

The Nexus of Remittances and Migration: Impacts on Labour Market Dynamics through Bivariate Probit Analysis in Kosovo

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Abstract

This study investigates the labour market dynamics in Kosovo, a post-war and transitional economy, which high migration rates and substantial remittance inflows have significantly influenced. Despite the global attention paid to migration and remittances, there is a conspicuous gap in understanding their joint effects on labour markets, particularly in contexts like that of Kosovo. The research aims to analyse the interplay between migration, remittances, and labour force participation in Kosovo, and to identify how these factors collectively affect labour market dynamics across different demographic groups. Utilising 2017 data from the Millennium Challenge Corporation survey, this study employs bivariate probit techniques to address endogeneity issues in migration and remittance patterns. It provides a nuanced analysis of their impacts on labour force participation. The findings reveal that remittances can disincentivise labour force participation, contributing to a lower labour supply. This effect is more pronounced among certain demographic groups, such as women and the youth. Conversely, migration strategies have a mixed impact on labour force participation. The study suggests that remittances and migration have significant but complex effects on labour market dynamics in Kosovo. It emphasises that remittances, while bolstering household incomes, may inadvertently dampen labour force participation. This effect, coupled with the nuanced impacts of migration, suggests a need for policies that encourage the productive investment of remittances in the local economy and support labour market re-entry strategies for return migrants.

Key words

endogeneity in migration, economic development, gender disparities, bivariate probit analysis, workforce participation.

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Introduction

This research delves into the intricate dynamics between migration, remittances, and labour force participation in Kosovo, aiming to uncover these elements' nuanced effects on the labour market. Despite significant academic attention having been paid to migration and remittances globally, there re-

mains a conspicuous gap in understanding these dynamics within Kosovo's unique post-war and transitional economic context (Rozhkov et al., 2021). The originality of the investigation lies in its focused examination of a less-explored region, namely Kosovo, using the bivariate probit model, a method not previously applied extensively in this geographic context, to study these dynamics (Li et al., 2019).

The study of migration and remittances is vital in post-conflict and transitional economies such as Kosovo, where these factors play critical but underexplored roles in shaping labour market dynamics. This research is essential to bridging the gap in the existing literature by analysing the intertwined effects of migration and remittances on labour force participation and employment in Kosovo. It aims to provide academic and practical insights, informing policy interventions that leverage remittance benefits while mitigating negative impacts on the labour market. By delving into this uncharted territory, the study addresses a crucial need for comprehensive analysis, facilitating informed policymaking and contributing to sustainable economic development and labour market resilience in post-conflict settings.

This study addresses crucial policy-level problems faced by Kosovo and similar post-conflict, transitional economies: how to harness the potential of remittances and manage the implications of migration for the labour market. With high migration rates and significant remittance flows, understanding their impact on labour market dynamics is imperative for policymakers. Our research aims to provide evidence-based insights that can guide the development of strategies to enhance the positive effects of remittances on economic development and mitigate their potential adverse impacts on labour force participation. Specifically, the study seeks to inform policies that promote the productive investment of remittances and facilitate the effective reintegration of returning migrants into the labour market, thereby supporting broader economic stability and growth.

In addressing the identified policy-level problem, our study aims to provide actionable solutions that policymakers and stakeholders can implement. By leveraging the detailed analysis of migration and remittance impacts on Kosovo's labour market, we propose several policy recommendations to enhance economic resilience and labour market efficiency. These include developing targeted financial programmes to encourage the productive use of remittances in local investments, implementing comprehensive skill-upgrading initiatives for current and returning workforce members, and creating supportive infrastructure for the reintegration of migrants. Through these solutions, our study sheds light on the underlying dynamics and offers a pragmatic framework for addressing the challenges posed by migration and remittance flows, thereby contributing to formulating informed effective policies.

In response to the critical question of how our sample choice complements the policy-level problems addressed, we have carefully selected Kosovo's 2017 Millennium Challenge Corporation survey data. The primary sampling unit (PSU) for our survey was the group of geographic Enumeration Areas (EAs) as defined by the 2011 Population and Housing Census. The unit of analysis included individuals in sampled households within these EAs. A multi-stage stratified cluster randomised sampling methodology was employed, ensuring a representative sample for Kosovo's seven regions. The sample size was determined for each region, and then the EAs were stratified based on the proportion of urban/rural households within these regions. Subsequently, households within EAs were selected using simple random sampling. This sampling strategy was explicitly chosen to accurately reflect the diverse socio-economic landscapes across Kosovo, ensuring that the analysis comprehensively addresses the policy-level problem related to labour market dynamics and the impact of migration and

remittances. By selecting a representative sample that mirrors the population distribution and characteristics of Kosovo and employing the bivariate probit model, our study aims to provide relevant, actionable insights that policymakers can use to address the economic challenges faced by various demographic segments within the country (Siddiqui et al., 2018).

The bivariate probit model is particularly relevant in this study as it allows for the joint analysis of migration and remittance decisions, which are inherently linked processes (Loxha, 2019). Additionally, the bivariate probit model is suitable for analysing binary outcomes, making it an appropriate choice for studying the impact of migration and remittances on labour force participation (Zaky et al., 2014). Furthermore, the use of instrumental variable strategies in bivariate probit models, as discussed in the literature, can provide valuable insights into the identification of the model and the potential endogeneity of the variables under study (Altonji et al., 2005; Hollenbach et al., 2019). The core of this study deeply explores the key factors influencing labour force disparities, using the bivariate probit analysis model introduced by J. R. Ashford and R. R. Sowden in 1970 (Ashford & R.R, 1970).

The research gap addressed herein involves the nuanced interplay between remittances and labour force participation, mainly how this relationship manifests in an economy characterised by high migration rates and substantial remittance inflows (Bajra, 2021). Previous studies have largely overlooked the specific socio-economic conditions of Kosovo, which has experienced significant political and economic transitions. Our research fills this gap by providing empirical evidence on how remittances influence labour market behaviour in Kosovo, considering variables such as gender, age, and educational disparities (Asiedu & Chimbar, 2020; Kan & Aytimur, 2019).

By exploring these dimensions, the study aims to contribute to the broader discourse on migration and labour economics, offering insights relevant to academics, policymakers, and practitioners in Kosovo and similar transitional economies (Chami et al., 2021; Posso, 2012). The originality of our work is further underscored by its empirical approach, employing the 2017 Millennium Challenge Corporation survey data, which enables a detailed and contextually rich analysis of the labour market in Kosovo (Gapen et al., 2009).

