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RESEARCH PAPER

Disaggregated role of economic, social and political globalization on quality of life

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Abstract
This paper attempts to estimate the impact of economic, social, and political globalization on the quality of life (QOL), using data reported by the KOF index of globalization. From 1990 to 2020, we analyze panel data from seven developing nations. A wide range of economies, including Bangladesh, India, Sri Lanka, Nepal, Thailand, Pakistan, and Vietnam, are under consideration. Analyzing our results from a symmetric ARDL model, this paper clarifies that political globalization contributes to higher QOL in the selected economies. The NARDL estimation demonstrates that globalization's positive changes on the economic and political segment have lasting positive effects on QOL. Over a long time, the QOL has weakened because of the adverse changes in globalization's economic structures. However, short-run asymmetric outcomes for individual countries identify a nonlinear association between economic globalization in India and Nepal, political globalization and the development of Sri Lanka and Pakistan, and social globalization in Sri Lanka and Vietnam.

Keywords Quality of life · Globalization · NARDL model · Bangladesh · India · Pakistan

JEL Classification F0 · F600 · F630 · I31 · O1 · O2

Introduction

Globalization can be thought of as the process of connecting countries in labor, capital, technology, information, ideas, goods, and services (Sirgy et al. 2004; Dreher 2006). Recent decades witnessed a growing interest in globalization among academics, policymakers, and ordinary citizens as countries became increasingly globalized over time (Bhagwati 2004; Stiglitz 2008; Dreher et al. 2008; Collier et al. 2008). Nonetheless, the ensuing discourses hardly generated any consensus apropos the winners and losers of globalization. In their attempt to explore the consequences of globalization, some studies discovered its beneficial impacts, whereas some noticed its detrimental impacts.

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The growth-promoting impacts of globalization have been confirmed by a good number of works (Levitt 1983; Yip 1989; Frankel and Romer 1999; Dreher 2006; Dreher and Gaston 2008; Dreher et al. 2008; Surugiu et al. 2015; Beneria et al. 2015; Grossman and Helpman 2015; Kilic 2015; Egbetunde and Akinlo 2015; Suci et al. 2016; Lee et al. 2017; Salifou and Haq 2017; Kilicarslan and Dumrul 2018; Latif et al. 2018). Other benefits of globalization reported in the literature include more enormous gains from trade (Thorbecke and Eigen-Zucchi 2002), higher productivity as well as wages of workers (Zoellick 2001), incentives for workers to acquire skills (Grennes 2003), and reducing inequality by promoting industrialization in developing countries (Firebaugh and Goesling 2004). Also, with globalization comes higher economic freedom and better access to information, making people more empowered (Cornia 2001; Akhter 2004; Dreher 2006). Some argue that globalization benefits the already privileged the most (Scholte 2005).

In contrast, a large body of work underlined the adverse impacts of globalization. According to them, globalization limits the government's role in ameliorating the living standard of their citizens (Soros 2000; Guillen 2001; Tsai 2007), eliminates manufacturing jobs (Scott 2001), raises inequalities (Boff 1999; Kodolko 2001; Dollar and Kraay 2004; Milanovic 2005; Strange 2007; Majeed 2015), increases trade of unhealthy products (Drewnowski and Popkin 1997), degrades the environment (Danilo 1995; Onishi 1998), creates scope for human trafficking (Majeed and Malik 2017), weakens family ties (Majeed and Kanwal 2019), adds to the insecurity of life (Mitchel 1999; Jedele 2001; Sanz et al. 2008) and increases social instabilities (Tsai 2007).

A cursory glance at the impacts presented above suggests that globalization can considerably influence the quality of life (QOL) of a country's citizens. Even so, as elucidated by Majeed (2018), though globalization's impact on productivity and growth has received the bulk of the attention, its impact on QOL still needs to be adequately explored. This paucity, to a large extent, is due to measurement issues relating to globalization, QOL, and the employment of questionable methodology. Working with narrow definitions of globalization and QOL and ignoring the associated multidimensionality can lead to biased estimates (Dreher 2006; Sapkota 2011). Additionally, many used cross-sectional datasets (Dreher 2006).

Dreher (2006) developed a comprehensive and widely accepted globalization index, incorporating its economic, social, and political aspects. QOL, an abstract and elusive concept used to weigh the well-being of humankind and states, has usually been measured with income variables that are incapable of capturing other aspects like psychological, environmental, and social facets of human life. With longevity, education, and the standard of living as its three components, the Human Development Index (HDI), generated and released by the United Nations Development Program (UNDP) in 1990, offers a more in-depth evaluation of quality of life (QOL). Ergo, using these two indices can reduce the measurement inaccuracy associated with these two multifaceted variables, i.e., globalization and QOL.

Currently, there is a gap in the existing literature as no study tried to examine the potential symmetry or asymmetry of the impacts of globalization indicators on QOL. In this paper, we endeavor to address the following research inquiry: How do the positive and negative shocks in economic, social, and political globalization affect QOL? The question is addressed using a panel dataset comprising seven distinct developing nations. We utilize the KOF index to demonstrate the depth of globalization and the HDI to gauge the overall quality of life. In our assessment, we use both panel linear and nonlinear autoregressive distributed lag models. By delving into the NARDL, we discover the asymmetries in the long and short term.

