

VET, Patience and the Wealth of Nations

Susanne Peters & Christine Siemer

Abstract Behavioral economics describe how preferences, experience, and individual characteristics relate to learning and choices, and therefore determine economic behavior. According to (economic) choice theories, patience is a key driving factor behind economic development as it affects economic behavior, as visible in health, crime, etc. Recent research sets up the relationship between patience and economic developments. It becomes clear that patience is strongly correlated to parameters like years of schooling, innovation, risk preferences and GDP per capita. We are interested in the connection between patience and the investment in initial and continuing vocational education and training (VET) in different European countries. This article examines whether there is a correlation between patience and the investments of the state and companies in vocational education and training (VET) in different European countries. We used a sample of European countries and correlated their values of patience (from the Global Preference Survey) with public investment in vocational training, with firm participation in vocational education and training and with enterprise expenditures on CVET. Our results indicate that there is a relationship between patience and the companies' participation in training.

Title VET, Patience and the Wealth of Nations

Keywords Patience, Vocational Education and Training, VET, Company Engagement in VET, Europe

1 Context and Research Approach

The *homo oeconomicus* is the central assumption of political economics: The human being of classical economics is a perfect calculator without emotions because, with constant irrationality, economic theory and policy modelling becomes impossible (Beck, 2014). Therefore, three characteristics determine this conception of mankind: unlimited ratio-

Dr. Susanne Peters & Dr. Christine Siemer (Institute of Technology and Education, University of Bremen);
speters@uni-bremen.de; chsiemer@uni-bremen.de;

<https://orcid.org/0000-0001-6245-601X>; <https://orcid.org/0000-0002-4316-5484>;

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nality, unlimited willpower and maximizing self-interest. *Behavioral economics* is the attempt to reconcile the human image of economics with the human image of psychology. It analyses psychological motives in people's behavior and tries to show where these are relevant in an economic context. For example, in contrast to traditional economy (where humans act consistent and are oriented towards their personal benefit), in behavioral economics, humans pay attention to the well-being of other people and the suggested future benefits depend on the time of decision. Behavioral economics describe how preferences, experience, and individual characteristics relate to learning and choices – and therefore determine economic behavior. This influence of individual conditions on visible effects can be related to learning theories in educational science: In contrast to behaviorism, where learning is a matter of stimulus-response within a black box, and constructivism, which does not define any truth and relates to the own personal experience (see e.g., Neubert et al. 2001), in social-cognitive learning theory by Bandura (1977) decisions and their emergence are central. Social-cognitive theory can be used when explaining, predicting, and influencing behavior.

Within the discipline of behavioral economics, we find a construct named *patience*, referring to intertemporal choices (effects of a decision will take place in a different time than the decision itself). We use this construct to examine a possible interrelation between patience and education with a special regard to vocational education and training.

According to (economic) choice theories, patience is a key driving factor behind economic development as it affects economic behavior, as visible in health, crime, etc. (e.g., Chabris et al., 2008; Sutter et al., 2013; Courtemanche et al., 2014). For example, Chabris et al. (2008) show that patience is one of the most important variables to explain individual differences in terms of behavior. The authors focus on behaviors that involve an intertemporal tradeoff and therefore should be associated with intertemporal preferences (e.g., smoking, drinking, nutrition, gambling). Patience is a construct of time preference and the research debate calls patience to be the ultimate reason for variations in living standards around the globe and emphasize the crucial role of the so-called “proximate determinants” of development, i.e., the accumulation of physical capital, human capital, and productivity (Dohmen et al., 2016). In other words, the more patient a society is, the higher accumulation of human capital and knowledge is probable. The stocks of these resources differ vastly across countries, as empirical evidence suggests. This observation leads to the research scope of explaining how differences in these stocks arise and how developments of corresponding determinants can be conceptualized (Dohmen et al., 2016). Concepts of path dependency show how characteristics like culture, history, or geography determine economic development.

Dohmen et al. (2016) proved in a first systematic investigation the relationship between patience and economic development. They titled their research “Patience and the wealth of nations” referring to Adam Smith's *Wealth of Nations* (1776/2008) and signaling the importance of patience regarding consumption and savings¹. They correlate patience with parameters like the countries' years of schooling, with R&D expenditures, innovation indices, risk preferences, and Gross Domestic Product (GDP) per capita. It becomes

1 “Savings” here relate to household savings as well as to gross (public) savings.

clear that patience is strongly correlated to all these mentioned parameters (Dohmen, 2019).