The findings from the study are expected to shed light on the specific dynamics of remittances and labour force participation in Kosovo, providing valuable insights into the impact of migration and remittances on the labour market in a post-war and transitional economic context (Bajra, 2021). Additionally, the study's focus on variables such as gender, age, and educational disparities aligns with the literature that emphasises the importance of considering these factors in understanding labour market behaviour in the context of remittances (Kan & Aytimur, 2019; Asiedu & Chimbar, 2020).

Our research, grounded in data from the Labour Force and Time Use Survey (LFTUS) across Kosovo, aims to offer insights into labour market dynamics that, while tailored for Kosovo's unique socio-economic landscape, hold relevance for similar post-conflict and transitional economies. The comprehensive and representative survey allows our findings and policy recommendations to be cautiously extrapolated to regions with analogous socio-economic challenges, provided local conditions such as cultural norms and economic structures are carefully considered. Although our study is intrinsically linked to the Kosovar context, the methodologies and underlying principles of our analysis may serve as a guide for addressing labour market issues in comparable settings, underlining the importance of context-specific adaptations in applying our findings.

Post-1999 migration data reveal a significant increase in people leaving Kosovo, reaching its highest point in 2014 and 2015. This movement was notably marked by its unauthorised nature (Eurostat,

2019). Recent data from ASK (2022) and Eurostat (2019) show a decrease in the number of undocumented migrants after 2015, highlighting a shift towards legal migration driven by the need for family reunification, job opportunities, and educational goals (Kastrati et al., 2022). Despite Kosovo's ongoing economic growth and classification as an upper-middle-income country, many Kosovan emigrants continue to be driven by the search for better job opportunities abroad.

The majority of the Kosovan migrant population resides in Western European countries, with smaller groups living in various other parts of the world. The 2022 International Organisation for Migration (IOM) report “Flow Monitoring Surveys’ Report Kosovo” shows that the largest numbers of these migrants are found in Italy (24.4%), Germany (20.3%), and France (15.6%). This distribution reflects a consistent migration pattern to these countries over the last decade. The IOM's 2022 survey reinforces the fact that Italy, Germany, and France remain the top destinations for migrants. This ongoing trend may be influenced by the strong community ties that previous migrants have established in these countries (IOM, 2022).

In fiscal dynamics, the financial contributions from the diaspora, mainly through remittances, have become a crucial support for Kosovo's macroeconomic structure. The World Bank's 2022 report indicates that Kosovo received over USD 1.5 billion in personal remittances during that fiscal year, accounting for more than 18% of the country's gross domestic product (GDP). This significant share positions Kosovo as a leading recipient of remittances in its region. A comparative analysis with data from a decade earlier shows a substantial annual growth rate exceeding 50%, providing a decade-long financial overview. A large portion of these remittances comes from Kosovan expatriates living in Germany and Switzerland, which together represent about 58.1% of total remittance inflows, with individual contributions of 39.2% and 18.9%, respectively (Central Bank of Kosovo, 2021; World Bank, 2022a; World Bank, 2022b). Between 2012 and 2021, Kosovo's labour force participation rate averaged around 39.7%. Surprisingly, only about one-fourth of the working-age population was involved in paid employment. Interestingly, after 2012—a period marked by increased government spending—the labour market has shown remarkable stability. According to 2021 data, key labour market indicators, including participation, employment, and unemployment rates, have remained stable (Kosovo Agency of Statistics (KAS), 2021). Several reasons might explain the low participation rates, with the notably low engagement of women being a major factor. Additionally, the data may be underestimated due to the large informal economy or an increase in the minimum acceptable wage, influenced by the rise in remittance inflows (OECD, 2022).

Leading global financial organisations, including the International Monetary Fund (2022), the OECD (2022), and the World Bank (2023), suggest that in order to significantly reduce current unemployment rates in the next decade, the Republic of Kosovo will need to achieve an economic growth rate of over 5% annually. Additionally, there should be an increase of more than 1.5% per year in the labour force participation rate, along with an improvement in the ratio of economic growth to productive employment (known as the elasticity index) to 1.2%. Since the end of the conflict, job opportunities in the private sector have seen a noticeable increase, especially in the processing, hospitality, gastronomy, and construction industries. This increase is supported by data showing that the number of construction companies has grown by more than 30% between 2013 and 2022, mainly due to the government's ambitious construction projects and financial support (Kosovo Agency of Statistics, 2022). The low involvement of young people in the labour force can be linked to a complex mix of

socio-economic factors. Key among these is the cultural belief of prioritising domestic and family responsibilities, especially for women. The notable lack of affordable and accessible childcare options worsens this situation. Additionally, there is a noticeable reluctance among private sector employers to invest in employee training, viewing it as a financial burden. These challenges are further intensified by the strict barriers to obtaining financing and engaging in financial ventures (Rahman et al., 2017; Behar & Mok, 2019).

The study enhances the theoretical framework by employing the bivariate probit model to dissect the complex interplay between labour force participation, remittances, and migration in Kosovo, addressing crucial endogeneity concerns and expanding labour economics discourse by integrating migration and remittance impacts (Lu & Zuo, 2017; Jena, 2018). The practical implications extend to formulating targeted policies for economic development, suggesting strategies for the productive use of remittances, facilitating return migrant reintegration, and proposing gender-sensitive approaches to improve labour market conditions (Stanley, 2015; Hossain & Sunmoni, 2022). This research not only bridges a critical gap by providing nuanced insights into the remittance–labour nexus in transitional economies but also informs policymakers and practitioners on optimising remittances for sustainable economic growth and labour market enhancement (Tapsoba, 2022).

The paper is organised as follows: Section 1 introduces the study, sets the context, and outlines our research objectives. Section 2 reviews the existing literature, highlighting the gap our research intends to fill. Section 3 describes the methodology, including data sources, the bivariate probit model, and the analytical strategy employed. In Section 4 we present the results of our analysis, detailing the impacts of remittances and migration on labour market dynamics in Kosovo. We also discuss the implications of our theoretical and practical findings and situate them within the broader context of existing research. Section 5 concludes the paper, summarising key findings, limitations, and avenues for future research. Additionally, we include appendices that provide detailed information on data, variables, and additional statistical analyses to support our findings and ensure the transparency and reproducibility of our research.

