Maastricht University

UNITED NATIONS UNIVERSITY

UNU-MERIT

Working Paper Series

#2020-025

Economic gender gap in the Global South: how institutional quality matters

Elena Bárcena-Martín, Samuel Medina-Claros and Salvador Pérez-Moreno

Published 5 June 2020

Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT)
email: **info@merit.unu.edu** | website: **http://www.merit.unu.edu**

Boschstraat 24, 6211 AX Maastricht, The Netherlands
Tel: (31) (43) 388 44 00

UNU-MERIT Working Papers
ISSN 1871-9872

Maastricht Economic and social Research Institute on Innovation and Technology
UNU-MERIT

UNU-MERIT Working Papers intend to disseminate preliminary results of research carried out at UNU-MERIT to stimulate discussion on the issues raised.

Economic gender gap in the Global South: how institutional quality matters

ELENA BÁRCENA-MARTÍN[a], SAMUEL MEDINA-CLAROS[b] & SALVADOR PÉREZ-MORENO[c]

Preliminary draft, June 2020

Abstract:

One of the most challenging gender gaps in the Global South remains in the economic sphere. This paper examines how public institutional quality affects the gender gap in economic participation and opportunities in 74 developing and emerging countries during the period 2006-2016. We find that the quality of public institutions is closely associated with the economic gender gap. Specifically, the protection of property rights, security guarantees and government efficiency seem to be the main factors associated to lower values of the economic gender gap. Nevertheless, public institutions do not matter equally throughout economically backward countries. Whereas in emerging countries, particularly in Latin America and the Caribbean, a broad variety of institutional aspects, including undue influence on judicial and government decisions, are closely related to the economic gender gap, in low-income developing countries, such as Sub-Saharan countries, the problems of ethics and corruption stand out as a key element against economic gender equality. Some significant policy implications are derived from our findings on the potential of public institutions reforms to reduce economic gender gap.

Keywords: economic gender gap, economic participation and opportunities, public institutions, developing and emerging countries

JEL classification: E02, J16

[a] University of Malaga, Dept. Applied Economics - Statistics and Econometrics. Email: barcenae@uma.es

[b] University of Malaga, Dept. Applied Economics - Political Economy. Email: smedina@uma.es

[c] UNU-MERIT (Affiliated Researcher) and University of Malaga, Dept. Applied Economics - Economic Policy. Email: sperezmoreno@uma.es. Corresponding author.

1. Introduction

Economic studies have paid increasing attention to the role of institutions since the last decades of the twentieth century. Specifically, ample literature has examined the interdependence between effective institutions and different aspects of economic performance, such as economic growth, poverty reduction or economic inequality (see e.g. Dollar & Kraay, 2003; Chong & Gradstein, 2007; Asongu & Kodila-Tedika, 2018). A significant number of studies have recently attempted to examine how institutional quality affects other human well-being facets of Sen's capability approach and further developments (see e.g. Kaushik & Lòpez-Calva, 2011; Dwumfour, 2020). In this context, the need to have adequate institutions that contribute to gender equality arises as a core concern in the framework of human development (Comim & Nussbaum, 2014).

Nowadays, gender inequality continues to be especially prominent in Global South countries in terms of education, health, political empowerment and economic participation. In this sense, it is noteworthy that, in line with the Global Gender Gap Report (Hausmann, Tyson, & Zahidi, 2017), one of the most challenging gender gaps remains in the economic sphere. According to the estimate provided by the Global Gender Gap Report 2020 (International Monetary Fund, 2019), the global average of woman's income is about $11,000 (in Purchasing Power Parity, PPPs) while the average income of a man is $21,000 (in PPPs). Moreover, in 2017 the economic gender gap reverted to where it stood in 2008 after a peak in 2013. At the current pace, it will not be closed for another 217 years.[1] In the event there is no progress in reducing economic gender gap, some of the Sustainable Development Goals, especially Goal 1 (End poverty in all its forms everywhere), Goal 5 (Achieve gender equality and empower all women and girls), and Goal 10 (Reduce inequality within and among countries) will be very difficult to attain.

Reducing economic gender gap is essential to boost the economy and promote social development. Gender equality promotes economic growth through the diversification of the economy, helps reduce income inequality and induces an inclusive society that is conducive for higher economic growth (Kochhar, Jain-chandra, & Newiak, 2017). Specifically, the full participation of women in the labor force would add percentage points to the majority of national growth rates. International Labor Organization (ILO) estimations suggest that closing the gender gap in economic participation by 25 per cent by 2025 could increase global GDP by US$ 5.3 trillion (ILO, 2017a). Furthermore, evidence shows that increasing the share of household income controlled by women, either through their own earnings or cash transfers, changes spending in ways that benefit their homes (see. e.g. Rubalcava, Teruel, & Thomas, 2009). Women's economic empowerment in a traditional society would mean enabling women to overcome poverty in their family (elders and children) and to be able to provide for basic needs of food, shelter and clothing. This indicates that the eradication of poverty in a society will be faster and have greater impact when women's economic empowerment takes place.

In this context, the 2030 Agenda highlights the importance of undertaking reforms to give women equal rights to economic resources in terms of financial services and inheritance, as well as fostering ownership rights over assets and other forms of property. With this aim in mind, it is intended to ensure the full and effective participation of women at all decision-making levels in political, economic and public life.[2] In order to reach the Sustainable Development Goals (SDG) by 2030, the United Nations Development Program (UNDP) brings to light the importance of institutional quality as a key factor in reducing the gender gap, considering "transforming institutions to advance gender equality" as a main area of work in its Gender Equality Strategy (UNDP, 2014). The UNDP Strategy encourages countries to boost strengthened institutions to progressively deliver universal access to basic services. In terms of economic

[1] Compared to other dimensions, the political one currently holds the widest gender gap, although it also shows the greatest progress and is expected to be closed within 99 years. The health gender gap is also larger than it was in 2006 and the time to close it remains undefined. Regarding the education–specific gender gap, Hausmann et al. (2017) point out that it could be reduced to parity within the next 13 years.

[2] In accordance to targets 5 and 7 of Sustainable Development Goal 5 (Gender equality), approved in the Resolution adopted by the General Assembly on 25 September 2015.

gender gap in particular, the UNDP Strategy emphasizes the relevance of the creation of institutional environments to develop gender-responsive economic plans, policies and social protection systems.[3]

This paper examines how public institutional quality affects the gender gap in economic participation and opportunities in economically backward countries by using the wide range of institutional quality variables of the Global Competitiveness Index (GCI), from property rights to public sector performance. A panel of 74 developing and emerging countries is analyzed over the period 2006–2016 through a dynamic panel model. The results provide insights for policy makers and practitioners on potential institutional reforms in developing and emerging countries, highlighting considerable differences in the role of public institutional quality in economic gender inequality across the Global South.

The paper is organized as follows. The next section provides a background regarding the links between economic gender gap and institutions. In Section 3, indicators and data are described. Section 4 presents and discusses the results and the last section offers some concluding remarks.

2. Background

2.1. Gender and Development

Approaches to gender inequality have evolved during the twentieth century, from considering women as passive stakeholders to acknowledging that they play a crucial role in the construction of parity (see e.g. Parpart, Connelly, & Barriteau, 2000; Momsen, 2004). In the 70s, the main approach was Women in Development (WID), the term used for the main approach that development planners and scholars applied during this decade. WID generally refers to the integration of women into global processes of economic, political, and social growth and change (Rathgeber, 1990).

By the end of the 70s, this approach was criticized because of the oversimplification of women's roles in the productive system. Subsequently, the Women and Development (WAD) approach became an influential trend, mainly embraced by Benería and Sen (1981). Its theories were nourished by Marxist-Feminist principles and focused on the dependency of the so-called Third World countries on the wealthiest nations (Chua, Bhavnani, & Foran, 2000), rather than on factors and causes that maintained the structures of gender inequality.

At the end of the 1980s and 1990s, the Gender and Development (GAD) approach was developed by feminist theorists (Young, 1997) and accepted by policy planners and the academic world. This perspective considered not only the importance of women in development, but also the unequal gender relations and mechanisms that produce gender inequality between women and men.

Under this concept, the Millennium Development Goals integrated a gender approach, promoting "Gender equality and empower women" (Goal 3) and "Improve maternal health" (Goal 5). Despite their relative success, they were criticized by civil society groups that demanded greater attention to other aspects, such as women's reproductive health problems and labor inequalities (Fukuda-Parr, 2016).

In recent years, the debate on the post-2015 Agenda has highlighted the need to adopt new approaches with which to contribute to a broader movement for global justice and the effective elimination of the gender gap by setting a specific goal focused on gender equality. In this line, this paper addresses the economic gender gap in developing and emerging countries from a GAD perspective expanded through the prism of the 2030 Agenda for Sustainable Development.