There are studies that indicate that the commitment of companies to continuing education is related to the commitment of companies to initial vocational training (Destatis, 2022). Additionally, Sunde et al. (2021) identify the links between patience and education as a research desiderate. Therefore, we ask: Is there a connection between patience and the investment in initial and continuing vocational education and training (VET) by the state and by companies in different European countries? Referring to the above-mentioned research results of patience, our hypothesis is that the more patient a society (on the country level) is, the more exists a willingness of firms and of the state to invest in apprenticeships. There is research on the costs of initial and continuing VET and their distribution among companies, private individuals and the public sector (e.g., OECD, 2022; Dohmen & Cordes, 2019), but no relation to the construct of patience is existing so far.

2 Methods

This chapter introduces the sample and the methodological approach of this study and provides a secondary analysis of the data sets used. The methodological approach of this article is quantitative. Based on three data sets and with a focus on the guiding research question, the aim is to answer whether there is a possible correlation between the independent variable “patience” and various dependent variables depending on VET-commitment. Therefore, the aim of the methodological approach is to use statistical parameters to show whether there is a demonstrable link between investment in education and patience from the perspective of behavioral economics.

2.1 Data Sets and Sample

The first data set was collected as part of the Global Preference Survey, which aims to determine economic preferences (Falk et al., 2015; 2018; Briq Institute, 2018). The data collection was funded and supported by the European Research Council with ERC Starting Grant No. 209214. For the measurement of the patience index, the sample consists of 76 countries covering all continents, every region within continents and different levels of development (Dohmen et al. 2016; also the following description of the patience data). The median sample size was 1,000 participants per country; in total, preference measures were collected for more than 80,000 participants worldwide. Respondents were selected by probability sampling and interviewed in person or by telephone by professional interviewers. In most countries, the samples are nationally representative of the resident population aged 15 years and older. From this data set, we use the variable *patience*² as the independent variable.

2 Example item for the variable patience „Would you rather receive 160 U.S. dollars today or 201 U.S. dollars in 12 months?“ (Falk et al., 2016, p. 14), see also <https://gps.briq-institute.org>.

Also, we use a sample of European countries for our research because the European Union (EU) is an economic world region with close economic and political interrelations. Especially regarding education, the vision of the European Education Area (to be achieved by 2025) is supposed to enrich the quality, inclusiveness and digital and green dimension of Member State education systems (European Commission, 2020). We use N=17 representing Austria, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Lithuania, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, United Kingdom (due to different availability of data, some countries are not included in all correlations).

The dependent variables result from the data sets of the UOE (UNESCO OECD Eurostat) data collection (Eurostat, 2024a) and from the micro data of the Continuing Vocational Training Survey (CVTS) (Eurostat, 2024b; for a detailed description of the variables, see below). The objective of the UOE data collection on education statistics is to provide internationally comparable data on key aspects of formal education systems, also regarding the cost and type of resources dedicated to education. The CVTS is surveyed in all member states of the European Union with the help of the federal and state statistical offices; in Germany, for example, 14.000 companies took part in the 2020 survey.

2.2 Hypothesis and Analysis

We choose the following dependent variables referring to Busemeyer and Iversen (2011) who use them to analyze youth unemployment, wage bargaining and labor market stratification:

1. *PublicExpend*: public investment in vocational education and training (public expenditure on initial vocational education and training as a percentage of GDP; Eurostat, 2022a). The data on public investment in vocational education and training comes from the annual UOE (UNESCO OECD Eurostat) data collection (Eurostat, 2024a).
2. *TrainSupport*: the commitment of companies to vocational training (proportion of companies that offer their employees some form of continuing vocational training; Eurostat, 2022b). The data on companies' involvement in vocational training comes from the micro data of the Continuing Vocational Training Survey (CVTS) (Eurostat, 2024b).
3. *ExpenCVT*: the commitment of enterprises to continuing vocational training (expenditure by enterprises on continuing training courses; Eurostat, 2022c). The data on companies' involvement in continuing vocational training also comes from the micro data of the Continuing Vocational Training Survey (CVTS) (Eurostat, 2024b).

Thus, our three hypotheses (H1a, H1b, and H1c) are:

H1a-c: There is a statistical correlation between *patience* and (1) *PublicExpend*, (2) *TrainSupport*, and (3) *ExpenCVT*.

To test the above hypotheses, we rely on bivariate and partial correlations when analyzing the data. Our research aims to examine the relationship between patience and *PublicExpend*, *TrainSupport* and *ExpenCVT*.

The data analysis was carried out using the statistical software SPSS version 28. First, the data were checked for normal distribution. Except for *TrainSupport*, the data follow a normal distribution. Then, we correlated patience with *TrainSupport*, *ExpenCVT* and *PublicExpend*. We used Pearson's parametric method for the normally distributed variables, and Spearman's Rho for the relations that involve *TrainSupport* (which was not normally distributed). In a further step we used partial correlations under controlling for the effect of the variables that were significant in the bivariate analysis. Again, we chose to conduct a non-parametric analysis when the non-normally distributed variable *TrainSupport* was involved.

