THE DEMOGRAPHIC DIVIDEND AND DEMOGRAPHIC WINDOW OF OPPORTUNITY: A CROSS-NATIONAL COMPARATIVE ANALYSIS

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Abstract
This study presents an empirical analysis of the demographic dividend (DD) and the demographic window of opportunity (DWO), examining their distinct roles in analysing the economic implications of age-specific population dynamics. The study proposes a mixed-methods approach that combines National Transfer Accounts (NTA) with a demographic assessment of the beneficial period – the DWO. Through an empirical analysis, the study illustrates the distinctions between the demographic dividend (DD) and the demographic window of opportunity (DWO). Drawing on evidence from eight selected countries, the study reveals time lags between the opening of the DWO and the emergence of the DD, as well as cross-country variations in the magnitude of both the DWO and the DD. The proposed analytical framework offers a replicable model for evaluating population dynamics within the context of the demographic dividend.

Keywords: demographic window of opportunity, demographic dividend, NTA, age structure, support ratio
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INTRODUCTION

The analysis of population age structure and its macroeconomic implications has become a central theme in demographic and developmental research, particularly in light of ongoing demographic global shifts. This interest has been reinforced by the emergence of the concept of the demographic dividend (DD). When a nation reaches a specific age structure in which the working-age population predominates over other age groups, economic growth can be accelerated – an effect called the demographic dividend. The complexity of the impact of demographic change on economic outcomes, however, framed in the demographic dividend concept, requires careful consideration.

Within the framework of the demographic transition, the point at which the working-age population prevails is referred to as the demographic window of opportunity (DWO). Despite the wide use of the demographic dividend concept in development discourse, however, the period in which the age structure becomes favourable – the demographic window of opportunity (DWO) – remains underutilised. The

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DWO is frequently treated as synonymous or interchangeable with the DD, leading to analytical simplifications and policy ambiguities. As a result, existing frameworks often fail to capture the timing, interaction, and variability of both the DWO and the DD phenomena across diverse national contexts.

This study builds upon previous conceptual work (*Şoldan,* 2023a) that distinguishes the DWO and DD as interconnected yet distinct phenomena. Exploring this matter further, the present article develops and applies a revised analytical framework that combines the demographic approach and the National Transfer Accounts (NTA) methodology to assess both the DD and DWO. Using comparative evidence from eight countries – Singapore, South Korea, Brazil, Mexico, Ireland, Slovakia, Moldova, and Georgia – the study investigates the timing, magnitude, and the overlap of the DWO and the DD. The findings contribute to the literature by clarifying conceptual boundaries of DD and the DWO and providing a replicable tool of analysis across diverse national contexts.

A DISCUSSION OF THE LITERATURE

The emergence of the demographic dividend concept has changed the way economic development and the population are viewed and has become the dominant paradigm in the population and development debate (*Pace – Ham-Chande eds.,* 2016). Moreover, the concept of the demographic dividend has become increasingly prominent in public discussions of international development as a particular way of looking at the effects of current demographic changes on economic development (*Lutz et al.,* 2019).

The idea of the demographic dividend emerged in the late 1990s, when *Bloom and Williamson* (1998) explained the economic miracle of East Asia, attributing about one-third of its accelerated economic growth to the demographic factor. The explanation of demographic dynamics provided by the demographic transition and its potential effect has given rise to a large body of literature analysing the phenomenon of the demographic dividend from different perspectives, including the various variables and factors by which a favourable age structure can accelerate economic development (*Pace – Ham-Chande eds.,* 2016). Reviewing the demographic dividend a decade later, *Williamson* (2013) discussed a wider range of aspects of the demographic dividend, including emigration, the brain drain, poverty, and inequality, drawing attention to its complexity. *Kelley and Schmidt* (2005), for example, advanced the demographic dividend debate by decomposing the model into the labour participation rate effect and the productivity effect. While the participation rate effect captures income gains from increased labour force participation at a constant productivity level, the productivity effect reflects broader influences such as economies of scale, population density, life-cycle savings and investment responses, and human capital (ibid.).

The National Transfer Account (NTA) framework is used to analyse the demographic dividend due to its ability to capture variations in labour force participation and wealth accumulation, while distinguishing between the first and second demographic dividends. The increase in the working-age population determines the labour participation effect, referred to as the first demographic dividend (DD1), while the productivity effect of the demographic dividend, i.e. the growth in output per worker, represents the second demographic dividend (DD2) (*Dramani – Oga,* 2017; *Mason et al.,* 2017; *Prskawetz – Sambt,* 2014). This second demographic dividend is typically identified after the first demographic dividend (*Lee – Mason,* 2006), although they may overlap (ibid.).

Since its inception, the concept of the demographic window of opportunity has been closely linked to that of demographic dividend. Growing interest in age-related population change and its positive economic implications led the United Nations to formalise the window of opportunity in 2004. It is defined as the period during which the proportion of children and young people under 15 falls below 30 per cent, and the proportion of people aged 65 and over is still below 15 per cent (*United Nations,* 2004). For several decades (usually 30–40 years), the proportion of the population of working age is particularly pronounced, usually between 40 and 60 per cent. According to this method, most European countries entered the demographic window before 1950 and are now exiting it, while many African countries will not enter the demographic window until 2045 or even later (ibid.). *Vallin* (2005) also used population projections to analyse the phenomenon of the demographic window, while

M. Carella and A. Parant (2016) assessed the DWO in Mediterranean countries using different methods. Despite these analyses, the focus on the DWO as a demographically specific period remains relatively uncommon, especially when compared to the extensive literature on DD.

A key issue in the literature is the tendency to treat the DD and the DWO as interchangeable concepts, which has led to conceptual and analytical inconsistencies. In this regard, a meta-analysis of the DWO and DD definitions and interpretations has been undertaken more recently (*Şoldan,* 2023a). Moreover, the question of the difference between the demographic dividend and the demographic window of opportunity is not just one of conceptual confusion, as it also has implications for the need to revise the frameworks for the analysis of the DWO and the DD. This is because the method selected for analysing the demographic dividend can influence its interpretation and, consequently, the policies formulated to achieve the demographic dividend (*Williamson,* 2013).

A review work on the demographic dividend, which includes methods for its assessment, has been published by *Oosthuizen and Magero* (2021) and by *James* (2018). While describing the primary methodologies for assessing the demographic dividend, *Oosthuizen and Magero* ask to what extent a specific methodological framework, given country-specific issues, can provide proper guidance for policy formulation for achieving the demographic dividend. In his review, James concluded that while every method has its strengths and weaknesses, there are two important aspects of the demographic dividend that attention should also be paid to: first, the aspect of timing, that is, when the specific age-structure occurs, and second, assessing the causality between age-structure changes and economic impact. Against this background, and based on earlier reviews of the DD and the DWO, the study proposes the following revised definitions:

- The **demographic window of opportunity (DWO)** represents a specific period when the dynamics of the working-age population predominate over the dependent age groups (children and the elderly), creating favourable demographic conditions for economic development.
- The **demographic dividend (DD)** is the accelerated economic development resulting from a specific population age structure, realised under supportive institutional conditions.