The article's structure includes an introductory part followed by a second section that provides a brief summary of previous inquiries. The theoretical underpinnings are addressed in section three, which comes after. Both the data and the methodology are presented in section four. The paper is concluded in the last section, following the discussion and evaluation of the results in section five.

Literature review

Globalization is a widely debated concept as it is multidimensional and can exert positive and negative influences. Since the early 1980s, globalization has received serious attention from social scientists (Rossi 2008). Abdel-Hadi (2012) has recognized the QOL and globalization as two of the three significant interrelated, interconnected aspects affecting daily life at both the individual and group levels. In his pioneering work, Levitt (1983) implied that globalization was supported dramatically by the Industrial Revolution, and it sped up international transactions, limiting the obstructive role of national borders. As reported by Burlacu et al. (2018), some researchers identified globalization with modernization, whereas some associated it with universalization. Globalization, some have claimed, is distinct from other ideologies such as international expansion, market liberalization, universalism, and modernization (Scholte 2018; Caselli 2013).

However, Figge and Martens (2014) reasoned that a pluralistic and multiscale definition does not require a separation of these concepts. Additionally, they commented that between 2000 and 2012, the pace of globalization reduced, though it was still growing. Brawley (2009) emphasized globalization as a "multidimensional process by which markets, firms, production, and national financial systems are integrated on a global scale." McGrew and Lewis (1992) suggest that globalization multiplies the ties between societies around the world. Hence, the choices made in one society have an essential bearing on societies situated at great distances. Sirgy et al. (2004) developed a conceptual model to evaluate the QOL impact of globalization. They, based on Held et al. (2000) defined globalization as "(t)he diffusion of goods, services, capital, technology, and people (workers) across national borders."

A few index-building initiatives have attempted to incorporate the many facets of globalization. Between 2001 and 2006, the A.T. Kearney/Foreign Policy Globalization Index, more often acknowledged as the ATK/FP, served as the standard by which many other indices were gauged. As stated by Dreher (2006) and Dreher et al. (2008), the KOF Globalization Index was modified in 2007 after its formation in 2002. An aggregate index as well as three component sub-indices that signify economic, political, and social integration are incorporated in the KOF Index. Two more technical and ecological facets of globalization are highlighted by Figge and Martens (2014) in the Maastricht Globalization Index. An overwhelming majority of experts support the KOF Globalization Index (Potrafke 2015).

Both subjective and objective treatments have been applied to represent the multidimensional QOL (Sirgy et al. 2001). Objective indicators of QOL measure the material living levels and their constituents, while subjective indicators measure self-reported personal well-being. As listed in Sirgy et al. (2001), some of the noteworthy objective measures of QOL are the United Nations Development Program's (UNDP) QOL measures, the Swedish Level of Living Survey, World Bank Measure of Societal QOL, International Living Survey, American Demographics Index of Well Being, Weighted Index of Social Progress, Net Economic Welfare Measure, and U.S. Bureau of Census Measure of Societal QOL. Glatzer (2011) reports some of the notable subjective indicators that include the Personal

Well-being Index (PWI), the Affect Balance Scale (ABS), and the Overall Satisfaction with Life (OSL). The Happy Life Expectancy (HLE) combines both subjective and objective behavior. However, one of the most widely accepted factors of QOL has been the HDI developed by UNDP. The HDI includes longevity of life, knowledge enlargement, and standard of living as its components (Glatzer, 2011).

The existing theory has predicted mixed relationships between globalization and QOL. Cornia (2001) defends that QOL can improve directly due to globalization so long as requirements such as open and competitive trade, strong security networks, efficient public rules, and ample health services are fulfilled. Since many developing countries lack the required conditions, Cornia (2001) argued that globalization had not improved QOL in these countries. Numerous theoretical hypotheses and mixed results were predicted by Sirgy et al. (2004). The authors predicted that global interaction in the economic sector attracts FDI inflows, creates jobs, provides a quality product at a low cost, and improves QOL. Again, competing domestic industries shrink, and natural resources deplete, resulting in a lower QOL.

The empirical evidence does not generate a consensus regarding globalization's impact on QOL. Dreher (2006), using a sample of 123 countries for 1970–2000 and applying the random effect model, confirmed the growth-promoting impact of globalization. However, greater impact was needed to reduce large-scale poverty. Bergh and Karlsson (2010) and Samini and Jenatabadi (2014) presented similar conclusions. Within the time period of 1975 to 2010, Gygli et al. (2019) deployed a sample of 137 nations. While they derived similar conclusions, they characterized between the de jure and de facto aspects of globalization. This growth-enhancing influence was discovered solely in the subsample of non-OECD countries, and they disclosed that the positive link is exerted by the de jure nature of globalization.

Majeed (2018) used a panel dataset of 44 Islamic countries for 1970–2010 and found a robust QOL improving the payoff of globalization. When the three forms of globalization were examined separately, all except social globalization exerted a positive influence on QOL. In a later study, Majeed (2019) investigated the nexus between globalization and QOL in 29 Asian nations from 1980 to 2015. His findings showed that, overall, globalization raised QOL. However, though both economic and social globalization raised QOL, political globalization registered no such impact. According to Santiago et al. (2020), political globalization failed to impact development significantly, while social and economic globalization had desirable impacts in the long run.