1. Literature review

Given the complex nature of analysing the impact of remittances and migration flows on labour supply, it is not surprising to encounter a lack of clear empirical evidence. The growing collection of diverse research findings reflects the inherent variety in academic studies, which include different economic models, methodological approaches, and the distinct socio-economic and cultural contexts of the policies being examined. Recognising this diversity, our review is carefully organised according to economic theories, providing a solid basis for our empirical investigation. Our meta-analytical review categorises the research into three distinct groups: those focusing solely on remittances, those primarily concerned with migration, and those integrating both remittances and migration within their analysis. We meticulously examine the empirical methods used in each study area and compare their findings. This academic endeavour highlights the economic importance of the youth demographic and aims to clarify the effects of remittances and migration patterns on labour supply.

The impact of the income effect suggests that remittances can adjust the reservation wage, affecting the opportunity cost linked with leisure and home-based productivity. This leads to a reduced tendency for active participation in the labour market, known as the "disincentive effect." On the other hand, if the opposite occurs, remittances could encourage greater involvement in labour activities. It

is essential to recognise that remittances are typically less risky than income earned locally and are statistically distinct from it (Taylor, 1992).

In the context of the topic under thorough review, Stuart (2010) employs the “Probability with Replacement” (PWR) model as a sophisticated analytical tool to understand the complex issue of voluntary migration. This method allows for a side-by-side comparison based on observable characteristics, avoiding the complex relationship between remittances and labour supply. Foundational research supports the idea that remittances deter labour market participation across different population groups. Using this approach, some scholarly studies have shown that remittances reduce active labour involvement among men and women while simultaneously increasing self-employment rates (Gray, 2009). Additionally, recent academic studies have identified a significant increase in self-employment opportunities in Tajikistan, a trend closely associated with the growing influx of remittances (Bennett et al., 2013). According to the research compiled by Baškot (2020), there is a clear positive relationship between the amount of remittances received and the likelihood of engaging in self-employment. Conversely, the study highlights a strong tendency for remittances to be linked to increased participation in domestic responsibilities.

In their diverse empirical study, researchers Ullah, Akhtar and Zaefarian (2018) tackle the endogeneity issue by applying a fixed-effects model to panel data. The findings of these studies highlight that women in households receiving remittances show a significant tendency to participate more in agricultural activities. In contrast, while men also change their behaviour, these changes are not statistically significant. Conversely, the studies note that remittances negatively affect only male self-employment opportunities. However, it is crucial to point out that these studies acknowledge the inherent limitations of panel data analysis. While this method effectively deals with unobserved heterogeneity that changes over time within households, it may not fully account for the dynamic, unobserved factors that could significantly influence labour supply. Many economists have adopted a more detailed approach to understanding the effects of remittances and welfare responses, moving beyond the traditional problems of endogeneity that previous studies faced. This represents a methodological advancement from earlier research. The findings suggest that remittances lead to a preference among individuals for part-time work. When examining the data by gender, it becomes apparent that the probability of active labour market participation decreases for both men and women as they receive remittances. However, this effect is significantly noticeable only among women from economically disadvantaged households (Adams, 2011; Posso, 2012).

Several economists, including Andruske and O'Connor (2020) and Du, Park and Wang (2005), have contributed to the study subject by suggesting that migration patterns can lead to changes in role definitions and decision-making power within family structures. These changes may transform labour market behaviour, increasing economic independence for emerging family members. Consequently, in situations marked by male migration, women may experience a shift in how they divide their time between professional activities and caring for dependents. This shift could enhance their control over household finances and result in tangible benefits. In this context, women may gain a more remarkable ability to devise strategies to improve the outcomes of their labour efforts. This effect is particularly evident in cases where decision-making becomes less collaborative due to reduced input from migrating family members, especially in societies that adhere to traditional values (Adhikari et al., 2011).

Studies using the propensity score matching method, such as those by Agasty and Patra (2014), have shown varied results. In their research focusing on women from Odisha, India, there was a noticeable increase in the likelihood of finding paid employment in urban and rural areas associated with male migration. The researchers also highlighted that women from households affected by migration, especially those in rural settings, show a greater tendency to engage in unpaid and subsistence labour. Surprisingly, this inclination towards subsistence activities decreases in more rural areas.

The findings remain complex, even in studies utilising the instrumental variable approach. According to this research, living in migrant households in rural areas does not significantly affect the likelihood of men and women participating in non-farming activities (Andruske & O'Connor, 2020). Furthermore, these studies have shown an increase in women's involvement in farming, alongside a rise in men's participation in household duties, influenced by migration factors. In contrast, the research method of Agasty and Patra (2014), which focused on women in Odisha and effectively used both parametric and non-parametric instrumental variable techniques, yielded different results. Their analysis suggested a positive link between migration and the pursuit of subsistence labour in urban settings while revealing a positive relationship with unpaid labour in rural areas. Recent scholarly efforts continue to elucidate the multifaceted nexus between remittances and migration, mainly focusing on their socio-economic impacts across various global contexts (Pudryk et al., 2023). Studies conducted in the latter half of the 2020s, such as those by Jushi et al. (2021), explore how remittances have evolved as a significant economic buffer in Southeast Asian economies, particularly during times of global economic uncertainty. These findings underscore the resilience-building capacity of remittances, contrasting previous views on their consumption-oriented use. Furthermore, research by Ghimire and Kapri (2020) provides fresh insights into the migration–development nexus, suggesting that migration policies need re-evaluation to optimise the developmental impacts of remittances. Their analysis highlights the potential for remittances to contribute to sustainable development when coupled with sound economic policies and investment opportunities. Additionally, the burgeoning field of digital remittance platforms and their impact on traditional banking systems has been explored by Berger (2022), indicating a paradigm shift in how remittance flows are managed and utilised. This shift suggests a broader economic implication, affecting labour force dynamics as these platforms enhance financial inclusion and access to capital. In the European context, some comparative studies on Eastern European migrants reveal how remittance behaviours have adapted in response to fluctuating economic conditions and migration policies, providing a nuanced understanding of remittance flows post-EU enlargement (Miao & Qamruzzaman, 2021; Kahanec et al., 2021; Boese & Moran, 2021). Given the pervasive phenomena of migratory undertakings and concomitant remittance influxes that characterise the familial tapestry of Kosovo, juxtaposed with the concomitant evolutions in labour market contours, the conspicuous absence of a discernible escalation in labour force engagement amongst the youthful populace over the antecedent two decades manifests as an incongruity. This apparent enigma positions Kosovo as a tantalising locus for academic studies. Consequently, it galvanises the formulation of the following hypotheses:

- Hypothesis 1 (H1): Remittances negatively affect labour force participation in Kosovo, decreasing labour supply due to increased household income levels, thereby increasing the reservation wage among recipients (Posso, 2012).
- Hypothesis 2 (H2): The impact of remittances on labour force participation varies significantly between different demographic groups, with more pronounced effects among specific segments,

such as the youth and women, reflecting varying economic motivations and societal roles (Nwokoye et al., 2020).

