Economic History

Assignment 1

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Invalid Date

# Check and Load necessary libraries

# Load data from the current folder

# Clean the car data

regex\_pattern <- "^[-+]?[0-9]\*\\.?[0-9]+$"  
car\_clean <- car %>%  
 filter(grepl(regex\_pattern, month)) %>%  
 pivot\_longer(  
 cols = -c(month,year),  
 names\_to = "state",  
 values\_to = "registrations"  
 )

# Merge the two datasets

# Create the post-crash dummy variable

# 5. An ideal measure of would be the average changes in stock wealth per capita.

# Construct a variable that measures the exposure of a state to the stock market

combined\_data <- combined\_data %>%  
 mutate(stock\_exposure = dividend\_income / total\_income)

# The idea behind this measure is that dividends income represents the returns that households in a state receive from their stock holdings. Therefore, we may assume that states with higher dividend income percentage have more investment in the stock market.

# 7. The regression uses a generalized difference-in-differences approach. It estimates the effect of the crash by comparing how consumption () changed after the crash () across states () based on their pre-crash exposure level (). The state fixed effects () account for constant differences across states, while the time fixed effects () account for common trends affecting all states over time. The key coefficient, , isolates the additional impact of the crash on states with higher exposure, assuming that otherwise, trends would have been parallel across states with different exposure levels (after controlling for the fixed effects).However, a major identification concern is the potential violation of this parallel trends assumption. The pre-crash exposure measure, , might be correlated with unobserved, state-specific factors that were already causing differential consumption trends before 1929. For instance, states with higher might have been on different economic growth paths. If these pre-existing trends continued after the crash, the model could wrongly attribute the difference to the crash effect () instead of the underlying trend. Additionally, using 1928 data introduces potential measurement error if exposure significantly changed between 1928 and late 1929.

# 8. Estimate the regression

OLS estimation, Dep. Var.: log\_sale  
Observations: 1,200  
Fixed-effects: state: 50, year\_month: 24  
Standard-errors: Clustered (state)   
 Estimate Std. Error t value Pr(>|t|)   
stock\_exposure:post\_crash 1.31128 0.337955 3.88005 0.00031187 \*\*\*  
... 2 variables were removed because of collinearity (stock\_exposure and post\_crash)  
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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
RMSE: 0.341664 Adj. R2: 0.929697  
 Within R2: 0.012311

# Assuming our measure of exposure to the stock market is the right one, would regression (1) be appropriate to capture the wealth channel of the crash? Would it capture the uncertainty channel that Romer writes about?

Yes, regression (1) is the right design for that channel. If stock-market-exposed states (high dividends share) see a sharper fall in car sales after October 1929, that is consistent with a causal wealth effect: the crash destroyed their balance sheets and they stopped buying cars.

No, regression (1) will not capture Romer’s uncertainty mechanism. Romer argues the crash created a temporary spike in income uncertainty that made consumers everywhere postpone durable purchases, even if they did not own stocks . That effect is mostly aggregate — the same for all states. In the regression, any common nationwide collapse in car buying after the crash is soaked up by (the time fixed effects) and by . It will not load on . So is blind to the uncertainty channel.

# The income data comes from federal tax returns. Do you see a potential problem there? Hint: less than 5% of population paid federal income tax in the 1920s

Yes: selection bias in the income data. The income data only covers tax filers, and in the 1920s fewer than 5% of Americans paid federal income tax. That means the data is basically rich households only. So if we use that income measure to proxy “state income,” we’re really tracking shocks to high-income taxpayers, not the overall population. That creates sample selection bias: we might falsely attribute a state’s consumption drop to “income falling,” when in fact we only observed the top tail. This can distort both levels and changes.

# Run the following variant of (1):

[ y\_{st} = + , x\_s MD\_t + \_t + *s + e*{st} ] where is a time dummy. Note that you will have to drop the dummy for one time period since those are colinear with the time and state fixed effects. Drop October 1929.

model2  
Dependent Var.: log\_sale  
   
stock\_exposure x year\_month = 1929-01-01 -3.124\* (1.428)  
stock\_exposure x year\_month = 1929-02-01 1.204 (0.9699)  
stock\_exposure x year\_month = 1929-03-01 2.697\* (1.074)  
stock\_exposure x year\_month = 1929-04-01 2.516\* (1.224)  
stock\_exposure x year\_month = 1929-05-01 2.729\* (1.248)  
stock\_exposure x year\_month = 1929-06-01 2.972\* (1.158)  
stock\_exposure x year\_month = 1929-07-01 1.213. (0.7098)  
stock\_exposure x year\_month = 1929-08-01 1.512. (0.8916)  
stock\_exposure x year\_month = 1929-09-01 0.5745 (0.6219)  
stock\_exposure x year\_month = 1929-11-01 1.082. (0.6379)  
stock\_exposure x year\_month = 1929-12-01 0.9486 (1.462)  
stock\_exposure x year\_month = 1930-01-01 -0.9532 (1.438)  
stock\_exposure x year\_month = 1930-02-01 1.117 (0.9017)  
stock\_exposure x year\_month = 1930-03-01 2.900\*\*\* (0.8102)  
stock\_exposure x year\_month = 1930-04-01 3.673\*\* (1.200)  
stock\_exposure x year\_month = 1930-05-01 3.679\*\* (1.207)  
stock\_exposure x year\_month = 1930-06-01 4.208\*\* (1.261)  
stock\_exposure x year\_month = 1930-07-01 2.257\* (0.9164)  
stock\_exposure x year\_month = 1930-08-01 3.329\*\* (1.060)  
stock\_exposure x year\_month = 1930-09-01 3.318\*\* (1.036)  
stock\_exposure x year\_month = 1930-10-01 2.451\* (0.9514)  
stock\_exposure x year\_month = 1930-11-01 3.385\*\*\* (0.9127)  
stock\_exposure x year\_month = 1930-12-01 4.175\* (1.573)  
Fixed-Effects: -----------------  
state Yes  
year\_month Yes  
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S.E.: Clustered by: state  
Observations 1,200  
R2 0.93883  
Within R2 0.08491  
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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1