Regional Aggregation II

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REMINDERS

1. First project draft due May 4.

Outline

OUTLINE

# MONETARY TRANSMISSION MECHANISM

- Intertemporal substitution (changes in the real interest rate affect C and I).

- Credit channel: monetary changes affect spreads, ability of banks to make loans, etc. (Jiménez, Ongena, Peydró, and Saurina, AER 2012)

- Relaxing liquidity constraints for some households by raising income (Cloyne, Ferreira, and Surico, ReStud 2020).

- Redistribute income to high MPC consumers (Hausman, Rhode, and Wieland, AER 2019).

- Increases real money balances (Chodorow-Reich, Gopinath, Mishra, Narayanan, QJE 2019).

OUTLINE

Recovery from the Great Depression

Figure 1 – Industrial production, 1929-1937
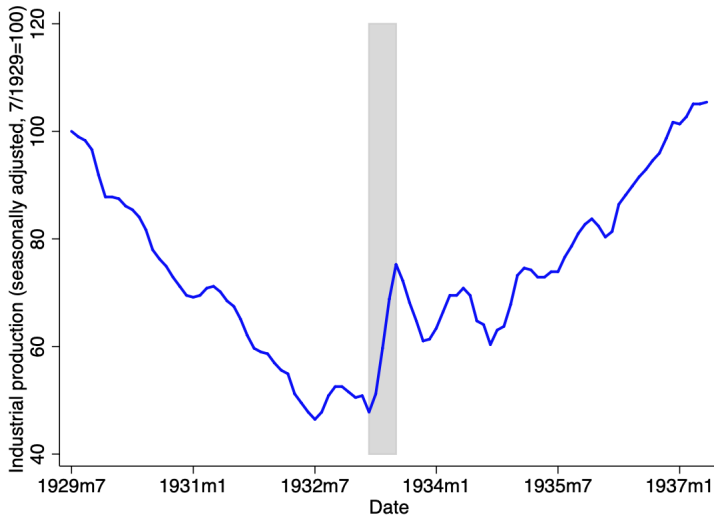
Figure 2 – The CPI, the exchange rate, and farm prices
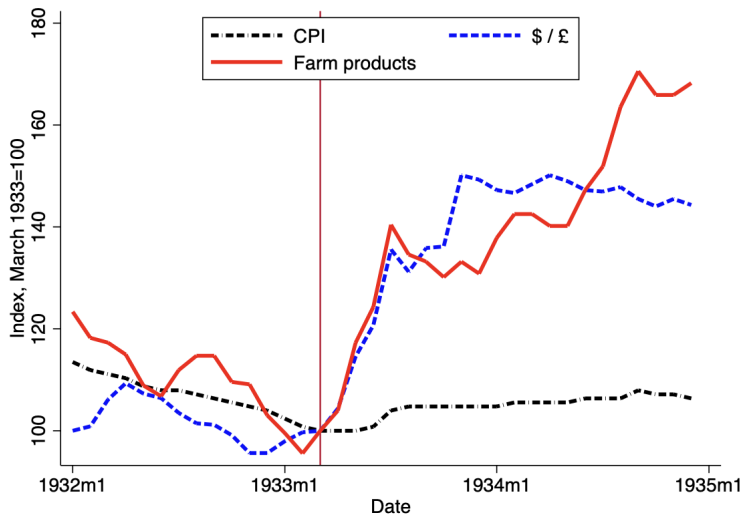
TRADABLE PRICES ROSE

