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How women's political emancipation affected economic growth?

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HOW WOMEN'S POLITICAL EMANCIPATION AFFECTED ECONOMIC GROWTH

КАК ЖЕНСКАЯ ПОЛИТИЧЕСКАЯ ЭМАНСИПАЦИЯ ПОВЛИЯЛА НА ЭКОНОМИЧЕСКИЙ РОСТ

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Abstract

The research studies how women's political emancipation affects economic growth by applying regression with fixed effects and the instrumental variable. The dependent variable is real GDP per capita growth. Control variables are: level of democratization, educational gender equality, female average schooling years, investments in education, total fertility rate. Regressors are: women's right to vote, share of women in parliament. The instrumental variable is anti-patriarchy level. Panel data consists of 206 countries and 62 periods (1960–2021). TSLS-based models driven on the initial sample show negative (insignificant) effect of both regressors. Regression applied to data filtered by democratization rates ≥ 0.7 shows a positive (insignificant) effect of share of women in parliament.

Keywords: political economy, women's enfranchisement, TSLS-based model, instrumental variable

I. INTRODUCTION

For a long time people in most countries lived in the paradigm of women's incapacity. Women had no control over their bodies, did not own property, could not get good education, had no access to children after a separation, and, most importantly, they could not vote. Women started obtaining rights within the time, while real GDP was rising. To find out if GDP growth can be boosted by expansion of women's rights, researchers started studying the subject.

It was confirmed that women's rights are positively significantly correlated with GDP per capita (Doepke, Tertilt and Voena, 2012). If women have access to education and economic opportunities, they are more likely to invest in children, increasing human capital, which boosts productivity of the next generation of workers (Carruthers and Wanamaker, 2015; Hessami and da Fonseca, 2020; Kose, Kuka and Shenhav, 2021). Higher levels of female education and participation in the labor force are a major contributor to fertility decline, which in turn reduces economic burden of dependency and increases the supply of savings (Klasen, 1999; Klasen, 2002; Klasen and Lamanna, 2009).

Thus, the positive effect of gender equality in education, employment and economic rights on GDP is achieved through the two channels — by increasing the average amount of human capital in society and reducing fertility rates. There is also the evidence of the opposite dependence — economy in the country influences its gender equality state. Doepke and Tertilt (2009) claim that married women's rights in the UK and US expanded mainly because of technological change. Labor saving technologies reduce women's unpaid domestic labor and let them take the opportunities, enlarged by the country's economic development, to state their autonomy (Lewis, 1955; Richards and Gelleny, 2007; Duflo, 2013). When the economy reaches some critical level of wealth, men's preferences change from patriarchy to gender equality (Fernández, 2014; Doepke and Tertilt, 2009).

As a result, economic growth and women's rights are linked in both directions: economic development may be a major driver of women's rights expansion, and women's suffrage influences decisions that lead to economic development (Doepke, Tertilt and Voena, 2012). Nevertheless, according to the meta analysis (Kabeer and Natali, 2013), gender equality in education and employment contributes to economic growth more consistently and robust than GDP growth contributes to gender equality.

When it comes to political rights, Bertocchi (2011) states that capital accumulation and industrialization accelerate women's enfranchisement. Concerning inverse relationship, Jayasuriya and Burke (2013) claim that for the period of 1993–2009 in democratic countries share of women in parliament has a positive significant influence on economic growth. Several studies demonstrate similar results — empowerment of women, measured by different indicators along with the proportion of women in parliament, influences economic growth positively, with statistical significance (Mitra, Bang and Biswas, 2015; Cabeza-García, Del Brio and Oscanoa-Victorio, 2018; Mirziyoyeva and Salahodjaev, 2023). Other researchers argue that women's enfranchisement is not associated with economic development directly but it correlates significantly with total fertility rate and female labor force participation (Tertilt et al., 2022).

Though gender equality was proven to have a positive influence on GDP, the effect of political rights specifically is understudied. In this paper it will be investigated if women's enfranchisement influences GDP growth. The following hypotheses will be considered: (1) women's right to vote influences the country's economic growth; (2) percentage of women in the country's parliament affects the rise of its GDP. What could be the mechanism for such a relation?

Several researchers confirm that an important determinant of economic growth is the quality of political and economic institutions (Acemoglu and Robinson, 2012; Nguyen et al., 2021; Azam, 2022). According to Acemoglu and Robinson (2012), inclusive political institutions lead to prosperity. They are characterized by secure property rights, an unbiased system of law, the provision of public services that ensure a level playing field. Hessami and da Fonseca (2020) state that stronger female representation in politics has improved the quality of institutions by reducing corruption and rent-extraction levels. The decreased engagement in corruption by female (in contrast to male) mayors in Brazil was proved by Brollo and Troiano (2016). Another study (Baltrunaite et al., 2014) concludes that gender quotas in Italian local elections increase the quality of elected politicians, which is measured by average years of education.

Besides, it was found that enfranchisement of women is associated with an increase in social spending (Abrams and Settle, 1999; Miller, 2008; Funk and Gathmann, 2015), which accelerates human capital and therefore leads to a growth in GDP.

