Has Globalization Triggered Collective Impact of National Intelligence on Economic Growth?

Nik Ahmad Sufian Burhan and Abdul Halim Sidek and Yohan Kurniawan and Mohd Rosli Mohamad

Department of Human Sciences, Centre for Language Studies and Generic Development, Universiti Malaysia Kelantan, Legal and Governance Division, Universiti Malaysia Kelantan, Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan

3 November 2014

Has Globalization Triggered Collective Impact of National Intelligence on Economic Growth?

Nik Ahmad Sufian Burhan [a,*], Abdul Halim Sidek [b, c], Yohan Kurniawan [a], Mohd Rosli Mohamad [d]

[a] *Department of Human Sciences, Centre for Language Studies and Generic Development, Universiti Malaysia Kelantan, 16100 Kota Bharu, Malaysia*

[b] *Legal and Governance Division, Universiti Malaysia Kelantan, 16100 Kota Bharu, Malaysia*

[c] *Politics, Security and International Affairs Cluster, National Council of Professors (Majlis Profesor Negara, MPN), Prime Minister's Department, 62200 Putrajaya, Malaysia*

[d] *Office of the Dean, Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, 16100 Kota Bharu, Malaysia*

*****Corresponding author. Tel.: +60194601530

E-mail addresses: nikahmadsufian@yahoo.com (Nik Ahmad Sufian Burhan)

Abstract

Previous studies found that the impact of intelligence (IQ) on productivity is larger at country level than at individual level. Labor works in clusters at the country level, and therefore, the effect of individual skill complementarities collectively magnifies per capita income at the national level, which is consistent with the O-ring theory of economic development. The main feature of the O-ring theory is positive assortative matching, in which individuals can augment productivity per capita when they team up with other individuals with equivalent levels of skills. We investigated whether global integration would intensify this impact owing to global interconnectivity of skills and intellectual ideas. By extending the O-ring theory, we examined the role of economic globalization (i.e., actual flows and restrictions), social globalization (i.e., personal contact, information flows, and cultural proximity), and political globalization in moderating the impact of national IQ on the economic growth of more than 110 countries during 1970–2010. The results of our hierarchical multiple regressions suggest that IQ rather than economic, political, or social globalization has the strongest impact on economic growth. Moreover, moderation analysis

revealed that globalization has reduced the impact of national IQ on economic growth at the cross-country level. We suggest that within the context of globalization, friction was present in the matching market and cognitive skill-sorting inefficiencies, which reduced the collective impact of IQ on economic growth.

Keywords: National IQ, collective IQ, economic growth, globalization, positive assortative matching.

JEL Classifications: D7, F62, I25, J24, O47

1. Introduction

Previous studies have been concerned with the direct impact on economic growth of national average intelligence (IQ), that is, cognitive ability and skills. The studies have concluded that countries with higher IQs generate higher productivity than countries with lower IQs (e.g., Burhan, Mohamad, Kurniawan, & Sidek, 2014a; Jones & Schneider, 2006; Lynn & Vanhanen, 2002, 2006, 2012; Meisenberg, 2012; Rindermann, 2012; Rindermann & Thompson, 2011; Weede & Kämpf, 2002). As the IQ–productivity relationship is robust, some other recent studies have established that it is possible to increase per capita national income by raising the impact of IQ on productivity through the O-ring effect of skill complementarities. Accordingly, with diverse levels of IQ distributed within a country, when individual laborers with equivalent levels of cognitive skills work in groups, they are inclined to cooperate through positive assortative matching, resulting in magnified per capita productivity (Jones, 2011a, 2011b, 2013; Kremer, 1993). For this reason, the impact of IQ on productivity is larger at cross-country level than at individual level (e.g., Hanushek & Kimko, 2000; Jones & Schneider, 2010).

Assortative matching occurs naturally in humans.[1] Arcand and Fafchamps (2012) found positive assortative matching in social attributes, such as proximity between ethnicity

[1] Positive assortative matching theory is comparable with "assortative mating" in population genetics, that is, non-random mating patterns in which individuals with similar characteristics (genotypes and/or phenotypes) tend to mate among each another more frequently than one would expect with random mating (disassortative mating), thereby raising the proportion of the same traits (homozygotes) (Raven, Johnson, Mason, Losos, & Singer, 2011, pp. 401–402). Assortative mating strengthens the mating bond to increase fertility and raises genetic relatedness, which assists communication and altruism, thereby increasing total fitness of a family unit to ensure stability in predictable environments (Wolf & Figueredo, 2011). Assortative mating in human beings

and wealth among affiliates in community-based organizations at cross-country level. Positive assortative matching implies that the probability of success between two partners is positively correlated (Gavrilova, 2014). The idea of assortative matching in productivity was proposed by Shapley and Shubik (1972) and Becker (1973), in which firms are inclined to match highest ability individuals to the most sophisticated and highest paying ventures (Abowd, Kramarz, & Margolis, 1999). Becker (1973) and Pencavel (1998) focused on marriage markets and established that in a household production, it is optimum to pair men and women with similar traits. In a labor market within an industry, such positive assortative matching corresponds to matching highly skilled agents with firms that employ the most sophisticated technology (Albrecht & Vroman, 2002). In addition, with numerous types of agents, the market performs a sorting function, where agents have manifold chances to pair with their complementary peers (Damiano, Li, & Suen, 2005). In academia, for example, co-authorships are organized by teaming up with a partner who is comparatively good at publishing articles, hence, producing a trend of positive assortative matching (Gavrilova, 2014). This is consistent with Bagues and Perez-Villadoniga (2012), who showed that in a natural experiment, recruiters favor candidates who are equivalent to their own assortment of skills to work together as a team. Since the assortative matching occurs only through cognitive ability, in the labor market, a worker lacking social skills but possessing excellent cognitive ability may nonetheless have a high wage (McCann, Shi, Siow, & Wolthoff, 2012). At global level, the O-ring effect of assortative matching of skills has taken place among firms of different countries. For example, Davidson, Matusz, and Shevchenko (2008), Davidson, Heyman, Matusz, Sjöholm, and Zhu (2012; 2014), and Helpman, Itskhoki, and Redding (2010) found robust empirical evidence that increased openness to international trade improves the positive assortative matching of skills in productivity, especially in industries with greater comparative advantage. This shows that globalization may enhance the effectiveness of positive assortative matching practices in the labor market.

