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The Impact of Unemployment, Income, and Dual Citizenship on International Migration: An Intertemporal Analysis

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Abstract

Migration plays a central role in shaping demographic, economic, and social structures, and is influenced by a wide range of economic, institutional, and political factors. Individuals migrate not only to escape adverse conditions such as unemployment, inflation, or political instability, but also to improve their welfare and access better opportunities. In this context, dual citizenship has emerged as an increasingly important institutional factor by facilitating mobility and access to labor markets in both origin and destination countries. This study investigates the determinants of international migration flows to the 44 countries receiving the highest number of immigrants over the period 1995–2020. The results indicate that traditional economic variables such as income differentials, unemployment, inflation, and geographical distance significantly affect migration decisions over time. More importantly, the findings reveal that while income-related factors were more influential in shaping migration during the early 2000s, the role of dual citizenship has become increasingly pronounced in recent years. This suggests a structural shift in migration dynamics, highlighting the growing importance of citizenship regimes alongside economic determinants in explaining international migration patterns.

Keywords: *Dual Citizenship, International Migration, Migration Flows, Count Models, Income.*

İşsizlik, Gelir ve Çifte Vatandaşlığın Uluslararası Göç Üzerindeki Etkisi: Zamanlararası Bir Analiz

Öz

Göç, demografik, ekonomik ve sosyal yapıların şekillenmesinde merkezi bir rol oynar ve çok çeşitli ekonomik, kurumsal ve politik faktörlerden etkilenir. Bireyler sadece işsizlik, enflasyon veya siyasi istikrarsızlık gibi olumsuz koşullardan kaçmak için değil, aynı zamanda refahlarını iyileştirmek ve daha iyi fırsatlara erişmek için de göç ederler. Bu bağlamda, çifte vatandaşlık, hem kaynak hem de hedef ülkelerde hareketliliği ve işgücü piyasalarına erişimi kolaylaştırarak giderek daha önemli bir kurumsal faktör olarak ortaya çıkmıştır. Bu çalışma, 1995-2020 döneminde en fazla göçmen alan 44 ülkeye yönelik uluslararası göç akışlarının belirleyicilerini araştırmaktadır. Sonuçlar, gelir farklılıkları, işsizlik, enflasyon ve coğrafi mesafe gibi geleneksel ekonomik değişkenlerin zaman içinde göç kararlarını önemli ölçüde etkilediğini göstermektedir. Daha da önemlisi, bulgular, 2000'li yılların başlarında gelirle ilgili faktörlerin göçü şekillendirmede daha etkili olduğunu, ancak son yıllarda çifte vatandaşlığın rolünün giderek daha belirgin hale geldiğini ortaya koymaktadır. Bu, göç dinamiklerinde yapısal bir kaymaya işaret etmekte ve uluslararası göç modellerini açıklamakta ekonomik belirleyicilerin yanı sıra vatandaşlık rejimlerinin artan önemini vurgulamaktadır.

Anahtar Kelimeler: *Çifte Vatandaşlık, Uluslararası Göç, Göç Akışı, Sayım Modeli, Gelir.*

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INTRODUCTION

From the past to the present, humanity has sought protected places to meet the need for shelter, ensure survival, and safeguard territories. As a result of this search, societies have settled in relatively more favorable areas and attempted to sustain their lives in these locations. In order to protect their territories, some communities have engaged in conflicts, while others have chosen to flee. These continuous movements throughout history have sometimes resulted in small-scale and sometimes large-scale migration flows. Migration affects not only individuals but also the demographic, social, and economic structures of both origin and host societies. Beyond migrations driven by wars, economic factors play a decisive role in migration decisions. When individuals are unable to maintain adequate living conditions in their home countries, they tend to migrate to destination countries in search of better living conditions and economic opportunities. This process generally involves migration flows from less developed countries to developing or developed countries, affecting the economic conditions of both sending and receiving countries. In particular, labor migration may reduce the skilled labor potential of origin countries while contributing positively to the labor markets of destination countries.

Numerous explanations have been proposed in the academic literature to explain why people migrate. Primarily, the “push” and “pull” factors of migration are emphasized. According to this framework, pull factors refer to the positive characteristics of destination countries that attract migrants, whereas push factors denote the negative conditions in origin countries that drive individuals to leave. Push factors include poor economic conditions, poverty, unemployment, population pressure, and corruption in sending countries. In contrast, pull factors include higher wages, more efficient resource allocation, and lower population density (Borjas, 1989; Lee, 1966). In addition, ineffective resource distribution, inhumane working conditions, wage differentials between source and destination countries, poverty levels, and institutional factors further shape individuals’ migration decisions.

Economic factors play a central role in migration decisions, particularly through their effects on individuals’ purchasing power in origin countries. In economies characterized by high inflation rates, individuals face rising living costs, which erode real incomes and reduce purchasing power. As purchasing power declines persistently, the sustainability of remaining in the origin country weakens, increasing the propensity to migrate toward destination countries offering higher living standards and stronger purchasing power. Consequently, increased migration may raise consumption demand in destination countries, which, under certain conditions, can contribute to inflationary pressures.

