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Predicting Entrepreneurial Intentions among the Youth in Serbia with a Classification Decision Tree Model with the QUEST Algorithm

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Abstract: Youth unemployment rates present an issue both in developing and developed countries. The importance of analyzing entrepreneurial activities comes from their significant role in economic development and economic growth. In this study, a 10-year research was conducted. The dataset included 5670 participants—students from Serbia. The main goal of the study is to attempt to predict entrepreneurial intentions among the Serbian youth by analyzing demographics characteristics, close social environment, attitudes, awareness of incentive means, and environment assessment as potential influencing factors. The data analysis included Chi-square, Welch's t-test, z-test, linear regression, binary logistic regression, ARIMA (Autoregressive Integrated Moving Average) regression, and a QUEST (Quick, Unbiased, Efficient, Statistical Tree) classification tree algorithm. The results are interesting and indicate that entrepreneurial intentions can be partially predicted using the dataset in this current study. Further, most likely due to the robust dataset, the results are not complementary with similar studies in this domain; therefore, these findings expand the current literature and invite future research.

Keywords: decision tree; classification; prediction; QUEST algorithm; entrepreneurial intentions; youth

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1. Introduction

Entrepreneurship in transition economies has an important role in economic development, as it possesses a tremendous amount of driving force, which can push economic growth [1,2]. In previous studies, it was noted that entrepreneurship has a central role in economic development [3,4], and it is a driver of innovation, competitiveness, productivity, and positively affects unemployment rates by creating new jobs [5–7]. Above average unemployment rates and low economic development characterize transitional countries. Compared to developed countries, transitional countries face tremendous challenges when it comes to conducting business on the globalized market [8]. Therefore, it is crucial to identify driving factors of entrepreneurship intentions in order to establish strategies for economic growth and entrepreneurship development in transition countries.

Further, youth unemployment rates are a "chronic" issue, which many countries face. As a potential solution, the young can employ themselves by starting their own business. This can lead to an increase of standard of living, significant decrease in unemployment, and an increase in value exchange on the market [9,10].

Youth entrepreneurship, and entrepreneurial activities overall are affected by various factors such as social environment, education, motivation, attitudes, family members, opportunity perception, etc. [11–15]. In addition, desirability, self-efficacy, attitudes, and feasibility were noted to have a strong impact on entrepreneurial intentions [16]. Innovation and technology can also have a significant impact on entrepreneurial intentions [17–19]. Innovation in this case can be viewed as macro-technological innovation on an industry-level, or innovation as a micro-technological solution, which opens opportunities for new

business models. From here, work-related creativity has been observed as an influential factor for the youth to start their own business [20].

Entrepreneurship across countries can significantly differ, as social, political, and economic environments differently affect new and existing entrepreneurs [21,22]. Socio-economic and political factors as part of national cultures have a significant influence on the forming of entrepreneurial activities and intentions to start own business. Besides national culture, the rapid changes and development in technology as well as workforce diversity have significantly affected how individuals view their careers and entrepreneurial endeavors [23]. Overall, the existing literature in the domain of youth entrepreneurship analyses a wide array of entrepreneurship topics including entrepreneurship education, entrepreneurship training, entrepreneurship perceptions, opportunity assessment, and other influential factors [24,25].

However, there is a gap in the existing body of literature. There are few if any empirical studies conducted over a long period of time (excluding meta-analyses) that analyze entrepreneurial intentions in a transitional setting and the potential factors that can influence these intentions.

This study aims to fill this gap by collecting, processing, and analyzing a significant amount of data over a period of ten years, in a transitional economy. The number of respondents was 5670 and it included high school students, undergraduate, and graduate students from the University of Belgrade and University of Novi Sad—the two largest universities in Serbia. In addition, the focus of the study was on the attempt to predict entrepreneurial intentions based on several key potential influencing predictors [26–29]. These are demographic information (gender, age, education), close social environment, attitudes, awareness of incentive means, and environment assessment.

A structured survey was used to obtain the data and the data analysis included Chi-square test, Welch's t-test, z-test, linear regression, binary logistic regression, ARIMA (Autoregressive Integrated Moving Average) regression, and a QUEST (Quick, Unbiased, Efficient, Statistical Tree) classification tree algorithm.

The study consists of four main sections (excluding the Introduction and Conclusion sections). First, a research background is provided through literature analysis. Second, the research methodology is presented in more detail. The third section presents the results of the research. The fourth section discusses the obtained results, the limitations of the study are addressed, and guidelines for future research are suggested. Based on this, conclusions are drawn.

2. Research Background and Knowledge Gap

2.1. Entrepreneurship, Economy, and Business Environment in Serbia

Entrepreneurship as a concept includes actions conducted by groups or individuals whose goal is to create or take on existing opportunities on the market, which are not within nor part of existing organizations [30]. Entrepreneurial activity can be viewed as a significant field of socio-economic research, while entrepreneurial intentions is viewed as planned and conscious decision [31]. This indicates the complexity of entrepreneurial activities as a social and economic construct that can affect economic development on a macro level, and the standard of living on a micro level. Entrepreneurship can act as a tremendous driving force of economic growth [32].

Furthermore, youth entrepreneurship is a key element for reducing youth unemployment rates that positively affects economic development [33]. Germany, the USA, and Japan are prime examples where entrepreneurship-focused policies resulted in economic development and economic growth [34]. Government support of entrepreneurs can positively affect overall entrepreneurial activity on a national level. Such policies are important, especially when the challenges of globalization, Industry 4.0, and more recently, the coronavirus pandemic, are taken into consideration. In order for governments to effectively address the improvement and expansion of entrepreneurial activities, it is necessary to examine the underlying mechanisms that "drive" entrepreneurship among different age

groups. Studies that address entrepreneurship aim at contributing to the clarification of entrepreneurial mechanisms in order to provide valuable information to national and/or local strategies for improving the entrepreneurial environment and to motivate people of various age groups to start their own business. In Serbia, low unemployment rates among the youth may be due to ineffective government policies and due to and overall inadequate socio-economic and business environment [35].

Next, in order to address the potential changes in the business environment, the Doing Business ranks from 2009 to 2020 are presented in Table 1. The Doing Business ranks for Serbia are noted in the Doing Business reports 2009–2020 published by the World Bank Group. These ranks represent the ease of doing business in Serbia, and as such, it provides some insight into how this indicator has changed in the last 12 years.

Table 1. Doing business ranks between 2009 and 2020.

Republic of Serbia Year	Doing Business Rank	Reference
2020	44/190	[36]
2019	48/190	[37]
2018	43/190	[38]
2017	47/190	[39]
2016	59/189	[40]
2015	91/189	[41]
2014	93/189	[42]
2013	86/185	[43]
2012	92/183	[44]
2011	89/183	[45]
2010	90/183	[46]
2009	94/181	[47]

The ranks are based on several indicators, including: ease of starting business (costs, procedures, time, minimum capital requirement); dealing with construction permits (procedures; time; cost; quality control); getting electricity (procedures, time, cost, reliability); registering property (procedures, time, cost, quality of land administration); getting credit (legal rights, depth of credit information, credits bureau and registry coverage); protection of minority investor (extent of director liability, shareholder suits, ownership, and control); paying taxes (payments; time; rates; postfilling); trading across borders (time and cost of export and import); contract enforcement (time, cost, quality of judicial processes); and resolving insolvency (time, cost, recover rate, strength of insolvency framework) [36].

Based on the ranks presented in Table 1, it is evident that the ease of doing business in Serbia has increased over the years. An exceptional jump in ranks is noted from the year 2015 to 2016 (from 91st place to 59th), and the following year (2017), where there is another jump to 47th place. In 2016, the most improvement was noted in the construction permits and tax payment sections, as new electronic payment systems were introduced, and increased the building quality control process [36]. These improvements were significant and heavily contributed to better competitive positioning. The increase in rank between 2016 and 2017 (from 59th to 47th place) is the results of significant improvement in the ease of starting business, construction permits, and property registration sections [41].

Overall, these ranks and the underlying parameters indicate that there is improvement in the past 12 years on a national level, when it comes to conducting business. This can, and most likely is, positively contribute to the entrepreneurial climate in Serbia. However, this current study did not include the possible effects of the two major "jumps" in ranks in from 2015 to 2017. These rankings are not directly aimed at the youth and young entrepreneurs, but at the overall national business environment.

