Journal of Economics, Finance and Accounting Studies
ISSN: 2709-0809
DOI: 10.32996/jefas
Journal Homepage: www.al-kindipublisher.com/index.php/jefas

JEFAS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Impact of the Inflation Rate, Gross Domestic Product, and the Unemployment Rate on the Fertility Rate of the Philippines

Jason Reuben B. Dela Cruz[1], Marcus Christian M. Dequilla[2] ✉ and Anna Corinna D. Pizarro-Uy, MA[3]
[123]Department of Economics, Faculty of Arts and Letters, University of Santo Tomas, Manila, Philippines
Corresponding Author: Marcus Christian M. Dequilla, **E-mail**: marcuschristian.dequilla.ab@ust.edu.ph

| ABSTRACT
The research aims to provide a closer look at the relationship between economic factors and the fertility rate in the Philippines. The economic factors will be based on the models of fertility written by Davis and Blake in 1956. The researchers used the variables of Gross Domestic Product, Female Unemployment Rate, Male Unemployment Rate, and Inflation Rate as independent variables and saw the relationship of these variables with the Fertility Rate. The results of the regression analysis show a significant relationship between the variables, with having a positive relationship between.

| KEYWORDS
Fertility rate, Inflation Rate, Gross Domestic Product, Female Unemployment Rate, Male Unemployment Rate, Multiple Regression Analysis.

| ARTICLE DOI: 10.32996/jefas.2022.4.2.20

1. Introduction

The Philippine Fertility Rate has been on a downward slope from the year 2000 up to the present, according to the data provided by the United Nations. The researchers would like to see if the decline in fertility rate can be explained by the economic changes brought upon by macroeconomic aggregates of the country and if there is a trend and a relation between the fertility rate and the various macroeconomic aggregates in the Philippines.

American economist Gary Becker proposed a theory stating that the more well off a family is, the more children they will conceive. However, higher economic groups tend to have lesser children, in which Becker states that higher-income families want higher-quality children who are more expensive. The researchers would like to see a relation between the economy and the downward-sloping fertility rate of the Philippines throughout the years.

The paper studies the effects of various macroeconomic aggregates that may affect the fertility rate and decisions in the Philippines. The main focus of the researchers would be the prevailing effects of the country's GDP, inflation rate, and female unemployment rate on the decision of women to conceive a child.

The researchers aim to provide sufficient evidence-based research on the relationship of economic factors on the macroeconomic scale to the rate of women living in the Philippines choosing to conceive a child.

The significance of this research is to provide a clear connection between the macroeconomic aggregates such as GDP Growth Rate, Female and Male Unemployment Rate, and Inflation Rate the Fertility Rate of the Philippines. The study will help give a clear picture of how and why families conceive from an economic perspective.

Thus, this research aims to measure the relationship between the unemployment rate of males and females, gross domestic product, and inflation rate as the independent variable on the fertility rate as the dependent variable in the Philippines. This research aims to answer the follower questions:

1. What is the relationship of the economic factors of a country to its fertility rate?

2. Is the drop in the fertility rate of the country related to the growth of the economy?

3. Is the fertility rate affected by the country's female unemployment rate?

4. Does an economy with a higher inflation rate have a lower fertility rate?

5. What would be the recommendations of the study in order to improve the fertility rate with regard to the improvement of the economy.

2. Literature Review

Schaller (2016) tests the Becker model empirically, finding that when women are positively affected by labor market shocks, fertility tends to decrease.

The same observation following Becker's Theory of Fertility can be seen in Cambodia in the research paper by Davalos and Morales (2017). The research states that an increase of 0.007 children per woman is observed in well-off areas while a decrease of 0.002 children per woman in poor areas of the country.

Recent literature uses changes in the social safety net to study the effect of income on health. Hoynes et al. (2015) find low birth weight rates decrease when earned-income tax credits increase among less-educated single women.

Comolli (2017)- stated that the Fertility rate had been significantly lowered by the female unemployment rate. A plummet in economy and female employment has shown a direct effect on the fertility rate in southern European countries.

It is also seen in the northern and central regions of Italy that the female and male unemployment rate has a negative effect on fertility rates, according to the time analysis of Cazzola et al. (2016)

According to the research by Daliri (2017), labor market indicators change people's opportunity costs and decision-making. It also affects expected income, which in turn affects the fertility decisions of families. The research showed reduced labor market risks for women, such as a lower unemployment rate and an increased fertility rate in the provinces of Iran.

The research by Lim (2019) shows that there is a preference for conception in single-person households due to an increase in savings than regular households in the same economic environment. The research also states that the increase in economic hardship and employment uncertainty may have led to a decrease in the fertility rate.