In a study of 52 African economies, Simplice (2013) showed that trade globalization augmented human prosperity, whereas financial globalization diminished it. In another study of 53 African countries from 1996 to 2008, Asongu et al. (2015) found a negative impact on quality of life for an endogenous external debt. With an interactive external debt, the impact of globalization was positive. Also, recent studies like Kiani et al. (2021) and Awad (2021) found positive impacts of globalization on QOL. Both these studies employed the autoregressive distributive lag (ARDL) model. Further, globalization was found to facilitate social justice. In addition to alleviating poverty, Sapkota (2011) discovered that globalization stimulates human and gender evolution. A few studies attempted to discover the health impacts of globalization (Bergh and Nilsson 2010; Martens et al. 2014; Jorda and Srabia 2015; Ali and Audi 2016), while some tried to dig up the environmental impacts (Shahbaz et al. 2015).

While globalization's growth reactions have been deeply examined in the literature, Majeed (2019) noted that experts need to pay more attention to how it has affected people's QOL. More importantly, as the literature review suggests, the asymmetric scenario

between globalization indicators and QOL has yet to be explored. By modeling a nonlinear autoregressive distributed lag (NARDL) structure, we add to the literature by exploring the influence of positive and negative changes associated with the three dimensions of globalization on QOL.

Theoretical underpinnings

To outline the theoretical relationship between globalization and QOL, we follow Sirgy et al. (2004, 2016), who derived 24 propositions for economic, consumer, and social QOL in terms of global integration of goods and services, technology, capital, and workers. Figure 1 depicts the theoretical linkage between globalization and QOL.

A country's exports, by generating new employment in the exporting department, strengthen the economic enrichment of the citizens (Hufbauer and Moran 2010; Felbermayr et al. 2011; Shiferaw 2015; Oh and Kim 2016; Whang 2019; and Liu et al. 2019) and consequently, the earnings of the workers increase (Mushtaq et al. 2014; Gozgor and Can 2016). Moreover, exports ameliorate production proficiency by cutting production costs, using modern technology, and raising capacity adjustment (Cassiman and Golovko 2011). Conversely, the propagation of exports at times faces an unfavorable environment due to the trade collapse in the importing nations, which ultimately hurts the exporting economies (Insch et al. 2011).

Besides, improving exports may validate a nation's welfare by enhancing public sector expenditures, promoting government effectiveness and local infrastructure development (Wilkinson 2005). In the context of social welfare, as a rule, higher tax earnings from the exporting sector are budgeted to ensure better mass education, safety, and health facilities. On the contrary, these public services may be negatively affected due to the government's tax cut decision (Henderson 2002). In addition, progressive exports are not beneficial for

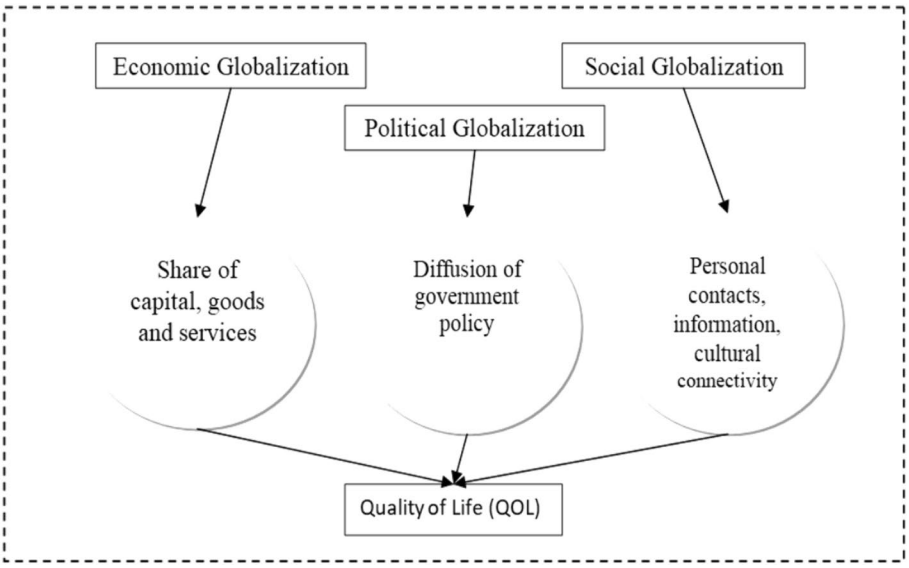

Fig. 1 Theoretical relationship between globalization and QOL

the environment by raising contamination and erosion of natural wealth, which lessen social welfare (Managi et al. 2009; Naoto and Hiroaki 2015; Bosupeng 2016).

Concentrating on imports of goods and services may fuel economic welfare by originating new earning sources in the import-based institutions (Scissors et al. 2012; Jin et al. 2019). Increases in imports induce open market competition for local firms. Consequently, firms and industries updated their labor efficiency (Turco and Maggioni 2013) and moved to modern technology. Despite the altruistic behavior of imports, there is also an opposite effect on the job market due to the trade deficiency, and as a result, many workers lose their work position (Pissarides 2000; Oscarsson 2000; Kongar 2006). Moreover, the people of imported nations may experience better consumer welfare, as imported products prolong the consumers' different product options and ensure better quality goods at economic costs (Scheve and Slaughter 2001). Again, increasing imports of goods and services can contribute to a mixed effect in the social welfare segment. Imports may produce high tax revenues and elevate the government's contribution to public services like education, health, culture, and leisure. Conversely, reducing tax income may lessen public expenditure and services (Henderson 2002).