Another key determinant of migration decisions is unemployment. Individuals often migrate from origin countries characterized by surplus labor and limited employment opportunities to destination countries with more favorable labor market conditions. This process may negatively affect the economic growth of origin countries through the loss of skilled labor. In destination countries, large-scale labor immigration can exert downward pressure on wages, potentially generating adverse effects for the local workforce. At the same time, migrants contribute to their origin countries through remittance flows, which generate foreign currency inflows. These inflows can help alleviate inflationary pressures, support economic development, and reduce poverty in origin countries (Czaika, 2015; Faist, 2008; Fitzgerald et al., 2014; Forte & Portes, 2017; Guzi & Mikula, 2022; Iancu et al., 2017; Warin & Svaton, 2008).

In the context of migration determinants, economic conditions, institutional structures, political environments, international relations, and opportunity costs in both source and

destination countries play a significant role in shaping migration decisions. Additionally, in a globalized world, the movement occurring behind national borders becomes a significant problem concerning individuals' sense of belonging. The issue of which country individuals who migrate to different countries belong to and the potential consequences of this belonging, become important for nations. In this context, migration is a significant phenomenon for individuals with dual citizenship, or the opposite might also be true (Hollifield, 2004). Individuals with dual citizenship can freely move between the source and destination countries and benefit from the potential labor markets of both. Consequently, their income levels tend to differ from those without dual citizenship. Furthermore, individuals with dual citizenship contribute to the transfer of human capital between the two countries. Even if migrants prefer to utilize the citizenship rights of the source country, they generally wish to benefit from the economic, political, and social rights provided by the country in which they reside (Dahlin & Hironaka, 2008). On the other hand, labor-exporting countries permit dual citizenship as a means of maintaining remittances, investments, and cultural and economic ties (Glenn, 2000). While countries with high immigration rates may grant dual citizenship to migrants, the reverse can also be true; individuals may migrate to destination countries to obtain dual citizenship (Koopmans & Statham, 1999). In this context, countries that allow dual citizenship tend to attract more immigrants compared to those that do not.

This study examines migration flows to the 44 countries receiving the highest number of immigrants by employing a dataset constructed at five-year intervals covering the period from 1995 to 2020. Unlike much of the existing literature that primarily emphasizes economic determinants of migration, this study explicitly incorporates dual citizenship as a key explanatory variable, thereby offering a novel perspective on migration dynamics. The analysis considers a set of economic and structural factors, including unemployment rates, inflation rates, gross domestic product, and geographical distance between countries, alongside the dual citizenship variable. Given the substantial presence of zero migration flows in the data, the study employs count data models, which allow for a more appropriate and robust estimation framework compared to traditional linear models. The main contribution of this study lies in its long-term and comparative approach, which enables an examination of how the determinants of migration evolve over time and whether the influence of dual citizenship on migration flows has intensified or diminished across different periods. By combining economic indicators with institutional factors, the study extends the migration literature by highlighting the role of citizenship regimes as a structural determinant of international migration. The remainder of the paper is organized as follows. The introduction discusses the theoretical links between economic conditions, distance, dual citizenship, and migration. The second section reviews the relevant migration literature. The third section presents the methodological framework. The fourth section describes the data set, variables, and econometric models. The empirical findings are discussed in the fifth section, and the final section concludes with policy implications.

1. LITERATURE REVIEW

The migration literature has extensively examined the economic, social, and institutional determinants of migration flows; however, studies explicitly focusing on the role of dual citizenship remain relatively limited. Accordingly, this section reviews the empirical literature in two strands: studies analyzing migration through economic and structural factors, and studies directly addressing the relationship between dual citizenship and migration.

A substantial body of research emphasizes economic conditions and structural characteristics as primary determinants of migration. Warin and Svaton (2008), employing a gravity model for European countries, demonstrate that migration flows are shaped not only by economic variables but also by welfare state characteristics, geographical proximity, and linguistic ties. Their findings suggest that unresolved unemployment in origin countries and the generosity of social protection systems in destination countries significantly influence migrants' destination choices. Similarly, Sarra and Signore (2010), using Poisson regression for Polish provinces during 2000–2005, find that GDP exerts a positive effect on migration, whereas unemployment and distance negatively affect migration flows, highlighting the importance of regional economic opportunities and housing conditions.

Extending the analysis to a global scale, Fitzgerald et al. (2014) examine migration flows from 178 origin countries to 18 destination countries using a gravity framework. Their results indicate that migration decisions are shaped not only by economic and social factors but also by political conditions, while distance, unemployment, population size, and migration costs negatively affect migration flows. Cheng et al. (2014) provide a comparative analysis of internal migration dynamics in the European Union and China using a negative binomial model, emphasizing the role of distance as a proxy for migration costs and income differentials as a key driver of migration in both contexts.

Several studies focus on specific regions and periods. Forte and Portes (2017), analyzing migration to the United Kingdom in 2015, find that macroeconomic indicators such as GDP, unemployment, and exchange rates exert only a limited influence on migration. Malaj and Rubertis (2017) and Malaj and Firza (2023), focusing on Western Balkan countries, conclude that migration is driven by income disparities, corruption, and weak governance structures, with migrants tending to move toward countries characterized by higher income levels and better institutional quality.

Other studies underline the importance of distance, income inequality, and political conditions. Abel et al. (2019) show that migration from Asia is negatively affected by geographical distance, while social networks and population factors facilitate migration. Winter (2020), using a gravity model for European Union member states between 1998 and 2016, finds that income disparities positively affect migration flows, whereas unfavorable political conditions in origin countries and favorable economic conditions in destination countries increase migration. Cimpoeru (2020) similarly identifies unemployment and low income as push factors, while political freedom acts as a pull factor in European migration flows.

