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Original Research

Economic and educational benefits of mother tongue and second language use: Evidence from Uzbekistan

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Despite growing recognition of the role of language skills in shaping human capital, the understanding of their influence on individual success in multilingual transition countries such as Uzbekistan remains limited. This study addresses this gap by empirically examining the interdependence of mother tongue and second-language use with individual income and academic attainment. The estimation draws on nationally representative microdata from the 2021 Household Budget Survey (HBS), based on a randomly distributed sample across all regions of Uzbekistan. The study estimates the return on language capital, contributing to a better understanding of its economic and academic outcomes in Uzbekistan. The empirical strategy applies well-established models (Marschak, Rubinstein, Grin, etc.) and the Mincer earnings function to new data using Ordinary Least Squares (OLS) with regional fixed effects, where income premiums are associated with each linguistic group and respondents' educational level. The findings reveal that the return on income for respondents with native Uzbek is not higher than for respondents who speak other languages. Moreover, native language education has no statistically significant effect on improving educational attainment levels. In contrast, the use of a second language (primarily English) increases earnings by 10–20% on average, with higher income premiums observed in economically active regions. The implications of the study include the interpretation of weaknesses in existing language practices and policies.

KEYWORDS: *mother tongue, second language, income premium, language capital, educational attainment, Uzbekistan*

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1. INTRODUCTION

Amid globalisation and digital transformation, language skills are becoming a key factor in accessing advanced levels of education, enabling upward socio-economic mobility and achieving higher individual earnings. Despite a wide range of empirical studies, the research problem is that the mechanisms by which both foreign and native languages influence income level and academic achievement remain poorly studied in the socio-economic context of transition countries like Uzbekistan. The purpose of the study is to identify and analyse the effect of the mother tongue and second language use on individuals' income and academic attainment and to offer recommendations in the field of language policy and education. The subject matter of the study is individuals' socio-economic outcomes resulting from the use of the native or second/foreign language in Uzbekistan.

The following objectives were set within the study: (1) to systematise theoretical approaches to the economics of language as an instrument of human capital; (2) to assess the impact of native language status on academic integration and labour income in Uzbekistan; (3) to analyse empirical data on income premiums associated with knowledge of foreign languages in

Uzbekistan; (4) to formulate recommendations for improving language policy and educational strategy for the development of language competences in the country.

The main hypothesis put forward is that proficiency in one's native or foreign language is positively correlated with income level, implying that insufficient support for the native language in educational and institutional systems has a negative impact on the academic achievements of linguistic groups.

The methodological basis of the study is a quantitative analysis primarily based on well-established models (Marschak, 1965; Rubinstein, 2000; Grin, 2003) and the standard Mincer earnings theoretical function analysing income premiums depending on the educational level and language acquisition, alongside a set of control variables. To test the research hypotheses, Ordinary Least Squares (OLS) with fixed effects regression analysis methods were used (to assess the impact of native and second language and education on income and academic attainment) and logistic regression (to assess the probability of second language proficiency), taking into account differences between groups by level of education, native language and place of residence. For the quantitative analysis, log-linear income regressions were estimated for all regions of Uzbekistan using OLS with regional fixed effects, controlling for accumulated human capital and individual characteristics (as well as 208 territorial community clusters called *mahallas*).

The findings of this study have several important implications for educational policy, language planning, and future research. Practical implications relate to the role of linguistic capital in human capital development: the study adds to the growing body of research supporting the idea that both native and second language proficiency are not only cultural assets but also economic resources, especially in multilingual societies. Methodologically, the research supports the importance of integrating language variables into socioeconomic and educational datasets, which may improve the precision of policy-oriented studies and cross-country comparisons in the field of language economics and education. Practical implications include the need to support bilingual and multilingual education policies in Uzbekistan, particularly in regions where the use of the mother tongue enhances individual performance and promotes equal access to economic opportunities. Encouraging second language proficiency, especially in global languages such as English, or ethnic minorities' languages (such as Tajik and Kyrgyz) may contribute to improved employment outcomes and social mobility.

The structure of the article is as follows. Section 1 describes research methods and the empirical database used in this study to assess the impact of language competence on household income and academic attainment. In section 2, theoretical models of language as an economic institution are discussed with a review of the results of previous studies. Section 3 presents quantitative results of the econometric analysis of the impact of native and additional foreign languages on income and academic success in Uzbekistan. Section 4 summarises the main conclusions and provides practical recommendations.

2. MATERIAL AND METHODS

This study employs a quantitative research design based on primary microdata from the Household Budget Survey (HBS) conducted in Uzbekistan in 2021. The sample includes a nationally representative population, randomly selected across all regions, encompassing both urban and rural households (10,000 in total). The sample size was 10,000 respondents aged 18 to 60 years, including both native speakers of Uzbek and other languages (Russian, Karakalpak, Tajik, etc.). Only economically active individuals were included in the analysis.

The study is based on a detailed dataset containing information on respondents' income levels, educational attainment, language of communication, language competence (proficiency in a second and third language), place of residence, age, and demographic characteristics.

A cross-sectional design with a representative sample by region, type of settlement (208 mahallas), and age groups was used to calculate econometric estimates of regression analysis in the STATA package.

To test the research hypotheses, Ordinary Least Squares (OLS) with fixed effects regression analysis methods were used (to assess the impact of native and second-language proficiency and education on income and academic attainment) and logistic regression (to assess the probability of second-language proficiency), taking into account differences between groups by level of education, native language, and place of residence. To account for spatial and social heterogeneity, regional fixed effects and community-level (mahalla) cluster effects were included in the model, allowing for more accurate estimation of the relationship between language use and economic/educational outcomes.