2.2. Entrepreneurial Intentions

Entrepreneurship intentions are affected by psychological factors (adaptability, risk capacity, internal control, proactivity, etc.), socio-educational factors (age, gender, employment, income, education on entrepreneurship, etc.) [48] and relational factors (informal and formal networks) [49–51]. In another study, it was noted that mentoring effects on entrepreneurial intentions were higher among students and the unemployed [52]. In addition, instrumental readiness has a significant influence on entrepreneurial intentions as well as creativity [53,54]. Entrepreneurial motivation and entrepreneurial education can significantly affect entrepreneurial intentions [33]. Experiences with entrepreneurship, creativity, and attitudes were identified as influential on entrepreneurial intentions [31].

Age has been also noted as an influential factor on entrepreneurial intentions. More precisely, older students were more likely to intend to start their own business compared to younger students [55]. Another study involving females from India noted that there is a relation between demographics of females and the intention to start their own business. In addition, attitudes were noted as an influencing factor among these women [27]. Self-efficacy, subjective norms, and perceived behavioral control have been found to affect entrepreneurial intentions differently between women and men [56]. Entrepreneurial education had a more positive impact on women compared to men, when it comes to entrepreneurial intentions and risk taking [29].

Further, a study conducted in Croatia argued that self-efficacy, identity aspirations, and social norms present key influencing factors on students' entrepreneurial intentions [56]. Self-efficacy was also noted as a significant factor that affects entrepreneurial intentions in Visegrad countries (Slovakia, Hungary, Czech Republic, and Poland) [57]. It is evident that there are differences across countries regarding entrepreneurial activities, therefore analyzing entrepreneurship across different countries is valuable for future comparative analysis, and it can positively affect the development of nation-wide strategies for economic growth and development. Long-term strategies on a national-level further affect international competitiveness, which additionally influences economic growth. Furthermore, developing entrepreneurial desires and attention have an important role of among students [58] and their intentions for entrepreneurship. In the same study it was noted that government support and support from the academic community can also positively affect entrepreneurial intentions. Further, schools and universities present a socio-cultural environment, which can heavily affect entrepreneurial intentions among students [59]. Two studies conducted among Romanian students presented that entrepreneurial education can positively affect entrepreneurial intentions, and that education should be a stimulant and catalyst of entrepreneurial behavior among students [60,61]. Entrepreneurial intentions were to be linked to the ability to quickly adapt to changes, emotional intelligence [62,63], and entrepreneurial capacity. Creativity and innovation were also argued as the main driving forces of entrepreneurial activities as creativity includes the identification of a problem and connecting it to a solution [64].

Furthermore, Ajzen (1991, 2002) discussed the idea of planned behavior, where behavior is influenced by intention and ability [65,66]. Further, the perceived behavioral control is addressed, which defines the peoples' perception of the ease or difficulty of doing something that is in their interest [67]. Behavioral beliefs present an influencing factor when it comes to attitudes towards behavior. This notion is not fully analyzed in this current study. However, it has to be taken into consideration when the results are discussed and evaluated. It is evident that attitudes are also a significant factor when it comes to intentions.

2.3. Attitudes and Entrepreneurship

Attitudes as an emotional factor include cognitive entrepreneurial passion, which can positively influence entrepreneurial intentions [68]. Attitudes in the form of affinity towards starting own business can be a strong predictor of entrepreneurial intentions among students [69]. Attitudes are complex behavioral constructs that are affected by education,

social circles, tradition, personal traits, etc. [70]. For example, attitude toward risk taking has been found to positively affect entrepreneurial intentions [71]. Next, attitudes can be affected by time constraints, task difficulty, and influence of others through social pressure [72]. Linan and Chan (2009) described attitudes towards starting a business as a degree of personal valuation (positive or negative) about being and becoming an entrepreneur [73]. They also noted that attitudes are accompanied by additional two motivational factors when it comes to entrepreneurial intentions. These subjective norms measure the person's perceived social pressure, and perceived behavioral control, which is defined as the perception of ease of becoming and being an entrepreneur [74].

Next, the process of socialization and its mechanisms can develop a basis for unconscious attitudes towards starting a business [75]. In the same study, it was discussed that beliefs, social norms, and values can affect the forming of entrepreneurial attitudes as well as motivation and self-efficacy [75].

In this current study, attitudes are analyzed in the context of entrepreneurial or entrepreneurship-friendly attitudes. More precisely, predictors in the attitude group are in the context of entrepreneurship.

The above noted factors that affect entrepreneurial intentions can be characterized as micro-level factors. These micro-level factors directly or indirectly affect entrepreneurial activities among the investigated demographic group. An important macro-level factor that simultaneously affects economic development and entrepreneurial activities is national culture [76,77]. National culture can be a bias if entrepreneurial attitudes and intentions are analyzed, and compared between countries. The main effect from national culture manifests in the form of environmental factors, which affect business performance of existing enterprises and new start-ups [78]. Other macro-factors that can affect entrepreneurial intentions include government policies and the global economic crisis [79]. The challenges of entrepreneurial actions is reflected in the low percentage (less than 5%) of graduated students that start their own business within two years of graduation [80]. This is why it is important to note that entrepreneurial intentions do not always translate into starting a business. Future research should address this concept by tracking graduated students' careers and if they did start their own businesses.

It is evident that there are numerous studies that analyze entrepreneurial intentions. However, there are no studies that have obtained data in a 10-year timeframe. There is a number of studies investigating youth entrepreneurship in a transitional setting, but not on a large scale. This current study aims to fill this gap by collecting and analyzing data in a 10-year period, in a transitional country. The focus of the study was to attempt to predict entrepreneurial intentions.

2.4. Hypotheses

As noted in the previous section, there is wide variety of potential influencing factors on entrepreneurial intentions. In this current study, predicting entrepreneurial intentions is based on several main potential influencing factors. The potential influence and relation between these factors and entrepreneurial intentions is present in various degrees in the existing body of literature. These factors include attitudes [27,31]; demographic characteristics such as age [28,48,55], gender [29,48,56], and education [29,48,59]; close social environment [49–51]; awareness of incentive means [62]; and environment assessment [53,67].

Based on the literature review, the following hypotheses are proposed as guidelines for the research:

- H_1: Attitudes positively affect student's intentions to start their own business.
- H_{2a}: Gender positively affects student's intentions to start their own business.
- H_{2b}: Age positively affects student's intentions to start their own business.
- H_{2c}: Education positively affects student's intentions to start their own business.
- H_3: Close social environment positively affects student's intentions to start their own business.

- H_4: Awareness of incentive means positively affects student's intentions to start their own business.
- H_5: Environment assessment positively affects student's intentions to start their own business.

The proposed hypotheses are analyzed with several different statistical methods and tools with the goal to identify the potential predictive effects of the analyzed factors, which are proposed through the hypotheses.

3. Methodology

The research methodology is in accordance with other accepted approaches [81], and it includes:

- Research objective identification (the objective is to attempt to predict entrepreneurial intentions through potential predictors);
- Literature review (writing a theoretical background in the domain of entrepreneurship, intentions, attitudes and other potential influencing factors);
- Data collection (developing a structured survey; distributing the survey, and collecting data from respondents);
- Data analysis and modelling (descriptive statistics, chi-square, Welch's t-test, z-test, linear regression, binary logistic regression, QUEST classification tree algorithm)
- Model evaluation (determining if it is possible to predict entrepreneurial intentions based on the observed predictors).

The study includes a structured survey for collecting data from 5670 respondents (sample size n = 5670). The data collection/surveying started in 2009 and was finalized at the end of 2018. The structured survey collected data on demographic information (gender, age, education); close social environment; entrepreneurial intentions; awareness of incentive means; and environment assessment. Details regarding the survey items within each predictor group are given in Appendix A (Table A1).

Surveying was conducted every school year at the end of the second semester (November and December each year). The first year of surveying was 2009, and the last 2019. After the data was acquired and the surveying phase was finished, the Covid-19 pandemic started, which heavily affected workflow at all levels of academia (from lecturing to research). Hence, there is a time-gap present from the last surveying to the data processing and analysis results. The surveying period was characterized with a shift in government politics as a new political party gained majority in the parliament. Additionally, the aftermath of the 2008–2009 economic crisis was affecting countries around the world.

