





The dynamics of migration and economic growth: A comparative perspective on the USA, Australia, and Germany

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ABSTRACT

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This study presents a thorough examination of the economic effects of net migration in the United States, Australia, and Germany from 1960 to 2022, using the Autoregressive Distributed Lag (ARDL) model to assess short- and long-term effects. The findings reveal divergent results. In the United States, migration has no statistically significant effect on economic growth in either period, suggesting that migration cannot sustain growth without complementary measures. In contrast, Australia has a substantial positive correlation between net migration and real GDP per capita, highlighting its role in long-term economic stability. However, in Germany, the effect is only significant in the short term. These findings imply that the effects of migration on the economy are not always consistent and can be impacted by several variables, including fiscal policy and the demands of the labor market today. Therefore, the current study emphasizes the importance of creating migration policies that are flexible enough to respond to both short-term economic fluctuations and long-term structural economic changes.

Contribution/Originality: This paper provides a thorough comparative analysis of the economic impact of net migration in three major destination countries (the United States, Australia, and Germany), distinguishing between short-term and long-term effects. Unlike many studies that focus on a single country or a specific time period, this paper offers strong empirical evidence by using the ARDL model, which captures different time dynamics. The studies emphasize that the impact of migration is strongly influenced by the national environment, particularly fiscal policy and labor market demand, providing important insights for policymakers.

1. INTRODUCTION

International migration has a profound economic, social, and political impact on both the countries of origin and destination. In today's society, the mobility of foreign populations has expanded significantly. The United Nations predicts that the global population will exceed 300 million people by 2024, driven by a combination of economic, political, and social factors. This enormous mobility has far-reaching consequences for both the countries of origin and destination, as it can significantly impact the economy, labor market, social fabric, and cultural identity (Castles, De Haas, & Miller, 2014). Migration can result in a substantial loss of human capital for the nations of origin (migration-exporting) when qualified workers depart for countries with better opportunities. This phenomenon can have negative repercussions on a nation's development and growth and can lead to the erosion of social cohesion and cultural identity. On the other hand, nations that receive migrants gain from the information and skills that are transferred, which may boost their labor markets and support economic expansion. However,

such migration may also increase strains on infrastructure and public services as [Chiswick and Miller \(2007\)](#) point out. Therefore, we may conclude that migration influences the economy in a variety of ways and is not only determined by one issue. Since [Jerome \(1926\)](#), numerous studies have been conducted to examine the relationship between migration and economic growth. The literature also reveals a complex dynamic with a range of effects on labour markets. For example, [Kerr and Kerr \(2011\)](#), [Friedberg and Hunt \(1995\)](#), and [Massey \(1990\)](#) emphasise that the overall effect of immigration on native employment is comparatively small. Therefore, an increase in immigration may not always have a significant negative impact on the employment of native workers, suggesting that other criteria are important in determining the impact of immigration on the labour market. However, [Borjas \(2013\)](#) and [Borjas \(2019\)](#) found that migration may have unfavourable consequences because it increases the wage gap, especially for low-skilled workers. This implies that the migration wave would lead to fewer employment opportunities for low-skilled native workers, which could widen the wage gap between different groups.