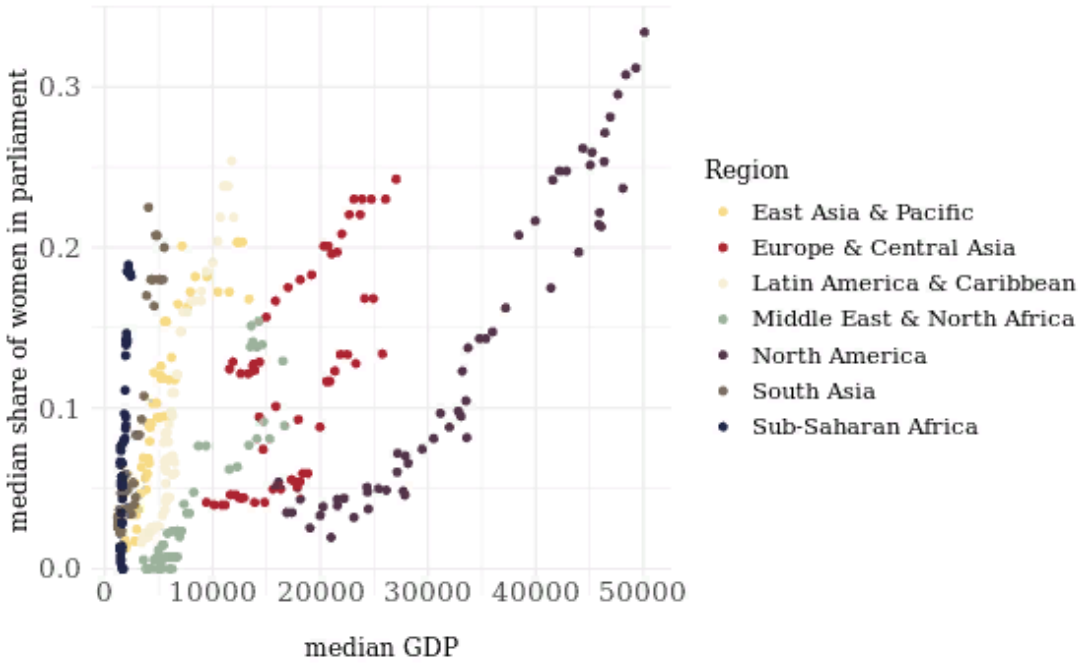
Thus, the expected dependence is as follows: women's enfranchisement leads to improvement in political institutions and increase in human capital, both of which induce economic growth. The research brings a clearer understanding to the influence of feminism on the world, which can be helpful for politicians in the matter of decision making. The article also discovers an important determinant of GDP growth, which could be practical for other studies in the field.

Section II describes data and methodology, constructs and explains OLS- and TSLS-based models. Section III provides results for the two samples: 1) initial data without outliers; 2) data with democracy estimates ≥ 0.7. Section IV accommodates conclusions and discusses shortcomings of the survey.

II. DATA AND METHODOLOGY

The research is grounded on two regressions that model panel data with 11583 observations[1]. Dataset consists of 206 countries[2] and 62 periods (1960–2021). The variables are: female right to vote, share of women in parliament, level of democratization, educational gender equality, female schooling years, investments in education, total fertility rate, anti-patriarchy score, and real GDP growth[3]. Descriptive analysis[4] shows the presence of several obvious outliers in educational gender equality and investments in education[5]. This can be caused by either mistakes in collecting data or specifics of it. In addition to points visible on the graphs, outliers imply values > 0.995 and < 0.005 quantile. Data without such values in the variables of interest (right to vote, share of women in parliament, GDP growth) will be explored. The dataset is unbalanced: educational variables have 5-years frequency, some countries contain observations for only several years. The distribution of observations varies for countries from different regions[6] and different income states[7].

Figure 1. Relationship between share of women in parliament and GDP[8]



[1] Full dataset and code in R are available by the links (dataset, code).
[2] List of the countries is in the Appendix — Table A1.
[3] Description of the variables with data sources is in the Appendix — Table A2.
[4] Descriptive statistics of the sample is in the Appendix — Table A3.
[5] Figure A1 and Figure A2 presenting the outliers are in the Appendix.
[6] Figure A3 with observation frequency among the regions is in the Appendix.
[7] Figure A4 with observation frequency among different income states is in the Appendix.
[8] Figure 1: countries were grouped by year and region. Each dot represents the median among all the countries of the region for 1 year. Detailed graphs with GDP and share in parliament instead of medians for Middle East & North Africa (Figure A5), Europe & Central Asia (Figure A6) and North America (Figure A7) are in the Appendix.

Data preprocessing shows strong positive dependence between median shares of women in parliament and GDP levels in the countries of: Middle East & North Africa, Europe & Central Asia, and North America (Figure 1). Yet, this relation can be invalid because of the coinciding trend in both variables, that is why the dependent variable in the survey is GDP growth instead of just GDP. Also, as Figure A5 in the Appendix shows, the positive connection between GDP and proportion of women in parliament in the region of Middle East & North Africa can be caused by the outlier.

Figure 2. Europe & Central Asia (53 countries)

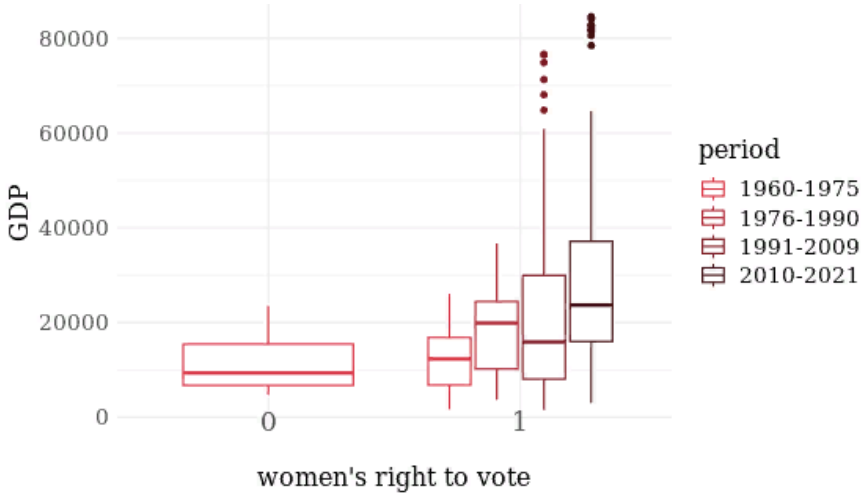
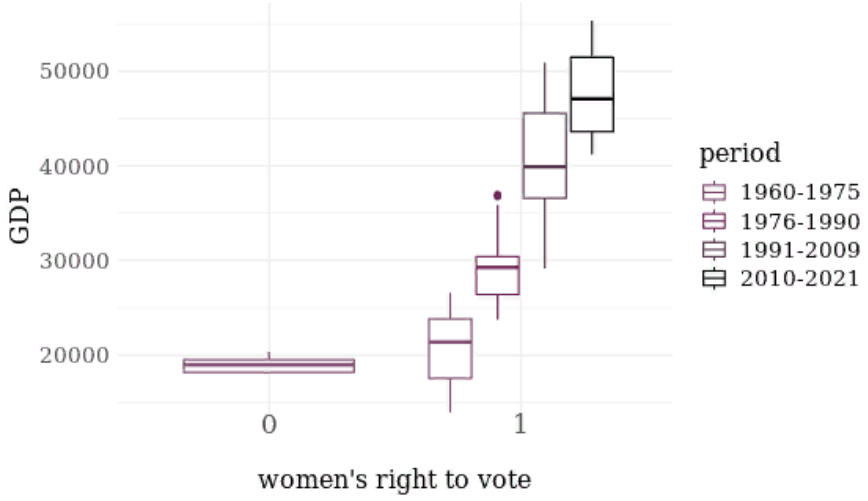