This study empirically explores the distinctions between the demographic window of opportunity and the demographic dividend by applying a revised methodological framework within a comparative analysis.

THE AIM OF THE STUDY AND THE RESEARCH QUESTIONS

This article aims to present a revised methodological framework for the demographic dividend and the window of opportunity, employing both the NTA and demographic approaches to observe the distinctions between the two phenomena.

To address this aim, the following key questions are examined:

1. How has the DWO manifested itself in selected countries?
2. What are the differences in the dynamics of the demographic and economic support ratio indicators?
3. What are the dynamics of the DWO as opposed to the first, second, and combined demographic dividends in selected countries?

METHODS AND DATA

Methods

This article presents a revised methodological framework for the analysis of the DD and the DWO. It incorporates, in addition to the NTA approach[2)] for estimating the DD, the demographic assessment of the beneficial period of the DWO. The presented framework aims to compare the DD and the DWO based on empirical data from selected countries.

2) The demographic dividend, i.e. the economic gain resulting from demographic changes, can be assessed through various approaches, and the NTA represents one such method (see *Oosthuizen and Magero,* 2021; *James,* 2018).

Assessing the demographic dividend (DD) – the NTA approach

Accounting for the DD requires assessing the interlinkage between age-structure dynamics and economic characteristics. The NTA methodology presents the mainstreaming framework for assessing the DD, and the economic support ratio (ESR) represents the main proxy.[3] This composite indicator captures the characteristics of the population's age-specific production and consumption patterns (*Abio et al.,* 2023). The economic support ratio is defined as the ratio of the effective number of producers *(L)* to the effective number of consumers *(N)*:

$$ESR(t) = \frac{L(t)}{N(t)} = \frac{\sum_x y(x) \text{ x } P(x,t)}{\sum_x c(x) \text{ x } P(x,t)}$$

where *y (x)* is the age-specific weight of production; *c (x)* is the age-specific weight of consumption; and *P(x, t)* is the population of age x in year t. The economic support ratio is then used to assess the demographic dividend (*Mason et al.,* 2017).

To estimate the DD, the NTA approach utilises the decompositional model (*James,* 2018). Per capita income is written as:

$$\frac{Y(t)}{N(t)} = \frac{L(t)}{N(t)} \times \frac{Y(t)}{L(t)}$$

where per capita income Y/N is determined by workforce participation (L/N) and productivity (Y/L); Y, L, and N stand for income, workers, and total population, respectively. Further, the income per effective consumer, y(t) = Y(t)/N(t), can be written as a function of two multiplicative factors:

$$y(t) = ESR(t) \text{ x } y_l(t)$$

where *ESR(t) = L(t)/N(t)* is the ratio of the number of effective workers to the number of effective consumers, and $y_l(t) = Y(t)/L(t)$ is the average income per worker (*Dramani – Oga,* 2017). Assuming gr is the growth rate, the logarithmic transformation of these identities can be expressed as follows:

$$gr[y(t)] = gr[ESR(t)] + gr[y_l(t)]$$

The growth rate in income per effective consumer *gr* [*y(t)*] is the sum of the rate of growth of the economic support ratio *gr* [*ESR(t)*] and the rate of growth in income per worker *gr* [$y_l(t)$]. Assuming a constant income per worker, the growth of the economic support ratio equals the growth rate of effective labour less the growth rate of the number of effective consumers:

$$gr[ESR(t)] = gr[L(t)] - gr[N(t)]$$

Accordingly, the demographic dividend occurs when the effective number of producers is growing more rapidly than the effective number of consumers, and the growth rate of the economic support ratio is positive (ibid.).

This methodological description refers to the calculation of the labour supply effect and defines what is referred to as the ***first demographic dividend (DD1)***. The full extent of the DD in this methodological framework, outside of the compositional effects of increasing the productive population over the total population, is completed with the productivity effect (*Mason et al.,* 2017). In the NTA approach, the productivity effect is called the second demographic dividend (DD2) and is assessed through lifetime savings and wealth effects. The methodology of the first demographic dividend outlined above and of the second demographic dividend in the NTA approach is described in detail in *Mason et al.* (2017). The second dividend is the expected capital accumulation due to the increase in life expectancy, the size of which will depend on the accumulation of savings and the shift in the age profile of wealth (*Mason,* 2005, cited in *James,* 2018). The NTA flows allow the second demographic dividend to be estimated on the basis of some assumptions about macroeconomic variables (*Oosthuizen – Magero,* 2021).

Assessing the demographic window of opportunity (DWO)

The demographic window of opportunity (DWO) is a purely demographic phenomenon, defined by

3) The primary aim of the NTA methodology is not to measure demographic dividends directly, but to map the flows of economic resources across age groups. However, its structure—disaggregating economic flows by age—allows for the estimation of both first and second demographic dividends.

the configuration of a population's age structure and particularly by the balance between the working-age population and dependent age groups. The standard threshold for the working-age population is typically set at ages 15–64, according to the United Nations (2004), though alternative definitions may also be used. While various methods exist for assessing the DWO, this study adopts a growth rate approach, in line with the NTA approach, and proposes two complementary methods to assess the DWO.

The first method is the comparative growth rate method, where the DWO is the period during which the growth rate of the working-age population (15–64 years) exceeds the combined growth rates of the dependent age groups (0–14 and 65+ years)[4]. This method is expressed as:

$$\text{DWO phase} = gr\,[(15-64\text{ years})\% > gr\,(0-14\text{ years}) + gr\,(65+\text{years})]\%$$

It captures the dynamic demographic advantage as it emerges and intensifies, reflecting shifts in population shares by age groups but also in the dynamics of age-structure change.

The second approach is the support ratio growth method, which focuses on the dynamics of the support ratio (SR).

Proxies to assess the demographic window of opportunity are demographic indicators such as the support ratio and the dependency ratios (*James,* 2018; *Oosthuizen – Magero,* 2021). These metrics are used to assess the predominance of the working-age population within a society. A higher ratio implies a lower dependency burden and potentially more economic output per capita.