To evaluate the impact of language competence on household income, the study applies the Mincerian earnings function, which models income as a function of years of education and other human capital indicators. Language variables are included as key explanatory factors, distinguishing between mother tongue fluency and proficiency in second languages (primarily Russian and English). The analysis uses log-linear income regressions for all regions of Uzbekistan, estimated via Ordinary Least Squares (OLS) with regional fixed effects, controlling for individual characteristics such as age, gender, education level, employment status, and membership in 208 territorial community clusters (mahallas). To analyse how knowledge of a second or multiple languages affects earnings, variables for knowledge of a second or multiple languages other than one's native language are included. An assessment was also made of whether the probability of knowing a second or third language would be higher for individuals with a high level of education, living in large regions, or being younger.

All statistical analyses were performed using robust standard errors to ensure the reliability of coefficient estimates. The methodological approach allows for causal interpretation under the assumption of conditional exogeneity and provides a framework for identifying policy-relevant language effects in multilingual developing contexts.

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The following indicators were used as dependent variables: respondents' income (in soums, logarithmic form), years of education (duration of study), and proficiency in a second and third language. The following variables were used as key explanatory variables: native language (dummy variable: Uzbek = 1, other = 0), education (years of study, categorical variables), age, gender, place of residence (region), as well as variables reflecting language competence (language of instruction, knowledge of a foreign language).

Tests for the significance of coefficients (t-statistics, p-value) and confidence intervals were used to test the statistical significance of the results of econometric estimations. Model diagnostics included testing for multicollinearity and stability of estimates (VIF tests), as a result, robust standard errors were used.

3. THEORETICAL BACKGROUND

The relationship between language skills and economic development remains one of the key topics within new institutional (macro) and behavioural (micro) economic theory. Research in this area demonstrates that language is not only a factor of social integration but also an important element in the formation of human capital, increasing labour productivity, stimulating innovation, and providing access to global markets.

Language skills are considered in economic theory as part of human capital, along with education, work experience, and professional competencies. The theoretical foundations of language as an economic resource (microeconomic models of the 'economics of language') were first described by Marschak (1965), who formulated the concept of the 'economics of language' and defined language as an economic instrument for minimising the transaction costs of communication. Rubinstein (2000), in his monograph *Economics and Language*, expanded on these ideas, presenting language as a coding system that influences the behaviour of agents under uncertainty. Further, Ginsburgh et al. (2007) developed a behavioural model of language choice in a multilingual society, according to which individuals tend to choose the language that maximises their future income – most often the language most widely used in the business environment. John (2016) emphasises that the market dynamics of languages result from market competition and institutional support for language processes: languages that promote economic opportunities displace 'less economically advantageous' languages if there is no institutional support for the latter.

Grin (2003) and Zhang and Grenier (2013) propose a classification of economic studies of language into two areas: (1) microeconomic analysis of the returns to language knowledge (including wages, employment, and migration); (2) macroeconomic analysis – the impact of language on economic growth, trade, and innovation.

In the macroeconomic context of human capital theory, Barro (1999) emphasises the importance of language skills as a foundation for acquiring other academic competencies and as a driver of economic growth. Language skills serve as a foundation for acquiring other knowledge and skills, which in the long run increases the income of both individuals and society.

Effective language policies that ensure multilingualism and support for native languages contribute to a more equitable distribution of economic opportunities, meaning that language policies can reduce or increase income inequality. Grin (2003) emphasises that societies with high levels of general language proficiency (including foreign languages) are more economically diversified and competitive. Subsequent research by Ginsburgh and Weber (2020) clarifies that language should be viewed not only as a means of communication, but also as an institution regulating access to resources. Thus, the inclusion of a language component in human capital development strategies can be an important step towards sustainable and inclusive economic growth, serving as a tool for reducing economic differentiation.

According to modern microeconomic and sociocultural theories, the language of instruction has a significant impact on academic achievement, cognitive development, and the subsequent ability to learn foreign languages.

First, education in the native language is considered a factor contributing to the formation of academic skills and cognitive development (Cummins, 1979, 2017). Cognitive Load Theory (Sweller, 2011) states that learning in an unfamiliar language can cause overload, especially if new educational content is introduced in parallel; a gradual transition from L1 to L2 reduces cognitive costs. Also, according to sociocultural theory (Vygotsky, 1978; Lantolf & Thorne, 2006) effective learning is possible when the language of instruction is understandable to the student, through which they achieve higher cognitive skills (promoting cognitive development) in the 'zone of proximal development'.

Modern research studies confirm that instruction in the mother tongue contributes to better assimilation of educational material, formation of academic skills and the cognitive development of students (UNESCO, 2021; Thomas & Collier, 2012). UNESCO (2021) emphasises the importance of using the mother tongue in education as a tool for increasing enrolment, reducing dropout and moving towards sustainable development.

Secondly, education in the native language is considered not only an important factor in the formation of academic skills, improving academic performance, but also a basis for subsequent acquisition of a second language. This is confirmed by the cognitive load hypothesis (Sweller, 1988), according to which the transition to education in a second language without

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basic skills in the native language reduces effectiveness. The BICS vs CALP model (Cummins, 2008) argues that early instruction in the native language is necessary for successful CALP development, distinguishing between basic communicative skills (BICS) that develop over 1-2 years, and academic language competence (CALP) that develops over 5-7 years.

Many studies confirm that early instruction in the native language has a positive effect on academic achievement and subsequent second language acquisition (Thomas & Collier, 2012; Auger & Locke, 2019). However, despite the existence of valid models, important questions remain, particularly regarding regional differences and the role of educational level as a moderator of the language effect, which is the subject of this study.