Almost all previous works assumed that firms within an industry are identical and labor markets are competitive; thus, they were concerned with sorting labor at cross-sectoral

includes such factors as physical traits, education, intelligence, religious beliefs, socioeconomic status, and political ideology (Bouchard & McGue, 1981; Escorial & Martín-Buro, 2012; Huber & Fieder, 2011; Kail & Cavanaugh, 2013, pp. 294; Wilson, 2000, pp. 80). A recent study on US census data by Greenwood, Guner, Kocharkov, and Santos (2014) found a rise in assortative mating in which the percentage of university graduates who married each other increased from 25% in 1960 to 48% in 2005. This produced divergence between highly educated and less educated groups, thus, magnifying the Gini coefficient of household income inequality from .34 to .43 (Greenwood et al., 2014). We suggest that this magnification effect is because of the O-ring effect of education on income.

level in order for sorting to be effective (Davidson et al., 2012). By extending the O-ring effect, our study analyses the role of globalization in moderating the impact of IQ on productivity at cross-country level. We question whether globalization has magnified the impact of national IQ on economic growth in previous decades. Through globalization in particular, national societies may encounter larger frameworks for economic freedom and be exposed to a more prolific network of complementary choices of ideas and skills. Through knowledge sharing across borders (Brown, Lauder, & Ashton, 2008), countries that open up their economic, social, and political frontiers will allow these complementary agents with similar levels of cognitive skills to collaborate through positive assortative matching, thus, enhancing collective IQ. Therefore, the O-ring theory should predict that globalization fosters collaboration between not only two high IQ agents, but also two low IQ agents. This is consistent with Albrecht and Vroman (2002) and Acemoglu (1999), that skill-biased technological change raises the productivity gap between high skill and low skill labor, thus amplifying the degree of positive assortative matching. In addition, a more globalized country would be exposed to positive externalities, with economic growth and innovation being dependent on knowledge spillover among agents (Lucas, 1988; Romer, 1986). This occurs between two countries when agents with sufficient levels of absorptive capacity of knowledge (e.g., cognitive ability) learn from agents with more experience (Audretsch & Feldman, 2004; Caloghirou, Kastelli, & Tsakanikas, 2004; Carlino, 2001; Cohen & Levinthal, 1989, 1990; Lagerström & Andersson, 2003; Stuetzer, Obschonka, Brixy, Sternberg, & Cantner, 2014; Zahra & George, 2002). This may occur not only as a result of face-to-face interaction between laborers but also through cultural activities and social networking, whereby economic and geographic clusters integrate social capital and link it to economic prosperity (Porter, 1998, pp. 227; Porter, 2000; Staber, 2007). Therefore, by extending the O-ring effect, we examine whether globalization has produced a collective impact of IQ on economic growth rates at a cross-country level (see Figure 1), where economic growth centers on the interconnectivity of skills and intellectual ideas (Glaeser, 1996).

[Insert Figure 1 here]

2. Globalization, IQ, and the O-ring Theory of Economic Development

Hanushek and Kimko (2000) and Jones and Schneider (2010) revealed that cognitive ability is important more for groups than for individuals: a small difference in levels of cognitive ability causes a small difference between individuals' wages within a country but is related to a large and permanent difference of private marginal product of labor across countries. Similar findings were established by Bils and Klenow (2000) and Krueger and Lindahl (2001), who employed education attainment (average years of schooling) instead of IQ scores and found that the schooling–productivity relationship was larger at a cross-country than at an individual level. In addition, the impact of human capital increments on growth was found to be greater among nations with larger wealth inequality. For instance, Hall and Jones (1999) found that the differences in productivity per worker between the five richest and five poorest countries produced a factor of 8.3, while the differences in workers' education achievements within those regions produced a factor of only 2.2. These findings can be explained by the O-ring theory, which emphasizes the complementarities among inputs in production processes (Kremer, 1993). The theory asserts that tasks of production must be executed efficiently by all workers together in order for these to be of high value. The main feature of the O-ring theory is positive assortative matching, in which individuals with equivalent levels of skills work together. By treating workers' skills as inputs in production, this theory postulates that skillful workers can augment productivity when their colleagues are also skillful workers, rather than if their colleagues' skills are substandard. Lower IQ workers would gain more profit if they worked with higher IQ workers, but this would tend to lower the total productivity of the whole economy. Therefore, the O-ring theory suggests that it is more efficient for lower skilled workers to work with complementary lower skilled agents with equivalent levels of cognitive skills. We consider the case of two types of workers with IQ levels q_L and q_H, where $q_H > q_L$. Kremer (1993) assumed that for effective labor, $q_L = 0.5q_H$ and production output is a product of workers' quality $Y = q*q$. With a fixed amount of workers and identical numbers of both types of workers, the O-ring theory suggests that it is more efficient to arrange workers into production in which all workers have the same quality:

$$q_H^2 + q_L^2 = 1.25q_H^2 > 2q_Hq_L = q_H^2$$

Resulting from the O-ring effect, the impact of such skill complementarities has led to vast wage discrepancies between workers in two firms, even when their individual skills levels are only slightly different (Kremer, 1993). Jones (2011a, 2011b, 2013) extended this logic of O-ring-type production technology to explain why a small cross-country difference in IQ is magnified into huge income differences across nations. Accordingly, a variation in the level of cognitive skills might not appear to be particularly significant for an individual's income within a country, but the collective impact of a country's IQ could cumulatively lead to very large productivity divergences across countries because those individuals work in clusters.

By extending this issue, an additional question is raised: if many countries amalgamate and form a larger global community, is there a possibility that the impact of national IQ on productivity would also be amplified through the O-ring effect? The answer to this question could best be considered with the role of globalization in purporting to minimize the non-integrating gap between countries (Barnett, 2005), as well in fostering interconnectivity between civilizations, institutions, and societies, whereby the accelerating interdependence of countries in a world system is associated with economic activities via mass media and modern transportation (Kottak, 2011, pp. 396). Through increased specialization and the principle of comparative advantage (Bhagwati, 2004; Croucher, 2004), globalization has formed a larger global community and, consequently, developed advanced platforms for transnational circulation of culture, media, technology, finance, and exchange of ideas (Kottak, 2011, pp. 43), assuming that nonrivalry of ideas and knowledge are directed towards increasing returns to scale (Acemoglu, 1996; Romer, 1986, 1990). Such outcomes have created "imagined communities" (Anderson, 2006), as cultures are not bound within specific regions but are distributed globally (Kottak, 2011, pp. 383), and societies can make use of the same reading materials and assimilate the same ideas without face-to-face communication (Appadurai, 1996, pp. 29; Gupta & Ferguson, 1992). Therefore, the degree of global community should refer not only to the degree of economic globalization but also to associated measures of social and political globalization. As specified by Dreher (2006) and Dreher, Gaston, and Martens (2008), globalization occurs via three dimensions: economic, social, and political. The authors of these studies define economic globalization as long distance flows of capital, goods, and services as well as information and perceptions associated with market exchanges; political globalization as the diffusion of government policies; and social globalization as the distribution of ideas, information, images, and people. These dimensions have led to global interconnectivity, integration, and interdependence

among individuals, knowledge, ideas, and skills in different countries. Altogether, people's global interconnectivity positively induces a "peer effect," which enhances their productivity, as has been proved empirically in various fields of study, such as development studies (e.g., Foster & Rosenzweig, 1996; Godlonton & Thornton, 2012; Miguel & Kremer, 2004), education (e.g., Brunello, De Paola, & Scoppa, 2010; Carrell, Fullerton, & West, 2009; Rindermann & Heller, 2005), industrial organization (e.g., Aschhoff & Grimpe, 2012; Mas & Moretti, 2009), and labor (e.g., Kling, Liebman, & Katz, 2007; Owens 2012). Globalization is focused consistently on the swift development of science and technology and on increasing cross-country division of labor, which encourages countries to reduce trade barriers steadily and open up their current accounts and capital accounts (Shangquan, 2000). It involves the practice of economic freedom around the world. Gwartney and Lawson (2003) delineated four elements of economic freedom: (1) individual choice rather than group preference, (2) voluntary trade synchronized by markets rather than distribution through the political route, (3) self-determination to participate and compete in markets, and (4) protection of individuals and their possessions from the violence of other parties. These criteria for freedom would motivate individual agents to join the global framework and freely choose their most suitable complementary partners in the interests of mutual productivity. In our study, the strength of peoples' interconnectivity is the basis for globalization moderating the impact of IQ on economic growth, with an assumption that individuals with equivalent levels of cognitive ability collaborate in clusters through positive assortative matching, which is consistent with the O-ring effect of skill complementarities. For this reason, whether globalization has increased the potential impact of national IQ on economic growth is precisely the question we attempted to answer.