The overall sample structure and dynamic changes that happened within the ten-year timeframe of the research contribute to the representability. The University of Novi Sad and University of Belgrade are the two biggest universities in Serbia and almost 80% of all students in Serbia attend a faculty from one of the two universities. Students from all over the country enroll these universities.

The sample included same students in different years of study, but also included new students that enrolled the first year of studies. This approach has its limitations and for future research, a different approach can be taken. On the positive side, as the sample is structured this way, the potential changes of students' intentions over the years are part of the dataset. However, these changes are not isolated. In future research, repeating students should be evaluated on a yearly basis, and even after their studies. This limitation is common with similar studies in this domain.

Furthermore, repeated measures in samples are widely used as they have an advantage over pure cross-sectional research designs. The mixed approach of repeated studies and data collection over time can increase the statistical significance of the obtained results. Drawbacks can occur if the sample size is not large enough [82,83]. In this current paper, the sample is robust; however, its potential is not fully utilized as the data analysis was not structured in a manner to determine potential differences between students enrolled in different years of study. This limitation can be avoided in future research.

In a 10-year timeframe in which the surveying was conducted, many external factors can affect entrepreneurial intentions. These factors range from transition economy changes, globalization, global crisis, and other socio-economic and political factors. In addition, the education mechanisms have mainly changed to the better over the years. As noted earlier, the business environment in Serbia is assessed through the Doing Business ranks from 2009 to 2020 (Table 1). The potential differences between the samples are addressed via Chi-square statistic for the yes/no items, and Welch's two-sample t-test for the ordinal values. Furthermore, within the research methodology, the following phases were conducted:

The first phase was developing a structured survey and distributing them to high school and university students. The survey was printed and distributed to all students within a classroom. The students were enrolled in management and business courses. The surveying was conducted during and right after classes, while students were still present in the classroom. They were instructed that the survey was anonymous, and to provide opinions regarding entrepreneurial intentions. The time allocated for surveying one class varied from 30 min up to 1 h, as every student was given the necessary time to fill the survey. The completed surveys were collected and stored for data processing.

The second phase was data processing and data analysis. The collected data was evaluated and processed in the MPlus 7.11 software.

For this current study, descriptive statistics, linear regression analysis (with standardized coefficients), binary logistic regression analysis, Chi-square, Welch's t-test, z-test, ARIMA regression, and a QUEST classification tree was conducted.

For the linear regression analysis and ARIMA regression, predictor groups were used, while for the other statistical analyses, predictor items were used.

The ARIMA (Autoregressive Integrated Moving Average) regression included all the external regressors (predictor groups) in the form of matrix x, which was used as the x parameter. In addition, an ARIMA graph including only the main key factor (intention to start business) was developed in order to see the (expected) differences in prediction.

The QUEST algorithm has an advantage over other decision trees, as it is characterized by speed while the accuracy in prediction is not affected [84]. The QUEST algorithm does not include identified bias in the variable process selection before splitting. However, the algorithm controls this lack of bias by handling the variation levels in the predictor variables [85]. The QUEST algorithm can be used for continuous and ordinal values, and for nominal values. The Analysis of variance (ANOVA) test is performed for continuous and ordinal values, while Pearson's χ^2 is used for categorical values [86].

The QUEST decision tree can be applied with linear combination splits as well as univariate splits, and uses cross-validation for pruning [87]. The QUEST tree is constructed by selection of a split independent variable, selection of a split point of the selected independent variable, and stopping. The following pseudocode is used to select the split of independent variable [88–90].

1. Specify and overall level of significance $\alpha \in (0, 1)$.
2. Let M be the number of variables, and M_1 be the number of continuous and ordinal variables.
3. For each continuous or ordered independent variable X, find the smallest p value according to the ANOVA F-test that tests if all the different categories of the dependent variable have the same mean as X, and find the smallest p value according to the Pearson's chi-squared (χ^2) statistic.
4. For each categorical independent variable, perform Pearson's χ^2 test of Y and X's independence, and find the p value according to the χ^2 statistic.
5. Determine the independent variable with the smallest p value and denote it by X*.
6. If this smallest p value is less than α/M, where $\alpha \in (0, 1)$ is a user-specified level of significance and M is the total number of independent variables, the independent variable X* is selected as the predictor for splitting the node. If not, go to 4.

7. For each continuous independent variable X, compute Levene' F statistic based on the absolute deviation of X from its class mean to test if the variances of X for different classes of Y are the same, and find the *p* value for the test.
8. Find the independent variable with the smallest *p* value and denote it by X**.
9. If this smallest *p* value is less than $\alpha/(M + M_1)$, where M_1 is the number of continuous independent variables, X** is selected as the split independent variable for the node. If not, this node is not split.

The equation for the Pearson's chi-squared statistic is:

$$\chi^2 = \sum_{i,\,j} \frac{\left(O_{\,i.j} - E_{\,i,j}\right)^2}{E_{\overline{i,j}}} \tag{1}$$

where $O_{i,j}$ is the observed value, $E_{i,j}$ is the expected value for the *i*th row, and *j*th column of the data cell.

The equation for the ANOVA F statistic is:

$$F = \frac{\sum nj\left(\overline{X}j - \overline{X}\right)^2/(k-1)}{\sum\sum\left(X - \overline{X}j\right)^2/(N-k)} \tag{2}$$

where *nj* is the sample size in the *j*th group, $\overline{X}j$ is the sample mean, and the $\overline{X}$ is the overall mean. *N* is the total number of observation (not the population size), and *k* is the number of independent groups.

In the first step, the algorithm analyzes the relation of each predictor variable (x_1, x_2, x_3 … x_n) with the dependent variable (y). The most statistically significant predictor variable is selected. Next, the algorithm searches for the subset of values of the predictor variable. Chi-square contingency tables and ANOVA F is used to select predictor variables for splitting. The QUEST algorithm first selects the main variable and then it selects its split point. This way the QUEST algorithm does not have categorical variable and bias computational problems that are present in the CAST algorithm [91,92]. If a predictor variable has multiple classes, then a Quadratic Discriminant analysis—QDA is used to merge them into two super-classes in order to conduct the binary split [93]. In case the QDA gave two binary split points, the one that is closer to the sample mean of the first superclass is chosen. The decision tree included every predictor variable in the calculation, but only the statistically significant ones are presented. More precisely, every predictor variable was included in the statistical calculation process; however, statistically insignificant factors were not presented within the decision tree.

In this research, the dataset includes nominal, ordinal and quantitative data. Statistical processing of data in the field of entrepreneurship is significant, as it allows to summarize and extract valuable empiric information. This approach is adequate for nominal, ordinal, and numerical data processing and analysis [94].

The third phase included the evaluation and discussion of the obtained results. The aim of the discussion is to re-evaluate the significance of the study and the significance of the results and the developed decision tree. In Table 2, the methodology summary and QUEST algorithm information are presented.

Table 2. Methodology summary and QUEST algorithm information.

Research Parameter	Information
Number of participants	5670 (n = 5670)
Research duration	2009–2018 (finalized in 2019)
Sample structure	high school students; students enrolled in management and business courses
Material for data collection	structured survey (presented in Table A1.)
Data analysis	descriptive statistics; Chi-square; Welch's t-test; binary logistic regression; decision tree with the QUEST algorithm
QUEST: predictor variable type	nominal/category; ordinal; quantitative
QUEST: number of branches	Two
QUEST: Branching variable	Single or multiple predictors
QUEST: Splitting rule	F/Chi-square test; ANOVA
QUEST: Tree pruning	Cross validation

Predictor items are grouped into five main sections:

1. demographic information (gender, age, education)
2. close social environment
3. attitudes
4. awareness of incentive means
5. environment assessment

The entrepreneurial intentions predictor groups was viewed as the dependent variable. For the linear regression analysis, predictor groups were used, rather than predictor items. For the logistic binary regression analysis and the decision tree, predictor variables were used.

4. Results

Due to its very large size, the table that includes the results of the descriptive statistics is given in Appendix B (Table A2). The sample has its limitations, and in order to partially analyze the possible statistical differences between each year's data, a Welch's two-sample t-test is conducted for the ordinal data for every consecutive "year pair" (e.g., 2009–2010; 2010–2011; 2011–2012, etc.). The same is conducted for the *Would you start your own business?* item, but instead of Welch's t-test, Chi-square was used. The summary of the obtained results are presented in Table 3.

