GOV 52: Replication Project

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Introduction

The original paper *The Dynamic American Dream* was coauthored by Jennifer Wolak and David A.M. Peterson (2020) and published in the *American Journal of Political Science*[1]. The paper analyzes behavior of belief in the American dream over time, and as it relates to economic inequality, social mobility, home ownership, public policy mood (that is, the public demand for liberal policy outcomes), consumer confidence, and the presence of U.S. midterm and presidential elections. The condition of the American Dream has long been seen as a barometer of America's perceived condition - of optimism in America's future - and American politicians on both sides of the aisle have historically appealed to the American Dream when discussing their vision of the nation. When times are good, the American Dream is alive as ever. When times are tough, politicians insist that change must happen, that we "need to write a new chapter in American Dream" and "bring it back bigger and stronger and more powerfully than ever before." Wolak and Peterson take a more objective approach in assessing the dynamics of the American Dream. Instead of relying on abstract terms, the authors aggregate responses from quarterly surveys of American citizens from 1973 to 2018 to quantify the percentage of Americans who believe the American Dream is achievable, exploring its dynamics relative to temporal economic, social, and political conditions. Further, the authors explore the responsiveness of belief in the American Dream to these short-term variables.

Model Replications

Because the model's variables - belief in the American dream, economic inequality, social mobility, home ownership, public policy mood (that is, the public demand for liberal policy outcomes), consumer confidence, and the presence of U.S. midterm and presidential elections - include both stationary and non-stationary

[1]The replication data was available through the Harvard dataverse. You can access the files here.

cointegrated time series, the authors employed a generalized error correction model (GECM) that is able to effectively combine these different variables (Bannerjee et al. 1993; DeBoef and Keele 2008). Because of the high correlation between social mobility and economic inequality, the authors split the data into two models, one with the gini coefficient variable and one with the social mobility variable, but which are otherwise identical. The GECM model, like the auto-regressive distributed lag model, uses the equation:

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \beta_0 \Delta x_t + \epsilon_t$$

Extending the findings from the GECM models, the original paper also looks at the extent to which the non-stationary explanatory variables have a long run relationship with belief in the American dream, as reflected by long run multipliers and their respective t-values. Ultimately, the authors found statistically significant, positive correlations between belief in the American dream and social mobility, home ownership, and consumer confidence (measured by index of consumer sentiment) and a statistically significant, negative relationship between belief in the American Dream and economic inequality. Intuitively, these findings make sense, because as the economy becomes more lopsided and social mobility wanes, Americans are naturally less optimistic about opportunity in America. Interestingly, the authors also find a positive relationship between election cycles and belief in the American dream, suggesting that non-policy political influences increase Americans' national optimism, too.

In this replication, I translate the originally-Latex paper into R and reconstruct the plots and models of the original authors in their entirety. Because variable stationarity affects the GECM model structure, I explore and confirm the stationarity of the variables used in the original GECM model to confirm the model was properly constructed. I also bootstrap the model errors and display the distribution of belief changes in the American dream between time periods (that is, I show how much belief in the American dream changes between time periods).

My replication of the models ultimately yielded the same numerical values and, therefore, the same conclusions as the original paper. I explain the different calculations and interpret some of model outputs with some visual aids I constructed from the data.

The model reconstruction was relatively straightforward. Using the lag function, I created the lag variables and then took the difference between the original and lag variables in order to get the delta variables for the GECM model input. Because these GECM variables were all calculated manually, I was able to use the lm() function, as opposed to some of the GECM specific functions within the ecm and ARDL packages. The linear regression calculated the coefficient, standard error, and p-value statistics that are displayed in Table 1. Extending from the original models, I also bootstrapped the variables' standard errors and output

them in table 2.