Regarding economic, social, and consumer welfare, capital outflow and inflow may lead to mixed effects. Capital outflow may fix the emergence of local investors in the international platform, evolve production proficiency, and update technology, clearly defining economic benefits (Moran 2011). On the other hand, it can also dissipate the local job markets by ending the home production capacities and moving forward to foreign production (Harrison et al. 2011). Investment outflow may boost consumer profits by generating quality products with low prices (Holtbrügge 2012). In other respects, it can raise the import cost due to the devaluation of the home currency (Jeannet and Hennessey 2001). In addition, capital outflow may promote social welfare by ensuring adequate public expenditures and services.

Foreign direct investment can enlarge economic welfare by assuring the domestic market proficiency and available job facilities (Qu et al. 2013; Alessandrini 2014), consumer welfare by producing excellent quality goods at minimum prices and budgeting more public expenditure, and social welfare by enhancing the public service quality. Contrarily, investment inflow may adversely affect economic well-being due to the extreme competition among local firms and industries, social well-being due to degradation of the environment, and mismanagement in labor selection (Olney 2013). Besides, the inflow and outflow of technology can improve the volume of QOL. For instance, it may enhance economic, consumer, and social welfare by cultivating earnings of domestic firms and industries, job facilities, quality products at low prices, residents' spending, organizational perfection and productivity, and better public services (Karkinsky and Riedel 2012; Kafouros and Forsans 2012; Chan and Cui 2013).

At the same time, the outflow and inflow of laborers are other indicators of globalization that have a massive contribution to QOL (Kolawole 2016). Migran workers may positively contribute to economic, consumer, and social welfare via repatriating earnings (Gibson et al. 2014), lessening the domestic unemployment rate, promoting high consumer services, and augmenting leisure and cultural quality (Diller 2013, 2018). Moreover, worker inflow develops technological progress, productivity and proficiency of local institutions, quality of goods and services, and cultural affluence, which may improve economic, consumer, and social welfare. Conversely, an enhancement in foreign labor can negatively influence the economic and social QOL by increasing the domestic unemployment rate (Longhi 2010) and causing social disputes.

Globalization has an asymmetric effect on the quality of the economy and people of developing nations to varying degrees. In EG, SG, and PG, the concept of dependency posits that developing countries are profoundly linked to the rest of the world. More precisely, trade, foreign direct spending, tourism, the internet, science and technology, innovations, medicines, labor migration, foreign aid, and defence of different nations all influence the human quality of life in local economies. Given that, a country's behavior toward globalization can either raise or lower living standards in the developing world, we cannot ignore the asymmetric behavior of globalization on people's QOL. In the case of the COVID-19 pandemic, for instance, the absence of global integration between countries has resulted in economic, social, and political insecurity, particularly for developing nations. Around that time, globalization indicators showed a downward pattern, and with it, the quality of life for humans. The ongoing conflict between Russia and Ukraine has also triggered global instability by raising both unemployment and the cost of living.

Data and methodology

Data

The goal is to propose an estimate of the nonlinear influence of globalization's various aspects on QOL. We build a panel dataset covering 1990–2020 and seven developing nations to do this. The countries selected are Bangladesh, Nepal, India, Sri Lanka, Pakistan, Thailand, and Vietnam. All these countries are developing, have geographical propinquity, and are comparable in terms of the HDI score. The KOF Index of globalization ranges from 1 to 100, with a higher value implying a higher degree of globalization. We also use population growth (Sapkota 2011; Hirt 2017), and the data comes from the World Development Indicators (2014). All variables are in their natural logs.

In this instance, globalization is the prime explanation for the observed phenomena. Each of Dreher's three metrics is constructed on a combined score of twenty-four sub-indices that quantify a particular aspect of globalization. Since it decomposes globalization into its constituent elements, evaluates each of the parts associated with each dimension, and accumulates these over a large sample of nations and years, Dreher's data are the best up-to-date assessment of these multiple facets of globalization. In the first dimension, the corresponding KOF sub-index defines economic globalization in various ways, some of which are the lack of tariffs and import restrictions, the quantity of trade between nations, and the circulation of capital across international borders. Firstly, the share of a country's gross domestic product (GDP) attributable to earnings paid to non-citizens and capital received is incorporated as an equivalent for the amount of international labor and capital invested in its economy. Also, invisible import obstacles, the average rate of tariffs, revenue taxation on trade between nations, and an indicator of capital regulation are evaluated in the subsequent section.

In the second dimension, the KOF index explains political globalization by counting foreign offices, international bodies, U.N. Security Council missions, and international agreements worldwide. (Dreher et al. 2008). This component aims to determine to what extent one nation participates in foreign affairs (Dreher 2006). Finally, the KOF index gauges social globalization by looking at personal contacts (phone calls, international visitors, letters, population), information flows (internet, television, internet, radio, newspaper), and cultural proximity (quantity of IKEAS, McDonald's, and export–import in books). More

precisely, the KOF index characterizes economic globalization as the cross-border transfer of goods, capital, and services; political globalization as government policy diffusion; and social globalization as a growing diversity of thoughts, data, visuals, and humans. Table A1 in the Annex briefly explains the KOF index. Table 1 exhibits the descriptive analysis of the considered variables.