Table 3. Summary of the Welch's t-test and the Chi-square statistic.

Year Pair	Welch's t-Test Result $p(T \leq t)$ Two-Tail (Alpha 0.05)	Year Pair	Chi-Square Result Observed Value; Critical Value; p-Value (df = 1, Alpha 0.05)
2009–2010	0.561	2009–2010	2.562; 3.841; 0.109
2010–2011	0.440	2010–2011	8.062; 3.841; 0.0045
2011–2012	0.725	2011–2012	11.825; 3.841; 0.001
2012–2013	0.100	2012–2013	2.144; 3.341; 0.143
2013–2014	0.646	2013–2014	0.795; 3.841; 0.037
2014–2015	0.602	2014–2015	7.622; 3.841; 0.007
2015–2016	0.733	2015–2016	0.923; 3.841; 0.337
2016–2017	0.795	2016–2017	7.505; 3.841; 0.0062
2017–2018	0.614	2017–2018	0.017; 3.841; 0.83

Further, a z-test was conducted between consecutive years in order to detect possible statistically significant differences between the samples. The results of the z-test are presented in Table 4.

Table 4. Summary of the Welch's t-test and the Chi-square statistic.

Year Pair	z-Test (z Stat; z Critical Two-Tail)
2009–2010	−1.290; 1.960
2010–2011	−0.888; 1.960
2011–2012	−0.621; 1.960
2012–2013	1.806; 1.960
2013–2014	0.716; 1.960
2014–2015	0.452; 1.960
2015–2016	−0.811; 1.960
2016–2017	0.513; 1.960
2017–2018	−0.907; 1.960

Based on the results presented in Table 3., there are no statistically significant differences when it comes to the ordinal values (predictor items). Statistically significant differences are present within the Chi-square results. More precisely, there are statistically significant differences regarding intentions to start own business, between the following years: 2009–2010, 2012–2013, 2015–2016, and 2017–2018. These differences are addressed in the Discussion section. The results of the z-tests indicate that the samples do not differ significantly. Next, the results of the linear regression analysis are presented in Table 5. For this analysis, the approach is different compared to the binary logistic regression and the QUEST decision tree. For the predictor variables, predictor groups were taken into consideration, without the demographic information as a predictor. The predictor group approach to predictor variables was conducted in accordance with other studies [95–97].

Table 5. Results of the linear regression analysis.

Independent Variables (Viewed as Predictor Groups)	Dependent Variable (Viewed as a Predictor Group)	Standardized Coefficients	*p*
Close social environment	Entrepreneurial intentions	0.118	0.855
Attitudes		−0.329	0.000
Environment assessment		−0.095	0.771
Awareness of incentive means		0.110	0.701

Compared to other studies [98–100], where attitudes were noted as a significant positive predictor of entrepreneurial intentions, in this study, the standardized coefficients indicate that only attitudes have an influence on entrepreneurial intentions, and it is interesting that this influence is negative. To gain additional insight into the relations between the predictors and entrepreneurial intentions, a binary logistic regression was conducted. The significant predictor variables were selected automatically by stepwise regression. The results of the binary logistic regression are given in Table 6.

Table 6. Results of the binary logistic regression.

Predictor Item	β	*p*	95% CI	
Age	1.04	0.001	1.01	1.06
A private enterprise is more successful compared to other types of business	1.38	0.000	1.29	1.46
In Serbia, people do not know the real opportunities in the domain of private enterprises	1.20	0.000	1.12	1.27
A private enterprise is not profitable and it is uncertain	0.69	0.000	0.64	0.72
The working conditions in a private enterprise are better than in other types of business	1.10	0.000	1.04	1.15
Do you have a member of family who owns a private enterprise?	0.83	0.009	0.72	0.95
Do you think that start-up loans from business banks are affordable for young entrepreneurs?	0.81	0.003	0.70	0.93
Are you familiar with the existence of incentive means for starting a business?	0.39	0.000	0.34	0.44
Do you think that there is a good entrepreneurial environment in Serbia to start a business?	0.84	0.072	0.69	1.01
Do you think that the government should have a key role in stimulating the youth to start their own enterprise?	0.86	0.168	0.70	1.06

The results indicate that students' attitudes and close social environment (their experiences with their family member owing a business) are statistically significant ($\chi^2 = 517.51$, df = 6, $p < 0.001$), explaining 14% of the total variance (Nagelkerke R^2) with classification successfulness of 80%. Further, the binary logistic regression model is statistically significant ($\chi^2 = 237.45$; df = 6; $p < 0.001$) when the awareness of incentive means and attitudes, and opinions on the entrepreneurial climate in Serbia (environment assessment) are viewed as predicting factors for the students' intentions to start their own business. The regression explains 6% of the total variance (Nagelkerke R^2). The sensitivity and specificity of the model are 87% and 90%, respectively. The results presented in Table 5 indicate:

- Age has an effect on the readiness to start own business, as older participants are more likely to conduct entrepreneurial activities. Therefore, it can be assumed that age has an influence when it comes to predicting the intention of starting a business.
- If the participant thinks that private businesses are more successful than others, then he is more likely to start his own business.
- If the participant thinks that owning a private business is uncertain and that there is no profit, that he is less prepared to start his own business.
- The participants who answered that the working conditions in a private business is better compared to other types of business are more likely and more ready to start their own business.
- Finally, it is interesting that the data indicates that participants who have a family member who owns a business are less likely to be entrepreneurs.
- The participants who think that start up loans from business banks are affordable are less likely to start their own business.
- The participants who are aware and are familiar with incentive means for starting own business are less likely to start their own business.

Interestingly, it appears that awareness of incentive means is not enough, nor crucial for the intention to start a business. Similarly, if bank loans are more affordable, it will negatively affect the students' intentions to start their business. The reason behind this could be the existing level of mistrust towards banks, and loans in general. Therefore, more affordable loans could be perceived as "too good to be true" loans, thus the trust issue remains. The logistic regression models reached only a small percentage of the pseudo R^2 expressed by Nagelkerke R^2 (14% and 6%). This indicates that there are other factors that could explain students' intentions to start their own business. ARIMA regression and a decision tree based on the QUEST algorithm have been developed in order to further

investigate potential influencing factors on students' entrepreneurial intentions. Before the ARIMA and the QUEST classification tree algorithm, multicollinearity is addressed. The results of the multicollinearity test are presented in Table 7.

Table 7. Results of the multicollinearity test.

	Close Social Environment	Attitudes	Environment Assessment	Awareness of Incentive Means
Tolerance	0.524	0.363	0.377	0.390
Variance Inflation Factor (VIF)	1.842	2.011	2.068	2.429

The results of the multicollinearity test indicate that there is no statistically significant correlation between the measured predictors as the Variance Inflation Factors (VIFs) are under 2.500. Next, in Table 8, the key parameters (Coefficients, Standard Error, *p*-values) of the ARIMA regression are presented.

Table 8. Key result parameters of the ARIMA regression.

Predictor	Coef.	Std. Err.	*p*-Value
Age	1.444	2.45	0.014
Gender	−0.849	0.105	0.417
Close social environment	1.950	1.112	0.049
Attitudes	−0.443	0.279	0.012
Awareness of incentive means	0.855	2.170	0.030
Environment assessment	−0.085	0.104	0.382

Based on the results presented in Table 8, gender, and environment assessment are not statistically significant, and could be removed from the model. However, we addressed the literature on this topic, and it adds more value if even the non-significant predictors are left in the model. Further, the ARIMA graph that included every predictor group is presented in Figure 1.