According to Yakita (2017), there are macroeconomic factors affecting fertility, such as income and the growth rate of the country. She provides theories and models that support the model of fertility by Samuelson and Diamond.

In the book written by Lindert (2016), he tackles the repercussions of the decision of families to have an additional child and how another child affects income and scarcity.

According to Spoorenberg (2017), there has been an observed increase in fertility in Central Asian Soviet countries after a rapid change and progress unfolded from the 1920s to the 1930s.

In an article written by Chiavegatto and Filho (2015), they showed a positive relationship between income inequality and adolescent fertility in Brazil. Adult fertility was also related to adolescent fertility in the cross-sectional and longitudinal methods.

The study was further improved by Castro and Fajnzylber in 2017, where they found that there is a negative relationship between fertility and income inequality specifically observed in low-income countries.

In a journal written by Colleran et al. (2015), two trends are observed in demographic transitions, where one is the reverse of the positive relationship of wealth and status to fertility, and second, wealth inequalities will increase and then decrease while in a demographic shift.

In a time-series analysis journal by Kato (2020), they studied the positive correlation between true fertility rate and female labor participation rate with the use of a structural VAR analysis and found that female wage has a negative impact on TFR and female participation rate.

According to Shastri (2015), in OECD countries, the cross-country correlation between the total fertility rate and the female labor force participation rate has changed from negative till the mid-1980s to positive afterwards.

In research by Jaba et al. (2016), it was shown that there exists a relationship between the female unemployment rate and the total fertility rate in European Union Countries using welfare state models.

The research by Suzuki (2019) uses the Butz-Ward model to test the correlation between the husband and wife's income and wages to the fertility rate of women in Japan.

In a study by Bar et al. (2018), it is shown that the negative relationship between income and fertility has flattened out due to income inequality between the poor and the rich. There is now a trend that can be observed in high-income families having higher fertility.

In a study by Wang (2015) on the fertility rate and unemployment in a social system, the amount of pension and support received by a family may improve fertility.

Demographic research by Yoo and Sobotka in 2018 shows that the decrease in fertility in Korea and other East Asian countries is increased in severity by a tempo effect.

A study by Brehm and Englehart (2015) shows that the relation between Female Participation Rate (FLP) and True Fertility Rate (TFR) is comprised of age-specific scenarios for women wherein older women detach their decision to give birth with the economy.

According to Behrman and Pons (2020), women's wages and employment are negatively correlated with fertility and unmet family planning while also being positively related to contraceptive use.

In a paper by Busetta et al. (2019), they revealed that consistent unemployment in women has a negative correlation with fertility decisions. In a relationship setting, male unemployment plays a larger role in fertility decisions.

A study by Rayno and Shibata (2017) shows that there has been a strong link between unemployment and non-standard employment in fertility decisions in Japan.

A study by Oshio (2019) shows that the more recent the data sets are, the stronger the correlation between the Female Labor Force Participation Rate and True Fertility Rate will be positive.

In France, a study on consistent unemployment shows that even though the country has high family values and stable fertility levels, employment stability halts fertility decisions in both men and women. (Ciganda, 2015)

Research by Özgören et al. (2018) shows that there is a two-way negative relationship between fertility and employment amongst women in Turkey.

In a paper by Teng and Tey (2017), it is observed that there is a negative relationship between female fertility and female education, employment, and healthcare, in Malaysia.

In a study in India about fertility and poverty, it is seen that there is a limited role of poverty in fertility decisions, and there are other factors. (Mohanty et al., 2016)

A study written by Adserà (2017) pointed out that there can be observed a negative gradient between education achieved and female fertility alongside labor participation and wages.

2.1 Synthesis

There are various factors affecting the fertility decisions of women all over the world. Level of education attained, wages, employment, cost of living, etc., are all factors, but in different settings, the relationship can change between the variables. The related research papers and journals all prove that fertility decisions can be proved in specific settings. Most of the studies show an increase in income and employment usually leads to an increase in fertility, but this is erroneous amongst households that are above the poverty line or a part of the high-income class.

The researchers would like to know what variables have an impact on the fertility rate of the Philippines and if the Philippine setting fits the usual assumption or if there are other non-economic factors that affect fertility decisions in the country.

2.2 Hypothesis

This research aims to determine and prove the hypotheses:

2.2.1. Female unemployment rate

Ho: The female unemployment rate has no direct relationship to the fertility rate.

H_1: The female unemployment rate has a direct relationship and an effect on the fertility rate.

2.2.2. Male unemployment rate

Ho: The male unemployment rate has no direct relationship to the fertility rate.

H_1: The male unemployment rate has a direct relationship and an effect on the fertility rate.