Figure 3 – The exchange rate and farm prices after devaluation
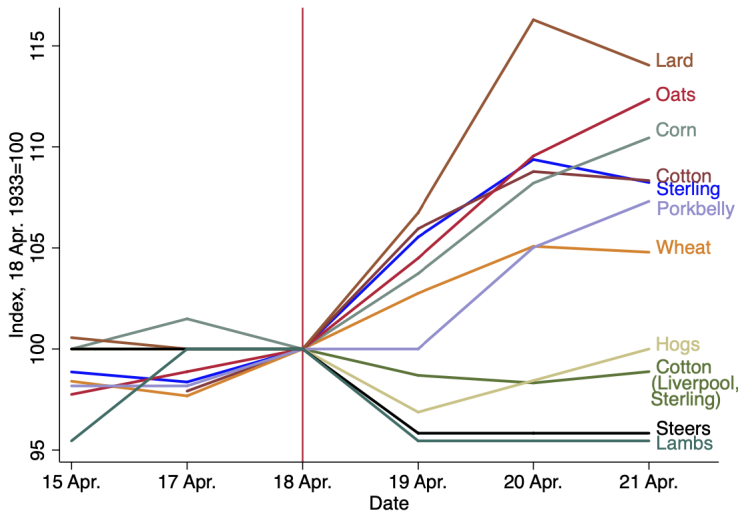
FARM INCOMES ROSE

Figure 5 – Farm income
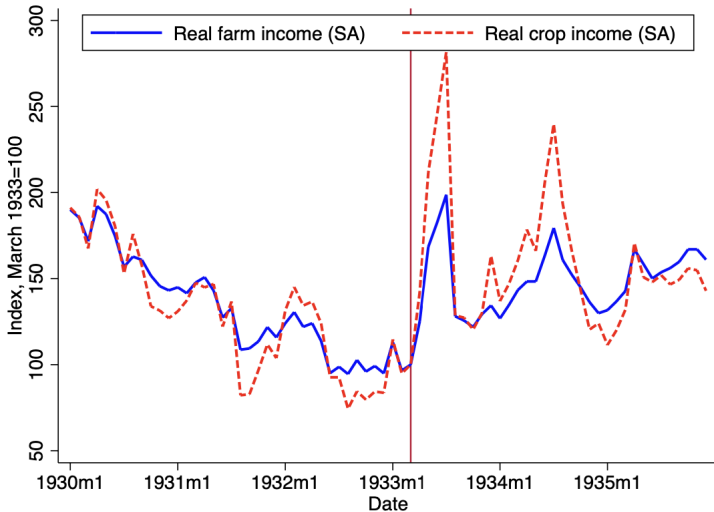
SPECIFICATION

- Cross-sectional regression of the form:

  $$\%\Delta\text{Auto sales}_{i,\text{Spring 1933}} = \beta_0 + \beta_1\text{Agricultural exposure}_i + \gamma' X_i + \varepsilon_i$$

- What is the identifying assumption?

- Comments? Concerns?

Farm States Grow Faster

Figure 6 – Percent change in car sales and farm channel exposure

TEST FOR PRE-TRENDS

Figure 7 – Auto sales by farm share quartile

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Table 3 – County New Auto Sales 1932-1933