3.1. Mother tongue, integration, and income

The study by Chiswick and Miller (1995) confirms that proficiency in the official language of the country of residence is a critical factor in successful employment, career advancement, and increased income. However, the mother tongue can also become a barrier if there is no access to quality education or employment in the official language. From another perspective, Laitin (2016) raises an important point: when government policies fail to provide access to quality education or employment in the official language, the mother tongue may become a barrier, leading to decreased income for these groups and increased social inequality.

In countries where access to quality education in native or global languages is limited, income gaps between social groups increase. Kennedy (2011) emphasises that an effective language policy should include support for native languages and a realistic bilingual education programme. Helliwell (1999) adds that language integration promotes trust and social cooperation, leading to a more equal distribution of income. Bruthiaux (2002) also notes that the mechanical incorporation of language into the education systems of developing countries, without creating conditions for effective acquisition, results in the economic and social marginalisation of large groups of the population.

3.2. Economic returns to foreign language proficiency

According to many studies, knowledge of a foreign (and especially a global language – English) increases labour mobility, ups its value and promotes integration into the global economy, and is directly related to an increase in wages. In countries with transition economies, knowledge of English provides a significant income premium. Thus, a study by Mavisakalyan (2017) shows that in post-Soviet transition countries, proficiency in English can increase wages by 20-40% depending on the industry and level of education. Similar findings are made by Grenier and Zhang (2021), who emphasise that foreign language skills not only increase income but also serve as a marker of high qualifications and increase the chances of occupying positions that require interaction with international counterparts, increasing career mobility or social status (language competencies also act as a social elevator), especially in the private sector.

This is consistent with the findings of Rozhkova and Roshchin (2019), who found that positive returns on knowledge of English were also recorded in the Russian labour market. According to the research of these authors, knowledge of English in Russia provides a salary premium of 15% to 30%, depending on the sector. Moreover, the effect of additional income for native English speakers is more pronounced among younger workers and in sectors with a high share of foreign economic relations.

The situation is similar in the EU countries. Williams (2011) indicates that in multilingual countries of Western Europe (Belgium, Switzerland and Germany), knowledge of two or more languages is associated with consistently higher incomes.

3.3. Language of instruction and academic achievement

Research shows that the choice of language of instruction has a significant impact on students' basic academic skills and long-term economic prospects. Research confirms that: (a) mother tongue instruction in early school improves basic academic skills; (b) gradual bilingual transition preserves these benefits while building sought-after language competencies; (c) quality implementation depends on the training of staff and the availability of educational resources; (d) successful implementation requires well-designed language policies and institutional support.

According to UNESCO (2021), mother tongue instruction increases enrolment and reduces dropout rates, particularly in primary school, and the organisation recommends models of bilingual education with the gradual introduction of international languages. A longitudinal study of 40,000 US students (Thomas & Collier, 2012) found that dual-language immersion programmes (starting with instruction in the native language and gradually switching to the second language) provide better reading and mathematics results by high school. Auger and Locke (2019), analysing the results of PISA 2018, showed that late introduction of a second language (after grade 7) gives the best academic results by the age of 15, and early immersion requires high resource support for academic success. According to Cummins (2017), early instruction in the native language accelerates subsequent acquisition of subjects in L2.

Thus, the literature review shows that: (1) the native language affects income through access to education and the degree of social integration and mobility, while proficiency in the

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official language is critical for access to skilled employment; (2) knowledge of a foreign language increases income and expands economic opportunities, and proficiency in English and other international languages increases competitiveness in the labour market and wage levels; (3) the language of instruction is a factor in academic performance: many studies also assess how the choice of language of instruction (native or foreign) affects students' academic performance and subsequent prospects. Instruction in the native language in elementary grades improves basic literacy and the assimilation of subject material, while a gradual transition to a foreign language in senior grades contributes to the formation of linguistic capital, which subsequently affects employment and income levels; (4) language policy can be an instrument of both social inclusion and institutional inequality, effective bilingual education programmes reduce income gaps, while unadapted ones cause marginalisation.

Despite established theoretical foundations, the literature continues to raise a number of controversial issues, giving rise to the following research questions.

1. To what extent does the native language influence not only academic performance, but also subsequent economic outcomes – income level and social mobility? The literature shows contextual variability (contradictory results) in the returns to native language proficiency across countries and regions, arising from local socio-economic conditions (differences in the institutional environment, labour market structure, and educational policies). There is a lack of studies that simultaneously analyse returns to language in the form of an income premium and academic achievement measured by years of education.

2. How does native language proficiency affect the ability to learn foreign languages? Existing studies often focus on monolingual and bilingual effects, but the mechanisms of language transmission in the educational system, especially in the post-Soviet context, remain poorly understood.

3. Does the return on foreign language proficiency operate in the context of increasing educational attainment and regional heterogeneity? Empirical evidence from post-Soviet countries is limited, and most existing data are either aggregated or do not take into account important moderators such as educational attainment, age, and urbanisation. This is especially relevant for countries with a multilingual population and pronounced regional differences, such as Uzbekistan.

To answer these research questions, this study formulates and tests two main hypotheses. Hypothesis 1 is that education in the native language contributes to the growth of human capital by increasing students' academic achievement, which, in turn, leads to higher income. Hypothesis 2 is that proficiency in the native language facilitates the successful learning of a second language, knowledge of which provides a significant income premium. In this regard, an assessment was conducted to determine whether the likelihood of mastering a second and third language increases among young people who speak Uzbek as their native language, as well as among individuals with higher levels of education and those living in cities.