2.2.3. Gross domestic product

H_o: The Gross Domestic Product has no direct relationship to the fertility rate.

H_1: The Gross Domestic Product has a direct relationship and an effect on the fertility rate.

2.2.4. Inflation rate

H_o: The inflation rate has no direct relationship to the fertility rate.

H_1: The Inflation rate has a direct relationship and an effect on the fertility rate.

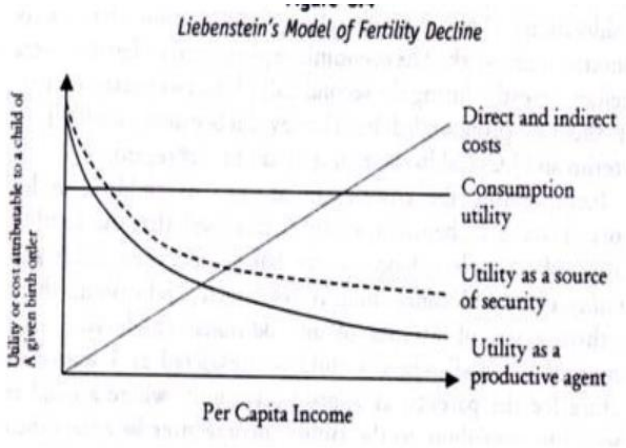
2.3. Theoretical Framework

2.3.1 Becker's Economic Theory of Fertility

Gary S. Becker, an American economist, published a paper entitled An Economic Analysis of Fertility in 1960, wherein he stated that the microeconomic theory of consumption could be used as a method to measure and predict fertility. He stated that fertility choices are made with consideration of the opportunity and monetary costs of a child.

2.3.2 Liebenstein's Theory on Fertility Decline

Harvey Leibenstein proposed a theory about fertility in which couples see children as three types of utilities for them; a consumption good based on the happiness the child gives them, a way of production when the child becomes a part of the labor force, and a measure of security for them as they reach older age. Liebenstein states that couples make a rough calculation of the utilities and disutility a child will bring them before deciding.



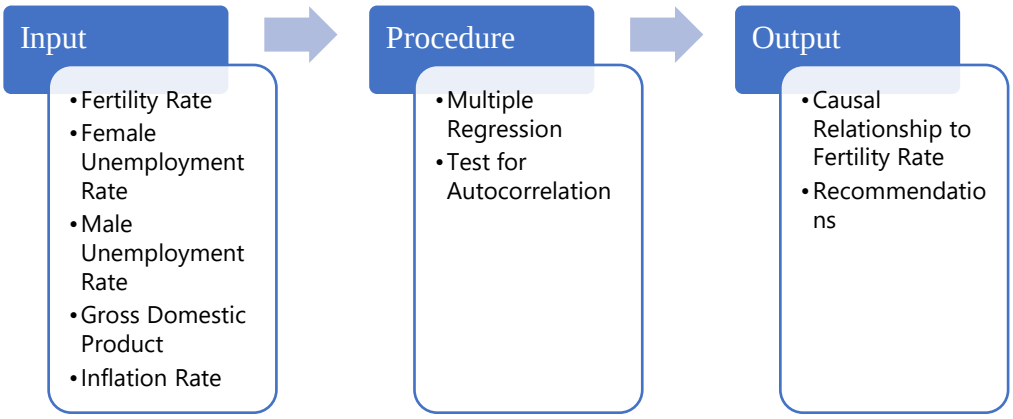
2.3.3 Cost-Benefit Analysis Theory

The cost-benefit analysis theory helps in making decisions by calculating the advantages and disadvantages of a product by how much it will benefit and if it is worth the cost of the product. This can be called the social exchange theory in psychology.

This theory can be used in predicting the effects of the economy on the fertility decisions of families. An assumption can be made using all theories wherein fertility decisions are heavily affected by the state of the economy of the country. People will not look to have children if they do not have the means to provide for their needs.

The researchers also followed what the previous research and journals have done on determining what economic factors are relevant to the declining fertility rate.

2.4. Conceptual Framework



The researchers used an Input-Procedure-Output model in presenting the relationship between the economic factors and the fertility rate. The input will consist of the dependent variable (Fertility Rate) and the independent variables (Male and Female Unemployment Rate, Inflation Rate, Gross Domestic Product). The procedure included multiple regression and multiple tests to show the output. The output would then be the results of the multiple tests, including the multiple regression and autocorrelation.

3. Methodology

3.1. Research Design

The main objective of the study is to observe the relationship between the macroeconomic factors of the Philippine economy to the country's fertility rate, as seen in other countries. A correlational quantitative research design was utilized by the researchers to identify the relationships between the independent and dependent variables. This research design was used in order to recognize the different trends and relationships of the variables given.