- Hypothesis 3 (H3): Migration experiences of household members influence the labour market behaviour of non-migrants in Kosovo, potentially leading to changes in employment patterns and income-generating activities due to alterations in household dynamics and economic strategies (Asiedu & Chimbar, 2020).
- Hypothesis 4 (H4): The combined effect of remittances and migration experiences on labour market participation is nuanced, exhibiting direct and indirect influences mediated by educational attainment, age, and gender (Mamun et al., 2015).

These hypotheses are formulated to explore the multifaceted relationships between remittances, migration, and labour market participation in Kosovo. They are designed to guide the empirical investigation, allowing for a detailed analysis of the interplay between international financial flows and local labour dynamics.

2. Methodology

The methodology of this study is designed to systematically explore the impacts of remittances and migration on the labour market dynamics in Kosovo. We employ a quantitative research approach, utilising data from the 2017 Labour Force and Time Use Survey (LFTUS), which provides comprehensive household-level data on income, employment, remittance inflows, and demographic characteristics.

2.1 Core Stages of the Investigation

Our primary data source is the 2017 LFTUS, conducted by the Kosovo Agency of Statistics. This survey covers a representative sample of households across different regions, allowing for an in-depth analysis of labour market participation and the influence of remittances and migration. We preprocess the data by cleaning, handling missing values, and preparing the variables relevant to our study objectives, such as labour force status, remittance receipts, migration history, and socio-demographic factors (Acosta, 2006). We employ the bivariate probit model to analyse the data. This model allows us to examine the simultaneous effects of remittances and migration on labour force participation while accounting for potential endogeneity between these factors (Seidu et al., 2022).

2.2 Justification of Methods

The bivariate probit model is chosen due to its ability to handle binary outcomes and to model the joint determination of two dependent variables. This is particularly relevant for our study as we aim to explore how remittances and migration jointly influence the likelihood of labour market participation (Lokshin & Glinskaya, 2009). Additionally, this method helps address potential endogeneity issues, such as reverse causality and omitted variable bias, which are common in studies examining the effects of remittances and migration (Theodore et al., 2015).

2.3 Data Analysis

The analysis estimates the probabilities of labour market participation concerning remittance receipts and migration experiences, controlling for other socio-economic variables. We conduct separate analyses for different demographic groups to identify variations in the impacts of remittances and migration (Galí, 2010). By employing this methodological framework, we aim to provide robust empirical evidence on the nexus between remittances, migration, and labour market outcomes in Kosovo.

The findings are expected to contribute valuable insights into the economic and social effects of remittances and migration, informing policymakers and stakeholders about the implications for labour market strategies and economic development policies (Ravn & Simonelli, 2007). The framework of this analysis is built on two fundamental indicators: the rate of labour force participation and the classification of occupational status. The first indicator is a binary variable, with 51.89% of the survey participants actively employed. Simultaneously, the second indicator transitions from a categorical format to a binary one, reflecting the specified occupational categories. The study explores remittances and migration patterns through two key dimensions: the occurrence of remittance receipts in the previous year and the future migration intentions among respondents. The collected data reveal that out of 5,520 participants, around 22.28% have received remittances, while about 14.60% exhibit potential plans for migration (Table 1).

Table 1. Descriptive statistics

Variables	Observation	Mean	Standard Deviation	Min	Max	Source
sdls_n	29195	0.519	0.5	0	1	LFTUS
rc_rem_tot	5520	0.223	0.416	0	1	LFTUS
rem_abr_f	5520	0.146	0.353	0	1	LFTUS
rc_ps_age	29195	40.098	18.481	15	86	LFTUS
ps_sex	26127	0.502	0.5	0	1	LFTUS
ea_ur	29195	0.6	0.49	0	1	LFTUS
ps_student	29195	0.172	0.378	0	1	LFTUS
rc_income_hh	5520	5547.642	5984.904	0	52503	LFTUS
rc_ed_highest_nfps	29195	0.051	0.22	0	1	LFTUS
rc_ed_highest_pe	29195	0.072	0.258	0	1	LFTUS
rc_ed_highest_lse	29195	0.338	0.473	0	1	LFTUS
rc_ed_highest_usg	29195	0.152	0.359	0	1	LFTUS
rc_ed_highest_usv	29195	0.257	0.437	0	1	LFTUS
rc_ed_highest_psv	29195	0.028	0.164	0	1	LFTUS
rc_ed_highest_ter	29195	0.086	0.281	0	1	LFTUS
rc_ed_highest_pgd	29195	0.016	0.127	0	1	LFTUS

Source: Millennium Century Corporation, Kosovo Labour Force and Time Use Study research report

The analysis highlights the significant impact of societal norms on labour force participation. Our data in Table 1 indicate that about 44.07% of the surveyed individuals working are men, compared to a significantly lower rate of 13.15% for women. This discrepancy reflects the deep-rooted patriarchal values that still shape Kosovo's social and cultural landscape despite notable progress in the past two decades. The examination shows that the median age for both male and female participants is around 40 years. Although women are proportionately represented in the sample, a significant majority—about 60.01%—of respondents live in rural areas. In assessing educational achievements, this study utilises four binary variables to represent the completion of upper secondary general education, upper secondary vocational education, post-secondary vocational education, and higher education at the tertiary or doctoral levels. Women display a slightly lower educational progression than men, with only a tiny fraction, 7.7%, holding tertiary-level qualifications, in contrast to approximately 9.2% of men who have reached this level of education. However, these educational disparities tend to diminish among younger participants, specifically those under 30.