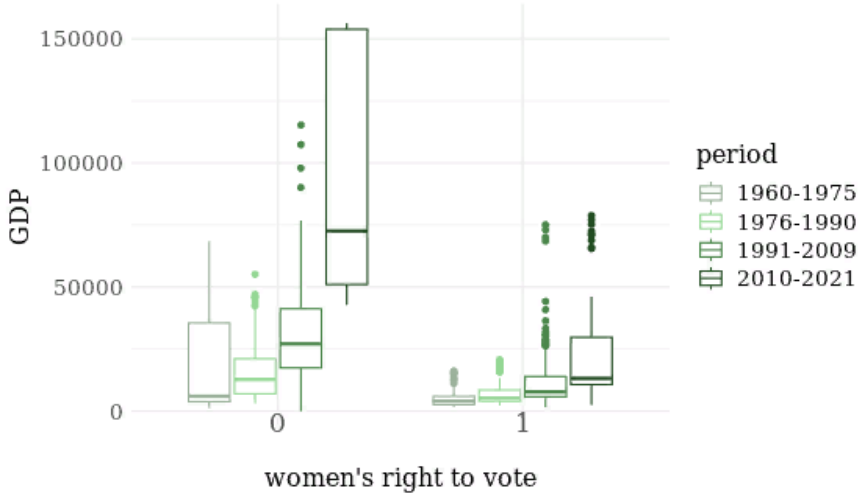
Figure 3. North America (2 countries)



Analysis of women's right to vote shows that countries in Europe & Central Asia (Figure 2) tend to have higher GDP rates when women emancipate (right to vote = 1). In 1991 average GDP values are getting lower, which might be connected with the post-USSR collapse crisis. 2010–2021

period already shows values outnumbering 1976–1990. North America demonstrates positive economic trend within the years (Figure 3) and higher, on average, GDP values in 1960–1975 in case of women's enfranchisement.

Figure 4. Middle East & North Africa (20 countries)



Countries of Middle East & North Africa since 1976 show bigger GDP if women are not empowered (Figure 4). According to Doepke, Tertilt and Voena (2012), women's political rights in African countries are formal. The reason for that might be relatively low democracy levels in the region[9].

Jayasuriya and Burke (2013) show that the positive effect of women's proportion in parliament is only obtained at the peak of the third wave of democratization, 1993–2009. Non-democratic countries might not show positive dependence between the variables due to their decision-making specifics[10]. That is why regression analysis might be not entirely applicable to countries with low democracy estimates. Regression models will be applied to the full sample and data with democracy level ≥ 0.7 (rounded 75% quantile).

There are two main models in the research [1], [2]. For both the dependent variable is GDP growth. Control variables are: level of democratization, educational gender equality, female average schooling years, investments in education, and total fertility rate. Model [1] reflects enfranchisement "on paper" — regressor is a dummy variable for women's right to vote. The ability

[9] Figure A8 with democracy levels for different regions is in the Appendix.
[10] More specific explanation is in Section III.

to vote does not mean women actually participate in politics. Model [2] shows actual enfranchisement — regressor is the share of women in parliament.

[1]

$$GDP\ growth_{it} = \alpha_0 + \alpha_1(women's\ right\ to\ vote)_{it} + \alpha_2(level\ of\ democratization)_{it} + \\ + \alpha_3(educational\ gender\ equality)_{it} + \alpha_4(female\ schooling)_{it} + \alpha_5(investments\ in\ education)_{it} + \\ + \alpha_6(total\ fertility\ rate)_{it} + \varepsilon_{1it}$$

[2]

$$GDP\ growth_{it} = \beta_0 + \beta_1(share\ of\ women\ in\ parliament)_{it} + \beta_2(level\ of\ democratization)_{it} + \\ + \beta_3(educational\ gender\ equality)_{it} + \beta_4(female\ schooling)_{it} + \beta_5(investments\ in\ education)_{it} + \\ + \beta_6(total\ fertility\ rate)_{it} + \varepsilon_{2it}$$

Where: α_m, β_m — coefficients; i — country; t — year; ε_{nit} — random error of the n-model.

To avoid the omitted variables bias models should contain factors correlating with the regressor and determining the dependent variable[11].

Level of democratization contributes to the quality of political institutions, so it determines GDP growth according to Acemoglu and Robinson (2012). Democracy is also correlated with women's political rights directly, because the definition of democracy includes suffrage of all adults.

Educational gender equality has a positive influence on the economy. Gap in education determines earnings potential of spouses, which influences the distribution of labor between the two. When a husband has a higher level of education, he will probably earn a bigger wage. As a consequence, the couple will specialize, which may lead to an increase in the husband's working hours in the market, while the wife will allocate more time to domestic responsibilities at the expense of her market work. This specialization impacts the economy negatively (Hill and King, 1995). Educational gender equality also correlates with the regressor — countries that have equality in education or labor are more likely to have political equality as well (Doepke, Tertilt and Voena, 2012).

Female average schooling years have a positive effect on GDP through increasing human capital and lowering fertility rates (Kabeer and Natali, 2013). The amount of female schooling years

[11] Pearson correlation test p-values is in the Appendix — Table A4.

is also associated with gender equality — in countries with higher equality levels girls are likely to obtain more years of school.