3.2. Sources of Data

The researchers will be using secondary data taken from the Philippine Statistics Authority and World Bank to use as data. The information gathered was used for linear regression as well as for autocorrelation tests. The researchers used the World Bank and Philippine Statistics Authority databases to get their raw data to be used in the research.

The researchers gathered the data from 1970-to 2020 annually, with a total of 50 observations to accomplish their study. The dependent variable, fertility rate, together with the independent variables, the unemployment rate of males and females, and inflation rate are from the world bank, and the gross domestic product is from the Philippine Statistics Authority (PSA)

For the dependent variable, the fertility rate measures the number of live births per 1000 women that are of their reproductive age per year. For the independent variable, the female unemployment rate is the ratio of the number of unemployed female citizens over the country's female labor force. This measures how much of the female current labor force is unemployed. Second, the male unemployment rate is the ratio of the number of unemployed male citizens over the country's male labor force. Next, Gross domestic product is the measure of the monetary value of all the finished products and services of an economy over the previous year. Lastly, the inflation rate measures the rate of the increase in the price of products over time.

3.3 Procedures

The researchers used an Ordinary Least Square regression method to see the relationship between the Gross Domestic Product, the inflation rate, and the male and female unemployment rate on the country's fertility rate. Doing so gave the researchers a closer look at the specific relationships of the variables on the fertility rate and allowed the researchers to understand how each individual economic factors make an impact on the overall fertility rate.

3.4 Statistical treatment of data

To observe if there is a relationship between the independent variables and the dependent variable, fertility rate, the researchers used a multiple regression analysis through the OLS or Ordinary Least Squares regression method. The researchers used a 95% confidence level for the regression.

The researchers will follow an econometric model that portrays the theorized relationship of the economic factors. The econometric model:

$$Fertility = \beta_0 - \beta_1(Female\ Unemployment\ Rate) - \beta_2(Male\ Unemployment\ Rate) - \beta_3(Gross\ Domestic\ Product) - \beta_4(Inflation\ Rate) + \mu_i$$

The variables stand for:

$$\beta_0 = Y - Intercept$$

$$\beta_1 = Female\ Unemployment\ Rate$$

$$\beta_2 = Male\ Unemplyment\ Rate$$

$$\beta_3 = Gross\ Domestic\ Product$$

$$\beta_4 = Inflation\ Rate$$

The residual term μ_i will be maintained to account for other variables that have an effect on the dependent variable.

4. Results and Discussion

The researchers used an OLS regression method and gathered the analysis results. The econometric model now has values seen below:

$$Fertility = 26.9165 + 0.0301 - 0.0724 -$$

$$0.9077 + 0.0011 + \mu_i$$

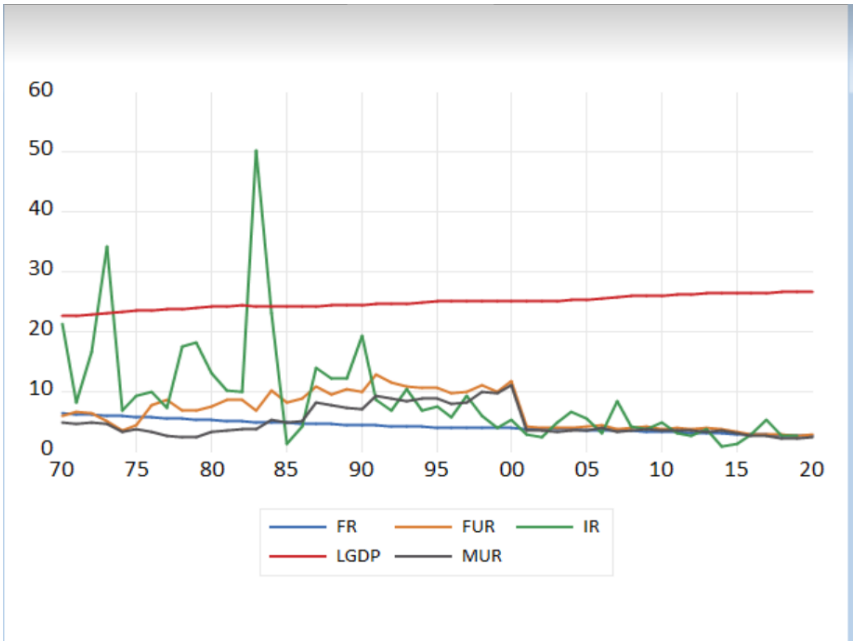
The model shows the results of the regression analysis done by the researchers, where the individual relationship between the economic factors and the fertility rate of the Philippines can be observed. The researchers found out that both the gross domestic product and the male unemployment rate have a negative relationship to the fertility rate, while the female unemployment rate and inflation rate have a positive relation to the fertility rate.