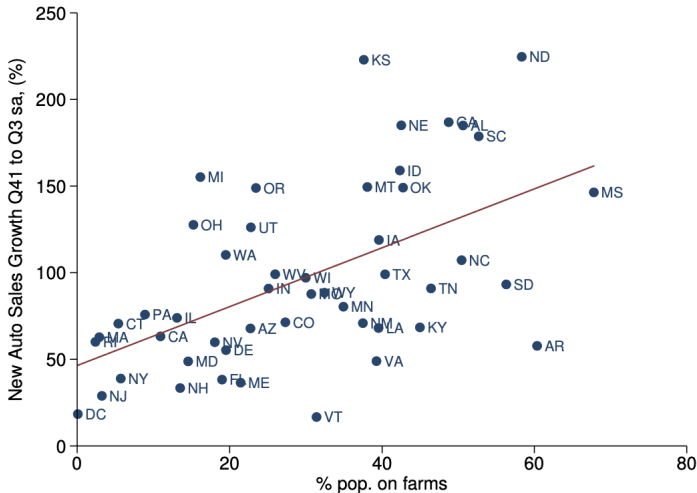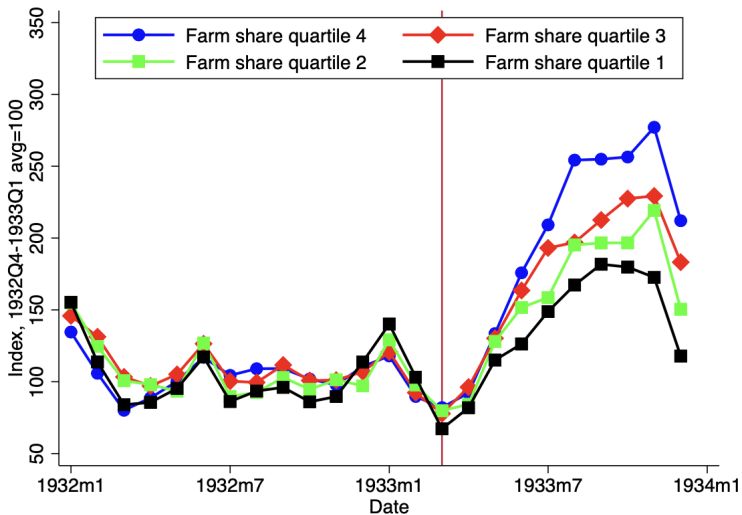| Dependent variable:	New auto sales growth (%)									Change p.c.
Geography:	State		County							County
Frequency:	Q41-Q3	1932-33	1932-33							1932-33
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Right hand side variables ($ p.c.):										
Change farm product value	1.49**	1.99**	1.54***	1.49***	1.20***	0.84**	1.05***	0.92***		5.30**
	(0.62)	(0.93)	(0.57)	(0.42)	(0.34)	(0.38)	(0.38)	(0.34)		(2.34)
Farm product value 1932	−0.55	−0.40**	−0.26**	−0.33***	−0.25***	−0.023	−0.16**	−0.16***		−1.09**
	(0.42)	(0.16)	(0.098)	(0.081)	(0.058)	(0.034)	(0.061)	(0.058)		(0.44)
AAA Transfers 1933					3.26**			2.66		
					(1.61)			(1.89)		
Cotton, tobacco, and wool value 1932									2.33***	
									(0.23)	
Corn, oats, and wheat value 1932									0.35**	
									(0.13)	
Hay, potato, and fruit value 1932									0.14	
									(0.18)	
Livestock value 1932									−0.11	
									(0.17)	
Milk and egg value 1932									−0.42***	
									(0.10)	
Control Variables	No	No	No	Yes	Yes	No	Yes	Yes	No	No
State Fixed Effects	No	No	No	No	No	Yes	Yes	Yes	No	No
Drought Interactions	No	No	No	Yes	Yes	No	Yes	Yes	No	No
R^2	0.27	0.19	0.09	0.31	0.36	0.31	0.40	0.43	0.26	0.06
Observations	48	48	2,100	2,079	2,079	2,100	2,079	2,079	2,100	2,093

CONVINCING?

AGGREGATE EFFECTS?

- Evidence is about *relative* changes in consumption expenditure.

- Three mechanisms by which it can be expansionary overall:

  1. Redistribution to higher-MPC households.

  2. Improves bank health.

  3. Raises inflation expectations.

TESTING FOR DIFFERENTIAL MPCs

- Cross-sectional regression of the form:

$$\%\Delta\text{Auto sales}_{i,\text{Spring 1933}} =$$
$$\beta_0 + \beta_1 \Delta\text{farm product value}_i \times \%\text{farms mortgaged} +$$
$$+ \beta_2 \text{farm product value}_i \times \%\text{farms mortgaged}$$
$$+ \beta_3 \Delta\text{farm product value}_i + \beta_4 \%\text{farms mortgaged}$$
$$+ \beta_5 \Delta\text{farm product value}_i + \gamma' X_i + \varepsilon_i$$

- What is the identifying assumption?

- Comments? Concerns?