3 Results

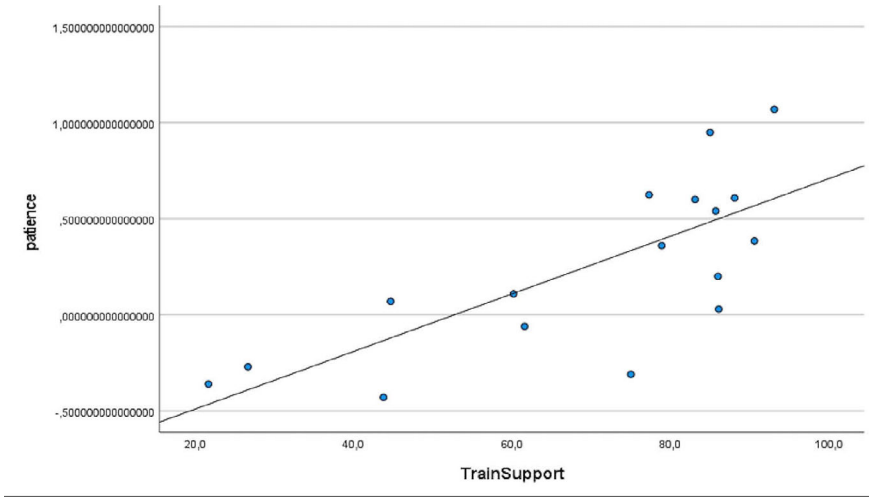
The results of the parametric correlation analysis show that for (1) *PublicExpend*, the relationship is rather moderate ($r = .503, p = .005$). The result of the non-parametric bivariate correlation analysis shows that there is a strong significant correlation between patience and (2) *TrainSupport*, i.e. the commitment of companies to vocational training that offer their employees some kind of continuing vocational training ($\rho = .713, p = .001$). For (3) *ExpenCVT*, no significant correlation was found ($r = .219, p = .399$).

Based on the identified correlations between patience and *TrainSupport* as well as patience and *PublicExpend*, the next step was to perform partial correlations between patience and *TrainSupport* as well as patience and *PublicExpend* to rule out possible spurious conclusions by controlling for the effect of a third variable. In contrast to the bivariate analysis, we found that the partial correlation of Patience and *PublicExpend* fails statistical significance when controlling for the influence of *TrainSupport* on the relation ($\rho = .301, p = .296$). Figure 1 displays the relation between patience and *TrainSupport*.

However, the correlation of patience and *TrainSupport* remains significant, even after accounting for the effect of *PublicExpend* ($\rho = .639, p = .014$). Adding *ExpenCVT* as a second control variable in the partial correlation analyses does not change the mentioned results.

The key result of the present study, taking into account the three hypotheses, is that a significant strong correlation between patience from the perspective of behavioral economics and the companies' commitment to training (*TrainSupport*) can be confirmed. While the construct of patience has no effect on public investment in vocational training (*PublicExpend*) and on the willingness of companies to invest in training courses (*ExpenCVT*).

Figure 1: Scatterplot of the correlation between patience and TrainSupport



4 Discussion

In social-cognitive learning theory, we construct when problem-solving and choose in the way that we have been shaped and socialized. This leads to individual preferences, and a set of preferences (like within a geographic region) leads to economic developments. Economic developments are responsible for people’s income, their employability, and therefore for their well-being. In this context, VET is also important and can contribute to a society’s well-being. When merging VET and the idea of patience, we can see a positive correlation for patience and the companies’ participation in vocational education and training.

The present quantitative results contribute to closing the research gap identified by Sunde et al. (2021) regarding a possible connection between patience and education. It was found that there is a strong, significant positive correlation between patience and the commitment of companies to offer a form of further vocational training (TrainSupport). Our hypothesis H1b can therefore be confirmed. While hypotheses H1a and H1c were rejected. It can therefore be assumed that public investment in vocational training and the commitment of companies to invest in vocational training by spending on training courses are independent of the patience of the countries studied. In order to be able to make statements about this, more predictors for the patience construct would have to be taken into account in the future in order to be able to interpret this from a behavioral economics perspective for vocational education and training.

Taking hypothesis H1b into account, the results lead to the assumption that the more patient the European countries studied (and thus the societies at country level) are, the greater the commitment of companies to invest in vocational training. This finding leads to the assumption that the companies belonging to the countries studied accumulate the effects of economic developments on their own operational processes and structures and

that, accordingly, the time preference of the decision to invest and spend can be justified by empirical knowledge.