Figure 1
Table Descriptive Statistic of Variables

	FERTILITY RATE	LOG GDP	INFLATION RATE	MALE UNEMPLOYMENT RATE	FEMALE UNEMPLOYMENT RATE
MEAN	4.2136	24.8579	9.1796	4.9358	6.7574
MEDIAN	4.0305	24.9341	6.7400	3.5800	6.6700
MAXIMUM	6.2640	26.6550	50.3300	10.9800	12.8300
MINIMUM	2.5760	22.6235	0.6800	2.0500	2.5300
STD. DEV.	1.0238	1.0961	8.8544	2.4905	3.0757
SKEWNESS	0.3479	-0.1227	2.6047	0.907332	0.2309
KURTOSIS	2.1093	2.2473	11.4369	2.3978	1.5939
JARQUE-BERA	2.6609	1.3057	204.8348	7.6159	4.5633
PROBABILITY	0.2644	0.5206	0.0000	0.0221	1.1021
SUM	210.6800	1242.897	458.9790	246.7900	337.8700
SUM SQ.DEV.	51.3591	58.8689	3841.625	303.9150	463.5364
OBSERVATIONS	50	50	50	50	50

The table shows the Descriptive Statistic of Variables in the research. The fertility rate has a mean value of 4.2136, a median value of 4.0305, a maximum of 6.2640, and a minimum of 2.5760. It has a standard deviation of 1.0237 and skewness of 0.3478. The female unemployment rate has a mean value of 6.7574, a median value of 6.6700, a maximum of 12.830, and a minimum of 2.530. It has a standard deviation of 3.0756 and skewness of 0.2309. The inflation rate has a mean value of 9.1795, a median value of 6.740. It has a maximum value of 50.3300 and a minimum 0f 0.6800. It has a standard deviation of 8.8544 and skewness of 2.6047. Gross domestic product has a mean value of 24.8579 and a median value of 24.9431. It has a maximum of 26.6550 and a minimum of 22.6234. It has a standard deviation of 1.0960 and skewness of -0.1226. The male unemployment rate has a mean value of 4.9358 and a median value of 3.58. It has a maximum value of 10.95 and a minimum value of 02 2.05. it has a standard deviation of 2.4904 and skewness of 0.9073.

Figure 2
Trendline of Variables



The trendline shows the trends of the variables such as fertility rate, gross domestic product, inflation rate, female unemployment rate, and male unemployment rate. The trendline shows that as the fertility rate goes down as the gross domestic product goes up, there is an instability in the inflation rate, female unemployment rate, and male employment rate, all of which follow a downward slope alongside the fertility rate.

Figure 3

Multiple Regression Analysis

VARIABLES	COEFFICIENT	STD. ERROR	T-STATISTIC	PROBABILITY
INTERCEPT	26.9165	0.06828	39.4163	0.000
FEMALE UNEMPLOYMENT RATE	0.0301	0.0159	1.8907	0.0650
MALE UNEMPLOYMENT RATE	-0.0724	0.0180	-4.0156	0.0002
INFLATION RATE	0.0011	0.0030	0.3881	0.6997
GROSS DOMESTIC PRODUCT	-0.9077	0.0261	-34.7397	0.000
R-Squared 0.97973		F- Statistic 555.9723		P-Value 0.000

The table shows the Multiple Regression Analysis results. The fertility rate is the dependent variable which shows a 26.9162 slope or b_0. The second slope b_1 is the female unemployment rate which shows that the fertility rate increases by 0.030199 with every

additional value of the female unemployment rate. The third variable, inflation rate, b_2, shows a coefficient of 0.00178, which means that an increase in its value leads to an increase of 0.000178 in the fertility rate. The third variable, or b_3, shows that an increase in the male unemployment rate shows a decrease of o.o72461 in the fertility rate. Lastly, b_4 or the gross domestic product shows that an increase in its value shows a decrease in the fertility rate by 0.907690.

Figure 4

Variance Inflation Factors

VARIABLES	VARIANCE INFLATION FACTORS
C	NA
FEMALE UNEMPLOYMENT RATE	5.11273
MALE UNEMPLOYMENT RATE	4.2338
INFLATION RATE	1.4924
GROSS DOMESTIC PRODUCT	1.7709

The table above shows the test for multicollinearity using variance inflation factors results. The results show a VIF of less than 10 for all variables meaning that there is no multicollinearity between the variables.