[3] This includes supporting measures to reduce women's unpaid work, initiatives to ensure women's equal access to decent employment opportunities, resources and finance, and helping to develop and implement gender-sensitive budget processes (UNDP, 2018).

2.2. Economic gender gap and development levels

Focusing on the economic dimension and following Hausmann, Tyson, & Zahidi (2006), under economic gender gap we refer to the differences between women and men in (i) labor force participation rates (participation gap), (ii) payment received in wages (remuneration gap) and the (iii) unequal representation of both sexes in management and responsibility positions in both public and private spheres (advancement gap).

Regarding the divide in the participation in the labor force (participation gap) between women and men, there has been a slowdown in narrowing the gap in the past decade. Despite the fact that 70% of women want to have a paid job in the labor market, only 50% of them achieve it (76% if we refer men) (Gallup & ILO, 2017). In 2017, the labor force participation gap was narrower in developing countries (12.3%) than it was in emerging (30.6%) or developed nations (16.9%) (ILO, 2017b), a phenomenon that in the specific literature is labelled as 'feminization U' (see e.g. Attanasio, Low, & Sanchez-Marcos, 2005; Gaddis & Klasen, 2014). The U-shaped hypothesis holds that as regions develop at an early stage of industrialization, Female Labor Force Participation (FLFP) decreases because of women´s displacement from agriculture and their exclusion from occupations in manufacturing and administration. At a later stage of development, spurred by structural change as well as increases in education and declining fertility, the female labor force subsequently increases.

Nevertheless, women continue suffering from a significant 'remuneration gap'. Globally, the gender wage gap is estimated to be 23 per cent (ILO, 2016) and if current trends prevail, it will take more than 70 years before gender wage gaps are completely closed. Cultural and social reasons are considered as central to understand the prevalence of the pay gap. On the one hand, women tend to be overrepresented in lower productivity sectors (Teow, Utkarshini, & Goel, 2018) and the prevailing societal norms confine them to lower paid positions (also called horizontal segregation or "glass walls") (ILO, 2016). On the other hand, women work fewer remunerated hours, either because they opt to work part time or because part-time work is the only option available to them (Budig & England, 2001).

Finally, it is worth noting that the unequal representation of both sexes in management and responsibility positions (advancement gap) contributes to increasing the wage gap. In both public and private spheres, women still have to overcome a set of barriers in order to reach positions of responsibility as legislators, senior officials, and managers: they make up less than 25 percent of management positions globally and 22 percent in ministerial and parliamentary roles (McKinsey&Company, 2017). In addition, the ILO Company Survey of companies across the developing regions (ILO & ACT/EMP, 2015), conducted in 2013, indicated that women entailed around 21 percent of all CEOs.

2.3. How institutional environment affects economic gender gap

According to the definition provided by North (1990), we construe institutions as "the rules of the game of a society", or more formally, "the humanly devised constraints that structure human interaction" (North, 1990, p. 3); in other words, they define the incentive structure of a society and the underlying determinants of economic performance and, in consequence, economic gender gap.

In this line, numerous authors have highlighted the central importance of some specific institutional aspects, such as property rights, corruption, transparency, impartial judicial systems, government efficiency and security, in the establishment of a strong institutional environment (see e.g. Schwab & Porter, 2006; Chong & Gradstein, 2007), although frequently ignoring their links with gender inequalities. Next, we argue how such institutional elements may be connected to economic gender inequality.

Property Rights

From a gender perspective, *property rights* contribute to empower women economically by creating opportunities for securing their place in the community, earning income and ensuring their livelihoods (see. e.g. Anderson & Bidner, 2015; Oduro & Van Staveren, 2015). Weak property rights are reflected in inequality in respect to the asset gender gap, which is especially significant in the economically backward

world where women's rights (not only to land but to the basic necessities of life such as shelter, water and food) are unbalanced (World Bank, 2015).

Corruption

Women often face cultural, political, economic and institutional discrimination in their countries, which is compounded when a society is *corruption* ridden (see e.g. Dollar, Fisman, & Gatti, 2001; Schimmel & Pech, 2004). Currently, discussions are bringing to light how corruption particularly affects women through some specific factors. First, corruption may lower women's opportunities to gain access to the decision-making circles in government, political systems, and companies: when political parties and institutional representation can be bought and sold, officials are elected through vote-buying and promotion is related to personal connections rather than merit (Transparency International, 2007a). Second, corruption reduces public revenue and affects the welfare of vulnerable groups such as women and children, who often rely most on accessing the vital services provided by the state (see e.g. Hao, Chang, & Sun, 2017; Transparency International, 2010). Finally, corruption reduces women's access to markets and credit, making it more difficult to obtain licenses and permits, for instance, to start a business, drive a car or build a house (Ellis, Manuel, & Blackden, 2006; Hossain, Musembi, & Hughes, 2010).

Furthermore, high income inequality allows wealthy spheres to wield stronger political and judicial influence, subverting institutions (Chong & Gradstein, 2007). Under biased law enforcement systems, human rights for women and girls (as well as for minorities and less-advantaged groups) suffer: the poor (mainly women) are not provided protection by an independent judicial system, and their position is inferior to that of the rich (Transparency International, 2007b). In addition, women's relatively weaker access to personal resources has meant that they are more frequently harmed (Nyamu-Musembi, 2007) in contexts where *undue influence* and bribery has become a prerequisite to accessing goods and services (Batabyal & Yoo, 2007; UNDP, 2012).

Public sector performance

This is related to better allocation of public resources and is consequently essential for providing to vulnerable groups (such as women) a better access to economic empowerment in the Global South, where women's limited access to resources is evidently a contributory factor to gender inequality (Fontanella, Sarra, & Di Zio, 2020). Better-quality institutions increase the efficiency and effectiveness of the delivery of social services to disadvantaged groups (Perera & Lee, 2013), which is essential for providing better access to vulnerable economic empowerment groups (women amongst others), especially in some developing countries. Weak institutions entail misallocation of resources, a heavy regulatory burden, wastefulness of government spending, and inefficiency of legal framework in challenging regulations and settling disputes. They foster rent-seeking activities by the rich at the expense of the rest of society, especially the disadvantaged groups.

Conflicts and terrorism

Women are particularly vulnerable to sexual exploitation by the police, military or other security-sector actors in conflict and post-conflict situations where the institutional environment is often very weak (Hossain et al., 2010). Furthermore, the impact on women may be further exacerbated by terrorist and violent extremist groups operating in conflict-affected areas, and vice versa (Fink & Barakat, 2013). These groups, the influence of warlords, the culture of impunity and international terrorism have had a huge impact on the social mindset and behavior towards women (Najimi, 2018) and their lack of economic opportunities in developing countries.

Previous empirical evidence

Empirical studies on economic gender gap in developing and emerging countries are essentially focused on how some economic aspects, such as long-term economic development and macroeconomic changes, trade liberalization, globalization and government size, affect labor force inequalities, mainly in terms of

the participation gap. For instance, Çagatay & Özler (1995) use cross-country pooled data for 1985 and 1990 to analyze the relationship between long-term economic development and macroeconomic changes on the FLFP in 96 countries. They find that structural adjustment policies have led to an increase in feminization of the labor force via worsening income distribution and increased openness. Meyer (2006) focuses on the effects of trade liberalization on women's integration into national labor markets. She conducts a cross-country analysis at 5-year intervals between 1970 and 1995 by using OLS for 121 countries. She concludes that trade openness has a larger effect on women's labor force participation rates in middle-income nations than in low-income and advanced industrialized countries.

Gray, Kittilson, & Sandholtz (2006) examine the impact of several measures of globalization on women's levels of participation in the economy and parliamentary office (among other aspects). They use data for 163 countries from 1975 to 2000 by employing cross-sectional time series regression techniques and conclude that globalization (in terms of foreign investment and membership in international organizations) are associated with higher FLFP and more women serving in parliament. In the same line, Bussmann (2009) analyzes the relationship between economic integration and some female-specific outcome variables for 134 countries for the years 1970-2000, using fixed effects and Generalized Methods of Moments (GMM) techniques. She concludes that trade openness increases female labor force participation in developing countries.

Finally, Wacker, Cooray, & Gaddis (2017) study the relationship between globalization and FLFP in a panel of 80 economically poor countries, considering the observations for every fifth year over the period 1980–2005 using the Fixed Effects estimator. They highlight that Foreign Direct Investment (FDI) and trade have a generally negative impact on FLFP, with a stronger impact for younger cohorts, possibly reflecting a higher return of education in open economies.

Other studies, however, address some aspects related to the remuneration and advancement gaps. Sepehrivand (2017), for example, considers the effects of government size and trade openness on gender wage gap in 35 developing and emerging economies during 2001–2013, revealing that growth in government size negatively affects men and women's wages and increases the gender wage gap. Almasifard (2018) examines the relationship between international trade and the gender wage gap for a sample of 13 emerging countries over the period 2001 to 2015. She highlights a negative effect of international trade on the gender wage gap as a result of a stronger effect of international trade on the female labor force.