Econometric modeling

Every facet of globalization has the potential to either raise or lower people's living standards. The potential positive impact of economic globalization on HDI is one example of a shock. This is because globalization has the ability to increase GDP growth rates and living standards by facilitating more trade, investment, and economic integration. Better HDI components could lead to increased spending on health care, education, infrastructure, and social programs as a whole as a result of easier access to information, resources, and capital. As a negative shock, economic globalization may make income disparity worse on a national and international scale. Thus, previously marginalized groups may see a further narrowing of educational opportunities, healthcare coverage, and economic prospects, all of which have a significant impact on their HDI scores. Along with lowering HDI, it may worsen climate change-related risks and vulnerabilities, increase pollution, and deplete natural resources, all of which make it more difficult to get clean air, water, and other necessities of life.

Not to mention that HDI benefits from increased education, literacy rates, and technical innovation brought about by social globalization's promotion of information, knowledge, and idea sharing. As a whole, human flourishing is aided by social globalization's promotion of communal harmony, tolerance, and empathy via increased opportunities for cross-cultural communication and understanding. In contrast, social globalization has the potential to bring about a loss of cultural diversity and the dismantling of long-established norms and practices, which in turn threatens social cohesiveness, cultural legacy, and personal prosperity—especially among already-vulnerable indigenous and disadvantaged populations—and thereby has a negative effect on HDI. Social isolation, poverty, and marginalization are some of the negative results that may follow from cultural upheaval, social displacement, and dislocation, all of which have a negative behavior on HDI.

Social justice, political stability, and human development—all of which have a positive impact on HDI results—may be possible outcomes of political globalization if it promotes democratic values, respect for human rights, and competent leadership. One advantage of fostering international cooperation, diplomacy, and collaboration on global issues including health, environmental sustainability, and poverty reduction is that it improves HDI by

Table 1 Descriptive statistics of the model *Source* Author's own calculations using STATA 16)

Variables	Obs	Mean	Std. Dev	Min	Max
QOL	217	− .5620	.1904	− .9314	− .2182
EG	217	3.638	.3574	2.6866	4.2287
SG	217	3.5367	.4576	2.5482	4.2531
PG	217	4.2236	.1967	3.6483	4.5220
PPG	217	.2006	.5418	− 1.6824	1.1931

QOL Quality of Life *EG* Economic Globalization *SG* Social Globalization *PG* Political Globalization *PPG* Population Growth

addressing cross-border concerns. Potential negative aspects of political globalization include its capacity to weaken democratic rule, national sovereignty, social justice, and political stability. Global power imbalances and HDI can be negatively affected as a result. The escalation of security threats, such as terrorism, transnational crime, and conflict, which disproportionately impact groups that are already vulnerable, might lead to a decrease in HDI.

To explore the nonlinear relationship with QOL, we employ the following models to explore the intensity of globalization on QOL. In contrast, the dimensions of globalization are disaggregated into positive and negative shocks. These modeling compositions are also utilized by Munir and Riaz (2019).

$$\mathrm{QOL} = f\left(\mathrm{EG}^{+}, \mathrm{EG}^{-}\right) \tag{1}$$

$$\mathrm{QOL} = f\left(\mathrm{SG}^{+}, \mathrm{SG}^{-}\right) \tag{2}$$

$$\mathrm{QOL} = f\left(\mathrm{PG}^{+}, \mathrm{PG}^{-}\right) \tag{3}$$

where superscripts (+) and (–) mean the partial positive and negative sums of the variables, respectively. To avoid spurious regression, we follow the panel unit root test introduced by Levin et al. (2002). The panel ARDL model expresses the symmetric behavior of QOL to changes in the forms of globalization (Pesaran and Shin 1995; Pesaran et al. 1999). The symmetric form of the panel ARDL model is:

$$\mathrm{Y_{it}} = \sum_{j=1}^{m} \varphi_{ij} Y_{i,t-j} + \sum_{j=0}^{n} \sigma_{ij} P_{i,t-j} + \mu_i + \varepsilon_{it} \tag{4}$$

where Y_{it} is the QOL for each unit of i over a period of time t, P_{it} denotes $(k \times 1)$ vector of independent variables, φ_{ij} expresses the coefficient of the lagged QOL, σ_{ij} represents the coefficients vector of independent variables, μ_i stands for the group-specific effects, and ε_{it} is the error term.