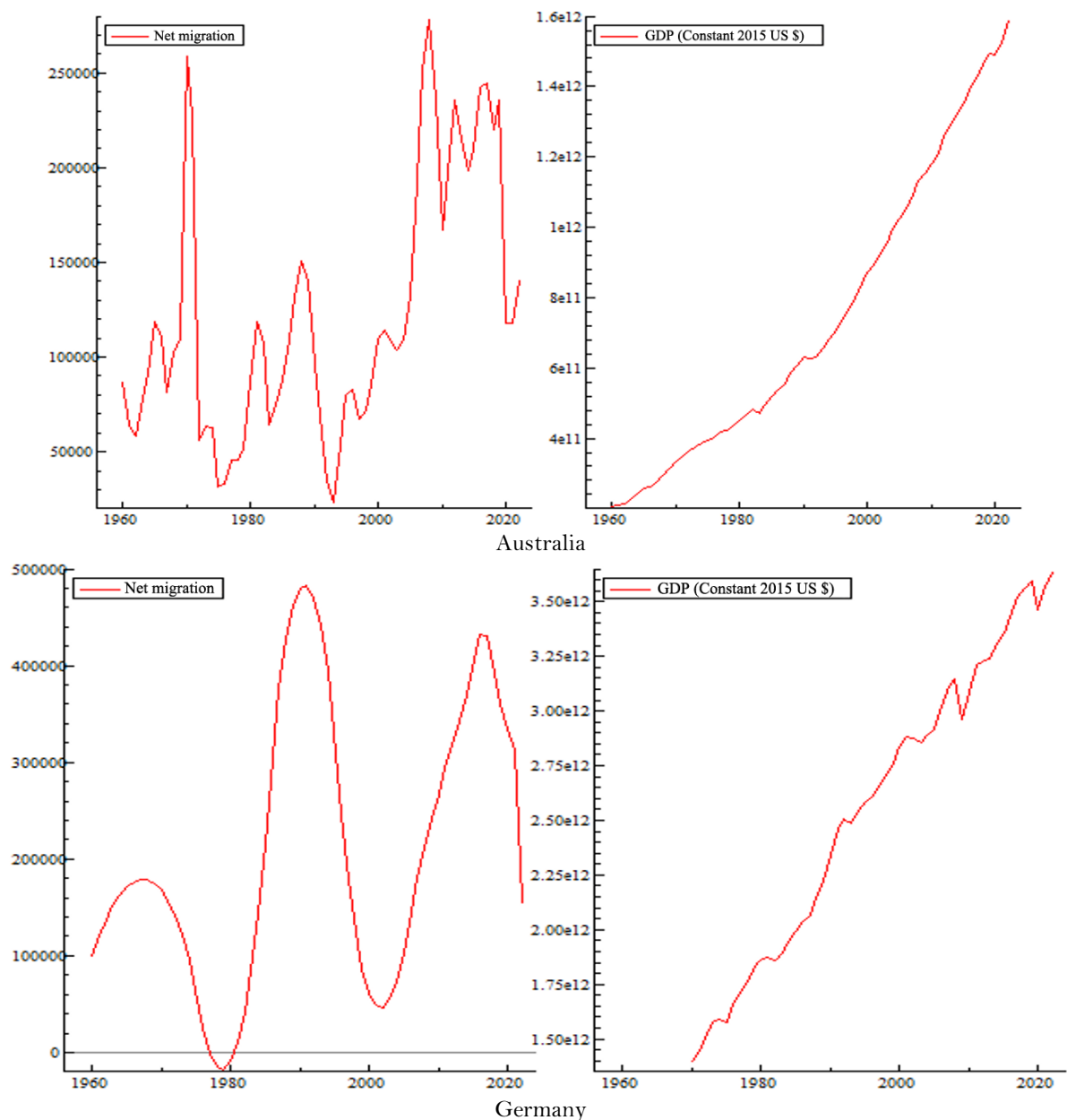
Furthermore, [Ottaviano and Peri \(2006\)](#) highlight how the cultural diversity associated with the influx of migrants can stimulate innovation and the development of a society. They argue that the presence of multiple cultures enhances the skills of the local workforce, thereby promoting positive economic growth for host countries and contributing to a more dynamic and creative working environment. Other works, such as [Clements \(2011\)](#) and [Clements and Pritchett \(2019\)](#), point out that restrictions on migration have a negative impact on developing countries, resulting in significant economic losses. Moreover, [Ajis and Arshad \(2021\)](#) demonstrate that inclusive migration policies promote the integration of immigrants, which enhances economic productivity. Meanwhile, [Khairi \(2020\)](#) emphasizes that negative perceptions of immigrants can hinder their potential positive economic contributions, while [Navarro-Chávez \(2022\)](#) indicates that countries with robust integration systems not only record stronger economic growth but also significant growth in innovation. Indeed, [Ottaviano and Peri \(2006\)](#) and [Peri \(2014\)](#) argue that immigrants can lead to economic benefits, and other papers, such as those ([Clements & Pritchett, 2019](#); [Clements, 2011](#); [George, 2019](#)) have found that immigration has a positive impact on economic growth. Confronted with the diverse effects of migration on economic growth, [Piore \(1983\)](#) pioneering study on labor market segmentation reveals a structural division of economies into spheres: a primary market (stable jobs, high production) and a secondary market (precariousness, low pay), where immigrants are often disproportionately concentrated. This duality sheds light on the mechanisms by which immigration influences growth: successful integration in the primary sector can boost overall productivity, while anchoring in the secondary sector limits its transformative potential. This debate, which is still current, calls for a re-examination of this question through innovative approaches, combining empirical rigor and multidimensional analysis.