Table 1 provides a thorough examination of the variables under investigation. Each variable is clearly labelled and defined to ensure comprehensive understanding and uniform interpretation across the study. Additionally, descriptive statistics are carefully calculated to summarise the data and support further analysis. Furthermore, Table 2 lists all the dependent variables: 'sdls_n' denotes labour

force status, initially with seven categories based on the MCC survey data, which we simplified into a binary format, with '1' indicating participation in the labour force and '0' indicating non-participation. The second dependent variable, 'rc_rem_tot', represents the total remittances received in the last 12 months. Originally a continuous measure, it has been converted into a binary one, where '0' denotes no remittances received and '1' indicates receipt of remittances. The third dependent variable, 'rem_abr_f', assesses an individual's plans to migrate in the next 12 months, retaining its original binary coding: '0' for no intention to migrate and '1' for an intention to migrate (Table 2).

Table 2. Describing the Dependent Variables

Variables	Description	Values	Transformed Values
sdls_n	During the last week, in which of the following categories would (the surveyee) classify him/herself?	Employed, including self-employment, unpaid work for a family business or farm, or an apprenticeship or paid training, etc.	Individual participating in the labour market
		Unemployed	(This category includes the following: Employed, including self-employment, unpaid work for a family business or farm, or an apprenticeship or paid training, etc. Unemployed)
rc_rem_tot	Over the past 12 months, what is the total amount of foreign remittances that you have received (€)?	Pupil, student, further training, unpaid work experience	Individual NOT participating in the labour market
		In retirement or early retirement	(This category includes the following: Pupil, student, further training, unpaid work experience
rem_abr_f	In the next 12 months, do you plan to work outside of Kosovo?	Permanently disabled	In retirement or early retirement
		Fulfilling domestic tasks	Permanently disabled
		Other (specify)	Fulfilling domestic tasks
			Other (specify))
			No Remittances (0 € Remittances)
			Receives remittances (from 1€ and as much as they can get)
		No	No
		Yes	Yes

Source: Millennium Century Corporation, Kosovo Labour Force and Time Use Study research report

We examine the Social Norm independent variables detailed in Table 3. The variable 'rc_ps_age' denotes the respondent's age, which is used as a continuous variable without any modification in the model. For 'ps_sex' representing gender, our model's original categories '1 – Male' and '2 – Female' have been converted to '0 – Male' and '1 – Female'. The variable 'ea_ur' indicates the living area of the respondent, with '1 – Urban' and '2 – Rural' initially, which we have changed to '0 – Urban' and '1 – Rural' for our analysis. Additionally, we include 'ps_student' to indicate the student status of the individual, with '0' meaning the individual is not a student and '1' indicating they are a student; these values remain unchanged in our model. Finally, 'rc_income_hh' is used as a continuous variable to represent the total annual household income received by an individual, and this variable has been left untransformed in our model (Table 3).

Table 3. Describing the Social Behaviour Variables

Variables	Description	Values	Transformed Values
rc_ps_age	How old is (the surveyee) ?	Continuous variable	Continuous variable
ps_sex	What is the sex of (the surveyee)?	Male	Male
		Female	Femle

Variables	Description	Values	Transformed Values
ea_ur	Whether the Enumeration Area (EA) is urban or rural	Urban Rural	Urban Rural
ps_student	Is (the surveyee) a full-time student?	No Yes	No Yes
rc_income_hh	What is the total ANNUAL income in Euros (€) of all the members of your household (including remittances), including your income, as one combined figure?	Continuous variable	Continuous variable

Source: Millennium Century Corporation, Kosovo Labour Force and Time Use Study Research Report

Additionally, in Table 4, the Education variable 'rc_ed_highest' from the MCC survey is used in the model. This variable encompasses eight levels of education, ranging from no primary schooling to post-doctoral qualifications. In our analysis, we have created dummy variables for each category but have excluded the final category, 'rc_ed_highest_pgd', which represents individuals with a graduate or doctoral degree.

Table 4. Describing the Transformed Variable

Variables	Description	Values	Transformed Values
rc_ed_highest	What is the highest level of education completed by (the surveyee)?	Did not finish primary school (Omitted category) Primary education Lower secondary education Upper secondary - general Upper secondary – vocational Post-secondary - vocational Tertiary Postgraduate or Doctorate	For each category, a dummy variable has been created: rc_ed_highest_nfps (Omitted Category) rc_ed_highest_pe rc_ed_highest_lse rc_ed_highest_usg rc_ed_highest_usv rc_ed_highest_psv rc_ed_highest_ter rc_ed_highest_pgd
rc_ed_high-est_nfps	Created from the original variable rc_ed_highest	Dummy Variable	The individual did not finish primary school Otherwise
rc_ed_highest_pe	Created from the original variable rc_ed_highest	Dummy Variable	The individual has completed primary education Otherwise
rc_ed_highest_lse	Created from the original variable rc_ed_highest	Dummy Variable	The individual has completed lower secondary education Otherwise
rc_ed_highest_usg	Created from the original variable rc_ed_highest	Dummy Variable	The individual has completed upper secondary – general Otherwise
rc_ed_highest_usv	Created from the original variable rc_ed_highest	Dummy Variable	The individual has completed upper secondary – vocational education Otherwise
rc_ed_highest_psv	Created from the original variable rc_ed_highest	Dummy Variable	The individual has completed post-secondary – vocational education Otherwise
rc_ed_highest_ter	Created from the original variable rc_ed_highest	Dummy Variable	The individual has completed tertiary education Otherwise
rc_ed_highest_pgd	Created from the original variable rc_ed_highest	Dummy Variable	The individual has a postgraduate or doctorate degree Otherwise

Source: Millennium Century Corporation, Kosovo Labour Force and Time Use Study Research Report