In this paper, on the basis of the existing theoretical links between public institutional quality and gender gap in economic participation and opportunities, we provide new empirical evidence on the extent to which public institutions matter for the economic gender gap in the Global South, revealing significant differences across country groups.

3. Data and methodology

3.1. Data

This paper uses an unbalanced panel for a sample of 74 developing and emerging countries, for which there is statistical information on economic gender gap, institutional quality and a number of control variables between 2006 and 2016 (see Table 1 on available data by country and years).

We consider developing and emerging economies those that the UNDP listed in its 2016 Human Development Report (UNDP, 2016). In particular, we consider, on the one hand, 52 developing countries, which include low-income (<US$ 1,005) and lower-middle income (US$ 1,006 - US$ 3,955) countries, and, on the other, 22 emerging countries, with GNI per capita over than US$ 3,955 at July 1, 2017.[4] The data

[4] Note that there is no consensus about a unique list of emerging economies. In our case, we use the income level within the UNDP list to classify countries in order to consider an objective classification criterion for our sample of countries.

on economic gender gap are from the Global Gender Gap Index (GGGI) (Hausmann et al., 2006). This index, published for the first time in 2006, seeks to measure the relative gaps between women and men across four key areas: health (through the subindex "Health and Survival"), education (subindex "Educational Attainment"), economy (subindex "Economic Participation and Opportunity") and politics (subindex "Political Empowerment"). We use the variable Economic Participation and Opportunity (EPO), which covers participation, remuneration and advancement gaps.

EPO is composed on a scale from 0 (imparity) to 1 (parity) and its methodology has remained unchanged since its original conception. Indicators related to country-specific policies, rights, culture and customs-factors are not considered by the World Economic Forum (WEF) in the construction of this variable, inasmuch as they are considered "input" or "means", thus providing a snapshot of the current situation whilst leaving the path open to analyze the causes.

In respect to institutional quality, we consider the indicators of public institutions reported annually by the WEF since 2004 in the Global Competitiveness Index (GCI). The GCI data set provides a framework and a corresponding set of indicators in twelve policy domains (pillars), where institutions constitute the first pillar. These data have been widely used by policymakers and academics for economically developed, emerging and developing countries (Despotovic, Cvetanovic, Nedic, & Despotovic, 2016; Pérez-Moreno, Rodríguez, & Luque, 2016; Ferreira, Fayolle, Fernandes, & Raposo, 2017). We focus on public institutions, whose composite indicator is calculated as the arithmetical mean of the following five components: Property rights (A1PR), Ethics and corruption (A2EC), Undue influence (A3UI), Public-sector performance (A4GE) and Security (A5S). Data from these five dimensions of public institutions come from an Executive Opinion Survey conducted annually by the WEF, capturing the opinions of business leaders around the world on a broad range of topics for which statistics are unreliable, outdated, or nonexistent for many countries. Their components and sub-components are specified in Table A1 of the Appendix.

The composite index and the indicators of the five components range from 1 to 7, 1 indicating the lowest and 7 the highest level of institutional quality. They exist in a chain-linked version, suitable for analysis over time, which we use in our study as explanatory variables.

Insert Table 1 about here

As control variable, we use the GDP per capita (GDPpc) in PPP[5], a widely used proxy for the level of economic development. We also carry out an additional robustness check, controlling with other socioeconomic variables related to women´s education and health from the World Development Indicators of the World Bank and the Human Development Data of the UNDP. In particular, in accordance with the literature and in relation to women's education, we consider female mean years of schooling (Myosf) and the ratio of mean years of schooling for females and males (Myosr); for women´s health, we consider female life expectancy at birth (Leabf); and for reproductive health, we consider the fertility rate (Fr). We also consider the level of general education and health of each country by using the UNDP Education Index (Eduindex) and the UNDP Life Expectancy Index (Leindex). See Table A2 of the Appendix for descriptive statistics of all variables used in the study and Table A3 for their definitions and sources.

[5] The GDP per capita variable is used in thousands.

3.2. Methodology

We have data on 74 countries for different years. We consider a data panel analysis in our estimation strategy that, given the wider variation of the variables over time, provides reliable estimates on the association between the institutional quality variables and the economic participation gender gap. Panel data models allow for unobserved fixed effects to be specified in the model, thus allowing for better control of unmeasured factors that affect outcomes, in particular countries or years. To begin with, we test for the null hypothesis of no country effects, which is rejected in all estimations (p-value 0.000), implying that a pooled regression model is inappropriate, as estimates made with pooled OLS would be biased (Breusch & Pagan, 1980). Therefore, we must use panel data models, as they permit controlling for individual effects not controlled by the explanatory variables introduced in the models.

The high persistence of economic gender gap is determinant in the choice of the most convenient panel data method of estimation, namely a dynamic panel data model. This dynamic panel data estimation has important advantages with respect to time series or traditional static techniques: (i) this approach allows us to work with the entire data panel, which ensures that unobserved or omitted fixed effects can be specified to estimate the relevant parameters (Hsiao, 2003); (ii) it highlights the short-term dynamics, showing if there is conditional convergence among countries; (iii) and it allows to account for the high persistence of economic gender gap.

Hence, we formulate the following panel data model to analyze the economic gender gap, EPO_{ct}, for country c at time t:

$$EPO_{ct} = \zeta_c + \beta_1 EPO_{ct-1} + \beta_2 IQ_{ct} + \beta_3 x_{ct} + \omega_{ct} \qquad (1)$$

where ζ_c is the fixed term for each country that captures individual-specific effects that are constant over time and not directly observed or included in the model, EPO_{ct-1} is the lagged level of the dependent variable that controls for short term dynamics and conditional convergence, IQ_{ct} is the respective index of public institutional quality (public institutions and its five major areas, A1PR-A5S), x_{ct} are the control variables, and ω_{ct} is a normally distributed error term.

The coefficient of the lagged variable is of special interest because, if we rewrite (1):

$$\Delta EPO_{ct} = \zeta_c + (\beta_1 - 1) EPO_{ct-1} + \beta_2 IQ_{ct} + \beta_3 x_{ct} + \omega_{ct}$$

ΔEPO_{ct}=$EPO_{ct} - EPO_{ct-1}$. If β_1 is smaller than one, it is consistent with conditional convergence, which means that countries relatively close to their steady-state economic participation gender gap will experience a slowdown in their economic participation gender gap growth. In this case, fixed effects, institutional variables and other control variables affect the steady-state EPO level to which country c converges. On the other hand, if β_1 is greater than one, there is no convergence effect and all regressors would measure differences in steady-state EPO growth rates. Our results show that β_1 is lower than one in all cases, so there is conditional convergence. A second interpretation of the coefficient on the lagged EPO is that the larger the parameter of persistence β_1 is, the longer the influence of institutional quality upon the EPO time series. The inclusion of the lag of EPO as an explanatory variable introduces long-term effects into the model (see Gundersen & Ziliak, 2004).

We discard using the model only in first-differences because it may lead to important finite sample bias problems when variables are highly persistent, which is expected to be the case for variables such as EPO. Moreover, the removal of unobserved time-invariant effects may lead to a spuriously better fit for the data and to a change in the inference drawn from the estimation (Bond, Hoeffler, & Temple, 2001; Malinen & Gallego Ramírez, 2013). Under these conditions, lagged levels of the variables are only weak instruments for subsequent first-differences. To overcome this problem, the system GMM procedure (Arellano & Bover, 1995; Blundell & Bond, 1998) adds to the first-difference model a set of equations in levels, where the instruments of the levels are suitable lags of their own first differences.

In particular, we use the one-step system GMM estimator that is more reliable for finite sample inference (Blundell & Bond, 1998; Blundell, Bond, & Windmeijer, 2000; Bond, 2002; Windmeijer, 2005). It estimates a system of equations in both first-differences and levels, in which the instruments in the level equations

are lagged first differences of the variables. We consider panel-robust standard errors to control for possible heteroskedasticity and serial correlation in errors originated by unobservable variables persistently correlated over time with EPO.

We validate the assumptions underlying system GMM by testing the null of absence of first- (m1 test) and second-order (m2 test) serial correlation in the disturbances, respectively (Arellano and Bond 1991). Absence of autocorrelation requires that the m1 test reject the null hypothesis, while the m2 does not. Additionally, the Hansen test of over-identifying restrictions is the most commonly used test in assessing the joint validity of the proposed instruments set. This test examines the correlation between the instruments and the regression residuals, where the null hypothesis is the absence of such a correlation.