DEBT-INTERACTION POSITIV

Table 5 – Auto sales growth in spring 1933 (% changes) and farm debt

Panel A: Linear interaction with % farms mortgaged				
	(1)	(2)	(3)	(4)
Linear Interaction	0.37*	0.77***	0.57**	0.72***
	(0.19)	(0.24)	(0.23)	(0.24)
Change farm product value p.c. ($)	1.39**	0.089	0.49	0.018
	(0.61)	(0.50)	(0.52)	(0.51)
State Fixed Effects	No	Yes	No	Yes
Control Variables	No	No	Yes	Yes
Drought Interactions	Yes	Yes	Yes	Yes
R^2	0.23	0.40	0.37	0.44
Observations	2,094	2,094	2,073	2,073

DIFFERENTIAL DEPOSIT GROWTH

Figure 12 – Net demand deposits, 1930-33
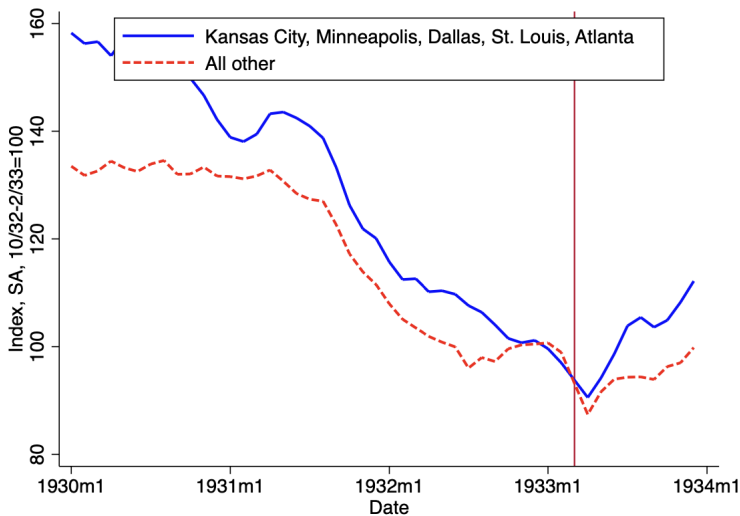
INFLATION EXPECTATIONS?

(b) Tires

AGGREGATION

- Simple framework to examine how cross-sectional estimates map to the aggregate economy.

- Model has heterogeneity on the following three dimensions:

  - Income from farming, labor, or pricing power.

  - Permanent income vs hand-to-mouth.

  - Farm vs urban area.

- Simplifications:

  - Model essentially static.

  - Exogenous relative price movements.

- Who looked at the appendix?

$$\%\Delta\text{Cars} = \underbrace{\beta \times \phi^f}_{\substack{\text{``naive''} \\ \text{extrapolation}}} \times \underbrace{\frac{\text{Farm area income per capita}}{\text{National income per capita}}}_{\text{Relative income p.c.}}$$

$$\times \underbrace{\left(1 - \xi\frac{\theta^w}{\theta^f}\right)}_{\substack{\text{Redistribution from} \\ \text{high-MPC consumers}}} \times \underbrace{\mu_t}_{\substack{\text{Aggregate} \\ \text{spending} \\ \text{multiplier}}}$$

$$+ \underbrace{-\sigma d\ln(1 + r_t)}_{\text{Intertemporal Substitution}}$$

- Comments? Concerns?

AGGREGATE EFFECT OF FARM CHANNEL

Table 7 – Implied aggregate effect

| Redistribution from high MPC consumers, $\xi\frac{\theta^w}{\theta^f}$ | Predicted %ΔCars | | | Fraction of actual %ΔCars | | |
| | Aggregate Multiplier | | | Aggregate Multiplier | | |
	$\mu = 1$	$\mu = 2$	$\mu = 3$	$\mu = 1$	$\mu = 2$	$\mu = 3$
0.7	8.0	15.9	23.9	9.2	18.4	27.6
0.6	10.6	21.2	31.9	12.3	24.6	36.8
0.5	13.3	26.6	39.8	15.4	30.7	46.1
0.4	15.9	31.9	47.8	18.4	36.8	55.3
0.3	18.6	37.2	55.8	21.5	43.0	64.5

Notes: Columns 2-4 display the implied new car sales growth rate from equation (8) given the indicated parameter values, and $\beta = 1.7$, $\phi^f = 0.248$, $\frac{Y_{p.c.,a}}{Y_{p.c.}} = 0.63$. Columns 5-7 show the fraction of actual new car sales growth (86.5%) explained.