The novelty of this study lies in its focus on a transition economy. Using the example of Uzbekistan, it offers a cross-sectional analysis comparing the economic and academic returns to education in the native language and measures the 'premium' for a second language (L2) in different regions (the second language proficiency effect). In addition, the study traces how language competence correlates with territorial differences in opportunities and returns to education. Also, the study clarifies the role of the native language as a basis for mastering global languages, which has practical implications for language policy, education strategies and the formation of inclusive growth models.

4. STUDY RESULTS

A consistent finding across studies on the impact of language proficiency on income is that knowledge of the country's dominant language yields substantial economic returns (Chiswick & Miller, 2015; Dustmann & Soest, 2001). In particular, in many European countries, individuals who are fluent in the dominant language (such as English, German or Hebrew) earn approximately 10-20% more than those who lack fluency (the income advantage is around 10-20%). According to UNESCO (Wisbey, 2017), mother tongue-based education (MTB, educational programmes with instruction in the native language), which provides opportunities to learn in the languages that are commonly spoken at home with family members, not only supports individuals' future development but also fosters the development of greater self-confidence. Mother tongue education enhances literacy and educational achievement, including improved access to higher education, greater economic productivity and competitiveness. Also, countries that place more emphasis on local languages tend to experience stronger social progress, increased mobility, and the development of human capital.

Overall, linguistic competencies alongside other skills are an element of human capital. From an economic perspective, they provide access to various markets (including the labour market and markets for goods and information) and enable individuals to engage more effectively and profitably with other people and organisations.

To analyse how education in the native language and knowledge of other languages affects earnings in Uzbekistan, and to assess the probability that knowledge of the second and third languages is higher among individuals with a high level of education, living in large regions or at a young age, we test the corresponding Hypothesis 1.

Hypothesis 1. Education in the native language improves learning outcomes and academic success and leads to an increase in human capital and income earnings.

To assess the current level of return on a particular native language in Uzbekistan, we estimate the education duration and income level depending on the respondent's native language (Tables 1 and 2). In Table 1, the assessment results do not support, at the 5% significance level, the idea that native language increases overall educational success, including the ability to more freely obtain higher education.

Table 1
Assessment of the impact of native language proficiency on the likelihood of access to higher education

Linear regression Number of obs = 8473						
F(4, 207) = 1453.52						
Prob > F = 0.0000						
R-squared = 0.5401						
Root MSE = 1.2301						
edu_years	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.455109	.0060204	75.59	0.000	.4432399	.4669781
gender	-.0214687	.0254999	-0.84	0.401	-.0717415	.0288041
language_native	.0066285	.0035792	1.85	0.065	-.0004279	.0136849
province	.0018405	.0057916	0.32	0.751	-.0095777	.0132586
_cons	1.977742	.6470394	0.33	0.003	.7021101	3.253374

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

Economic research has shown that an important investment in human capital is learning a country's dominant language and that fluency in a country's dominant language provides advantages in the labour market and is important for its economic success. The results in Table 2 show that the return on income for respondents with Uzbek as their native language is not statistically significantly higher than that for respondents with other native languages.

Table 2
The influence of native language on income level

Linear regression Number of obs = 5.998						
F(5, 207) = 169.61						
Prob > F = 0.0000						
R-squared = 0.1642						
Root MSE = .62132						
ln_hired_wage	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
edu_years	.0879776	.0067342	13.06	0.000	.0747011	.1012541
age	.0042314	.0008617	4.91	0.000	.0025326	.0059303
gender	-.4772029	.0242917	-19.64	0.000	-.5250937	-.429312
language_native	-.0019727	.0017764	-1.11	0.268	-.0054749	.0015294

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Table 2
The influence of native language on income level (continued)

province	.0186862	.0051795	3.61	0.000	.0084749	.0288976
_cons	14.21138	.53961	26.34	0.000	13.14754	15.27522

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

Thus, the analysis of the dependence of the duration of education (or education attainment level) and income level in Uzbekistan on the native language of respondents (Tables 1 and 2) shows that the form of education in the native language has no significant effect on educational achievements, including access to higher education (according to Table 1) and native speakers of the Uzbek language do not receive a statistically significant advantage in income compared to other groups (Table 2 shows that the economic return on education for native speakers of the Uzbek language is not statistically higher than for native speakers of other languages). This underlines the importance of taking language factors into account in educational and economic policies.

Moreover, the dominance of one language can lead to negative wage premiums, especially if there are differences in the quality of education offered in different languages (Aldashev & Danzer, 2020). Therefore, Uzbekistan needs to strive to enhance quality and enrich the scientific baggage in its native language and disseminate globally accessible knowledge through mass translation into Uzbek.

It is worth noting, however, that the costs of providing linguistic diversity are relatively low. For example, providing bilingual education may increase the cost of education by 4-5% compared to the cost of monolingual education, mainly due to the additional teaching materials and teacher training required (Grin, 2003). However, this seems to be a burden that must be accepted in order to pass on language and knowledge to the next generation.

Hypothesis 2. Knowledge of the native language facilitates learning a foreign (second) language, which in turn leads to an increase in wage premiums (from knowledge of the second language).

Knowledge of a foreign language constitutes an important component of human capital, and the returns to this skill in international labour markets have been extensively studied. Positive economic returns on knowledge of a foreign language are confirmed in various countries. In Switzerland, such knowledge can be rewarded with a significant bonus (12-30%) in salary. In developing countries, such as Vietnam, it is even higher – 40-60%.