Despite the extensive literature on economic and institutional determinants of migration, studies explicitly examining the role of dual citizenship are comparatively scarce. Dahlin and Hironaka (2008), using data from 102 countries for the year 2000, find a significant relationship between migration and governments' recognition of dual citizenship. Alarian and Goodman (2016), analyzing migration flows between 184 origin and 24 destination countries over the period 1981–2006, demonstrate that dual citizenship policies act as an important pull factor, significantly increasing migration flows and shaping migration policy outcomes.

This study contributes to the migration literature in several important ways. First, while the existing literature predominantly focuses on economic, demographic, and geographical determinants of migration, empirical studies that explicitly incorporate dual citizenship as a core explanatory variable remain relatively scarce. By systematically integrating dual citizenship into a comprehensive migration framework, this study extends the conventional push–pull approach by emphasizing the role of citizenship regimes as an institutional determinant of international migration. Second, unlike most prior studies that rely on cross-sectional or short-period analyses,

this study adopts a long-term perspective using five-year interval data covering the period from 1995 to 2020. This approach enables an examination of how the impact of economic variables and dual citizenship on migration flows evolves. Third, by focusing on the 44 countries that receive the highest number of immigrants, the study provides a comparative and destination-centered perspective, which complements the source-country-oriented analyses prevalent in the literature. Finally, the use of count data models addresses the issue of excess zero migration flows, offering a more appropriate econometric framework and improving the robustness of the empirical findings. Overall, the study enriches the migration literature by jointly analyzing economic conditions, geographical distance, and citizenship policies, thereby offering new insights into the structural and institutional drivers of international migration.

2. METHOD

The study employs a range of count data models, including the Poisson Regression Model, the Negative Binomial Regression Model, the Zero-Inflated Poisson Regression Model, and the Zero-Inflated Negative Binomial Regression Model. A key limitation of the Poisson regression model is its restrictive assumption that the conditional mean equals the conditional variance. However, empirical migration data frequently exhibit overdispersion, where the conditional variance exceeds the conditional mean. To address this issue, the negative binomial regression model relaxes this assumption by allowing for unobserved heterogeneity (Hilbe, 2011). Moreover, migration flow data are often characterized by an excess number of zero observations. To accommodate this feature, Lambert (1992) introduced the zero-inflated Poisson regression model, which combines a point mass at zero with a Poisson distribution. Considering both overdispersion and excess zeros, Greene (1994) proposed the zero-inflated negative binomial regression model as a more flexible alternative. This model integrates a zero-generating process with a negative binomial distribution, making it particularly suitable for migration data with a large proportion of zero flows.

The Poisson Regression Model (PRM) used in count-based data assumes that each y_i comes from a population with a Poisson distribution for $x = (x_1, x_2, \dots, x_k)$, under the assumption that the probability density function of the model is as shown in Equation (1):

$$Pr(Y = y_i \vee x_i) = \frac{e^{-\mu_i}\mu_i{}^{y_i}}{y!} \quad (1)$$

Where, y_i is defined as $y_i = 0,1,2, \dots$ and the conditional mean and conditional variance of the probability density function is as follows:

$$\mu_i = E(y_i|x_i) = V(y_i|x_i) = exp(x_i'\beta) \quad (2)$$

In Equation (2), it can be observed that both the mean and the variance are equal to μ_i (Sarra & Signore, 2010). The model containing Equations (1) and (2) is known as the Poisson regression model. Several estimation methods are used to estimate the Poisson regression model. One of these estimation methods is the maximum likelihood (ML). Under the assumption that the observation values $(y_i \vee x_i)$ are independent of each other, the log-likelihood function is obtained as follows:

$$lnL(\beta) = \sum_{i=1}^{n}(y_i x_i'\beta - exp(x_i'\beta) - lny_i!) \quad (3)$$

Parameter estimation is achieved through the solution of Equation (4) (Cameron & Trivedi, 2013).

$$\sum_{i=1}^{n}\big(y_i - exp(x_i'\beta)\big)x_i = 0 \quad (4)$$

One of the constrained disadvantages of the Poisson regression model is the assumption that the conditional mean equals the conditional variance. The negative binomial regression model, which extends this assumption, can also be used when the conditional variance exceeds the conditional mean. The probability density function of the negative binomial distribution, which is the distribution of the sum of independent random variables, is given in Equation (5):

$$Pr(Y = y_i \vee \mu, \upsilon) = \frac{\Gamma(y_i+\nu)}{\Gamma(y+1)\Gamma(\upsilon)}\left(\frac{\mu_i}{\mu_i+\nu}\right)^{y_i}\left(\frac{\upsilon}{\mu_i+\nu}\right)^{\upsilon} \quad (5)$$

The mean and variance of the negative binomial regression model are as follows:

$$\mu_i = E(y_i|x_i) = exp(x_i'\beta) \quad (6)$$

$$V(y_i|x_i) = \mu_i + \frac{\mu_i^2}{v} \quad (7)$$

Where, it can be observed that allowing for overdispersion where $\mu_i > 0$ and $\nu > 0$, the conditional variance exceeds the conditional mean. The negative binomial regression model is estimated using the maximum likelihood method.