Nevertheless, identification of the parameters would be weak or even not possible in the event of the series are random walks or near unit root processes. Owing the fact that spurious regressions are susceptible to appear in time series, we perform a stationarity analysis with the object of providing the most convenient method of estimation. Irrespective of variables that are bounded in the unit interval should not possess a unit root since they cannot have an infinite variance (see Jäntti & Jenkins, 2010), it is possible that the distribution could have a stochastic trend at other moments such as at the mean or kurtosis (White & Granger, 2011). Thereby, notwithstanding that EPO is bounded by the unit interval, we test for possible unit roots. To study the stationarity of all the time series, we run the augmented Dickey-Fuller tests (ADF) (Said & Dickey, 1984) as well as the Im-Pesaran-Shin (IPS) panel unit-root test (Im, Pesaran, & Shin, 2003), which assumes cross-section independence. If the results show that the time series have unit roots, the data should be differentiated in order to make it stationary and thus to avoid spurious regression in the variables. For both tests, we consider the equation with and without a linear trend. The results for each variable in the model are shown in Table A4 and A5 of the Appendix so that it can be verified that the unit-root hypothesis is rejected for all variables.

Our dynamic approach includes the lagged values of EPO as explanatory variables, which control for omitted variables that change over time, in contrast with other estimations that control for country characteristics that are constant over time. It also takes into consideration the potential endogenous nature of public institutional quality. In this sense, consideration could be given to the possibility of a two-way causality that may run from EPO to public institutional quality as well. We can also relax the strict exogeneity assumption for the control variables, which can be considered as predetermined, allowing for no contemporaneous correlation with disturbances and for feedback from lagged EPO values to the current value for the respective control variables. This way, our dynamic panel data models treat the lagged information on EPO and the different public institutional quality measures as endogenous, while the control variables are considered predetermined rather than strictly exogenous.

Our baseline model includes, as a control variable, the log of GDP per capita in PPP. To test the robustness of our results, in accordance with prior studies we estimate other model specifications considering the set of additional education and health control variables described above.

4. Results

The baseline results of the one-step system GMM estimator are presented in Table 2. The results show that the models are well-fitted with statistically insignificant test statistics for both the second-order autocorrelation in the second differences (m2) and the statistics of over identifying restrictions. The residuals in the first difference can be serially correlated (m1) by way of construction but the residuals in the second difference should not be serially correlated (m2). The first lag of EPO and the logarithm of GDP per capita are significant in most specifications.

The results highlight that some aspects of public institutions are significantly associated to the economic gender gap. In particular, we observe that a better structure of property rights (A1PR), an efficient government that does not waste public resources (A4GE) and a secure environment (A5S) seem to be associated to lower economic gender gap. Nevertheless, according to our findings, public trust in politicians or irregular payments and bribes (related to Ethics and Corruption, A2EC) or favoritism in

decisions of government officials and judicial independence (related to Undue Influence, A3UI) appear not to account for the economic gender gap.

Insert Table 2 about here

In order to test the robustness of our baseline model, we conduct a sensitivity analysis by introducing several socioeconomic variables commonly used in the literature (see Table 3). We show that the baseline results remain significant in most model specifications. That is, Property Rights, Government Effectiveness and Security are significant while Ethics and Corruption and Undue Influence continue to be irrelevant on the basis of our results, corroborating the foregoing findings.

Given the considerable heterogeneity existing across countries in terms of economic and social development, we also estimate separately the baseline model by geographical areas and income levels.

As shown in Table 4, the results differ from the baseline model when we consider specific regions on their own. In the case of Latin America and the Caribbean (LAC), it is worth emphasizing the high significance of the variety of institutional variables examined, highlighting how public institutions particularly matter for economic gender gap in these countries.

Concerning Sub-Saharan Africa (SSA) countries, we observe that the problems related to ethics and corruption seem to be especially detrimental for economic gender equality in these countries. In this line, our outcomes endorse Stockemer's (2011) conclusions, which point out that high levels of corruption appear to be a major barrier against women's efforts to gain positions of responsibility and management in SSA countries, as they tend to reinforce human rights violations and strengthen traditional power networks.

Lastly, it should be stressed that the results suggest the absence of statically significant relationship between public institutions and the economic gender gap in Middle East and North Africa (MENA) and East and South Asia and Pacific (ESAP) countries. This suggests that in these countries we should focus on factors other than public institutions to account for the economic gender gap. In this sense, some authors have underlined the importance of social institutions, including cultural and religious aspects, in some countries of these regions (see e.g. Morrisson & Jütting, 2005; Branisa, Klasen, Ziegler, Drechsler, & Jütting, 2014).

In order to reveal potential differences across developing and emerging countries, we separately address developing economies, distinguishing in turn between low-income and lower-middle income ones, and emerging economies. In Table 5, we highlight that the significance of the diverse institutional variables in emerging countries (including numerous LAC and European and Central Asian countries) is remarkable. Similarly, as expected, Ethics and Corruption appears as a significant component in low-income countries, most of them being SSA countries. In this regard, according to Davis (2014), it is important to underline that the state capacity of low-income developing countries is sharply limited by resource constraints, making it difficult to recruit foreign courts, prosecutors, regulators, and plaintiffs into the project of combating local corruption and to create effective anticorruption institutions.

Insert Tables 3, 4 and 5 about here

5. Concluding remarks

In this paper, we study the extent to which some key facets of public institutions are associated to economic gender gap in Global South countries. Our findings suggest that institutional quality is significantly related to the gender gap in economic participation and opportunity, so that a higher quality institutional environment seems to go hand in hand with lower gender gap. Among the specific institutional aspects examined, deficiencies in property rights, government ineffectiveness and lack of security appear to be especially linked to higher economic gender gap.

The results reveal that public institutions do not matter equally among groups of countries. In the case of emerging countries, particularly Latin America and the Caribbean, a broad range of institutional aspects of the public sphere, including undue influence on judicial and government decisions, appear to be closely related to economic gender gap. This tends to highlight the potential benefits of structural reforms in public institutions in these countries, not only in order to enhance economic efficiency, but also to propel economic gender equality. Improvements in the state's capability in the fields of property rights, judicial independence, government efficiency and security can be construed as key policy reforms to progress in labor participation, remuneration and representation in management and responsibility positions of women. In this sense, specific governance reforms, such as promoting the implementation of participatory processes in the planning, execution and monitoring of public policies by civil society or taking advantage of the new technologies for a more transparent allocation of public services, can be regarded as potential instruments to narrow the economic gender gap in emerging countries.

In developing economies, particularly in SSA countries, problems of ethics and corruption emerge as a key matter against economic gender equality. Therefore, reducing corruption should be at the heart of gender equality policies, as corruption tends to perpetuate situations of discrimination against women, lowering the opportunities for women to have access, for example, to certain markets and credits and to the decision-making circles in government, political systems and companies. Nevertheless, it should not be forgotten that addressing corruption is not automatic and requires the concerted attention of a wide range of stakeholders, from politicians and government officials to the private sector and civil society organizations, as well as international development cooperation organizations and wealthy countries, since corruption operates globally.

References

Almasifard, M. (2018). Gender wage gap in selected developing upper-middle income countries. *International Journal for Researcher Development*, *17*(2), 142–156. https://doi.org/http://dx.doi.org/10.1108/MRR-09-2015-0216

Anderson, S., & Bidner, C. (2015). Property Rights over marital transfers. *The Quarterly Journal of Economics*, *130*(3), 1421–1484. https://doi.org/10.1093/qje/qjv014

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, *68*(1), 29–51. https://doi.org/10.1016/0304-4076(94)01642-D

Asongu, S. A., & Kodila-Tedika, O. (2018). Institutions and Poverty: A Critical Comment Based on Evolving Currents and Debates. *Social Indicators Research*, *139*(1), 99–117. https://doi.org/10.1007/s11205-017-1709-y

Attanasio, O., Low, H., & Sanchez-Marcos, V. (2005). Female labor supply as insurance against idiosyncratic risk. *Journal of the European Economic Association*, *3*(2), 755–764. Retrieved from http://eprints.ucl.ac.uk/15265/

Batabyal, A. A., & Yoo, S. J. (2007). Corruption, bribery, and wait times in the public allocation of goods in developing countries. *Review of Development Economics*, *11*(3), 507–517. https://doi.org/10.1111/j.1467-9361.2007.00419.x

Benería, L., & Sen, G. (1981). Accumulation, Reproduction, and "Women's Role in Economic Development": Boserup Revisited. *Signs: Journal of Women in Culture and Society*, *7*(2), 279–298. https://doi.org/10.1086/493882

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8

Blundell, R., Bond, S., & Windmeijer, F. (2000). Estimation in dynamic panel data models: Improving on the performance of the standard GMM estimator. In *Nonstationary panels, panel cointegration, and dynamic panels* (pp. 53–91). Emerald Group Publishing Limited. https://doi.org/10.1016/S0731-9053(00)15003-0

Bond, S. (2002). Dynamic panel data models: a guide to micro data methods and practice. *Portuguese Economic Journal*, *1*(2), 141–162. https://doi.org/10.1007/s10258-002-0009-9

Bond, S., Hoeffler, A., & Temple, J. R. W. (2001). *GMM Estimation of Empirical Growth Models* (CEPR Discussion Paper No. 3048). Nuffield College, University of Oxford.