In Europe, the most consistent impact on income is demonstrated by proficiency in widely used foreign languages such as English and German. The degree of impact depends on the prevalence of the language in a given labour market. For example, in Austria, where almost half of the population speaks English as a second language, the return is 11%, while in Spain, where English proficiency is less common, it is 39%. The return on fluency in English in Germany is about 12%, provided the language is used in the workplace. Using a large European dataset, a study of the impact of foreign language skills on unemployment (focusing on natives, not immigrants) showed that knowledge of a foreign language reduces the likelihood of unemployment by at least 3.4 percentage points.

The results have also demonstrated that using a second language in the workplace increases earnings by 3-5% in some Western European countries, and even more in others (Williams, 2011).

A study on the wage effects of foreign language proficiency in the Russian labour market found that the return is 9% when controlling for job characteristics, while the return on fluent proficiency is 24%, which significantly exceeds the return on lower proficiency levels (Rozhkova & Roshchin, 2019). It is usually difficult to separate the premium for formal education from the premium for language proficiency, since foreign language learning occurs mainly within the framework of education. When controlling for education, the premium for language proficiency in Russia is 8%. Without this control, the coefficient for the variable almost doubles (in other words, with education included in the model, the wage premium was 8%; without it – almost 24%).

Another study has demonstrated that the return on knowledge of a foreign language in Russia yields a 'solid premium' in terms of earnings – about 11% (Kapelyushnikov & Lukyanova, 2010).

Uzbekistan ranks very low in terms of proficiency in the main language of international communication – English – placing 98th out of 116 countries in the EF English Proficiency Index (EF EPI) compiled by EF Education First. EF EPI is a global assessment of working-age adults using a common methodology to measure English proficiency levels. In 2024, Uzbekistan scored 439 points, which corresponds to the category of 'very low proficiency' – the lower half of level B1 according to the Common European Framework of Reference (CEFR).

An assessment of the return on each year of education across all regions of Uzbekistan (Table 3) showed that wage gains amount to 8.7%, compared to up to 12.5% per year of study reported in a previous study of one region – Jizzakh (Ibragimova, 2022a, 2022b). The inclusion of variables measuring proficiency in a second (or third) language (Table 3) further indicates that second- or foreign-language proficiency is critical for career development and yields higher economic returns for individuals who actively use languages other than their native Uzbek.

Table 3
Estimated return on income, bonuses for higher education and knowledge of the second and third language

Linear regression Number of obs = 4,187						
F(7, 8) = .						
Prob > F = .						
R-squared = 0.1385						
Root MSE = .63256						
ln_hired_wage	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
edu_years	.0872301	.002646	32.97	0.000	.0811284	.0933319
age	.0020256	.0004492	4.51	0.002	.0009897	.0030615
gender	-.455107	.0140638	-32.36	0.000	-.4875382	-.4226758
language_second						
Karalkalpak	.1185788	.031073	3.82	0.005	.0469244	.1902332
Tajik	.0893055	.0320731	2.78	0.024	.0153448	.1632662
Russian	.0559556	.0341793	1.64	0.140	-.022862	.1347732
Kazak	-.1438056	.0523531	-2.75	0.025	-.264532	-.0230793
Kyrgyz	.0917579	.0325083	2.82	0.022	.0167936	.1667222
Tatar	.0637662	.034954	1.82	0.106	-.0168379	.1443702
Turkmen	-.0793269	.0321156	-2.47	0.039	-.1533857	-.0052681
Farsi	-.0114107	.0741417	-0.15	0.881	-.1823818	.1595603
English	.1628677	.0316527	5.15	0.001	.0898764	.235859
Other	-.0294955	.0320606	-0.92	0.384	-.1034275	.0444364
province	.0179986	.0020298	8.87	0.000	.0133178	.0226793
_cons	14.33497	.2432744	58.93	0.000	13.77398	14.89596

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

The highest premiums are observed for knowledge of such second languages as English (16.3%), Karakalpak (11.8%), and Kyrgyz (9.2%). (Knowledge of a second language refers to its use in the workplace or in everyday activities.)

It is worth noting that, both taking into account the level of education and without it, the premium for knowledge of the second and third language can be up to 10-20% (Table 3 and Table 4). That is, despite the fact that learning a second, etc. language occurs mainly within the framework of education, when excluding the variable premium for formal education years (i.e., without control for the level of education) the premium for knowledge of an additional language (the coefficient for the variable of the second language) does not change significantly, i.e. these two types of premiums can be easily separated. The latter may indicate a weak study of the second and third languages within the existing education system.

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Table 4
Estimated returns to income and premiums for second language proficiency (without controlling for the variable of higher education level)

Linear regression Number of obs = 4,187						
F(7, 8) = .						
Prob > F = .						
R-squared = 0.1006						
Root MSE = .64626						
ln_hired_wage	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.0017257	.0003767	4.58	0.002	.000857	.0025944
gender	-.4769774	.016669	-28.61	0.000	-.5154161	-.4385387
language_second						
Karalkalpak	.1180557	.0415867	2.84	0.022	.0221567	.2139548
Tajik	.067656	.0386811	1.75	0.118	-.0215427	.1568548
Russian	.045784	.0390129	1.17	0.274	-.0441799	.1357479
Kazak	-.157042	.0363358	-4.32	0.003	-.2408326	-.0732514
Kyrgyz	.048068	.0390715	1.23	0.254	-.042031	.1381669
Tatar	.018752	.0408503	0.46	0.658	-.075449	.1129529
Turkmen	-.1466011	.0389808	-3.76	0.006	-.236491	-.0567111
Farsi	.1397817	.161612	0.86	0.412	-.2328962	.5124597
English	.1881069	.0393122	4.78	0.001	.0974529	.2787609
Other	-.0561489	.0392128	-1.43	0.190	-.1465737	.0342759
province	.0206503	.0029944	6.90	0.000	.0137454	.0275553
_cons	15.13411	.3182042	47.56	0.000	14.40033	15.86789

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

When learning a new (second or third) language, the skills acquired in learning to spell and read in the native language are transferred. If an individual cannot read or write in their native language, it may be difficult for them to learn to read in a second language. In general, the more educated a person is, the more effectively they learn a language (Chiswick & Miller, 2015).

