RESEARCH PAPER

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Part I Content

Abstract

This paper explores how labor force participation rates in the United States from 1953 to 2020 are influenced by political party governance at the state and national level. Using a Weighted Least Squared (WLS) regression, the study analyzes changes in labor force participation, comparing states with Republican governors (treatment group) to those with Democratic governors (control group), as well as an Ordinary Least Squared (OLS) regression analyzing changes in labor force participation against the political party of the president, either Republican (treatment group) or Democratic (control group). The findings suggest that on both the national and state level political party leadership does not correlate with increased labor force participation. Therefore, it can not be concluded that there exists a direct relationship.

Introduction

The research question being explored is: "How does the labor force participation rate from the 1953 until 2020 in the United States vary with political party governance, as well as broader policies implemented by said parties?" The topic seeks to consider factors that lead to changes in labor force participation rates particularly in terms of policy. If there exists a statistically significant relationship policy tendencies of said party will be explored to isolate particular ones with a significant effect.

The period of 1953 through 2020 will be used for national statistics on labor force participation rate, however for state wide statistics the period observed will be from 1976 through 2020 as that is the data available from the Federal Reserve Bank of St. Louis. On a national level the political party of the president will be considered, while on the state level the political party of each governor will be observed excluding the few governors that are registered as independence or under a party other than Democratic or Republican. Using a Weighted Least Squared (WLS) regression for the state level model, the population of the state will be considered in the regression. On the national level an Ordinary Least Squared (OLS) regression will be utilized.

The literature suggests there is a relationship between provisions of childcare by the state as it frees up the time for the mother and the entry of women into the labor force. Meanwhile, disability insurance and social security provisions have been suggested to de-incentivize entry into the labor force. Dependent upon the type of welfare will impact the affect on the labor force participation rate, however since childcare provisions aren't common in the U.S. democratic policies providing welfare will likely lead to lower labor force participation. Notably however, it is difficult to isolate any individual factor without the consideration of age.

The results suggest that there is no direct significant relationship between political party governance and labor force participation rates.

¹Federal Reserve Bank of St. Louis. (n.d.). Civilian labor force participation rate [CIVPART]. Federal Reserve Bank of St. Louis. Retrieved November 11, 2024, from https://fred.stlouisfed.org/series/CIVPART

Literature Review

Four factors and their relationship to labor force participation rates were frequently brought up in the literature. The contribution to labor force participation rates that will be examined are: health, social welfare programs, educational policies, and family planning initiatives.

Beginning with health, some literature suggests a relationship between health, emotional well-being, and labor force participation across different demographic groups. Notably, about half of prime-age men who are not in the labor force report having serious health conditions, with many relying on pain medication, primarily prescription opioids. Meanwhile, labor force participation among women born after 1960 has stagnated, with those outside the workforce citing reasons beyond home responsibilities reporting emotional well-being at similar levels to those in the workforce. By contrast, prime age men outside the labor force, report less happiness (Krueger, 2018)². Labor can be important to well being of individuals and may limit the effects of policies on labor force participation rate. Some literature counters this notion, and suggests that with an increase in Disability Insurance the labor force participation rate declines. Between 1984 and 2001, the number of non-elderly adults receiving Social Security Disability Insurance (DI) increased by 60%, reaching 5.3 million beneficiaries, despite improvements in overall health. This growth is attributed to several factors: less stringent screening processes, a decreased demand for low-skilled workers, and an unexpected rise in the earnings replacement rate. There has also been an increase in the likelihood of labor force exit among displaced high school dropouts, which contributed to a reduction of approximately 0.5 percentage points in the measured U.S. unemployment rate. The study projects a further increase in DI receipt rates moving forward (Duggan, Autor, 2003)³ (Parsons, 1980)⁴. However, even though unemployment rate accounts for those actively seeking out work, many individuals may be still searching for employment but not counted.

