**Overview**

For this project, I was curious to test for personal tax exemptions really do affect women’s fertility. While population growth has been viewed as one of the main reasons for environmental degradation, developed nations' concern over the aging population brings attention at least in academic and pronatalist policy implementation. And interestingly, it seems the concept of personal tax exemption does affect positively on childbirth and is widely conceived and accepted. And I am intrigued that raising a child is a huge effort for at least a mother in terms of financial, physician, and time commitment, will empirically study would support it? After researching some papers in this field, I decided to replicate recent research work written by Morris et al (2021) which also replicated another paper written by Whittington et al (1990 and 1993), a pioneer in the field of child tax credit and fertility.

**Tools & Models used in this project:**

• R

• Time series regression model

**Process:**

1. Step 1 Collect data from 1960 to 2016 in the US for variables specified in the replicating papers

One caveat is that some datasets had slight differences due to the ambiguity of the calculation approach and techniques. I used a weighted average for regrouping into desired age grouping method for the variable general fertility rate (GFR) and personal exemption. All dollar-valued variables were converted to 2010 dollars

2. Step 2 Define the theoretical model

As I am interested in the validation of the result concluded by Whittington et al and Morris et al, decided to use their model for my regression.

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3. Step 3 Unit Root Test

As time series regression is a widely used techniques such as forecasting or predicting mathematical finance, weather forecasting, econometrics, and so on. But one of the cons that need to be aware of is stationarity, which is resulting faulty high statistical significance due to variables covariance. So, I have tested unit root tests on all variables and identified un-stationary variables.

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4. Step 4 Cointegration Test

I used Johansen Test for cointegration for un-stationary variables and concluded that at least 1 cointegrating relationship exists at 5% statistical significance at a lag length of 2.

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5. Step 5 Short- and Long-Term Result

The result PTE is not statistically significant both in the long and short run, holding all other variables constant. And the magnitude of the effect of PTE is associated with an increase in fertility by 0 to 1 increase in children born per 1000 women which supported my hypothesis.

Img\_f\_4 and img\_f\_5

**Conclusion**

After completing the project, I have one main take-aways – always be aware of `Validity and Reliability` of any data sources. Not only any news we see on social media, but a statement or report submitted by a reputable organization or individuals, or even a research article found in a journal also doesn’t mean its information can be taken as given, and there will be always a gray area that I need to be aware of.