Investments in education, as a part of investing in human capital, are increasing with increasing female suffrage because women tend to vote for the laws that impact human capital positively (Abrams and Settle, 1999; Miller, 2008; Funk and Gathmann, 2015). And the adoption of these laws accelerates GDP growth.

Drop in the total fertility rate, according to Klasen (2000), led to growth in the share of the working age population and reduction of burden dependency in the economy. This caused 0.6–1.6% of annual per capita growth in the Asian tiger economies in 1966–1990. Also, decrease in fertility rates enlarges returns to human capital, which causes the extension of women's rights, according to Doepke and Tertilt (2009). The researchers claim: once returns to human capital reach some critical point, fathers start to favor women's rights because they care about their daughters' well-being. So, women's suffrage is correlated with fertility rates.

Yet, simple models can show untrustworthy results because of the endogeneity of the regressors. Endogeneity might happen due to the unobserved factor (economic policy) and mutual causality. Policy in the economic field influences resource allocation determining which public services and programs are funded and which groups of population have access to them. Unequal allocation among the sexes may affect women's enfranchisement. If women face discrimination in resource distribution, this can lead to negative public opinion regarding gender equality in politics, which means women will have fewer opportunities for political emancipation. As a result, the correlation between women's enfranchisement and economic growth can be explained not by political emancipation of women but by the influence of economic policy. There can be a reverse causal relationship as well. It was not the political emancipation that affected economic growth, but richer countries gave women more rights, which subsequently affected GDP growth due to the social orientation of laws adopted by women. The endogeneity will be eliminated by the use of the instrumental variable, which is: relevant (correlates with female enfranchisement) and exogenous (does not correlate with economic policy or affect GDP directly). Anti-patriarchy level — the variable which defines women's enfranchisement by slowing it down (Bertocchi, 2011) and does not associate with changes in economic policy or GDP growth. Thus, model equations will be extended to [3] and [4].

[3]

$$women's\ right\ to\ vote_{TSLS,\,it} = \gamma_0 + \gamma_1(anti\ patriarchy\ score)_{it} + \gamma_2(level\ of\ democratization)_{it} + \gamma_3(educational\ gender\ equality)_{it} + \gamma_4(female\ schooling)_{it} + \gamma_5(investments\ in\ education)_{it} + \delta_6(total\ fertility\ rate)_{it} + \omega_{1,i} + p_{1,t} + u_{1it}$$

$$GDP\ growth_{it} = \lambda_0 + \lambda_1(women's\ right\ to\ vote)_{TSLS,\,it} + \lambda_2(level\ of\ democratization)_{it} + \lambda_3(educational\ gender\ equality)_{it} + \lambda_4(female\ schooling)_{it} + \lambda_5(investments\ in\ education)_{it} + \lambda_6(total\ fertility\ rate)_{it} + \mu_{3i} + \eta_{3t} + \varepsilon_{3it}$$

[4]

$$share\ of\ women\ in\ parliament_{TSLS,\,it} = \delta_0 + \delta_1(anti\ patriarchy\ score)_{it} + \delta_2(level\ of\ democratization)_{it} + \delta_3(educational\ gender\ equality)_{it} + \delta_4(female\ schooling)_{it} + \delta_5(investments\ in\ education)_{it} + \delta_6(total\ fertility\ rate)_{it} + \omega_{2,i} + p_{2,t} + u_{2it}$$

$$GDP\ growth_{it} = \nu_0 + \nu_1(share\ of\ women\ in\ parliament)_{TSLS,\,it} + \nu_2(level\ of\ democratization)_{it} + \nu_3(educational\ gender\ equality)_{it} + \nu_4(female\ schooling)_{it} + \nu_5(investments\ in\ education)_{it} + \nu_6(total\ fertility\ rate)_{it} + \mu_{4i} + \eta_{3t} + \varepsilon_{4it}$$

Where: γ_m, δ_m — coefficients in regression models of the instrumented variables, 1st step in TSLS-based models; $regressor_{TSLS,\,it}$ — regressor estimated on the 1st step of TSLS; λ_m, ν_m — coefficients of the 2d step in TSLS; i — country; t — year; ε_{nit} — random error of the n-model; ω_{ni}, μ_{ni} — unobserved variables in the n-equation characterizing features that change among the countries but stay within the time (country fixed effects); η_{nt}, p_{nt} — unobserved variables in the n-equation that characterize features changing with time but similar for all countries (year fixed effects).

III. RESULTS

Two pooled OLS-based models were constructed — equations [1] and [2]. Regression was performed on the sample without outliers in the variables of interest. Standard errors are clustered, resistant to heteroskedasticity and autocorrelation. Table 1 shows coefficients calculated by the ordinary least squares method. Both regressors have a positive, though insignificant effect on GDP growth.

Table 1. Estimation results for models [1] and [2]

Dependent variable: GDP growth	[1] OLS	[2] OLS
Women's right to vote = 1	**0.045 (0.161)**	

Share of women in parliament		**0.026 (0.203)**
Level of democratization	-0.031** (0.002)	-0.027* (0.010)
Educational gender equality	-0.011 (0.556)	-0.019 (0.412)
Female schooling years	0.002 (0.139)	0.002 (0.184)
Investments in education	-0.002 (0.154)	-0.002 (0.087)
Total fertility rate	-0.007** (0.002)	-0.008** (0.002)
Observations	*532*	*532*

SE are clustered, resistant to heteroskedasticity and autocorrelation.
P-values are given in the brackets.

(*) p-value < 0.05
(**) p-value < 0.01
(***) p-value < 0.001

Two-stage least square-based models were constructed on the sample without outliers in the variables of interest. The models include individual (country) and time (year) fixed effects. Individual effects help to consider differences between the countries which do not change within the time — some cultural, historical or institutional characteristics. Time effects imply factors similar for all countries but changing in time. Table 2 shows results for the models [3] and [4]. Standard errors are clustered, resistant to heteroskedasticity and autocorrelation. Both regressors show negative insignificant effects.