The long run multipliers were calculated with the equation $LRM_x = -\beta_x/\alpha_1$, with inputs taken from the GECM model outputs. There are two primary ways to calculate the standard errors of long run multipliers: the delta method and the Bewley transformation, which yield asymptotically accurate values (Nieman & Petersen, 2019). Because the two methods are roughly equal in accuracy, I used the delta method, which used the model covariance and the LRM value to yield the LRM standard errors. The respective LRM t-values were simply the ratio of the LRM to the LRM's standard error ($LRM_x/\epsilon_{_{LRM_x}}$). These methods yielded the same results as the original paper.

Interpretations

Looking at top half of the model outputs, we can see a lag home ownership coefficient for the first model of .932 and a delta coefficient of .877. This suggests that a 1% increase in the home ownership rate, all else equal, will increase belief in the American Dream by 2.4 percent. Looking at the LRM values, the we can interpret that, for example, an increase of 0.00525 in the gini coefficient (which was the largest between quarters) would lead to a .57 percent decline in belief in the American dream.

As mentioned earlier, treating the respective stationarities of the different variables properly is crucial in yielding accurate results from the GECM model. However, as Webb, Linn, and Lebo (2019, 2020) have explored and documented, the many different tests for stationarity are low-powered. Instead of relying on these tests, Wolak and Peterson judged the accuracy of their LRM values by relying on the methods suggested by Webb, Linn, and Lebo: For the given model with k = 2 and n = 150, t-values above the upper bound of |3.56| were deemed statistically significant with t-values below |3.56| deemed insignificant. I applied the same reasoning in my own analysis and reached the same conclusions; that the gini coefficient, social mobility, home ownership rates, and consumer confidence all had significant long term relationships with belief in the American dream. However, extending from the original model, I also measured the stationarity of variables by the Phillips-Perron Test, documented in Table 4. I also visualize and compare the stationarity of two different variables, gini coefficient and presidential campaign cycle.

Table 1: Explaining Belief in the American Dream

	Dependent variable:	
	Δ in Belief in the American Dream	
	Model 1	Model 2
Belief in the American Dream$_{t-1}$	-0.386^{***}	-0.388^{***}
	(0.057)	(0.058)
Δ Gini coefficient	−315.981	
	(251.617)	
Gini coefficient$_{t-1}$	-41.727^{***}	
	(11.932)	
Δ Social mobility		105.564^{*}
		(61.247)
Social mobility$_{t-1}$		10.237^{***}
		(3.019)
Δ Homeownership	0.877	0.827
	(0.865)	(0.916)
Homeownership$_{t-1}$	0.932^{***}	0.788^{***}
	(0.230)	(0.219)
Δ Policy mood	−0.146	−0.116
	(0.143)	(0.152)
Policy mood$_{t-1}$	0.092	0.121^{*}
	(0.069)	(0.071)
Δ Index of consumer sentiment	−0.025	−0.032
	(0.050)	(0.051)
Index of consumer sentiment$_{t-1}$	0.097^{***}	0.088^{***}
	(0.024)	(0.025)
Midterm election	1.203	1.204
	(1.043)	(1.066)
Presidential campaign	0.535^{**}	0.382^{*}
	(0.221)	(0.221)
Constant	-38.657^{***}	-54.838^{***}
	(12.240)	(15.443)
Long run multipliers		
LRM, Gini coefficient	-108.1521†	
standard error	(26.9571)	
t-value	-4.0120	
LRM, Social mobility		26.3578†
standard error		(6.9230)
t-value		3.8073
LRM, Home ownership	2.4165†	2.0295†
standard error	(.4556)	(.4571)
t-value	5.3041	4.4403
LRM, Policy mood	.2394	.3111
standard error	(.1750)	(.1791)
t-value	1.3681	1.7370
LRM, Index of consumer sentiment	.2527†	.2258†
standard error	(.0578)	(.0560)
t-value	4.3723	3.7635
Observations	175	167
R^2	0.267	0.270

Note: *p<0.1; **p<0.05; ***p<0.01
† denotes significant LRMs, where t-value exceeds absolute value of 3.560
standard errors wrapped in parentheses