3. Methodology

Based on the O-ring theory of economic development and theories of globalization, we constructed two assumptions (1 and 2) that generated a preconclusion (3) in our study:

1. Within a country, individuals with specific levels of skills augment productivity when they team up with colleagues who have complementary levels of skills.
2. Globalization intensifies people's interconnectivity across countries and enables them to freely choose complementary skills that are mutually profitable and productive.

3. Based on Assumptions 1 and 2, greater globalization would amplify the impact of national average IQ on economic growth rates over time.

To investigate the role of globalization in moderating the IQ–growth relationship, we employed a standard economic growth model as follows:

$$GROWTH_{\mathrm{i}} = \beta_0 + \beta_1(Y_{1970})_{\mathrm{i}} + \beta_2 IGDP_{\mathrm{i}} + \beta_3 IQ_{\mathrm{i}} + \beta_4 X_{\mathrm{i}} + \beta_5(IQ * X)_{\mathrm{i}} + e_{\mathrm{i}}$$

where the dependent variable is *GROWTH*, which denotes the average growth rate of real GDP per capita over the 1970–2010 period. Y_{1970} and *IGDP* are two control variables, initial GDP per capita in 1970 and investment as a percentage of annual GDP averaged over the years 1970–2010, respectively. These two control variables are employed in most standard growth models (e.g., Mankiw, Romer, & Weil, 1992; Minier, 2007; Ram, 2007). Data on *GROWTH*, Y_{1970}, and *IGDP* were obtained from Penn World Table 7.1 (Heston, Summers, & Aten, 2012). *IQ* is the national average IQ for a specific country *i*, obtained from Meisenberg and Lynn (2011). In addition, we included *X*, which is a set of globalization variables to moderate growth through the impact of *IQ* on *GROWTH*. Lastly, e_{i} is an error term. We hypothesized that the relationship between *IQ* and *GROWTH* would be affected by each value of *X*. Following Dawson (2014) and Zajenkowski, Stolarski, and Meisenberg (2013), we constructed an interaction term (*IQ*X*) that is the cross product of the two predictor variables. To overcome a collinearity problem between lower order terms and their interactions, we followed procedures suggested by Burhan, Mohamad, Kurniawan, and Sidek (2014b), Frazier, Tix, and Barron (2004), and Dawson (2014), in which all variables (*GROWTH*, Y_{1970}, *IGDP*, *IQ*, and *X*) were standardized to a standard deviation of one. Then, we standardized the value of the interaction term (*IQ*X*) constructed from these standardized predictor values.

Table 1 shows the list of countries ranked by selected variables. We employed a set of *X*'s representing the degree of globalization in terms of economic, political, and social integration. All data on globalization were obtained from the KOF Index of Globalization (Dreher, 2012), which was introduced originally by Dreher (2006) and was updated and described in detail in Dreher et al. (2008). We obtained annual values averaged for the years 1970–2010. Each *X* was incorporated individually into the regression model as follows.

i. Economic globalization index, *ECONOMIC*

This index was constructed from two subindexes, that is, actual flows and restrictions.

ACTUAL_FLOWS refers to the subindex on actual economic flows and includes data on trade, portfolio investment, and stocks of foreign direct investment. In particular, trade is the total of a country's exports and imports and portfolio investment is the total of a country's stock of assets and liabilities normalized by gross domestic product (GDP). In addition, income payments to foreign nationals and capital were incorporated as a proxy for the degree to which a country employs foreigners in production activities.

RESTRICTIONS refer to boundaries on trade and capital using hidden import barriers, mean tariff rates, taxes on international trade (as a share of current revenue), and an index of capital controls. Assigned a specified degree of trade, a country with more revenue from tariffs is considered to be less globalized. Nations were given lower ratings as their mean tariff rate rose. The rating dropped toward 0 as the mean tariff rate approached 50%.

ii. Social globalization index, *SOCIAL*

This index was constructed from three subindexes, that is, personal contacts, information flows, and cultural proximity:

CONTACT measures direct interaction between populations of different nations. It includes international telecommunications traffic (in minutes per person) and number of tourists (incoming and outgoing) to which a national population is exposed. Government and workers' transfers received and paid (as a percentage of GDP) indicate the extent to which nations interact, whereas the stock of foreign population was incorporated to measure existing interactions with society from other nations. In addition, the number of international letters received and sent captures direct interaction between populations living in different nations.

INFORMATION measures the possible flow of ideas and images, including the number of internet users (per 100 people), the ratio of families with a television set, and international newspapers traded (as a percentage of GDP). All these indicators contribute to the global distribution of ideas because, to some extent, they signify the potential for receiving news from other nations.

CULTURAL includes the value of imported and exported books (relative to GDP) because traded books are a proxy for the extent to which beliefs and values circulate across a country's borders. Furthermore, cultural globalization refers mainly to the dominance of US cultural products. Because the United States is a dominant force in the global sociocultural environment, cultural proximity includes the number of McDonald's restaurants in a nation. For most populations, the global distribution of McDonald's has become a symbol for globalization itself. In addition, the number of IKEA per country is used.

iii. Political globalization index, *POLITICAL*

This refers to the diffusion of government policies and includes the number of embassies and high commissions in a nation, the number of international organizations of which the nation is a member, and the number of peacekeeping missions conducted by the United Nations in which a nation participates. In addition, political globalization incorporates the number of agreements authorized between nations since 1945.

[Insert Table 1 here]

4. Results

Table 2 shows the correlation matrix for all variables. Table 3 shows correlation between IQ and economic growth in two separate groups of countries, that is, more globalized and less globalized countries. Accordingly, IQ–economic growth correlation was substantially higher in the less globalized region (r=.598–.668) than in the more globalized region (r=.159–.429). Figure 2 shows that the slopes for IQ–economic growth correlation were higher for less globalized than more globalized countries. These correlation values r=.64 for less globalized and r=.31 for more globalized countries were calculated based on Table 3 by averaging the six correlation values for each group.

[Insert Table 2 here]

[Insert Table 3 here]

[Insert Figure 2 here]

Tables 4, 5, and 6 provide a summary of hierarchical multiple regression analyses. We used 26 models based on the inclusion and exclusion of the present variables. All models included Y_{1970} and *IGDP* but varied with regard to the inclusion of other variables and interaction terms. Principally, all models reveal a strong potency of IQ relative to other determinants of economic growth as IQ was significant (p<.01) in all regressions. According to Table 4, there was a substantial rise in adjusted *R*-squared between Model 1 (R^2=.266) and Model 2 (R^2=.551) after we accounted for national IQ in growth. In line with this, Model 2 explained about 56.3% of the variation in economic growth, in which one standard deviation rise in IQ increased economic growth rates by a standard deviation of .782. When IQ and interaction terms were added into our estimations, *POLITICAL* (Model 5) and *ECONOMIC* (Model 8) maintained their significance at p<.01. *SOCIAL* (Models 9, 10 and 11) was nonsignificant in all models. Hence, *POLITICAL* and *ECONOMIC* are more essential for economic growth in comparison with *SOCIAL*. While *IQ*SOCIAL* (Model 11) was nonsignificant, we found that *IQ*ECONOMIC* (Model 8) was negatively significant at p<.05, while *IQ*POLITICAL* (Model 5) was negatively significant at p<.01 and increased the adjusted R^2 from its lower order model. Accordingly, a rise in *ECONOMIC* and *POLITICAL* would reduce the impact of *IQ* on economic growth.