The NTA framework uses the Economic Support Ratio (ESR) as its core indicator for assessing the demographic dividend as described above. It shows the ratio between effective producers and consumers based on age-specific profiles of production and consumption. To reflect purely the demographic structure and isolate the age composition effect, this study introduces the Support Ratio (SR), which is calculated as:

$$SR(t) = \frac{P(15-64)(t)}{P(\text{total})(t)}$$

An increase in the support ratio will indicate the positive event of the opening and occurrence of the period of the demographic window of opportunity. Despite relying on distinct metrics – the first focusing on population share-specific growth dynamics and the second on the support ratio – their empirical application suggests that the periods identified by both methods coincide (*Şoldan,* 2024). Such convergence of the two methods might not typically be observed in analyses of the demographic window of opportunity, where methodological differences often result in divergent timelines for the DWO. This observation adds to the relevance of dynamic approaches for identifying the DWO and suggests the potential value of a temporally sensitive analytical framework.

Furthermore, the trends of the first and second demographic dividends, as accounted for using the NTA methodology, are compared with those of the demographic window of opportunity (DWO), which is assessed based on the growth rate of the support ratio (SR). The inclusion of the latter enables the integration of DWO trends into the analysis of the first and second demographic dividends, resulting in a unified analytical framework that encompasses both DWO and DD.

Data

This analysis draws on the World Population Prospects (2022) and the National Transfer Accounts (NTA) data series (2022) to examine age-structure dynamics – specifically the demographic window of opportunity (DWO) and its potential economic effect – the demographic dividend (DD).[5] While the NTA data

4) The method stems from the initial findings on the economic implications of age-related population dynamics (*Bloom and Williamson,* 1998), as well as from the review by *James* (2018).

5) A more precise assessment of demographic dividends would ideally rely on national-level projections and national NTA estimates. However, the objective of this article is to propose a replicable comparative framework, and such consistency across countries requires harmonised and internationally available data – for which national-level NTA projections are often not available or remain incomplete for many countries.

are employed to assess the DD, the World Population Prospects are used to identify and analyse the DWO. The two datasets are compatible for the analysis, as the latest NTA series has been aligned with the 2022 revision of the World Population Prospects (www.ntaccounts.org).

Country selection

The study includes eight countries, which were selected to reflect diverse regional experiences and trajectories of the demographic transition and realisation of the demographic dividend. The sample comprises two countries from each of four distinct regions: East Asia (Singapore and South Korea), Latin America (Brazil and Mexico), Western and Central Europe (Ireland and Slovakia), and post-Soviet Eastern Europe (Moldova and Georgia).

The selection of the countries was based on their comparability in terms of the onset of their demographic transition, which occurred after 1950. This criterion ensured that the analytical basis for examining the dynamics of the demographic window of opportunity (DWO) and the demographic dividend (DD) was within a relatively comparable economic context. The comparative analysis covers the period 1950–2050, which allows for cross-national comparisons at different stages of the demographic transition and makes it possible to trace the evolution of both the DD1 and the DD2 in relation to the DWO, both before and after the demographic transition. Moreover, the diversity of countries allows for the representation of varying outcomes in terms of the realisation of the demographic dividend, as shown in prior studies:

- **Singapore and South Korea** illustrate successful experiences of significant economic boosts during their demographic transition, like other East Asian tigers, representing a hallmark example of DD achievement (*Bloom et al.,* 2003; *Bloom – Williamson,* 1998).
- **Brazil and Mexico** offer contrasting examples in which, despite the demographic transition occurring in the same period, the beneficial period remained underutilised (*Bloom et al.,* 2003).
- **Ireland and Slovakia** provide a European comparative base – with Ireland representing a case of the efficient harnessing of the DWO (the 'Celtic Tiger') (ibid.), and Slovakia presenting more moderate results (*Şoldan,* 2023b).
- **Moldova and Georgia** both represent post-Soviet contexts and exemplify specific demographic dynamics shaped by their respective political and economic transitions, offering distinct comparative insights.

The cross-country selection enables an empirical comparison across regional, institutional, and demographic dimensions, demonstrating the application of a replicable methodology that supports the integration of the DWO into DD estimation, in alignment with the NTA approach.

