings from literature review

One significant similarity between the results and findings from existing literature is about the fields of Art and Agriculture, Forestry and Environment. In this study, it is found that graduates with a degree in Art or Agriculture, Forestry and Environment are more likely to engage in self-employment compared to graduates from a basic field. This result is in line with the findings by Salas-Velasco (2023) in which he explains that fields requiring a relatively higher level of creativity and practicality are best suited for entrepreneurial activities. The findings by Bennion and Locke (2010) also align with this study's results because in their literature, authors indicate that students from the fields that could support independence and innovative skills show higher intention towards self-employment options.

There are also some differences between the results and findings from literature. One of the differences is about the relationship between level of educational attainment and self-employment decision. While Premand et al. (2012) found the positive relationship between them, I do not find a significant positive effect of higher educational attainment on employment decisions. In their study, they indicate that entrepreneurship training and higher education levels could provide graduates with the skills and confidence to engage in self-employment. In my study, the effect of entrepreneurship training is not addressed, thus this might make the results differ from their findings.

Implications of the Results for Theory, Practice, and Policy

Theoretically, the findings of this study could improve the understanding of how the choice of study fields influence employment decisions. They support human capital theory by showing how the educational backgrounds and socio-economic factors interact to influence the employment type. Practically, these findings could provide valuable insights on how to better prepare students for diverse career outcomes to higher education institutions and career services. For policymakers, this

study highlights the need for supportive and effective measures, such as targeted entrepreneurship programs and incentives, to encourage self-employment among graduates from fields with lower self-employment rates. This could eventually reduce unemployment rates and foster economic growth.

Limitation

While this study provides the insights into the relationship between field of study and employment type, several key limitations of this study have to be mentioned. First, the dataset utilized for this study is limited to the Dutch population. This geographic limitation may affect the generalizability of the findings to other countries. Different countries have different educational systems, labor markets, and cultural attitudes towards self-employment, which could influence the applicability of these results.

Secondly, control variables used for this analysis including age and highest level of education completed do not necessarily account for all factors that could influence the employment decision. Unobserved variables such as gender, personal interests, number of household members, and some socioeconomic factors could also have a significant impact on employment type. The lack of these variables could lead to inappropriate understanding of the factors that facilitate self-employment for graduates.

It also should be mentioned that this study does not establish the causality between the field of study and employment outcome. Logistics regression analysis could estimate the associations, but it does not indicate that choice of field of study causes graduates to become self-employed. Even though including control variables and interaction terms could account for confounding factors, unobserved variables and potential reverse causality may have an impact on the associations that are found throughout this research. Given these, the results show the associations between field of study and employment type, not causal effect.

Conclusion

The main research question addressed in this study was: "How does the choice of field of study among second or higher education graduates influence their decision to engage in self-employment versus traditional employment?" Throughout the analysis, this study shows that Graduates from creative and practical fields, such as Art and Agriculture, Forestry, and Environment, are more likely to choose self-employment compared to graduates from other fields. This research has provided comprehensive insights into this relationship between the field of study and employment choice and revealed significant associations between specific fields of study and the propensity for self-employment.

First hypothesis formulated for this study is that graduates from fields which need high levels of creativity, such as Art and Design, are more likely to engage in self-employment compared to graduates from fields which do not need much creativity. The results from model 1, basic logistic regression support this hypothesis. The coefficient of field of Art is significant and positive, indicating that graduates from this field are more likely to engage in self-employment compared to graduates from nonspecific fields. Hypothesis 2, which is that graduates from practical and creative fields, such as Agriculture and Art, are more likely to engage in self-employment as they age, compared to graduates from less practical fields, is rejected because model 2 shows that there is no significant positive interaction effect for the field of Art and Agriculture. The regression result of model 3 rejects hypothesis 3, which indicates that graduates with higher levels of education are not significantly more likely to engage in self-employment compared to graduates with lower levels of education within the same fields. The final hypothesis which is about the combined effect of age and education is rejected by the result of model 4. It shows that the combined effect of age and education is not significant.

The implications of these findings are multifaceted. From a theoretical perspective, the results support the human capital theory by demonstrating how educational background and socio-economic factors jointly influence employment decisions. Practically, these insights can inform higher education institutions and career services about the need to target their support and training programs to provide a better preparation for students to be able to proceed to diverse career paths, including self-employment. For policymakers, the study highlights the importance of developing targeted entrepreneurship programs and incentives, especially for fields with lower self-employment rates. Such measures could potentially reduce unemployment and stimulate economic growth by

fostering a more entrepreneurial workforce.

Future research should address the limitations of this study, such as geographic limitation to the Dutch population, which may affect the generalizability of the findings. If the dataset includes different countries with varied educational systems and labor markets, it would provide a more comprehensive understanding of the relationship between field of study and employment type. Additionally, incorporating a broader range of socio-economic variables, such as gender and family background, could offer deeper insights into the factors influencing self-employment decisions.

References

Becker, G. S. (1964). Human capital: A theoretical and empirical analysis, with special reference to education. *University of Chicago Press*.

Bennion, A., Locke, W. (2010). The early career paths and employment conditions of the academic profession in 17 countries. *European Review*, 18, 7-33.

CentERdata. (n.d.-b). How it works. *Longitudinal Internet Studies for the Social Sciences (LISS) panel.* Retrieved from https://www.lissdata.nl/how-it-works

CentERdata. (n.d.). Methodology. *Longitudinal Internet Studies for the Social Sciences (LISS) panel.* Retrieved from https://www.lissdata.nl/methodology

Cunha, F., Heckman, J. J. (2007). The technology of skill formation. *American Economic Review*, 97(2), 31-47.

DiPrete, T. A., & Eirich, G. M. (2008). Cumulative Advantage as a Mechanism for Inequality: A Review of Theoretical and Empirical Developments. *Annual Review of Sociology*, 32, 271-297.

Huber, L. R., Sloof, R., Van Praag, M. (2014). The effect of early entrepreneurship education: Evidence from a field experiment. *European Economic Review*, 72, 76-97.

Lemma, H. (2014). Livestock entrepreneurship as an emerging self-employment option for university graduates in Ethiopia: Overview of concerns and potentials for growth. *European Journal of Business and Management*, 6(4), 95-105.

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior, 45*(1), 79-122.

O'Brien, J. P., Folta, T. B., & Johnson, D. R. (2003). A real options perspective on entrepreneurial entry in the face of uncertainty. *Managerial and Decision Economics, 24*(8), 515-533.

Oosterbeek, H., Van Praag, M., Ijsselstein, A. (2010). The impact of entrepreneurship education on entrepreneurship skills and motivation. *European Economic Review*, 54(3), 442-454.

Peterman, N. E., Kennedy, J. (2003). Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship Theory and Practice*, 28(2), 129-144.

Premand, P., Brodmann, S., Almeida, R., Grun, R., Barouni, M. (2012). Entrepreneurship Training and Self-Employment among University Graduates: Evidence from a Randomized Trial in Tunisia. *Impact Evaluation Series* 77.

Salas-Velasco, M. (2023). Propensity for self-employment in a model of occupational choice: Evidence from a cohort of recent university graduates in Spain. *Sustainability*, 15(3400).

Souitaris, V., Zerbinati, S., Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business Venturing*, 22(4), 566-591.

Super, D. E. (1990). A life-span, life-space approach to career development. In D. Brown, L. Brooks, & Associates, *Career choice and development* (2nd ed., pp. 197-261).