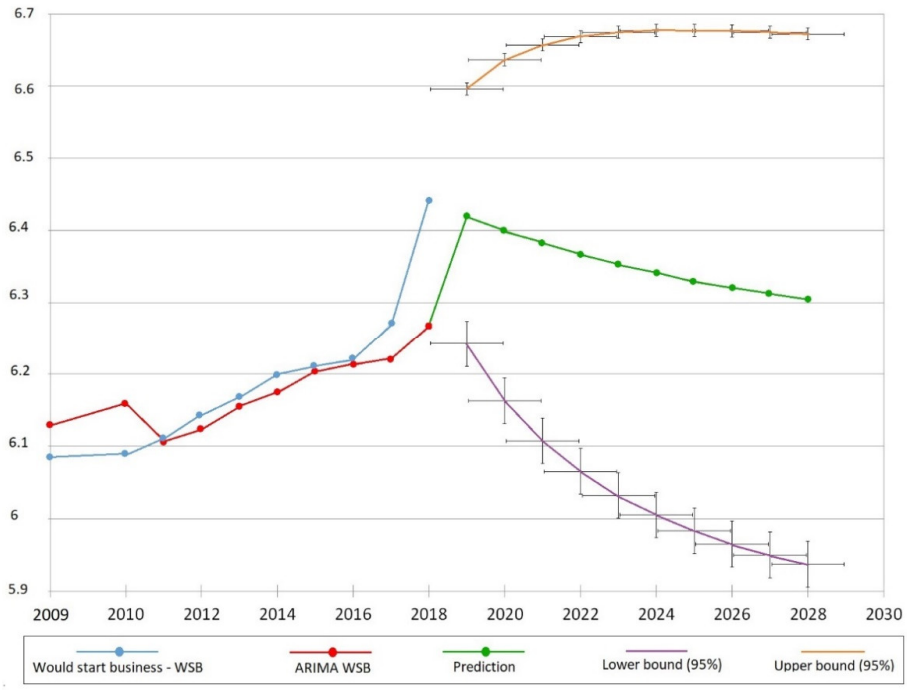

Figure 1. ARIMA forecasting graph (includes all the predictors).

Next, an ARIMA forecasting graph is presented that does not include the two insignificant predictors (gender and environment assessment) is presented on Figure 2, with the goal to see if there are any differences.

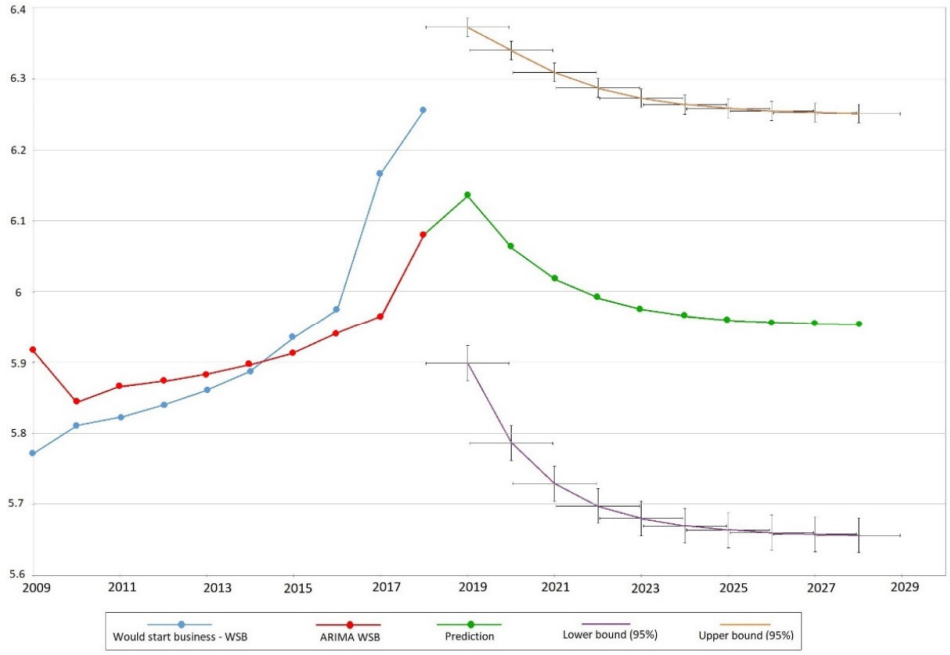

Figure 2. ARIMA forecasting graph (without non-significant predictors).

Based on Figures 1 and 2, it is seen that the prediction line has more curvature and narrower bounds. This is within the expected analysis, as the graph in Figure 2 does not include two non-significant predictors.

Finally, a third ARIMA graph is presented in Figure 3. Here, predictor factors are not taken into consideration. This approach of three graphs is used for graphically presenting the influence of predictors.

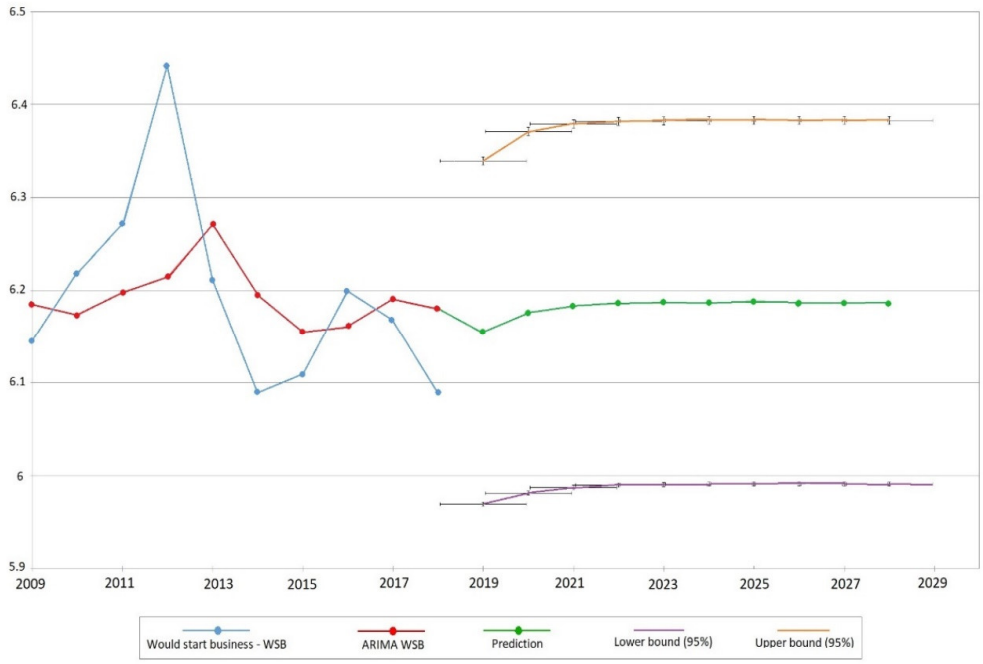

Figure 3. ARIMA forecasting graph (without predictors).

As expected, when there are no predictors included in the forecasting graph, the prediction is almost a straight line. Overall, the ARIMA regression values and the presented forecasting graphs provide a broader view of the influence of predictors on entrepreneurial intentions.

Furthermore, a QUEST classification tree algorithm was used to attempt the prediction of entrepreneurial intentions. Cross-validation was included in the procedure. In Figure 1, the decision tree with significant predictors is presented. The decision tree that is based on the QUEST algorithm is created for classifying cases, where the values of predictor variables can predict the dependent variable (in this case, entrepreneurial intentions).

The decision tree model presents a yes/no structure, where the primary goal is analyzed through several influencing factors. Here, the main/primary goal is whether the participant would start their own business. More precisely, the decision tree predicts which factors influence the decision to start a business. In this case, the following factors were found to have an effect on entrepreneurial intentions:

- Willingness to use incentive means (Would you be a user of these resources? USERES)
- Attitude on start-up loans (Do you think that start up loans from business banks are affordable for young entrepreneurs? AFFLOAN)
- Parent occupation (Mother's occupation MOTHOCC) (Father's occupation FATHOCC)

Based on the statistical significance of the strongest predictor with the outcomes variable, in the first step, the readiness to use incentive means for starting a business was singled out.

Among the participants who would use those incentive means, the decision tree model was able to predict 87% of the time a participant would intend to start his own business. In the next step, attitude towards start-up loans as affordable was identified as the most significant predictor.

Among the participants who view start-up loans as affordable for young entrepreneurs and who would be ready to use those loans, the model was able to predict 90% of the time that a participant would start their own business. Now, for participants who would not use incentive means, but are ready to start their own business, the two most influential predictors are the mother's and father's occupations.