The sample examined shows a certain heterogeneity due to the different countries. As the European countries were analysed as cases, it cannot be assumed that the results of the analysis of the sample examined can be generalized to the population as a whole.

The fact that the patience scale only includes time preference in connection with future-oriented behaviors is critical – particularly with regard to the analysis carried out. In order to determine comprehensively the construct of patience from a behavioral economics perspective for the context of vocational training research, further characteristics would be useful.

The quantitative results presented here help to close the gap in the identification of links between patience and education by demonstrating an empirical link between patience and the willingness to invest in vocational training by the state and companies in various European countries. By this, we only indicate that patience is a determinant to explain investments in VET and CVET. The extent to which an investment in vocational education and training has an effect and also leads to long-term changes in behavior could be the subject of further research.

In summary, what do we can learn from the patience-exkursus in VET? Patience-oriented societies foster investment in education. We find proof for companies' commitment offering their employees some form of continuing vocational training and therefore, we could doubt that there is a connection to initial vocational education. Still, there is evidence that firm engagement in CVET is related to engagement in IVET: In Germany, 86.2 % of companies providing IVET also offered CVET in 2020; in companies without initial vocational training, only 64.5 % offered further training (Destatis, 2022). We assume that companies that offer CVET tend to be more committed to education and to the development of human capital due to the determinant of patience.

In conclusion, patience-oriented societies prioritize education, with companies emphasizing continuing vocational training. Companies offering CVET presumably tend to be more education-focused and human capital development-oriented. A lack of resources and insufficient information about training opportunities can be reasons for not investing in education. From an education theory perspective, we can reinforce this result: There are several reasons why patience-oriented societies – and the companies within them – tend to place a strong emphasis on education. First, education is seen as a means to promote social mobility and reduce inequality, as it provides individuals with the opportunity to improve their economic prospects and social status. Second, education is viewed as a means to promote innovation and economic growth, as it helps to develop the human capital needed to drive economic progress, e.g. technological developments, and improve productivity.

5 Limitations and further research

For a critical evaluation of the results, we first want to focus on the construct of patience. The idea of patience is to indicate in how far time preference relates to future-oriented behaviors, resulting for example in economic variables like income. Therefore, we take

a closer look at how the data has been collected. For the determination of the patience value, respondents were asked whether they would prefer to receive 100 euros today or 154 euros in 12 months from now. Following this logic, respondents decided to receive payments now or later within four more questions according to these choice questions. We can see that the patience value is collected via a monetary assessment of the participants. This is a comprehensible approach but does not take into account the monetary stability (or individual's perception of the stability), so to gain precise (inflation-adjusted) patience values, we would have expected to have this factor included in the survey in a direct way.³ To address this challenge, we could add control variables for inflation and interest rates, but we assume it makes a difference within the questioning already.

There are limitations in the research design such as we use the *individual-level* patience measures and *collective-level* financial (investment; expenditure) measures. Furthermore, a small sample (N=17) leads to the question in how far our results are representative. Though, the data comes from valid and representative statistics/surveys and in this case, a small sample with a significant model is an indicator for an actual relationship between patience and the companies' engagement in training in the population as well. Nevertheless, our approach could be extended and used for a regression with more countries around the world as the Global Preference Survey is available for 76 countries. Following on from the present study, a comparison between the chosen countries can be pursued. In a next step, the nominal-scaled variables could be analyzed to determine the extent to which there are differences between the countries in relation to the existing patience of the sample. Such an approach would allow, on the one hand, to show in which countries the willingness of the state and companies to invest in vocational education and training can be expected to be accompanied by greater patience. Also, private educational expenditures by educational level could be included in a model.

Beyond a continuation of this research approach, we consider further research to be useful, e.g., regarding the question whether educational institutions can change patience. Dohmen (2019) argues that programs that are helping and supporting developing countries would work if they would foster patient behavior, e.g., if institutions create a certain and stable environment. Furthermore, it would be interesting from a vocational and economic pedagogical perspective to analyze the relation of the patience value of European countries and the skills development of employees and the economic returns of companies and countries, taking into account the changed skills requirements to be expected as a result of innovations. Based on a mixed-methods design, the methodological approach chosen here could be expanded in a follow-up study to include qualitative approaches in order to include different macro- or meso-perspectives, such as these of government stakeholders or employers/companies. Recommendations for education policy can then be derived from this further research.

3 In the questionnaire, it reads: "Please assume there is no inflation"; still, this does not include explicitly the expected monetary stability.

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