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## GENDER FACTORS AND INCLUSIVE ECONOMIC GROWTH: THE SILENT REVOLUTION

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The gender factors that trigger economic growth in both high- and low-income countries were studied. To address these gender factors, four characteristic

dimensions of gender inclusion were considered: education, access to the labor market, fertility, and democracy. The relationship between economic growth and gender factors was analyzed in a sample of 127 countries. Value and robustness were added to the results using dynamic models applied to panel data while accounting for endogeneity. We conclude that high fertility in women has negative effects on economic growth. However, when women have greater access to secondary education and the labor market in conditions of equality, the effects are positive. Similarly, the access of women to active political participation has significant effects on economic growth. Overall, this study helps identify which gender factors may promote inclusive economic growth, which is economic growth achieved when both men and women are incorporated in equal conditions.

**Gender factors; inclusive economic growth; education; labor force;**

ensure equal opportunity in the processes of human development as a fundamental element for achieving equitable and sustainable development, and growth for all [4]. This is the philosophy that underlies our paper and which aimed to determine which gender variables favor inclusive and sustained economic growth of a country. Previous studies have examined the relationship between gender factors and economic growth. A significant number of studies showed that, on a micro level, gender gaps negatively affect macroeconomic results and economic growth, and that the influence of gender factors on economic growth seems to be determined by variables such as the economic system, education of women, distribution of work between sexes, and political regime [5–9].

However, other studies investigated the effects of gender gaps, determining that the higher the gap, the higher the economic growth [10–12] by keeping women in a role that balances the family, favors the education of the children, and reduces the available labor force. These results are obviously solely based on economic reasons and the concept of inclusive economic development, where economic efficiency should be obtained, while respecting human rights and defending the equality of women in accessing the same rights as their male peers. A third group of studies [13] found the significance of the relationship between the gender gap and economic growth varied according to whether the impact was measured in the short or long term.

Regardless, the understanding and quantification of the economic importance of gender factors in their different dimensions—including education, employment, fertility, democracy, and technology, as well as the quantification of their effects on the economic growth and how the economic growth helps to reduce these gaps—are a basic question for gender research and advances in equality. This is important from an academic perspective, but even more so in the political sphere to facilitate decision-making that favors economic growth and the equitable distribution of profits between men and women. This equitable distribution is what we term ‘inclusive economic growth’ in this paper.

The aim of this paper was to analyze the effects that gender factors produce on a country’s economic growth from a macroeconomic perspective, considering different gender dimensions: female education, female labor force, fertility, and access of women to the political arena (democracy). Previous literature analyzed some of these female dimensions. To the best of our knowledge, this is the first investigation that incorporates all these dimensions into the same model. To accomplish this, we conducted an empirical study from an

مقدمة

The study of gender equality and its impact on social, political, and economic aspects is a constant theme in the literature, due to the efforts in the social and political arenas to incorporate women in the different decision-making areas under conditions of equality with men. Our analysis was conducted on the impact of gender factors on the economic growth in different nations. To define economic growth from an inclusive perspective, we defined the term “inclusive economic growth” for the first time in the literature. Inclusive economic growth means that the effort to advance a country’s growth and development should be produced with the contribution of all citizens without excluding an important group of the society, more specifically, women. Considering the assessment that “gender equality brings about economic growth but economic growth does not necessarily bring about gender equality” [1], we focused on the gender factors that trigger an increase in and stimulate economic growth in a country, for both low and high income countries, and thus result in inclusive economic growth.

The study of economic growth and its factors have been a constant in economic history. Different models have tried to clarify the factors that explain economic growth. A previous study [2] supported exogenous factors and attributed economic growth to the accumulation of capital, which was only achieved through saving. Subsequently, the models have been improved [3] by including endogenous factors and highlighting the role of human capital and technology as key indicators of growth.

