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Socioeconomic Impact of Demographic Change: Do Dividends Exist and are they Gendered?

Abstract: The research aims to determine the presence of demographic dividends and analyze their gender-specific characteristics. For this purpose, the influence of the total working-age population and the working-age population disaggregated by gender on the socioeconomic outcomes of countries categorized into early-demographic, late-demographic, pre-demographic, and post-demographic transition groups is investigated. The results demonstrated the presence of demographic dividends in both early and late-demographic transition countries. This phenomenon can be attributed to the male working-age population in the case of early-demographic transition countries, whereas for late-demographic transition countries, both genders contribute to this realization. Moreover, the analysis indicated that inflation, globalization, and financial development positively impact socioeconomic performance, whereas trade openness and corruption are associated with a decline in socioeconomic performance. The study highlights the underutilization of the female working population, emphasizing that without their active participation, the dividends of economic participation may either remain unrealized or, if achieved, may not be sustained.

Keywords: Socioeconomic Performance, Demographic change, Inflation, Trade openness, Globalization, Institutional Quality, Financial Development

Introduction

The demographic transition refers to a phenomenon depicting changes in the age structure of the world's population across time. The principle of demographic transition explains variations in the birth and death rates, as well as population growth rates (Grover 2014). Vishnevsky (1973) played a pivotal role in advancing the theory of demographic transition in his famous demographic transition model (DTM). In 1982, he formulated a four-phase model of demographic transition that has gained widespread adoption across the world. Fundamentally, the demographic transition entails a progression through a minimum of four distinct phases, where countries shift from experiencing high fertility and low life

expectancy to attaining reduced fertility and extended life expectancy. This transformation involves a transition from a significant percentage of children and a limited elderly population to a scenario marked by a diminished proportion of children and a larger elderly share in the population.

The initial transition phase is characterized by a relatively youthful population and steady but moderate population growth; both fertility and mortality rates are high. The pace of population expansion gains momentum, resulting in a high count of children and increased reliance on the younger demographic if mortality rates decrease while fertility rates remain elevated, as observed in the second phase. As the third phase unfolds, population growth persists, accompanied by a reduction in fertility rates. Over an extended period marked by declining fertility, the growth rate of the working-age population decelerates, and the ratio of elderly dependents to working age population begins to rise. The fourth and final stage of the demographic transition materializes with population growth stabilizing at a sluggish pace, driven by diminished fertility and mortality rates.

With a drop in death rates, the global demographic shift started in the eighteenth century in regions of the world that are at present economically developed. This demographic shift holds great significance for a nation's economic performance, particularly in the third phase of the transition, which is recognized as the period that gives rise to the 'demographic dividend' concept." As stated by Bloom et al. (2003), the demographic transition, marked by a decrease in fertility rates, gives rise to a "demographic dividend" due to the accelerated growth of the working-age population compared to the overall population. Similarly, the increase in life expectancy, contributing to improved and extended lives, played a significant role in population aging, thus forming the foundation for generating the demographic dividend.

The term demographic dividend describes the economic growth brought on by a considerable rise in the number of competent workers aged 15–64. It is the phase of economic life where people are living longer and having fewer children. According to Sathar et al. (2013), a demographic dividend creates a temporary window of opportunity for economic progress with a growing skilled young population that fills the workforce and a decreasing proportion of population that is dependent on it. While the demographic dividend is often seen as a potential avenue to accelerate economic development, its realization is not assured and remains subject to uncertainty. Its capitalization hinges on seizing opportunities and implementing effective strategies.

The concepts of the demographic window, demographic bonus, and demographic dividend are interconnected and pertain to the potential economic growth arising from shifts in a country's age structure. The demographic window denotes a period conducive to swift economic growth, characterized by a working-age population surpassing the dependent population. This window typically spans 30–40 years, contingent on the country, and is closely linked to a decline in fertility rates. The demographic dividend represents the accelerated economic growth resulting from this alteration in age distribution, particularly attributable to the heightened productivity of the working-age populace. It comprises two periods: the initial period, lasting five decades or more, and the subsequent period commencing as the first one concludes. The demographic bonus, also identified as the demographic dividend, embodies the potential advantage of this period. However, it

remains merely a potential advantage if the requisite social and economic policies are not in place to harness it effectively (Crombach and Smits 2022; Bloom et al. 2003).

Demographic change and economic development are mutually reinforcing. Under appropriate institutional circumstances, an aging population structure could have benefits, such as a demographic dividend (Cai 2010). Demographic change has an impact on key development indicators such as per capita income, savings, human capital, and employment. Changes in the population's age structure also alter the ratio of prospective workers to potential consumers, which has direct consequences for per capita growth, savings, and poverty (Bloom 2003). Nonetheless, the demographic dividends do not materialize automatically, according to Bloom et al. (2003); rather, it requires a supportive policy environment that may help to translate the impact of demographic change into labor market performance like an increase in employment, and trade, savings, and human and physical capital accumulation and overall economic growth.