In terms of the domestic sphere, internationally governmental policies have skewed labor force participation. In countries with more robust publicly funded childcare, including Sweden, literature finds there to be higher levels of labor market activity of women with preschoolers even regardless of spousal income. (Gustafsson, Stafford, 1984)⁵ While in West Germany, responses of surveys to mothers found that "part-time working mothers would work full-time if they had greater access to subsidized child care" (Bick, 2016)⁶. The pattern of a positive correlation between female labour force participation and childcare provision was found in crosscountry analysis as well, with one study focusing on developed nations primarily in Europe, East Asia, and the United States (Borck, Rainald, Rabenmutter, 2014)⁷. Fertility and the linkage with economic activities and female labor force participation has also been argued to not be as pronounced nowadays as believed (Ashraf, 2013)⁸. Similarly, expansion of welfare programs have been seen to increase the rate of female labor force participation. One paper explores the relationship between labor supply and the risk of divorce, suggesting that labor force participation might be influenced by marital stability (Johnson, Skinner, 1986)⁹. Meanwhile the increase in participation of single mothers in the labor force "most likely reflects the impact of the 1996 welfare reform act, in which the welfare entitlements embodied in the old Aid for Families with Dependent Children (AFDC) program were transformed into more temporary and conditional assistance in the Temporary Assistance to Needy Families (TANF) program" (Juhn, Potter, 2006¹⁰. The study's results indicate that female labor supply significantly increases after marital separation, while male labor supply sees

²Alan B. Krueger, Brookings Papers on Economic Activity, Fall 2017

³Autor, David & Duggan, Mark. (2003). The Rise In The Disability Rolls And The Decline In Unemployment. The Quarterly Journal of Economics. 118. 157-205. 10.1162/00335530360535171.

⁴Parsons, Donald O. "The Decline in Male Labor Force Participation." Journal of Political Economy, vol. 88, no. 1, 1980, pp. 117–34. JSTOR, http://www.jstor.org/stable/1830962. Accessed 11 Nov. 2024.

⁵Gustafsson, Siv, and Frank Stafford. "Child Care Subsidies and Labor Supply in Sweden." The Journal of Human Resources, vol. 27, no. 1, 1992, pp. 204–30. JSTOR, Gustafsson and Stafford [1992]. Accessed 11 Nov. 2024.

⁶Bick, Alexander. "THE QUANTITATIVE ROLE OF CHILD CARE FOR FEMALE LABOR FORCE PARTICIPATION AND FERTILITY." Journal of the European Economic Association, vol. 14, no. 3, 2016, pp. 639–68. JSTOR, http://www.jstor.org/stable/43965320. Accessed 11 Nov. 2024.

⁷Borck, Rainald. "'Adieu Rabenmutter'—Culture, Fertility, Female Labour Supply, the Gender Wage Gap and Childcare." Journal of Population Economics, vol. 27, no. 3, 2014, pp. 739–65. JSTOR, http://www.jstor.org/stable/44289682. Accessed 11 Nov. 2024.

⁸Ashraf, Quamrul H., et al. "The Effect of Fertility Reduction on Economic Growth." Population and Development Review, vol. 39, no. 1, 2013, pp. 97–130. JSTOR, http://www.jstor.org/stable/41811954. Accessed 11 Nov. 2024.

⁹Johnson, William R., and Jonathan Skinner. "Labor Supply and Marital Separation." The American Economic Review, vol. 76, no. 3, 1986, pp. 455–69. JSTOR, http://www.jstor.org/stable/1813362. Accessed 11 Nov. 2024.

¹⁰Juhn, Chinhui, and Simon Potter. "Changes in Labor Force Participation in the United States." The Journal of Economic Perspectives, vol. 20, no. 3, 2006, pp. 27–46. JSTOR, http://www.jstor.org/stable/30033665. Accessed 11 Nov. 2024.

a slight decline. Women often enhance their labor participation even before separation occurs, suggesting that anticipating divorce may drive them to work more. These findings highlight the influence of marital status on labor supply decisions, with women's labor force participation rising in response to potential instability in their marriages. (Johnson, Skinner, 1986)¹¹. Juhn and Potter's study finds that the U.S. labor force participation rate, which rose steadily from the mid-1960s, slowed in the 1990s and declined by 1.5 percentage points from its peak in 2000 by 2005. Key findings include that married women's participation is unlikely to rise significantly, while low-income single mothers may increase their workforce presence due to the Earned Income Tax Credit. Employers might adopt flexible work policies to attract mothers and older workers, and changes in disability and Social Security rules could impact men's withdrawal from the labor market and encourage delayed retirement among older workers (Juhn, Potter, 2006)¹².