Paradigm shifts have incorporated new variables into the growth models, highlighting certain variables, such as the level of corruption perceived by citizens, political conflicts, population in rural areas, and many others. A surge of factors related to gender have emerged, coinciding with the expansion of gender research in other disciplines. A small sample of these gender variables include the existence of quota systems or positive laws that favor the participation of women in different decision-making bodies; the educational level of women; the fertility of adult women or adolescent women; the participation of women in governing bodies, including female directors or advisors in companies and women in the political arena; women in competitive areas, such as sports; and the effect of women on the culture of a country.

The concept of ‘gender’ has acquired outstanding protagonism in different social areas, as it is considered an elemental and strategic principle in development policy. These policies stress the need to

marginal performance in education, meaning that educating women generates more additional profitability than educating men [7].

The education of girls was argued to have a “catalytic effect” in all the dimensions of economic development, including a higher level of productivity and encouraging economic growth [29]. The increase in the quantity of education and employment of women was shown to broaden the available talent pool in an economy, increase the income of women, and produce GDP growth [30]. Similarly, other studies indicated that the gender inequality in education reduces the average amount of human capital in a society and, therefore, harms economic growth [9,15,18,19,21,24,31].

In view of the above arguments, we present the following hypothesis:

With a higher educational level of women, **1 (H1). Hypothesis** greater economic growth is expected.

## 2.2. Economic Growth and the Female Labor Force

Since the Second World War, one of the most notable changes in the labor markets is the increase of women in the labor market. In the U.S.A., the employment rate of women of working age has doubled from approximately 35% in 1945 to 77% at the end of the century. Similar trends have been detected in most Organization for Economic Co-operation and Development (OECD) countries [32]. Despite this increase, important obstacles to the integration of women into the working world still exist in different economies [33].

Some authors have concentrated their research on analyzing the consequences of the gender labor gap on economic growth. The majority of them, with few exceptions, have found a positive relationship between the greater access of women to employment and economic growth [23,34–36], which should encourage public and private institutions to incentivize female employment.

Two measures of inequality have been used: the proportion of women participating in the overall labor force, and the proportion of the female population of working age in formal employment [25,37].

The proportion of women in formal employment was found to have a positive and significant impact on economic growth [37]. Gender differences in education were thought to lead automatically to gender differences in employment, particularly in the formal sector, where the employers would prefer workers with good training and, therefore, would not consider applications from women without education [9,24]. Conversely, if large barriers exist for women to access employment, the parents might decide that educating girls is not sufficiently lucrative and beneficial for the family, thereby producing a lower educational demand for women, resulting in a greater gender gap in education. Thus, gender differences in education and employment are closely related to each other and separating the effects of one from the other is difficult. This is the reason why models that control for endogeneity are required. These same difficulties were encountered in a model that suggested that gender inequality in employment is associated with higher levels of fertility, which is determined by the lack of education of girls, which in turn reduces economic growth [38].

Economic growth is triggered by the access of women to the labor force only when they are rewarded by low salaries, thus promoting the gender wage gap [39]. The access of women to the labor force not only increases economic growth, but also stimulates social welfare and human rights, causing the authors to demand positive laws promoting gender equality [30].

Based on these arguments, the following hypothesis is posed:

international database, rarely used in previous studies. The study was based on a robust methodology that applies panel data and dynamic models such as the Generalized Method of Moments (GMM), allowing us to control for the endogeneity inherent in the model as well as the unobservable heterogeneity (country effects) by using the first differences for all the variables. Using this method, we wanted to offer robust, current, and timely results on the link between the -inclusion of women and economic growth in a globalized and multi country environment.

The results obtained from a sample of 127 countries lead to the conclusion that high female fertility has negative effects on economic growth. However, when women have greater access to secondary education and to the labor market, the effects are positive. The effects are also positive when women have access to active political participation.

## Literature Review on Effects of Gender Factors on .2 Economic Growth: Hypotheses Statement

### 2.1. Economic Growth and Access of Women to Education

The relationship between the education levels of women and economic growth has been previously studied, with contradictory results, since evidence exists for both a negative and positive relationship [14,15]. The education gender gap was found to block economic growth and significantly reduce GDP, when modelled theoretically [12,16,17]. The gender gap in education was also found to have a negative impact on economic growth in a subsequent period [18–21]. Therefore, an increase in the educational level of women is supported as a form of increasing economic growth. Regardless, the opposite situation has been defended [22,23], one of which was with a Pakistani sample.