The value of the predictive precision of this model (risk value) is 0.209 (0.005), which means that in 21% of the cases, a miss-classification occurs. The rules explaining the decision tree in Figure 4 are quite simple and as follows:

- Node 1: if (USERES = yes) then class yes = 86.7% and class no = 13.3%
- Node 2: if (USERES = no) then class yes = 70.6% and class no = 29.4%
- Node 3: if (AFFLOAN = no) then class yes = 83.4% and class no = 16.6%
- Node 4: if (AFFLOAN = yes) then class yes = 89.6% and class no = 10.4%
- Node 5: if (MOTHOCC = [retired] OR [agriculture]) then class yes = 56.4% and class no = 43.6%
- Node 6: if (MOTHOCC = [enterprise] OR [institution] OR [private business] OR [unemployed] OR [no data]) then class yes = 73% and class no = 27%
- Node 7: if (MOTHOCC = [institution] OR [no data]) then class yes = 67.2% and class no = 32.8%
- Node 8: if (MOTHOCC = [enterprise] OR [private business] OR [unemployed]) then class yes = 74.9% and class no = 25.1%
- Node 9: if (AFFLOAN = no) then class yes = 62.3% and class no = 37.7%
- Node 10: if (AFFLOAN = yes) then class yes = 75.6% and class no = 24.4%
- Node 11: if (FATHOCC = [enterprise] OR [private business]) then class yes = 77.3% and class no = 22.7%
- Node 12: if (FATHOCC = [unemployed] OR [institution] OR [retired] OR [no data] OR [agriculture]) then class yes = 71.5% and class no = 28.5%

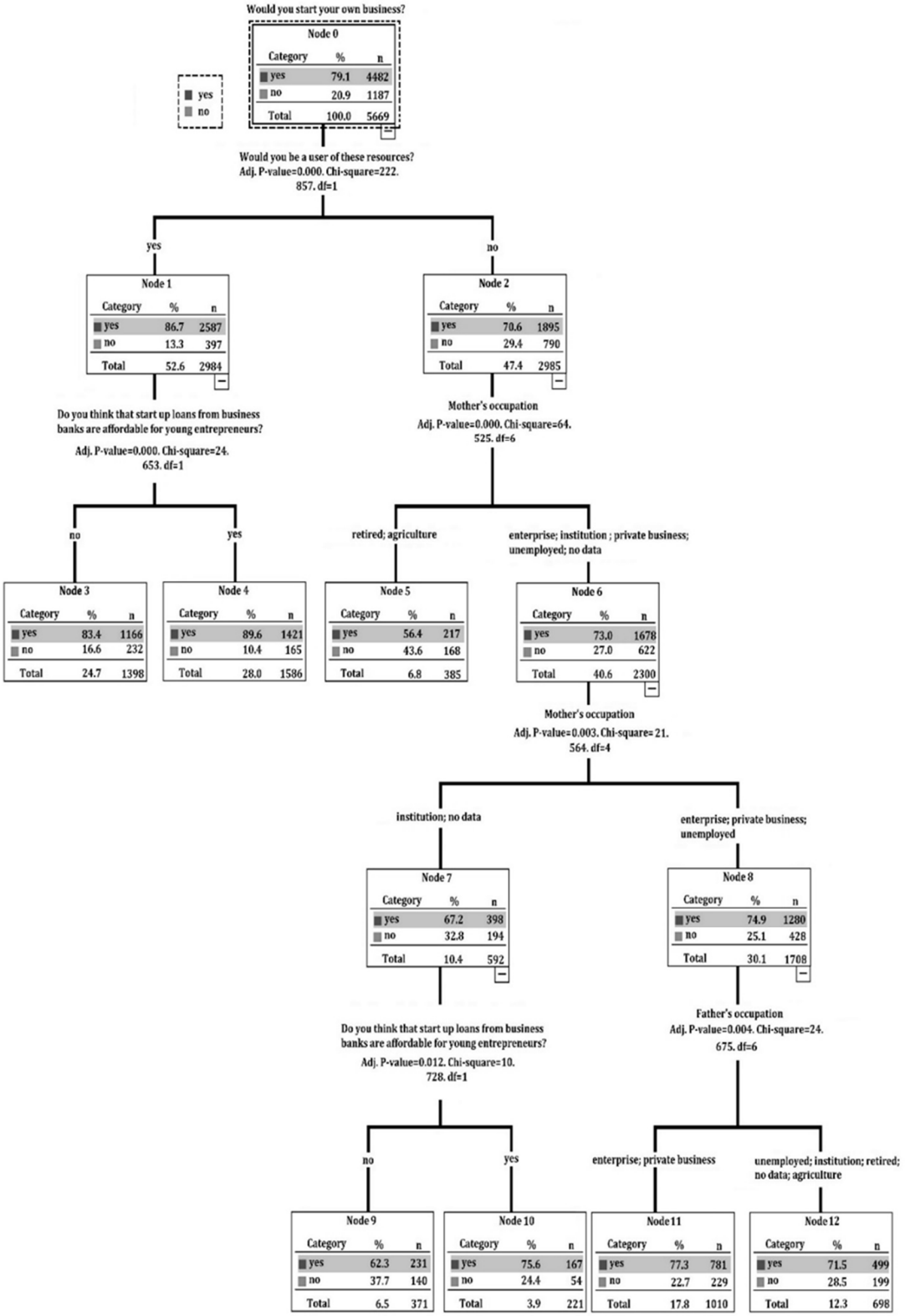

Figure 4. Decision tree based on the QUEST algorithm for predicting entrepreneurial intentions.

5. Discussion

Before the results are discussed, it is necessary to understand the complex nature of entrepreneurship attitudes, especially in a transitional economic environment. In previous research, it was discovered that rational investments and financial planning have positive relationships with entrepreneurial attitudes [101]. Additionally, intentions, proactive

personality, anticipated regret, and entrepreneurship education together have the strongest effect on entrepreneurial actions [102]. Entrepreneurial intentions are also affected by proactiveness, attitude to risk, innovativeness, and self-efficacy, and from these, attitude to risk was the strongest and most influential predictor for entrepreneurial intentions [102].

Currently, there are no other studies that take a similar approach to attempting to predict entrepreneurial intentions, such as in this current paper. A robust dataset in this form is not present in the existing body of literature. The results are unexpected and this may be due to the large dataset, other external or internal influencing factors, or something else. Before this is further discussed, the following question is first addressed:

How does this present research compare to previous findings?

Entrepreneurship education was analyzed through the opinions of students on the necessary knowledge and skills for starting their own business. From all the participants and multiple answers regarding limitations for starting a business, 14.3% noted that they did not have enough knowledge to start their own business. Some of these knowledge gaps included management basics (14%), marketing basics (11.9%), entrepreneurship and small business basics (29.8%), accounting basics (24.6%), computer skills (6.2%), foreign languages (29.3%), and business communication (18.4%). It can be argued that a more adequate entrepreneurial education system could improve entrepreneurial intentions and development. The "grim" economic development in a transitional country heavily affects youth entrepreneurship activities. A similar situation, from a different study conducted in Bosnia and Herzegovina among business school students, was observed, where entrepreneurship education regarding skills and knowledge were noted as factors that affect entrepreneurial intentions [103]. It seems that similar results are achieved across various studies, where attitudes where noted as significant predictors of entrepreneurial intentions [104,105]. Further, personal traits were investigated among Pakistani students in the context of entrepreneurial intentions [105]. The findings indicate that personal traits such as entrepreneurial attitudes, locus of control, and risk taking positively affect entrepreneurial intentions [105]. Another study from Pakistan that collected information from 120 students noted that entrepreneurial attitudes, entrepreneurial education, and family support were significant in a positive relationship with entrepreneurial intentions [106]. Entrepreneurial education was also found to strengthen the influence of attitudes on entrepreneurial intentions [105].

The results from a study conducted in Finland found that the concept of sustainability within entrepreneurship increases meaning and perceived desirability towards entrepreneurial actions [106]. In another study, 237 undergraduate business school students were evaluated regarding entrepreneurial intentions, and it was noted that entrepreneurial attitudes were instrumental in entrepreneurial intention development [107].

In this current paper, the results of linear regression analysis in this research indicate that students' attitudes is the only predictor that affect their intentions on starting their own business. What is even more interesting is that this influence is negative—meaning that positive attitudes negatively affect intentions to start a business.

