The Potential Impact of Migration on Prospective Population Ageing in Asia
- Extended abstract -

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Introduction

Population ageing, characterized by increasing shares of older persons in a population, has become a global trend. The onset of population ageing and the speed in which such changes in age-structure unfold differs across countries and regions. In many European and Northern American countries but also in other countries as Australia and Japan population ageing has already reached an advanced stage whereas in other countries the share of older persons in the population is still smaller (Scherbov et al. 2022, UN DESA 2023). In all world regions, however, the share of older persons is projected to increase further in the next decades, with the fastest pace of population ageing expected in Eastern and South-Eastern Asia (Basten 2013).

Population ageing is linked to various opportunities and challenges across the economic, social, and environmental dimension of sustainable development (UN DESA 2023). Not surprisingly, population ageing has become an important policy issue all over the world (UN DESA 2020). Immigration as a mean to counteract population ageing is often named in policy debates and controversially discussed in many ageing countries (Marois et al. 2020). The impact of migration on the age structure received a lot of attention from scholars but also from the public starting with the UN report on replacement migration released in 2000. Replacement migration is the number of net migrants needed to reach specific demographic goals, such as to stabilize total or working age population size or to prevent increasing age dependency ratio. The UN report showed for selected countries worldwide that international migration can to some extent slow down the process of population ageing, but extremely high numbers of migrants would be needed to fully offset it (UN DESA 2000). Huguet (2003) came to similar results for six Asian countries. Whereas these studies used chronological measures of age, Craveiro et al. (2019) for the first time did a similar exercise for selected European countries using prospective measures of age. In the prospective concept of age, differences in life expectancy across time and space are taken into account to define age (Sanderson and Scherbov 2007). Even when using these prospective measures of age, the magnitude of migration needed to counteract population ageing in European countries remains high (Craveiro et al. 2019). Nonetheless, it remains an open question to which extent these findings can be transferred to other countries and world regions.

In this study, we assess the impact migration could potentially have on population ageing in 11 Asian countries 2022-2050 by estimating replacement migration and comparing it to observed net migration.[1] Moreover, policy implications of the estimated replacement migration flows are discussed. We apply both chronological and prospective measures of age. Such a comparative and forward-looking study is well-needed in Asia where both some of the oldest populations worldwide and countries which are projected to age extremely rapidly in the next decades are situated.

Prospective ageing

Conventionally, the old-age population is defined as the persons at age 60 or 65 and older. However, this approach does not take into account neither health improvements nor increases in life expectancy at older ages which have been observed in many countries since the 1950s (Vaupel et al. 2021). Furthermore, mortality and life expectancy vary also spatially across countries. Building upon prior research Sanderson and Scherbov (2007) developed the prospective concept of age which they later further refined into the characteristics approach (Sanderson and Scherbov 2013). In this approach

[1] [1] In this study, when referring to migration, international migration is implied unless otherwise specified.

persons are considered to be of old-age not only based on their chronological age, but on other characteristics, such as health, physical strength, or cognitive abilities. Based on the assumption that a person's characteristics depend more on the expected remaining years of life than on the number of years lived, they propose a prospective old-age threshold based on the remaining life expectancy (RLE). The most common definition of the prospective old-age threshold (POAT) is at RLE = 15 years (Sanderson and Scherbov 2013). Hence, a person is considered to be of old-age when the age is reached at which the RLE is 15 years or lower. Due to increases in life expectancy and the dynamic old-age threshold prospective measures of ageing point toward a slower speed of population than chronological measures.

Data and methods

In our analyses, we use data from the United Nations' World Population Prospects (WPP) 2022 (UN DESA 2022b). The WPP 2022 projections available for the period 2022-2100 are based on medium fertility and medium mortality assumptions (UN DESA 2022a). We further use the prospective old-age thresholds provided by the World Aging Data Explorer which are also based on the WPP 2022 estimates and projections (Scherbov et al. 2022).