Several focuses are possible for the analysis of the relationship between educating women and economic growth, which could explain these different results. The majority of the authors considered the effects of female education on the creation of employment in that same generation, that is, in the short term, whereas others [21] analyzed the impact of female education on the following generation. In the first case, the effect of female education was analyzed based on their training and qualification as labor, and how this affects growth. In the second case, the effect of female education on fertility was examined in the long term. The negative impact of education on female fertility resulted in a negative impact on the creation of human capital in the following generation and, therefore, a reduction in long-term economic growth [24].

Different focuses based on the variable used can also measure the education level of women. Thus, we found papers that used the access of women to primary education measured by the number of girls in school, or the access of women to secondary education. Few studies measured the access of women to university, although a positive relationship between economic growth and university studies was identified [25]. In addition, some studies analyzed both the educational level of women and men. Female secondary education has been shown to be positively associated with growth [10,26,27], whereas the impact of male education was negatively but not significantly associated. Conversely, male education was observed to have a positive relationship with economic growth, whereas female education had a negative relationship [22,23].

Studies have suggested that increasing female education results in greater economic growth as long as these women represent an increase in qualified labor [10,11,28]. These studies are consistent with another that used micro data to show that girls have a superior

democracy [60–62] underscored a positive relationship between the two variables. With the democratization of countries in Latin America and Eastern Europe [63], and a simultaneous increase in economic liberalization, this positive relationship between economic development and democracy was observed [64–66]. The passing of time has permitted a retrospective view, thus leading to the conclusion that the growth of a country is directly influenced by the number of years it has existed and the quality of its democracy [67].

For the participation of women in political life, the evidence shows that participation in bodies of power and institutions is predominantly masculine, whereas voluntary associations, organizations, and “informal” community politics tend to be led by women. According to the data [68], the gender differences in political participation are present in many countries and do not visibly diminish as the countries become richer. The participation is even less in low-income countries. In a sample of

16 Latin American countries, including 15,828 municipalities, only 5.3% were headed by women [69]. This occurs despite the fact that the political representation of women can have an immediate positive influence on the level of democracy in a country due to being a direct measure of gender equality and human rights [70,71].

Furthermore, a greater proportion of women with legislative power would help introduce new policies for social and economic development that also empower women. These policies include establishing gender quotas, redirecting the distribution of wealth, and eliminating discrimination against women, since women know the many difficulties they faced to dedicate themselves to politics [30,33,72].

For the existence of a positive relationship between the presence of women in parliament and economic growth, little empirical evidence is available. The two relevant studies were both for Asian countries [73,74]. In both cases, their conclusions were clear cut, “it is evident that high representation of women in parliament has simulated economic growth”. A similar conclusion was attained in one other study [75].

Given this scenario, our last hypothesis is posed:

With the greater participation of women in the **4 (H4). Hypothesis** democratic system, a greater economic increase is expected.

### Sample Variables and Methodology .3

#### 3.1. Sample

To test our hypotheses, we built a panel containing both high and low income markets for the period of 2000 to 2014. Data were obtained from The World Bank DataBank, which contains collections of time series data on a variety of topics for many countries. We were able to build a panel including 127 countries and 1905 observations. However, the econometric technique we used, the Generalized Method of Moments (GMM), requires information to be available for at least four consecutive years per country to test the absence of second-order serial correlation. In addition, due to some missing values in some of the variables, we obtained an unbalanced panel of 1718 observations for 127 countries over 15 years.

#### 3.2. Variables and Methodology

The variables used in the analysis are shown in Table 1. For the methodology, we used a panel data methodology to estimate our models. We used the two-step difference GMM model for dynamic

With a higher participation of women in the **2 (H2). Hypothesis** labor market, greater economic growth is expected.