Rewriting equation (4) to add an error correction term:

$$\Delta Y_{\mathrm{it}} = \delta_i ECT_{\mathrm{it}} + \sum_{j=1}^{m} \varphi_{ij} \Delta Y_{i,t-j} + \sum_{j=0}^{n} \sigma_{ij} \Delta P_{i,t-j} + \mu_i + \varepsilon_{\mathrm{it}} \tag{5}$$

Where, $\mathrm{ECT_{it}} = \vartheta_i Y_{i,t-1} - \gamma_i P_{t-1}$ explains the error correction term for each unit. The parameter ϑ_i denotes the speed of adjustment of the error correction term. One drawback of the panel linear ARDL model is that it fails to account for the impacts of dynamic asymmetries. In order to discover a way around the issue, Shin et al. (2014) came up with the NARDL model. Their process entails dividing a variable down into its partial positive and partial negative sums.

$$P^{+} = \sum_{j=1}^{t} \Delta P_j^{+} = \sum_{j=1}^{t} \max\left(\Delta P_j, 0\right) \tag{6}$$

$$P^{-} = \sum_{j=1}^{t} \Delta P_j^{-} = \sum_{j=1}^{t} \min\left(\Delta P_j, 0\right) \tag{7}$$

Hence, we write the nonlinear asymmetric long-run association among Y and P as:

$$Y_t = \beta^+ P_t^+ + \beta^- P_t^- + u_t \tag{8}$$

$$P_t = P_0 + P_t^+ + P_t^- \tag{9}$$

Here, β^+ and β^- are the asymmetric character of the long-run parameters. P^+ and P^- present the partial positive and negative sums of the variable, respectively. Following the literature, we write the NARDL model:

$$\Delta Y_{it} = \delta_i ECT_{it} + \sum_{j=1}^{m} \varphi_{ij} \Delta Y_{i,t-j} + \sum_{j=0}^{n} (\sigma_{ij}^+ \Delta P_{i,t-j}^+ + \sigma_{ij}^- \Delta P_{i,t-j}^-) + \mu_i + \varepsilon_{it} \tag{10}$$

Where, $\mathrm{ECT}_{it} = \vartheta_i Y_{i,t-1} - (\gamma_i^+ P_{i,t}^+ + \gamma_i^- P_{i,t}^-)$. We also employ the Pesaran CD test (Pesaran 2004) to inspect cross-sectional dependence.

Results and discussion

The outcomes of the LLC panel unit root test are displayed in Table 2, which highlight that each of the variables are stationary of order zero and one for the intercept and trend. The orders are symbolized by I(0) and I(1). Nevertheless, none of the variables are stationary in order two, which is identified by the symbol I(2). The aforementioned results are in agreement with the wants and needs of both the panel ARDL and NARDL models.

Tables 3 and 4 summarize the estimated findings of the symmetric Eq. (4) and asymmetric Eq. (5) for the long-run and short-run dynamics of EG, SG, and PG on QOL. Table 3 indicates that the long-run elasticities of QOL for EG, SG, and PG are different at various levels of significance. Following the individual models, EG and SG have a negative and insignificant influence on QOL. However, PG positively affects QOL at the 1 percent significant level. Logically, high levels of PG contribute to an improvement in quality of life due to regular participation in UN security tasks, involvement in a global body, and the maintenance of positive relations with other nations through embassies in the country.

Now, focusing on the aggregate model, EG helps to generate a better quality of life by expanding possibilities for employment, trade and foreign direct investment, improving the availability of schooling and governmental revenue, and enhancing efficiency. It

Table 2 Results of LLC panel unit root test *Source* Author's calculation

Variable	Levin-Lin-Chu (LLC) test				Order of integration	
	Intercept		Trend		LLC	
	Level	1st diff	Level	1st diff	intercept	Trend
QOL	−3.5337***	–	−1.6570**	–	I(0)	I(0)
EG	−5.3306***	–	−2.4532***	–	I(0)	I(0)
SG	−4.4704***	–	4.1353	−3.9134***	I(0)	I(1)
PG	−6.4318***	–	−2.8145***	–	I(0)	I(0)
PPG	1.0189	−4.7533***	−0.6815	−4.9612***	I(1)	I(1)

All the variables are in natural logs. ***, **, and * exhibit significance at 1%, 5%, and 10% level, respectively

Table 3 Without asymmetric long and short-run dynamics of EG, SG, and PG (combine effects) *Source* Author's calculation

Variable	Model-I	Model-II	Model-III	Aggregate model
Panel (a): Long run dynamics				
EG	−.1218 (.1031)	–	–	.1746*** (.0361)
SG	–	−.0102 (.0736)	–	.2153*** (.0261)
PG	–	–	.1562*** (.0451)	.0091 (.0525)
PPG	−.1488*** (.0343)	−.1323*** (.0291)	−.1252*** (.0171)	−.0560*** (.0199)
Panel (b): Short-run ECM				
ECT_{t-1}	−.0235*** (.0084)	−.0298*** (.0095)	−.0517*** (.0134)	−.0476 (.0373)

*** reveals significance level at 1%. Standard errors are in parentheses

Table 4 With asymmetric long and short-run dynamics of EG, SG, and PG (combine effects) *Source* Author's calculation

Variable	Model-I	Model-II	Model-III	Aggregate model
Panel (a): Long run dynamics				
EG^+	.1995*** (.0169)	–	–	.1191*** (.0357)
EG^-	−.4321*** (.0617)	–	–	−1.2742*** (.3671)
SG^+	–	.0055 (.0565)	–	−.1386 (.0844)
SG^-	–	−.0737 (.5481)	–	2.0558** (.8501)
PG^+	–	–	.1639*** (.0456)	.1595* (.0901)
PG^-	–	–	.5127 (.4622)	1.6926* (.9925)
PPG	−.0874*** (.0122)	−.11894*** (.0222)	−.1197*** (.0184)	−.1085*** (.0210)
Panel (b): Short-run ECM				
ECT_{t-1}	−.0510 (.035)	−.0318*** (.0095)	−.0555*** (.0140)	−.0201 (.0258)