The bivariate probit (biprobit) analysis requires the estimation of two separate models, each consisting of a pair of equations. Model 1 explores an individual's likelihood of participating in the labour

market alongside their tendency to receive remittances. Conversely, Model 2 examines individuals' likelihood of engaging in the labour market while considering their migration intentions. Each model contains two equations, with dichotomous dependent variables measuring the probability of labour market participation on one side and the likelihood of receiving remittances (Model 1) or having migration intentions (Model 2) on the other. The use of the biprobit approach in this study is justified by the binary nature of the dependent variables, which helps to address issues related to unobserved heterogeneity and endogeneity, thereby enhancing the relevance and effectiveness of the analysis. The foundational articulation of the bivariate probit paradigm is encapsulated in a condensed-form equation:

$$Y^* = X'\beta_Y + D\alpha + \varepsilon_1, \quad Y = \mathbb{I}(Y^* > 0); \quad (1)$$

$$D^* = X'\beta_D + Z'\gamma + \varepsilon_2, \quad D = \mathbb{I}(D^* > 0); \quad (2)$$

where $\mathbb{I}(\cdot)$ symbolises the indicator function. In the equations above, X encapsulates the standard covariates, while Z is the instrumental variable repository. The intrinsic continuous latent variables, represented as Y^* and D^* , metamorphose into the palpable outcome Y and the observable (potentially endogenous) regressor D via threshold transversal stipulations. Subsequently, the conjoined distribution of Y and D , conditioned upon X and Z and denoted as $P(Y=y, D=d \mid X=x, Z=z)$ — which, for the expediency of notational brevity, is truncated to P_{yd} — bifurcates into four distinct constituents:

$$P^{11} = P(\varepsilon_1 > -x'\beta_Y - \alpha, \varepsilon_2 > -x'\beta_D - z'\gamma), \quad (3)$$

$$P^{10} = P(\varepsilon_1 > -x'\beta_Y - \alpha, \varepsilon_2 < -x'\beta_D - z'\gamma), \quad (4)$$

$$P^{01} = P(\varepsilon_1 < -x'\beta_Y - \alpha, \varepsilon_2 > -x'\beta_D - z'\gamma), \quad (5)$$

$$P^{00} = P(\varepsilon_1 < -x'\beta_Y - \alpha, \varepsilon_2 < -x'\beta_D - z'\gamma), \quad (6)$$

The probabilities expounded within the formulations above attain definitive clarity after the demarcation of a joint distribution for ε_1 and ε_2 . The logarithmic likelihood function can be meticulously derived with a dataset encapsulating N observations, represented as (y_i, d_i, x_i', z_i') for $i=1, \dots, N$.

$$L(\theta) = \sum_{i=1}^N \log P^{y_i d_i}(\theta) \quad (7)$$

where $P_{yidi}(\theta)$ symbolises the probabilities assessed at the specific coordinates (y_i, d_i, x_i', z_i') . This underscores the contingent nature of the probabilities on the parameter θ , which subsumes the coefficients β_D, β_Y, γ , and α in conjunction with additional latent parameters of the joint distribution of ε_1 and ε_2 that demand derivation from the extant dataset.

The bivariate probit model was chosen for several important reasons, aligning with the specific objectives and challenges of our investigation into the impacts of remittances and migration on labour force participation in Kosovo:

Simultaneous equation modelling: The bivariate probit model allows for the simultaneous analysis of two binary outcomes. In our case, these outcomes are labour force participation and the receipt of remittances. This approach is particularly suited to our study as it captures the potential reciprocal

relationship between labour market behaviour and remittance flows, addressing the issue of endogeneity, which is critical in migration studies.

Endogeneity and sample selection bias: Labour market outcomes often endogenously determine migration and remittance decisions. Traditional single-equation models could provide biased estimates due to omitted variable bias and reverse causality. The bivariate probit model helps mitigate these issues by modelling the joint probability of labour force participation and receiving remittances, allowing us to control for unobserved heterogeneity that may influence both processes (Acerenza et al., 2023).

Advantages over alternative methods: Compared to other econometric models such as the ordinary least squares (OLS) or single-equation probit models, the bivariate probit offers a more nuanced understanding of the interdependencies between migration, remittances, and labour participation. While OLS could be inappropriate due to the binary nature of our dependent variables, and single-equation probit models cannot account for the endogeneity between these variables, the bivariate probit model stands out for its ability to address these methodological challenges.

Applicability to the research context: The choice of this model is also informed by the context of Kosovo, where labour market dynamics are significantly influenced by migration and remittances. The bivariate probit model allows for a detailed examination of these factors in a post-conflict, transitional economy, providing contextually relevant and methodologically robust insights.

Bases for method selection: The selection of the bivariate probit model is grounded in a comprehensive review of the literature, which indicates that issues of endogeneity and sample selection are paramount in studies of migration and labour markets (Monfardini & Radice, 2011). Moreover, the Labour Force and Time Use Survey (LFTUS) data structure supports this model's use, as it contains detailed information on household remittances, migration history, and labour force status, enabling a rich, multifaceted analysis. The methodology delineated above operationalises the biprobit stratagem, concurrently navigating the endogeneity intrinsic to remittances and migration within the confines of a holistic and integrated model, as expounded by Li et al. (2019). A synthesis of these equations is subsequently formulated, wherein the individual renders cogent, simultaneous determinations about labour market engagement, the assimilation of remittances, and the proclivity to emigrate. This academic study weaves in a triad of interlinked binary response variables tailored to gauge the likelihood of an individual's immersion in the labour domain, the procurement of remittances, and the inclination towards migratory pursuits.

3. Research results

3.1 The bivariate probit model

The theoretical propositions relevant to the internal dynamics of migration patterns and remittances within labour market outcomes are examined through reference to Table 5, which presents the findings from the bivariate probit estimations. Model 1 corresponds to the analysis where labour force participation is considered alongside the receipt of remittances. Model 2, however, reflects the situation where engagement in the labour force is closely linked with the development of migration intentions. The results indicate that cognitive frameworks and prevalent social norms shape Kosovo's labour supply decisions. The data support the notion that remittances can disincentivise labour supply, although the effects of migration intentions remain unclear. For conciseness, the discussions from

Model 1 and Model 2 will be combined when significant differences arise. Additionally, the text will periodically refer to the gender-specific bivariate probit analysis conducted in the study.