In our study, we examine the complex dynamics by analyzing the short- and long-term effects of net migration on economic growth in three major destination countries: the United States, Australia, and Germany. Using the Autoregressive Distributed Lag (ARDL) approach, the study provides an in-depth analysis of the dynamic relationship between net migration and economic growth over the period 1960-2022. This research contributes to the literature by offering a cross-national comparison, revealing chronological variations in economic effects, and highlighting the crucial role of contextual migration policies. Unlike prior studies, our paper distinguishes between short-term adjustments and long-term equilibrium effects, shedding light on how migration interacts with broader economic contexts. Thus, the short- and long-term approaches adopted offer a nuanced understanding of the relationship. The immediate impact of immigration often results in adjustments in the labor market, increased consumption, and fluctuations in demand for goods and services. Conversely, the long-term impacts include structural transformations in the economy, such as innovation, productivity, and social integration, which sustainably shape the economic landscape. By integrating these two temporal dimensions, this study provides a comprehensive view that enables decision-makers to formulate appropriate strategies, considering not only current challenges but also the future implications of immigration on economic growth. Therefore, we will be better equipped to understand how demographic trends interact with economic dynamics over time in various contexts,

such as those of the United States, Germany, and Australia. The rest of this paper is organized as follows. In Section 2, we develop our empirical investigation, including our econometric methodology and country-specific findings. Finally, we provide our conclusion in Section 3, which offers some policy implications derived from the results.

2. DATA AND EMPIRICAL INVESTIGATION

Our database used in this analysis includes annual records of net migration and real GDP per capita for three countries: the United States, Australia, and Germany, from 1960 to 2022. All the data is drawn from the World Bank database. Net migration figures reflect the difference between the number of immigrants and emigrants and provide insights into demographic change and labor market dynamics. Real GDP per capita, a key indicator of economic performance, measures the average economic output per person, adjusted for inflation, allowing meaningful comparisons across time and economies. A visual representation of these dynamics is provided in Figure 1.