[Insert Table 4 here]

The next step was to separate the measure of economic globalization into actual flows and restrictions, as shown in Table 5. We found that *ACTUAL_FLOWS* and *RESTRICTIONS* were significant at the p<.01 level when the *IQ* and interaction terms were included together in the regressions (Models 3 and 6). Accordingly, a rise in actual flows would positively increase the economic growth rate, while a rise in restrictions would have a negative effect. This shows that the increase in the size of international trade as well as the removal of trade barriers tend to enhance economic growth. Furthermore, *IQ*ACTUAL_FLOW* was nonsignificant, while *IQ*RESTRICTION* was positively significant at the p<.05 level. Accordingly, an increase in *RESTRICTION* would raise the impact of *IQ* on economic growth.

[Insert Table 5 here]

In addition, we separated the measure of social globalization into personal contacts, information flows, and cultural proximity. As shown in Table 6, we found that the

independent effect of *CONTACT* (Model 3), *INFORMATION* (Model 6), and *CULTURAL* (Model 9) were positively significant after the inclusion of *IQ* and interaction terms into the regressions. This indicates that an increase in the degree of personal contact, information flows, and cultural proximity between two or more countries will directly encourage more economic activities that enhance the cross-national growth of productivity. Furthermore, these three measures were significant moderators as they were negatively significant in moderating the impact of *IQ* on economic growth rates. This demonstrates that an inverse relationship exists between national IQ and personal contact, information flows, and cultural proximity on economic growth.

[Insert Table 6 here]

5. Discussion

The main objective of our study was to examine the effect of globalization and its role in moderating the impact of national IQ on economic growth. The study established that IQ rather than economic, political, or social globalization has the strongest impact on economic growth. Among the factors of globalization, we found that the independent effects of political globalization, actual flows, personal contact, information flows, and cultural proximity on economic growth were significantly positive; and the effect of restrictions was significantly negative. In addition, we found that political globalization, personal contact, information flows, and cultural proximity were significantly negative in moderating the effect of national IQ on growth, while economic restrictions were a positively significant moderator. Actual flows were a nonsignificant moderator. Furthermore, the magnitudes of the all interaction terms were smaller than their lower order predictors independently.

Our study was conceptualized based on Kremer's O-ring theory of economic development and the various theories of globalization. Accordingly, individuals with given levels of skills can enhance productivity when they work with colleagues who have complementary levels of skills through positive assortative matching of cognitive skills. By maintaining the principles of globalization that foster interconnectivity between people across nations, we deduced that globalization could serve as an essential platform for societies of different countries to communicate and freely choose their complementary skills for mutual

profit and productivity. Therefore, we proposed that greater globalization would positively magnify the IQ–growth relationship. However, our empirical findings were in contrast to our hypothesis: we found that components of globalization *did* reduce the impact of IQ on economic growth during 1970–2010.

Based on our findings, we deduce that globalization in the previous four decades has not strengthened but weakened the collective impact of IQ on economic growth at the cross-country level. We propose two possible underlying mechanisms that might serve to explain this phenomenon. First, positive assortative matching of cognitive skills has not been all embracing within the globalization process. The practice of free will through globalization has not fostered cognitive skill complementarities comprehensively among global populations with different political backgrounds and cultures, but instead has worsened the positive assortative matching of IQ on economic growth across countries. This occurs where positive assortative matching may be impeded by the existence of friction in the matching market (Shimer & Smith, 2000). Theoretically, in a matching market with the presence of ideally positive assortative matching, the discrepancy in probability of success between the two complementary agents would approach zero. Therefore, in the presence of friction, a discrepancy in the probability of success between two complementary agents would deviate from zero to the discrepancies in mean probability of success separating the two demographic groups (Shimer & Smith, 2000; Smith, 2006). Moreover, through globalization, there are large numbers and types of agents that participate in the matching market, and they all seek high earnings and productivity. However, in each matching round, to match with their peers across countries, it may occur that there are more types of peers than the number of matching rounds, which leads to sorting inefficiency in the matching market (Damiano, Li, & Suen, 2005). Furthermore, it may be that most agents participate more in comparatively disadvantaged industries than in comparatively advantaged industries. This trend has been observed in Davidson et al. (2008; 2014), whereby positive assortative matching increases in comparatively advantaged industries but it decreases in comparatively disadvantaged industries; this imperfect matching causes productivity losses (Hsieh & Klenow, 2009).

Second, it could be that the forces of international neoliberal politics and multiculturalism policies through globalization have resulted in the widening of socioeconomic inequalities within a national society, and consequently, led to loss of its social cohesion (Ariely, 2012; Barry, 2001, pp. 88; Coburn, 2000, 2004; Green, Janmaat, &

Cheng, 2011; Green, Preston, & Janmaat, 2006, pp. 4). Social cohesion concerns how positively individuals in a group bond to one another (Lockwood, 1992, 1999) by sharing collective values and purpose in a society, and having a sense of belonging and solidarity for individuals from various backgrounds (Cheong, Edwards, Goulbourne, & Solomos, 2007). Socioeconomic equalities make individuals feel to some extent that they are in the same boat, which are fundamentals of a collective solidarity connecting not just individuals but also national citizens (Ranci, 2011). Individuals prefer and trust others with whom they share similar characteristics (McPherson & Smith-Lovin, 2002; Uslaner, 2003). Therefore, the widening of socioeconomic inequalities owing to globalization will simply weaken the social cohesion of a society (Eraydin, 2008; Ratcliffe & Newman, 2011; Robinson, 2013; Turok, 2005). We suggest that this may occur through increasing social and cultural disparity and differences in political ideologies between individuals with similar IQ levels, which makes trusting and tolerance harder, and subsequently, discourages cooperation or assortative matching of cognitive skills among these individuals. In line with this discussion, our arguments on friction in the matching market, cognitive skill-sorting inefficiencies, and socioeconomic inequality induced by globalization may explain why the positive impact of national IQ on economic growth has been declining at cross-country level. We suggest that it would be insightful for future studies to analyze these mechanisms so that societies may utilize globalization as a useful channel to boost the impact of national IQ on economic growth.

Acknowledgment The authors would like to thank three anonymous reviewers and the editor of Intelligence, Douglas K. Detterman (Louis D. Beaumont University Professor Emeritus at the Department of Psychological Sciences, Case Western Reserve University, Ohio, USA) for their valuable suggestions. The first author would like to express his deepest thanks to Garett B. Jones (BB&T Professor for the Study of Capitalism at the Mercatus Center, George Mason University, Virginia, USA) for his helpful advice, and a professional proofreader from Elsevier. Responsibility for all errors and omissions remains our own.

References

Abowd, J. M., Kramarz, F., & Margolis, D. N. (1999). High wage workers and high wage firms. *Econometrica, 67,* 251–333.

Acemoglu, D. (1996). A microfoundation for social increasing returns in human capital accumulation. *Quarterly Journal of Economics, 111,* 779–804.