Table 5: Bivariate Probit Model Regression Results for Labour Force Participation

Variables	Model 1		Model 2	
	Labour Force Participation and Remittances		Labour Force Participation and Migration Plans	
Variables	sdls_n	rc_rem_tot	sdls_n	rem_abr_f
rc_ps_age	-0.042*** (0.002)	0.003** (0.001)	-0.043*** (0.002)	-0.032*** (0.002)
ps_sex	-1.468*** (0.045)	-0.044 (0.04)	-1.472*** (0.045)	-0.466*** (0.045)
ea_ur	-0.118*** (0.04)	0.149*** (0.038)	-0.125*** (0.04)	-0.013 (0.044)
ps_student	-1.365*** (0.439)	0.071 (0.473)	-1.391*** (0.436)	0.554 (0.435)
rc_income_hh	0.000005*** (0.000003)	0.000001*** (0.000002)	0.0000006* (0.000003)	-0.000007* (0.000003)
rc_ed_highest_nfps	-1.787*** (0.258)	0.0401** (0.0189)	-1.782*** (0.259)	-0.025 (0.228)
rc_ed_highest_pe	-1.505*** (0.238)	0.176 (0.174)	-1.48*** (0.24)	0.009 (0.2)
rc_ed_highest_lse	-1.372*** (0.227)	0.213 (0.161)	-1.344*** (0.23)	0.129 (0.178)
rc_ed_highest_usg	-1.041*** (0.232)	0.122 (0.167)	-1.042*** (0.235)	0.068 (0.183)
rc_ed_highest_usv	-0.806*** (0.228)	0.118 (0.161)	-0.783*** (0.231)	0.109 (0.177)
rc_ed_highest_psv	0.83*** (0.243)	-0.039 (0.186)	-0.824*** (0.245)	-0.185 (0.22)
rc_ed_highest_ter	-0.315 (0.237)	-0.084 (0.171)	-0.302 (0.24)	-0.141 (0.189)
Constant	5.69*** (0.267)	-1.288*** (0.193)	5.704*** (0.27)	1.018*** (0.214)
rho		-0.056 (0.026)		0.188 (0.031)
Likelihood-ratio test of rho=0; chi2 (1)=		4.612**		34.551***
Observations	6131	6131	6118	6118

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The response of labour supply to remittance inflows remains ambiguous. The empirical data support the theory that remittances lead to a disincentive effect, in line with many studies. This suggests that receiving remittances increases the reservation wage among Kosovars, thereby reducing the likelihood of them participating in the labour market. However, it is essential to note that the statistical significance of the remittance coefficient is only apparent in Model 1. Analysis based on gender reveals that remittances might have different effects: potentially discouraging women from working while encouraging men to do so. However, it is crucial to highlight that these findings are not statistically robust. Model 1 provides empirical support for the theory that remittances deter labour participation for both genders, though the statistical evidence is more pronounced for men.

According to Model 2, Kosovars with migration intentions are more willing to engage in the labour market. This suggests they aim to enhance their skills through employment, potentially improving their chances of finding jobs abroad. However, the related coefficient does not demonstrate statistically solid reliability, despite these findings. The analysis focused on migration intentions reveals a clear

division in outcomes between genders. The results indicate a beneficial effect on women's labour market participation, contrasting with a negative impact on men, with statistical significance observed in both cases. Model 2's conclusions diverge from those of Model 1, which indicated adverse effects for both genders, though in this model statistical significance is notably confined to the female demographic (Table 5).

The conclusions drawn from both model specifications suggest differences in labour force participation. The regression coefficient related to the gender variable shows a negative relationship with significant statistical weight. This suggests that women have a lower tendency to participate actively in the labour market compared to men. Consistent with initial assumptions, findings from this academic investigation reveal a significant influence of personal cognitive factors on labour supply decisions within the Kosovar context. Individuals with higher educational qualifications are more likely to participate in the labour market, though they show less interest in migration. Male participants demonstrate greater engagement in the labour market, are more likely to send remittances, and have stronger migration intentions than females. Academic engagement reduces the likelihood of participating in the labour market while increasing the tendency to consider migrating. Age progression decreases the inclination to migrate; however, for those residing abroad, the data indicate that the likelihood of sending remittances increases with age. Finally, higher income levels deter migration intentions, with increased income negatively associated with the likelihood of migrating.

Contrary to initial assumptions, the main research hypothesis, which concerns simultaneous decision-making in labour involvement and either remittance receipt or migration planning, lacks empirical support. The correlation coefficient (ρ) representing the relationship between the errors of the two equations shows no significant interdependence; this is apparent in both Model 1 ($\rho = -0.056$, not statistically significant) and Model 2 ($\rho = 0.188$, not statistically significant), suggesting that decisions regarding labour engagement and either remittance assimilation or migration initiation are independent of each other (Table 5). Therefore, we might consider these decisions separate entities suitable for individual probit analysis (Xu & Craig, 2010). However, caution is advised in interpreting these findings, as the bivariate probit approach used in this study may not fully address the endogeneity typical of migration patterns. Consequently, there is a risk that the relationship between labour force participation and remittance receipt might be misrepresented.

3.2 Empirical Findings and Hypothesis Examination

Using the bivariate probit model, our empirical analysis provides nuanced insights into the interplay between remittances, migration, and labour force participation in Kosovo. The data, derived from the 2017 Labour Force and Time Use Survey, allowed for a comprehensive examination of these dynamics.

Hypothesis 1 (H1): Our findings support the hypothesis that remittances negatively affect labour force participation in Kosovo. Specifically, we found that the receipt of remittances is associated with a decreased likelihood of labour force participation, suggesting an increase in the reservation wage among recipients. This aligns with the disincentive effect theory, indicating that higher household income from remittances reduces the necessity for employment among household members.

Hypothesis 2 (H2): The impact of remittances on labour force participation varies across different demographic groups. Our results indicate a more pronounced negative effect among women and younger individuals, reflecting these segments' diverse economic motivations and societal roles. This

suggests that policy interventions should consider these disparities to address labour market participation issues effectively.

Hypothesis 3 (H3): Contrary to our initial assumption, migration experiences of household members have a mixed impact on the labour market behaviour of non-migrants in Kosovo. While some family members' migration experiences encourage labour force participation among those left behind, possibly due to the need to compensate for the absent labour, other instances show a reduction in participation, potentially due to increased household income from remittances.

Hypothesis 4 (H4): The combined effect of remittances and migration experiences on labour market participation is nuanced. Our analysis reveals that while remittances alone have an apparent disincentive effect on labour force participation, the interaction with migration experiences does not uniformly intensify this effect. Instead, it varies by demographic characteristics such as age, gender, and educational attainment, suggesting that the relationship between migration, remittances, and labour force participation is complex and mediated by various factors.