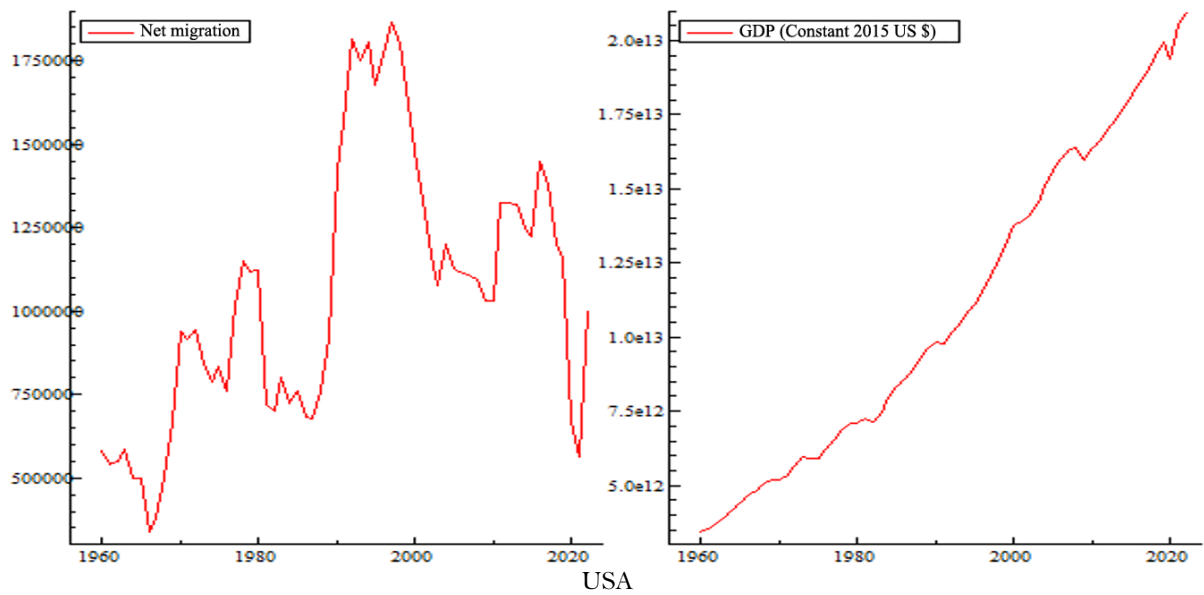


Figure 1. Annual real GDP per capita and net migration.

Figure 1 illustrates the annual trends in real GDP per capita and net migration for the countries studied. In Australia, there is a clear correlation, with net migration having a positive impact on economic growth, reflecting effective integration policies that capitalize on the economic benefits of immigration. In the United States, while real GDP per capita has grown consistently, the impact of net migration appears to be weaker, suggesting that other structural factors, such as innovation and domestic labor market dynamics are driving the economy. In Germany, fluctuations in net migration have a noticeable short-term economic impact, but the effect diminishes over time, probably due to integration challenges in the labor market. This comprehensive data allows for a robust examination of the relationship between migration flows and economic growth, facilitating insights into the economic implications of immigration policies in diverse national contexts.

Therefore, to analyze this relationship, the dynamic behavior of economic growth and net migration time series is studied using an approach that involves two steps. The first step is to examine the existence of a co-integration relationship among the variables by employing the bounds testing procedure (Pesaran, Shin, & Smith, 2001). The test can identify the long-run relationship with a dependent variable. The second step is to estimate the long- and short-run dynamic coefficients if a long-run relationship is found in the first step.

However, the Pesaran et al. (2001) approach is used to test whether the estimated variables are not integrated in an order higher than one. The results of the Augmented Dickey-Fuller (ADF) unit root test suggest that the order of integration for all variables is either $I(0)$ or $I(1)$.

First, we estimate the following autoregressive distributed lag models (ARDL).

$$grt_t = c_1 + \sum_{i=1}^p \alpha_i grt_{t-i} + \sum_{j=0}^q \beta_j imm_{t-j} + \varepsilon_t \quad (1)$$

Where index represents the time dimension of the variables. Furthermore, grt is per capita real GDP, which approximates economic growth imm , and is net migration. The parameter c_1 captures the underlying or starting point of grt_t , serving as a reference level around which the variable fluctuates, independent of the other explanatory variables. The parameters α_i measure the influence of past values of grt on its current value, with each α_i representing the effect of the i -th lag. Positive values suggest persistence or short-term memory effects within the series. Similarly, the coefficients β_j quantify the impact of past values of the explanatory variable imm on grt , with each β_j indicating the effect of the j -th lag of imm variable. Positive or negative signs denote direct or inverse

relationships between *imm* and *grt*, respectively. To reduce the variance over time and to make the econometric estimation more stable and reliable, we use logarithmic transformation in our study.

To appropriately select an ARDL model for analyzing the short- and long-term relationships between net migration (*imm*) and economic growth (*grt*) for different economies under study, it is crucial to use the AIC criterion. The specification, using this criterion, for all economies, is shown below: Australia is characterized by an *ARDL*(1,1) model. For the USA, an *ARDL*(1,0) model is selected, and an *ARDL* (1,2) model is used for Germany. The parameter estimation and all the specific tests for the different models are presented in Table 1.

Table 1. Estimated ARDL model for the period (1960–2022).