Table 2: Model One Standard Error vs. Bootstrapped Standard Errors

	original	bootstrapped	pct_diff
(Intercept)	12.24	11.38	0.07
am_lag	0.06	0.06	0.02
gini_delta	251.62	244.98	0.03
gini_lag	11.93	12.28	-0.03
home_delta	0.87	0.84	0.03
home_lag	0.23	0.20	0.12
mood_delta	0.14	0.15	-0.03
mood_lag	0.07	0.07	0.02
ics_delta	0.05	0.06	-0.23
ics_lag	0.02	0.03	-0.07
midterm	1.04	1.22	-0.17
prezcamp	0.22	0.22	-0.01

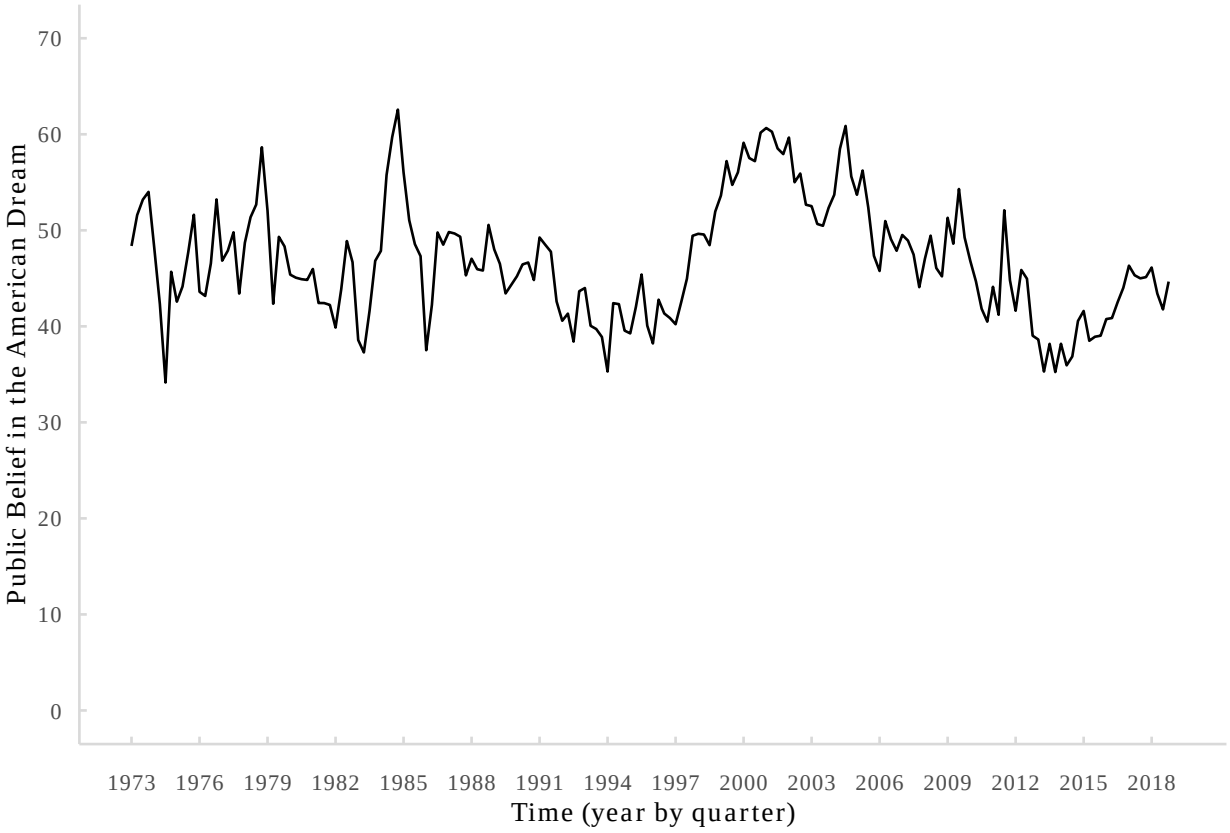
Table 3: Model Two Standard Error vs. Bootstrapped Standard Errors