Branisa, B., Klasen, S., Ziegler, M., Drechsler, D., & Jütting, J. (2014). The Institutional Basis of Gender Inequality: the Social Institutions and Gender Index (SIGI). *Feminist Economics*, *20*(2), 29–64. https://doi.org/10.1080/13545701.2013.850523

Breusch, T. S., & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *Review of Economic Studies*, *47*(1), 239–253. https://doi.org/10.2307/2297111

Budig, M. J., & England, P. (2001). The Wage Penalty for Motherhood. *American Sociological Review*, *66*(2), 204–225.

Bussmann, M. (2009). The Effect of Trade Openness on Women's Welfare and Work Life. *World Development*, *37*(6), 1027–1038. https://doi.org/10.1016/j.worlddev.2008.10.007

Çagatay, N., & Özler, S. (1995). Feminization of the Labor Force: The Effects of Long- Term Development and Structural Adjustment. *World Development*, *23*(11), 1883–1894. https://doi.org/10.1016/0305-750X(95)00086-R

Chong, A., & Gradstein, M. (2007). Inequality and Institutions. *The Review of Economics and Statistics*, *89*(3), 454–465.

Chua, P., Bhavnani, K.-K., & Foran, J. (2000). Women, culture, development: a new paradigm for development studies? *Ethnic and Racial Studies*, *23*(5), 820–841. https://doi.org/10.1080/01419870050110913

Comim, F., & Nussbaum, M. C. (2014). *Capabilities, Gender, Equality : Towards Fundamental Entitlements.* Cambridge University Press.

Davis, K. E. (2014). The prospects for anticorruption law in middle-income countries. In R. Peerenboom & T. Ginsburg (Eds.), *Law and Development of Middle-Income Countries: Avoiding the Middle-Income Trap* (pp. 288–306). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139235730

Despotovic, D., Cvetanovic, S., Nedic, V., & Despotovic, M. (2016). Economic, social and environmental dimension of sustainable competitiveness of European countries. *Journal of Environmental Planning and Management*, *59*(9), 1656–1678. https://doi.org/10.1080/09640568.2015.1085370

Dollar, D., Fisman, R., & Gatti, R. (2001). Are women really the "fairer" sex? Corruption and women in government. *Journal of Economic Behavior and Organization*, *46*(4), 423–429. https://doi.org/10.1016/S0167-2681(01)00169-X

Dollar, D., & Kraay, A. (2003). Institutions, trade, and growth. *Journal of Monetary Economics*, *50*, 133–

162. https://doi.org/10.1016/S0304-3932(02)00206-4

Dwumfour, R. A. (2020). Poverty in Sub-Saharan Africa: The Role of Business Regulations, Policies and Institutions. *Social Indicators Research*. https://doi.org/10.1007/s11205-020-02277-z

Ellis, A., Manuel, C., & Blackden, C. M. (2006). *Gender and Economic Growth in Uganda: Unleashing the Power of Women*. *Directons in development*. Washington, DC: The World Bank. https://doi.org/10.1596/978-0-8213-6384-3

Ferreira, J. J., Fayolle, A., Fernandes, C., & Raposo, M. (2017). Effects of Schumpeterian and Kirznerian entrepreneurship on economic growth: panel data evidence. *Entrepreneurship and Regional Development*, *29*(1–2), 27–50. https://doi.org/10.1080/08985626.2016.1255431

Fink, N. C., & Barakat, R. (2013). *Strengthening Community Resilience against Violence and Extremism: The Roles of Women in South Asia*. Goshen.

Fontanella, L., Sarra, A., & Di Zio, S. (2020). Do Gender Differences in Social Institutions Matter in Shaping Gender Equality in Education and the Labour Market? Empirical Evidences from Developing Countries. *Social Indicators Research*, *147*(1), 133–158. https://doi.org/10.1007/s11205-019-02148-2

Fukuda-Parr, S. (2016). From the Millennium Development Goals to the Sustainable Development Goals: shifts in purpose, concept, and politics of global goal setting for development. *Gender and Development*, *24*(1), 43–52. https://doi.org/10.1080/13552074.2016.1145895

Gaddis, I., & Klasen, S. (2014). Economic development, structural change, and women's labor force participation:: A reexamination of the feminization U hypothesis. *Journal of Population Economics*, *27*(3), 639–681. https://doi.org/10.1007/s00148-013-0488-2

Gallup, & ILO. (2017). *Towards a better future for women and work: Voices of women and men*.

Gray, M. M., Kittilson, M. C., & Sandholtz, W. (2006). Women and globalization: A study of 180 countries, 1975-2000. *International Organization*, *60*(2), 293–333. https://doi.org/10.1017/S0020818306060176

Gundersen, C., & Ziliak, J. P. (2004). Poverty and macroeconomic performance across space, race, and family structure. *Demography*, *41*(1), 61–86. https://doi.org/10.1353/dem.2004.0004

Hao, Y., Chang, C. P., & Sun, Z. (2017). Women and corruption: evidence from multinational panel data. *Quality and Quantity*, 1–22. https://doi.org/10.1007/s11135-017-0530-7

Hausmann, R., Tyson, L. D., & Zahidi, S. (2006). *The Global Gender Gap Report*. *World Economic Forum*. Geneva.

Hausmann, R., Tyson, L. D., & Zahidi, S. (2017). *The Global Gender Gap Report 2017*. *World Economic Forum*.

Hossain, N., Musembi, C. N., & Hughes, J. (2010). *Corruption, Accountability and Gender : Understanding the Connections*.

Hsiao, C. (2003). *Analysis of panel data*. Cambridge: University Press.

ILO. (2016). *Women at Work: Trends 2016*. *International Labour Organization* (Vol. 42). Geneva. https://doi.org/ISBN 978-92-2-130795-2

ILO. (2017a). *Economic Impacts of Reducing the Gender Gap* (What Works Research Brief No. 10). Geneva.

ILO. (2017b). *World Empoyment and Social Outlook: Trends for Women 2017*. *International Labour Organization*. Geneva.

ILO, & ACT/EMP. (2015). *Women in Business and Management: Gaining Momentum*. Geneva. https://doi.org/10.1016/j.rbms.2017.09.001

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, *115*(1), 53–74. https://doi.org/10.1016/S0304-4076(03)00092-7

International Monetary Fund. (2019). *Global Gender Gap Report 2020*. Geneva. https://doi.org/10.1002/9781119085621.wbefs350

Jäntti, M., & Jenkins, S. P. (2010). The impact of macroeconomic conditions on income inequality. *Journal of Economic Inequality*, *8*(2), 221–240. https://doi.org/10.1007/s10888-009-9113-8

Kaushik, B., & Lòpez-Calva, L. F. (2011). Functionings and Capabilities. In K. J. Arrow, A. Sen, & K. Suzumura (Eds.), *Handbook of Social Choice and Welfare* (Vol. 2, pp. 153–187). Amsterdam: Elsevier B.V. https://doi.org/10.1016/S0169-7218(10)00016-X

Kochhar, K., Jain-chandra, S., & Newiak, M. (Eds.). (2017). *Women, work, and economic growth: Leveling the playing field*. Washington, DC: International Monetary Fund, Publication Service.

Malinen, T., & Gallego Ramírez, D. (2013). Inequality and growth: Another look with a new measure and method. *Journal of International Development*, *25*(1), 122–138. https://doi.org/10.1002/jid.2812

McKinsey&Company. (2017). *Women Matter: Time to accelerate, ten years of insights on gender diversity*.

Meyer, L. B. (2006). *Trade liberalization and women's integration into national labor markets: A cross-country analysis*. *Social Indicators Research* (Vol. 75). https://doi.org/10.1007/s11205-004-6399-6

Momsen, J. H. (2004). *Gender and development*. London: Routledge.

Morrisson, C., & Jütting, J. P. (2005). Women's discrimination in developing countries: A new data set for better policies. *World Development*, *33*(7), 1065–1081. https://doi.org/10.1016/j.worlddev.2005.04.002

Najimi, B. (2018). *Gender and public participation in Afghanistan: Aid, Transparency and Accountability*. Palgrave-Macmillan.

North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.

Nyamu-Musembi, C. (2007). Gender and corruption in the administration of justice. In D. Rodriguez (Ed.), *Global Corruption Report: Corruption in Judicial Systems* (pp. 121–128). New York: Cambridge University Press.

Oduro, A. D., & Van Staveren, I. (2015). Engendering economic policy in Africa. *Feminist Economics*, *21*(3), 1–22.

Parpart, J. L., Connelly, P., & Barriteau, E. (2000). *Theoretical perspectives on gender and development*. Ottawa: International Development Research Centre.