***, **, and * show significance at 1%, 5%, and 10% level, respectively. Standard errors are in parentheses

has been hypothesized that increased global social integration improves personal contacts between people, including tourism, information, and cultural sharing, all of which contribute to a high standard of life for individuals. These results are identical to the study accomplished by Kiani et al. (2021), Majeed (2019), Mukherjee and Krieckhaus (2012), Majeed (2018), Tsai (2007), Sapkota (2011), Cornia (2001), Jorda and Sarabia (2015). All the symmetric analyses consist of theoretical underpinnings. However, the calculated elasticity is significant and negative in all models relative to population growth. However, the significant and negative error correction term reveals the presence

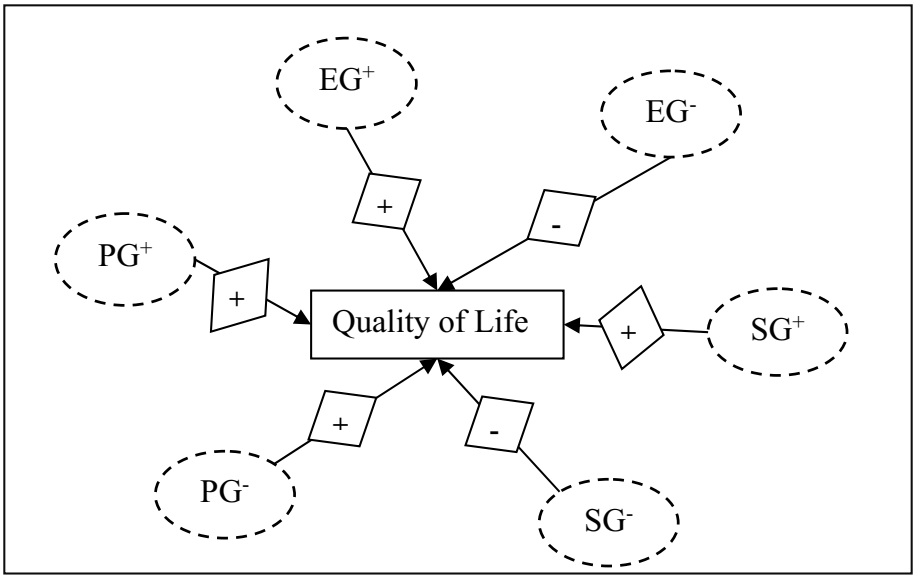

Fig. 2 Expected results of the asymmetric analysis

of long-run association only in all individual models, and the aggregate model shows negative but insignificant results.

Now, concentrating on the asymmetric impact of the three globalization indicators on QOL, Fig. 2 reveals the expected outcomes of the asymmetric models. Empirically, the results of Table 4 indicate that positive shocks in economic globalization (EG^+) exert a significant favorable impact on QOL in the long run. In contrast, negative shocks in economic globalization (EG^-) have a significant adverse impact on QOL. These findings suggest that increases in economic globalization lead to favorable changes in QOL. Also, the response of QOL is positive relative to positive shocks in social globalization (SG^+) but insignificant in the long-run, while adverse fluctuations in social globalization (SG^-) have no significant impact on QOL. In the long run, the coefficient associated with positive fluctuations in political globalization (PG^+) has a significant and positive influence on QOL, while the negative shocks (PG^-) have an insignificant and negative effect on QOL. The findings confirm that an increase in PG enhances QOL. All the asymmetric findings are consistent with the theoretical underpinnings.

When the estimation is performed on the aggregate model, this paper has almost identical findings for EG, SG, and PG. Besides, the response of QOL relative to population growth confirms an adverse and statistically significant for all the models. The significant and negative sign of the error correction term (ECT_{t-1}) for models-II and III confirm the long-run association. Though model-I generates a negative value, it is insignificant.

Following the Wald statistics in Table A2, economic globalization has an asymmetric long-run association with QOL. A short-run asymmetric association does not exist between economic globalization and QOL. Moreover, social and political globalization have no additive symmetric effect in the long or short run. Table A3 presents the outcomes of the Pesaran cross-sectional dependence test and the evidence confirms that the models are free from cross-sectional dependence.

After analyzing the nonlinear behavior, this paper also explores the asymmetric short-run effects of individual countries for all three models. In Table 5, positive fluctuations in economic globalization lead to significant adverse changes in QOL in India, while on the contrary, unfavorable fluctuations produce significant beneficial impacts on QOL in Nepal. For positive shocks in social globalization, QOL falls significantly in Sri Lanka, whereas for negative shocks, QOL rises significantly in Sri Lanka and Nepal but declines in Vietnam. Along the same line, positive shocks in political globalization negatively affect QOL in Sri Lanka and Pakistan at the 10 and 5 percent significant levels respectively. On the other hand, population growth has ambiguous effects on QOL in Pakistan but has a positive influence in India, Nepal, and Bangladesh. In the meantime, the degree of QOL relative to population growth is negative and significant for Vietnam. This work also uses feasible generalized least squares (FGLS) and Driscoll-Kraay standard errors model to check the robustness of this attempt. According to Table A4, this paper confirms the consistency and reliability of all models.