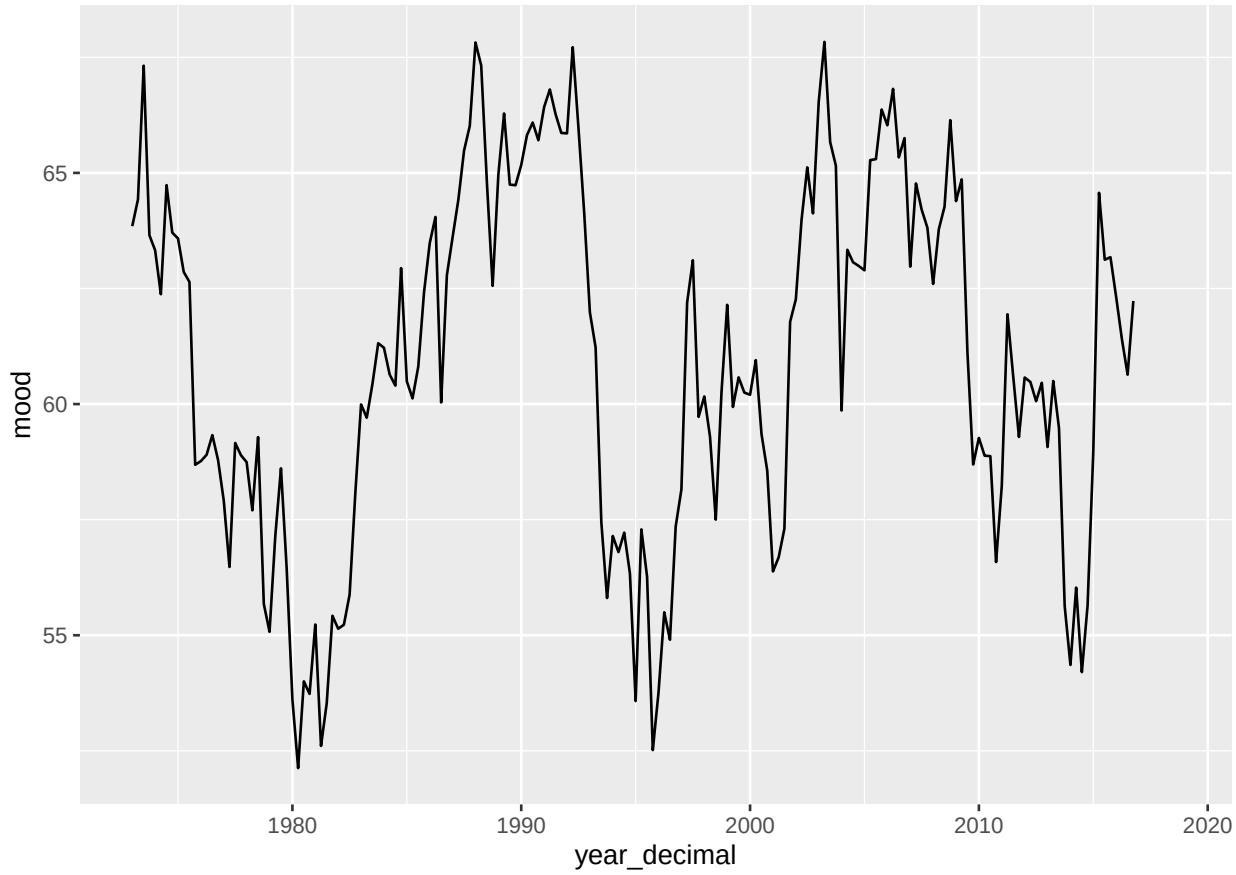
	original	bootstrapped	pct_diff
(Intercept)	15.44	15.65	-0.01
am_lag	0.06	0.06	-0.02
soc_delta	61.25	60.82	0.01
soc_lag	3.02	3.52	-0.16
home_delta	0.92	0.91	0.00
home_lag	0.22	0.22	0.01
mood_delta	0.15	0.16	-0.03
mood_lag	0.07	0.07	0.06
ics_delta	0.05	0.06	-0.18
ics_lag	0.02	0.03	-0.10
midterm	1.07	1.33	-0.25
prezcamp	0.22	0.22	0.01