Economy variable	Australia (1,1)	USA (1,0)	Germany (1,2)
c_1	0.312 (0.000)	0.4410 (0.003)	1.286 (0.016)
α_1	0.987 (0.000)	0.986 (0.000)	0.954 (0.000)
β_0	0.0253 (0.000)	0.000213 (0.9789)	-0.05499 (0.000)
β_1	-0.0187 (0.001)		0.1016 (0.001)
β_2			-0.0425 (0.016)
\overline{R}^2	0.999	0.998	0.98
F	35205.73 (0.000)	20261.37 (0.000)	898.77 (0.000)
Jarque-Bera	4.802 (0.091)	9.235 (0.009)	8.36 (0.015)
Breusch-Godfrey	0.107072 (0.947)	0.8993 (0.412)	0.294 (0.863)
Breusch-Pagan-Godfrey	15.136 (0.001)	1.8808 (0.161)	1.2074 (0.320)
ARCH-test	0.486 (0.617)	0.235 (0.791)	0.122 (0.727)

Note: (...): P-value.

The first part of Table 1 displays the estimated parameters, while the second part shows the goodness fit tests. The results of the diagnostic tests show that the appropriate ARDL models are generally well specified, with no major-term issues of autocorrelation or heteroskedasticity in all cases, supporting the results.

The results reveal significant patterns across all three economies. In both the United States and Germany, the short-term dynamics of real GDP per capita are strongly dependent on their own lagged values, with coefficients

$\alpha_1 = 0.986$ in the USA and 0.954 in Germany, indicating considerable economic inertia where past performance

largely influences current growth trajectories. Notably, neither country exhibits a strong long-term relationship between net migration and economic growth, demonstrating that migration alone cannot sustain economic growth without structural improvements or policy initiatives. Germany's findings also suggest a complex, non-linear interaction between migration and economic outcomes, with multiple lagged effects

($\beta_1 = 0.1016$ and $\beta_2 = -0.0425$, both significant), implying that its effects depend on contextual factors such as

labor market flexibility and policy frameworks. In contrast, Australia shows a very different situation, with net migration having a direct short-term impact on real GDP per capita. The significant estimated coefficient

$\beta_0 = 0.0253$ indicates that each unit increase in net migration contributes positively to economic growth

immediately while the negative coefficient $\beta_1 = -0.0187$ suggests that the effect of past migration flows tends to

diminish over time. Additionally, the high value of $\alpha_1 = 0.987$ suggests a strong persistence in growth rates, reinforcing Australia's rapid responsiveness to migration inflows. This demonstrates Australia's increased adaptability to migration-driven labour market changes and highlights its adaptive economic structure. These findings underline that the economic impact of migration is highly context-specific, influenced by institutional frameworks, labour market adjustments, and policy contexts. The different outcomes in these advanced economies suggest that the impact of migration on growth is highly dependent on complementary economic and regulatory conditions. These results suggest a possible long-run equilibrium relationship between net migration and economic growth. Therefore, we validate this assumption by examining the long-term relationship between net migration and real GDP per capita. To assess the existence of a long-run relationship, the following error-correction version of the ARDL model is used.

$$\Delta g r t_t = c_2 + \gamma g r t_{t-1} + \theta i m m_{t-1} + \sum_{i=1}^{p-1} \phi_i \Delta g r t_{t-i} + \sum_{j=0}^{q-1} \mu_j \Delta i m m_{t-j} + \varepsilon_t \quad (2)$$

The parameters ϕ and μ are the short-run dynamic coefficients and γ and θ are the corresponding long-run multipliers of the underlying *ARDL* model. The bounds test for examining evidence for a long-run relationship can be conducted using the F-test. The statistic tests the null hypothesis of no cointegration that $\gamma = \theta = 0$. The calculated F-statistics are reported in the panel below in [Table 2](#).

Table 2. Conditional error correction regression.