A core issue with any assessment of one factor and labor force participation is the aging demographic. In one study analyzing educational attainment and the impact on labor force participation rates it was found that for European women educational attainment did have a significant impact on their participation in the labor force, but that was not immediately statistically clear for overall rates due to the impact of aging demographics (Loichinger, Elke, Prskawetz, 2017)¹³. Isolation of variables may present difficulties when it comes to analysis of any one factor. Similarly, it was found that LFP rates of adult women and men in a study across European countries would have increased more during a period studied, 2000-2010, had it not been for the aging population. ¹⁴

Together, several studies suggest there is a relationship between provisions of childcare by the state as it frees up the time for the mother and the entry of women into the labor force. Meanwhile, disability insurance and social security provisions have been suggested to de-incentivize entry into the labor force. Dependent upon the type of welfare will impact the affect on the labor force participation rate, however since childcare provisions aren't common in the U.S. democratic policies providing welfare will likely lead to lower labor force participation. Notably however, it is difficult to isolate any individual factor without the consideration of age.

¹¹Johnson, William R., and Jonathan Skinner. "Labor Supply and Marital Separation." The American Economic Review, vol. 76, no. 3, 1986, pp. 455–69. JSTOR, http://www.jstor.org/stable/1813362. Accessed 11 Nov. 2024.

¹²Juhn, Chinhui, and Simon Potter. "Changes in Labor Force Participation in the United States." The Journal of Economic Perspectives, vol. 20, no. 3, 2006, pp. 27–46. JSTOR, http://www.jstor.org/stable/30033665. Accessed 11 Nov. 2024.

¹³Loichinger, Elke, and Alexia Prskawetz. "Changes in Economic Activity: The Role of Age and Education." Demographic Research, vol. 36, 2017, pp. 1185–208. JSTOR, http://www.jstor.org/stable/26332163. Accessed 11 Nov. 2024.

¹⁴Loichinger, E., & Prskawetz, A. (2017). Changes in economic activity: The role of age and education. Demographic Research, 36, 1185-1208. Max Planck Institute for Demographic Research.

Methodology

This study employs a quantitative approach to analyze labor force participation rates across all 50 U.S. states from 1976 to 2020. Data on labor force participation rates were sourced from The Federal Reserve Bank of St. Louis Fed¹⁵, while information regarding the political affiliation of each state's governor during this period was compiled into a binary variable, where 1 indicates a Democratic governor and 0 indicates a Republican governor, with the data obtained from Open ICPSR. Additionally, population figures for each state, essential for calculating weighted participation rates, were retrieved from The United States Census Bureau. To compute the weighted labor force participation rates, the study utilized the formula:

Weighted Mean =
$$\frac{\sum (Participation \text{ Rate} \times Population)}{\sum Population}$$
(1)

As well as a model of the regression analysis:

Labor Force Participation Rate = $\beta_0 + \beta_1 \times \text{Democratic Governor} + \epsilon(2)$

To conduct the regression analysis, Python was employed, utilizing libraries such as pandas and statsmodels. The weighted least squares (WLS) method was applied to account for population size, with rigorous checks for linearity, independence, homoscedasticity, and normality of residuals. This methodology provides a comprehensive framework to assess the impact of political governance on labor force participation across the states, facilitating a nuanced understanding of the relationship between governance and workforce engagement.