Table 4: Variable Stationarities

Variable	Z_rho	p-value
American Dream		
Type 1: no drift, no trend	-0.4229186	0.5960181
Type 2: with drift, no trend	-29.2144709	0.0100000
Type 3: with drift, and trend	-29.5016390	0.0100000
Gini Coefficient		
Type 1: no drift, no trend	0.1815872	0.7303527
Type 2: with drift, no trend	-0.5720620	0.9183873
Type 3: with drift, and trend	-7.9586331	0.5796473
Social Mobility		
Type 1: no drift, no trend	-0.6523428	0.5449164
Type 2: with drift, no trend	-1.7047092	0.8003862
Type 3: with drift, and trend	-3.7382584	0.9004809
Home Ownership		
Type 1: no drift, no trend	-0.0193342	0.6857035
Type 2: with drift, no trend	-1.7416056	0.7962397
Type 3: with drift, and trend	-0.5692698	0.9900000
Policy Mood		
Type 1: no drift, no trend	-0.0885227	0.6703283
Type 2: with drift, no trend	-19.2059513	0.0135664
Type 3: with drift, and trend	-19.5549765	0.0714619
Consumer Confidence		
Type 1: no drift, no trend	-0.1562859	0.6552698
Type 2: with drift, no trend	-15.7278998	0.0321491
Type 3: with drift, and trend	-16.3027041	0.1642804
Midterm Election		
Type 1: no drift, no trend	-175.0000000	0.0100000
Type 2: with drift, no trend	-169.7220028	0.0100000
Type 3: with drift, and trend	-169.7124886	0.0100000
Presidential Election		
Type 1: no drift, no trend	-53.4972563	0.0100000
Type 2: with drift, no trend	-67.5167961	0.0100000
Type 3: with drift, and trend	-67.8242200	0.0100000

Figure 1: The Dynamics of Public Belief in the American Dream




mood
65
60
55
1980
1990
2000
2010
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year_decimal