$$\sum_{i=1}^{n}\frac{y_i-\mu_i}{1+\alpha\mu_i}x_i = 0 \quad (8)$$

$$\sum_{i=1}^{n}\frac{1}{\alpha^2}\left((ln(1+\alpha\mu_i) - \sum_{j=0}^{y_i-1}\frac{1}{(j+\alpha^{-1})}\right) + \frac{y_i-\mu_i}{\alpha(1+\alpha\mu_i)} = 0 \quad (9)$$

Parameter estimators are obtained by solving Equations (8) and (9) (Winkelmaan, 2008). In cases where zero values are prevalent in the dataset, the zero-inflated Poisson regression model is used, which combines a distribution concentrated at zero with the Poisson distribution (Lambert, 1992). The probability function of the zero-inflated regression model is as shown in Equation (10):

$$Pr(Y = y_i \vee x_i) = \begin{cases} p_i + (1-p_i)e^{-\mu_i}, y_i = 0 \\ (1-p_i)\frac{\mu_i^{y_i}}{y_i!}e^{-\mu_i}, y_i > 0 \end{cases} \quad (10)$$

Where $0 \leq p_i \leq 1$ and $\mu_i > 0$. The conditional mean of the zero-inflated Poisson regression model is expressed as $E(y_i|x_i) = (1-p_i)\mu_i$ and the conditional variance is $V(y_i|x_i) = (1-p_i)\mu_i(1+p_i\mu_i)$. The Moswlin log-likelihood function is as follows:

$$lnL(\gamma,\beta) = \sum_{y_i=0} ln\left(e^{G_i\gamma} + e^{B_i\beta}\right) + \sum_{y_i>0}(y_iB_i\beta - e^{B_i\beta}) - \sum_{i=1}^{n}(1+e^{G_i\gamma}) - \sum_{y_i>0} ln(y_i!) \quad (11)$$

Where the Expectation Maximization algorithm is recommended for parameter estimation (Lambert, 1992). The zero-inflated negative binomial regression model takes into account both the density of zeros and overdispersion. This model was developed as an alternative to the zero-inflated Poisson model by Greene (1994). The model is formed by combining a distribution concentrated at zero with the negative binomial distribution. The probability function of the zero-inflated negative binomial regression model is as follows:

$$Pr(Y = y_i \vee x_i) = \begin{cases} p_i + (1-p_i)\left(\frac{\alpha^{-1}}{\mu_i+\alpha^{-1}}\right)^{\alpha^{-1}}, y_i = 0 \\ (1-p_i)\frac{\Gamma(y_i+\alpha^{-1})}{\Gamma(y+1)\Gamma(\alpha^{-1})}\left(\frac{\mu_i}{\mu_i+\alpha^{-1}}\right)^{y_i}\left(\frac{\alpha^{-1}}{\mu_i+\alpha^{-1}}\right)\alpha^{-1}, y_i > 0 \end{cases} \quad (12)$$

Here, the conditional mean is $E(y_i|x_i) = (1-p_i)\mu_i$ and the conditional variance is $V(y_i|x_i) = (1-p_i)\mu_i(1+\mu_i(p_i+\alpha)$ Birecikli et al. (2021).

3. DATA AND MODEL

In this study, migration data covering the period from 1995 to 2020 at five-year intervals are utilized for the 44 countries that receive the highest number of immigrants worldwide. The sample is constructed by pooling observations across countries and time periods, resulting in a pooled cross-country dataset. Countries are selected based on the criterion that the total number of immigrants exceeds one million. Given the structure of the data and the prevalence of zero migration flows, pooled count data models are employed. Table 1 presents detailed descriptions of the variables used in the analysis.

Table 1: Variable Description

Variable	Definition	Resource
$Migration$	Migration from the origin country to the destination country	CEPII
$Distance$	The distance between the origin and destination country	CEPII
Gdp_d	The gross domestic product of the destination country	World Bank
Gdp_o	The gross domestic product of the origin country	World Bank
$Unemp_d$	The unemployment rate of the destination country	World Bank
$Unemp_o$	The unemployment rate of the origin country	World Bank
Inf_d	The inflation rate of the destination country	World Bank
Inf_o	The inflation rate of the origin country	World Bank
Dc	The countries allowing dual citizenship	Immigrant Invest

Note: Authors' compilation. The natural logarithm of all variables was used.

The models used in the study are presented in Equation (13):

$$Migration = \alpha + \beta_1 Distance + \beta_2 Gdp_h + \beta_3 Gdp_m + \beta_4 Unemp_h + \beta_5 Unemp_m + \beta_6 Inf_h + \beta_7 Inf_m + \beta_8 Dc + \varepsilon \quad (13)$$

In the equation, the subscript t represents time, and the subscript i represents countries. ε represents the error terms of the equation, α is the intercept term, and β_k (k=1,2,…,8) are the parameters indicating the effects of the explanatory variables used in the model on the dependent variable. The distance variable, which is both influential and significant in international migration, is used in the model. The structure of the model is similar to such of Arif (2020), Dimant et al. (2013), Malaj and Firza (2023), and Malaj and Rubertis (2017).

4. EMPIRICAL RESULTS

This study examines the estimation results derived from pooled migration flows to 44 destination countries. Several count data models are employed, namely the Poisson regression model (Poisson), the negative binomial regression model (nbm), the zero-inflated Poisson model (zip), and the zero-inflated negative binomial model (zinb). The use of zero-inflated models is primarily motivated by the substantial proportion of zero observations in the migration data. Specifically, out of 6.560 total observations, 3.738 represent zero migration flows, while 2.822 are non-zero, indicating that approximately 57% of the sample consists of zeros. Appendix 1 presents the estimation results for each time period from 1995 to 2020. The results reported in Appendix 1 indicate that the estimated parameters are generally statistically significant across all models; however, the variable unemployment is not statistically significant in 2010.