The main ways that population change may impact economic growth, especially production per capita, are outlined by Eastwood and Lipton (2011). The weakening of natural capital (i.e., the stock of natural capital declines over time as the number of workers increases), rising returns to the population via productivity gains and scale economies as a result of higher population density, the dilution of reproducible capital (i.e., the failure of investment to keep up with labor force growth), and age structure effects are some of these channels.

The objectives of the study and its contribution to the literature are multifaceted To begin with, the majority of research regarding the demographic dividend has primarily concentrated on exploring how population composition influences economic growth. This study introduces a novel dimension by investigating how the working-age population affects a comprehensive range of variables that illustrate a country's socioeconomic performance. For this purpose variables depicting socioeconomic performance are accounted for, i.e. income per capita, human capital, employment, and investment. Secondly, it delves into the influence of the working-age population on the socioeconomic performance of countries across various stages of demographic transition, as classified by the World Bank into four categories: early-demographic, late-demographic, post-demographic, and pre-demographic transition countries (Ahmed et al. 2016). If the total fertility rate (TFR) was below replacement in 1985, countries are likely to be advanced in their demographic transition, having already experienced the first demographic dividend. Such countries are classified as post-dividend nations. Conversely, if the TFR in 1985 was at or above replacement levels, it suggests a more recent entry into the final phase of demographic transition. These countries may still be benefiting from the first demographic dividend, if they were able to realize it, but they are approaching the end of that demographic window. Such nations are classified as late-dividend countries.

The second category comprises nations where the proportions of the working-age population are anticipated to increase until 2030, and where the potential timeframe for the initial demographic dividend has either recently occurred or is expected in the future. If the TFR < 4 births per woman, it is likely that the country is progressing through the demographic transition model, leading to rapid declines in the population share of its youth. These nations fall into the early-dividend category. Conversely, if current TFR $\geqslant 4$ births

per woman or higher, it suggests that countries are still in the midst of the demographic transition and have yet to encounter the reduced child population share associated with the first demographic dividend. These countries are classified as pre-dividend. The threshold of four births per woman serves as a cut-off point, approximately twice the replacement level, making it improbable that fertility rates in these countries would fall below replacement level by 2030.

This study addresses the fundamental question of whether or not these dividends existed for these groups of countries. Additionally, this research offers an analysis from a gender perspective, examining the impact of both the male and female working-age populations on socioeconomic performance. Conducting a gender-based analysis is crucial for identifying segments of the population whose potential contributions to socioeconomic performance remain untapped. This analysis also serves as the foundation for formulating labor market policies that are tailored to the specific needs of different gender groups.

The remainder of the study is as follows. Section 2 contains a literature review. Methodology and Data are presented in section 3. Section 4 discusses the results and section 5 concludes.

Literature Review

For decades, researchers have been interested in examining the link between population shifts and the economy. The neoclassical growth theory (Solow 1956), which was based on Western economies' experiences, claimed that the only way to ensure continuous economic growth was to increase the contributive share of total factor productivity (TFP) in the economy. As some major economies reached their Lewis turning points, the newly entered stage of demographic transition rendered their economic growth no longer reliant on the traditional demographic dividend, and those economies shifted their economic growth pattern from capital and labor-driven to TFP-driven. While mainstream growth theory incorporated population into endogenous growth, it frequently overlooked the peculiarities of dual economy demographic transition. In the time between a decrease in the mortality rate and a subsequent decrease in the birth rate, the population's natural growth rate was normally on the increase. After a given amount of time, as fertility declined and the baby boomers reached retirement age, the proportion of working-age people increased. According to neoclassical growth theory, the link between economic growth rate and population was not simply linear, but rather complicated nonlinear. That was, when the total fertility rate fell, the economic growth rate rose at first, then fell.

The relationship between socioeconomic progress and population change has been widely assessed. According to Hondroyiannis and Papapetrou (2000), demographic change harms socioeconomic performance in the post-demographic transition group because an increase in the dependency ratio of the elderly and a drop in the fertility rate raised the amount of public debt and total spending while lowering total tax revenues. Davis and Li (2003) estimated the direct time-series connection between returns on stock and demographic factors in 7 OECD countries over the past 50 years. The results found a significant impact of panel, US, and international demographics on real stock prices and

real bond yields. They discovered that their projections accurately estimate profitability and returns for industries such as retail, manufacturing, and oil and gas over the next 5–10 years. Ang and Maddaloni (2003) looked at the association between excess stock returns and three demographic variables: the population's average age, the proportion of adults over 65, and the percentage of persons aged 20 to 64. Their results from Overlapping Generations models predict that changes in age distributions of the population do alter the relative pricing of financial assets and that demographic changes predict future excess returns in international data, but it was found to be very weak in for the US. Moreover, it was found that on average, faster growth in the fraction of retired persons significantly decreases risk premiums. Their life-cycle risk aversion hypothesis received a lot of support. Kurek (2011), believed that the demographic changes that initiated in Poland during the 1980s and intensified in the early stages of the socio-economic transition is associated with the concept of the Second Demographic Transition. It has very distinct spatial characteristics and influences the country in multitude of ways.