Therefore, an assessment was also made of whether the probability of proficiency in a second (or third) language is higher among young native Uzbek speakers living in Tashkent and among individuals with a high level of education (Table 5).

The results show that knowledge of the native language increases the probability of mastering other languages. The probability of mastering a second and third language is higher among young people, those who have received secondary general or higher education, and those living in large cities.

Language policy should therefore focus on systematically expanding bilingual and trilingual education opportunities for youth, gradually scaling successful urban language programmes to other regions of the country, and embedding advanced language training into both school and university curricula.

Table 5
The influence of higher education, age, and region of residence on multilingualism

Linear regression Number of obs = 4.755						
F(18, 198) = 13.80						
Prob > F = 0.0000						
R-squared = 0.0245						
Root MSE = 4.0814						
language_second	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
edu_highest	.1724006	.0924941	1.86	0.064	-.0099993	.3548005
language_native	.0080266	.0030547	2.63	0.009	.0020027	.0140505
language_third	.0031707	.006193	0.51	0.609	-.009042	.0153833
age	-.007793	.0030606	-2.55	0.012	-.0138286	-.0017574
gender	.0100092	.119731	0.08	0.933	-.2261024	.2461209
province						
Andijan region	1.797885	.6534913	2.75	0.006	.5091883	3.086581
Bukhara region	.4052873	.1334089	3.04	0.003	.1422026	.668372
Jizzakh region	1.262542	.1737869	7.26	0.000	.9198312	1.605253
Kashkadarya region	2.207658	.6949456	3.18	0.002	.8372129	3.578103
Navoi region	1.214893	.1545006	7.86	0.000	.9102151	1.519571
Namangan region	1.153424	.1618229	7.13	0.000	.8343063	1.472541
Samarkand region	.6654023	.1780815	3.74	0.000	.3142225	1.016582
Surkhandarya region	.8228201	.1678918	4.90	0.000	.4917346	1.153906
Syrdarya region	1.133975	.1834083	6.18	0.000	.7722905	1.495659
Tashkent region	1.956465	.2911965	6.72	0.000	1.38222	2.53071
Fergana region	1.839297	.426399	4.31	0.000	.9984312	2.680164
Khorezm region	1.092219	.1473352	7.41	0.000	.8016711	1.382767
Tashkent city	1.124404	.1407163	7.99	0.000	.8469092	1.401899
_cons	1.867229	.7902951	2.36	0.019	.308753	3.425705

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

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'First, the estimation results showed that the level of return on education and income for respondents with native Uzbek language is currently still not statistically significantly higher than the level of return on education of respondents in other languages. The estimates also show that using a second language increases income levels (English – by 16.3%, Karakalpak – by 11.8%, Kyrgyz – by 9.2%), even when controlling for education and other demographic variables, increasing earnings by 10–20% on average'

Overall, these study results confirm that linguistic proficiency is a key dimension of human capital in a multilingual society.

First, the estimation results showed that the level of return on education and income for respondents with native Uzbek language is currently still not statistically significantly higher than the level of return on education of respondents in other languages. The estimates also show that using a second language increases income levels (English – by 16.3%, Karakalpak – by 11.8%, Kyrgyz – by 9.2%), even when controlling for education and other demographic variables, increasing earnings by 10-20% on average. Regional dummies are very strong (coefficients >1 for many provinces), suggesting location effects dominate (Tashkent, Samarkand). This indicates that place of residence (urban versus regional context) constitutes a key determinant of income levels, alongside language skills and educational attainment. To reduce regional disparities, targeted scholarships and online learning initiatives are needed to provide rural populations with equitable access to multilingual education, thereby fostering human capital and improving labour market outcomes. These findings underscore the need to support bilingual and multilingual education strategies that promoting second language acquisition. Therefore, national education and employment policies should consider language proficiency as a measurable and actionable factor contributing to individual and collective well-being.

In sum, the research confirms that language is not only a medium of communication or cultural identity but also a form of capital that shapes economic opportunities. Recognising and investing in this capital is vital for inclusive and sustainable development in Uzbekistan and beyond.

5. DISCUSSION

The obtained results check the proposed research hypotheses and allow us to take a new look at the relationship between language, education and economic opportunities in the context of multilingual society in Uzbekistan.

Hypothesis 1 has not received empirical confirmation. Education in the dominant native language does not indeed contribute to better assimilation of educational material, academic success and the formation of human capital. These findings are inconsistent with the theoretical models of Vygotsky's (1978) sociocultural theory, Sweller's (2011) cognitive theory, according to which the native language provides a cognitive basis for the successful acquisition of more complex academic knowledge.

In accordance with Hypothesis 2, native language proficiency increases the likelihood of successful learning of a second (and even third) language. This confirms the theoretical hypothesis of interdependence of languages (Cummin's (2008) BICS/CALP theory), whereby the skills formed in L1 are transferred and contribute to the development of L2. Thus, knowledge of the native language is not an obstacle, but on the contrary, a foundation for the formation of multilingual competencies.