#### 2.3. Economic Growth and Fertility

Prior evidence uncovered the existence of a “demographic dividend” and a window of opportunity for economic growth as a result of fecundity decreases [40,41]. This demographic dividend is basically due to the decrease in rates of juvenile dependence, increasing the percentage of active population. So, the decrease in fecundity leads to changes in behavior that are translated into higher income. For example, the changes in fertility and the age structure can affect the rates of national savings and investment [42,43], and increase productivity by improving the health and education of each child [41,44–48]. Lower fertility can induce higher rates of business activity or employment for women [49], especially for low-income countries. Many papers have thoroughly analyzed fertility and economic growth. The relevant role of fertility and the demographic transition have been stressed to contribute to the successful economic growth of Eastern Asia [50].

The interrelations are crucial, since the decrease in fertility is initiated by incorporating women into the education system. With women accessing more education, the possibilities for a country to begin a demographic transition of decreasing fertility increase, providing a path to economic growth. By decreasing the number of children and increasing the number of young workers, and supposing that salaries do not increase, the young labor force tends to increase and generate a positive impact on the growth of the economy. The underlying idea is that the rapid growth of the population produces an exhaustion of resources, dilution of capital due to the rapid growth of the labor force, urbanization, and reductions in the rate of savings caused by a large dependent population [51].

Fertility negatively and significantly influencing the rate of growth of the GDP has been confirmed [52], whereas fertility and the income per capita have been shown to be positively associated in the majority of high-income OECD countries [53]. This relationship is also produced when salaries increase, the salary gap persists [53], and the results of fertility are translated into higher salaries for women [54]. The necessity of good social planning so that fertility significantly raises the production per capita has been demonstrated [55–57].

Still, supporters of the existence of a negative relationship between fertility and economic growth exist [53,58,59]. In the first two studies, fertility was negatively correlated to economic growth for low-income countries. However, the once-negative association between fertility and economic growth has become positive for OECD economies with high levels of income per capita [59].

Notably, in countries where the fertility rate has radically decreased in recent decades and family life is not emphasized, such as in Spain or France, the relationship is positive, and governments have had to advocate measures to increase birth rates to maintain pension systems and future growth.

Overall, the economic literature mostly supports a negative relationship, so this is reflected in our hypothesis.

With higher fertility and fecundity, lower **3 (H3). Hypothesis** economic growth is expected.

#### 2.4. Economic Growth and Democracy

Early research on the relationship between economic growth and



-panel data models that was created previously [76]. Unlike cross sectional analysis, the dynamic panel data analysis is a more robust methodology that allowed us to control for individual heterogeneity or unobservable individual effects (country effects) by considering first differences and control for an endogeneity problem. In addition, to the best of our knowledge, our study is the first related to inclusive growth that applied a panel data methodology.

### Definition of variables. **able 1. T**

Panel A: Dependent Variable Description

Annual percentage growth rate of GDP. Aggregates are based on constant 2010

U.S. dollars. GDP is the sum of gross value added by all resident producers in

GDP

the economy, plus any product taxes, minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or for depletion and degradation of natural resources [77,78].

### Panel B: Explanatory and Control Variables

**EDUCATION** Percentage of female students enrolled in all secondary education programs in a given school year [17,25].

The extent to which women are active in the labor force (%). Labor force

FEMALE LABOR

FERTILITY

includes people aged 15 and older who meet the international labor organization's definition of the economically active population [33,36].

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 current age-specific fertility rates [51].

DEMOCRACY Women in parliament as the percentage of parliamentary seats in a single or lower chamber held by women [71].

The proportion of the population aged 15 and older that is economically active:

LABOR\_FORCE

TECHNOLOGY

all people who supply labor for the production of goods and services during a specified period.

Expenditures for research and development are current and capital expenditures (both public and private) on creative work systematically undertaken to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications. Research and development (R&D)

H2 must be also confirmed, because if women are more active in the labor force (FEMALE\_LABOR), the annual percentage growth rate of GDP increases ( $\beta = 0.737$ ;  $p = 0.024$ ). We thus corroborated the most common results already obtained in the previous literature, whereas the evidence against this relationship is scarce.