McKibbin (2006) has taken five different age groups to measure their effect on socioeconomic performance. With every age group, its effect has been changing on socioeconomic factors. It was found that in advanced countries, population aging will have a negative impact on per capita growth rates in the future, while in developing countries high working-age population could lead to stronger per capita growth provided the additional labor resources are effectively utilized. Moreover, it was concluded that a demographic shift can result in significant changes in saving, investment, and current account balances over the next 80 years. Asongu (2013) analyzed the links between population growth and a variety of investment patterns, including public, private, international, and domestic investments, from a long-term viewpoint using asymmetric panels from 38 nations with data covering 1977 to 2007. A long-run positive causal relationship between population growth and only public investment is discovered. Romero (2013) utilized a computed general equilibrium model to show that Taiwan's demographic shift might account for 22% of the per capita GDP increase between 1965 and 2005. Self (2015) study backed up the theory that increased female representation had a statistically significant role in explaining emerging economies' rising savings rates. The population's aging was also found to have a considerable negative influence on savings. The influence of the aging population (while not robust when considering dynamic analysis) on economic development in these countries was substantially bigger than was the gender makeup of the workforce.

Audi and Ali (2017) examined the influence of socioeconomic and demographic changes on total labor productivity in Pakistan from 1980 to 2013. Log of Labor productivity was negatively impacted by the human development index, dependency ratio, foreign direct investment, and globalization. Arnott and Chaves (2012) found a significant and clear association between demographic shifts and both socioeconomic growth and capital market returns.

Mason and Lee (2016) demonstrated that altering the age structure may benefit society for two reasons: a lower dependency ratio implies more resources can be invested in the economy, and increased longevity influences population saving behavior. As the number of children per adult decreased, the country's and household's per capita income rose. According to Eastwood and Lipton's (2000) research, lowering fertility was not just pro-

growth, but also pro-poor. Differences in demographic country types caused significant spillovers between nations contributing to shifts in comparative advantage that underlie trade and labor and capital returns. This also encourages labor-intensive production to transfer from aging societies to younger societies, or migration from nations with expanding working-age populations to those with declining populations.

A concise review of the existing literature reveals a focus on limited countries or a narrow selection of economic performance indicators within this domain. Additionally, studies investigating the gender dimension of demographic dividends are quite sparse. This study aims to contribute novel insights to the current body of literature by adopting a comprehensive approach. It examines a diverse set of countries, and a wide range of variables portraying socioeconomic performance, and takes into account gender perspectives. Consequently, this study is anticipated to provide fresh perspectives and enrich the existing discourse.

Methodology and Data

Model Specification

The main ways that population change may impact economic growth are outlined by Eastwood and Lipton (2011). While Eastwood and Lipton (2011) provided a thorough theoretical explication of this channel, it may be summed up as follows. Think of an economy's production as Y, its population as N, and its working-age population as WA. The growth rate of variables is indicated by the symbol g.

$$g(Y/N) = g(Y/WA) + g(WA/N) \tag{1}$$

Equation 1 shows that if the percentage of the working-age population increases by one point, the growth rate of per capita output will also increase by one percentage point. The arithmetic age-structure dividend is the term used to describe this connection. The age-structure hypothesis then goes on to argue that any change in demographic structure is mediated by the working age share, with the size of this influence potentially being bigger (or lower) than the arithmetic dividend. This is known as the strong form of the age-structure hypothesis.

Consequently, the model constructed in this paper focuses on the impact of demographic change on income and other variables like employment, and human and physical capital accumulation. The variables depict the performance of the socio-economic side of the economy and hence are referred to as socio-economic performance. The general form of the model is given as follows:

$$SEP_{it} = f(DC_{it}) + X_{it} + \mu_{it} \tag{2}$$

Equation 2 depicts that socio-economic performance is the function of demographic change and control variables. Where SEP_{it} depicts socio-economic performance, DC_{it} is demographic change and X_{it} is the vector of control variables. The empirical form of the model is given as follows:

$$SEP_{it} = \alpha_{it} + \beta_o DC_{it} + \beta_1 FD_{it} + \beta_2 IQ_{it} + \beta_3 TO_{it} + \beta_4 INF_{it} + \mu_{it} \quad (3)$$

