

# The Relationship Between Fertility Rate and Immigration Policies in Different Countries

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## Abstract

Building upon the extant literature, this study provides a comprehensive examination of the relationship between fertility rates and immigration policies. While a significant body of recent research positions immigration as a primary catalyst for declining birth rates, our study pivots to explore the possibility that decreasing fertility rates might, in fact, serve as a fundamental motivator for the increase in immigrant numbers within a country. By correlating both fertility rate and immigration policy with GDP per Capita, we underscore the significance of immigration policies as a strategic response to waning birth rates.

Keywords: fertility rates, immigration policy, population growth

## 1. Introduction

The dynamics of population growth, characterized by the ebb and flow of fertility rates, the average number of children a woman is projected to have in her lifetime, and migration patterns, have long been of interest to demographers, policymakers, and social scientists. As countries worldwide grapple with aging populations, dwindling workforces, and shifts in societal structures, understanding these dynamics becomes paramount. The unfolding scenario in Japan starkly underscores the vital ramifications of demographic shifts on a global scale. As detailed in a 2022 article by Toshihiro Menju, Japan is aggressively tackling its demographic challenges, marked by a declining birth rate and a stark workforce deficit, through the adoption of a pioneering immigration policy aimed at bolstering its economy<sup>1</sup>. Tokyo, steering beyond its initial focus on the shipbuilding and construction sectors, now intends to broaden the scope of its specialized workers' program to encompass 12 additional sectors facing labor shortages, marking a

comprehensive approach to sustain economic buoyancy and growth. This strategy echoes a broader global trend where nations like Germany, the UK, and Canada are leaning towards immigration as a pragmatic solution to labor market challenges. It's crucial to emphasize that the fertility rate, while seemingly straightforward, exerts a subtle and nuanced impact on immigration policies, a dynamic that, when unaddressed, can ripple through and potentially reshape a nation's economic trajectory.

While the intersection of fertility rates and immigration policies holds significant importance, there is limited comprehensive research on their interdependent relationship across diverse national contexts. This paper aims to fill this gap by examining how different countries have tailored their immigration policies in response to their unique fertility rate trajectories. Furthermore, it seeks to understand the broader implications of these policies on socioeconomic factors, cultural integration, and long-term population strategies.

Numerous scholarly studies have explored the intricate relationship between immigration and fertility rates over the years. David Maurice's 1924 study, rooted in data spanning from 1820 to 1900, reveals a surprising trend where, "despite the influx of millions

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<sup>1</sup> Menju, Toshihiro. "Japan Is Finally Facing up to Its Economic Need for Immigrants." *Nikkei Asia*, 7 Nov. 2022, [asia.nikkei.com/Opinion/Japan-is-finally-facing-up-to-its-economic-need-for-immigrants](https://asia.nikkei.com/Opinion/Japan-is-finally-facing-up-to-its-economic-need-for-immigrants).

of immigrants, the total U.S. population in each decade since 1840, with a singular minor exception, has consistently fallen short of Watson's predictions<sup>27</sup> (Maurice, 69). This observation was anchored in the assumption that fertility rates were primarily influenced by the native population's numbers, a stance that might seem somewhat myopic in the face of more recent research.

Adding depth to the discussion, Christina Bradatan posits a nuanced viewpoint, suggesting that “migration is a disruptive process for fertility: migrants tend to postpone having children because of the sociopsychological stress associated with living in a new place and spouse separation<sup>37</sup>” (Bradatan, 2). While this proposition appears logical, it particularly emphasizes the short-term effects of migration on fertility rates.

Simultaneously, some researchers advocate for a reversal of this narrative, examining fertility rate fluctuations as a potential catalyst for immigration, rather than a repercussion. In this vein, Martin C. Libicki has championed the idea of immigration serving as a “perfect substitute<sup>47</sup>” for the declining birth rate (Libicki, 6), highlighting a direct correlation between a nation’s economic vitality and sustained decreases in birth rates. Libicki further elucidates that young immigrants can substantially bolster the labor force upon arrival, a benefit not mirrored by newborns, who “won't contribute for about two decades” (Libicki, 4). This perspective seems especially pertinent given the labor shortages experienced in several Asian and European nations over the past decade.

Nonetheless, the complex interplay between immigration policies and fertility rates remains a somewhat enigmatic research area, with many questions left unanswered. As G. Nargund suggests, while immigration appears a feasible remedy for chronic low fertility rates, its long-term success hinges greatly on a nation's capacity to retain immigrants, leaving the effect of policy changes in the hands of each nation. This lingering uncertainty underscores the

necessity for continual, in-depth research into this multifaceted issue.<sup>5</sup>

By synthesizing data from multiple countries with differing demographic, immigrant population, and GDP per Capita, this research offers insights that could inform future policymaking. As countries worldwide recalibrate their stances on migration in the face of evolving demographic needs, understanding the intricate connection between fertility rates and immigration becomes more crucial than ever.