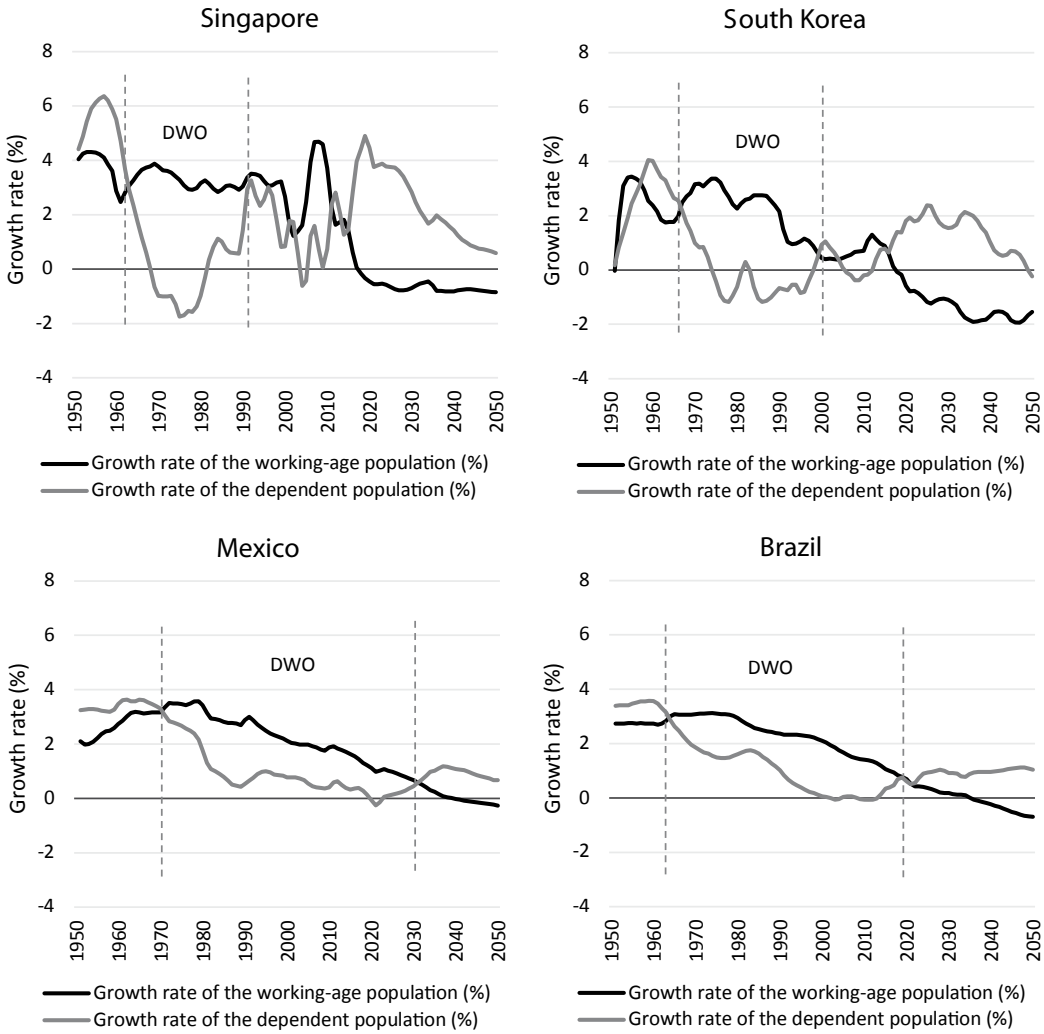
RESULTS

The demographic window of opportunity in selected countries

Age-specific population dynamics during the demographic transition shape the configuration of the demographic window of opportunity (DWO). Specifically, changes in the proportion of working-age and dependent populations over time serve as proxies for identifying the DWO. The DWO is identified as the period during which the growth rate of the working-age population exceeds that of the dependent population (see Figures 1 and 2). This period also corresponds to a positive growth rate of the support ratio (SR) (see below). However, this method also offers additional insights by allowing the separate dynamics of the working-age and dependent populations to be examined.

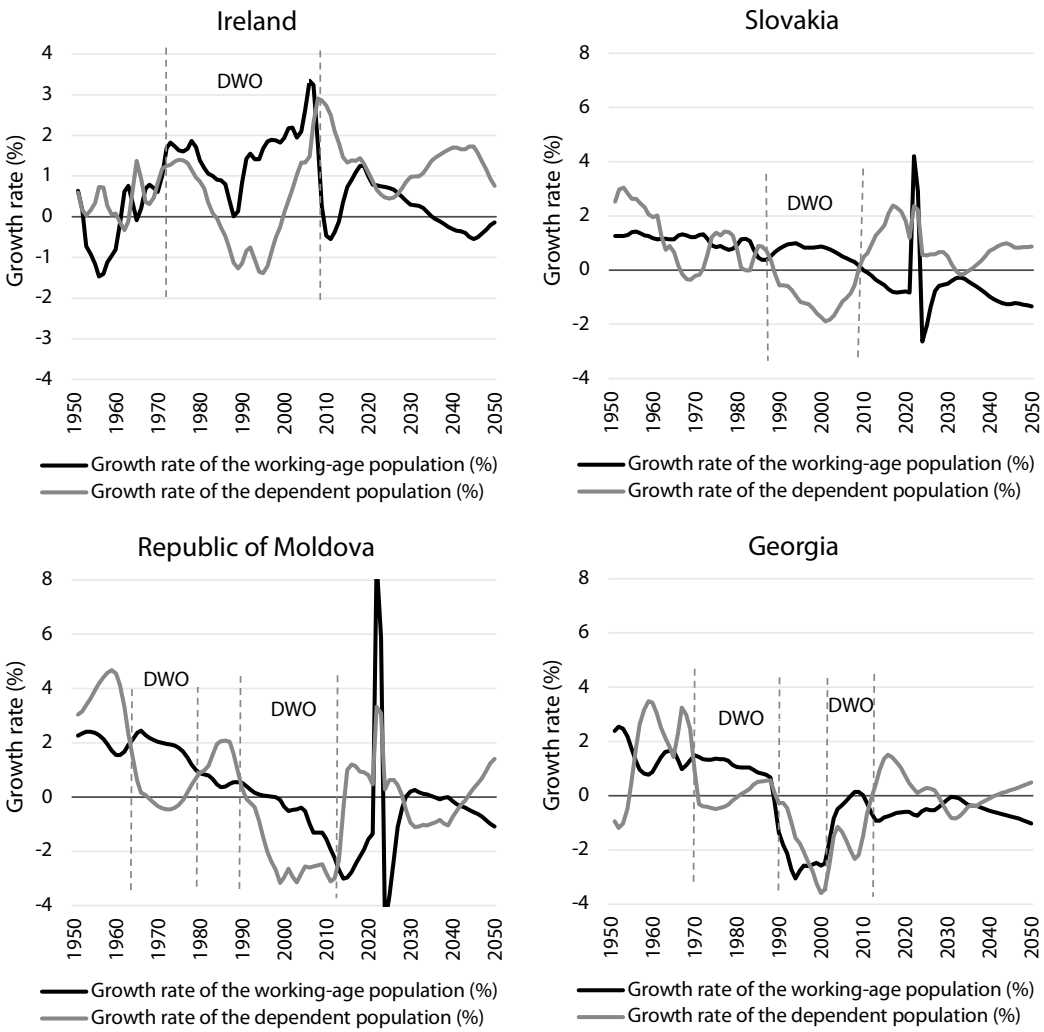
Figures 1 and 2 present the demographic window of opportunity for the selected countries. What is observed here is that while in the two Latin American countries, Brazil and Mexico, the magnitude of the DWO is indeed smaller than in the two Asian countries, the dynamics of the dependent population also vary significantly. While the size of the working-age population remains large, in Singapore and South Korea, the growth rate of the dependent population during the period of the DWO actually decreased, registering negative values. By contrast, in Mexico and Brazil, the pace of the decrease in the dependent population was small, leading to a less pronounced DWO. Likewise, in Singapore, South Korea, Ireland, and Slovakia, the dynamics of the dependent population growth rate

Figure 1 **The existence of the demographic window of opportunity between 1950 and 2050 – selected East Asian and Latin American countries (%)**



Source: *World Population Prospects (2022) of the UN DESA; author's calculations.*

Figure 2 **The existence of the demographic window of opportunity between 1950 and 2050 – selected European countries (%)**



Source: *World Population Prospects (2022) of the UN DESA; author's calculations.*

registered negative values, which gave rise to a pronounced DWO.

In Moldova and Georgia, these dynamics are quite specific. A decrease in both age groups at different paces produces a DWO for a small period between 1964 and 1979 in Moldova and between 1970 and 1987 in Georgia (Fig. 2). The population started to decrease after 1990 in both countries. However, the demographic situation remains beneficial, as the working-age population is decreasing at a slower pace than that of the dependent population, with a DWO between 1990 and 2011 in Moldova and between 1998 and 2012 in Georgia (Fig. 2).

Demographic and economic support ratio dynamics in selected countries

Demographic and economic support ratios serve as proxies for analysing the demographic window of opportunity and the demographic dividend. A positive growth rate in the support ratio (SR) indicates the opening of the demographic window of opportunity (DWO), while a positive growth rate in the economic support ratio reflects the first demographic dividend (DD1).