Our study used four indicators human capital, investment, employment, and income per capita to measure socioeconomic performance in the form of an index constructed by principal component analysis (PCA). According to a report by ILO by Harasty and Ostermeier (2020), the working-age population ranges from 15 to 64 which is taken as an indicator of demographic change. A variant of the model presented in equation 3 is regressed with male and female working age population as is symbolically represented as

$$SEP_{it} = \alpha_{it} + \beta_0 DCg_{it} + \beta_1 FD_{it} + \beta_2 IQ_{it} + \beta_3 TO_{it} + \beta_4 INF_{it} + \beta_5 GL_{it} + \mu_{it} \quad (4)$$

$$DCg = \begin{bmatrix} Male\ Working\ Age\ Population \\ Female\ Working\ Age\ Population \end{bmatrix}$$

SEP = Socioeconomic Performance (measured by Income per capita, Investment, Employment, and Human Capital)
DC = Demographic Change (depicted by working age population)
DCg = Demographic change (depicted by working age population of males and females)
TO = Trade openness
GL = Globalization (social and political globalization)
FD = Financial development
INF = Inflation
IQ = Institutional Quality measured by corruption index
μ = Error Term

Theoretical Justification of the Variables

The control variables included in the model have strong theoretical justification. Trade openness improves efficiency, promotes resource reallocation, and increases the level of competition among domestic manufacturers (Felbermayr et al. 2011). Socio-economic performance in free-trade economies is higher than those in protectionism- and restricted-trade nations, which increases employment (Onifade et al. 2020).

A rise in inflation expectations, following Mundell's (1963) model, immediately reduces people's wealth. This operates under the assumption that people's real money balances have decreased their rate of return. To build the desired wealth, people save more by investing in assets, which raises their prices and lowers the real interest rate. More savings leads to quicker capital accumulation and improved socioeconomic performance. The financial sector is considered to play a significant role in maintaining long-term growth, which also has an impact on investment choices, savings rates, and technological advancement (Levine 2005). Through banks or stock markets, financial development stimulates socioeconomic growth by gathering and pooling funds and distributing resources to sectors that are anticipated to have a favorable socioeconomic impact (Beck and Levine 2004).

Institutions' quality influences the social incentive structure, which may promote or restrain socioeconomic activity. According to North (1990), high-quality institutions may

support an incentive structure that increases socioeconomic performance by increasing efficiency and minimizing uncertainty while institutional quality deteriorates by the presence of corruption and illicit activities that hinder socioeconomic performance. Similarly, Hall and Jones (1999) argued that a nation's total productivity of its means of production is influenced by the quality of its institutions.

Variable Description and Data Sources

The data is collected for 150 developing and developed countries on an annual basis and from 1980 to 2020. Table 1 shows different indicators used to construct dependent variables and data sources.

Table 1

Dependent Variables and Data Sources

Variables	Indicators	Data Sources
Employment	Number of persons engaged as a percentage of the total Population	PWT (10.0)
Human Capital	Human capital index	PWT (10.0)
Income Per Capita	GDP per capita growth (annual %)	WDI (2020)
Investment	Gross fixed capital formation (% of GDP)	WDI (2020)
SEP	Socio-economic Performance is constructed by applying principal component analysis on four variables mentioned above	Authors' constructed index using PCA

Information on how independent and control variables are constructed is provided in Table 2. The variables' construction as well as the proxies used for them has been provided. For each variable in the table, the data sources and predicted relationship with dependent variables are also listed.