## 2. Data and Methods

Our comprehensive database amalgamates a wealth of contemporary data, offering insights into various socio-economic factors across 195 countries. This database incorporates records concerning fertility rates, immigration statistics, GDP per capita, and overall population metrics, which are procured from reliable and renowned sources. Here are the specifics of the data gathered:

- **Total Immigrants:** This data, derived from research conducted by the United Nations, grants an understanding of migration patterns across the globe.
- **GDP per Capita:** Extracted from the World Bank Database, this data aids in evaluating the economic standing of different nations.
- **Overall Population:** The latest population statistics have been gathered from Worldometer, offering a current view of population dynamics globally.

To ensure the precision and fairness of our analysis, the immigrant population was normalized by the total population of each country, thus deriving a percentage representation of the immigrant populace. This meticulous approach aids in establishing a clear correlation between the fertility rate and immigrant population when juxtaposed with the GDP per capita, thereby illuminating their interrelated dynamics.

During the data compilation phase, it was necessary to omit a few countries due to the unavailability of comprehensive data from some sources. However, this research stands as a robust examination of existing trends, knitting together four distinct data streams from the year 2023, to articulate

<sup>2</sup> Davie, Maurice. “Immigration and the Declining Birthrate - JSTOR.” *Immigration and the Declining Birthrate*, 1924, www.jstor.org/stable/7222.

<sup>3</sup> Bradatan, Cristina. “Does Migration Reduce Fertility? - PAA2005.” *Does Migration Reduce Fertility?*, 2005, paa2005.populationassociation.org/papers/51562.

<sup>4</sup> Libicki, Martin C., et al. “APPENDIX B: Trade-Offs Between Fertility Rates and Migration Rates.” 2011.

<sup>5</sup> Nargund, G. “Declining Birth Rate in Developed Countries: A Radical Policy Re-Think Is Required.” *Facts, Views & Vision in ObGyn*, 2009, www.ncbi.nlm.nih.gov/pmc/articles/PMC4255510/.

the nuanced relationship between fertility rates and immigration patterns.

The limitation of my research is the potential inaccuracies in the original data sources, and the limited availability of data from some countries or regions. Despite these constraints, the study endeavors to offer a substantial analysis, presenting an interconnected relationship between these vital socio-economic factors.

To facilitate a visual and intuitive understanding of these relationships, a scatter plot has been constructed, juxtaposing each variable against GDP per capita. This graphical representation aims to elucidate the interconnected relationships between these vital socio-economic factors, potentially paving the way for deeper analyses and insightful discussions.

In terms of methodology, the study adopted a quantitative design, leveraging the internet as a vital medium for data collection, primarily focusing on gathering qualitative data through secondary research. This internet-centric methodological approach allowed the study to efficiently collect a substantial amount of data from a diverse group of participants, enhancing both the depth and breadth of the research.

### 3. Results

This research intends to discover how fertility rate could have an indirect relationship to the number of immigrants by relating them both to the GDP Per Capita.

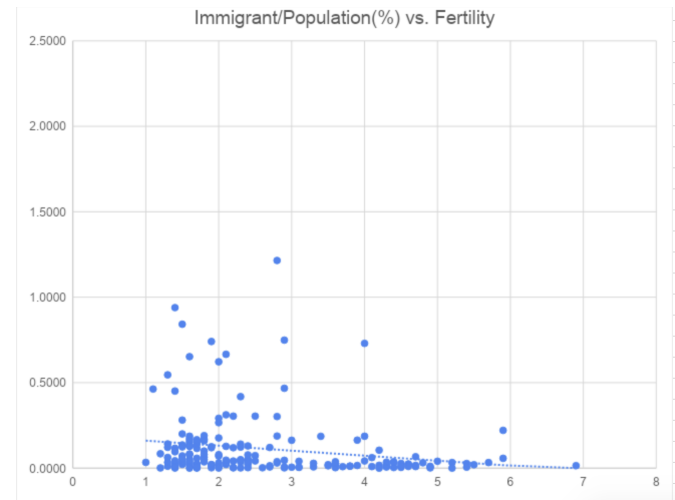
**Table 1: Estimates of the Fertility rate, GDP per Capita, Total immigration, Population, and Immigration/Population, 2022-2023.**

	Fertility rate	GDP per Capit.	Total immigra	Population	Immigrant/Population(%)
Average	2.692391304	26234.73837	1,417,233	40,638,311	0.1228
Median	2.2	17191.5	251,303	8,865,270	0.0374
Std. Dev.	1.27083585	27142.57272	4268291.498	148485096.6	0.2446425305
Min.	1	836	239	10,585	0.0000
Max.	6.9	142214	50,632,836	1,411,750,000	2.2604

Table 1 delineates the calculated estimates concerning fertility rates across various countries.