Figure 5

Breusch – Godfrey Serial Correlation LM Test and Durbin – Watson Stat Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	40.25384	Prob. F(2,43)	0.0000
Obs*R-squared	32.59218	Prob. Chi-Square(2)	0.0000

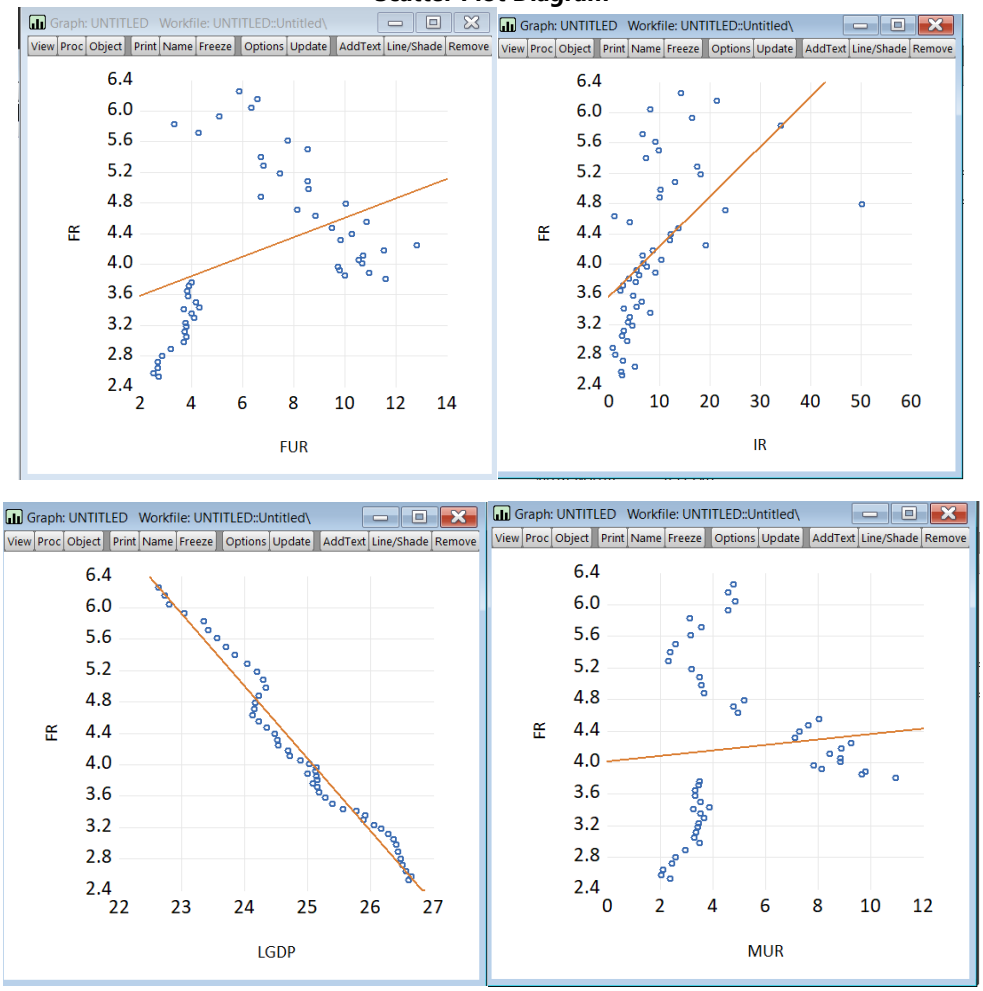
Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 12/16/21 Time: 16:02
Sample: 1970 2019
Included observations: 50
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.149886	0.432311	0.346707	0.7305
FUR	-0.005261	0.009745	-0.539855	0.5921
IR	-0.000556	0.001821	-0.305139	0.7617
LGDP	-0.006330	0.016564	-0.382148	0.7042
MUR	0.009574	0.011338	0.844426	0.4031
RESID(-1)	0.993790	0.145414	6.834190	0.0000
RESID(-2)	-0.247896	0.151923	-1.631720	0.1100

R-squared	0.651844	Mean dependent var	-5.41E-16
Adjusted R-squared	0.603264	S.D. dependent var	0.147924
S.E. of regression	0.093173	Akaike info criterion	-1.779541
Sum squared resid	0.373292	Schwarz criterion	-1.511858
Log likelihood	51.48853	Hannan-Quinn criter.	-1.677606
F-statistic	13.41795	Durbin-Watson stat	1.930490
Prob(F-statistic)	0.000000		

The table shows the data nR^2 is less than α, which is 0.05. The tests results show that there is no serial correlation in the model.

Figure 6
Scatter Plot Diagram



The table above shows the scatter plot of the dependent variable (fertility rate) among the independent variables. The first scatter plot is with the unemployment rate, female that shows a positive relationship, and some of the points are near the regression line. Next is the inflation rate, which shows that they have a positive relationship, and some of the points are near the regression line. Next is the gross domestic product, wherein it shows a negative relationship, and most of the points are near the regression line. Lastly, there is a negative relationship with the male unemployment rate, and most points are away from the regression line.