Table 2

Independent and Control Variables and Data Sources

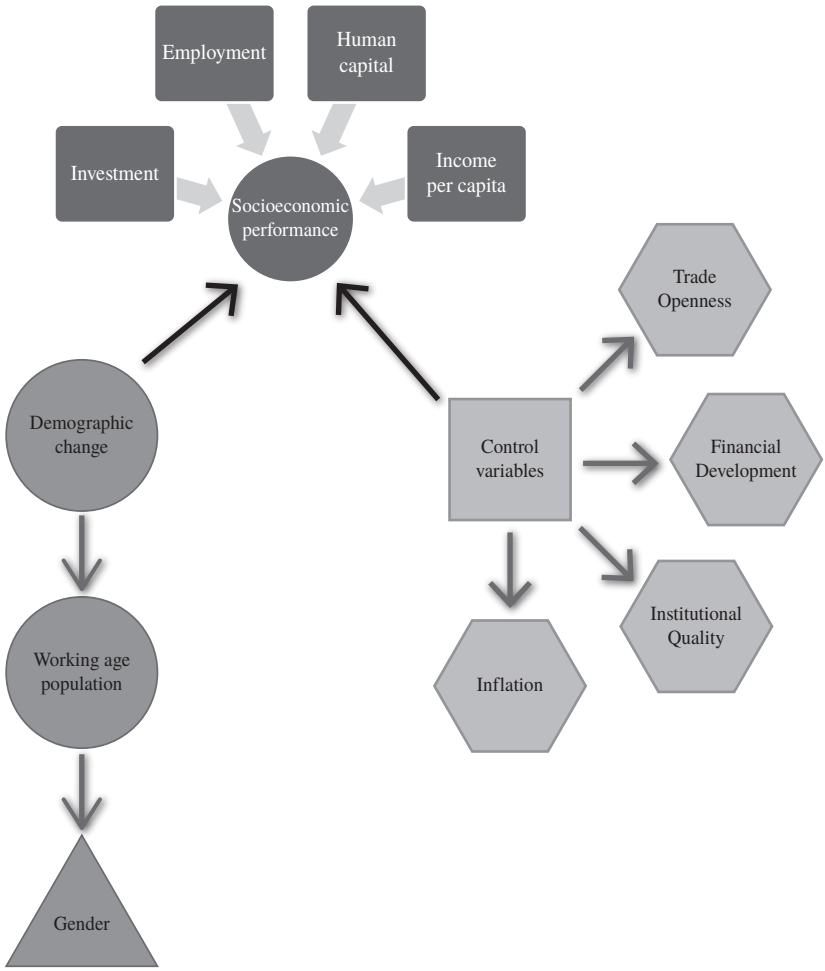
Variables	Indicators and construction	Sources	Expected Signs
Demographic change	Working age population (% of total population)	WDI (2020)	+/–
Trade Openness	Trade (% of GDP)	WDI (2020)	–
Financial Development	An index of financial development has been used which includes measures of depth, access, efficiency and stability of the financial system.	Global Financial Development Database	+
Institutional Quality	Corruption index rangig from 0 to 6 where 6 denotes high corruption	ICRG (2020)	+/–
Inflation	Inflation, consumer prices (annual %)	WDI (2020)	+/–
Globalization	KOF index (excluding economic globalization)	KOF (2020)	+

Estimation Technique

The most significant stage to get credible study results is choosing a suitable estimating strategy. This study has used fixed and random effects to analyze the impact of demographic change on socioeconomic performance. The Hausman specification test is a technique that includes contrasting two distinct estimators for a panel data regression model's parameters. In particular, it is well known that under the assumption that the model is correctly specified and that (among other things) the regressors are independent of the "individual-specific effects" (the "random effects" assumption), both the "random effects" and the "fixed effects" panel estimators are consistent. The random effects estimator is likewise asymptotically effective in this situation. Thus, there won't be much of a difference between the fixed effects and random effects estimators. The fixed effects

Figure 1

Conceptual Framework



estimator, on the other hand, continues to be consistent even if the random effects assumption is violated but the model is still correctly defined. Therefore, there may be a significant discrepancy between the fixed effects and random effects estimators. Thus, the validity of the random effects assumption may be determined by contrasting the random and fixed effects estimators. Using robust standard errors, which are more "robust" to the problem of heteroskedasticity and generally tend to offer a more accurate assessment of the real standard error of a regression coefficient, is one technique to deal with this issue. The probability value of F-statistics depicts the overall significance of the model. According to the fixed effect hypothesis, the effects that are specific to each individual are tied to the independent factors. Based on the results of the Hausman test fixed effect model is used for all estimation specifications in this study. In all specifications heteroscedasticity and autocorrelated corrected standard errors are reported. The conceptual framework of the model is presented in Figure 1.

Results and Discussion

The section contains the result of equation 3 and equation 4.

Total Working Age Population and Socioeconomic Performance

Table 3 reports the effect of the total working-age population on socio-economic performance in early, late, pre-, and post-demographic transition countries.

In all demographic groups, results show there exists a positive relationship between socioeconomic performance and the total working-age population, the highest relationship has been shown in the early demographic and the lowest in post demographic transition countries, because in the case of the early, first demographic phase has been passed and the fertility rate is lower than 4 children per women but in the case on post demographic, first demographic has been passed and not sure about next demographic in future. In the early demographic transition countries with 1% increase in the working-age population there will be 0.977% increase in socioeconomic performance and it is significant at 1%. For the late demographic transition countries, with 1% increase in the working-age population there will be 0.815% increase in socioeconomic performance and it is significant at 1%. For pre-demographic transition countries, with 1% increase in the working-age population, there will be 0.543% increase in socioeconomic performance and it is insignificant. For post demographic transition, with 1% increase in working age population, there will be 0.21% increase in socioeconomic performance and it is not significant.