Table 2. Estimation results for models [3] and [4]

Dependent variable: GDP growth	[3] TSLS	[4] TSLS
Women's right to vote = 1	**-0.299 (0.605)**	
Share of women in parliament		**-0.339 (0.387)**
Level of democratization	0.064 (0.261)	0.027 (0.320)
Educational gender equality	0.040 (0.521)	0.046 (0.271)
Female schooling years	-0.001 (0.942)	-0.007 (0.296)
Investments in education	-0.003 (0.3)	-0.000 (0.990)
Total fertility rate	-0.017 (0.530)	0.000 (0.977)
Observations	*528*	*528*

SE are clustered, resistant to heteroskedasticity and autocorrelation.
P-values are given in the brackets.

(*) p-value < 0.05
(**) p-value < 0.01
(***) p-value < 0.001

The negative effect of women's enfranchisement on GDP growth shown by the models could happen because of the prevailing number of non-democratic countries in the sample.

In authoritarian and totalitarian countries, parliaments and elections often turn out to be imitation institutions. In personalist autocracies and totalitarian regimes, a large number of decisions are made by a ruler or elites, which makes parliament a nominal authority. Elections in such regimes are often aimed at maintaining the status quo rather than seeking citizens' opinion. As a result, models show results contradicting the theory.

Models [2] and [4] were applied to data with democracy rates ≥ 0.7 — Table 3. Because highly-democratized countries appear to have women's rights throughout the whole observation period, hypotheses from the equations [1] and [3] cannot be tested. Both models show the positive effect of share of women in parliament on GDP growth.

Table 3. Estimation results for models [2] and [4]

Dependent variable: GDP growth	[2] OLS	[4] TSLS
Share of women in parliament	**0.043 (0.080)**	**0.834 (0.736)**
Level of democratization	-0.172** (0.004)	-0.003 (0.998)
Educational gender equality	-0.020 (0.629)	0.094 (0.858)
Female schooling years	0.002 (0.309)	0.005 (0.755)
Investments in education	0.000 (0.955)	-0.006 (0.828)
Total fertility rate	-0.011* (0.027)	-0.033 (0.156)
Observations	*234*	*234*

SE are clustered, resistant to heteroskedasticity and autocorrelation.
P-values are given in the brackets.

(*) p-value < 0.05
(**) p-value < 0.01
(***) p-value < 0.001

IV. CONCLUSIONS AND DISCUSSION

The survey examined the relationship between women's political emancipation and GDP growth. Initial data contains 206 countries and 62 periods (1960–2021). Analysis included two regression models — one reflects suffrage "on paper", regressor is women's right to vote; another shows actual enfranchisement with the regressor of women's share in parliament.

It is important to acknowledge data limitations. The availability and quality of data on women's political empowerment and economic growth varies across countries and time periods. Quality of observations 60 years ago may be poor because of the methods of its collection and storage. That is probably why other researches mostly use latest data: 1993–2009 (Jayasuriya and Burke, 2013), 1990–2000 (Mitra, Bang and Biswas, 2015), 2004–2014 (Cabeza-García, Del Brio and Oscanoa-Victorio, 2018), 2000–2018 (Mirziyoyeva and Salahodjaev, 2023).

Regressors were presumed to be endogenous because of mutual dependence and an unobserved factor, so it was decided to augment the OLS-based models with the anti-patriarchy score as an instrumental variable. Results of the TSLS-based regression analysis driven on the full sample indicated that both share of women in parliament and women's right to vote have a statistically insignificant negative effect on economic growth. Such inconsistency with the theoretical assumptions could be caused by a large number of non-democratic countries in the sample. Because of the nominality of elections and parliament institutions, representation of women in politics in authoritarian and totalitarian regimes cannot have a considerable impact on GDP growth.

Models applied to the data with democratization estimates ≥ 0.7 manifests a positive insignificant effect of women's share in parliament = 0.834. Because democracy implies the right to vote for all adults, the influence of female right to vote was impossible to calculate — the dummy variable had only one level during the whole period (right_to_vote = 1).

The findings correspond to the study of Jayasuriya and Burke (2013) who obtained a positive effect of share of women in parliament on GDP growth, conducting research on democratic countries. Although, other articles achieve significant positive results without focusing on democracy estimates (Cabeza-García, Del Brio and Oscanoa-Victorio, 2018; Mirziyoyeva and Salahodjaev, 2023).

A possible explanation for inconsistency with other studies could be model oversight. Surveys that obtain positive significant effect of women's enfranchisement often use the generalized

method of moments (Jayasuriya and Burke, 2013; Cabeza-García, Del Brio and Oscanoa-Victorio, 2018; Mirziyoyeva and Salahodjaev, 2023). Besides, Cabeza-García, Del Brio and Oscanoa-Victorio (2018) claim that (apart from fertility rates, education years, and share of women in parliament) female labor force and expenditures for research and development are important determinants of economic growth. Additionally, though anti-patriarchy score is assumed to be relevant and exogenous, further research could explore alternative instruments to obtain better results.

Although, inconsistency with other studies could be, in fact, because the connection between women's enfranchisement and economic growth in non-democratic countries is explained not by political emancipation but by the influence of economic policy, as it was stated at the beginning of the survey. The instrumental variable used in this paper helped to point out complex relationship between the variables and underline the possible shortcoming of the previous articles. The finding requires deeper investigation, though it could be a breakthrough in this field of research.