Model selection is conducted using information criteria (AIC and SIC), log-likelihood values, likelihood ratio (LR χ^2) statistics, and the bias-corrected Vuong test. Based on this evaluation, the zero-inflated poisson (zip) model is identified as the most appropriate specification among the four competing models. Table 2 presents the model estimation results for each time period separately over the 1995–2020 period. The Wald χ^2 statistics indicate that all regression models are statistically significant at the 1% level. The pseudo R^2 values suggest that the explanatory variables—including distance, GDP, unemployment, inflation, and dual citizenship, account for approximately 38% of the variation in international migration flows, a magnitude comparable to the findings reported by Poprawe (2015).

Table 2: Determinants of International Migration: Estimation Results

	1995 Period	2000 Period	2010 Period	2020 Period
$Distance$	-1.3849***	-1.3971***	-1.3825***	-1.2961***
	(0.0502)	(0.0504)	(0.0524)	(0.0567)
Gdp_h	0.7182***	0.8675***	0.8636***	0.1243***
	(0.0204)	(0.0253)	(0.0325)	(0.0117)
Gdp_m	0.1538***	0.1851***	0.3503***	0.1739***
	(0.0156)	(0.0231)	(0.0460)	(0.0239)
$Unemp_h$	0.8208***	0.3709***	0.8518***	0.9621***
	(0.0625)	(0.0695)	(0.0771)	(0.1028)
$Unemp_m$	0.1871***	0.2069***	0.0560	0.3270***
	(0.0540)	(0.0554)	(0.0620)	(0.0664)
Inf_h	-0.2753***	0.2994***	-1.29544***	-1.2501***
	(0.0306)	(0.0353)	(0.0729)	(0.0764)
Inf_m	0.0662***	-0.0012	0.4480***	0.1324***
	(0.0308)	(0.0408)	(0.0870)	(0.0580)
Dc	0.9779***	1.2834***	1.4407***	2.1235***
	(0.0753)	(0.0793)	(0.0776)	(0.0827)
McFadden R^2	0.155	0.141	0.149	0.105
Cox-Snell R^2	0.412	0.380	0.398	0.301
Cragg-Uhler/Nagelkerke R^2	0.426	0.393	0.412	0.311
Wald χ^2	736.73***	761.42***	829.56***	726.62***
Log Likelihood	-9466.131	-9575.063	-9527.221	-10073.54
AIC	18968.26	19186.13	19090.44	20183.08
SIC	19090.46	19308.32	19212.64	20305.28
Observation	6560	6560	6560	6560

Note: *** indicates significance at the 1% level. The values in parentheses represent robust standard errors.

The estimated zip model coefficients can be interpreted as follows:

Distance consistently emerges as a strong deterrent to international migration. Empirical estimates indicate that a 1% increase in the geographical distance between origin and destination countries leads to a reduction in migration flows of approximately 1.29% to 1.38%. This result is fully consistent with migration cost theory and gravity-based migration models, which emphasize the role of distance as a proxy for economic, informational, and psychological migration costs. The estimated magnitude closely aligns with previous empirical findings in the literature (Abel et al., 2019; Amara & Jemmali, 2018; Amirault et al., 2012; Cheng et al., 2014; Fitzgerald et al., 2014; Iqbal, 2007; Karemera et al., 2000; Kugler et al., 2013; Malaj & Rubertis, 2017; Poprawe, 2015; Warin & Svaton, 2008). Notably, the effect of distance remains remarkably stable across all sub-

periods examined (1995, 2000, 2010, and 2020), suggesting that geographical separation continues to constitute a persistent and largely time-invariant barrier to international migration. This stability implies that, despite significant advances in transportation and communication technologies, physical distance has not lost its explanatory power in shaping global migration patterns.

Beyond labor market conditions, income levels in destination countries exhibit a positive yet time-varying effect on international migration flows. The elasticity of migration with respect to destination-country income was approximately 0.75% in 1995, increased to around 0.86% during the 2000–2010 period, and then declined markedly to 0.12% by 2020. This trajectory suggests that although income opportunities in destination countries continue to function as an important pull factor, their relative attractiveness has weakened over time. This decline may be attributed to rising migration costs, stricter immigration policies, or diminishing marginal income gains in host economies. In contrast, the effect of income changes in origin countries remains consistently modest throughout the sample period, generally ranging between 0.15% and 0.18%, with a temporary increase to 0.35% in 2010. This persistent asymmetry indicates that improvements in income levels in origin countries do not substantially reduce migration incentives. Rather, migration decisions appear to be driven primarily by relative income differentials and expectations of future income growth, welfare improvements, and enhanced employment opportunities in destination countries, making migration more attractive than remaining in the source country.