Figure 2: Gini and Presidential Campaign Stationarities

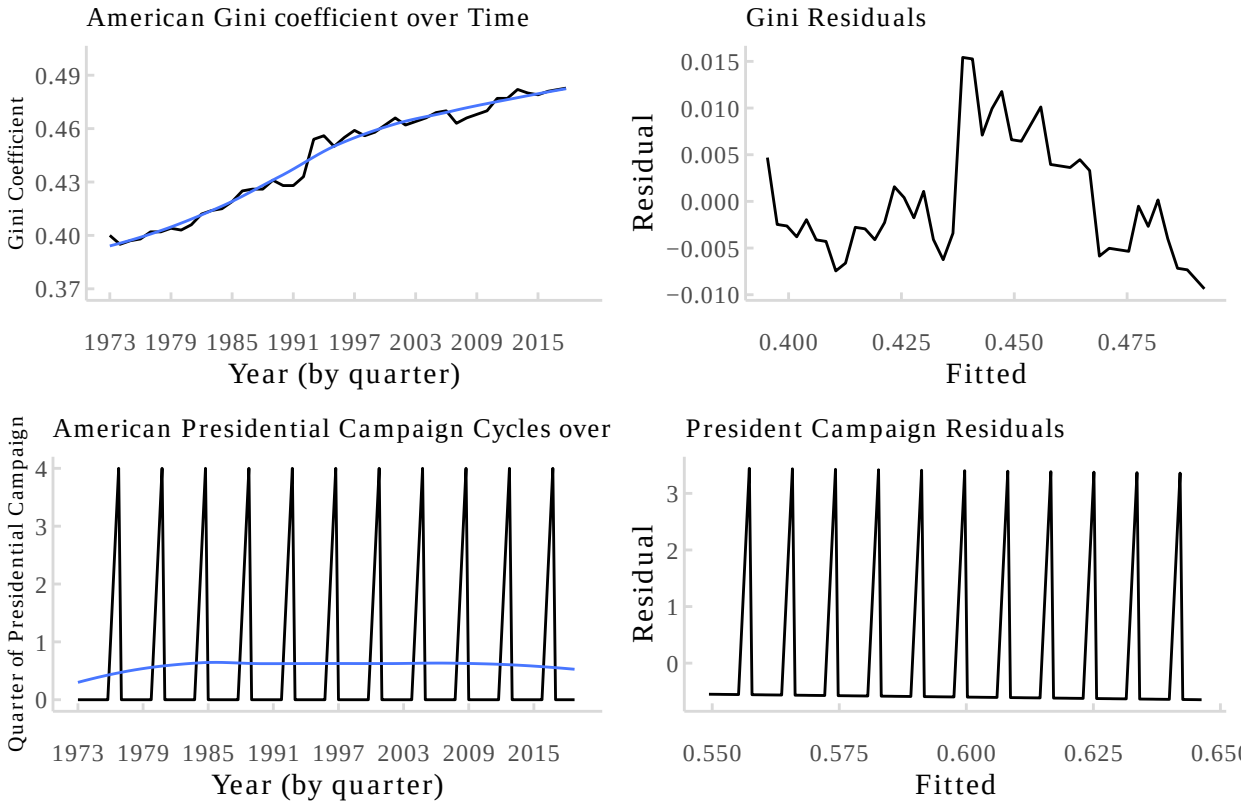


Figure 3: Estimated Lag Distributions for Belief in the American Dream