Acemoglu, D. (1999). Changes in unemployment and wage inequality: An alternative theory and some evidence. *American Economic Review, 89,* 1259–1278.

Albrecht, J., & Vroman, S. (2002). A matching model with endogenous skill requirements. *International Economics Review, 43,* 282–305.

Anderson, B. (2006). *Imagined communities: Reflections on the origin and spread of nationalism.* New York, NY: Verso.

Appadurai, A. (1996). *Modernity al large: Cultural dimensions of globalization.* Minneapolis: University of Minnesota Press.

Arcand, J. L., & Fafchamps, M. (2012). Matching in community-based organizations. *Journal of Development Economics, 98,* 203–219.

Ariely, G. (2012). Globalisation and the decline of national identity? An exploration across sixty-three countries. *Nations and Nationalism, 18,* 461–482.

Aschhoff, B., & Grimpe, C. (2012). Peer effects and academics' industry involvement: The moderating role of age on professional imprinting. *ZEW Discussion Paper 12–011*. Mahhheim: Center for European Economic Research

Audretsch, D. B., & Feldman, M. P. (2004). Knowledge spillovers and the geography of innovation. In J. V. Henderson, & J. F. Thisse (Eds.), *Handbook of regional and urban economics* (pp. 2713–2739). New York: Elsevier.

Bagues, M., & Perez-Villadoniga, M. J. (2012). Do recruiters prefer applicants with similar skills? Evidence from a randomized natural experiment. *Journal of Economic Behavior & Organization, 82,* 12–20.

Barnett, T. P. M. (2005). *The Pentagon's new map: War and peace in the twenty-first century*. New York: Penguin.

Barry, B. (2001). *Culture and equality.* Cambridge, Massachusetts: Harvard University Press.

Becker, G. S. (1973). A theory of marriage: Part I. *Journal of Political Economy, 81,* 813–846.

Bhagwati, J. (2004). *In defense of globalization.* New York: Oxford University Press.

Bils, M., & Klenow, P. J. (2000). Does schooling cause growth? *American Economic Review, 90*, 1160–1183.

Bouchard T. J. & McGue M. (1981). Familial studies of intelligence: A review. *Science, 212,* 1055–1059.

Brown, P., Lauder, H., & Ashton, D. (2008). *Education, globalisation and the knowledge economy: A commentary by the Teaching and Learning Research Programme.* London: TLRP Institute of Education.

Brunello, G., De Paola, M., & Scoppa, V. (2010). Peer effects in higher education: Does the field of study matter? *Economic Inquiry, 48*, 621–634.

Burhan, N. A. S., Mohamad, M. R., Kurniawan, Y., & Sidek, A. H. (2014a). The impact of low, average, and high IQ on economic growth and technological progress: Do all individuals contribute equally?. *Intelligence, 46*, 1–8.

Burhan, N. A. S., Mohamad, M. R., Kurniawan, Y., & Sidek, A. H. (2014b). National intelligence, basic human needs, and their effect on economic growth. *Intelligence, 44,* 103–111.

Caloghirou, Y., Kastelli, I., & Tsakanikas, A. (2004). Internal capabilities and external knowledge sources: Complements or substitutes for innovative performance?. *Technovation, 24*, 29–39.

Carlino, G. A. (2001). Knowledge spillovers: Cities' role in the new economy. *Federal Reserve Bank of Philadelphia Business Review, Q4*, 17–23.

Carrell, S. E., Fullerton, R. L., & West, J. R. (2009). Does your cohort matter? Measuring peer effects in college achievement. *Journal of Labor Economics, 27*, 439–464.

Cheong, P. H., Edwards, R., Goulbourne, H., & Solomos, J. (2007). Immigration, social cohesion and social capital: A critical review. *Critical Social Policy, 27*, 24–49.

Coburn, D. (2000). Income inequality, social cohesion and the health status of populations: The role of neoliberalism. *Social Science & Medicine, 51*, 135–146.

Coburn, D. (2004). Beyond the income inequality hypothesis: Class, neo-liberalism, and health inequalities. *Social Science & Medicine, 58*, 41–56.

Cohen, W. M., & Levinthal, D. A. (1989). Innovation and learning: the two faces of R&D. *Economic Journal, 99*, 569–596.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*, 128–152.

Croucher, S. L. (2004). *Globalization and belonging: The politics of identity in a changing world.* Maryland and Oxford: Rowman and Littlefield.

Damiano, E., Li, H., & Suen, W. (2005). Unravelling of dynamic sorting. *Review of Economic Studies, 72*, 1057–1076.

Davidson, C., Heyman, F., Matusz, S., Sjöholm, F., & Zhu, S. C. (2012). Liberalized trade and worker-firm matching. *American Economic Review, 102*, 429–434.

Davidson, C., Heyman, F., Matusz, S., Sjöholm, F., & Zhu, S. C. (2014). Globalization and imperfect labor market sorting. *IFN Working Paper No. 856.* Stockholm: Research Institute of Industrial Economics.

Davidson, C., Matusz, S. J., & Shevchenko, A. (2008). Globalization and firm level adjustment with imperfect labor markets. *Journal of International Economics, 75*, 295–309.

Dawson, J. F. (2014). Moderation in management research: What, why, when, and how. *Journal of Business and Psychology, 29*, 1–19.

Dreher, A. (2006). Does globalization affect growth? Empirical evidence from a new index. *Applied Economics, 38*, 1091–1110.

Dreher, A. (2012). KOF Index of Globalization. ETH Zurich. Available online at: http://globalization.kof.ethz.ch/.

Dreher, A., Gaston, N., & Martens, P. (2008). *Measuring globalization: Gauging its consequences.* New York: Springer.

Eraydin, A. (2008). The impact of globalisation on different social groups: Competitiveness, social cohesion and spatial segregation in Istanbul. *Urban Studies, 45*, 1663–1691.

Escorial, S., & Martín-Buro, C. (2012). The role of personality and intelligence in assortative mating. *Spanish Journal of Psychology, 15*, 680–687.

Foster, A. D., & Rosenzweig, M. R. (1996). Comparative advantage, information and the allocation of workers to tasks: Evidence from an agricultural labour market. *Review of Economic Studies, 63*, 347–374.

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology. *Journal of Counseling Psychology, 51*, 115–134.

Gavrilova, E. (2014). A partner in crime: Assortative matching and bias in the crime market. *NHH Dept. of Economics Discussion Paper No. 25/2014.* Bergen: Norwegian School of Economics.

Glaeser, E. (1996). Economic growth and urban density: A review essay. In *Cities and the new global economy conference proceedings, Vol. 3.* (pp. 227–246). Government Printing Office: Melbourne.

Godlonton, S., & Thornton, R. (2012). Peer effects in learning HIV results. *Journal of Development Economics, 97*, 118–129.

Green, A., Janmaat, G., & Cheng, H. (2011). Social cohesion: Converging and diverging trends. *National Institute Economic Review, 215*, R6–R22.

Green, A., Preston, J., & Janmaat, G. (2006). *Education, equality and social cohesion: A comparative analysis*. London: Palgrave.

Greenwood, J., Guner, N., Kocharkov, G., & Santos, C. (2014). Marry your like: Assortative mating and income inequality. *American Economic Review,104*, 348–353.

Gupta, A., & Ferguson, J. (1992). Beyond "culture": Space, identity, and the politics of difference. *Cultural Anthropology, 7*, 6–23.