Figures 3 and 4 illustrate the demographic window of opportunity (DWO) and the first demographic dividend (DD1) for the selected countries. The DWO and the DD1 in Singapore, South Korea, Mexico, and Brazil are presented as two separate processes. A key observation is that the DWO tends to emerge earlier than the DD1, which aligns with the generally accepted idea that labour market adjustments require time, even though the DWO has opened. Thus, even if the demographically beneficial period has occurred, the dynamics of the ESR may exhibit different trends. Following the opening of the DWO, the demographic dividend may occur with different delays and with varying intensities as observed in Figures 3 and 4. Hence, Singapore and South Korea have registered important DDs that exceed the magnitude of their DWOs (Fig. 3).

Usually, in the literature, the Asian tigers are compared with Latin American countries, which, having experienced the demographic transition in the same period, have lost the possibility of gaining the demographic dividend. Indeed, unlike the Asian Tigers, the DD in Mexico and Brazil is much smaller than that in East Asian countries (Fig. 3). Nevertheless, the DWO in selected Latin American countries is also much smaller than the magnitude of the DWO in the two selected Asian countries. This finding shows that differences in the configuration and the DWO can also influence the magnitude of the DD.

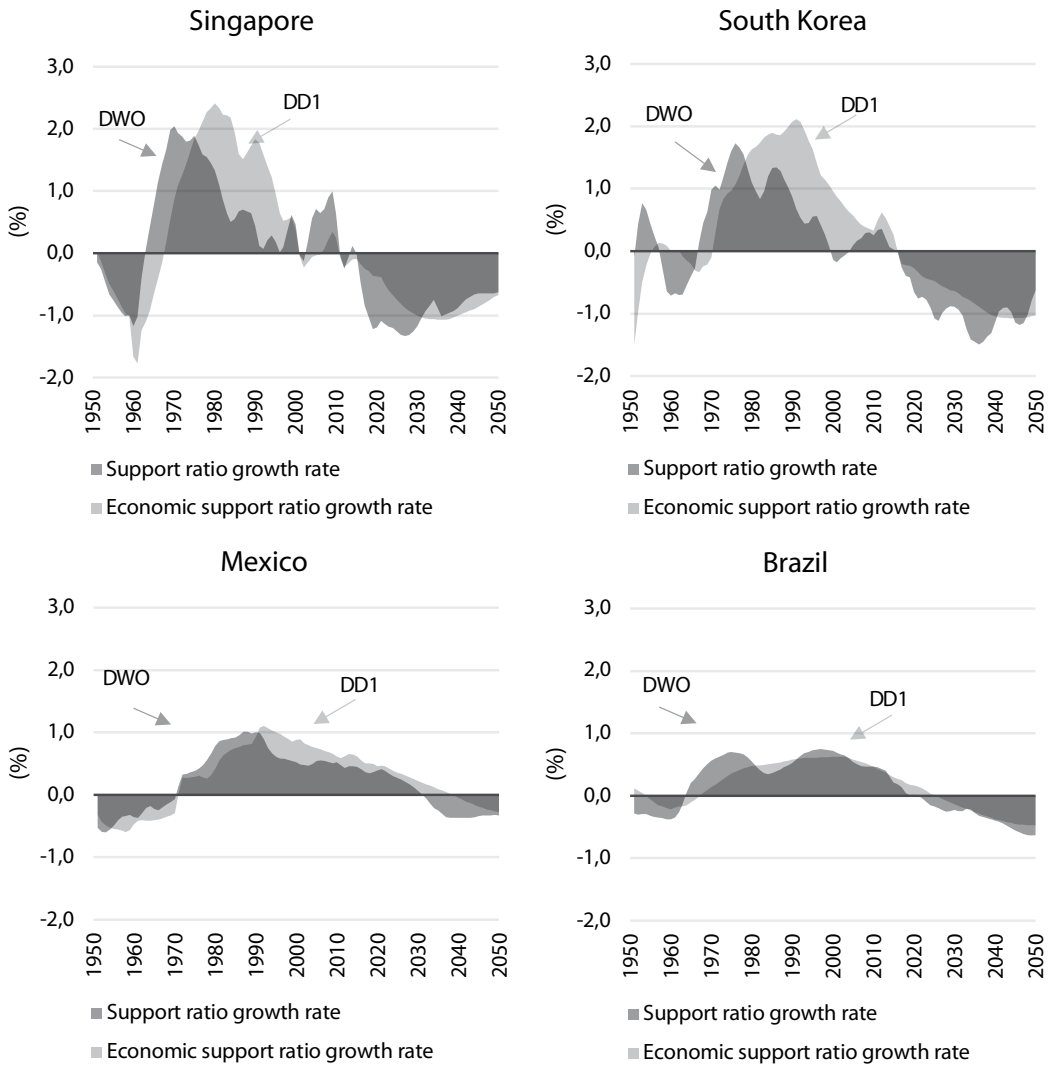
The configuration of the DWO compared to the DD for the selected European countries exhibits the same trends, except for Ireland. As in the Asian tigers, the Celtic tiger's DD is more pronounced than the DWO, but what is specific to Ireland is that its DWO and DD1 periods occur concurrently. It seems that the dynamics of the economic support ratio responded well to the demographic dynamics, with good harnessing of the beneficial period of the DWO in this country (Fig. 4).

For Slovakia, Moldova, and Georgia, the comparison of the DD and the DWO presents the same pattern as for the other countries: the magnitude of the DD1 will depend on the magnitude of the DWO, and the DD1 will occur sometime later after the demographic window opens. In these countries, the beneficial period, with its fluctuating cohort flows, led to more than one DWO (Fig. 4). The magnitude of the beneficial period in Brazil and Mexico was much smaller than in Ireland, Singapore, or South Korea. Notably, in Georgia and Moldova, the first demographic dividend (DD1) is smaller even relative to the demographic window of opportunity (DWO), indicating that the potential benefits of the window were harnessed to a limited extent. Thus, comparing the SR and the ESR demonstrates their utility for analysing the DD. Except for Ireland, the DD1 occurs after the DWO in all the selected countries, showing the challenges for market and institutional adaptation to harness the beneficial period. Further, the ESR dynamics observed in Singapore, South Korea, and Ireland suggest a well-adapted response to demographic changes, marked by a high level of attainment of DD1. In contrast to these countries, Moldova, Georgia, and Slovakia present a small demographic dividend, which is determined not only by the smaller magnitude of the DWO but also by the lower growth rate of the ESR compared with the magnitude of the DWO.