Several recent studies indicate that older populations are linked to higher per capita income, and the rise in population aging correlates with an increase in per capita income growth (Acemoglu and Restrepo 2017; Eggertsson, Lancastre, and Summers 2019; Bloom et al. 2021 highlight that lower fertility and higher life expectancy contribute to increased growth). As population aging often involves a decrease in the proportion of the population in working ages, this trend would typically result in a negative coefficient for post-transitional societies. The observed low and statistically insignificant coefficient

Table 3

Socioeconomic Performance and Demographic Change (15–64)

Variables	Early Demographic Transition Countries	Late Demographic Transition Countries	Pre Demographic Transition Countries	Post Demographic Transition Countries
Demographic Change (DC)	0.977*** (0.264)	0.815*** (0.241)	0.543 (0.563)	0.21 (0.302)
Inflation (INF)	0.002*** (0.0004)	0.002*** (0.0003)	–0.00005 (0.0001)	–0.0002 (0.0002)
Globalization (GB)	0.01*** (0.003)	0.009*** (0.002)	0.012*** (0.003)	0.017*** (0.002)
Trade Openness (TO)	–0.96*** (0.03)	–0.05 (0.036)	–0.065 (0.043)	–0.115* (0.062)
Financial Development (FD)	0.001* (0.001)	0.0004 (0.0002)	0.011*** (0.002)	0.002*** (0.0002)
Institutional Quality (IQ)	–0.001 (0.002)	–0.003* (0.001)	–0.007** (0.003)	–0.008* (0.004)
Constant	–3.724*** (1.036)	–3.248*** (0.963)	–1.817 (2.156)	–1.035 (1.43)
F-Statistics	134.606***	149.901***	37.492	67.222***
R-Squared	0.866	0.806	0.421	0.667

Note: ***, ** and * denote the significance at 1%, 5% and 10% respectively.

estimated in this study is consistent with this expectation. Moreover, population aging is also associated with an increase in capital per worker (Eggertsson et al. 2019a; Auclert, Mamberg, Martenet and Rognlie 2021). Again, this is consistent with the low coefficient found for demographic change in post-transition societies here. This is also in line with the neoclassical theory of growth, which claimed that the only way to ensure continuous economic growth was to increase the contributive share of total factor productivity (TFP) in the economy (Solow 1956). The studies of Boucekkine et al. (2002), Bloom and Canning (2004), Queiroz and Turra (2010), Mason and Lee (2004) and Zhu et al. (2017) proved the positive impact of the working-age population on socioeconomic performance. In terms of control variables, inflation has a positive relationship with socioeconomic performance in early and late-demographic transition countries but a negative relationship in pre and post-transition groups of countries. Umaru and Zubairu (2012) examined the impact of inflation on economic growth in the instance of Nigeria and their findings show that inflation increases Nigeria's productivity and production level, which is a beneficial factor in the country's economic growth. The study of Cuaresma and Silgoner (2014), Khan and Senhadji (2001) found a positive relationship between socioeconomic performance and inflation. But in the case of pre and post-demographic transition groups, it is opposite and insignificant.

Globalization (GB) constituting social and political aspects of integration has positive relationship with socioeconomic performance in all groups, with the highest relation with

post-demographic and lowest in the late demographic transition group. In the case of early, with an increase of 1% in globalization, there will be 0.01% increase in socioeconomic performance and it is significant at 1%. In case of late-demographic transition countries, with 1% increase in globalization, there will be 0.009% increase in socioeconomic performance and it is significant at 1%. In case of pre-demographic transition countries, with 1% increase in globalization, there will be 0.012% increase in socioeconomic performance and it is significant at 1%. In case of post-demographic transition, with 1% increase in globalization, there will be 0.017% increase in socioeconomic growth and it is significant at 1%. Due to the high degree of collaboration in the context of globalization, interconnected regional entities will promote the formation of production networks, which are a significant driver of socioeconomic growth (Scott and Storper 2003). The studies of Lee (1996), Muhammad et al. (2010) and Orbeta (2002) proved the positive relationship between globalization and socioeconomic performance.

In the case of trade openness (TO) which represents economic globalization, there is negative relationship with socioeconomic performance in all groups. In case of early-demographic transition countries, with an increase of 1% in trade openness there will be 0.96% decrease in socioeconomic performance and it is significant at 1%. In the case of late-demographic, with 1% increase in trade openness, there will be 0.05% decrease in socioeconomic performance and it is not significant. In case of pre-demographic transition countries, with 1% increase in trade openness, there will be 0.065% decrease in socioeconomic performance and it is not significant. In case of post-demographic transition, with 1% increase in trade openness, there will be 0.0115% decrease in socioeconomic performance and it is significant at 1%. In Nigeria, Lawal et al. (2016) discovered that trade openness has a negative long-term effect on socioeconomic growth. Insufficient or negative effects of trade openness on socioeconomic performance were documented by Vlastou (2010), Polat et al. (2015), Ulaşan (2015), and Lawal et al. (2016).