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Appendix

I. Table A1. List of the countries.

Afghanistan	Ecuador	Macedonia	Slovakia
Albania	Egypt	Madagascar	Slovenia
Algeria	El Salvador	Malawi	Solomon Islands
Andorra	Equatorial Guinea	Malaysia	Somalia
Angola	Eritrea	Maldives	Somaliland
Antigua and Barbuda	Estonia	Mali	South Africa
Argentina	Ethiopia	Malta	Spain
Armenia	Fiji	Marshall Islands	Sri Lanka
Australia	Finland	Mauritania	St. Kitts and Nevis
Austria	France	Mauritius	St. Lucia
Azerbaijan	Gabon	Mexico	St. Vincent and the
Bahamas	Gambia	Micronesia	Grenadines
Bahrain	Georgia	Moldova	Sudan
Bangladesh	Germany	Monaco	Suriname
Barbados	Germany, East	Mongolia	Swaziland
Belarus	Germany, West	Montenegro	Sweden
Belgium	Ghana	Morocco	Switzerland
Belize	Greece	Mozambique	Syria
Benin	Grenada	Myanmar	Taiwan
Bhutan	Guatemala	Namibia	Tajikistan
Bolivia	Guinea	Nauru	Tanzania
Bosnia and Herzegovina	Guinea-Bissau	Nepal	Thailand
Botswana	Guyana	Netherlands	Togo
Brazil	Haiti	New Zealand	Tonga
Brunei	Honduras	Nicaragua	Trinidad and
Bulgaria	Hungary	Niger	Tobago
Burkina Faso	Iceland	Nigeria	Tunisia
Burundi	India	Norway	Turkey
Cabo Verde	Indonesia	Oman	Turkmenistan
Cambodia	Iran	Pakistan	Tuvalu
Cameroon	Iraq	Palau	Uganda
Canada	Ireland	Palestine/Gaza	Ukraine
Central African Republic	Israel	Palestine/West Bank	United Arab

Chad	Italy	Panama	Emirates
Chile	Jamaica	Papua New Guinea	United Kingdom
China	Japan	Paraguay	United States
Colombia	Jordan	Peru	Uruguay
Comoros	Kazakhstan	Philippines	USSR
Congo Brazzaville	Kenya	Poland	Uzbekistan
Costa Rica	Kiribati	Portugal	Vanuatu
Cote d'Ivoire	Korea, North	Qatar	Venezuela
Croatia	Korea, South	Romania	Vietnam
Cuba	Kuwait	Russia	Vietnam, North
Cyprus	Kyrgyzstan	Rwanda	Vietnam, South
Czech Republic	Laos	Sahrawi	Yemen
Czechoslovakia	Latvia	Samoa	Yemen, North
Democratic Republic of	Lebanon	San Marino	Yemen, South
Congo	Lesotho	Sao Tome and Principe	Yugoslavia
Denmark	Liberia	Saudi Arabia	Zambia
Djibouti	Libya	Senegal	Zanzibar
Dominica	Liechtenstein	Seychelles	Zimbabwe
Dominican Republic	Lithuania	Sierra Leone	
East Timor	Luxembourg	Singapore	

II. Table A2. Description of the variables.

Variable (units)	*Data source*	*Description*
Real GDP per capita growth (%)	Maddison Project Database	$(\frac{GDP\ pc\ 2011\$\ (T)}{GDP\ pc\ 2011\$\ (T-1)} - 1) * 100\%$
Women's right to vote (dummy)	Skaaning, Gerring and Bartusevičius, 2015	= 1 at the year of giving women right to vote and all years after; = 0 for the years without political rights.
Women in parliament (share)	IPU Parline	Number of women in lower and upper chambers was divided by the number of all members in parliament.
Level of democratization (electoral democracy index)	Our World Data	Electoral democracy was estimated by Bastian Herre, Esteban Ortiz-Ospina and Max Roser with lower and upper bounds. Estimates without bounds were taken for the research.

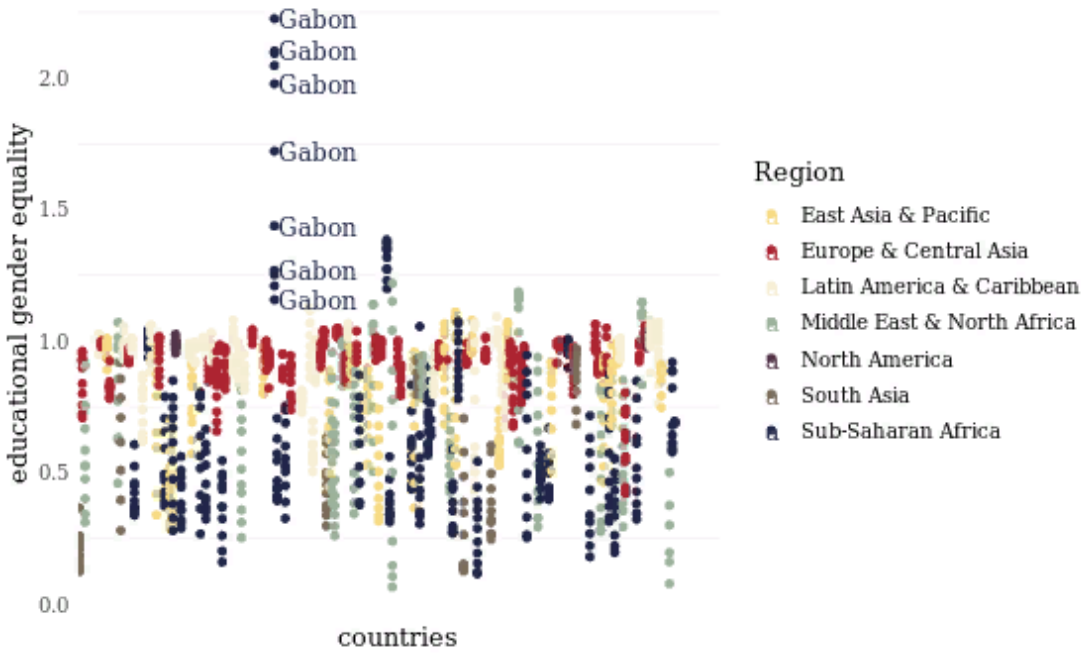
Educational gender equality (years)	BarroLee Educational Attainment Data Set	Females' mean years of education were divided by males' mean years of education (for people 15 and older).
Female schooling (years)	BarroLee Educational Attainment Data Set	Average years of education (5-year frequency data), females 15 years and older.
Investments in education (% to GDP)	Worldbank	Total government expenditure on education as a percentage of GDP.
Total fertility rate (births per woman)	Worldbank	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.
Anti-patriarchy level (index - the sum of 35 dummy parameters)	Worldbank report	Index contains 35 questions with answers 0 ("no") or 1 ("yes"). Index = 35 at the lowest level of patriarchy. For more information click on the data source.