The demographic dividends and demographic window of opportunity in selected countries

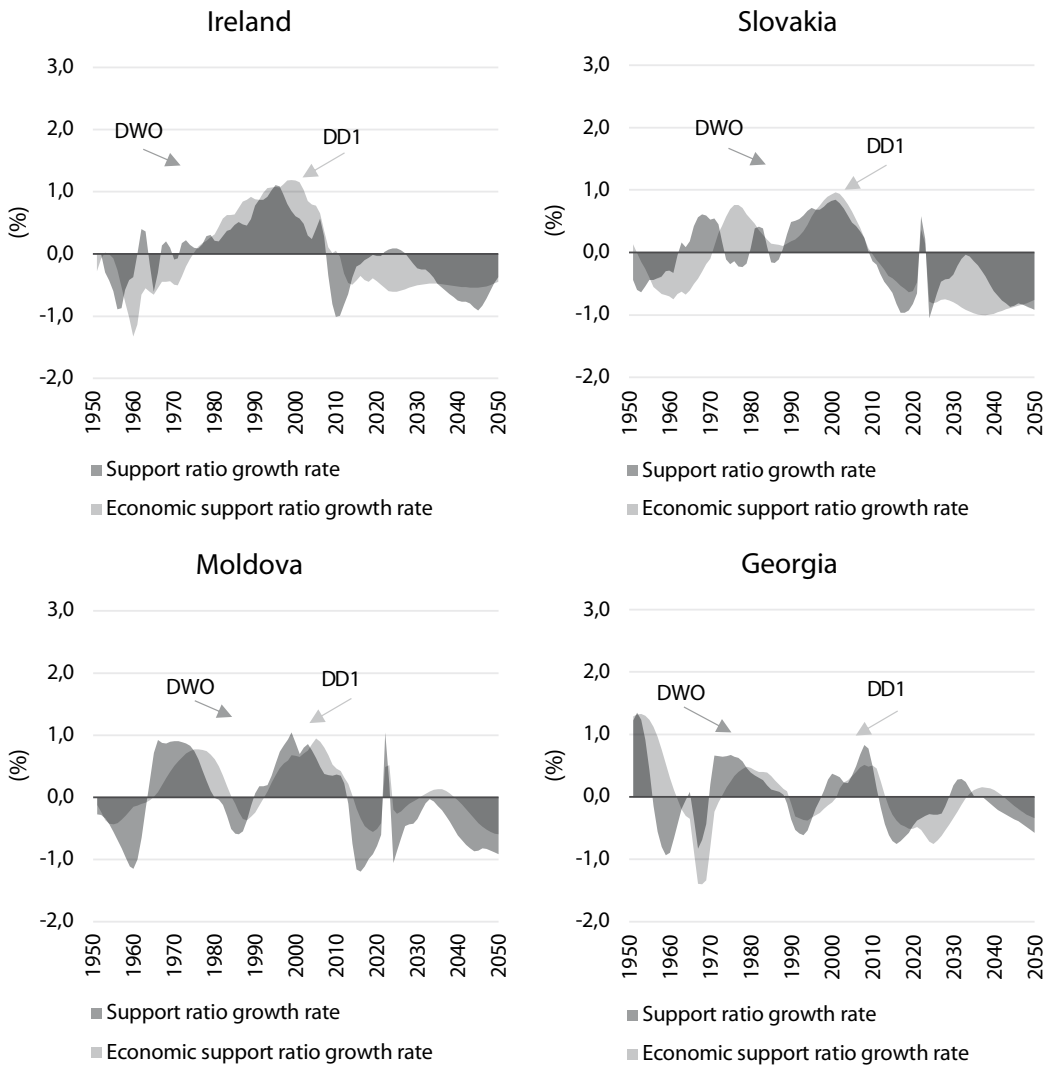
This study compares the DWO period with the dynamics of both DD1 and DD2, as well as with the combined

Figure 3 **Growth rates of the demographic and economic support ratios – selected East Asian and Latin American countries**



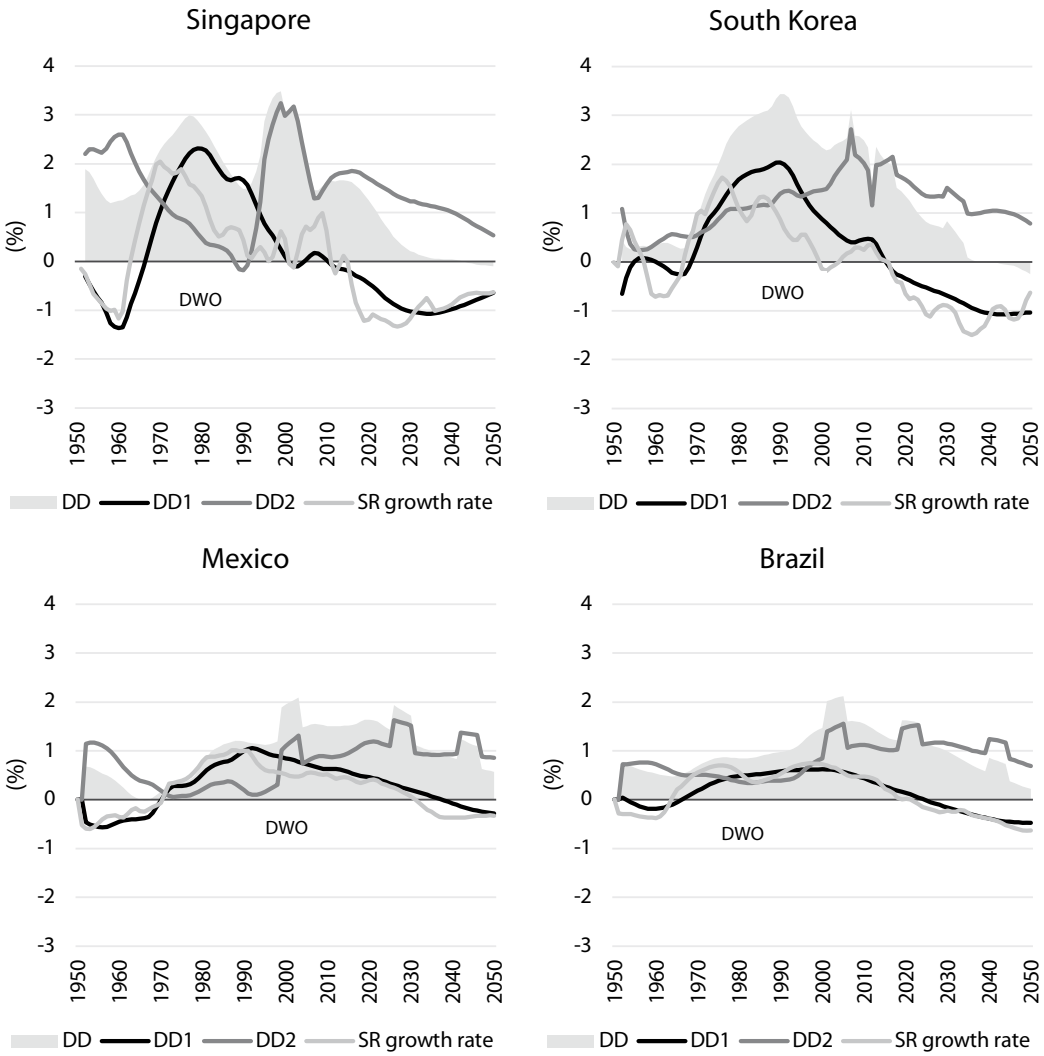
Source: *World Population Prospects (2022) of the UN DESA and NTA Network (2022), NTA Indicators, accessed 15.08.2024, www.ntaccounts.org; author's calculations.*