Financial development (FD) shows a positive relationship with socioeconomic performance in all groups. In case of early-demographic transition countries, with 1% increase in financial development, there will be 0.001% increase in socioeconomic performance and it is significant at 10%. In case of late demographic transition countries, with 1% increase in financial development, there will be 0.0004539% increase in socioeconomic performance and it is not significant. In case of pre-demographic transition countries, with 1% increase in financial development, there will be 0.011% increase in socioeconomic performance and it is significant at 1%. In case of post-demographic, with 1% increase in financial development, there will be 0.002% increase in socioeconomic performance and it is significant at 1%. It is stated that having a strong domestic financial industry helped boost the rate of savings and investment and, as a result, achieve socioeconomic progress (Becsi and Wang 1997). King and Levine (1993), Levine, Loayza, and Beck (2000) studies proved the positive influence of financial development on socioeconomic performance.

Institutional quality (IQ) measured by corruption shows a negative relationship with socioeconomic performance showing increase in corruption is deteriorating socioeconomic performance. In the case of early demographic transition nations, with 1% increase in institutional quality, there will be 0.001% decrease in socioeconomic performance and it is not significant. In the case of late demographic transition countries, with 1% increase

in institutional quality, there will be 0.003% decrease in socioeconomic performance and it is significant at 10%. In case of pre-demographic transition, with 1% increase in institutional quality, there will be 0.007% decrease in socioeconomic performance and it is significant at 5%. In the case of post-demographic transition, with 1% increase in institutional quality, there will be 0.008% decrease in socioeconomic performance and it is significant at 10%. A long-term stable institutional environment was necessary for socioeconomic progress, according to negative institutional quality indicators (Zouhaier and Karim 2012). Acemoglu (2010), Angeles (2010) and Angeles, L. (2010) proved the negative relationship between institutional quality and socioeconomic performance.

Influence of the Male and Female Working Age Population on Different Demographic Groups

Table 4 shows the impact of the gender-specific working-age population on socioeconomic performance to examine the gendered nature of dividends.

Demographic change has a positive relationship with socioeconomic performance in all groups and gender but their impact has been different. In the case of early demographic transition countries, the male working-age population has more impact than females on socio-economic growth. With 1% increase in the working population of the males, there will be 0.904% increase in socioeconomic performance and it is significant at 1% but with 1% increase in the working age population of females there will be 0.228% increase in socioeconomic performance and it is not significant. In the case of late demographic transition countries, there is little difference between the impact of males and females on socioeconomic performance, with 1% increase in working age population of males there will be 0.882% increase in socioeconomic performance and it is a significant at 1% but with 1% increase in female working-age population there will be 0.732% increase in socioeconomic performance and it is significant at 5%. when it comes to pre-demographics transition countries, the male working-age population having slightly more effect than female, with 1% increase in male working age population there will be 0.564% increase in the working-age population and it is not significant but with 1% increase in female working-age population there will be 0.504% increase in socioeconomic growth and it is not significant. In case of post demographic transition countries, here female contribution is more than male, with 1% increase in male working-age population there will be 0.161% increase in socioeconomic performance and it is not significant but with 1% increase in the female working-age population there will be 0.228% increase in socioeconomic performance and it is not significant.

In pre-transitional societies, a significant portion of women's labor is situated outside the formal sector, and the output of their work is not accounted for in GDP measurements. Consequently, augmentations in the share of working-age women may exert minimal impact on the measured socioeconomic outcomes. Conversely, at advanced developmental stages and in post-transitional societies, a substantial portion of production activities has shifted from household settings to the market. Women's employment in these societies is more frequently within the marketized sector. As a result, increases in the working-age share of women lead to a more substantial rise in the recorded GDP, irrespective of whether there is a discernible difference in their actual contributions to economic

Table 4

Socioeconomic Performance and Demographic Change (Gender Specified)