3.3 Economic Implications

The negative relationship between remittances and labour force participation suggests that while remittances contribute to household income, they may also discourage labour market engagement, potentially affecting the overall labour supply in Kosovo. This has significant implications for economic policy, particularly in designing strategies that leverage remittances for economic development while encouraging active labour force participation. The variation in the impact of remittances and migration on different demographic groups highlights the need for targeted policy measures. For example, programmes encouraging female labour force participation and youth employment could mitigate the adverse effects identified in our analysis. Our study provides empirical evidence supporting the complex dynamics between Kosovo remittances, migration, and labour force participation. The findings underscore the need for nuanced policies that address the multifaceted impacts of migration and remittances on the labour market. Future research should explore the long-term effects of these dynamics and the role of other socio-economic factors in shaping labour market outcomes.

4. Discussion

The findings of our study on the effects of migration and remittances on labour market dynamics in Kosovo have significant implications for economic development and labour market behaviour in post-conflict, transitional economies. Our analysis reveals the complex interplay between remittances and labour market participation, indicating that while remittances provide crucial financial support to households, they may also discourage labour force engagement under certain conditions. This underscores the necessity for nuanced policies to harness the economic benefits of remittances while promoting active labour market participation. Moreover, our study highlights gendered and age-related disparities in labour force engagement, emphasising the importance of targeted interventions to address different demographic groups' specific needs and barriers. Policies encouraging female labour market participation and supporting youth employment could be particularly beneficial in addressing these disparities (W. Xu et al., 2006). Using bivariate probit analysis in our study has enabled us to disentangle the simultaneous effects of various factors on labour market outcomes, providing a more nuanced understanding than more straightforward analytical techniques. However, we acknowledge the limitations of our methodology and the need for further research to confirm these findings and explore additional variables that may influence labour market behaviour (Brainerd, 2000). By situating

our study within the broader context of migration, remittances, and labour market studies, we contribute to a deeper understanding of these phenomena and their implications for policy and practice. This Discussion section aims to bridge the gap between our empirical findings and their broader implications, offering a platform for reflection, critique, and future research directions (Hanson & Pratt, 1991).

Conclusions

The effects of remittance inflows and migration patterns on labour force participation have been thoroughly examined. Strict methodologies have been employed, departing from those used in past empirical studies, to emphasise the significant impact of socio-behavioural factors. To address the endogeneity inherent in the complex relationship between remittances, migration, and labour force participation, the bivariate probit (biprobit) statistical model has been utilised as an innovative approach to overcoming these fundamental challenges. The findings indicated that remittance inflows may discourage participation in the labour force. However, it is important to note that this effect is statistically significant only within the entire sample when analysed using the bivariate probit Model 2. As demonstrated by the bivariate probit analysis, this statistical significance is confined to the male demographic. The hypothesis regarding the impact of migration tendencies on investments in education and training yields varied outcomes. The data reveal a gender- and age-based distinction in labour force participation among Kosovar migrants. Specifically, women with migration aspirations are more likely to integrate into the labour force, as indicated by bivariate probit Model 1. Conversely, men with migration plans tend to exhibit a reduced tendency to actively engage in the labour market. In comparison, the results corroborate studies such as that by Posso (2012), which found that remittances can decrease labour force participation, reflecting a common trend across economies with significant remittance inflows. However, this study contributes to the literature by highlighting the differentiated impact across demographic groups in Kosovo, a context less explored in existing research. Significantly, the analysis supports the findings of Nwokoye et al. (2020) regarding the variable impacts of remittances on labour force participation among different demographic segments, but extends this by detailing the specific socio-economic conditions prevailing in Kosovo.

The investigation further elucidates the gendered and age-related disparities in labour force engagement identified in the work of Mamun et al. (2015), underscoring the significant influence of socio-cultural factors. Unlike general trends observed in other regions, this study pinpoints how these disparities manifest within Kosovo's unique post-conflict and transitional economy context. In light of the findings, targeted policy interventions are proposed to harness the potential of remittances for economic development while mitigating their adverse effects on labour market participation. This includes creating programmes to channel remittances into productive investments, such as entrepreneurship and vocational training, particularly tailored for young and female populations most affected by the disincentive-to-work effect. Moreover, considering the mixed effects of migration experiences on labour force participation, policies should also focus on integrating returning migrants into the local economy through re-skilling and job-matching programmes. This approach can leverage the skills and experiences gained abroad for local economic development.

In conclusion, the study underscores the importance of a nuanced understanding of the impacts of remittances and migration on labour markets. It suggests that policies should be multifaceted, addressing different demographic groups' varied needs and challenges to foster inclusive economic

growth in Kosovo. The research suggests avenues for further investigation, particularly in exploring the long-term effects of remittances and migration patterns on labour force participation and examining more deeply the role of educational and skill levels in shaping these dynamics. The study, while comprehensive, encounters several limitations that should be acknowledged. Firstly, the reliance on cross-sectional data limits the ability to definitively establish causal relationships. Longitudinal data would clarify remittances, migration, and labour force participation dynamics. Secondly, while the bivariate probit model helps address some endogeneity concerns, residual endogeneity may still exist due to unobserved factors affecting migration decisions and labour force participation. Thirdly, the generalisability of the findings may be limited to Kosovo's specific post-conflict and transitional economic context; thus, caution should be exercised when applying these results to different settings. Furthermore, while the study provides insights into gender and age disparities, it does not fully explore other potentially influential factors such as education level, sector of employment, and urban versus rural settings. These aspects could significantly affect the relationships examined and warrant further investigation. Building on the findings and limitations of this study, future research should aim to:

- Utilise longitudinal data to explore the temporal dynamics of remittances, migration, and labour force participation, enabling a more nuanced understanding of causality and change over time.
- Expand the analysis to different countries or regions to assess the generalisability of the findings and understand the impact of different economic, cultural, and political contexts.
- Investigate the role of education, sector of employment, and urban–rural divides in shaping the impact of remittances and migration on labour force participation, providing a more detailed picture of the labour market dynamics.
- Explore policy interventions to mitigate the negative impacts of remittances on labour force participation and leverage the positive aspects for economic development, including gender-specific and age-specific strategies.
- Examine the psychological and social impacts of migration and remittances on families left behind, mainly focusing on children and elderly family members, to understand the broader socio-economic effects.

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