Economy variable	Australia	USA	Germany
c_2	0.312 (0.000)	0.4410 (0.003)	1.286 (0.016)
γ : LOG($g r t_{-1}$)	-0.013078 (0.000)	-0.014160 (0.026)	-0.0462 (0.014)
θ : LOG($i m m_{-1}$)	0.006590 (0.091)	0.000213 (0.978)	0.004124 (0.391)
μ_1 : Δ LOG($i m m_{-}$)	0.0253 (0.000)		-0.05499 (0.000)
μ_2 : Δ LOG($i m m_{-1}$)			0.0425 (0.001)
F-statistic	115.5499*	45.71743*	6.332*
ECT(-1)	-0.013078 (0.000)	-0.0142 (0.000)	-0.0462 (0.000)

Note: The upper limit of the critical value for the F-test is 6.017 (1%), 4.343 (5%), and 3.623 (10%).

*: Significantly at 1%, (...): p-value.

[Table 2](#) presents the results of the conditional error correction regression for Australia, the United States, and Germany. The results show that the F statistics are greater than the upper limit critical value. Thus, a clear co-integration relationship between net migration and real GDP per capita was detected for all countries. Furthermore, as can be reported in [Table 2](#), the adjustment coefficient or restoring force is statistically significant and is between zero and one in absolute value. This result guarantees an error correction adjustment, thereby confirming the existence of a long-term relationship (cointegration) between the variables under study.

The significant error correction terms shown in [Table 2](#) indicate that the model adequately captures the long-run dynamics among the variables, implying that they tend to readjust toward their long-run equilibrium after any shocks or disturbances. In the context of net migration and the growth rate across Australia, the USA, and Germany, this might suggest that any divergence from the long-run equilibrium between these variables is corrected through a readjustment process. The negative coefficients highlight the system's tendency to correct imbalances by moving closer to the equilibrium position. Therefore, approximately 1.3%, 1.4%, and 4.6% of any disequilibrium from the previous year are corrected in the current year for the economies of Australia, the USA, and Germany, respectively. Notably, Germany exhibits a more rapid correction towards long-term equilibrium.

In the short term, migration has a significant positive effect on Australia's economic growth, with a 1% increase in migration corresponding to a 0.025% acceleration in growth. Therefore, any change in immigration policy could

quickly influence Australia's economic growth. In contrast, the results for the United States indicate no immediate statistically significant impact of net migration on real GDP per capita, reflecting a slower adjustment to changes in immigration flows and suggesting a stable long-term relationship between net migration and real GDP per capita. This delayed response may be attributable to various factors, including the time required for new immigrants to assimilate into the labor market, start businesses, or contribute to economic growth. The long-term coefficients are shown in Table 3. The coefficients presented in elastic form reveal that net migration positively influences economic growth in all three countries: a 1% increase in net migration accelerates growth by 0.5%, 0.015%, and 0.22% in the long term for Australia, the USA, and Germany, respectively. However, the insignificance of the long-term estimates in the USA and Germany implies that the effects of net migration on economic growth may not be sustainable over time, suggesting that the economic benefits of net migration are limited. In contrast, Australia's significant long-term coefficient indicates that changes in immigration can have a persistent and lasting impact on economic growth. Overall, these findings highlight that net migration can substantially influence economic growth in both the short and long term, with varying degrees of significance across different economies.

Table 3. Estimated ARDL Long-Run coefficients.

Variable	Australia (1,1)	USA (1,0)	Germany (1,2)
<i>c</i>	23.842 (0.000)	31.726 (0.000)	27.843 (0.00)
<i>log(imm)</i>	0.504 (0.044)	0.01502 (0.978)	0.0894 (0.389)

Note: (...) : P-value.