Based on the results of linear regression analysis, the proposed hypotheses are evaluated as follows:

- H_1: Attitudes positively affect student's intentions to start their own business—not supported.
- H_{2a}: Gender positively affects student's intentions to start their own business—not supported.
- H_{2b}: Age positively affects student's intentions to start their own business—not supported.
- H_{2c}: Education positively affects student's intentions to start their own business—not supported.
- H_3: Close social environment positively affects student's intentions to start their own business—not supported.

- H_4: Awareness of incentive means positively affects student's intentions to start their own business—not supported.
- H_5: Environment assessment positively affects student's intentions to start their own business—not supported.

This is in contradiction with other findings, where it was found that attitudes, perceived opportunity positively affect entrepreneurial intentions. Next, the results of the ARIMA regression indicate that gender and environment assessment are non-significant predictors. Based on the results of the ARIMA regression analysis, the proposed hypotheses are evaluated as follows:

- H_1: Attitudes positively affect student's intentions to start their own business—failed to be rejected.
- H_{2a}: Gender positively affects student's intentions to start their own business—not supported.
- H_{2b}: Age positively affects student's intentions to start their own business—failed to be rejected.
- H_{2c}: Education positively affects student's intentions to start their own business—failed to be rejected.
- H_3: Close social environment positively affects student's intentions to start their own business—failed to be rejected.
- H_4: Awareness of incentive means positively affects student's intentions to start their own business—failed to be rejected.
- H_5: Environment assessment positively affects student's intentions to start their own business—not supported.

Further, based on the results of the binary logistic regression analysis and the QUEST classification tree algorithm, the hypotheses are evaluated as follows:

- H_1: Attitudes positively affect student's intentions to start their own business—failed to be rejected.
- H_{2a}: Gender positively affects student's intentions to start their own business—not supported.
- H_{2b}: Age positively affects student's intentions to start their own business—failed to be rejected.
- H_{2c}: Education positively affects student's intentions to start their own business—not supported.
- H_3: Close social environment positively affects student's intentions to start their own business—failed to be rejected.
- H_4: Awareness of incentive means positively affects student's intentions to start their own business—failed to be rejected.
- H_5: Environment assessment positively affects student's intentions to start their own business—not supported.

Overall, it is interesting to see that depending on the statistical approach, there are differences when it comes to the predicting effect of predictors on entrepreneurial intentions. The ARIMA regression and the QUEST classification tree algorithm managed to provide some insight into the potential predictive "power" of attitudes, age, close social environment, and awareness of incentive means on entrepreneurial intentions. The reason behind these results may be due to the large dataset, or due to the specific transition conditions of Serbia.

How does this study contribute to the existing body of literature?

First, it provides a significant insight into the complexity of youth entrepreneurship predictors in a transitional economic environment. The credibility of the conducted research lies in the sample structure and size (n = 5670). After analyzing the existing literature in this domain, no similar studies we found, which include such a large and structured sample. As noted previously, such a large dataset, collected in a 10-year timeframe, provides a strong representative sample. This sample is not without limitations. The Welch's t-test

indicates that when it comes to comparing sample between years, the differences between the ordinal values across all years is not statistically significant. However, when it comes to intentions on starting a business between years, the Chi-square indicates statistically significant differences between the following years: 2009–2010; 2012–2013; 2015–2016; 2017–2018. There seems to be no correlation with the previously presented Doing Business ranks. Only 2015 and 2016 have dramatic changes in doing business ranks, and at the same time, intentions are statistically significant. The z-test indicates that there are no statistically significant differences between the samples.

Furthermore, the study is not without limitations. Noting these limitations is significant as it provides insight and additional guidelines and a basis for future research.

The limitations of this paper include:

- The lack of tracking of respondents to see if their intentions translated into starting their own business (like most studies in this field);
- Not addressing non-English literature and non-Serbian literature sources for the theoretical background;
- Sample structure has limitations regarding data analysis (whether time-series analysis would be appropriate or not, is relative as there are different opinions in the existing body of literature in the domain of statistics);
- Random forest classification was not appropriate with the obtained dataset (probably due to no significant differences between the observed samples);
- Last year students were not analyzed and compared with students from first, second, and third-year students (the sample is not structure appropriately for such analysis);
- Unexplained variance is possible, which may be due to unexplored potential influencing factors), and should be addressed in future research.

Even with these limitations, the paper broadens the existing body of literature when it comes to applied machine-learning, more precisely the application of ARIMA regression and QUEST classification tree algorithm on a dataset that was obtained in a 10-year timeframe.

For future research, for fellow scholars, the following is recommended:

- Take notice of the above noted limitations and structure research approach accordingly.
- Include additional external and internal potential predictors of entrepreneurial intentions in the study (economic trends, job market, and national culture could be included in order to obtain a broader view on youth entrepreneurship and economic development factors. Such factors could improve the decision tree modelling process. Internal factors include creativity, intelligence, personality, motivation, social environment, diligence, etc.
- Further, it would be interesting to see how the concept of sustainability affects entrepreneurial intentions in a transition setting, as well how the pandemic affected the entrepreneurial environment.
- The potential influence of dataset size on predicting entrepreneurial intentions could be investigated.

Next, the practical implications of the study include guidelines for regulations, policies, agendas, and other actions, which would enhance and develop entrepreneurial environments in developing economies. Additionally, the practical contribution of the paper can be seen with educational organizations (schools, universities), and the government (policies, regulations, laws, etc.). Fellow researchers can address this paper for their own future studies, as this current study provides a solid theoretical and empirical base for further research. Due to the large dataset, generalization is possible, but only for an assumption-based discussion and as a guideline for research in other transitional counties. Strong statistically significant relations cannot be argued, as this would require multi-country approach, where the external and internal influencing factors are not significantly different.

6. Conclusions

In this research paper, linear regression analysis found that from several analyzed groups of predictors, such as close social environment, awareness of incentive means, and environment assessment, only students' attitudes affect intention to start their own businesses. In addition, this effect is negative, meaning that the more positive attitudes, the less likely would students have entrepreneurial intentions. This can be due to the aforementioned inadequate economic development in a transitional country. However, there is unexplained variance present, which may be due to other influencing factors (socio-economic, political, or other); thus, future research should address the potential influence of these factors.

Further, the ARIMA regression and QUEST classification tree algorithm have managed to provide additional insight into the influence of potential predictors on entrepreneurial intentions. Due to the nature of the dataset, the noted results should be investigated further. Overall, the results of the ARIMA regression and QUEST classification tree are complementary to other studies in this domain.

In conclusion, the approach taken in this study with the obtained dataset has provided insight into the relations between the potential influencing factors, and entrepreneurial intentions and forecasting was conducted. The obtained results are interesting, as some findings are contradictory and some are complementary regarding the existing body of literature. There is a solid basis for future research.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to the risk of unethical publishing by unauthorized parties.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Survey items, predictor items, and predictors groups are presented in Table A1.

Table A1. Survey items, predictor items, and predictor groups.

Frist Predictor Group: Sample Size and Structure (Demographic Information)		
Code	**Attribute**	**Description**
GEN	Gender	Male Female
AGE	Age	no specific age range; every age is viewed individually
EDU	Education (enrolled in)	high school undergraduate studies - 1st year - 2nd year - 3rd year - 4th year graduate studies—master studies graduate studies—doctorate studies