The obtained estimates in line with Hypothesis 3 show that competence in a second language (most often English, Karakalpak, Kyrgyz) is associated with a wage premium of 10–20%, especially in economically active regions such as Tashkent and Samarkand, where proficiency in a second language increases average incomes by 25–30%. This result highlights the role of language skills as an element of human capital: the effect of the 'premium' for a second language is consistent with the theory of 'returns to language capital' presented in the works of Ginsburgh and Weber (2020) and coincides with estimates for transition economies (Mavisakalyan, 2017). Such estimates are also confirmed in the Russian context: Rozhkova and Roshchin (2019) report a 15–30% premium for knowledge of English. Whereas regional peaks in the capital and cultural centres (Tashkent, Samarkand) reflect a higher concentration of international business and the tourism industry, emphasising the economic value of multilingualism in an open market.

However, an important clarification is that so far the level of returns to education for native Uzbek speakers (Hypothesis 1) is not statistically significantly higher than for other language groups (it is not statistically different from the returns for graduates with instruction in other languages). This is consistent with the findings of Grenier and Zhang (2021), who note that, given the same level of programme standards, returns to education do not depend on the language of instruction. However, unlike some Western European countries (Williams, 2011), where returns to native and second languages can vary significantly, in Uzbekistan there is a relative homogeneity of returns to education regardless of the language of instruction. At the same time, it points to existing barriers that prevent the full realisation of the advantages of the native language – possibly due to insufficient coverage of quality education in the Uzbek language.

Thus, the study contributes to the growing field of language economics by demonstrating that second language competence function as measurable, productivity-enhancing assets within the labour market and educational systems. The results of this study offer important implications at the policy and methodological levels.

Methodologically, this research underscores the value of integrating national household surveys and language variables into further microeconomic and sociolinguistic studies in multilingual countries. The study employs a replicable model approach for examining how language skills intersect with human

'Methodologically, this research underscores the value of integrating national household surveys and language variables into further microeconomic and sociolinguistic studies in multilingual countries. The study employs a replicable model approach for examining how language skills intersect with human capital accumulation by leveraging regionally disaggregated individual data. This approach can be used in applying log-linear income regressions with fixed effects at the linguistic group and mahalla (community) level'

capital accumulation by leveraging regionally disaggregated individual data. This approach can be used in applying log-linear income regressions with fixed effects at the linguistic group and mahalla (community) level.

At the policy level, the findings support the need to strengthen bilingual education and promote second language learning as a factor of socioeconomic advancement in Uzbekistan. The observed income and academic returns to proficiency in non-native languages suggest that language skills serve as a key element of human capital. Language-sensitive educational policies – particularly those that support multilingual learning environments in regional and ethnolinguistically diverse contexts – may contribute to greater social inclusion and economic mobility.

The findings highlight the need for a balanced language policy that supports the native language while creating conditions for effective bilingual education. Based on the empirical findings obtained, the following recommendations for improving language policy and educational programmes are proposed for improving language policy and educational programmes in the country.

1. Expanding support for mother tongue curriculum development and teacher training at the primary and secondary levels is essential. Although mother-tongue education has not yet consistently demonstrated positive effects on academic outcomes, it is recommended to invest in the development of curricula and training of teachers for primary and secondary education to teach in the mother tongue (Uzbek and other ethnic minorities' native languages of Uzbekistan). Strengthening instruction in Uzbek and minority languages can provide a stronger foundation for learning and foster equity.

2. Integrating the mother tongue into the multilingual education strategy. The second research hypothesis confirmed that proficiency in the mother tongue increases the likelihood of mastering the second and third languages.

Therefore, it is necessary to adapt foreign language teaching methods taking into account the linguistic base of L1 (with the mother tongue as a support); institutionally support the development of bilingual education, starting with the mother tongue and with a gradual transition to teaching in international languages. Gradual bilingual transition models (L1 → L2) should be implemented without compromising academic performance: when designing a language education strategy (trajectory), a solid foundation should be laid in the mother tongue before moving on to teaching in foreign languages.

The results also show that, although learning a second (or additional) language occurs mainly within the framework of formal education, two types of premiums – those associated with years of education and those linked to knowledge of an additional language – can be clearly distinguished. The latter may indicate a weak study of the second and third languages within the existing education system. This may indicate that the current education system provides insufficient opportunities for effective learning of second and third languages, which limits students' ability to fully benefit from the wage premiums associated with multilingualism.

3. Reducing regional inequalities in language and educational access. According to the findings, the language premium (income effect of language proficiency) is stronger in active regions such as Tashkent and Samarkand. To enhance language policy and reduce regional inequalities, it is recommended to expand bilingual and trilingual education for youth, strengthen language programmes in major cities and extend best practices to other regions, integrate advanced language training into school and university curricula, provide scholarships and incentives for mastering additional languages, and ensure equitable access for rural populations through online and distance learning platforms. To reduce the regional gap, it is recommended to expand language education programmes in rural and remote areas, especially with a focus on teaching foreign languages: ensure equal access to quality language courses and resources regardless of place of residence, introduce online courses and digital platforms for language learning in sparsely populated regions.

4. Increasing the economic return on language education. Since the use of a second language increases income by 10-20% on average, it is necessary to expand the integration of second language training into vocational and higher education programmes, take into account the language education component in the preparation of state employment programmes, human capital development and youth policy, increase motivation for young people to study foreign languages, especially in cities and among students with a high level of education, encourage multilingualism in the private sector, including bonuses for knowledge and use of foreign languages.

