Quarterly Journal of Quantitative Economics(JQE) **22(4) 1-36**

Shahid Chamran University of Ahvaz

Quarterly Journal of Quantitative Economics

Journal Homepage: www.jqe.scu.ac.ir
Print ISSN: 2008-5850
Online ISSN: 2717-4271



The effects of immigration on the macroeconomic variables of Iran in the dynamic stochastic general equilibrium model framework

Ramin Behyarfar *, Mehrzad Ebrahimi **, Hashem Zare***, Abbas Aminifard

** Ph.D. candidate of Department of Economics, Shiraz Branch, Islamic Azad University, Shiraz, Iran.*
***Email**: rbehyarfar@yahoo.com*

*** Assistant professor of Department of Economics, Shiraz Branch, Islamic Azad University, Shiraz, Iran.(Corresponding Author)*
***Email**: mhrzad@yahoo.com*
0000-0002-0986-509
***Postal address**: Department of Economics, Shiraz Branch, Islamic Azad University, Shiraz, Iran.*

**** Assistant professor of Department of Economics, Shiraz Branch, Islamic Azad University, Shiraz, Iran.*
***Email**: hashem.zare@gmail.com*

***** Assistant professor of Department of Economics, Shiraz Branch, Islamic Azad University, Shiraz, Iran*
***Email**: aaminifard@yahoo.com*

ARTICLE HISTORY	JEL CLASSIFICATION	KEYWORDS
Received: 20 May 2023 *Revision: 04 November 2023* *Acceptance: 12 February 2024*	*E44 ،O15 ،E32 ،F42.*	*Migration, Human Capital DSGE Model, Business Cycles*

Further Information:
The present article is derived from Ramin Behyarfar's doctoral dissertation with the Supervisority of Mehrzad Ebrahimi, and the advisory of Hashem Zare and Abbas Aminifard completed in the Azad University of Shiraz, Iran.

Shahid Chamran University of Ahvaz
Quarterly Journal of Quantitative Economics
(former Economic Studies)

Acknowledgments: Acknowledgments may be made to individuals or institutions that have made an important contribution.
Conflict of Interest: The authors declare no conflict of interest.
Funding: The authors received no financial support for the research, authorship, and publication of this article.

How to Cite:
Behyarfar, Ramin., Ebrahimi, Mehrzad., Zare, Hashem & Aminifard, Abbas. (2026). The effects of immigration on the macroeconomic variables of Iran in the dynamic stochastic general equilibrium model framework. *Quarterly Journal of Quantitative Economics(JQE)*, 22(4), 1-36.
10.22055/jqe.2024.43819.2555

© 2026 Shahid Chamran University of Ahvaz, Ahvaz, Iran. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0 license) (http://creativecommons.org/licenses/by-nc/4.0/)

EXTENDED ABSTRACT

INTRODUCTION

This paper examines the effects of migration on Iran's business cycles in the framework of a Bayesian dynamic stochastic general equilibrium model. The present study defines migration as a shock, explained as a first-order autoregression process. This shock enters the model through changes in human capital and is effective in causing fluctuations in economic variables by changing the structure of population and human capital. Two tools of variance decomposition and impulse response functions have been used to analyze migration's effects on the Iranian economy's business cycles. Based on the variance decomposition results, the migration shock explains more than 20% of output fluctuations, more than 14% of consumption fluctuations, and more than 10% of housing price fluctuations in the Iranian economy. They are also, based on the results of the impulse response functions of the variables, in response to the shock of migration, output, consumption, investment, capital formation in the housing sector, human capital, employment, wages, and capital stock decrease, while housing prices increase. Finally, based on the results obtained from the estimation of the final likelihood of the model based on the Laplace approximation, different

scenarios regarding the effects of immigration on human capital are compared. The results show that the model with a lower ratio of immigrants' human capital compared to internal human capital is accepted.

METHODOLOGY

In this research, the effects of immigration shocks on the dynamics of business cycles are analyzed using a DSGE stochastic dynamic general equilibrium model in a small open economy. For this purpose, seasonal data from 1370 to 1396 have been used in the space of business cycles, and the relationship between the research variables was evaluated using Bayesian econometric methods. In this research, according to Smith and Swensen (2019), a DSGE model for Iran's economy will be specified as a small open economy, which includes households, enterprises, the construction sector, and foreigners. In this model, net migration affects other economic variables through the impact on the population and human capital changes. Finally, for the ratio of the human capital of immigrants to the country and the country's population, three values are considered, which are compared with each other based on the estimation of the final likelihood of the model based on the Laplace approximation.