Labor Force Participation Rate (national) Data – from FRED



Weighted Mean Calculations

Calculate final weighted mean

weighted_means['Weighted_Mean'] = weighted_means['Weighted_Mean'] / weighted_means['Total_Population']

¹⁵Federal Reserve Bank of St. Louis. (n.d.). Civilian labor force participation rate [CIVPART]. Federal Reserve Bank of St. Louis. Retrieved November 11, 2024, from https://fred.stlouisfed.org/series/CIVPART

```
# Map party numbers to names
weighted means['party'] = weighted means['party'].map({0: 'Republican', 1: 'Democratic'})
# Drop unnecessary columns
weighted_means = weighted_means[['party', 'Weighted_Mean']]
# Print the results
print(weighted_means)
party Weighted_Mean
0 Republican 65.486649
1 Democratic
                65.188772
State Level WLS Regression
import pandas as pd
import statsmodels.api as sm
import warnings
# Load data from a CSV file
df = pd.read csv('/home/idies/workspace/Temporary/ymettawa/scratch/as.180.369/contrib/yazzymettawa/Pape
# Define the dependent variable (Y) and independent variable (X)
Y = df['number']
X = df['party'] # Use the Party as a binary variable for regression
# Add a constant to the model
X = sm.add constant(X)
# Fit the weighted regression model
weights = df['population'] # Use population as weights
# Check for the number of observations
if len(df) >= 8:
   model = sm.WLS(Y, X, weights=weights).fit()
   print(model.summary())
   with warnings.catch_warnings():
       warnings.simplefilter("ignore")
       model = sm.WLS(Y, X, weights=weights).fit()
       print(model.summary())
WLS Regression Results
Dep. Variable: number R -squared: 0.002
Model: WLS Adj. R -squared: 0.001
Method: Least Squares F -statistic: 3.544
Date: Mon, 18 Nov 2024 Prob (F -statistic): 0.0599
Time: 14:13:12 Log -Likelihood: -5336.4
No. Observations: 1839 AIC: 1.068e+04
                         1839
No. Observations:
                                                              1.068e+04
                                    AIC:
                          1837
Df Residuals:
                                    BIC:
                                                              1.069e+04
Df Model:
                             1
Covariance Type: nonrobust
______
                                 t P>|t| [0.025 0.975]
               coef std err
 _____
const 65.4866 0.109 602.302 0.000 65.273 65.700 party -0.2979 0.158 -1.882 0.060 -0.608 0.012
_____
Omnibus:
                          231.480 Durbin -Watson:
                           0.000 Jarque -Bera (JB): 370.087
Prob(Omnibus):
```

 Skew:
 -0.865
 Prob(JB):
 4.33e -81

 Kurtosis:
 4.356
 Cond. No.
 2.56

Notes:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Interpretting the Results Examine the coefficients

 $\beta_1 > 0$ = states with Democratic governors have higher LFPR(3)

$$\beta_1 < 0 = \text{states with Democratic governors have lower LFPR}$$
 (4)

Statistical Significance: Look at the p-values associated with your coefficients to determine if the results are statistically significant (typically, p <0.05). Model Fit: Check the R-squared value to see how much of the variance in labor force participation is explained by your model.

National Level OLS Regression

```
import pandas as pd
import statsmodels.api as sm

def ols_regression(csv_file):
    # Load the CSV file into a DataFrame
    df = pd.read_csv(csv_file)

    # Extract the necessary columns: 'CIVPART' and 'Party'
    X = df.iloc[:, 4]  # Party column (5th column)
    y = df.iloc[:, 1]  # CIVPART column (2nd column)

# Add a constant to the model for the intercept term
    X = sm.add_constant(X)

# Fit the OLS regression model
    model = sm.OLS(y, X).fit()

# Print the summary of the regression results
    print(model.summary())
```

Example usage:

ols_regression('/home/idies/workspace/Temporary/ymettawa/scratch/as.180.369/contrib/yazzymettawa/Paper_

OLS Regression Results

=======================================			
Dep. Variable:	CIVPART	R -squared:	0.000
Model:	OLS	Adj. R -squared:	-0.001
Method:	Least Squares	F -statistic:	0.1830
Date:	Mon, 18 Nov 2024	Prob (F -statistic):	0.669
Time:	14:13:12	Log -Likelihood:	-2023.5
No. Observations:	816	AIC:	4051.
Df Residuals:	814	BIC:	4060.
Df Model:	1		
Covariance Type:	nonrobust		
=======================================			
C	coef std err	t P> t	[0.025 0.975]

const 63.1123 0.132 478.078 0.000 62.853 63.371 Party 0.0880 0.206 0.428 0.669 -0.316 0.492 ______