Column 1 displays computed data pertaining to fertility rate indicators. The data reveals a fertility rate spectrum, ranging from a minimum of 1 to a maximum of 6.9. The mean fertility rate is registered at 2.69, with a median value of 2.2. This information suggests that a significant number of countries are grappling with potential population decline, considering the baseline

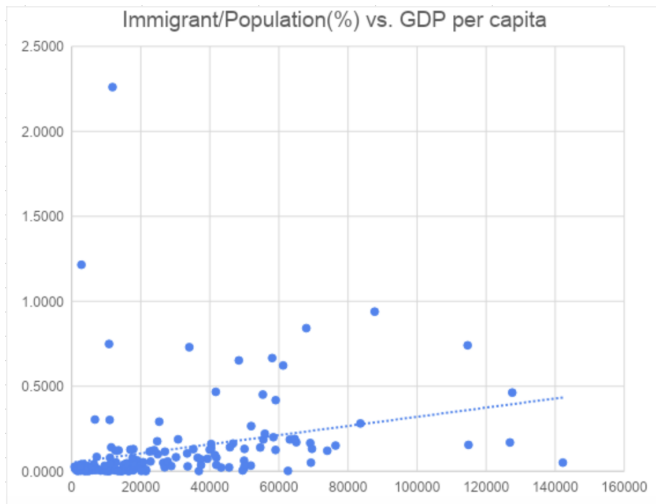
fertility rate required to sustain population growth is 2.1.<sup>6</sup>



**Figure 1: Immigration and Fertility**

Figure 1 vividly illustrates the relationship between the Immigration-to-Population ratio and the Fertility Rate, as captured by the line of best fit. The notable downward trend portrayed by this line signifies a negative correlation, suggesting that nations boasting higher fertility rates tend to exhibit a diminished proportion of immigrants. Furthermore, it is evident that all data points with an Immigration-to-Population ratio exceeding 0.5% are positioned below a fertility rate of four, with a significant concentration found before reaching a rate of two.

<sup>6</sup> J., Craig. “Replacement Level Fertility and Future Population Growth.” *Population Trends*, U.S. National Library of Medicine, 1994, [pubmed.ncbi.nlm.nih.gov/7834459/#:~:text=In%20developed%20countries%2C%20replacement%20level,need%20to%20be%20much%20higher.](https://pubmed.ncbi.nlm.nih.gov/7834459/#:~:text=In%20developed%20countries%2C%20replacement%20level,need%20to%20be%20much%20higher.)



**Figure 2: Immigration and GDP per capita**

Figure 2 delineates the relationship between the immigration-to-population ratio and GDP per capita. The graph clearly illustrates a correlation where countries with a lower GDP generally have a lower immigration-to-population percentage. A significant portion of countries, particularly those clustered around a GDP of 20,000, exhibit less than 0.1% in their immigration-to-population ratio. However, an outlier exists: the country with the highest immigration-to-population percentage showcases a lower GDP per capita, thus deviating from the prevalent trend depicted in the graph. On the other end of the spectrum, the graph also reveals that many developed countries with higher GDP per capita maintain a notably higher average immigration-to-population ratio.

**Table 2. Correlations Table**

Correlations	GDP-cap and Immmigration/Pop Ratio
	0.2918277353
	Fertility and Immmigration/Pop Ratio
	-0.4449303155

Finally, Table 2 presents the correlations between immigration to population ratio and GDP per capita and fertility, respectively. The table confirms what is observed in Figures 1 and 2, that is there are significantly negative correlations for both variables.

**4. Conclusion**

In conclusion, this research illuminates a complex, yet discernible relationship between fertility rates and immigration patterns, unravelling potential strategies nations might employ to stabilize labor markets and sustain economic vigor in the face of declining birth rates. The data substantiates a significant shift in the perception of the reciprocity between fertility rates and immigration, advocating for an intricate understanding that extends beyond traditional narratives.