3. CONCLUSION

The effect of net migration on economic growth in three important destination nations the US, Australia, and Germany during the years 1960–2022 is thoroughly examined in this article. The study investigates the immediate and long-term impacts of net migration on real GDP per capita using the ARDL technique, revealing significant differences among the nations under investigation. The results indicate several dynamics. In the case of the United States, we found no significant effect between net migration and the variables of real GDP per capita, neither in the short nor in the long term. On one hand, a delay in the structural adjustment of the American economy to migration flows may explain the short-term insignificance. However, the long-term insignificance suggests that migration alone is not sufficient to boost long-term growth. This calls for reflection on the complexity of the factors driving growth in the United States, where other elements such as innovation, investment, and productivity may play a predominant role. In contrast to the findings for the United States, net migration in Australia has a significant and positive impact on real GDP per capita in the long run. The results show that migration significantly enhances economic dynamism by bringing in new talent, diversity, and economic opportunities, in addition to increasing real GDP per capita. This underscores the importance of inclusive migration policies to promote growth, facilitate the successful assimilation of foreign talent into the economy, and enhance domestic innovation and competitiveness. The results for Germany show a significant short-term correlation between net migration and real GDP per capita. This pattern suggests that while migrants quickly boost economic activity, their effects tend to fade over time, perhaps due to uneven economic policies or integration challenges. This finding underscores the need for the nation to develop long-term structural strategies that can both maximize the benefits of managed immigration and remove barriers that could eventually undermine those benefits. Aligning migration flows with national socio-economic goals may be achievable with such an approach. In summary, our findings offer valuable implications for policymakers, highlighting the need to design migration policies that are not only reactive to migratory flows but also proactive in creating an environment conducive to the economic integration of migrants, ensuring they can contribute effectively to national growth. The findings also call for continuous evaluation of the policies implemented to ensure that they maximize the economic benefits of immigration while

considering the social, cultural, and economic aspects of each country. Thus, understanding the nuances and impacts of immigration remains essential for developing sustainable and inclusive economic growth strategies.

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REFERENCES

- Ajis, M. N., & Arshad, M. R. M. (2021). *Policies and integration of migrants in Southeast Asia: Challenges and opportunities* [Working Paper No. 2021-005]. Southeast Asia Migration Institute. Retrieved from <https://www.examplelink.com>
- Borjas, G. J. (2013). The economics of migration. *Journal of Economic Perspectives*, 27(1), 11-32.
- Borjas, G. J. (2019). *Immigration and economic growth*. NBER Working Paper, No. 25836.
- Castles, S., De Haas, H., & Miller, M. J. (2014). The age of migration: International population movements in the modern world. In (5th ed.). London, UK: Palgrave Macmillan.
- Chiswick, B. R., & Miller, P. W. (2007). The impact of immigrants on the host country labor market. *Journal of Economic Literature*, 45(2), 1-34.
- Clemens, M. A., & Pritchett, L. (2019). The new economic case for migration restrictions: An assessment. *Journal of Development Economics*, 138, 153-164.
- Clements, M. A. (2011). Economics and emigration: Trillion-dollar bills on the sidewalk? *Journal of Economic Perspectives*, 25(3), 167-190.
- Friedberg, R. M., & Hunt, J. (1995). The impact of immigrants on native-born employment. *Economic Inquiry*, 33(2), 267-291.
- George, B. (2019). The impact of immigration on economic growth: A review of the literature. *Journal of Economic Studies*, 46(2), 255-273.
- Jerome, H. (1926). Migration and business cycles. *National Bureau of Economic Research (NBER)*, 5(129-398).
- Kerr, W. R., & Kerr, S. P. (2011). Economic impacts of immigration: A review of the literature. *Journal of Economic Surveys*, 25(5), 846-863. <https://doi.org/10.3386/w16736>
- Khairi, A. (2020). *Social perceptions of immigration: Stereotypes and their impacts*. [Unpublished Manuscript].
- Massey, D. S. (1990). The social and economic origins of immigration. *The Annals of the American Academy of Political and Social Science*, 510(1), 60-72.
- Navarro-Chávez, C. L. (2022). *Comparative migration studies: Lessons from global trends* [Report No. 2022-001]. Migration Policy Institute. Retrieved from <https://www.migrationpolicy.org/>
- Ottaviano, G. I., & Peri, G. (2006). The economic value of cultural diversity: Evidence from cities in the United States. *Journal of Urban Economics*, 59(3), 343-365.
- Peri, G. (2014). The effect of immigration on native-born skills: Evidence from the US. *Journal of Labor Economics*, 32(2), 309-334.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-326.
- Piore, M. J. (1983). Labor market segmentation: To what paradigm does it belong? *The American Economic Review*, 73(2), 249-253.

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