Table 3 lists the correlation coefficients of the variables used in the panel data estimations.

Although some variables showed multicollinearity, an analysis of the variance inflation factors (VIF) revealed no evidence of multicollinearity, as all of them remained below 10 [79].

Panel A: Continuous Variables				Panel B: Dummy Variables
Variable	Mean	Min	Max	
GDP	5.129	4.079	104.487	
EDUCATION	17.469	41.001	58.136	
FEMALE_LABOR	11.417	39.464	51.810	
FERTILITY	1.464	2.686	7.354	
DEMOCRACY	10.874	16.362	53.1	
LABOR_FORCE	14.264	60.972	89.6	
TECHNOLOGY	0.934	0.601	4.523	
				Frequency (%)
	(73.43 %)	1356		COUNTRY
	(45.23 %)	835		CRISIS

Table 3 lists the correlation coefficients of the variables used in the panel data estimations. Although some variables showed a statistically significant correlation, an analysis of the variance inflation factors (VIF) revealed no evidence of multicollinearity, as all of them remained below 10 [79].

Correlation matrix for the dependent and explanatory variables. **able 3. T**

[illegible]

(in terms of education, access to the labor market, fertility and fecundity, and democracy) have a significantly negative effect on economic growth. The previous studies on the subject were not conclusive, since authors affirmed that reducing the gap between men and women can significantly stimulate economic growth, whereas others affirmed that its effect is nil or marginal. Our results help to advance the understanding of this issue. In addition, our methodology allowed us to solve the problems of endogeneity, which generated noise in previous studies. This noise impeded definitively concluding whether gender factors affected economic growth or whether the effects were a result of another factor, or the causality was the reverse.

We conclude that the effects on economic growth are positive for the greater access of women to secondary education, access of women to the labor market, and for the active political participation of women. Conversely, a high fertility rate in women has negative effects on economic growth. Besides, as expected, the crisis negatively affected economic growth.

The results mostly coincide with the expected results and with prior evidence in the literature, corroborating the need to demand that politicians and regulators strongly influence the policies of sex education and prevention of pregnancy, especially in low-income countries. Politicians and regulators should also focus on guaranteeing obligatory and free primary and secondary education, and should introduce positive measures that favor the contracting of women in qualified jobs. These measures must be voluntarily demanded by our politicians in the defense of human rights. Reasons of economic efficiency should be considered, since, as derived from our analysis, the improvement in education, qualified jobs, and the reduction of pregnancy translate into greater wealth for the country that adopted these positive measures. Moreover, investing in female education would be a waste of resources if women do not have access a qualified job afterwards. This phenomenon requires deeper analysis in future research.

For fertility, our results showed a negative relationship, but we should recall that for some high-income countries, low fertility rates have had perverse effects on economic growth. In many developed countries, fertility rates have radically decreased, often under the sub-replacement threshold, challenging future growth unless migration is favored. In such scenarios, the governments should advocate measures to increase birth rates and promote family life as a way to increase fertility rates and maintain future economic growth and their pension systems.

Access of women to political life was a significant variable in our study, thus, we must make a plea in its favor and encourage governments to increase the number of women in the political arena. In this study, the number of women in politics was very low, with 16% of women in the governments of 127 countries. Not even one woman was in a top parliamentary management post per country and year of our sample. As previously noted [74], the way to improve gender balance may come “ . . . from choosing multi-member electoral districts, multi-party systems, and stipulate fixed -quotas, since there are findings that countries with multi member electoral districts, multi-party systems and strict quotas had more female members of parliament than those with flexible quotas and only one or two major political

Our results also support H3, as the lower female fertility (FERTILITY), the larger the GDP ( $\beta = -3.107$ ;  $p = 0.007$ ), also corroborating results in the economic growth literature.