Kurtosis:	1.583	Cond. No.	2.46
Skew:	-0.184	Prob(JB):	1.47e −16
<pre>Prob(Omnibus):</pre>	0.000	Jarque -Bera (JB):	72.909
Omnibus:	10216.381	Durbin -Watson:	0.005

Notes:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

1 Results

Returning to the research question: "How does the labor force participation rate from the 1953 until 2020 in the United States vary with political party governance" the results suggest that there is little evidence to support a strong or reliable relationship between political party governance and labor force participation rates. This was found to be the case when observing both national political party governance (through the president's party affiliation and state labor force participation rates) as well on the state level (through the governor's party affiliation and state labor force participation rates). However, on the state level the tendency was for participation rates to be higher during Democrat governorships, while on the national level the tendency was for participation rates to be higher during Republican presidencies further undermining any relationship.

State Level

The WLS regression results indicate a weak relationship between the independent variable (party) and the dependent variable (labor force participation rate). The effect of "party" is marginally statistically significant (p ≈ 0.06), but the overall model fit is very poor (R² ≈ 0.002). The low R-squared value indicates that the predictor "party" explains almost none of the variance in "number."

STATE CIVPART =
$$65.4866 + -0.2979 \times \text{Party}$$
 (5)

National Level

The OLS regression results indicate a weak relationship between the independent variable (party) and the dependent variable (labor force participation rate). The effect of "party" is marginally statistically significant (p ≈ 0.669), but the overall model fit is very poor (with an adjusted $R^2 \approx -0.001$). The low R-squared value indicates that the predictor "party" explains almost none of the variance in "number."

NATIONAL CIVPART =
$$63.1123 + 0.0880 \times Party$$
 (6)

Conclusion

In this paper, the question of how the labor force participation rate from 1953 until 2020 in the United States varied with political party governance was explored. The findings are that both the state level, as determined by the governor's political party affiliation, and the national level, as determined by the president's political party affiliation, had no statistically significant correlation with the labor force participation rate of the state or country. Further research into other branches of government and political affiliations, both local and in the House of Representatives can be used to further describe the existence or non-existence of a relationship. Some limitations include the limited time scope due to data constraints, as well as the lack of statistical accounting for economic and social factors affecting labor force participation rates outside of preliminary research. In terms of broader implications, specific policies, and their effects would need to be observed as opposed to the general policies of each political party to determine their effectiveness.

```
Bibliography
import bibtexparser
# Open and load the .bib file
with open('newreferences.bib') as bibfile:
   bib_database = bibtexparser.load(bibfile)
# Function to format each entry in APA style
def format_apa(entry):
    authors = entry.get('author', '').replace(',', '').split(' and ')
    authors = [author.strip() for author in authors] # Clean up the authors' names
   # Format authors in APA style (last name, first initial)
   formatted_authors = ', '.join([f"{name.split(' ')[ -1]}, {' '.join(name.split(' ')[: -1])[:1]}." fo
    # Handle publication year
   year = entry.get('year', 'n.d.') # Use 'n.d.' for no date
   # Title of the article
   title = entry.get('title', '')
   # Journal details (if applicable)
    journal = entry.get('journal', '')
    volume = entry.get('volume', '')
   issue = entry.get('number', '')
   pages = entry.get('pages', '')
   # Build the APA formatted citation
    citation = f"{formatted_authors} ({year}). {title}. {journal}, {volume}({issue}), {pages}."
   # If there is no journal, it's likely a book or other type of source.
    if not journal:
       publisher = entry.get('publisher', 'Publisher not available')
       citation = f"{formatted_authors} ({year}). {title}. {publisher}."
   return citation
# Print each reference in APA format
for entry in bib database.entries:
    citation = format_apa(entry)
   print(citation)
   print("\n") # Separate citations by a newline
Rainald, B. (2011). Adieu rabenmutter - the effect of culture on fertility, female
labour supply, the gender wage gap and childcare. SSRN Electron. J., (), .
B, K. (2017). Where have all the workers gone? An inquiry into the decline of
the {U}.s. labor force participation rate. Brookings Pap. Econ. Act., 2017(2), 1 - -87.
Gary, B. (2013). Can Educational Attainment Explain the Rise in Labor Force
Participation at Older Ages?. Center for Retirement Research.
Rainald, B. (n.d.). 'Adieu Rabenmutter' culture, fertility, female labour supply, the
gender wage gap and childcare. J. Popul. Econ., (), .
```

H, A., N, W., Joshua, W. (2013). The effect of fertility reduction on economic growth. Popul. Dev. Rev.