Table A1. *Cont.*

Second Predictor Group: Experience of Family Member Owning a Business (Close Social Environment)		
Code	**Attribute**	**Description**
FAMBUS	Do you have a member of family who owns a private enterprise?	Yes No
FATHOCC MOTHOCC	Father has own business employed—public enterprise employed—private enterprise own business—agriculture in retirement unemployed no answer provided	Mother has own business employed—public enterprise employed—private enterprise own business—agriculture in retirement unemployed no answer provided
KNOSKIL	What knowledge and skills do you lack for owning and managing a business? (up to three answers)	Management basics Marketing basics Entrepreneurship and small business basics Accounting basics Computer skills Foreign languages Business communication Other
Third Predictor Group: Students' Attitudes towards Entrepreneurship (Attitudes)		
Code	**Attribute**	**Description**
MEANBUS	What does private business mean to you? (up to three answers)	Challenge Risk and uncertainty Satisfaction and self-proving
WOREN	The working environment in a private enterprise is better compared to public jobs.	I agree I mostly agree I do not know I mostly disagree I disagree
MOSUCC	A private enterprise is more successful compared to other types of business.	I agree I mostly agree I do not know I mostly disagree I disagree
NOPROF	A private enterprise is not profitable and it is uncertain.	I agree I mostly agree I do not know I mostly disagree I disagree
Dependent Variable: Intentions to Start own Business (Entrepreneurial Intentions)		
Code	**Attribute**	**Description**
STARTBUS (dependent variable)	Would you start your own business?	Yes No
Fourth Predictor Group: Students' Awareness of Existing Incentive Means (Awareness of Incentive Means)		
Code	**Attribute**	**Description**
RESUSE	With what resources would you start your business?	Private—own Government Bank loans Associated resources
AFFLOAN	Do you think that start-up loans from business banks are affordable for young entrepreneurs?	Yes No
AWAR	Are aware of the existence of incentive means for starting own business?	Yes No
USERES	Would you be a user of these resources?	Yes No

Table A1. *Cont.*

Fifth Predictor Group: Serbian Environment in the Context of Entrepreneurship (Environment Assessment)		
CODE	**Attribute**	**Description**
STIMEN	Is there a stimulating environment in Serbia for starting a business?	Yes No
REALIPP	In Serbia, people do not know the real opportunities in the domain of private enterprises.	I agree I mostly agree I do not know I mostly disagree I disagree
GOVSTIM	Do you think that the government should have a key role in stimulating the youth to start their own enterprise?	Yes No
HOWGOV	How should the government stimulate the young to start their own business? *(up to three answers)*	Affordable loans Education Better laws and regulation of youth entrepreneurship Development of new business centers and incubators Market regulation Promoting the concept of youth entrepreneurship Other

Appendix B

The results of the descriptive statistics for the measured items are presented in Table A2.

Table A2. Results of the descriptive statistics.

Question	NOTE: Most frequent answers (due to multiple answer by one participant for some questions, the sum of % can exceed 100)
Sample size and structure (Demographic information)	
Gender	Male (2200 respondents; 38.8%) Female (3470 respondents; 61.2%)
Age	Mean 21.9 Variance 7.05 Standard deviation 2.65 Median 21 Mode 21 Percentages: 17 (2 respondents; 0.04%) 18 (164 respondents; 2.89%) 19 (943 respondents; 16.63%) 20 (1011 respondents; 17.83%) 21 (1101 respondents; 19.42%) 22 (579 respondents; 10.21%) 23 (368 respondents; 6.49%) 24 (264 respondents; 4.66%) 25 (344 respondents; 6.07%) 26 (355 respondents; 6.26%) 27 (537 respondents; 9.47%) 28 (1 respondent; 0.02%) 29 (1 respondent; 0.02%)
Education (enrolled in)	high school (542 respondents; 9.56%) undergraduate studies (4582 respondents; 80.81%): 1st year (1541 respondents; 27.18%) 2nd year (1241 respondents; 21.89%) 3rd year (954 respondents; 16.82%) 4th year (846 respondents; 14.11%) graduate studies—master (474 respondents; 8.36%) graduate studies—Ph.D. (72 respondents, 1.27%)

Table A2. *Cont.*

Experience of family member owning a business (close social environment)	
Do you have a member of family who owns a private enterprise?	Yes (2211 respondents; 39.9%) No (3459 respondents; 60.1%)
Father has own business (907 respondents; 16%) employed (public enterprise) (680 respondents; 12%) employed (private enterprise) (1928 respondents; 34%) own business—agriculture (340 respondents; 6%) in retirement (851 respondents; 15%) unemployed (567 respondents; 10%) no answer provided (397 respondents; 7%)	Mother has own business (510 respondents; 9%) employed (public enterprise) (1021 respondents; 18%) employed (private enterprise) (1710 respondents; 30%) own business—agriculture (227 respondents; 4%) in retirement (680 respondents; 12%) unemployed (1304 respondents; 23%) no answer provided (227 respondents; 4%)
What knowledge and skills do you lack for owning and managing a business? (up to three answers)	Management basics (794 responses; 14%) Marketing basics (675 responses; 11.9%) Entrepreneurship and small business basics (1690 responses; 29.8%) Accounting basics (1395 responses; 24.6%) Computer skills (352 responses; 6.2%) Foreign languages (1661 responses; 29.3%) Business communication (1043 responses; 18.4%) Other (108 responses; 1.9%)
Students' attitudes towards entrepreneurship (attitudes)	
What does private business mean to you? *(up to three answers)*	Challenge (2722 responses; 48%) Risk and uncertainty (2438 responses; 43%) Satisfaction and self-proving (2483 responses; 43%)
The working environment in a private enterprise is better compared to public jobs.	I agree (1311 respondents; 23.1%) I mostly agree (1179 respondents; 20.8%) I do not know (904 respondents; 15.9%) I mostly disagree (1329 respondents; 23.4%) I disagree (947 respondents; 16.7%)
A private enterprise is more successful compared to other types of business.	I agree (278 respondents; 4.9%) I mostly agree (493 respondents; 8.7%) I do not know (907 respondents; 16%) I mostly disagree (2625 respondents; 46.3%) I disagree (1366 respondents; 24.1%)
A private enterprise is not profitable and it is uncertain.	I agree (1463 respondents; 25.8%) I mostly agree (414 respondents; 7.3%) I do not know (1072 respondents; 18.9%) I mostly disagree (811 respondents; 14.3%) I disagree (1905 respondents; 33.6%)
Intentions to start own business (entrepreneurial intentions)	
Would you start your own business?	Yes (4482 respondents; 79.1%) No (1187 respondents; 20.9%)
If not, what are the reasons for not starting your own business?	I do not have the right idea (1327 responses; 23.4%) I do not have enough knowledge (811 responses; 14.3%) Lack of financial resources (2478 responses; 43.7%) Lack of leadership experience (1072 responses; 18.9%) Insecure about own abilities (301 responses; 5.3%) Uncertain political and economic situation (2132 responses; 37.6%) Lack of good associates with who I would start a business (856 responses; 15.1%) I am not interested (822 responses; 14.5%) Other (85 responses; 1.5%)

Table A2. *Cont.*

Students' awareness of existing incentive means (awareness of incentive means)	
With what resources would you start your business?	Private—own (3737 respondents; 65.9%) Government (624 respondents; 11%) Bank loans (505 respondents; 8.9%) Associated resources (805 respondents; 14.2%)
Are start-up loans from business banks affordable for young entrepreneurs?	Yes (2483 respondents; 43.8%) No (3187 respondents; 56.2%)
Are aware of the existence of incentive means for starting own business?	Yes (2444 respondents; 43.1%) No (3226 respondents; 56.9%)
Would you be a user of these resources?	Yes (2999 respondents; 52.9%) No (2671 respondents; 47.1%)
Serbian environment in the context of entrepreneurship (environment assessment)	
Is there a stimulating environment in Serbia for starting a business?	Yes (919 respondents; 16.2%) No (4751 respondents; 83.8%)
In Serbia, people do not know the real opportunities in the domain of private enterprises.	I agree (221 respondents; 3.9%) I mostly agree (2843 respondents; 5%) I do not know (658 respondents; 11.6%) I mostly disagree (1899 respondents; 33.5%) I disagree (2608 respondents; 46%)
What are the biggest limitations for starting own business?	Lack of financial resources (4394 responses; 77.5%) Limited market (1497 responses; 26.4%) Unstable political and economic situation (4326 responses; 76.3%) Disloyal competition (1089 responses; 19.2%) High tax rates (3204 responses; 56.5%) Other (34 responses; 0.6%)
Do you think that the government should have a key role in stimulating the youth to start their own enterprise?	Yes (5058 respondents; 89.2%) No (612 respondents; 10.8%)
How should the government stimulate the young to start their own business? (up to three answers)	Affordable loans (4043 responses; 71.3%) Education (3544 responses; 62.5%) Better laws and regulation of youth entrepreneurship (2308 responses; 40.7%) Development of new business centers and incubators (1191 responses; 21.0%) Market regulation (2121 responses; 37.4%) Promoting the concept of youth entrepreneurship (1752 responses; 30.9%) Other (28 responses; 0.5%)

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