Our findings, as encapsulated in Table 1 and Table 2, elucidate a noticeable correlation between fertility rates and the proportion of immigrants in a population. Particularly, data points with an immigration-to-population ratio exceeding 0.5% predominantly reside below a fertility rate of four, with a substantial concentration apparent before a rate of two. This suggests that countries experiencing lower fertility rates, nearing the median value of 2.2, might be more inclined to open doors to immigrants, potentially as a mechanism to buffer against declining native workforce numbers.

Figure 3 further complements this narrative by illustrating a tangible relationship between GDP per capita and the immigration-to-population ratio. A majority of nations with a GDP hovering around 20,000 showcase a migration rate less than 0.1%, hinting at an economic threshold that might influence immigration policies. The pronounced correlation between elevated levels of immigration and a substantial GDP per capita is conspicuously evident in this figure. The notable outlier – a country with a high immigration-to-population ratio yet a lower GDP per capita – stands as a testament to the multifaceted nature of immigration dynamics, indicating that economic factors alone cannot dictate the complexity of immigration trends.

Moreover, the data reveals a pronounced disparity in fertility rates globally, ranging from a minimum of 1 to a peak of 6.9, with an alarming number of nations hovering below the threshold of 2.1 required to maintain population stability. This statistic accentuates the urgency for countries, particularly those below the mean fertility rate of 2.69, to proactively strategize their immigration policies, to possibly counteract the impending repercussions of a dwindling native population.

The presented data corroborates the hypothesis that declining fertility rates might indeed serve as a significant motivator for increased immigrant numbers

within a country. Through a meticulous analysis, the study refutes the traditional standpoint that primarily positions immigration as a precursor to diminishing birth rates, advocating instead for a more interconnected perspective that considers the broader socio-economic landscape. Moreover, it echoes the pioneering insights of researchers like Libicki, emphasizing the potential for immigration to act as a substantial buffer against workforce deficits arising from declining birth rates.

## 5. References

Menju, Toshihiro. "Japan Is Finally Facing up to Its Economic Need for Immigrants." *Nikkei Asia*, 7 Nov. 2022, [asia.nikkei.com/Opinion/Japan-is-finally-facing-up-to-its-economic-need-for-immigrants](https://asia.nikkei.com/Opinion/Japan-is-finally-facing-up-to-its-economic-need-for-immigrants).

Davie, Maurice. "Immigration and the Declining Birthrate - JSTOR." *Immigration and the Declining Birthrate*, 1924, [www.jstor.org/stable/7222](http://www.jstor.org/stable/7222).  
 Bradatan, Cristina. "Does Migration Reduce Fertility? - PAA2005." *Does Migration Reduce Fertility?*, 2005, [paa2005.populationassociation.org/papers/51562](http://paa2005.populationassociation.org/papers/51562).

Libicki, Martin C., et al. "APPENDIX B: Trade-Offs Between Fertility Rates and Migration Rates." 2011.

J, Craig. "Replacement Level Fertility and Future Population Growth." *Population Trends*, U.S. National Library of Medicine, 1994, [pubmed.ncbi.nlm.nih.gov/7834459/#:~:text=In%20developed%20countries%2C%20replacement%20level,need%20to%20be%20much%20higher](https://pubmed.ncbi.nlm.nih.gov/7834459/#:~:text=In%20developed%20countries%2C%20replacement%20level,need%20to%20be%20much%20higher).

World Bank. "World Development Indicators - Google Public Data Explorer." *Google*, Google, 2014, [https://www.google.com/publicdata/explore?ds=d5bncppjof8f9\\_&ctype=l&strail=false&bcs=d&nselm=h&met\\_y=ny\\_gdp\\_pcap\\_cd&scale\\_y=lin&ind\\_y=false&rdim=region&idim=region:EAS:ECS:LCN:MEA:NAC:SAS&ifdim=region&tstart=-312512400000&tend=1265410800000&hl=en&dl=en&ind=false](https://www.google.com/publicdata/explore?ds=d5bncppjof8f9_&ctype=l&strail=false&bcs=d&nselm=h&met_y=ny_gdp_pcap_cd&scale_y=lin&ind_y=false&rdim=region&idim=region:EAS:ECS:LCN:MEA:NAC:SAS&ifdim=region&tstart=-312512400000&tend=1265410800000&hl=en&dl=en&ind=false)

World Population Review. "Immigration by Country 2023." *Immigration by Country 2023*, 2023, [worldpopulationreview.com/country-rankings/immigration-by-country](https://worldpopulationreview.com/country-rankings/immigration-by-country).

Worldometer. "Countries in the World by Population (2023)." *Worldometer*, 2022, [www.worldometers.info/world-population/population-by-country/](https://www.worldometers.info/world-population/population-by-country/).