Gwartney, J., & Lawson, R. (2003). The concept and measurement of economic freedom. *European Journal of Political Economy, 19*, 405–430.

Hall, R. E., & Jones, C. I. (1999). Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics, 114*, 83–116.

Hanushek, E. A., & Kimko, D. D. (2000). Schooling, labor-force quality, and the growth of nations. *American Economic Review, 90*, 1184–1208.

Helpman, E., Itskhoki, O., & Redding, S. (2010). Inequality and unemployment in a global economy. *Econometrica, 78*, 1239–1283.

Heston, A., Summers, R., & Aten, B. (2012). Penn World Table (Version 7.1). Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, November 30, 2012. Available online at https://pwt.sas.upenn.edu/php_site/pwt71/pwt71_form.php.

Hsieh, C. T., & Klenow, P. J. (2007). Misallocation and manufacturing TFP in China and India. *Quarterly Journal of Economics, 124*, 1403–1448.

Huber, S., & Fieder, M. (2011). Educational homogamy lowers the odds of reproductive failure. *PloS One, 6*(7), E22330.

Jones, G. (2011a). National IQ and national productivity. In S. N. Durlauf, & L. E. Blume (Eds.), *The new Palgrave dictionary of economics* [Online Version]. Palgrave Macmillan.

Jones, G. (2011b). National IQ and national productivity: The hive mind across Asia. *Asian Development Review, 28*, 51−71.

Jones, G. (2013). The O-Ring sector and the foolproof sector: An explanation for skill-externalities. *Journal of Economic Behavior and Organization, 85*, 1–10.

Jones, G., & Schneider, W. J. (2006). Intelligence, human capital, and a Bayesian averaging of classical estimates (BACE) approach. *Journal of Economic Growth, 11*, 71–93.

Jones, G., & Schneider, W. J. (2010). IQ in the production function: Evidence from immigrant earnings. *Economic Inquiry, 48*, 743–755.

Kail, R., & Cavanaugh, J. (2013). *Human development: A life-span view.* Belmont, CA.: Wadsworth, Cengage Learning.

Kling, J., Liebman, J., & Katz, L. (2007). Experimental analysis of neighbourhood effects. *Econometrica, 75*, 83–119.

Kottak, C. P. (2011). *Cultural anthropology: Appreciating cultural diversity* (14th ed.). Boston: McGraw-Hill.

Kremer, M. (1993). The O-Ring theory of economic development. *Quarterly Journal of Economics, 108*, 551–575.

Krueger, A. B., & Lindahl, M. (2001). Education for growth: Why and for whom? *Journal of Economic Literature, 39*, 1101–1136.

Lagerström, K., & Andersson, M. (2003). Creating and sharing knowledge within a transnational team—the development of a global business system. *Journal of World Business, 38*, 84–95.

Lockwood, D. (1992). *Solidarity and schism: The problem of disorder in Durkeimian and Marxist sociology.* Oxford: Clarendon Press.

Lockwood, D. (1999). Civic integration and social cohesion. In: I. Gough, & G. Olofsson (Eds.), *Capitalism and social cohesion: Essay on exclusion and integration,* (pp. 63–84). New York: Palgrave Macmillan.

Lucas, R. (1988). On the mechanics of economic development. *Journal of Monetary Economics, 22*, 3–42.

Lynn, R., & Vanhanen, T. (2002). *IQ and the wealth of nations*. Westport, CT: Praeger.

Lynn, R., & Vanhanen, T. (2006). *IQ and global inequality.* Augusta, GA: Washington Summit.

Lynn, R., & Vanhanen, T. (2012). *Intelligence: A unifying construct for the social sciences*. London: Ulster Institute for Social Research.

Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics*, *107*, 407–437.

Mas, A., & Moretti, E. (2009). Peers at work. *American Economic Review, 99*, 112–145.

McCann, R. J., Shi, X., Siow, A., & Wolthoff, R. P. (2012). Becker meets Ricardo: Multisector matching with social and cognitive skills. *IZA Discussion Papers 6533.* Bonn: Institute for the Study of Labor (IZA).

McPherson, M., & Smith-Lovin, L. (2002). Cohesion and membership duration: Linking groups, relations and individuals in an ecology of affiliation. *Advances in Group Processes*, *19*, 1–36.

Meisenberg, G. (2012). National IQ and economic outcomes. *Personality and Individual Differences, 53*, 103–107.

Meisenberg, G., & Lynn, R. (2011). Intelligence: A measure of human capital in nations. *Journal of Social, Political and Economic Studies, 36*, 421–454.

Miguel, E., & Kremer, M. (2004). Worms: Identifying impacts on education and health in the presence of treatment externalities. *Econometrica, 72*, 159–217.

Minier, J. (2007). Nonlinearities and robustness in growth regressions. *American Economic Review, 97*, 388–392.

Owens, M. (2012). Responsibility-alleviation and other-regarding preferences with peer workers in labor markets: An experimental investigation. *Journal of Labor Research, 33*, 353–369.

Pencavel, J. (1998). Assortative mating by schooling and the work behavior of wives and husbands. *American Economic Review*, *88,* 326–329.

Porter, M. E. (1998). *On competition.* Boston, MA: Harvard Business School Press.

Porter, M. E. (2000). Locations, clusters, and company strategy. In G. L. Clark, M. P. Feldman, & M. S. Gertler (Eds.), *The Oxford handbook of economic geography*, (pp. 253–274). Oxford University Press: Oxford,

Ram, R. (2007). IQ and economic growth: Further augmentation of Mankiw–Romer–Weil model. *Economics Letters*, *94*, 7–11.

Ranci, C. (2011). Competitiveness and social cohesion in Western European cities. *Urban Studies, 48*, 2789–2804.

Ratcliffe, P., & Newman, I. (Eds.) (2011). *Promoting social cohesion: Implications for policy and evaluation*. Bristol: Policy Press.

Raven, P., Johnson, G. B., Mason, K. A., Losos, J. B., & Singer, S. S. (2011). *Biology* (9th ed.). New York: McGraw Hill.

Rindermann, H. (2012). Intellectual classes, technological progress and economic development: The rise of cognitive capitalism. *Personality and Individual Differences*, *53*, 108–113.

Rindermann, H., & Heller, K. A. (2005). The benefit of gifted classes and talent schools for developing students' competence and enhancing academic self-concept. *Zeitschrift für Pädagogische Psychologie, 19*, 133–136.

Rindermann, H., & Thompson, J. (2011). Cognitive capitalism: The effect of cognitive ability on wealth, as mediated through scientific achievement and economic freedom. *Psychological Science, 22*, 754–763.

Robinson, D. (2013). Peter Ratcliffe and Ines Newman (eds), Promoting Social Cohesion: Implications for Policy and Evaluation. *International Sociology*, *28*, 552–555.

Romer, P. (1986). Increasing returns and long-run growth. *Journal of Political Economy, 94*, 1002–1037.

Romer, P. (1990). Endogenous technological change. *Journal of Political Economy, 98,* 71–102.

Shangquan, G. (2000). *Economic globalization: Trends, risks and risk prevention.* Peking: China Research Society for Restructuring the Economic System.

Shapley, L. S., & Shubik, M. (1971). The assignment game I: The core. *International Journal of Game Theory, 1*, 111–130.