Using a cohort-component population projection, we estimate zero-migration and replacement migration scenarios for the period 2022-2050 for the eleven Asian countries where population ageing is most advancing. To prevent any influence of reductions in life expectancy during the Covid-19 pandemic on our estimates, we set the baseline in the year for which the return to the pre-pandemic trajectories is assumed (UN DESA 2022a): Armenia (2023), China (2022), Georgia (2024), Hong Kong (2023), Japan (2022), Macao (2022), North Korea (2022), Singapore (2022), South Korea (2022), Taiwan (2022), Thailand (2022). Four replacement migration scenarios using different indicators of population ageing are calculated: (1) Constant chronological old-age dependency ratio, (2) Constant prospective old-age dependency ratio, (3) Constant size of the chronological working-age population. (4) Constant size of the prospective working-age population. The chronological working-age population (WA) includes the population age 20 to 64 and the chronological old-age population (OA) the population age 65 and older. The prospective working-age population (PWA) is defined as the population older than 20 and younger than the prospective old-age threshold (POAT) at remaining life expectancy RLE equals 15 years. The prospective old-age population (POA) comprises individuals at the POAT and older. The chronological old-age dependency ratio (OADR) is defined as the ratio between chronological old-age population and working-age population (OA/WA). The prospective old-age dependency (POADR) is calculated accordingly using the prospective definitions of the age groups (POA/PWA).

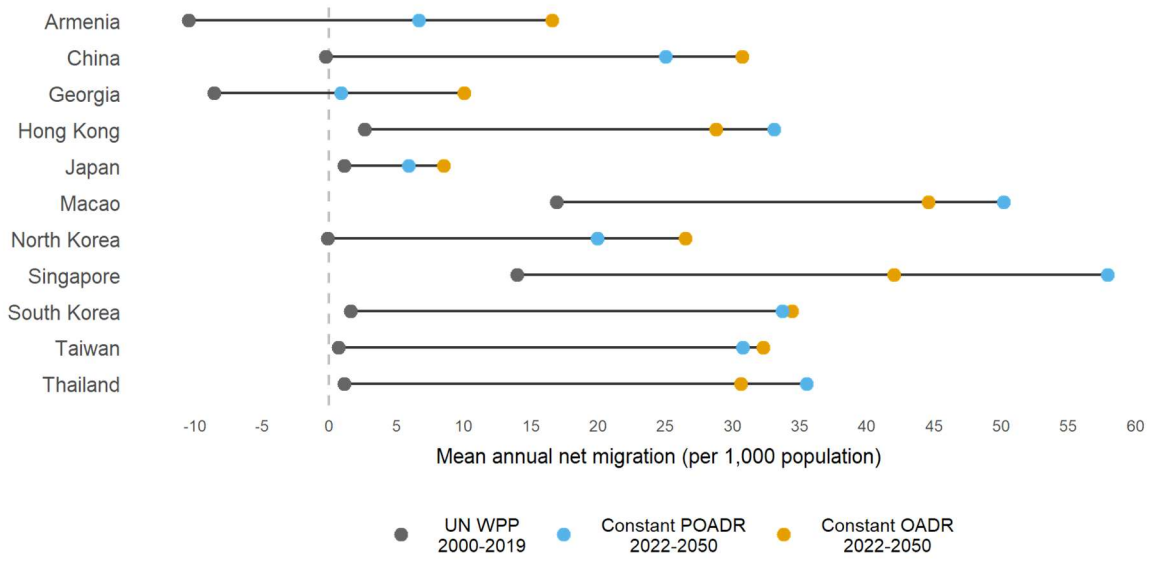
Results

Our results reveal large variations across countries in the zero-migration trajectories of the (prospective) old-age dependency ratio and size of the (prospective) working-age population from 2022 to 2050. Accordingly, also the level of replacement migration varies significantly across countries based on their specific current and projected age-structure. Replacement migration to keep the prospective old-age dependency ratio (POADR) constant ranges from 0.9 to 57.9 annual net migrants per 1,000 population (Figure 1). Japan, Georgia, and Armenia, where population ageing is already most advanced, have the lowest demand for replacement migration whereas replacement migration rates in Macao and Singapore, which still have younger populations, exceed all other countries analyzed.

As Figure 1 depicts, the mean annual net migration in both scenarios (constant OADR and constant POADR) exceeds observed net migration of the first decades of the 21st century in all countries. Generally, given the level of replacement migration compared to observed net migration and the potential impact such migration would have on the total population size, from a demographic point of view maintaining the old-age dependency ratio due to migration seems to be an unrealistic goal in most countries – also when using prospective measures. Only in Georgia it could be considered realistic

to keep the prospective old-age dependency ratio constant over the next decades. Nevertheless, also Georgia would need to undergo a transformation from high negative to positive net migration.