III. Table A3. Descriptive statistics 1960-2021.

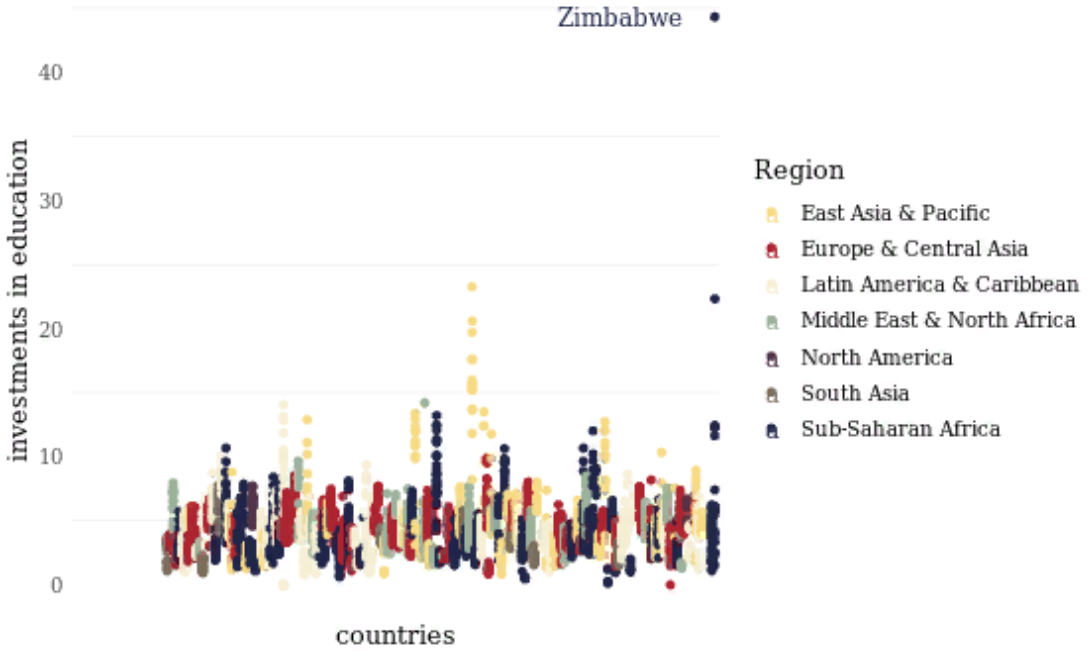
	N	Mean	Std. dev	Min.	25%	Median	75%	Max
Right to vote	11540	0.900	0.299	0.000	1.000	1.000	1.000	1.000
Share in parliament	9342	0.119	0.109	0.000	0.033	0.091	0.178	0.800
Level of democratization	10042	0.422	0.287	0.007	0.170	0.349	0.699	0.926
Educational gender equality	1469	0.785	0.261	0.065	0.596	0.873	0.969	2.226
Female Schooling	1469	5.405	3.383	0.010	2.370	5.270	8.200	13.230
Investments in education	4577	4.388	2.075	0.000	3.034	4.210	5.391	44.334
Total fertility rate	10355	4.076	2.037	0.837	2.127	3.788	5.994	8.864
GDP growth	8757	0.023	0.067	-1.000	0.000	0.025	0.049	1.309

Anti-patriarchy score	8995	20.757	6.644	6.000	16.000	21.000	26.000	35.000

IV. Figure A1. Distribution of educational gender equality observations among the countries.

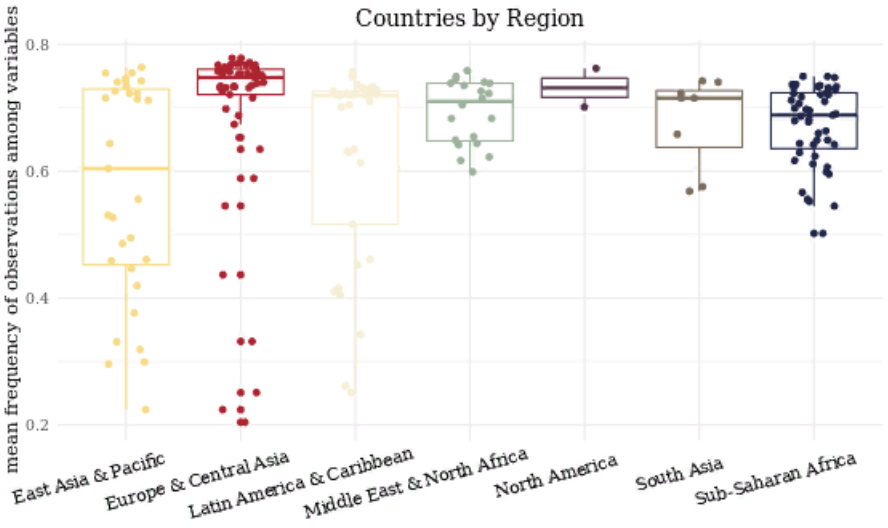


V. Figure A2. Distribution of investments in education observations among the countries.



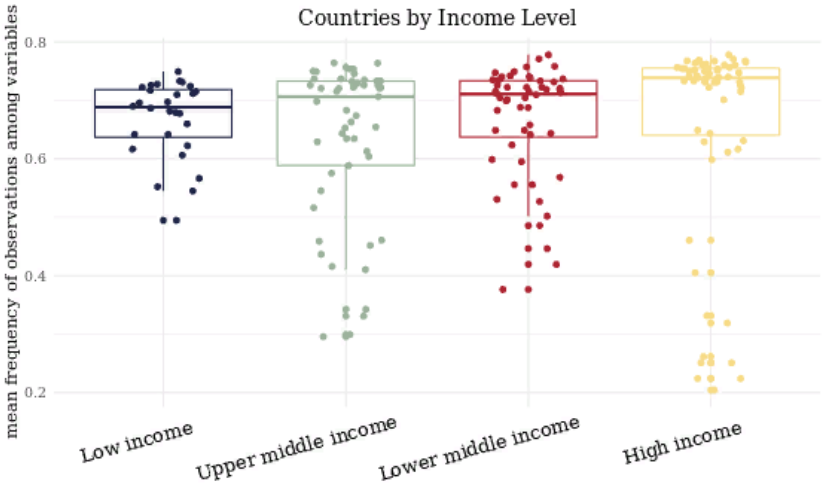
VI. Figure A3.

