



Intelligence and gender (in)equality: Empirical evidence from developing countries



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ABSTRACT

This paper makes an attempt to explore whether intelligence of nations is related to gender inequality, measured by Social Institutions and Gender Index (SIGI), in developing countries. Related literature robustly links intelligence to economic development, poverty, quality of institutions and informal economic activity. Controlling for conventional antecedents of gender inequality (i.e. religion, political regime, legal origins and trade openness), this paper finds that, on average, a 10-point increase in national IQ scores in the developing world is associated with an 8.2 point reduction in SIGI, ceteris paribus. To test the robustness of our findings we apply instrumental variables (IV) and robust regression methods. We also test whether our results are sensitive to the choice of control variables and heterogeneity of nations in our sample. The negative association of intelligence with gender inequality remains statistically significant and intact in all cases.

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1. Introduction

Promoting gender equality and women's empowerment is at the core of the international development agenda. Naturally, gender inequality has important implications for society as it has been shown to hinder overall development and increase deprivation (World Bank, 2001). In particular, it has been connected to economic growth (Esteve-Volart, 2000), investment in infrastructure (Chattopadhyay & Duflo, 2004) and corruption (Dollar, Fisman, & Gatti, 2001). Therefore, identifying the driving forces of gender equity has been an important subject of research in social sciences, especially over the last decade.

While a growing literature reports that religion, institutions and democracy 'make a significant impact on gender inequity' (Rao & Kelleher, 2003 p. 142), we investigate a variable that has not received the recognition we think it deserves in the analysis of international differences in gender inequality, namely intelligence.

The significance of intelligence (cognitive skills) has become broadly acknowledged in empirical literature over the last decade (Lynn & Vanhanen, 2012a). For example, intelligence has a significant association with long-run economic growth (Ram, 2007), earnings and income inequality (Kanazawa, 2009). Yet, it is conceivable that intelligence leads to other benefits to the public which are not captured by monetary indicators such as GDP per capita and wages. One possible noteworthy

illustration of the positive externalities of intelligence may be an enhanced role of women in society.

To what extent does intelligence contribute to gender equality? In this study we hypothesize that the benefit of intelligence builds up either through the quality of institutions, or through civic participation among citizens. Indeed, related literature demonstrates that intelligence is an important determinant of institutional arrangements (Kanyama, 2014; Salahodjaev, 2015a). For example, in early empirical articles intelligence, measured by the Army General Classification Test, is positively linked with the rule of law at the US state level (Davenport & Remmers, 1950). More recently, Potrafke (2012), using data from 125 countries, documents that intelligence, measured by national IQs, has a negative relationship with the corruption perceptions index. In this vein, cognitive abilities are positively correlated with approval for progressive reforms and negatively correlated with radical positions (Inglehart, 1997).

Further, particular causal explanations connecting the quality of institutions to gender equality are a cognitive effect and an ethical effect, which are in turn determined by the intelligence of nations that 'can process complex information and actively participate in politics' (Simpson, 1997 p. 157). Certainly, if *traditional patriarchal societies ignored the role of women in the community, then intelligence is a potential determinant of modern values as it nurtures 'a habit of critical thinking, questioning religious dogmas and other sources of traditional authority'* (Meisenberg, 2004 p. 139). While Solon (2014) highlights that intelligent individuals are more likely to provide greater freedom to less represented groups of society, there is also evidence that intelligence leads to liberalism, prosociality (Solon, 2014) and generosity (Millet & Dewitte, 2007). Therefore, a positive link between intelligence and

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pro-gender institutions is predictable as intelligence 'broadens man's outlook, enables him to understand the need for norms of tolerance, restrains him from adhering to extremist doctrines, and increases his capacity to make rational electoral choices' (Lipset, 1960 p. 54).

Moreover, gender inequality is also negatively associated with political participation, an aspect of human behavior that is captured by intelligence (e.g. Meisenberg & Lynn, 2011). For example, in a study of 12,000 respondents from the High School and Beyond Survey, Dee (2004) documents that educational attainment is an important antecedent of an efficiently functioning democracy. In particular, when schooling increases by one year, political participation increases by 6.8%. Dee (2004) also shows that education has a positive impact on other measures of civic behavior.

Milligan, Moretti, and Oreopoulos (2004) finds that education has a positive association with political participation. Their results show that educated individuals are more likely to vote, follow political news and possess more information on candidates and campaigns since they recognize the public needs which will influence their vote. In a study of participants in the 1970 British Cohort Study, Deary, Batty, and Gale (2008) detect a positive relationship between childhood intelligence and the probability of voting in elections. Further, the study reports that individuals with higher scores in the British Ability Scales test are more likely to attend demonstrations and sign petitions. In this line, similar studies find that assessment test scores are negatively correlated with conservatism — another determinant of gender inequality (Cohen, 2004) on an individual and country level (Stankov, 2009). Thus, we anticipate that intelligence has a negative association with gender inequality as 'democratic societies usually have more women in parliament than under democratic societies' (Inglehart, Norris, & Welzel, 2002 p. 232).