R, J., Jonathan, S. (n.d.). Labor Supply and Marital Separation. Publisher not available.

Chinhui, J., M, P. (2006). Changes in labor force participation in the United States. Journal of Econom

Elke, L., Alexia, P. (2017). Changes in economic activity: The role of age and education. Demogr. Res.,

And, F. (n.d.). ${THE} {QUANTITATIVE} {ROLE} {OF} {CHILD} {CARE} {FOR} {FEMALE} {LABOR} {FORCE} {PARTICIPATION}. Publisher not available.$

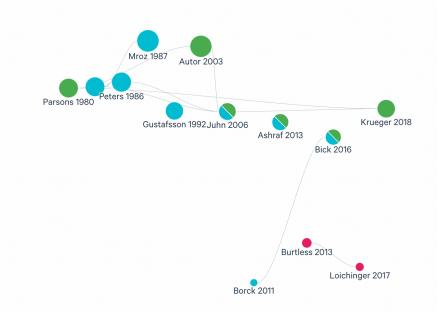
Siv, G., Frank, S. (1992). Child care subsidies and labor supply in Sweden. J. Hum. Resour., 27(1), 204

H, A., G, D. (2003). The rise in the disability rolls and the decline in unemployment. Q. J. Econ., 118

B, K. (2017). Where Have All the Workers Gone. Brookings Papers on Economic Activity, (Fall 2017), .

O, P. (1980). The decline in male labor force participation. J. Polit. Econ., 88(1), 117 - -134.

Appendix



		========		ion Res	========		
Dep. Variabl	e:	CIV	PART	R-squa	red:		0.000
Model:			0LS	Adj. R	-squared:		-0.001
Method:		Least Squa	ares	F-stat	istic:		0.1830
Date:	M	on, 11 Nov 3	2024	Prob (F-statistic)	:	0.669
Time:		12:13	3:19	Log-Li	kelihood:		-2023.5
No. Observat	ions:		816	AIC:			4051.
Df Residuals	:		814	BIC:			4060.
Df Model:			1				
Covariance T	ype:	nonrol	oust				
	coef	std err		t	P> t	[0.025	0.975]
const	63.1123	0.132	478	.078	0.000	62.853	63.371
Party	0.0880	0.206	0	428	0.669	-0.316	0.492
Omnibus:		10216	.381	Durbin	 -Watson:		0.005
Prob(Omnibus):	0	.000	Jarque	-Bera (JB):		72.909
Skew:		-0	184	Prob(J	B):		1.47e-16
Kurtosis:		1	583	Cond.	No.		2.46

Notes: [1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Dep. Variabl Model: Method: Date: Time: No. Observat Df Residuals Df Model: Covariance T	ions: :	Least Squa Mon, 11 Nov 2 14:54	024 :31 839 837 1	F-sta Prob	ared: R-squared: tistic: (F-statistic) ikelihood:	:	0.002 0.001 3.544 0.0599 -5336-4 1.068e+04 1.069e+04
========	coef		=====	 t	P> t	[0.025	0.975]
const party	65.4866 -0.2979			.302 .882	0.000 0.060	65.273 -0.608	65.700 0.012
Omnibus: Prob(Omnibus Skew: Kurtosis:):	-0.	480 000 865 356				1.596 370.087 4.33e-81 2.56

Notes: [1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

References

Siv Gustafsson and Frank Stafford. Child Care Subsidies and Labor Supply in Sweden. The Journal of Human Resources, 27(1):204, 1992. ISSN 0022-166X. doi:10.2307/145917. URL http://dx.doi.org/10.2307/145917.