Figure 4 **Growth rates of the demographic and economic support ratios – selected European countries**



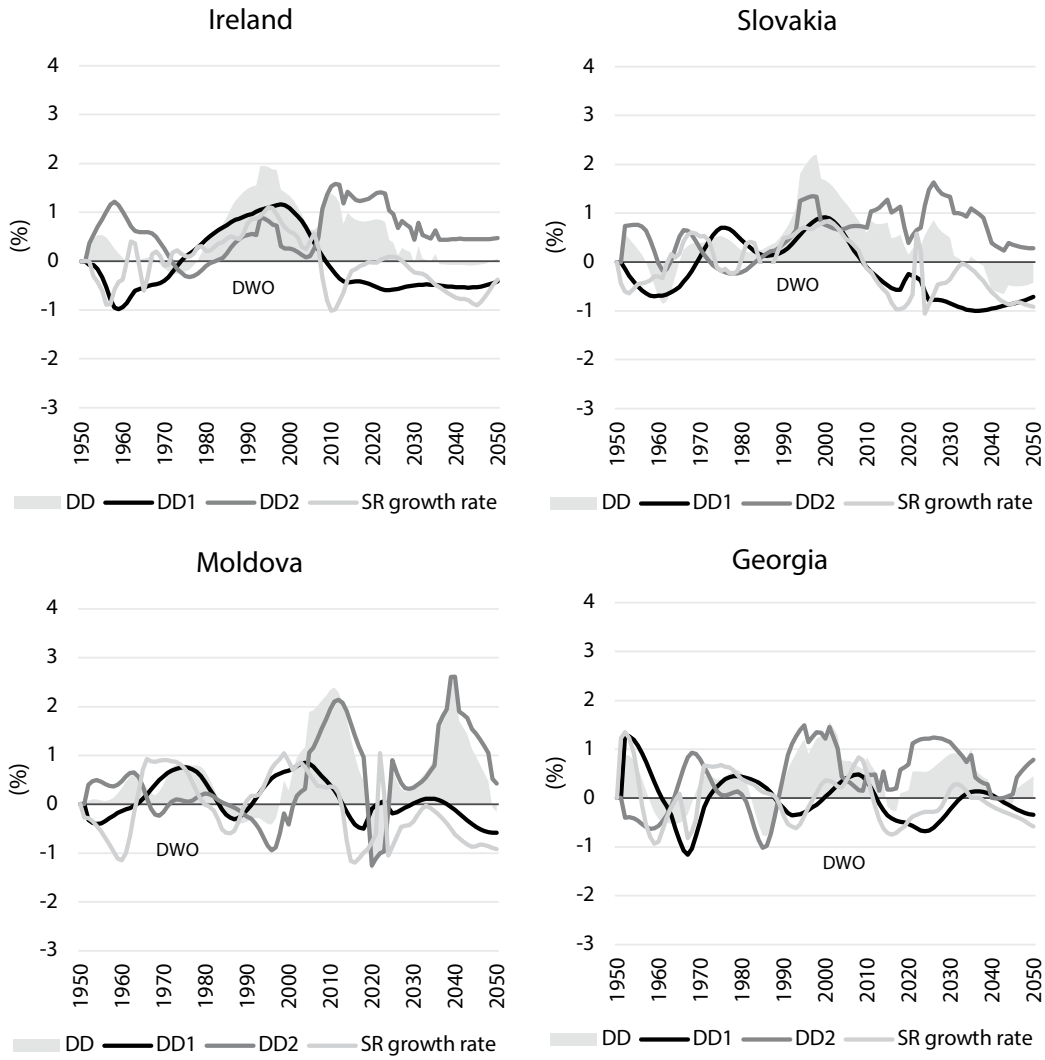
Source: *World Population Prospects (2022) of the UN DESA and NTA Network (2022), NTA Indicators, accessed 15.08.2024, www.ntaccounts.org; author's calculations.*

Figure 5 **The combined demographic dividend (DD), the first and second demographic dividends (DD1 and DD2), and the support ratio (SR) growth rate – selected East Asian and Latin American countries, 1950–2050 (%)**



Source: *World Population Prospects (2022) of the UN DESA (author's calculations) and the NTA Network (2022) (NTA Indicators accessed on 15.08.2024, www.ntaccounts.org).*

Figure 6 **The combined demographic dividend (DD), the first and second demographic dividends (DD1 and DD2), and the support ratio (SR) growth rate – selected European countries, 1950–2050 (%)**



Source: *World Population Prospects (2022) of the UN DESA (author's calculations) and the NTA Network (2022) (NTA Indicators accessed on 15.08.2024, www.ntaccounts.org).*

demographic dividend (DD1 plus DD2) (Figs. 5 and 6). The overall DD is more than the compositional effect of the increase in the participation rate (DD1), but is also the result of the effect of an increase in productivity (DD2). The second demographic dividend (DD2) is not directly related to age-structure dynamics, and that is why the particular aim here is to observe this productivity effect during the DWO period.

As can be observed, the magnitude of the overall demographic dividend (DD) varied considerably between the selected countries. These differences also result from the level of the DD2 (Figs. 5 and 6). Therefore, as well as the specific configuration of the DWO in selected countries, the extent to which the DWO is harnessed and the level of DD attained will depend on the level of the productivity effect (i.e. the second demographic dividend) during this period. In the countries that, during the DWO, obtained a higher level of DD (Singapore, South Korea, Brazil, Ireland, and Slovakia), the productivity effect has also been important. Similarly, in the countries that had a negative or insignificant productivity effect (Moldova, Georgia, Mexico, Brazil), the overall DD was much smaller compared with the magnitude of the DWO, and, as such, the DD was not fully realised.