As found in previous studies [73,74], H4 is also supported, as DEMOCRACY is statically significant ( $\beta = 0.081$ ;  $p = 0.030$ ). These results show that the participation of women in the political arena significantly affects the level of economic growth.

For the control variables, neither labor force nor technology was significant, which does not diminish the validity of the results. In fact, the gender studies quoted in this paper omitted these variables when modelling economic growth, considering only the effects of the gender factors. Similarly, the type of country was not significant. We also tested the significance of other country classifications, such as the origin of their legal system, or other control variables such as the total level of education, and neither were significant and the results did not vary significantly. However, the economic situation was influential, since our analyses revealed that economic crises (CRISIS) have a negative impact on a country's economic growth, as expected ( $\beta = -3.429$ ;  $p = 0.000$ ). Finally, it is also worth mentioning that we considered controlling for the effects of the informal sector, due to its potential impact on economic growth, as shown in [80,81] which noted that the informal sector consists of all activities operating outside the official legal and fiscal system, with a resulting lack of reliable statistical information. In fact, this lack of data represented such a reduction in our sample size, which would have dropped from 1719 to 64 observations as well as in the number of countries (which would have dropped from 127 to 18), that its use as control variable is discouraged.

$$3 \text{ Fertilityit} + \beta_2 \text{ FemaleLaborit} + \beta_1 \text{ Educationit} + \beta_0 + \beta \text{ GDPit} = \\ 4 \text{ Democracyit} + \beta + \\ i + \text{vit} + \beta_8 \text{ Crisisit} + \beta_7 \text{ Countryit} + \beta_6 \text{ k5it} + \beta_5 \text{ lit} + \beta +$$

## استنتاج

Interest in studying the different effects of gender in its different dimensions with a multidisciplinary focus has been growing steadily. Given its impact on the economy, the study of female inclusion and gender gaps should not be limited to pay gaps, or their access to the management team, or to the board of directors, which are research topics characteristic of most developed countries. Basic questions that affect all countries should be analyzed, such as the impact of gender on the country's economic growth, regardless of its GDP. If we seek to improve the wellbeing of our citizens, including both men and women, we must all participate together in searching for solutions that do not exclude women. This paper brings together a set of literature that has pursued understanding the factors that determine economic growth. To this list, a set of gender variables have been added, that were studied individually but had not yet been subjected to joint analysis, for such a broad sample, or through accurate and sophisticated econometric methods. These are some of the main contributions of this study. We also wanted to revitalize a subject that the economic crisis had pushed to the background: -the role of women in the economic growth of high- and low income countries.

In this paper, we approached the issue of whether gender gaps

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parties”. Still, women who reach posts of local, municipal, or national government usually occupy posts of lesser political importance and more of a cultural and social nature [82,83]. Given the above results, we conclude that the existence of the gender gap presents an obstacle for reaching the full economic growth of nations. Not adopting measures that empower women means accepting the existence of those obstacles and impeding obtaining sustained and inclusive economic growth. Some limitations could affect the relevance of our results, since we used proxies when the proper measurement was not available for variables such as capital formation. Our study was also limited to 127 countries, although the results were representative and easy to generalize. In fact, in order to avoid further reductions in the sample size which may erode the validity and generalization of our results, we did not control for the effects of the informal sector in our model, with the limitations that it may imply. Other questions still remain, which could be analyzed in further research, such as the proportion of female participation necessary to revitalize the economy of a country. To address this question, the objective of our future research is to calculate an index of female empowerment and identify the point from which the effects of the gender gap are negative. Other further lines of research include analyzing the moderating role of gender in other important economic relationships, such as the relationship between the distribution of wealth and economic growth, or the financial inclusion of women and economic growth. Meanwhile, we want to conclude this paper with a call to the public and those in public office to empower women and to enable inclusive economic growth.

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**Author Contributions:** Laura Cabeza-García and Esther B. Del Brio work on gender topics and are experts in panel data methodology, so they were responsible for those areas. Mery Luz Oscanoa-Victorio investigated economic growth and contributed to its modelling and analysis.

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