Shimer, R., & Smith, L. (2000). Assortative matching and search. *Econometrica, 68,* 343–369.

Smith, L. (2006). The marriage model with search frictions. *Journal of Political Economy, 114,* 1124–1144.

Staber, U. (2007). Contextualizing research on social capital in regional clusters. *International Journal of Urban and Regional Research, 31*, 505–521.

Stuetzer, M., Obschonka, M., Brixy, U., Sternberg, R., & Cantner, U. (2014). Regional characteristics, opportunity perception and entrepreneurial activities. *Small Business Economics*, *42*, 221–244.

Turok, I. (2005). *Social cohesion as a factor of competitiveness and regional growth*. Paper presented at the *OECD International Conference 'Sustainable Cities: Linking Competitiveness with Social Cohesion'*, October, Montreal.

Uslaner, E. (2003). Trust, democracy and governance: Can government policies influence generalised trust?. In: M. Hooghe, & D. Stolle (Eds), *Generating social capital: Civil society and institutions in comparative perspective*, (pp. 171–190). Basingstoke: Palgrave.

Weede, E., & Kämpf, S. (2002). The impact of intelligence and institutional improvements on economic growth. *Kyklos, 55*, 361–380.

Wilson, E. O. (2000). *Sociobiology: The new synthesis*. Cambridge, MA: Harvard University Press.

Wolf, P. S., & Figueredo, A. J. (2011). Fecundity, offspring longevity, and assortative mating: Parametric tradeoffs in sexual and life history strategy. *Biodemography and Social Biology, 57,* 171–183.

Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review, 27,* 185–203.

Zajenkowski, M., Stolarski, M., & Meisenberg, G. (2013). Openness, economic freedom and democracy moderate the relationship between national intelligence and GDP. *Personality and Individual Differences, 55,* 391–398.

Table 1

List of countries with top- and bottom-10 rankings for selected variables.

	GDP Growth (%), *GROWTH* (*N*=122)	**National IQ, *IQ* (*N*=122)**	**Political Globalization, *POLITICAL* (*N*=122)**	**Economic Globalization, *ECONOMIC* (*N*=113)**	**Social Globalization, *SOCIAL* (*N*=120)**
10 Countries at Highest Ranking	1. China: 7.85 2. S. Korea: 5.89 3. Macau: 5.68 4. Singapore: 5.36 5. Botswana: 5.27 6. Malaysia: 4.65 7. Malta: 4.60 8. Thailand: 4.28 9. Mauritius: 4.24 10. Vietnam: 4.20	1. Singapore: 106.9 2. China: 105.9 3. S. Korea: 104.8 4. Japan: 104.1 5. Finland: 100.8 6. Canada: 100.4 7. Netherlands: 100.4 8. Mongolia: 100.0 9. Macau: 99.9 10. N. Zealand: 99.3	1. Canada: 83.8 2. Singapore: 83.2 3. Switzerland: 82.8 4. Sweden: 77.2 5. Austria: 77.0 6. Netherlands: 76.3 7. Denmark: 75.3 8. Belgium: 74.9 9. Australia: 74.4 10. U. Kingdom: 73.6	1. Luxembourg: 94.9 2. Singapore: 92.3 3. Ireland: 88.2 4. Belgium: 87.6 5. Netherlands: 85.9 6. Bahrain: 78.9 7. Denmark: 78.1 8. Switzerland: 75.9 9. Sweden: 73.4 10. Norway: 72.4	1. U. Kingdom: 96.4 2. France: 95.5 3. Sweden: 94.6 4. Belgium: 93.7 5. Italy: 92.7 6. Denmark: 92.3 7. Austria: 91.9 8. Netherlands: 91.6 9. Canada: 90.0 10. USA: 89.6
10 Countries at Lowest Ranking	113. Jamaica: .08 114. Zambia: .01 115. Cote d'Ivoire: -.13 116. Burundi: -.16 117. Nicaragua: -.56 118. Comoros: -.80 119. Madagascar: -1.17 120. Centr. Af. R.: -1.21 121. Niger: -1.27 122. Congo DR: -2.43	113. Cameroon: 68.2 114. Congo DR: 68 115. Benin: 67.7 116. Chad: 67.1 117. Guinea: 66.5 118. Sierra Leone: 64 119. Centr. Afr. R.: 64 120. Gambia: 62.0 121. Malawi: 61.9 122. Niger: 61.2	113. Guinea: 14.9 114. Sierra Leone: 14.4 115. Centr. Af. R.: 13.3 116. Mali: 13.3 117. Laos: 13.1 118. Niger: 12.1 119. Bangladesh: 12.1 120. Congo DR:10.7 121. Ethiopia: 10.4 122. Chad: 10.1	104. Uganda: 26.6 105. India: 25.9 106. Centr. Afr. R.: 25.1 107. Madagascar: 24.5 108. Sudan: 21.7 109. Iran: 21.5 110. Nepal: 18.9 111. Burundi: 18.6 112. Bangladesh: 16.5 113. Rwanda: 16.0	111. Oman: 33.9 112. Papua NG: 33.5 113. Belize: 32.9 114. Bahrain: 31.9 115. Botswana: 31.6 116. Suriname: 30.2 117. Lesotho: 28.8 118. Swaziland: 28.3 119. Laos: 27.3 120. Comoros: 24.0

Note: All variables are unstandardized values.

Table 2

Correlation matrix for all variables.

	1	2	3	4	5	6	7	8	9	10	11
1. *GROWTH*	-										
2. Y_{1970}	-.031	-									
3. *IGDP*	.570**	.164	-								
4. *IQ*	.501**	.674**	.469**	-							
5. *POLITICAL*	.208*	.860**	.225*	.733**	-						
6. *ECONOMIC*	.257**	.738**	.310**	.614**	.862**	-					
7. *ACTUAL_FLOW*	.177	.498**	.280**	.314**	.595**	.850**	-				
8. *RESTRICTIONS*	-.264**	-.778**	-.265**	-.732**	-.893**	-.887**	-.513**	-			
9. *SOCIAL*	.050	.532**	-.017	.558**	.550**	.378**	.089	-.541**	-		
10. *CONTACT*	.131	.764**	.176	.503**	.886**	.826**	.683**	-.757**	.309**	-	
11. *INFORMATION*	.236*	.848**	.286**	.739**	.948**	.828**	.589**	-.843**	.495**	.825**	-
12. *CULTURAL*	.190	.736**	.158	.729**	.892**	.706**	.377**	-.826**	.677**	.645**	.763**

*$p<.05$

**$p<.01$

Table 3

Correlations between IQ and economic growth in more globalized and less globalized countries; median-splits.

		Globalization Index					
		POLITICAL	*ECONOMIC*		*SOCIAL*		
			ACTUAL_FLOW	*RESTRICTIONS*	*CONTACT*	*INFORMATION*	*CULTURAL*
Correlation, *r*	More globalized Countries	.307*	.309*	.224	.329*	.159	.429**
	Less globalized Countries	.680**	.668*	.659**	.662**	.663**	.598**

*$p<.05$

**$p<.01$

Table 4

Summary of growth regression analysis where political globalization, economic globalization, and social globalization acts as moderators.