Perera, L. D. H., & Lee, G. H. Y. (2013). Have economic growth and institutional quality contributed to poverty and inequality reduction in Asia? *Journal of Asian Economics*, *27*, 71–86. https://doi.org/10.1016/j.asieco.2013.06.002

Pérez-Moreno, S., Rodríguez, B., & Luque, M. (2016). Assessing global competitiveness under multi-criteria perspective. *Economic Modelling*, *53*, 398–408. https://doi.org/10.1016/j.econmod.2015.10.030

Rathgeber, E. M. (1990). WID, WAD, GAD: trends in research and practice. *Journal of Developing Areas*, *24*(4), 489–502.

Rubalcava, L., Teruel, G., & Thomas, D. (2009). Investments , Time Preferences , and Public Transfers

Paid to Women. *Economic Development and Cultural Change*, *57*(3), 507–538.

Said, S. E., & Dickey, D. A. (1984). Testing for unit roots in autoregressive-moving average models of unknown order. *Biometrika*, *71*(3), 599–607. https://doi.org/10.2139/ssrn.2882101

Schimmel, B., & Pech, B. (2004). *Corruption and Gender: Approaches and Recommendations for Technical Assistance*. Eschborn: Federal Ministry for Economic Cooperation and Development of Germany.

Schwab, K., & Porter, M. E. (2006). *The Global Competitiveness Report 2006-2007*. Geneva.

Sepehrivand, A. (2017). The Effect of Government Size and Trade Openness on Gender Wage Gap in Developing Countries during 2001–2013. *The Indian Journal of Labour Economics*, *60*(3), 501–515. https://doi.org/10.1007/s41027-018-0105-8

Stockemer, D. (2011). Women's parliamentary representation in Africa: The impact of democracy and corruption on the number of female deputies in national parliaments. *Political Studies*, *59*(3), 693–712. https://doi.org/10.1111/j.1467-9248.2011.00897.x

Teow, Y. J., Utkarshini, S., & Goel, S. (2018). *PwC Women in Work Index: Closing the gender pay gap*. *PricewaterhouseCoopers AG*. London.

Transparency International. (2007a). *Gender and Corruption: Understanding and Undoing the Linkages* (TI Working Paper No. #03/2007).

Transparency International. (2007b). *Global Corruption Report 2007: corruption in judicial systems*. (D. Rodriguez, Ed.). New York: Cambridge University Press.

Transparency International. (2010). *Corruption and Gender in Service Delivery : The Unequal Impacts* (TI Working Papers No. #02/2010).

UNDP. (2012). *Seeing Beyond the State: Grassroots Women's Perspectives on Corruption and Anti-Corruption*. New York.

UNDP. (2014). *UNDP Gender Equality Strategy 2014-2017. The Future We Want: Rights and Empowerment*. *United Nations Development Programme*. New York.

UNDP. (2016). *Human Development Report 2016*. *United Nations Development Programme*. New York. https://doi.org/eISBN: 978-92-1-060036-1

UNDP. (2018). Gender equality: women's economic empowerment. Retrieved May 15, 2018, from http://www.undp.org/content/undp/en/home/gender-equality/women-s-economic-empowerment.html

Wacker, K. M., Cooray, A., & Gaddis, I. (2017). Globalization and Female Labor Force Participation in Developing Countries: An Empirical (Re-)Assessment. In B. Christensen & C. Kowalczyk (Eds.), *Globalization* (pp. 545–583). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-662-49502-5

White, H., & Granger, C. W. J. (2011). Consideration of Trends in Time Series. *Journal of Time Series Econometrics*, *3*(1). https://doi.org/10.2202/1941-1928.1092

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics*, *126*(1), 25–51. https://doi.org/10.1016/j.jeconom.2004.02.005

World Bank. (2015). *World Bank Group Gender Strategy (FY16-23): Gender Equality, Poverty Reduction and Inclusive Growth*. Washington, DC: The World Bank.

Young, K. (1997). Gender and development. In N. Visvanathan (Ed.), *The women, gender & development reader* (pp. 51–54). London: Zed Books.

Table 1. Available data by country and years

Developing countries						Emerging countries	
Low income economies			Lower-middle income economies				
	Country	Years		Country	Years	Country	Years
1	Armenia	2007-2016	23	Côte d'Ivoire	2010-2016	52 Albania	2006-2016
2	Burundi	2011-2016	24	Cameroon	2006-2013, 2015-2016	53 Argentina	2006-2016
3	Benin	2006-2013, 2015-2016	25	Egypt, Arab Rep.	2006-2016	54 Azerbaijan	2007-2016
4	Burkina Faso	2006-2014	26	Georgia	2006-2016	55 Barbados	2008-2016
5	Bangladesh	2006-2016	27	Ghana	2008-2016	56 Belize	2011
6	Bolivia	2006-2016	28	Honduras	2006-2016	57 Brazil	2006-2016
7	Bhutan	2013-2016	29	Indonesia	2006-2016	58 China	2006-2016
8	Ethiopia	2006-2016	30	India	2006-2016	59 Colombia	2006-2016
9	Guinea	2014-2015	31	Jordan	2006-2016	60 Dominican Republic	2006-2016
10	Gambia, The	2006-2012, 2015-2016	32	Kenya	2006-2016	61 Ecuador	2006-2013, 2015-2016
11	Liberia	2015-2016	33	Kyrgyz Republic	2006-2016	62 Guyana	2009-2015
12	Madagascar	2006-2016	34	Cambodia	2006-2016	63 Jamaica	2006-2016
13	Mali	2006-2016	35	Lao PDR	2013-2016	64 Kazakhstan	2006-2016
14	Mozambique	2007-2016	36	Lesotho	2006-2016	65 Mexico	2006-2016
15	Malawi	2008-2016	37	Morocco	2006-2016	66 Macedonia, FYR	2006-2016
16	Nepal	2006-2016	38	Moldova	2010-2016	67 Montenegro	2014-2016
17	Rwanda	2014-2016	39	Mongolia	2006-2016	68 Namibia	2006-2016
18	Senegal	2009-2016	40	Mauritania	2006-2016	69 Peru	2006-2016
19	Chad	2006-2016	41	Nigeria	2006-2016	70 Serbia	2012-2016
20	Tanzania	2006-2016	42	Nicaragua	2006-2016	71 Suriname	2011-2014
21	Uganda	2006-2016	43	Pakistan	2006-2016	72 Thailand	2006-2016
22	Zimbabwe	2006-2011, 2014-2016	44	Philippines	2006-2016	73 Trinidad and Tobago	2006-2016
			45	Swaziland	2014-2016	74 South Africa	2006-2016
			46	Tajikistan	2007-2012, 2014-2016		
			47	Tunisia	2006-2011, 2014-2016		
			48	Ukraine	2006-2016		
			49	Vietnam	2007-2016		
			50	Yemen, Rep.	2011-2014, 2016		
			51	Zambia	2006-2015		

Table 2. Institutional quality and economic participation and opportunity. Baseline models.

	A.PI	A1PR	A2EC	A3UI	A4GE	A5S
A. Public Institutions (A.PI)	0.020**					
	[0.0073]					
A1. Property Rights (A1PR)		0.019***				
		[0.0053]				
A2. Ethics and corruption (A2EC)			0.007			
			[0.0057]			
A3. Undue influence (A3UI)				0.010		
				[0.0067]		
A4. Government efficiency (A4GE)					0.020**	
					[0.0069]	
A5. Security (A5S)						0.014***
						[0.0040]
GDPpc	0.002*	0.002*	0.002*	0.002*	0.001	0.001
	[0.0007]	[0.0007]	[0.0008]	[0.0009]	[0.0006]	[0.0006]
Lagged EPO (t-1)	0.871***	0.870***	0.948***	0.928***	0.881***	0.894***
	[0.0427]	[0.0338]	[0.0314]	[0.0382]	[0.0396]	[0.0289]
Number of countries	74	74	74	74	74	74
Observations	685	685	685	685	685	685
Over identifying restrictions Test p-value	0.1488	0.1415	0.0982	0.1083	0.0721	0.1081
m1 p-value	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001
m2 p-value	0.3906	0.3214	0.3813	0.4024	0.4653	0.4118

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

m1: Arellano a Bond Test AR (1); m2: Arellano a Bond Test AR (2)

Table 3. Summary of sensitivity analysis including variations in the baseline specifications