5. Conclusion

The research aimed to identify the relationship between the dependent variable, the fertility rate of the Philippines, to the independent variables, namely, male and female unemployment rates, inflation rate, and the gross domestic product of the Philippines.

The results show that there is a correlation between the fertility rate and the economic factors and that the constant decreasing fertility rate in the Philippines can be partially explained by how the country has been slowly developing and increasing its economy. The results show that there is a clear correlation between the fertility rate and the various economic factors GDP, Inflation Rate, Male and Female Unemployment Rate. The Multiple Regression Analysis shows an R-Squared value of 0.97, which pertains to relevant regression analysis. The Variance Inflation Factors show that all variables have a Centered VIF of less than 10, which means that the regression coefficients are not poorly estimated.

The Multiple Regression results show that an increase in the Female Unemployment Rate and Inflation Rate leads to an increase in Fertility Rate, while an increase in Male Unemployment Rate and Gross Domestic Product would lead to a decrease in the Fertility Rate.

The research has shown that the declining fertility rate is increased as the economy grows, but also when the male population have an increased unemployment rate, but the opposite can be observed in the female unemployment rate. The fertility rate of

any country falls when unemployment goes up, but the opposite can be observed with the female unemployment rate in the Philippines. The research showed that female unemployment does not negatively affect the fertility rate in the Philippines. The researchers recommend that the government take notice of the unemployment issue in the country, as it could be the key to slowing down the declining fertility rate of the Philippines.

The researchers have been limited by the lack of regional data on the fertility rates collected by region in the Philippines. The researchers state that using different data sets from different regions would give a more concise and clear result of the relationship between the dependent and independent variables.

The researchers recommend using data on the fertility rate in the Philippines by region, if possible, as there is a huge difference in the economic status of the various regions in the country.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