Dependent Variable: *GROWTH* (GDP Growth Rates, % (1970–2010))											
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**	**Model 10**	**Model 11**
Y_{1970}	-.105	-.567**	-.679**	-.813**	-.915**	-.408**	-.765**	-.791**	-.212*	-.548**	-.531**
IGDP	.543**	.300**	.485**	.298**	.217*	.518**	.291**	.231*	.560**	.291**	.285**
IQ		.782**		.692**	.628**		.709**	.724**		.808**	.794**
POLITICAL			.682**	.357*	.612**						
ECONOMIC						.411**	.306**	.367**			
SOCIAL									.171	-.100	-.078
IQ*POLITICAL					-.257**						
IQ*ECONOMIC								-.131*			
IQ*SOCIAL											.068
N	122	122	122	122	122	113	113	113	120	120	120
***R*-squared**	.278	.563	.395	.591	.633	.406	.613	.626	.310	.577	.580
Adjusted *R*-squared	.266	.551	.379	.577	.618	.390	.599	.609	.292	.562	.561

Note: Regression coefficients are standardized betas. All regressions are estimated using White heteroskedasticity correction. All regressions include a constant term.

*p<.05

**p<.01

Table 5

Summary of growth regression analysis where economic globalization (actual flows and restrictions) acts as moderators.

Dependent Variable: *GROWTH* (GDP Growth Rates, % (1970–2010))						
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Y_{1970}	-.208*	-.735**	-.740**	-.507**	-.693**	-.698**
IGDP	.532**	.272**	.262*	.534**	.337**	.279**
IQ		.809**	.813**		.631**	.610**
ACTUAL_FLOW	.099	.201**	.206**			
RESTRICTION				-.526**	-.260*	-.350**
IQ*ACTUAL_FLOW			-.028			
IQ*RESTRICTION						.163*
N	114	114	114	109	109	109
***R*-squared**	.297	.603	.603	.461	.594	.613
Adjusted *R*-squared	.278	.588	.585	.445	.578	.594

Note: Regression coefficients are standardized betas. All regressions are estimated using White heteroskedasticity correction. All regressions include a constant term.

*p<.05

**p<.01

Table 6

Summary of growth regression analysis where social globalization (personal contacts, information flows, and cultural proximity) acts as moderators.

Dependent Variable: *GROWTH* (GDP Growth Rates, % (1970–2010))									
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**
Y_{1970}	-.299*	-.824**	-.828**	-.656**	-.816**	-.829**	-.423**	-.597**	-.649**
IGDP	.553**	.296**	.235**	.482**	.313**	.255**	.547**	.323**	.306**
IQ		.796**	.807**		.661**	.647**		.763**	.638**
CONTACT	.220	.299**	.358**						
INFORMATION				.682**	.392**	.457**			
CULTURAL							.403**	.104	.322*
IQ*CONTACT			-.150*						
IQ*INFORMATION						-.149*			
IQ*CULTURAL									-.250**
N	119	119	119	118	118	118	120	120	120
***R*-squared**	.318	.607	.625	.438	.617	.624	.364	.571	.595
Adjusted *R*-squared	.300	.594	.608	.423	.593	.607	.347	.556	.578

Note: Regression coefficients are standardized betas. All regressions are estimated using White heteroskedasticity correction. All regressions include a constant term.

*p<.05

**p<.01

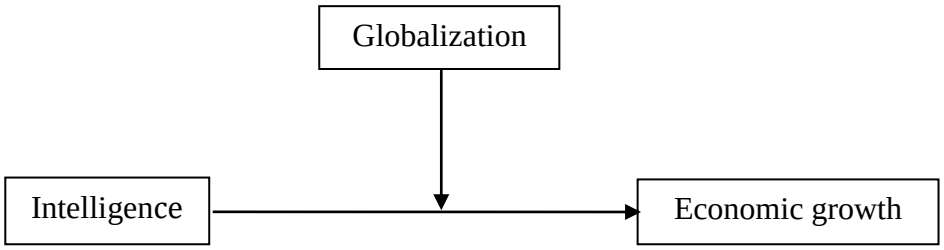

Figure 1. The possible role of globalization in moderating the impact of national IQ on economic growth rates.

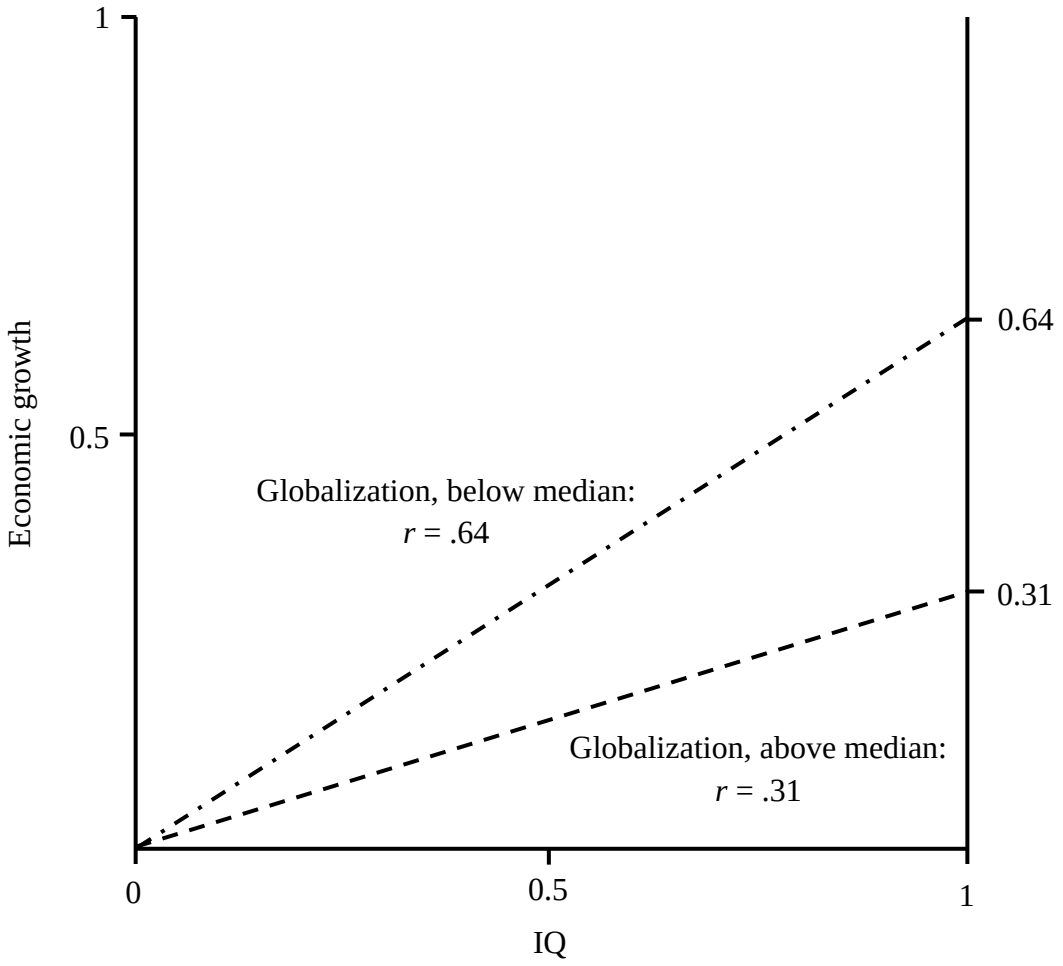

Figure 2. Slopes for average IQ–economic growth correlations, *r* for two country samples separated by the level of globalization (i.e., below and above median-split).