	A.PI	A1PR	A2EC	A3UI	A4GE	A5S
Baseline	0.020**	0.019***	0.008	0.011	0.021**	0.014***
	[0.007]	[0.005]	[0.006]	[0.007]	[0.007]	[0.004]
Including Myosf	0.020**	0.019**	0.016*	0.011	0.020**	0.014***
	[0.007]	[0.006]	[0.008]	[0.007]	[0.007]	[0.004]
Including Myosr	0.024**	0.024***	0.017*	0.015*	0.024**	0.016***
	[0.008]	[0.007]	[0.008]	[0.008]	[0.008]	[0.005]
Including Leabf	0.018*	0.021**	-0.005	0.000	0.010	0.013**
	[0.008]	[0.006]	[0.007]	[0.008]	[0.008]	[0.004]
Including Fr	0.018*	0.019***	0.008	0.007	0.019*	0.010*
	[0.008]	[0.006]	[0.007]	[0.008]	[0.008]	[0.004]
Including Myosf and Leabf	0.018*	0.020**	0.006	0.002	0.011	0.013**
	[0.008]	[0.007]	[0.008]	[0.008]	[0.008]	[0.005]
Including Myosf and Fr	0.003*	0.014*	0.011	0.005	0.014*	0.008*
	[0.002]	[0.006]	[0.007]	[0.007]	[0.007]	[0.004]
Including Myosr and Leabf	0.016	0.020**	0.003	-0.001	0.009	0.011*
	[0.009]	[0.007]	[0.008]	[0.009]	[0.009]	[0.004]
Including Myosr and Fr	0.016*	0.018**	0.012	0.007	0.016*	0.008*
	[0.008]	[0.007]	[0.007]	[0.008]	[0.008]	[0.004]
Including Myosf, Leabf and Fr	0.013	0.016*	0.007	0.001	0.009	0.008*
	[0.008]	[0.007]	[0.007]	[0.007]	[0.008]	[0.004]
Including Myosr, Leabf and Fr	0.014	0.018**	0.008	0.002	0.010	0.007
	[0.008]	[0.007]	[0.007]	[0.008]	[0.008]	[0.004]
Including UNDP Eduindex and UNDP Leindex	0.017*	0.018**	-0.002	0.005	0.016*	0.013**
	[0.007]	[0.006]	[0.007]	[0.007]	[0.007]	[0.004]

A.PI: Public institutions, A1PR: Property rights, A2EC: Ethics and corruption, A3UI: Undue influence, A4GE: Public-sector performance and A5S: Security.
*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Table 4. Summary of sensitivity analysis by groups of countries. Baseline

	A.PI	A1PR	A2EC	A3UI	A4GE	A5S	Number of countries / Observations
Baseline	0.020**	0.019***	0.007	0.010	0.020**	0.014***	74 / 685
	[0.007]	[0.005]	[0.006]	[0.007]	[0.007]	[0.004]	
Sub-Saharan Africa	0.027**	0.021**	0.029**	0.017	0.026*	0.013*	28 / 247
	[0.010]	[0.007]	[0.011]	[0.010]	[0.011]	[0.006]	
East and South Asia and Pacific	0.007	0.005	-0.004	0.004	0.004	0.010	13 / 129
	[0.006]	[0.006]	[0.005]	[0.005]	[0.005]	[0.006]	
Europe and Central Asia	0.017**	0.006	0.008	0.011*	0.014*	0.024*	12 / 111
	[0.006]	[0.004]	[0.005]	[0.005]	[0.006]	[0.011]	
Latin America and the Caribbean	0.046***	0.037***	0.017*	0.029***	0.041***	0.025***	16 / 151
	[0.009]	[0.008]	[0.007]	[0.006]	[0.007]	[0.007]	
Middle East and North Africa	0.021	0.020	0.012	0.017	0.025	0.012	5 / 47
	[0.017]	[0.016]	[0.011]	[0.010]	[0.021]	[0.008]	

A.PI: Public institutions, A1PR: Property rights, A2EC: Ethics and corruption, A3UI: Undue influence, A4GE: Public-sector performance and A5S: Security.
*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Table 5. Summary of sensitivity analysis by income level. Baseline

	A.PI	A1PR	A2EC	A3UI	A4GE	A5S	Number of countries / Observations
Baseline	0.020**	0.019***	0.007	0.010	0.020**	0.014***	74 / 685
	[0.007]	[0.005]	[0.006]	[0.007]	[0.007]	[0.004]	
Low income developing countries	0.025***	0.018**	0.024**	0.009	0.020**	0.013*	18 / 154
	[0.007]	[0.006]	[0.008]	[0.006]	[0.007]	[0.005]	
Lower-middle income developing countries	0.019*	0.012*	0.011	0.010	0.020**	0.013**	34 / 317
	[0.008]	[0.005]	[0.007]	[0.005]	[0.008]	[0.005]	
Emerging countries	0.034***	0.031***	0.000	0.020**	0.028***	0.023***	22 / 195
	[0.007]	[0.006]	[0.007]	[0.007]	[0.008]	[0.005]	

A.PI: Public institutions, A1PR: Property rights, A2EC: Ethics and corruption, A3UI: Undue influence, A4GE: Public-sector performance and A5S: Security.
*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Appendix

Table A.1. Areas, components, and sub-components of public institutions

A. Public institutions

1. Property Rights
   - 1.01 Property rights
   - 1.02 Intellectual property protection½

2. Ethics and corruption
   - 1.03 Diversion of public funds
   - 1.04 Public trust in politicians
   - 1.05 Irregular payments and bribes

3. Undue influence
   - 1.06 Judicial independence
   - 1.07 Favoritism in decisions of government officials

4. Government efficiency
   - 1.08 Wastefulness of government spending
   - 1.09 Burden of government regulation
   - 1.10 Efficiency of legal framework in settling disputes
   - 1.11 Efficiency of legal framework in challenging regulations
   - 1.12 Transparency of government policymaking

5. Security
   - 1.13 Business costs of terrorism
   - 1.14 Business costs of crime and violence
   - 1.15 Organized crime
   - 1.16 Reliability of police services

Source: Global Competitiveness Report (Schwab & Sala-i-Martín, 2017)

Table A2. Descriptive statistics.

Variable	Obs.	Min.	Max.	Mean	Standard deviation
EPO	685	0.31	0.88	0.64	0.11
A.PI	685	2.33	5.70	3.48	0.56
A1PR	685	2.03	5.79	3.68	0.68
A2EC	685	1.63	5.71	2.92	0.69
A3UI	685	1.69	5.34	3.09	0.66
A4GE	685	2.14	5.53	3.40	0.53
A5S	685	2.56	6.36	4.33	0.74
GDPpc	685	721.18	31,951.02	7,071.40	5,839.29
Myosf	388	1.00	12.30	6.55	3.14
Myosr	388	0.10	1.35	0.83	0.21
Leabf	617	47.40	80.71	68.94	8.43
Fr	617	1.25	6.99	3.34	1.48
Eduindex	617	0.18	0.81	0.55	0.15
Leindex	617	0.35	0.89	0.71	0.12

Source: UNDP (2018), World Bank (2018), World Economic Forum (2018)

Table A.3. Definitions and sources of the variables

Variable	Abbreviation	Definition	Source
Economic Participation and Opportunity	EPO	Weighted average obtained by scaling the participation gap (0.199 of final weight), the remuneration gap (0.531 of final weight) and the advancement gap (0.27 of final weight). The participation gap is captured using the difference between women and men in labor force participation rates. The remuneration gap is captured through a hard data indicator (ratio of estimated female-to-male earned income) and a qualitative indicator gathered through the World Economic Forum's annual Executive Opinion Survey (wage equality for similar work). Finally, the gap between the advancement of women and men is captured through two hard data statistics (the ratio of women to men among legislators, senior officials and managers, and the ratio of women to men among technical and professional workers).	World Economic Forum (1)
Public Institutions	A0PI	Weighted average of property rights, ethics and corruption, undue influence, government efficiency and security subindexes in order to determine the legal and administrative framework within which individuals, firms, and governments interact in a country.	World Economic Forum (2)
Property Rights	A1PR	Weighted average obtained by scaling the answer of the Executive Opinion Survey data from 1 to 7 in order to quantify to the extent to which property rights (including financial assets) and intellectual property are protected in a country.	World Economic Forum (2)
Ethics and Corruption	A2EC	Weighted average obtained by scaling the answer of the Executive Opinion Survey data from 1 to 7 in order to quantify the frequency of irregular payments and bribes, the frequency of illegal diversion of public funds to companies, individuals, or groups and the ethical standards of politicians in a country.	World Economic Forum (2)
Undue Influence	A3UI	Weighted average obtained by scaling the answer of the Executive Opinion Survey data from 1 to 7 in order to quantify the independence of the judicial system from influences of the government, individuals, or companies as well as the favoritism of government officials to well-connected firms and individuals when deciding upon policies and contracts in a country.	World Economic Forum (2)
Government Efficiency	A4GE	Weighted average obtained by scaling the answer of the Executive Opinion Survey data from 1 to 7 in order to quantify the wastefulness of government spending, the burden of government regulation, the transparency of government policymaking and the efficiency of the legal framework in settling disputes and challenging regulations in a country.	World Economic Forum (2)
Security	A5S	Weighted average obtained by scaling the answer of the Executive Opinion Survey data from 1 to 7 in order to quantify the extent to which crime, violence, organized crime (mafia-oriented racketeering, extortion) and the threat of terrorism impose costs on businesses and the reliability of police services in a country.	World Economic Forum (2)
GDP per capita based on purchasing power parity (PPP). (constant 2011 international $)	GDPpc	PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in constant 2011 international dollars.	The World Bank (3)

Note: (1) Global Gender Gap Report (Hausmann, Tyson, & Zahidi, 2017); (2) Global Competitiveness Index (World Economic Forum, 2018); (3) World Development Indicators (World Bank, 2018); (4) Human Development Data (UNDP, 2018).