Conclusions and policy suggestions

This paper aims to estimate the nonlinear impact of the different dimensions of globalization on human QOL. We apply panel data of seven developing countries for the 1990–2020 period to investigate the impacts of the three dimensions of globalization, reported by the KOF Index of globalization, on the QOL. Besides the estimation of linear ARDL model, our paper contributes to the field by employing a nonlinear ARDL model to examine the impacts of positive as well as negative shocks in EG, SG, and PG on the QOL.

The findings of the linear ARDL estimation suggest that political globalization generates improvements in the QOL in the selected developing economies. The nonlinear ARDL estimation shows that positive changes in economic and political globalization exert long-term positive impacts on QOL. Adverse shocks in economic globalization negatively affect the QOL in the long term. When we consider economic globalization, positive oscillations hurt the QOL in India, but negative variations have a favorable effect on the QOL in Nepal. In response to positive social globalization shocks, QOL drops dramatically in Sri Lanka; in response to adverse shocks, QOL increases dramatically in Nepal and Sri Lanka but falls

Table 5 Asymmetric short-run dynamics of EG, SG, and PG (Individual country effects) *Source* Author's calculation

	$D(EG^+)$	$D(EG^-)$	D(PPG)
Model-I:	- India**	Nepal*	India***, Nepal***, Pakistan**,
	$D(SG^+)$	$D(SG^-)$	D(PPG)
Model-II:	-Srilanka**	Srilanka*, Nepal**, -Vietnam**	Bangladesh**, India*, -Pakistan*, -Vietnam*
	$D(PG^+)$	$D(PG^-)$	D(PPG)
Model-III:	-Srilanka*, -Pakistan**		Bangladesh**

***, ***, and * exhibit significance at 1%, 5%, and 10%, respectively

in Vietnam. In the same vein, positive PG spikes have an unfavorable impact on the QOL in Pakistan and Sri Lanka at 5% and 10% significant levels, respectively.

According to the results, the governments of Nepal and India should prioritize economic globalization by pursuing a more accommodating trade policy, creating a welcoming atmosphere for foreign investors, and reduce tariffs and import obstacles. Along with developing tourism spots, inviting foreigners to participate, and sending international letters, Sri Lanka, Nepal, and Vietnam should prioritize personal contacts. Further, it is necessary to boost the dissemination of information by establishing reliable access to the Internet, cable TV, radio, and newspapers. Along these lines, Pakistan and Sri Lanka must increase their involvement in UN missions and reaffirm their membership in international organizations.

The overall findings of the paper advocate increasing economic, social, and political globalization in the selected countries because of their desirable impacts on QOL, which policymakers should take into consideration while devising policies to enhance the QOL of citizens.

Appendix

See Tables 6, 7, 8 and 9

Table A1 The index of globalization *Source* KOF Globalization Index

Economic globalization	Social globalization	Political globalization
(a) Actual flows	(a) Data on personal contacts	Embassies in-country
Trade	Transfers(% of GDP)	Participation in UN security missions
Foreign direct investment stock	Outgoing telephone traffic	Membership in an international organization
Foreign direct investment flows	International tourism	
Income payment to foreign nationals	International letters(per capita)	
Portfolio investment	Foreign population(% of total population)	
All the above variables are accepted in percentage (%) of GDP	(b) Data on information flows	
(b) Restrictions	Internet host (per 1000 people)	
Mean tariff rate	Cable television (per 1000 people)	
Hidden import barriers	Internet users per (per 1000 people)	
Capital account restrictions	Radios (per 1000 people)	
Taxes on international trade (percentage of current revenues)	Trade-in a newspaper (% of GDP)	
	(c) Data on cultural proximity	
	Number of IKEAS (per capita)	
	Number of McDonald's restaurants	
	Trade-in books (% of GDP)	

Table A2 Results of the Wald test *Source* Author's calculation

Model	$WD_{Longrun}$	$WD_{Short-run}$
Model-I	114.76*** (0.0000)	0.77 (0.3809)
Model-II	0.02 (0.8818)	2.30 (0.1293)
Model-III	0.59 (0.4407)	1.27 (0.2597)

p-values are in parenthesis. ***, **, and * represent significance level at 1%, 5%, and 10%, respectively

Table A3 Diagnostic tests *Source* Author's calculation

Model	Test	Statistic	Null hypothesis
Model-I	CSD: Pesaran abs test	1.186 (0.2358)	No CSD
Model-II	CSD: Pesaran abs test	0.646 (0.5183)	No CSD
Model-III	CSD: Pesaran abs test	−0.267 (0.7892)	No CSD

p-values are in parenthesis; CSD: Cross-sectional dependence

Table A4 Robustness check *Source* Author's calculation

Variables	Feasible generalized least squares (FGLS)	Driscoll-Kraay standard errors
EG^+	−.0394 (.0311)	−.0394449 (.0533)
EG^-	.1751*** (.0460)	.175104** (.0720)
SG^+	.1161*** (.0349)	.1161796*** (.0211)
SG^-	.8283*** (.2113)	.8283786*** (.1653)
PG^+	.3937*** (.0848)	.393767*** (.1019)
PG^-	−1.0053*** (.2036)	−1.005353*** (.3539)
PPG	−.1461*** (.0175)	−.146122*** (.0518)
Constant	−.6838*** (.0211)	−.6838725*** (.0546)

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Declarations

Conflict of interest The authors declare no conflict of interest.

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