From a labor market segmentation perspective, higher unemployment in destination countries does not necessarily imply a contraction of employment opportunities for migrants. Migrants—particularly those with limited legal or institutional constraints—are disproportionately employed in secondary labor market segments characterized by low wages, high informality, and jobs that native workers tend to avoid, even during economic downturns. As a result, rising unemployment among natives may coexist with sustained or even increased demand for migrant labor in specific sectors such as agriculture, caregiving, construction, and low-skilled services. Institutional factors further reinforce this pattern. In countries with permissive migration and citizenship regimes, especially those allowing dual citizenship, unemployment rates may capture broader macroeconomic conditions rather than migrants' effective access to employment. For individuals holding or eligible for dual citizenship, migration decisions are less sensitive to short-term labor market fluctuations and more strongly influenced by long-term considerations such as legal security, residence stability, access to social rights, and future mobility options. Consequently, higher unemployment in destination countries does not constitute a binding constraint for these migrants, but instead reflects environments where institutional access outweighs cyclical labor market risks. Importantly, the strengthening positive effect of destination-country unemployment over time coincides with the increasing significance of dual citizenship policies documented elsewhere in this study. This temporal overlap suggests a structural shift in migration behavior: as institutional barriers decline and legal mobility expands, migrants—particularly those with dual citizenship or facilitated legal status—become less responsive to conventional labor market indicators. In this sense, unemployment in destination countries may function as a proxy for broader economic restructuring rather than a direct deterrent to migration. By contrast, unemployment in origin countries exhibits a weaker and less stable association with migration flows. Estimated effects generally range between 0.18% and 0.32% across most periods and decline sharply to around 0.06% by 2010. This asymmetry reinforces the interpretation that migration decisions are shaped more by structural opportunities and institutional accessibility in destination countries than by labor market pressures in countries of origin. Taken together, these findings suggest that the positive association between destination-country unemployment and

migration should not be interpreted as an empirical anomaly, but rather as evidence of an evolving migration regime in which institutional arrangements—particularly dual citizenship—mediate the relationship between labor market conditions and migration flows. Once this institutional dimension is accounted for, the result aligns with a broader theoretical framework emphasizing long-term legal security and segmented labor market dynamics over short-term economic push–pull forces.

Inflation rates reflect the broader macroeconomic environment and, in this context, emerge as an influential factor in migration decisions. The findings reveal that inflation in destination countries increasingly discourages migration over time. Specifically, a 1% rise in destination-country inflation reduced migration by approximately 0.27% in 1995, while this deterrent effect intensified markedly after 2010, exceeding 1.25%. This heightened sensitivity likely reflects greater awareness of macroeconomic risks among migrants in the post–global financial crisis period. In contrast, inflation in origin countries exerts a positive but gradually weakening influence on migration, reaching a peak effect of 0.44% in 2010 before declining in subsequent years. Taken together, these results underscore inflation as a meaningful push–pull factor: macroeconomic instability in origin countries encourages emigration, whereas instability in destination countries discourages migrant inflows. Overall, the estimated effects of unemployment and inflation align well with the existing literature, corroborating the findings of Czaika (2015), Fitzgerald et al. (2014), Forte and Portes (2017), Guzi and Mikula (2022), Iancu et al. (2017), and Warin and Svaton (2008).

The findings further indicate that dual citizenship is among the most robust and consistently significant institutional determinants of international migration across all periods examined. The estimated coefficients remain positive and statistically significant at the 1% level in each five-year interval, indicating that destination countries permitting dual citizenship attract substantially higher migration flows. Moreover, the magnitude of this effect exhibits a clear upward trajectory over time, increasing from 0.98 in 1995 to 1.28 in 2000, 1.44 in 2010, and reaching 2.12 by 2020. This pronounced trend suggests that the role of citizenship regimes in shaping migration decisions has intensified considerably over the past three decades. From a theoretical standpoint, these findings support the argument that dual citizenship reduces institutional and legal barriers to migration by mitigating uncertainty related to residence rights, labor market access, and long-term settlement prospects. As globalization has deepened and international labor mobility has expanded, migrants appear to have increasingly prioritized institutional security alongside traditional economic incentives. In particular, the sharp increase in the estimated coefficient after 2010 points to a structural shift in migration behavior, whereby legal status and mobility rights have become more influential than conventional economic push–pull factors alone. The results further indicate that while income-related considerations played a more dominant role in migration decisions during the early 2000s, institutional factors—especially dual citizenship—have gained prominence in recent years. Migrants are increasingly inclined to move to countries characterized by low inflation, permissive citizenship regimes, and, notably, higher unemployment rates, suggesting that migration decisions are shaped not merely by short-term labor market conditions but by broader and longer-term strategic considerations. These considerations include access to social rights, political participation, and enhanced transnational mobility. Overall, the strengthening impact of dual citizenship relative to conventional economic variables extends the existing migration literature by demonstrating that citizenship policies function not as peripheral or complementary factors, but as central institutional drivers of international migration flows. Consistent with the findings of Dahlin and Hironaka (2008) and Alarian and Goodman (2016), the evidence underscores the growing importance of inclusive citizenship regimes in contemporary

migration dynamics. From a policy perspective, these results highlight the necessity for policymakers to explicitly account for the migration-inducing effects of dual citizenship arrangements when designing and reforming migration and integration policies.

5. CONCLUSION

This study provides a comprehensive and long-term assessment of the determinants of international migration by examining flows to 44 major destination countries over the period 1995–2020. By employing count data models that explicitly address excess zeros, the analysis offers robust empirical evidence on how economic, geographic, and institutional factors jointly shape migration patterns and how their relative importance has evolved over time.