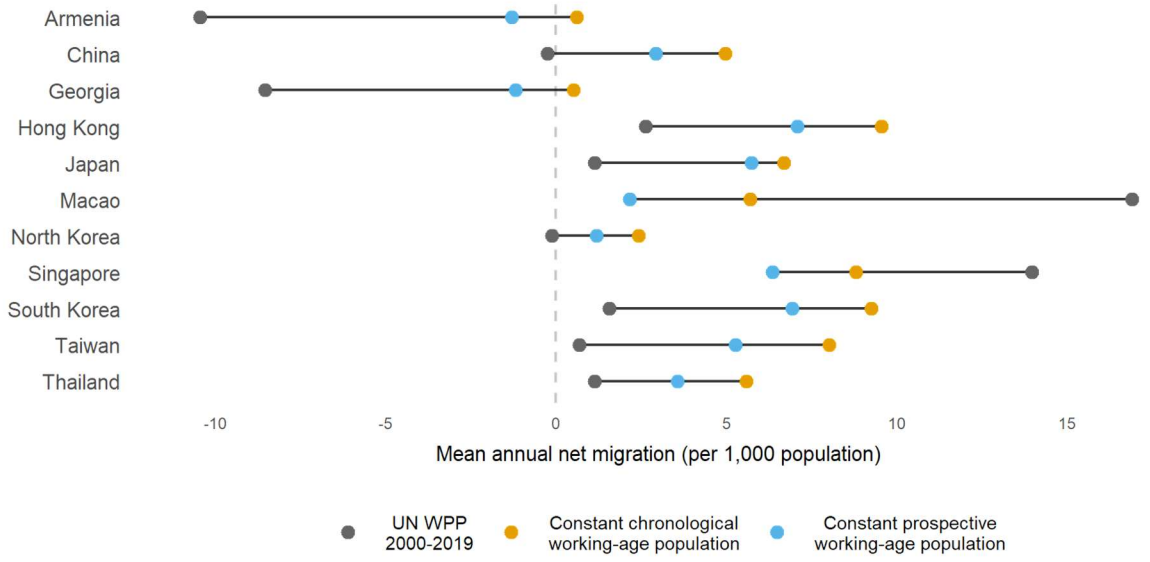
Figure 1: Mean annual net migration rates in constant OADR and constant POADR scenario (2022-2050) and observed net migration rates (2000-2019)



Notes: Baseline year=2022 except for Armenia (2023), Georgia (2024), and Hong Kong (2023).

Turning towards the potential impact of migration on the size of the (prospective) working-age population, we observe significantly lower replacement migration than needed to keep the (prospective) old-age dependency ratio constant. Replacement migration needed to maintain the size of the prospective working-age population ranges from negative annual net migration rates in Armenia (-1.3) and Georgia (-1.2) to 7.1 annual net migrants per 1,000 population in Hong Kong (Figure 2). Given these numbers, to maintain the size of the prospective working-age population seems to be a more realistic scenario. However, with the exception of Singapore and Macao which are already characterized by high immigration, also in this scenario more immigration as observed in the last decades would be needed to do so.

Figure 2: Mean annual net migration rates in constant WA and constant PWA scenario (2022-2050) and observed net migration rates (2000-2019)



Notes: Baseline year=2022 except for Armenia (2023), Georgia (2024), and Hong Kong (2023).

Conclusions

This study underlines the applicability of prospective measures of age in the replacement migration concept. Our results indicate that immigration alone may not be sufficient to completely offset population ageing – expressed as the maintenance of the old-age dependency ratio – in Asian countries also when using prospective measures of age. In line with findings for European countries, the volumes of replacement migration to maintain the size of the working-age population seem more realistic in many of countries analyzed. However, even if the magnitude of replacement migration to counteract decreases in the size of the prospective working-age population does appear realistic, higher net migration would be needed in most countries. Given the challenges associated with higher immigration and immigration-promoting policies, further policies addressing the socioeconomic challenges posed by population ageing should be considered by policy-makers (Bijak et al. 2008). Such policy options include changes in retirement and health systems, strategies to increase (female) labor force participation, investments in human capital, among others (e.g., UN DESA 2000, Bijak et al. 2008, Bloom et al. 2015). As higher immigration can barely be seen as the sole solution for population ageing, policy makers may consider a combination of different strategies to ensure future development – in countries where population ageing is already relatively advanced and in countries which will face the challenges associated with population ageing soon.

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