FINDINGS

The data used in this research are presented in **Table 1**, collected from 1395 to 1370 .All the data are seasonally adjusted, and after logarithmization, they have been detrended using the Hodrick-Prescott filter (λ=677).

Table 1. Research data in the period from 1370 to 1395

reference	symbol	Variable
central bank	Y	gross domestic product
central bank	X	Formation of fixed gross capital
central bank	C	private consumption
Statistics Center	EMP	working population
Statistics Center	V	immigrants
central bank	CPI	Consumer Price Index
Statistics Center	PH	House price
central bank	H	Investment in the housing sector

Shahid Chamran University of Ahvaz
Quarterly Journal of Quantitative Economics
(former Economic Studies)

CONCLUSION

The theoretical foundations, the model structure and the results of using the research data show that migration plays a significant role in the fluctuation of the macroeconomic variables of Iran. This variable affects the labor market, wages, products and other economic variables by affecting human capital and population changes. The experimental evidence and the results of the logarithm of the model correction based on the Laplace approximation show that the level of human capital of immigrants in Iran is lower than that of native people.

Most Iranian immigrants immigrated to Iran based on the theory of repulsion, such as war and their countries' internal problems, and based on the spatial theory, due to the neighborhood.

The results of the analysis of variance and instantaneous response functions of the DSGE model of this research indicate the adverse effects of immigration on Iran's economy, such as the reduction of production, investment, human capital formation, etc., from its stable state. Population growth has increased housing prices.

Reference

Arabmazar, A., Moshrefi, R., & Mostafazadeh, M. (2017). Iranian labor migration to OECD countries and economic factors affecting it. *Journal of Economics and Modelling*, *8*(30), 63–94. https://ecoj.sbu.ac.ir/article_52215.html [in Persian]

Bang, J. T., & Mitra, A. (2009). Brain drain and institutions of governance: Educational attainment of immigrants to the United States, 1988–2000. *World Development*, *37*(1), 31–50. https://doi.org/10.1016/j.worlddev.2008.01.013

Boubtane, E., Dumont, J.-C., & Rault, C. (2016). Immigration and economic growth in the OECD countries 1986–2006. *Oxford Economic Papers*, *68*(2), 340–360. https://doi.org/10.1093/oep/gpw001

Bove, V., & Elia, L. (2017). Migration, diversity, and economic growth. *World Development*, *89*, 227–239. https://doi.org/10.1016/j.worlddev.2016.08.012

Heidari, H., Davoudi, N., & Talebi, F. (2023). Macroeconomic and sectoral effects of labor immigration: A CGE model approach. *Quarterly Journal of Research and Planning in Higher Education, 22*(4), 25–42. https://journal.irphe.ac.ir/article_702909.html [in Persian]

Jantan, E., Falahi, M. A., & Seifi, A. (2015). Determinants of migration from developed and developing countries to the United States. *Journal of Social Sciences (Ferdowsi University of Mashhad), 12*(1), 167–196. https://doi.org/10.22067/jss.v12i1.18743

Karimi, N., & Gharaati, S. (2013). Why do brains drain? Brain drain in Iran's political discourse. *Cadaad Journal, 6*(2), 154–173.

Kim, D., & Lee, C.-I. (2007). On-the-job human capital accumulation in a real business cycle model: Implications for intertemporal substitution elasticity and labor hoarding. *Review of Economic Dynamics, 10*(3), 494–518. https://doi.org/10.1016/j.red.2007.01.002

Lozej, M. (2019). Economic migration and business cycles in a small open economy with matching frictions. *Economic Modelling, 81*, 604–620. https://doi.org/10.1016/j.econmod.2019.07.012

Motaghi, S. (2015). The impact of economic factors on migration in Iran. *Quarterly Journal of Macro and Strategic Policies, 3*(11), 63–74. https://www.jmsp.ir/article_11014.html

Ruhs, M., & Vargas-Silva, C. (2015). The labour market effects of immigration. *Migration Observatory*, University of Oxford. https://migrationobservatory.ox.ac.uk

Shirkhani, M. A., & Baizidi, R. (2018). Immigration, human capital exit, and development: Comparing Iran and Turkey. *Political and International Approaches, 10*(2), 98–122. https://piaj.sbu.ac.ir/article_99766.html [in Persian]

Smith, C., & Thoenissen, C. (2019). Skilled migration and business cycle dynamics. *Journal of Economic Dynamics and Control, 109*, 103781. https://doi.org/10.1016/j.jedc.2019.103781