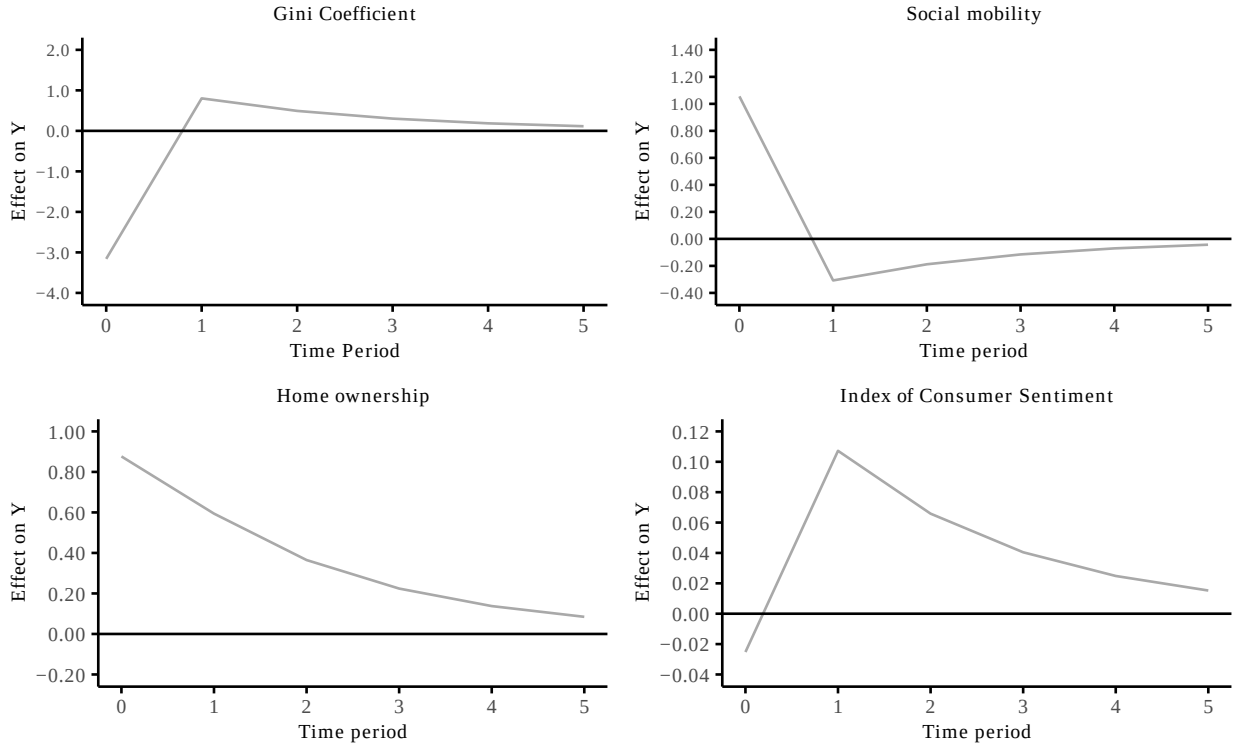
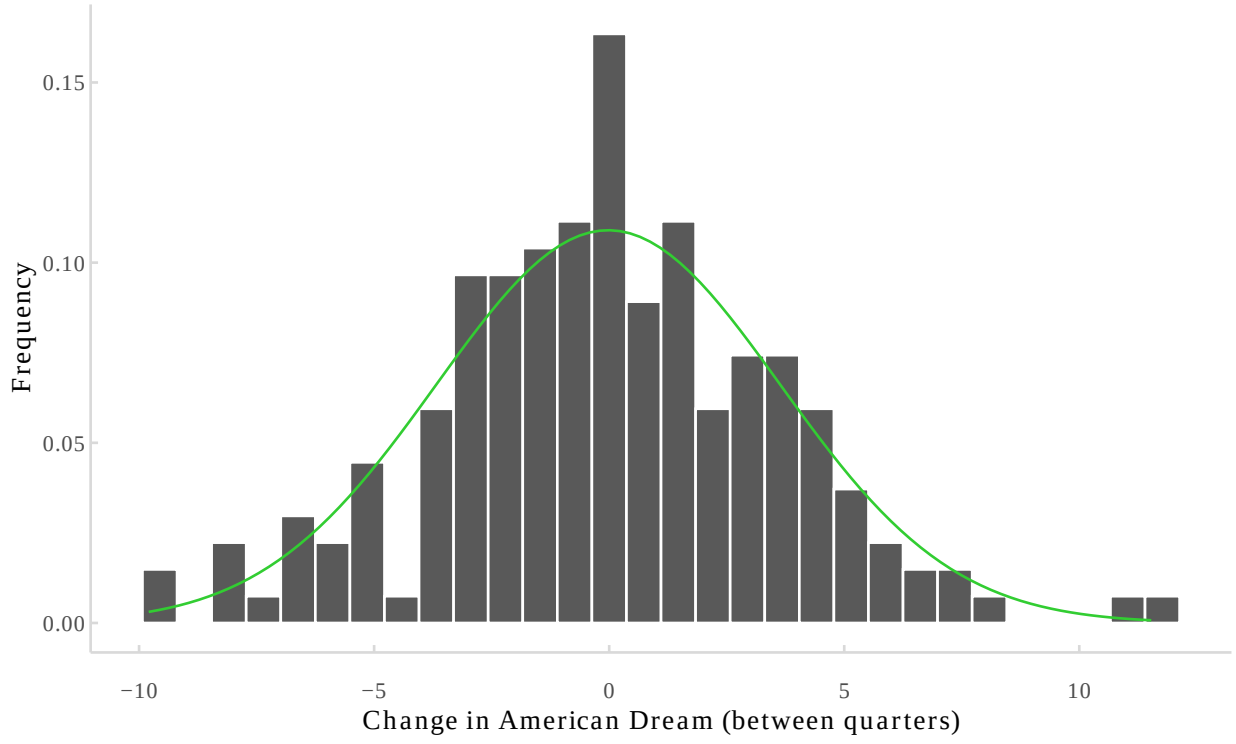


Figure 4: Distribution of Change in Belief in American Dream



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