Table A.3. Definitions and sources of the variables (cont.)

Variable	Abbreviation	Definition	Source
Mean years of schooling, female (years)	Myosf	Average number of years of education received by women ages 25 and older, converted from education attainment levels using official durations of each level.	United Nations Development Programme (4)
Mean years of schooling, ratio female over male value	Myosr	Average number of years of education received by people ages 25 and older, converted from educational attainment levels using official durations of each level, female over male value.	United Nations Development Programme (4)
Life expectancy at birth, female (years)	Leabf	Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.	The World Bank (3)
Fertility rate, total (births per woman)	Fr	Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year.	The World Bank (3)
UNDP Education index	Eduindex	Average of mean years of schooling (of adults) and expected years of schooling (of children), both expressed as an index obtained by scaling with the corresponding maxima.	United Nations Development Programme (4)
UNDP Life expectancy index	Leindex	Life expectancy at birth expressed as an index using a minimum value of 20 years and a maximum value of 85 years.	United Nations Development Programme (4)

Note: (1) Global Gender Gap Report (Hausmann, Tyson, & Zahidi, 2017); (2) Global Competitiveness Index (World Economic Forum, 2018); (3) World Development Indicators (World Bank, 2018); (4) Human Development Data (UNDP, 2018).

Appendix A.4. The Augmented Dickey-Fuller (ADF) panel-data unit-root tests

Variable			Time trend not included		Time trend included	
			Statistic	p-value	Statistic	p-value
Economic Participation and Opportunity (EPO)	Inverse chi-squared	P	278.130	0.000	401.452	0.000
	Inverse normal	Z	-4.376	0.000	-5.465	0.000
	Inverse logit t	L*	-6.052	0.000	-9.734	0.000
	Modified inv. chi-squared	Pm	8.618	0.000	16.095	0.000
A. Public Institutions (A.PI)	Inverse chi-squared	P	434.541	0.000	410.273	0.000
	Inverse normal	Z	-6.935	0.000	-8.683	0.000
	Inverse logit t	L*	-11.448	0.000	-11.567	0.000
	Modified inv. chi-squared	Pm	18.102	0.000	16.630	0.000
A1. Property Rights (A1PR)	Inverse chi-squared	P	317.067	0.000	467.846	0.000
	Inverse normal	Z	-5.524	0.000	-7.029	0.000
	Inverse logit t	L*	-7.678	0.000	-11.977	0.000
	Modified inv. chi-squared	Pm	10.979	0.000	20.121	0.000
A2. Ethics and corruption (A2EC)	Inverse chi-squared	P	354.070	0.000	429.468	0.000
	Inverse normal	Z	-6.584	0.000	-6.886	0.000
	Inverse logit t	L*	-8.911	0.000	-11.699	0.000
	Modified inv. chi-squared	Pm	13.222	0.000	17.794	0.000
A3. Undue influence (A3UI)	Inverse chi-squared	P	463.151	0.000	467.155	0.000
	Inverse normal	Z	-8.336	0.000	-8.115	0.000
	Inverse logit t	L*	-13.018	0.000	-13.070	0.000
	Modified inv. chi-squared	Pm	19.836	0.000	20.079	0.000
A4. Government efficiency (A4GE)	Inverse chi-squared	P	414.490	0.000	455.814	0.000
	Inverse normal	Z	-6.173	0.000	-8.366	0.000
	Inverse logit t	L*	-10.775	0.000	-13.200	0.000
	Modified inv. chi-squared	Pm	16.886	0.000	19.392	0.000
A5. Security (A5S)	Inverse chi-squared	P	316.807	0.000	371.109	0.000
	Inverse normal	Z	-5.934	0.000	-6.068	0.000
	Inverse logit t	L*	-7.935	0.000	-9.648	0.000
	Modified inv. chi-squared	Pm	10.963	0.000	14.256	0.000

Appendix A.5. The Im-Pesaran-Shin (IPS) panel-data unit-root tests

Variables	Time trend not included		Time trend included	
	Statistic	p-value	Statistic	p-value
Economic Participation and Opportunity (EPO)	-5.378	0.000	-5.303	0.000
A. Public Institutions (A.PI)	-15.257	0.000	-4.281	0.000
A1. Property Rights (A1PR)	-11.822	0.000	-7.823	0.000
A2. Ethics and corruption (A2EC)	-4.393	0.000	-3.747	0.000
A3. Undue influence (A3UI)	-8.220	0.000	-6.365	0.000
A4. Government efficiency (A4GE)	-5.443	0.000	-5.380	0.000
A5. Security (A5S)	-3.997	0.000	-2.931	0.002

The UNU-MERIT WORKING Paper Series

2020-01 *Debating the assumptions of the Thirlwall Model: A VECM analysis of the Balance of Payments for Argentina, Brazil, Colombia, and Mexico* by Danilo Spinola
2020-02 *The La Marca Model revisited: Structuralist Goodwin cycles with evolutionary supply side and balance of payments constraints* by Danilo Spinola
2020-03 *Uneven development and the balance of payments constrained model: Terms of trade, economic cycles, and productivity catching-up* by Danilo Spinola
2020-04 Time-space dynamics of return and circular migration: Theories and evidence by Amelie F. Constant
2020-05 *Mapping industrial patterns and structural change in exports* by Charlotte Guillard
2020-06 *For real? Income and non-income effects of cash transfers on the demand for food* by Stephan Dietrich and Georg Schmerzeck
2020-07 *Robots and the origin of their labour-saving impact* by Fabio Montobbio, Jacopo Staccioli, Maria Enrica Virgillito and Marco Vivarelli
2020-08 *STI-DUI innovation modes and firm performance in the Indian capital goods industry: Do small firms differ from large ones?* By Nanditha Mathew and George Paily
2020-09 *The impact of automation on inequality across Europe* by Mary Kaltenberg and Neil Foster-McGregor
2020-10 *What matters in funding: The value of research coherence and alignment in evaluators' decisions* by Charles Ayoubi, Sandra Barbosu, Michele Pezzoni and Fabiana Visentin
2020-11 *The productivity impact of business visits across industries* by Mariacristina Piva, Massimiliano Tani and Marco Vivarelli
2020-12 *Technological revolutions, structural change & catching-up* by Jan Fagerberg and Bart Verspagen
2020-13 *Semi-endogenous growth models with domestic and foreign private and public R&D linked to VECMs with evidence for five countries* by Thomas Ziesemer
2020-14 *The economic impact of public R&D: an international perspective* by Luc Soete, Bart Verspagen and Thomas H.W. Ziesemer
2020-15 *Taking the challenge: A joint European policy response to the corona crisis to strengthen the public sector and restart a more sustainable and social Europe* by Jo Ritzen, Javi Lopez, André Knottnerus, Salvador Perez Moreno, George Papandreou and Klaus F. Zimmermann
2020-16 Migration of higher education students from the North Africa Region to the United Kingdom by Samia Satti Osman Mohamed Nour
2020-17 Overview of the Sudan Uprising by Samia Satti Osman Mohamed Nour
2020-18 *Inter-country Distancing, Globalisation and the Coronavirus Pandemic* by Klaus F. Zimmermann, Gokhan Karabulut, Mehmet Huseyin Bilgin and Asli Cansin Doker
2020-19 *How does innovation take place in the mining industry? Understanding the logic behind innovation in a changing context* by Beatriz Calzada Olvera & Michiko Iizuka
2020-20 Public universities, in search of enhanced funding by Jo Ritzen
2020-21 Ph.D. research output in STEM: the role of gender and race in supervision by Giulia Rossello, Robin Cowan and Jacques Mairesse
2020-22 Labour market effects of COVID-19 in sub-Saharan Africa: An informality lens from Burkina Faso, Mali and Senegal by Racky Balde, Mohamed Boly, and Elvis Avenyo

2020-23 *Occupational sorting and wage gaps of refugees* by Christopher F Baum, Hans Lööf, Andreas Stephan and Klaus F. Zimmermann

2020-24 *Policy opportunities and challenges from the Covid-19 pandemic for economies with large informal sectors* by Rajneesh Narula

2020-25 *Economic gender gap in the Global South: how institutional quality matters* by Elena Bárcena-Martin, Samuel Medina-Claros and Salvador Pérez-Moreno