- Thoughts? Comments?

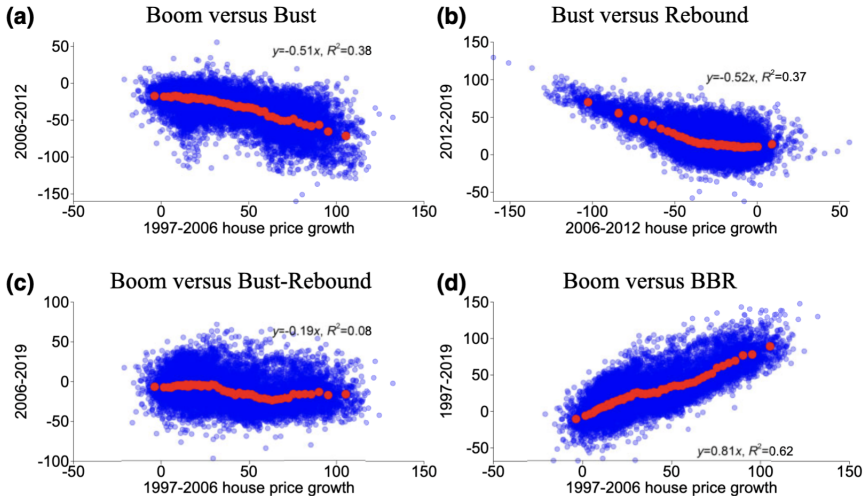# CONVINCING?

OUTLINE

HOUSING

[graph of house prices]

- Bubble or Fundamentals? If fundamentals, demand or supply? (What is a fundamental?)

- Bubble view: Shiller, Charles et al

- Fundamental view: Chodorow-Reich et al, Mondragon and Wieland

CHODOROW-REICH, GUREN, MCQUADE (2024, RESTUD)

1. Document boom-bust-rebound.

2. Fundamentals explain cross-city variation in long-run house price growth.

3. Model that generates boom-bust-rebound from single fundamental shock with endogenous belief overreaction.

BOOM, BUST, AND REBOUND

(a) Boom versus Bust
$y=-0.51x$, $R^2=0.38$
2006-2012 vs 1997-2006 house price growth

(b) Bust versus Rebound
$y=-0.52x$, $R^2=0.37$
2012-2019 vs 2006-2012 house price growth

(c) Boom versus Bust-Rebound
$y=-0.19x$, $R^2=0.08$
2006-2019 vs 1997-2006 house price growth

(d) Boom versus BBR
$y=0.81x$, $R^2=0.62$
1997-2019 vs 1997-2006 house price growth

FRAMEWORK FOR LONG-RUN FUNDAMENTALS

- Good practice: write down the DGP.

- LR supply block:

$$P_{it} = C_{it} + L_{it}$$
$$C_{it} = A_{it} H_{it}^{\alpha_i}$$
$$L_{it} = B_{it} H_{it}^{\beta_i}$$

A, B are cost shifters independent of population.

- LR demand block:

$$\frac{\dot{H}_{it}}{H_{it}} = G_i \left(\frac{V_{it}}{P_{it}} \right) V_{it} \qquad = E_t \int_t^\infty e^{-\rho s} D_{is} ds$$

ESTIMATING LR SUPPLY

- Taking log differences with s_{it} as the land share in P:

$$\Delta p_{it} = \Delta a_{it} + s_{i,t-1}(\Delta b_{it} - \Delta a_{it}) + (\alpha_i + s_{i,t-1}(\beta_i - \alpha_i))h_{it}$$