Variables	Early demographic Transition Countries		Late demographic Transition Countries		Pre demographic Transition Countries		Post demographic Transition Countries	
	Male (A)	Female (B)	Male (A)	Female (B)	Male (A)	Female (B)	Male (A)	Female (B)
Demographic Change (DC)	0.904*** (0.224)	0.228 (0.311)	0.882*** (0.22)	0.732** (0.279)	0.564 (0.525)	0.504 (0.571)	0.161 (0.293)	0.228 (0.311)
Inflation (INF)	0.002*** (0.0003)	0.002 (0.0003)	0.002*** (0.0003)	0.002*** (0.0003)	−0.0001 (0.0001)	−0.00005 (0.0001)	−0.0002 (0.0002)	−0.0002 (0.0002)
Globalization (GB)	0.11*** (0.003)	0.017*** (0.002)	0.009*** (0.002)	0.009*** (0.002)	0.011*** (0.003)	0.012*** (0.003)	0.017** (0.002)	0.017*** (0.002)
Trade Openness (TO)	−0.93*** (0.03)	−0.116* (0.063)	−0.053 (0.037)	−0.05 (0.036)	−0.066 (0.043)	−0.064 (0.043)	−0.117* (0.061)	−0.116* (0.63)
Financial Development (FD)	0.001* (0.001)	0.002*** (0.0007)	0.0004 (0.0002)	0.0004 (0.0002)	0.011*** (0.002)	0.011*** (0.002)	0.002** (0.0002)	0.002*** (0.0002)
Institutional Quality (IQ)	−0.002 (0.002)	−0.008* (0.004)	−0.003* (0.001)	−0.003* (0.002)	−0.008** (0.003)	−0.007** (0.003)	−0.008* (0.004)	−0.008* (0.004)
Constant	−3.448*** (0.882)	−1.111 (1.469)	3.502*** (0.882)	−3.248** (0.963)	−1.884 (1.99)	−1.679 (2.208)	−0.821 (1.38)	−1.111 (1.469)
F-Statistics	135.7***	133.9***	156.1***	133.8***	36.9***	36.9***	67.3***	67.2***
R-Squared	0.866	0.864	0.808	0.864	0.421	0.420	0.667	0.668

Note: ***, ** and * denote the significance at 1%, 5% and 10% respectively.

output. According to Lusindilo (2007), the variables that contribute to women's limited engagement in socioeconomic and political activities include educational background, marital status, religion, area of residence, and age group. Nagengast et al. (2011), examined the complex connections between gender and socioeconomic growth.

The variations in labor force participation rates may vary due to educational achievements, and occupational types. According to the Bureau of Labor Statistics, the employment-population ratio in 2022 was 67.9% for men aged 25 and above, contrasting with 55.4% for women. However, this gender gap tends to diminish with higher levels of educational attainment. Globally, the labor force participation rate for women is slightly below 47%, in contrast to 72% for men, and certain regions experience a disparity exceeding 50 percentage points.

Furthermore, women are more likely to engage in informal employment and encounter limited opportunities in the business sector. The nature of women's employment often differs significantly from that of men, with women being disproportionately represented in certain types of vulnerable jobs. All these are translated into overall low effect of female labor force participation on socioeconomic performance.

The results of the other control variables are largely consistent with the benchmark model. For instance, there is positive relationship between inflation and socioeconomic performance in case of early and late demographic transition groups but negative relationship in pre and post-demographic transition groups. Globalization has positive relationship with socioeconomic performance in all groups of demographic change. The strongest globalization relationship has been shown in early-demographic and the lowest for late-demographic transition countries. Trade openness has a negative relationship with socioeconomic performance for all demographic groups. For financial development, there is positive relationship with socioeconomic performance in all demographic transition groups. For institutional quality, corruption has negative relationship with socioeconomic performance. By encouraging market participants to continue working on redistributive politics with lower economic rewards instead of activities that would promote socioeconomic growth, poor-quality institutions might slow down socioeconomic activity (Murphy, Shleifer, and Vishny 1993). Iqbal and Daly (2014) contend that deficient institutions cause resources to be diverted from the productive sector to the unproductive sector, which in turn encourages rent-seeking behavior. So these studies proved the negative relationship between institutional quality and socioeconomic performance by taking corruption as an indicator of institutional quality.

Conclusion

The main focus of the study is to investigate the presence of demographic dividends, specifically in relation to indicators such as income per capita, employment, and the accumulation of both human and physical capital. Additionally, the research aims to identify the primary mechanism through which demographic shifts contribute to enhanced socioeconomic performance in countries experiencing changing population structure. As the working-age population is changing gradually, demographic change has been

affecting socioeconomic performance in the world over the previous decades. The are four demographic groups of countries namely early-demographic, late-demographic, pre-demographic, and post-demographic transition countries taken in our study.

The results showed that in the case of early-demographic and late-demographic transition countries demographic change translates into high socioeconomic performance. For early-demographic transition countries, these dividends materialize through the male working-age population. For late-demographic transition countries both male and female working-age populations significantly contribute, to socioeconomic performance. Inflation, financial development, and globalization also have a positive relationship with socioeconomic performance but trade openness and institutional quality have a negative relationship with socioeconomic performance in all groups with gender cohort. The study's results highlight a worrisome issue regarding the productivity of women in the working-age population, particularly in countries situated within pre and post-demographic transition stages. This underscores the need for initiatives aimed at enhancing their meaningful engagement in economic activities.

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