The hypothesized intelligence–gender equality nexus is tested on a sample of 107 nations. The measure of inequality is the Social Institutions and Gender Index (SIGI) for 2014. The results indicate that a 10-point increase in national IQ scores is associated with an 8.2 point reduction in gender inequality (SIGI).

This paper is structured as follows: Section 2 presents data and methodology, Section 3 discusses the main results and Section 4 concludes the paper.

2. Data and methods

2.1. Dependent variable

Whereas many gender-related indices such as the Gender Equity Index (Social Watch Report, 2005), Gender Inequality Index (GII Report, UNDP, 2010), Global Gender Gap Index (Lopez-Claros & Zahidi, 2005) and others are generally considered to be outcome-based indicators that disclose the after-effects of already-established institutional environments (gender-related gaps in education, health, employment, and political participation), the Social Institutions and Gender Index (SIGI) mainly targets the origins of gender inequalities and reflects the state of affairs in both formal and informal institutions (societal norms, values, traditions, customs, cultural peculiarities etc.) that shape and bring about gender-related inequality issues in different countries (Branisa, Klasen, Ziegler, Drechsler, & Jütting, 2014; Neumayer & de Soysa, 2007). As Klasen and Schüller (2011 p. 8) put it 'the innovation of SIGI is that it shows how social institutions affect gender inequality; thus, it focuses not on gender outcomes, but on institutions that affect such outcomes'. In this sense the SIGI captures those aspects of gender inequality that go beyond related rights and liberties, and rest upon institutional causes of the issue.

The SIGI consists of such sub-indices as Family code, Civil liberties, Physical integrity, Son preference, and Ownership rights which are calculated based on different social indicators taken from the Organization for Economic Cooperation and Development's (OECD) Gender, Institutions and Development Database. It 'combines them into a multidimensional index of women's deprivation caused by gendered

social institutions ... and empirical results confirm that the SIGI complements other gender-related indices' (Branisa et al., 2014 p. 29).

This index has been used in different contexts. For instance, Branisa, Klasen, and Ziegler (2013) empirically proves that contemporary issues surrounding gendered development outcomes need to consider inequalities in social institutions as a separate constraint. They demonstrate how institutions fostering gender equality are associated with female education, child mortality, fertility, and corruption. On the other hand, there is evidence that these institutions are also associated with women's labor market participation (e.g. Jütting et al., 2010). Yet, some other studies using SIGI show that the economic and social aspects of globalization strengthen institutions fostering gender equality (e.g. Potrafke & Ursprung, 2012).

2.2. Independent variable

Intelligence is the main variable of interest in this study. As a proxy for intelligence we rely on national IQ data from Lynn and Vanhanen (2012b). This dataset, a revised edition of Lynn and Vanhanen (2002), contains national IQs for the majority of nations and has been widely used in empirical studies (see e.g. Burhan, Sidek, Kurniawan, & Mohamad, 2015; Salahodjaev, 2015a,b; Voracek, 2004). It represents a compilation of numerous average national IQ tests observed over the past 100 years or longer. For those geopolitical regions with missing administered intelligence tests 'estimated IQs were obtained from the measured IQs of neighboring countries with culturally and racially similar populations' (Lynn & Meisenberg, 2010 p. 354). Overall, after discarding possible missing observations for other control variables IQ scores range from 60.1 in Malawi to 105.8 in China.

2.3. Control variables

In order to address potential omitted variable bias, we use a set of control variables. First, we control for the percentage share of Muslims among the population. Related studies find that cross-country differences in gender inequality are substantially explained by the established heritage, beliefs and norms related to marriage, proprietorship and paternity (e.g. Morrisson & Jütting, 2005).

In addition to religion, political studies suggest that democratic regime and political orientation of the ruling government are also linked to enforcement of gender equality laws. We use democracy index, measured as average of political rights and civil liberties, in our empirical model because it is widely conjectured that democratic societies pay greater attention to gender balance compared to authoritarian regimes (Beer, 2009; Norris & Inglehart, 2001). Neumayer and de Soysa (2007 p. 1521) argue that "[s]ince women represent a slight majority in most country's electorate, one would expect that in fully democratic countries women enjoy no worse economic rights than men". Similarly, related studies establish that left-leaning parties put greater value on gender equality (Dahlerup, 2005). For example, gender movements in Eastern Europe were successful to initiate legislative and institutional reforms under the rule of leftist parties (Avdeyeva, 2009). As a measure of political orientation we use a dichotomous variable for left-leaning governments.

We add dummy variables for Napoleonic civil law and Communist common law from La Porta, Lopez-di-Silanes, Shleifer, and Vishny (1999). Indeed, since the seminal works of Acemoglu, Robinson, and Johnson (2001) and La Porta et al. (2009) ample cross-country studies document the impact of legal origins on institutions, corruption, financial development and gender inequality (Albouy, 2012; Jayachandran, 2015; La Porta, Lopez-de-Silanes, & Shleifer, 2008; Salahodjaev, 2015c). For instance Potrafke and Ursprung (2012) find that gender institutions are stronger in nations with communist common laws as compared to nations with English common law.

Finally, we include a trade openness variable and a dummy for high income countries to proxy economic opportunities. Trade openness is calculated as the ratio of the sum of exports and imports to GDP. The

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