Data was grouped by country. For each variable in the dataset (Right_to_Vote, Share_in_Parliament, GDP, Democracy_Estimate, Educ_Gender_Equality, Female_Years_School, Investments, Total_Fertility_Rate, Anti_Patriarchy_Score) the frequency of observations was calculated - 9 frequencies for each state. Average of all 9 frequencies was computed for every country. The graph shows distribution of mean frequencies among countries' regional groups (according to World Bank regions). Each dot represents a country.

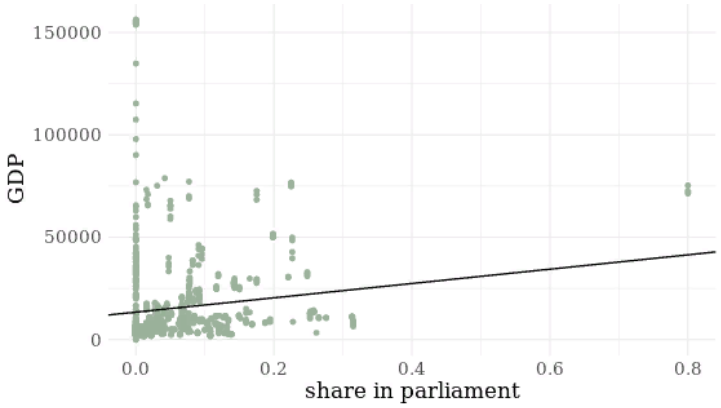


VII. Figure A4.

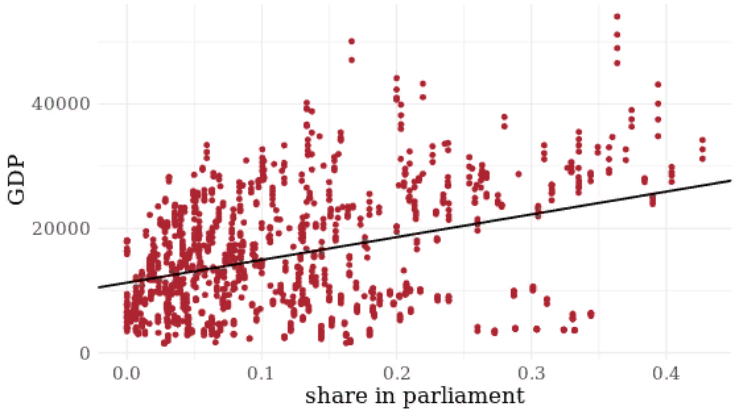
The graph shows distribution of mean frequencies among countries' income groups (according to World Bank income groups). Each dot represents a country.



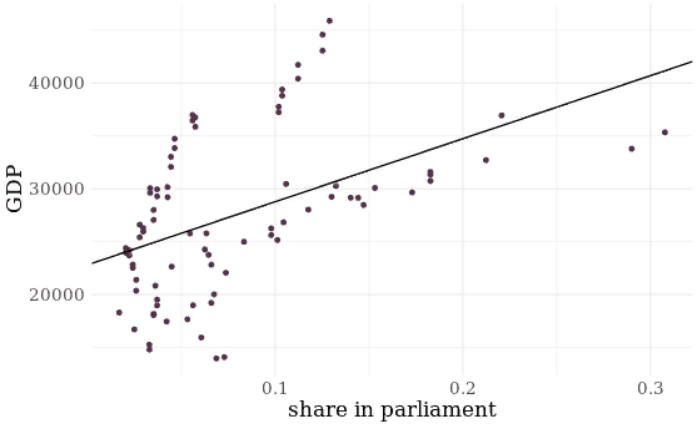
VIII. Figure A5. Dependence between GDP and share in parliament in the Middle East & North Africa.



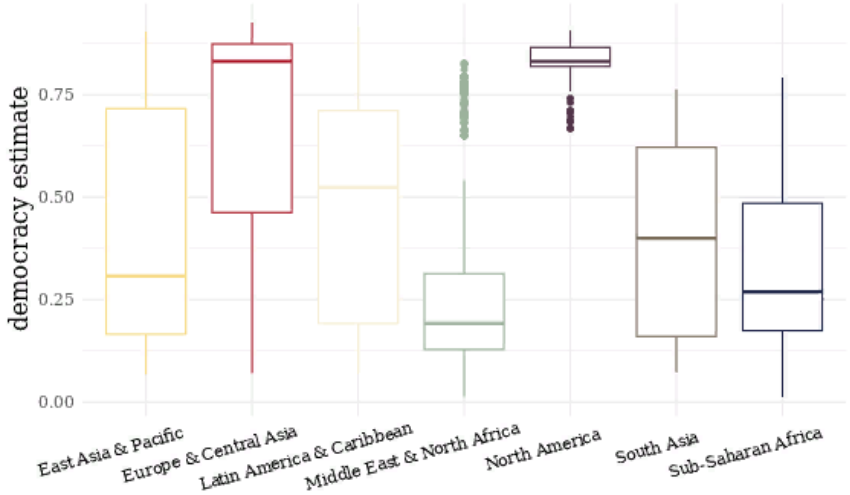
IX. Figure A6. Dependence between GDP and share in parliament in Europe & Central Asia.



X. Figure A7. Dependence between GDP and share in parliament in North America.



XI. Figure A8. Democracy levels distribution among the regions.



XII. Table A4. Pearson correlation test.

	GDP growth	Share in parliament
Share in parliament	0.002	—
Level of democratization	0.029**	0.305***
Educational gender equality	0.128***	0.303***
Female Schooling	0.143***	0.456***
Investments in education	-0.035*	0.184***

Total fertility rate	-0.090***	-0.425***