Given the impact of language on access to economic opportunities, it is necessary to monitor and analyse the impact of language inequality on educational (number of years of education, results of international education quality tests such as PISA, TIMSS, etc.) and economic indicators (include monitoring of language inequality and its impact on income in government statistics).

Some limitations of the study should be acknowledged. First, the data are based on a cross-sectional 2021 household budget survey in Uzbekistan, which does not allow to assess the dynamic trend of changes in returns over time. Second, in this

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study due to data availability limitations, endogeneity concerns (for example, whether higher income enables language learning rather than the reverse) are not addressed (GMM estimations are possible only with longitudinal data). Third, the sample may have been biased towards urbanised areas, where access to a second language is higher. In addition, research did not analyse the impact of the quality of teaching and methods of teaching a second language, which could clarify the cause of regional differences.

Future research directions include longitudinal monitoring of graduates from different language programmes to assess long-term effects, as well as comparative analysis of bilingual education models (e.g., immersion programmes vs. elective education). It is also important to examine the impact of teacher training and the availability of specialised methodologies on the effectiveness of second-language instruction across different regions of the country.

6. CONCLUSION

Language skills are an important component of human capital, which has a direct and indirect impact on the person's income and achievements. Language not only facilitates access to education and information, but also affects employment opportunities, mobility, labour productivity and inclusion in economic processes. In the context of globalisation, the role of both a foreign and native language is becoming increasingly important, especially in transition economies and countries with a high level of linguistic diversity. Today language is not only a tool of communication and economic differentiation, but also a key component of educational strategies that influence academic achievement and, as a result, the future income of the population. Given the growing role of labour mobility and international business, attention to language policy and educational infrastructure is becoming an important element of sustainable development.

The study by Alhendi et al. (2021) covers the analysis of 99 countries and demonstrates a statistically significant relationship between the level of language proficiency, the quality of education and regional economic growth. The authors emphasise that multilingualism and access to education in international languages (primarily English) enhance integration into the global economy. Countries with high linguistic diversity but well-organised language policies have more balanced regional development.

The aspect is the quality of teaching in a foreign language. Zhang and Grenier (2013) emphasise that the success of such programmes is largely determined by the training of teachers and the availability of teaching materials adapted for bilingual classes. Low teacher qualifications and a lack of adapted textbooks can offset the benefits of early introduction of a foreign language, reducing student motivation and their academic performance. Laitin (2016) also raises an important question about how language affects human development: in countries with a dominant official language and weak support for minorities, language policy can become an instrument of exclusion.

Finally, language policies at the national level provide the framework for the implementation of effective educational strategies. Kennedy (2011) points out that without institutional support (funding for teacher training, developing methods, creating bilingual schools), even well-designed programmes can face resistance and low achievement.

This study aimed to identify the status of the native language and the role of language skills in shaping economic and academic outcomes for the individuals in Uzbekistan, using nationally representative data and an established human capital framework. In Uzbekistan, where the population is linguistically diverse and educational opportunities vary greatly across regions, the impact of language use on income and academic achievement has not been systematically quantified.

The hypotheses of this study are built on the several theoretical foundations. This study employs existing models of language economics and human capital and emphasises the specificity of the language factor of increasing income and academic achievement in the context of a transition economy by adding empirical data on the relationship between native and foreign languages, education duration and economic outcomes in a multilingual society.

More specifically, this study provides empirical support for the idea that linguistic proficiency functions as a distinct and complementary form of capital within the framework of educational and labour market theory. Using microdata from the 2021 Household Budget Survey and applying the well-established models (Marschak, 1965; Rubinstein, 2000; Grin, 2003) and the Mincer earnings function with regional fixed effects, the analysis revealed that language skills significantly affect income levels.

Thus, the contribution to the development of the theory consists in the refinement of the L1/L2 balance for the transition economy: we show that in Uzbekistan, education in the native language (L1) is not inferior in terms of returns, and proficiency in the second language (L2) provides an additional bonus (premium) – knowledge of the second language increases income (and in regions such as Tashkent and Samarkand – even higher), which confirms the economic effect of linguistic capital. The results also confirm that knowledge of the native language increases the likelihood of mastering a second and third language, especially among young people, people with a high level of education and residents of large cities.

The study provides new empirical evidence on the socioeconomic consequences of language use, contributing to the broader literature on linguistic capital and educational inequality. The new result of this work is a more precise estimate of the homogeneity of returns to education regardless of the language of instruction in Uzbekistan (for native Uzbek speakers, the returns are not statistically significantly different from those of graduates with instruction in other languages) and evidence of regional differences in the 'premium' for a second language (proficiency in a second language, mostly English, brings an additional premium to earnings of an average of 10-20%, reaching 25-30% in large regions).

The study also integrated micro- and macro-level methodological approaches, which demonstrated how individual language skills relate to regional characteristics of economic activity and policy. The inclusion of community-level fixed effects (mahalla clusters) together with controls for accumulated human capital illustrates the potential of combining socioeconomic and linguistic variables in national household surveys.

The practical significance of the work is that language policies in the field of education can rely on the empirical results when developing bilingual education programmes and improving the quality of teacher training. Overall, the study suggests that a balanced language policy is needed – one that strengthens the role of the native language in education while simultaneously expanding access to second language learning to improve social and economic outcomes.

However, the results obtained show that the return to education among Uzbek speakers is not statistically higher than the return among other groups, which indicates the need for further analysis of institutional factors (quality of education, availability of infrastructure for study, access to the labour market, etc.). This opens the way for further research, for example, a longitudinal analysis of the career trajectories of graduates of bilingual programmes and a comparative study of different models for introducing a second language into the educational process.

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