The findings confirm that geographical distance remains a persistent and stable constraint on migration, consistently exerting a negative effect throughout the sample period. Income differentials continue to function as a key pull factor, particularly in the earlier years of the analysis; however, the declining magnitude of income effects in more recent periods suggests a gradual shift away from purely economic motivations. Improvements in origin-country income levels do not significantly deter migration, underscoring the relevance of relative rather than absolute economic conditions in shaping migration incentives. Labor market and macroeconomic conditions in destination countries have become increasingly influential. Migration flows exhibit growing sensitivity to unemployment and inflation in destination countries, particularly after 2000, indicating that migrants have become more attentive to employment prospects and macroeconomic stability. By contrast, unemployment and inflation in origin countries display weaker and less consistent effects, suggesting that destination-country conditions play a more decisive role in contemporary migration decisions.

The central contribution of this study lies in identifying dual citizenship as a core institutional determinant of international migration. The results demonstrate that permissive dual citizenship regimes significantly facilitate migration by reducing legal and institutional barriers, lowering uncertainty, and enhancing long-term mobility prospects. Importantly, the influence of dual citizenship strengthens over time and increasingly rivals or exceeds that of traditional economic variables. This finding challenges migration frameworks that treat citizenship policies as secondary considerations and instead positions them as fundamental structural drivers of migration flows. From a policy perspective, the results imply that effective migration management requires a broader institutional lens. Economic incentives alone are insufficient to explain or steer migration patterns. Destination countries seeking to attract and retain migrants—particularly skilled labor—may benefit from more inclusive citizenship and integration frameworks. At the same time, origin countries can leverage dual citizenship policies to sustain transnational ties, facilitate circular migration, and promote human capital circulation. The growing importance of macroeconomic stability further highlights the need for coherent economic governance to maintain migration attractiveness.

Despite its contributions, this study is not without limitations. The use of aggregated country-level data and five-year intervals may mask short-term fluctuations and individual-level motivations. Future research could build on this framework by incorporating micro-level data, distinguishing between migrant skill categories, or examining interactions between dual citizenship and other institutional arrangements such as labor market regulations or migration quotas. Overall, this study demonstrates that international migration is shaped by a dynamic interplay of economic, geographic, and institutional forces. By highlighting the rising prominence of dual

citizenship alongside traditional determinants, it contributes to a more nuanced and institutionally grounded understanding of global migration dynamics in an increasingly interconnected world.

AUTHOR STATEMENT

Statement of Research and Publication Ethics

This study has been prepared in accordance with scientific research and publication ethics.

Ethics Committee Approval

This research does not require ethics committee approval.

Author Contributions

The authors contributed equally to the work.

Conflict of Interest

There is no conflict of interest arising from the study for the authors or third parties.

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APPENDIX 1

Table A1: Estimated Marginal Effects (1995)

	Model 1: poisson	Model 2: nbm	Model 3: zip=zinb	Model 4: zinb
$Distance$	-1.1405***	-2.2623***	-1.3849***	-1.3849***
	(0.0511)	(0.1254)	(0.0502)	(0.0502)
Gdp_h	0.7832***	1.1224***	0.7182***	0.7182***
	(0.0301)	(0.0684)	(0.0204)	(0.0204)
Gdp_m	0.1941***	0.1536***	0.1538***	0.1538***
	(0.0246)	(0.0158)	(0.0156)	(0.0156)
$Unemp_h$	0.9664***	1.5048***	0.8208***	0.8208***
	(0.0772)	(0.1634)	(0.0625)	(0.0625)
$Unemp_m$	0.0386***	0.1236	0.1871***	0.1871***
	(0.0610)	(0.1066)	(0.0540)	(0.0540)
Inf_h	-0.2341***	-0.4644***	-0.2753***	-0.2753***
	(0.0404)	(0.0623)	(0.0306)	(0.0306)
Inf_m	0.1170***	0.0170	0.0662***	0.0662***
	(0.0325)	(0.0576)	(0.0308)	(0.0308)
Dc	1.3185***	1.5644***	0.9779***	0.9779***
	(0.1093)	(0.1737)	(0.0753)	(0.0753)
McFadden R^2	0.246	0.051	0.155	0.155
Cox-Snell R^2	0.829	0.188	0.412	0.412
Cragg-Uhler/Nagelkerke R^2	0.830	0.191	0.426	0.426
Wald χ^2	3018.21***	1249.40***	736.73***	736.73***
Vuong			122.27***	106.38***
LR χ^2	10003.12***		0.001	
Log Likelihood	-17773.59	-12772.03	-9466.131	-9466.131
AIC	35565.19	25564.07	18968.26	18968.26
SIC	35626.28	25631.96	19090.46	19090.46
Observation	6560	6560	6560	6560

Note: *** indicates significance at the 1% level. The values in parentheses represent robust standard errors.

Table A2: Estimated Marginal Effects (2000)