It is also possible to observe a continuation of the DD resulting from the high level of the DD2 for each of the selected countries after the DWO is closed. This high productivity effect offsets the negative effect of the age structure after the period of the DWO for the selected countries (Figs. 5 and 6). The factors determining these productivity effects may vary significantly across countries, depending on their economic structure, levels of human capital, migration patterns, remittances and other context-specific variables. What remains essential for the analysis, however, is that the second demographic dividend constitutes an important component in assessing the overall demographic dividend during the DWO period.

DISCUSSION

In contrast to the mainstream literature, this study proposes an analytical framework that demonstrates that the demographic window of opportunity (DWO) and the demographic dividend (DD) do not necessarily align in timing or magnitude, thereby reinforcing the conceptual distinction between the two (*James,* 2018; *Şoldan,* 2023a). In this empirical analysis of the DD and the DWO, the DWO tends to emerge earlier than the DD, suggesting that institutions, labour markets, and broader systems must adjust to the evolving age structure in order for the DD to be achieved.

The comparison between the DWO and the DD provides additional insight into our understanding of the factors that determine the differences in the level of the DD achieved across countries. While it is often suggested that countries perform differently in terms of the DD attained because of the policies they implement, the findings here indicate that the configuration of the DWO and the specific patterns of age-structure dynamics also play a central role. Once the DWO opens, its duration and magnitude directly influence the size and timing of the DD1, as the analytical framework used in this analysis demonstrates. This further supports the integration of demographic indicators, such as the demographic support ratio, alongside the NTA approach in DD assessments.

The level of the DD2 – understood as the productivity-related component of the demographic dividend – proves to be a key explanatory factor for the differing degrees of DD realised during the DWO period in the selected countries. The effect of the DD2 can be quite substantial, as evidenced by the selected countries. It thus confirms the above statement that the demographic dividend is more than just an effect of increased labour force participation. How countries respond to the need to increase productivity will influence the extent to which the favourable period of the demographic window of opportunity (DWO) can be used to offset the negative effects of age structure dynamics that follow.

It should be noted that assessing the DWO and the DD is not just a methodological or conceptual concern. It is a practical matter with implications for the state and its ability to understand, anticipate, and respond to demographic change. Whether states take (full) advantage of the demographically favourable period depends on whether they are able to respond to demographic change with the necessary policies and programmes – this is the core idea of the demographic dividend and its non-deterministic nature.

Estimating the DWO remains relatively straightforward because of its inherently demographic nature. One of the advantages of demographic phenomena is their considerable predictability, even over long periods. By contrast, economic forecasts tend to be less precise, especially in the case of long-term projections. Many factors influence the course of economic development, making it more difficult to predict. Irrespective of the method used to assess the DD, whether it is the National Transfer Accounts (NTA) method or some other approach, such estimates are quite hypothetical and will vary according to the method chosen. When examining fluctuations in the age structure and, in particular, the phenomenon known as the DWO, these assessments can serve as preliminary tools for decision-making at the government level.

CONCLUSIONS

This study offers a comparative analysis of the demographic dividend (DD) and the demographic window of opportunity (DWO) across selected countries. The estimation of DD using the National Transfer Accounts (NTA) methodology was complemented by a demographic approach that identifies the DWO, enabling a more integrated assessment. The empirical findings confirm that DD and DWO are distinct phenomena, each following its own trajectory.

DD have inherent policy implications. Achieving the demographic dividend requires that governments respond to the demographically favourable period with development policies – covering areas such as health, education, and labour market adjustments (*Bloom et al.,* 2003). The distinction is important: referring to the 'demographic dividend' (i.e. economic growth acceleration resulting from a favourable demographic phase) as the 'demographic window of opportunity' (i.e. the period itself) risks obscuring the need for such targeted adjustments and policy design.

Representing the DD and the DWO within the proposed integrated framework makes it possible to capture additional tendencies for future policy insights. (i) The favourable period of the demographic window of opportunity (DWO) typically precedes the realisation of the first demographic dividend (DD1), as time is required for labour market adjustments. Anticipating such age-specific dynamics can help policymakers mitigate this delay. In a wider perspective, the introduction of the DWO analysis aims to underline the strategic relevance of age-specific population dynamics in development planning for achieving the DD. (ii) Cross-country differences between the magnitude of the DWO and the level of the DD are shaped by each country's specific conditions during the DWO period. While some contexts are supportive, others may not be. This entails further policy research and a policy design that enables a supportive environment. Further, (iii) the proposed method of integrating the demographic window of opportunity (DWO) into analysis of the demographic dividend (DD) enables a more nuanced understanding of cross-country differences observed within the NTA framework. These differences are not solely the result of economic or institutional factors but also reflect the specific dynamics of age structures – an aspect often overlooked when the focus is exclusively on DD estimations. The study shows that countries that achieve a significant demographic dividend typically experience a pronounced DWO, and, conversely, limited demographic dividends are often associated with weaker demographic windows. While the magnitude of the DWO is not a policy-driven factor, the role of the DWO in shaping the demographic dividend suggests that age structure dynamics specifically should be taken into account in developmental discourse and comparative analyses to support more balanced and realistic policy expectations regarding the demographic dividend.

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SUMMARY

This study examines the demographic dividend (DD) and the demographic window of opportunity (DWO) as interconnected yet distinct phenomena. Often treated as synonymous in the mainstream literature, this analysis draws attention to their distinctiveness, as the temporal and magnitude dynamics of each one differ. The research drew evidence from eight countries: Singapore, South Korea, Brazil, Mexico, Ireland, Slovakia, Moldova, and Georgia. The comparative evidence presents the differences between the DWO and the DD, which are manifested to varying degrees in the selected countries. The evidence for the selected countries shows that the DWO often precedes the DD, suggesting that for the economic benefit to occur, markets and institutions first need time to adapt.

The study follows the trends of the demographic dividend as calculated using the NTA approach. Two demographic dividends are distinguished: the DD1 and the DD2. Unlike the DD1, which is largely determined by the dynamics of the working-age population, the DD2 is indirectly linked to the dynamics of the age structure. The second demographic dividend (DD2) can significantly contribute to the total demographic dividend during the demographic window of opportunity and in the period that follows, due to its foundation in productivity gains. This study sought to present a revised analytical framework for the demographic dividend and the demographic window of opportunity, employing, along with the NTA approach to the assessment of the demographic dividend, a demographic approach to assessing population age-structure dynamics. The revised framework incorporates, along with the economic support ratio, the demographic support ratio for the assessment of the two phenomena.

The article contributes to the debate on the topic by refining the conceptual distinction between the DWO and the DD and demonstrating the importance of demographic timing in policy planning. The proposed analytical framework provides a replicable model for assessing population dynamics in the context of the demographic dividend.