References

[1] Adserà, A. (2017). Education and fertility in the context of rising inequality. *Vienna Yearbook of Population Research, 15,* 63-92. Retrieved June 2, 2021, from https://www.jstor.org/stable/26506101
[2] Brehm, U., & Engelhardt, H. (2015). On the age-specific correlation between fertility and female employment: Heterogeneity over space and time in OECD countries. *Demographic Research, 32,* 691-722. Retrieved June 4, 2021, from http://www.jstor.org/stable/26350129
[3] Bar, M., Hazan, M., & Leukhina, O. (2018). Why did rich families increase their fertility? Inequality and marketization of child care. *Journal of Economic Growth,* 427–463. https://doi.org/https://doi.org/10.1007/s10887-018-9160-8
[4] Behrman, J., & Gonalons-Pons, P. (2020). Women's employment and fertility in a global perspective (1960–2015). *Demographic Research, 43*, 707-744. Retrieved June 2, 2021, from https://www.jstor.org/stable/26967822
[5] Busetta, A., Mendola, D., & Vignoli, D. (2019). *Persistent joblessness and fertility intentions. Demographic Research, 40,* 185-218. Retrieved June 2, 2021, from https://www.jstor.org/stable/26726997
[6] Bongaarts, J. (1987). The Proximate Determinants of Exceptionally High Fertility. *Population and Development Review, 13*(1), 133–139. https://doi.org/10.2307/1972125
[7] Cazzola, A., Pasquini, L., & Angeli, A. (2016). The relationship between unemployment and fertility in Italy: A time-series analysis. *Demographic Research, 34,* 1-38. Retrieved May 23, 2021, from http://www.jstor.org/stable/26332027
[8] Comolli, C. (2017). The fertility response to the Great Recession in Europe and the United States: Structural economic conditions and perceived economic uncertainty. *Demographic Research, 36*, 1549-1600. Retrieved May 23, 2021, from http://www.jstor.org/stable/26332174
[9] Chiavegatto-Filho, A. D. P., & Kawachi, I. (2015). Income inequality is associated with adolescent fertility in Brazil: *a longitudinal multilevel analysis of 5,565 municipalities. BMC Public Health, 15*(1). https://doi.org/10.1186/s12889-015-1369-2
[10] Castro, R., & Fajnzylber, E. (2017). Income inequality and adolescent fertility in low-income countries. *Cadernos De Saúde Pública, 33*(9). https://doi.org/10.1590/0102-311x00203615
[11] Ciganda, D. (2015). Unstable work histories and fertility in France: An adaptation of sequence complexity measures to employment trajectories. *Demographic Research, 32*, 843-876. Retrieved June 2, 2021, from http://www.jstor.org/stable/26350134
[12] Colleran, H., Jasienska, G., Nenko, I., Galbarczyk, A., & Mace, R. (2015). Fertility decline and the changing dynamics of wealth, status and inequality. *Proceedings of the Royal Society B: Biological Sciences, 282*(1806), 20150287. https://doi.org/10.1098/rspb.2015.0287
[13] Davalos, E., & Morales, L. (2017). Economic crisis promotes fertility decline in poor areas: Evidence from Colombia. *Demographic Research, 37*, 867-888. Retrieved May 23, 2021, from http://www.jstor.org/stable/26332214
[14] Daliri, H. (2018). The Impact of Economic Variables on Fertility Rate in Iran's Provinces. *Journal Of Economics and Regional Development, 25*(16), 67-96. DOI: 10.22067/erd.v25i15.64057
[15] Hoynes, H., Miller, D., & Simon, D. (2015). Income, the Earned Income Tax Credit, and Infant Health. *American Economic Journal: Economic Policy, 7*(1), 172-211. Retrieved May 23, 2021, from http://www.jstor.org/stable/24465947
[16] Jaba, E (2016). The Analysis Of The Effect Of Women'S Participation In The Labor Market On Fertility In European Union Countries Using Welfare State Models. In A. Chirianu (Ed.), *Economic Computation and Economic Cybernetics Studies and Research (pp. 69–84). essay, Faculty of Economic Cybernetics.*
[17] Kato, H. (2020). Does a relationship between fertility and labor participation of women really exist? Perspectives from time series analysis. *International Journal of Economic Policy Studies, 14*(1), 3–23. https://doi.org/10.1007/s42495-020-00033-2
[18] Lim, T. (2019). THE RISE OF SINGLE-PERSON HOUSEHOLDS AND THE MACROECONOMIC CONSEQUENCES. *Hitotsubashi Journal of Economics, 60*(2), 189-198. Retrieved May 23, 2021, from https://www.jstor.org/stable/26838634
[19] Lindert, P. H. (2016). Fertility and scarcity in America. Princeton University Press.
[20] Mohanty, S., Fink, G., Chauhan, R., & Canning, D. (2016). Distal determinants of fertility decline: Evidence from 640 Indian districts. *Demographic Research, 34,* 373-406. Retrieved June 2, 2021, from http://www.jstor.org/stable/26332039
[21] Oshio, T. (2019). Is a positive association between female employment and fertility still spurious in developed countries? *Demographic Research, 41*, 1277-1288. Retrieved June 2, 2021, from https://www.jstor.org/stable/26850685
[22] Özgören, A., Ergöçmen, B., & Tansel, A. (2018). Birth and employment transitions of women in Turkey: The emergence of role incompatibility. *Demographic Research, 39*, 1241-1290. Retrieved June 2, 2021, from https://www.jstor.org/stable/26585367
[23] Raymo, J., & Shibata, A. (2017). Unemployment, Nonstandard Employment, and Fertility: Insights From Japan's "Lost 20 Years". *Demography, 54*(6), 2301-2329. Retrieved June 2, 2021, from http://www.jstor.org/stable/45047342

[24] Schaller, J. (n.d.). Booms, Busts, and Fertility. *Journal of Human Resources*. http://jhr.uwpress.org/content/51/1/1.refs.
[25] Spoorenberg, T. (2017). The Onset of Fertility Transition in Central Asia. *Population (English Edition, 2002-), 72*(3), 473-503. Retrieved June 4, 2021, from http://www.jstor.org/stable/26383358
[26] Shastri, V. (2015). The Changing Relationship between Fertility and Female Employment. *CMC Senior Theses. 1094.* https://scholarship.claremont.edu/cmc_theses/1094
[27] Suzuki S. (2019). Structural Changes in the Patterns of Japanese Fertility, *Economics Bulletin, AccessEcon, 39*(2) 894-907.
[28] Tang, C., & Tey, N. (2017). Low fertility in Malaysia: Can it be explained? *Journal of Population Research, 34*(2), 101-118. Retrieved June 2, 2021, from http://www.jstor.org/stable/45179109
[29] Wang, L. (2015). Fertility and unemployment in a social security system. *Economics Letters, 133*, 19–23. https://doi.org/10.1016/j.econlet.2015.05.014
[30] Yakita, A. (2017). Preference for Having Children, Fertility and Social Security. *Population Aging, Fertility and Social Security, 85*–101. https://doi.org/10.1007/978-3-319-47644-5_6
[31] Yoo, S., & Sobotka, T. (2018). Ultra-low fertility in South Korea: *The role of the tempo effect. Demographic Research, 38,* 549-576. Retrieved June 2, 2021, from https://www.jstor.org/stable/26457056