	Model 1: poisson	**Model 2: nbm**	**Model 3: zip=zinb**	**Model 4: zinb**
$Distance$	-1.1612***	-1.9640***	-1.3971***	-1.3971***
	(0.0501)	(0.1101)	(0.0504)	(0.0504)
Gdp_h	0.9407***	1.3263***	0.8675***	0.8675***
	(0.0336)	(0.0691)	(0.0253)	(0.0253)
Gdp_m	0.2405***	0.1491***	0.1851***	0.1851***
	(0.2306)	(0.0223)	(0.0231)	(0.0231)
$Unemp_h$	0.2895***	0.2124	0.3709***	0.3709***
	(0.0798)	(0.1559)	(0.0695)	(0.0695)
$Unemp_m$	0.1116*	0.1817*	0.2069***	0.2069***
	(0.0584)	(0.1017)	(0.0554)	(0.0554)
Inf_h	0.4643***	0.7640***	0.2994***	0.2994***
	(0.0381)	(0.0882)	(0.0353)	(0.0353)
Inf_m	0.0036	-0.1439**	-0.0012	-0.0012
	(0.0429)	(0.0703)	(0.0408)	(0.0408)
Dc	1.7118***	2.0887***	1.2834***	1.2834***
	(0.1081)	(0.1873)	(0.0793)	(0.0793)
McFadden R^2	0.235	0.045	0.141	0.141
Cox-Snell R^2	0.821	0.168	0.380	0.380
Cragg-Uhler/Nagelkerke R^2	0.821	0.171	0.393	0.393
Wald χ^2	2932.61***	1168.49***	761.42***	761.42***
Vuong			118.75***	102.23***
LR χ^2	10703.78***		0.001	
Log Likelihood	-18315.31	-12963.42	-9575.063	-9575.063
AIC	36648.63	25946.84	19186.13	19186.13
SIC	36709.72	26014.73	19308.32	19308.32
Observation	6560	6560	6560	6560

Note: *** indicates significance at the 1% level. The values in parentheses represent robust standard errors.

Table A3: Estimated Marginal Effects (2010)

	Model 1: poisson	Model 2: nbm	Model 3: zip=zinb	Model 4: zinb
$Distance$	-1.1732***	-2.1145***	-1.3825***	-1.3825***
	(0.0547)	(0.1154)	(0.0524)	(0.0524)
Gdp_h	0.8997***	1.3395***	0.8636***	0.8636***
	(0.0405)	(0.0802)	(0.0325)	(0.0325)
Gdp_m	0.4258***	0.2414***	0.3503***	0.3503***
	(0.0399)	(0.0414)	(0.0460)	(0.0460)
$Unemp_h$	0.9438***	1.6295***	0.8518***	0.8518***
	(0.0909)	(0.1924)	(0.0771)	(0.0771)
$Unemp_m$	-0.0745	0.0361	0.0560	0.0560
	(0.0628)	(0.1117)	(0.0620)	(0.0620)
Inf_h	-1.3582***	-1.8344***	-1.29544***	-1.29544***
	(0.1037)	(0.1578)	(0.0729)	(0.0729)
Inf_m	0.6702***	0.5268***	0.4480***	0.4480***
	(0.0949)	(0.1569)	(0.0870)	(0.0870)
Dc	1.9036***	2.2514***	1.4407***	1.4407***
	(0.1136)	(0.1920)	(0.0776)	(0.0776)
McFadden R^2	0.259	0.047	0.149	0.149
Cox-Snell R^2	0.860	0.178	0.398	0.398
Cragg-Uhler/Nagelkerke R^2	0.860	0.181	0.412	0.412
Wald χ^2	3195.57***	1390.38***	829.56***	829.56***
Vuong			111.44***	99.50***
LR χ^2	10718.98***		0.001	
Log Likelihood	-18486.77	-13127.28	-9527.221	-9527.221
AIC	36991.54	26274.56	19090.44	19090.44
SIC	37052.64	26342.45	19212.64	19212.64
Observation	6560	6560	6560	6560

Note: *** indicates significance at the 1% level. The values in parentheses represent robust standard errors.

Table A4: Estimated Marginal Effects (2020)

	Model 1: poisson	Model 2: nbm	Model 3: zip=zinb	Model 4: zinb
$Distance$	-1.1654***	-1.7412***	-1.2961***	-1.2961***
	(0.0549)	(0.0920)	(0.0567)	(0.0567)
Gdp_h	0.1792***	0.1313***	0.1243***	0.1243***
	(0.0265)	(0.0116)	(0.0117)	(0.0117)
Gdp_m	0.2372***	0.1568***	0.1739***	0.1739***
	(0.0378)	(0.0197)	(0.0239)	(0.0239)
$Unemp_h$	0.8620***	1.3913***	0.9621***	0.9621***
	(0.0932)	(0.1984)	(0.1028)	(0.1028)
$Unemp_m$	0.2928***	0.3413***	0.3270***	0.3270***
	(0.0714)	(0.1168)	(0.0664)	(0.0664)
Inf_h	-1.1644***	-1.7006***	-1.2501***	-1.2501***
	(0.0802)	(0.1286)	(0.0764)	(0.0764)
Inf_m	0.1879***	0.1620***	0.1324***	0.1324***
	(0.0628)	(0.0952)	(0.0580)	(0.0580)
Dc	2.6149***	3.3148***	2.1235***	2.1235***
	(0.1253)	(0.1818)	(0.0827)	(0.0827)
McFadden R^2	0.185	0.0301	0.105	0.105
Cox-Snell R^2	0.764	0.120	0.301	0.301
Cragg-Uhler/Nagelkerke R^2	0.765	0.121	0.311	0.311
Wald χ^2	2254.96***	1280.68***	726.62***	726.62***
Vuong			107.50***	99.50***
LR χ^2	14808.38***		0.001	
Log Likelihood	-20878.63	-13474.44	-10073.54	-10073.54
AIC	41775.26	26968.87	20183.08	20185.08
SIC	41836.36	27036.76	20305.28	20314.06
Observation	6560	6560	6560	6560

Note: *** indicates significance at the 1% level. The values in parentheses represent robust standard errors.